

STATE OF DELAWARE

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DeIDOT in order to bid.



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201807401.01

SILVER LAKE DAM REPAIRS

NEW CASTLE COUNTY

ADVERTISEMENT DATE: March 30, 2020

COMPLETION TIME: 320 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
DELAWARE DEPARTMENT OF TRANSPORTATION
AUGUST 2016

Bids will be received in the Bidder's Room at the Delaware Department of Transportation's Administration Building, 800 Bay Road, Dover, Delaware prior to 2:00 P.M. local time April 28, 2020

Contract No. T201807401.01

**SILVER LAKE DAM REPAIRS
NEW CASTLE COUNTY**

GENERAL DESCRIPTION

LOCATION

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

DESCRIPTION

The improvements consist of furnishing all labor and materials for, and other incidental construction in accordance with the location, notes and details shown on the plans and as directed by the Engineer.

COMPLETION TIME

All work on this contract must be complete within 320 Calendar Days. The Contract Time includes an allowance for 56 Weather Days. It is the Department's intent to issue a Notice to Proceed such that work starts on or about August 3, 2020.

PROSPECTIVE BIDDERS NOTES:

1. BIDDERS MUST BE REGISTERED with DelDOT and request a cd of the official plans and specifications in order to submit a bid. Contact DelDOT at dot-ask@delaware.gov, or (302) 760-2031. Bids will be received in the Bidder's Room at the Delaware Department of Transportation's Administration Building, 800 Bay Road, Dover, Delaware prior to 2:00 P.M. local time April 28, 2020 unless changed via addendum.
2. QUESTIONS regarding this project are to be e-mailed to dot-ask@delaware.gov no less than six business days prior to the bid opening date in order to receive a response. Please include T201807401.01 in the subject line. Responses to inquiries are posted on-line at <http://www.bids.delaware.gov>.
3. PREQUALIFICATION REQUIREMENT - 29 Del.C. §6962 (c)(12)(a) requires DelDOT to include a performance-based rating system for contractors. The Performance Rating for each Contractor shall be used as a prequalification to bid at the time of bid. Refer to Contract '*General Notices*' for details. **NEW**
4. **THE BID PROPOSAL software used by DelDOT has changed. We now use Bid Express.** This new software is an updated version of the previous software used and operates similarly. The cd you request from DelDOT contains the Bid Express file and its installation file. Bidders are to use the cd provided to enter their bid amounts into the Bid Express file. The Bid Express bid file must be printed and submitted in paper form along with the electronic bid file and other required documents prior to the Bid due date and time. (DelDOT is not utilizing web based electronic bidding for this project).
5. SURETY BOND - Each proposal must be accompanied by a deposit of either surety bond or security for a sum equal to at least 10% of the bid.
6. DRUG TESTING - Regulation 4104; The state Office of Management and Budget has developed regulations that require Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds pursuant to 29 Del.C. §6908(a)(6). **Refer to the full REVISED requirements at the following link:** http://regulations.delaware.gov/register/december2017/final/21_DE_Reg_503_12-01-17.htm

Note a few of the Drug Testing requirements;

- * At bid submission - Each bidder must submit with the bid a single signed affidavit certifying that the bidder and its subcontractors has in place or will implement during the entire term of the contract a Mandatory Drug Testing Program that complies with the regulation, *the form is attached*;
 - * At least two business days prior to contract execution - The awarded Contractor shall provide to DeIDOT copies of the Employee Drug Testing Program for the Contractor, and any other listed Subcontractors;
 - * Subcontractors - Contractors that employ Subcontractors on the job site may do so only after submitting a copy of the Subcontractor's Employee Drug Testing Program along with the standard required subcontractor information. A Subcontractor shall not commence work until **DeIDOT** has approved the subcontractor in writing;
 - * Penalties for non-compliance are specified in the regulation.
7. No RETAINAGE will be withheld on this contract unless through the Prequalification Requirements.
 8. EXTERNAL COMPLAINT PROCEDURE can be viewed on DeIDOT's Website [here](#), or you may request a copy by calling (302) 760-2555.
 9. REMINDER; A copy of your firm's Delaware Business License must be submitted with your bid.
 10. AUGUST 2016 STANDARD SPECIFICATIONS apply to this contract. The Contractor shall make himself aware of any revisions and corrections (Supplemental Specifications, if any) and apply them to the applicable item(s) of this contract. The 2016 Standard Specifications can be [viewed here](#).
- 10a. FLATWORK CONCRETE TECHNICIAN CERTIFICATION TRAINING:
Section 501.03, 503.03, 505.03, 610.03, 701.03 and 702.03 of the 2016 Standard Specifications require contractor's to provide an American Concrete Institute (ACI) or National Ready Mix Concrete Association (NRMCA) certified concrete flatwork technician to supervise all finishing of flatwork concrete. Concrete flatwork certification will be effective starting on June 1, 2018.

**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.

GENERAL NOTICES

SPECIFICATIONS:

The specifications entitled "Standard Specifications for Road and Bridge Construction, August, 2016", hereinafter referred to as the Standard Specifications, and 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. The Specifications and Supplemental Specifications can be [viewed here](#).

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.

PREQUALIFICATION REQUIREMENT

29 Del.C. §6962 (c)(12)(a) requires a Department of Transportation project, excluding a Community NEW Transportation Fund or municipal street aid contract, to include a performance-based rating system. At the time of bid, the Performance Rating for each Contractor shall be used as a prequalification to bid.

Bidders with Performance Rating scores equal to or greater than 85% shall be permitted to bid. Bidders with scores of less than 85% who comply with the retainage requirements of 29 Del.C. §6962 shall be permitted to bid provided the *Agreement to Accept Retainage* (located on the Certification Page) is executed and submitted with the bid. Lack of an executed *Agreement to Accept Retainage* will result in the rejection of the bid by the Department. Successful bidders awarded Department contracts who have no performance history within the last five (5) years will be assigned a provisional Performance Rating of 85% at the date of advertisement.

Notification of Performance Rating. The Department shall post publicly the Performance Rating for all Contractors on the Department's [website](#). DelDOT will complete performance-based evaluations on the construction company contracted by the Department to build the project (the "Contractor"). Provisions to appeal Performance Ratings are described in the regulations. The regulations are set forth in Section 2408 of Title 2, Delaware Administrative Code, found [here](#).

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) states;

- 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, sexual orientation, gender identity 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, sexual orientation, gender identity 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, sexual orientation, gender identity or national origin.
3. The contractor will ensure employees receive equal pay for equal work, without regard to sex. Employee pay differential is acceptable if pursuant to a seniority system, a merit system, a system which measures earnings by quantity or quality of production, or if the differential is based on any other factor other than sex.

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.

CONTRACTOR / SUBCONTRACTOR LICENSE: 29 DEL. C. §6967:

(b) No agency shall accept a proposal for a public works contract unless such contractor has provided a proper and current copy of its occupational and/or business license, as required by Title 30, to such agency.

(c) Any contractor that enters a public works contract must provide to the agency to which it is contracting, within 30 days of entering such public works contract, copies of all occupational and business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the

contractor entered the public works contract the occupational or business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

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.

RIGHT TO AUDIT

The Department shall have the right to audit the books and records of the contractor or any subcontractor under this contract or subcontract to the extent that the books and records relate to the performance of the contract or subcontract. The books and records shall be maintained by the contractor for a period of 3 years from the date of final payment under the prime contract and by the subcontractor for a period of 3 years from the date of final payment under the subcontract (29 Del.C. §6930)

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.

REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION

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 prevailing wage regulations implementing §6960 relating to the effective date of the wage rates, at Section 6.3, which in relevant part states:

"Public agencies (covered by the provisions of 29 Del.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."

Contractor may contact:

Department of Labor, Division of Industrial Affairs, 4425 N. Market Street, Wilmington, DE 19802
Telephone (302) 761-8200

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 761-8200

Mailing Address:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

Located at:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

PREVAILING WAGES FOR **HEAVY CONSTRUCTION** EFFECTIVE MARCH 13, 2020

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	23.54	20.70	45.02
BOILERMAKERS	82.52	34.21	62.76
BRICKLAYERS	73.45	63.07	26.53
CARPENTERS	56.46	56.46	44.83
CEMENT FINISHERS	46.44	25.94	19.32
DIVER	88.31	-	-
DIVER TENDER	95.04	-	-
ELECTRICAL LINE WORKERS	78.46	78.05	68.87
ELECTRICIANS	72.49	72.49	72.49
GLAZIERS	21.75	18.89	12.79
INSULATORS	59.68	59.68	59.68
IRON WORKERS	67.70	64.93	67.70
LABORERS	49.20	49.20	49.20
MILLWRIGHTS	76.83	76.83	61.93
PAINTERS	85.91	85.91	85.91
PILEDRIVERS	79.62	41.92	32.62
PLASTERERS	20.48	17.80	12.02
PLUMBERS/PIPEFITTERS/STEAMFITTERS	92.63	82.92	19.06
POWER EQUIPMENT OPERATORS	73.29	73.29	73.29
SHEET METAL WORKERS	32.73	20.31	19.07
SPRINKLER FITTERS	35.28	13.36	11.06
TRUCK DRIVERS	34.05	21.96	23.72

CERTIFIED:

03/19/2020

BY:

[Signature]
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: T201807401.01 Silver Lake Dam Repairs , New Castle County

SUPPLEMENTAL SPECIFICATIONS TO THE 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; <https://www.deldot.gov>
- under 'BUSINESS', Click; 'Publications'
- scroll down under 'MANUALS' and Click; "Standard Specifications"
- be sure and choose the correct Standard Specification year; 2001 or 2016
- choose the latest revision prior to the date of this advertisement

The full Website Link is;

https://www.deldot.gov/Publications/manuals/standard_specifications/index.shtml

Copies of the Supplemental Specifications can be printed from the Website.

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

Contract T201807401.01
SILVER LAKE DAM REPAIRS
SPECIAL PROVISIONS

S.P. Code	SPECIAL PROVISION DESCRIPTION
401502-15	ASPHALT CEMENT COST ADJUSTMENT
401699-15	QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE
604500-15	COFFERDAMS
610512-15	SELF CONSOLIDATING CONCRETE
615520-15	STAINLESS STEEL SLIDE GATE
615521-15	METAL FABRICATIONS
624504-15	HYDROPHILIC WATERSTOP
763501-15	CONSTRUCTION ENGINEERING
763508-15	PROJECT CONTROL SYSTEM DEVELOPMENT PLAN
763509-15	CPM SCHEDULE UPDATES AND/OR REVISED UPDATES
801500-15	MAINTENANCE OF TRAFFIC, ALL INCLUSIVE

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. A comprehensive list of construction item numbers are listed in 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.

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 link for the [posting is here](#).

The Project Asphalt Cement Base Price will be the Delaware Posted Asphalt Cement Price in effect on the date of advertisement.

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 using the weight of eligible asphalt that is shown on the QA/QC pay sheets as a percentage for the delivered material.

If the mix was not inspected and no QA/QC pay sheet was generated, then the asphalt percentage will be obtained from the job mix formula for that mix ID.

The asphalt percentage eligible for cost adjustment shall only be the virgin asphalt cement added to the mix.

There shall be no separate payment per ton cost of asphalt cement. That cost shall be included in the various unit prices bid per 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 per ton for the project will be the Delaware Posted Asphalt Cement Price in effect on the date of project advertisement.

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 or more of hot-mix bid quantity in case of Sections 401, 402 and 403; and 15,000 gallons or more in case of Sections 304, 404 and 405.

5/05/15

401699 - QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE

.01 Description

This item shall govern the Quality Assurance Testing for supplying bituminous asphalt plant materials and constructing bituminous asphalt pavements and the calculation for incentives and disincentives for materials and construction. The Engineer will evaluate all materials and construction for acceptance. The procedures for acceptance are described in this Section. Include the costs for all materials, labor, equipment, tools, and incidentals necessary to meet the requirements of this specification in the bid price per ton for the bituminous asphalt. Payment to the Contractor for the bituminous asphalt item(s) will be based on the Contract price per ton and the pay adjustments described in this specification.

.02 Bituminous Concrete Production – Quality Acceptance

(a) Material Production - Tests and Evaluations.

All acceptance tests shall be performed by qualified technicians at qualified laboratories following AASHTO or DelDOT procedures, and shall be evaluated using Quality Level Analysis. The Engineer will conduct acceptance tests. The Engineer will directly base acceptance on the acceptance test results, the asphalt cement quality, the Contractor's QC Plan work, and the comparisons of the acceptance test results to the QC test results. The Engineer may elect to utilize test results of the Contractor in some situations toward judging acceptance.

Supply and capture samples, as directed by the Engineer under the purview of the Engineer from delivery trucks before the trucks leave the production plant. Hand samples to the Engineer to be marked accordingly. The sample shall represent the material produced by the Contractor, and shall be of sufficient size to allow the Engineer to complete all required acceptance tests. The Engineer will direct the Contractor when to capture these samples, on a statistically random, unbiased basis, established before production begins each day based upon the anticipated production tonnage. The captured sample shall be from the Engineer specified delivery truck. The Contractor may visually inspect the specified delivery load during sampling and elect to reject the load. If the contractor elects to reject the specified delivery truck, each subsequent load will be inspected until a visually acceptable load is produced for acceptance testing. All visually rejected loads shall not be sent to a Department project.

The first sample of the production day will be randomly generated by the Engineer between loads 0 and 12 (0-250 tons). Subsequent samples will be randomly generated by the Engineer on 500-ton sub-lots for the production day. Samples not retrieved in accordance with the Contractor's QC plan will be deemed unacceptable and may be a basis for rejection of material produced. Parallel tests or dispute resolution tests will only be performed on material captured at the same time and location as the acceptance test sample. Parallel test samples or Dispute Resolution samples will be created by splitting a large sample or obtaining multiple samples that equally represent the material. The Engineer will perform all splitting and handling of material after it is obtained by the Contractor.

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The Contractor may retain dispute resolution samples or perform parallel tests with the Engineer on any acceptance sample.

The Engineer will evaluate and accept the material on a lot basis. All the material within a lot shall have the same JMF (mixture ID). The lot size shall be targeted for 2000 tons or a maximum period of three days, whichever is reached first. If the 2000th ton target lot size is achieved during a production day, the lot size shall extend to the end of that production day. The Contractor may interrupt the production of one JMF in order to produce different material; this type of interruption will not alter the determination of the size or limits of material represented by a lot. The Engineer will evaluate each lot on a subplot basis. The size for each subplot shall be 100 to 500 tons and testing for the sub lots will be completed on a daily basis. For each subplot, the Engineer will evaluate one sample.

The target size of sub-lots within each lot, except for the first sample of the production day, is equal-sized 500 ton sub lots and will be based upon anticipated production, however, more or fewer sublots, with differing sizes, may result due to the production schedule and conditions. If the actual production is less than anticipated, and it's determined a sample will not be obtained (based upon the anticipated tonnage), a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. If the actual production is going to be 50 tons or greater over the anticipated sub lot production, a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. The Engineer will combine the evaluation and test results for all of the applicable sublots in order to evaluate each individual lot.

If the Engineer is present, and the quantity exceeds 25 tons, a statistically random sample will be used for analysis. When the anticipated production is less than 100 tons and greater than 25 tons, and the Engineer is not present, the contractor shall randomly select a sample using the Engineer's random location program. The captured sample shall be placed in a suitable box, marked to the attention of the Engineer, and submitted to the Engineer for testing. A box sample shall also be obtained by the contractor at the same time and will be used as the Dispute Resolution sample if requested by the Engineer. The Contractor shall also obtain one liquid asphalt sample (1 pint) per grade of asphalt used per day and properly label it with all pertinent information.

The Engineer will conduct the following tests in order to characterize the material for the pavement compaction quality and to judge acceptance and the pay adjustment for the material:

- AASHTO T312 - Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T166, Method C (Rapid Method) - Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens
- AASHTO T308 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method
- AASHTO T30 - Mechanical Analysis of Extracted Aggregate
- AASHTO T209 - Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt (HMA)

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- ASTM D7227 - Standard Practice for Rapid Drying of Compacted Asphalt Specimens using Vacuum Drying Apparatus

(b) Pavement Construction - Tests and Evaluations.

The Engineer will directly base acceptance on the compaction acceptance test results, and on the inspection of the construction, the Contractor's QC Plan work, ride smoothness as referenced in the contract documents, lift thickness as referenced in the contract documents, joint quality as referenced in the contract documents, surface texture as referenced in the contract documents, and possibly the comparisons of the acceptance test results to the independent test results. For the compaction acceptance testing, the Engineer will sample the work on a statistically random basis, and will test and evaluate the work based on daily production.

Notify the Engineer of any locations within that road segment that may not be suitable to achieve minimum (93%) compaction due to existing conditions prior to paving the road segment. Schedule and hold a meeting in the field with the Engineer in order to discuss all areas that may potentially be applicable to Table 5a before paving starts. Areas that will be considered for Table 5a will be investigated in accordance to the method described in Appendix B. If this meeting is not held prior to paving, no areas will be considered for Table 5a. Areas of allowable exemptions that will not be cored include the following: partial-depth patch areas, driveway entrances, paving locations of less than 100 tons, areas around manholes and driveway entrances, and areas of paving that are under 400 feet in continuous total length and/or 5 feet in width.

The exempt areas around manholes will be a maximum of 4 feet transversely on either side from the center of the manhole, and 20 feet longitudinally on either side from the center of the manhole. The exempt areas around driveway entrances shall be the entire width of the driveway, and 3 feet from the edge of the longitudinal joint next to the driveway. Areas of exemption that will be cored for informational purposes only include: areas where the mat thickness is less than three times the nominal maximum aggregate size as directed by the Engineer, violations of Section 401.08 in the Standard Specifications as directed by the Engineer, and areas shown to contain questionable subgrade properties as proven by substantial yielding under a fully legally loaded truck. Failure to obtain core samples in these areas will result in zero payment for compaction regardless of the exempt status.

The Engineer will evaluate and accept the compaction work on a daily basis. Payment for the compaction will be calculated by using the material production lots as referenced in **.02 Acceptance Plan (a) Material Production - B Tests and Evaluation** and analyzing the compaction results over the individual days covered in the material production lot. The compaction results will be combined with the material results to obtain a payment for this item.

The minimum size of a compaction lot shall be 100 tons. If the compaction lot is between 101 and 1000 tons, the Engineer shall randomly determine four compaction acceptance test locations. If the compaction lot is between 1001 and 1500 tons, the Engineer shall randomly determine six compaction acceptance test locations. If the compaction lot is between 1501 and 2000 tons, the Engineer shall randomly determine eight compaction acceptance test locations. If the compaction lot is greater than 2000 tons, the Engineer shall randomly determine two compaction acceptance test locations per 500 tons.

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If a randomly selected area falls within an Engineer approved exemption area, the Engineer will select one more randomly generated location to be tested per the requirements of this Specification. If that cannot be accomplished, or if an entire location has been declared exempt, the compaction testing shall be performed as per these Specifications but a note will be added to the results that the location was an Engineer approved exempt location.

Testing locations will be a minimum of 1.0 feet from the newly placed longitudinal joint and 50 feet from a new transverse joint.

Cut one six (6) inch diameter core through the full lift depth at the exact location marked by the Engineer. Cores submitted that are not from the location designated by the Engineer will not be tested and will be paid at zero pay.

Notify the Engineer prior to starting paving operations with approximate tonnage to be placed. The Contractor is then responsible for notifying the appropriate Engineer test personnel within 12 hours of material placement. The Engineer will mark core locations within 24 hours of notification. After determination of locations, the Contractor shall complete testing within two operational days of the locations being marked. If the cores are not cut within two operational days, the area in question will be paid at zero pay for compaction testing.

Provide any traffic control required for the structural number investigation, sampling, and testing work at no additional cost to the Department.

Commence coring of the pavement after the pavement has cooled to a temperature of 140°F or less. Cut each core with care in order to prevent damaging the core. Damaged cores will not be tested. Label each core with contract number, date of construction, and number XX of XX upon removal from the roadway. Place cores in a 6-inch diameter plastic concrete cylinder mold or approved substitute for protection. Separate cores in the same cylinder mold with paper. Attach a completed QC test record for the represented area with the corresponding cores. The Engineer will also complete a test record for areas tested for the QA report and provide to Materials & Research. Deliver the cores to the Engineer for testing, processing, and report distribution at the end of each production day.

Repair core holes per Appendix A, Repairing Core Holes in Bituminous Asphalt Pavements. Core holes shall be filled immediately. Failure to repair core holes at the time of coring will result in zero pay for compaction testing for the area in question.

The Engineer will conduct the following tests on the applicable portion of the cores in order to evaluate their quality:

- AASHTO T166, Method C (Rapid Method) B Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens

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- AASHTO T209 - Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt
- ASTM D7227 - Standard Practice for Rapid Drying of Compacted Asphalt Specimens using Vacuum Drying Apparatus

The Engineer will use the average of the last five test values of the same JMF (mixture ID) material at the production plant in order to calculate the average theoretical maximum specific gravity of the cores. The average will be based on the production days test results and as many test results needed from previous days production to have an average of five samples. If there are less than five values available, the Engineer will use the JMF design value in addition to the available values to calculate the average theoretical maximum specific gravity.

.03 Payment and Pay Adjustment Factors.

The Engineer will determine pay adjustments for the bituminous asphalt item(s) in accordance with this specification. The Engineer will determine a pay adjustment factor for the material produced and a pay adjustment factor for the pavement construction. Pay adjustments for material and construction will be calculated independently. When the pay adjustment calculation for either material or construction falls to zero payment per tables 4, 5, or 5a, the maximum pay adjustment for the other factor will not exceed 100.

Pay Adjustment factors will only be calculated on in place material. Removed material will not be used in payment adjustment calculations.

Material Production Pay Adjustments will be calculated based upon 70% of the contract unit price and calculated according to section .03(a) of this specification. Pavement construction Pay Adjustments will be calculated based upon 30% of the contract unit price and calculated according to section .03(b) of this specification.

(a) Material Production - Pay Adjustment.

Calculate the material pay adjustment by evaluating the production material based on the following parameters:

Table 2 - Material Parameter Weight Factors		
Material Parameter	Single Test Tolerance (+/-)	Weight Factor
Asphalt Content	0.4	0.30
#8 Sieve (>=19.0 mm)	7.0	0.30
#8 Sieve (<=12.5 mm)	5.0	0.30
#200 Sieve (0.075mm Sieve)	2.0	0.30
Air Voids (4.0% Target)	2.0	0.10

Using the JMF target value, the single test tolerance (from Table 2), and the test values, the Engineer will use the following steps to determine the material pay adjustment factor for each lot of material:

1. For each parameter, calculate the mean value and the standard deviation of the test values for the lot to the nearest 0.1 unit.
2. For each parameter, calculate the Upper Quality Index (QU):

$$QU = ((JMF \text{ target}) + (\text{single test tolerance}) - (\text{mean value})) / (\text{standard deviation}).$$
3. For each parameter, calculate the Lower Quality Index (QL):

$$QL = ((\text{mean value}) - (JMF \text{ target}) + (\text{single test tolerance})) / (\text{standard deviation}).$$
4. For each parameter, locate the values for the Upper Payment Limit (PU) and the Lower Payment Limit (PL) from Table 3 - Quality Level Analysis by the Standard Deviation Method. (Use the column for "n" representing the number of sublots in the lot. Use the closest value on the table when the exact value is not listed).
5. Calculate the PWL for each parameter from the values located in the previous step:

$$PWL = PU + PL - 100.$$
6. Calculate each parameter's contribution to the payment adjustment by multiplying its PWL by the weight factor shown in Table 2 for that parameter.
7. Add the calculated adjustments of all the parameters together to determine the Composite PWL for the lot.

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8. From Table 4, locate the value of the Pay Adjustment Factor corresponding to the calculated PWL. When all properties of a single test are within the single test tolerance of Table 2, Pay Adjustment factors shall be determined by Column B. When any property of a single test is outside of the Single Test Tolerance parameters defined in Table 2, the Material Pay Adjustment factor shall be determined by Column C
9. For each lot, determine the final material price adjustment:

Final Material Pay Adjustment =

(Lot Quantity) x (Item Bid Price) x (Pay Adjustment Factor) x 70%. This final pay calculation will be paid to the cent.

In lieu of being assessed a pay adjustment penalty, the Contractor may choose to remove and replace the material at no additional cost to the Department. When the PWL of any material parameter in Table 2 is below 60, the Engineer may require the removal and replacement of the material at no additional cost to the Department. Test results on removed material shall not be used in calculation of future PWL calculations for Mixture ID.

The test results from the Engineer on production that is less than 100 tons will be combined with the two most recently completed Engineer tests with the same Mixture ID to calculate payment for the lot encompassing the single test. If that cannot be accomplished, the approved JMF will be used to calculate payment for the lot encompassing the single test. Payment for previously closed lots will not be affected by the analysis.

When a sample is outside of the allowable single test tolerance for any Materials criteria in Table 2, that sample will be isolated. For payment purposes, the test result of the out of acceptable tolerance sample will be combined with the two previous acceptable samples of the same JMF and analyzed per this specification. The material that is considered out of the acceptable tolerance will only include the material within the represented sub-lot (i.e., a maximum of 500 tons). If the previous acceptable test result is from the previous production day, only the material produced on the second production day will be considered out of tolerance. All future sub lots will not include the isolated test. The pay factors for the out of tolerance sample lot will be calculated using column C of table 4.

If, during production, a QA sample test result does not meet the acceptable tolerances and the Contractor's QC sample duplicates the QA sample test result, the Contractor can make an appropriate change to the mixture (within the JMF boundaries), and request to have that sample further isolated. After the Contractor has made appropriate changes, the Contractor will visually inspect each produced load. The first visually acceptable load will be sampled and tested. If that sample test result shows compliance with the specifications, the material that is considered out of the acceptable tolerance will include the material from the previous acceptable test result to the third load after the initially sampled and tested sample. If the sample does not meet the specification requirements, the Engineer will no longer accept material. Production may resume when changes have been made and an acceptable sample and test result is obtained.

Table 3 B Quality Level Analysis by the Standard Deviation Method							
PU or PL	QU and QL for An@ Samples						
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
100	1.16	1.50	1.79	2.03	2.23	2.39	2.53
99	-	1.47	1.67	1.80	1.89	1.95	2.00
98	1.15	1.44	1.60	1.70	1.76	1.81	1.84
97	-	1.41	1.54	1.62	1.67	1.70	1.72
96	1.14	1.38	1.49	1.55	1.59	1.61	1.63
95	-	1.35	1.44	1.49	1.52	1.54	1.55
94	1.13	1.32	1.39	1.43	1.46	1.47	1.48
93	-	1.29	1.35	1.38	1.40	1.41	1.42
92	1.12	1.26	1.31	1.33	1.35	1.36	1.36
91	1.11	1.23	1.27	1.29	1.30	1.30	1.31
90	1.10	1.20	1.23	1.24	1.25	1.25	1.26
89	1.09	1.17	1.19	1.20	1.20	1.21	1.21
88	1.07	1.14	1.15	1.16	1.16	1.16	1.17
87	1.06	1.11	1.12	1.12	1.12	1.12	1.12
86	1.04	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.04	1.04	1.04	1.04
84	1.01	1.02	1.01	1.01	1.00	1.00	1.00

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83	1.00	0.99	0.98	0.97	0.97	0.96	0.96
82	0.97	0.96	0.95	0.94	0.93	0.93	0.93
81	0.96	0.93	0.91	0.90	0.90	0.89	0.89
80	0.93	0.90	0.88	0.87	0.86	0.86	0.86
79	0.91	0.87	0.85	0.84	0.83	0.82	0.82
78	0.89	0.84	0.82	0.80	0.80	0.79	0.79
77	0.87	0.81	0.78	0.77	0.76	0.76	0.76
76	0.84	0.78	0.75	0.74	0.73	0.73	0.72
75	0.82	0.75	0.72	0.71	0.70	0.70	0.69
74	0.79	0.72	0.69	0.68	0.67	0.66	0.66
73	0.75	0.69	0.66	0.65	0.64	0.63	0.63
72	0.74	0.66	0.63	0.62	0.61	0.60	0.60
71	0.71	0.63	0.60	0.59	0.58	0.57	0.57
70	0.68	0.60	0.57	0.56	0.55	0.55	0.54
69	0.65	0.57	0.54	0.53	0.52	0.52	0.51
68	0.62	0.54	0.51	0.50	0.49	0.49	0.48
67	0.59	0.51	0.47	0.47	0.46	0.46	0.46
66	0.56	0.48	0.45	0.44	0.44	0.43	0.43

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65	0.52	0.45	0.43	0.41	0.41	0.40	0.40
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35
62	0.43	0.36	0.34	0.33	0.32	0.32	

Table 3 B Quality Level Analysis by the Standard Deviation Method

QU and QL for An@ Samples							
PU or PL	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
61	0.39	0.33	0.31	0.30	0.30	0.29	0.29
60	0.36	0.30	0.28	0.27	0.27	0.27	0.26
59	0.32	0.27	0.25	0.25	0.24	0.24	0.24

Table 4 - PWL Pay Adjustment Factors

PWL	Pay Adjustment Factor (%) Column B	Pay Adjustment Factor (%) Column C
100	+5	0
99	+4	-1
98	+3	-2
97	+2	-3
96	+1	-4
95	0	-5

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94	-1	-6
93	-2	-7
92	-3	-8
91	-4	-9
PWL<91	PWL - 100	PWL - 100

(b) Pavement Construction - Pay Adjustments.

The Engineer will determine the pavement construction pay adjustment by evaluating the construction of the pavement, based on the following parameter:

- Degree of compaction of the in-place material

Using the test values for the cores, the Engineer will use the following steps to determine the pavement construction pay adjustment for each lot of work. .

1. Calculate the core bulk specific gravity values from the subplot tests values, to the nearest 0.001 unit. Obtain the Theoretical maximum Specific Gravity values from the corresponding laboratory subplot tests.
2. Calculate the Degree of Compaction:
Degree of Compaction =
$$\left(\frac{\text{Core Bulk Specific Gravity}}{\text{Theoretical Maximum Specific Gravity}} \right) \times 100\%$$
 recorded to the nearest 0.1%.
3. The average compaction for the sublots shall be averaged together for the compaction level of the lot. The lots compaction test level shall be averaged and recorded to the nearest whole percent.
4. Locate the value of the Payment Adjustment Factor corresponding to the calculated degree of compaction from Table 5 or Table 5a.
5. Determine the pavement construction price adjustment by using the following formula:
Construction Pay adjustment = (Lot Quantity) x (Bid Price) x (Pay Adjustment Factor) x 30%.

Table 5: Compaction Price Adjustment Highway Locations		
Degree of Compaction (%)	Range	Pay Adjustment Factor (%)
>= 97.0	>= 96.75	-100*
96.5	96.26 – 96.74	-5
96.0	95.75 – 96.25	-3
95.5	95.26 – 95.74	-2
95.0	94.75 – 95.25	0
94.5	94.26 – 94.74	0
94.0	93.75 – 94.25	1
93.5	93.26 – 93.74	3
93.0	92.75 – 93.25	5
92.5	92.26 – 92.74	3
92.0	91.75 – 92.25	0
91.5	91.26 – 91.74	0
91.0	90.75 – 91.25	-5
90.5	90.26 – 90.74	-15
90.0	89.75 – 90.25	-20
89.5	89.26 – 89.74	-25
89.0	88.75 – 89.25	-30
88.5	88.26 – 88.74	-50
=<88.0	=<88.25	-100*

* or remove and replace it at Engineer's discretion

Table 5A: Compaction Price Adjustment Other¹ Locations		
Degree of Compaction	Range	Pay Adjustment Factor (%)
>= 97.0	>= 96.75	-100*
96.5	96.26 – 96.74	-5
96.0	95.75 – 96.25	-3
95.5	95.26 – 95.74	-2
95.0	94.75 – 95.25	0
94.5	94.26 – 94.74	0
94.0	93.75 – 94.25	0

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93.5	93.26 – 93.74	1
93.0	92.75 – 93.25	3
92.5	92.26 – 92.74	1
92.0	91.75 – 92.25	0
91.5	91.26 – 91.74	0
91.0	90.75 – 91.25	0
90.5	90.26 – 90.74	0
90.0	89.75 – 90.25	0
89.5	89.26 – 89.74	0
89.0	88.75 – 89.25	-1
88.5	88.26 – 88.74	-3
88.0	87.75 – 88.25	-5
87.5	87.26 – 87.74	-10
87.0	86.75 – 87.25	-15
86.5	86.26 – 86.74	-20
86.0	85.75 – 86.25	-25
85.5	85.26 – 85.74	-30
85.0	84.75 – 85.25	-40
84.5	84.26 – 84.74	-50
=< 84.0	=<84.25	-100*

* or remove and replace at Engineer's discretion

¹ This chart is to be used for areas where the structural value of the area to be paved is less than 1.75 as determined by the Engineer. See Appendix B - Method for Obtaining Cores for Determination of Roadway Structure. This chart is applicable to rehabilitation work only; full depth construction will not be considered for Table 5a.

.04 Dispute Resolution.

Disputes or questions about any test result shall be brought to the attention of the Contractor and the Engineer within two operational days of reported test results. The following dispute resolution procedures will be used.

The Engineer and the Contractor will review the sample quality, the test method, the laboratory equipment, and the laboratory technician. If these factors are not the cause of the dispute, a third party dispute resolution will be used.

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Third party resolution testing can be performed at either another Contractor's laboratory, the Engineer's laboratory, or an independent accredited laboratory. Unless otherwise mutually agreed upon by DAPA and the Engineer, the Engineer's qualified laboratory in Dover and qualified personnel shall conduct the necessary testing for third party Dispute Resolution after the Engineer has provided reasonable notice to allow the Contractor to witness this testing.

When disputes over production testing occur, the samples used for Dispute Resolution testing will be those samples the properly captured, labeled, and stored, as described in the second paragraph of the section of these specifications titled **.02 Acceptance Plan, (a) Material Production - Tests and Evaluations**. If no samples are available, the original testing results will be used for payment calculations.

Dispute Resolution samples for air void content will be heated by a microwave oven.

If there is a discrepancy between the Engineer's acceptance test result and the Contractor's test result, the Contractor may ask for the Dispute Resolution sample to be tested. The Contractor may request up to two dispute resolution samples be tested per calendar year without charge. Any additional Dispute Resolution samples run at the Contractors request where the results substantiate the acceptance test result will be assessed a fee of \$125. Any additional Dispute Resolution samples that substantiate the Contractors test result will not be assessed the fee.

When disputes over compaction core test results occur, the Engineer's acceptance core will be used for the dispute resolution sample. The Contractor will be advised on when the testing will occur as referenced above to witness the testing.

The results of the dispute resolution testing shall replace all of the applicable disputed test results for payment purposes.

Appendix A - Repairing Core Holes in Bituminous Asphalt Pavement

Description.

This appendix describes the procedure required to repair core holes in a bituminous concrete pavement.

Materials and Equipment.

The following material shall be available to complete this work:

- Patch Material - DelDOT approved High Performance Cold Patch material shall be used.

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The following equipment shall be available to complete this work:

- Sponge or other absorbent material - Used to extract water from the hole.
- Compaction Hammer - mechanical (electrical, pneumatic, or gasoline driven) tamping device with a flat, circular tamping face smaller than 6 inches in diameter. .

Construction Method.

After core removal from the hole, remove all excess water from within the hole, and prevent water from re-entering the hole.

Place the patch material in lifts no greater than 3 inches and compact with mechanical tamping device. If the hole is deeper than 3 inches, use two lifts of approximately equal depths so that optimum compaction is achieved. Make sure that the patch surface matches the grade of the existing roadway. Make every effort to achieve the greatest possible compaction

Performance Requirements.

The Engineer will judge the patch on the following basis:

- The patch shall be well compacted
- The patch surface shall match the grade of the surrounding roadway surface.

Basis of Payment.

No measurement or payment will be made for the patching work. The Contractor must gain the Engineer's acceptance of the patching work before the Engineer will accept the material represented by the core.

Appendix B - Method for Obtaining Cores for Determination of Roadway Structure

The Contractor is responsible for obtaining cores in areas that they propose are eligible for compaction price adjustments according to Table 5a in this specification. Table 5a is not applicable for new full-depth pavement box construction. Cores submitted for this process shall be obtained according to the following process.

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1. Contact Materials & Research (M&R) personnel to determine if information about the area is already available. If M&R has already obtained cores in the location that is being investigated, the contractor may opt to use the laboratory information for the investigation and not core the area on their own.
2. If M&R does not have information concerning the section of the roadway, the contractor needs to contact M&R to arrange for verification of coring operations. Arrangements shall be made to allow for an individual from M&R to be on the site when the cores are obtained. Cores will be turned over to M&R for evaluation.
3. The Contractor is responsible for providing all traffic control and repairing core holes in accordance to 401699 Appendix A - Repairing Core Holes in Bituminous Asphalt Pavements.
4. Cores are to be taken throughout the entire project for the area in question. Cores will be spaced, from the start of the project in increments determined based on field and project specifics. Cores will be evenly distributed throughout the project location. The cores will be taken in the center of the lane in question.
5. Additional cores may be taken at other locations, if surface conditions indicate that there may be a substantial difference in the underlying section. The location of these cores should be documented and submitted to M&R.
6. Cores shall be full depth and include underlying materials. If there is a stone base included in the pavement section, at a minimum 1 core must have information concerning the thickness of the base. This is determined by augering to the subgrade surface.
7. The calculations used to determine the structural capacity of the roadway is as follows. If the contractor finds, upon starting the coring process, that the areas are of greater thickness than applicable to Table 5a, they may terminate the coring process on their own and retract the request.

Structural Number Calculations

Each pavement box material is assigned a structural coefficient based upon AASHTO design guides. The structural coefficient is used to determine the total strength of the pavement section.

Materials used in older pavement sections are assigned lower structural coefficients to compensate for aging of the materials. The coefficients used to determine the structural number of an existing pavement are:

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Existing Material	Structural Coefficient
HMA	0.32
Asphalt Treated Base	0.26
Soil Cement	0.16
Surface Treatment (Tar & Chip)	0.10
GABC	0.14
Concrete	0 - 0.7*

* The Structural Coefficient of Concrete is dependent upon the condition of the concrete. Compressive strengths & ASR analysis are used to determine condition - contact the Engineer if this situation arises.

Newly placed materials use a different set of structural coefficients. They are as follows:

New Material	Structural Coefficient
HMA	0.40
Asphalt Treated Base (BCBC)	0.32
Soil Cement	0.20
GABC	0.14

Example:

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Location includes placement of a 1.25" Type C overlay on 2.25" Type B. Existing roadway is cored and is shown to consist of 2" HMA on 7" GABC.

Calculation:

For the Type B lift the calculation would be:

Existing HMA	$2 * 0.32$	=	0.64
GABC	$7 * 0.14$	=	0.98
			1.62

For the Type C lift the calculation would be:

Newly Placed B	$2.25 * 0.4$	=	0.90
Existing HMA	$2 * 0.32$	=	0.64
GABC	$7 * 0.14$	=	0.98
			2.52

11/3/14

604500 - COFFER DAMS

Description:

- A. This work pertains to Contract T201807401 and includes performing the following in accordance with the notes on the Plans, this Special Provision and the direction of the Engineer:
1. Preparation and submission of a Water Control Plan.
 2. Effective implementation of designs, construction, and maintenance of all cofferdams and necessary diversion works.
 3. Furnishing, installing, and operating all necessary pumps, piping, and other facilities and equipment.
 4. Removing all temporary works and equipment after they have served their purpose.
- B. The Contractor is responsible for design and construction of the following, but not limited to:
1. All temporary cofferdams and diversion walls installed to facilitate construction of the work in an unwatered and safe condition. This includes structures necessary upstream and downstream of the existing bridge and gate structures, or laterally (left to right) within a culvert. Sheet piles are not permitted at Bridge 1-407 and additional sheet piles are not permitted in the vicinity of existing gasline at Bridge 1-504.
 2. Repairs to the existing sheeting located upstream of Bridge 1-504 as shown on the Drawings and as necessary to facilitate reconstruction of Bridge 1-504 and associated gate system in an unwatered and safe condition. The Contractor may elect to remove the existing sheeting and construct a new cofferdam system at no additional cost to the Department.
 3. Removal of existing sheet piling upstream of Bridge 1-504 and returning the sheeting to Mumford & Miller, 1005 Industrial Road, Middletown, DE 19709 (302-378-7736) upon completion of the work at Bridge 1-504. Bulk and conventional sandbags at this location shall become the property of the Contractor and shall be removed from the site upon completion of the work.
 4. Conventional sandbags and cofferdams at Bridge 1-407 shall become the property of the Contractor and shall be removed from the site upon completion of the work.
 5. Clearing of debris upstream of Bridge 1-504 and 1-407 within the limits of the cofferdam(s).

Materials:

The type of cofferdam to be constructed shall be selected by the Contractor. The design and construction shall be in accordance with the applicable requirements of the Standard Specifications. The Contractor may submit for approval,

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proprietary diversion device(s) such as PORTADAM or AQUA-BARRIER or approved equal. The Contractor is not required to construct a cofferdam similar to any conceptual designs shown on the contract drawings provided their design performs in accordance with these specifications, including applicable involvement of a Professional Engineer Registered in the State of Delaware. If the sheet pile cofferdam upstream of Bridge 1-504 is to be used, the bracing shown on the Drawings shall be constructed as a minimum. If the contractor decides to use an alternative cofferdam at Bridge 1-504, it shall be provided in accordance with these specifications and at no additional cost to the Department. It is the contractor's responsibility to inspect, test, and verify existing conditions as necessary to complete their design or implement bracing. The contractor is solely responsible for their design assumptions; the failure of the material or other physical properties of the existing conditions to meet their design needs and assumptions will not be considered as justification for cost overruns.

- A. The use of sheeting upstream of the Bridge 1-407 structure is prohibited because of the presence of an unlocated gas line.
- B. Cofferdam work upstream of Bridge 1-504 shall be conducted using materials and methods that will not harm an existing unlocated gas line utility in this area. It is the responsibility of the contractor to protect this utility.
- C. Walers and bracing shall conform to ASTM A572, A992, or A913 Grade 50.
- D. Scour Hole Fill: AASHTO #57 aggregate

Construction Methods:

- A. Submittals:
 - 1. Submit a Control of Water Plan signed and sealed by an Engineer registered in the state of Delaware, detailing the design and calculations for all cofferdams and bracing at least 30 days before the proposed start of cofferdam construction. The plan shall include a description of methods, schedule, and equipment to be used for installation and construction of cofferdams, diversions, and other surface water control mechanisms. The plan shall be submitted and approved before starting construction of control of water measures.
 - 2. The Control of Water Plan shall include items listed below that are applicable to each control of water measure:
 - a. A narrative that describes the cofferdam and associated systems to protect the work, the existing dam, existing unlocated gas line upstream of Bridge 1-407 and Bridge 1-504, and other site features from surface and groundwater.

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- b. Arrangement and details for each cofferdam, supporting design calculations, and construction methods to be used for installation of each system.
 - c. Elevations of ground surface, existing and temporary structures, as applicable.
 - d. The proposed method(s) and timing of installation and removal of temporary cofferdams and protection including sequence and equipment description. Multiple phases of cofferdam construction and use are anticipated to complete the work; phasing shall be described in detail.
 - e. Operation plan indicating means and methods to safely convey water through the site without impact to the flow, site, or surrounding property; flows from floods; base (normal) stream flow; groundwater; leakage; or any other water intruding the site.
 - f. Monitoring and action plan indicating means and methods of monitoring cofferdam and control of water performance. Plan shall include means of monitoring reservoir levels, anticipated weather, cofferdam leakage, and stability. Include threshold values for reservoir levels, cofferdam leakage, and stability with actions that will be taken should these thresholds be exceeded.
 - g. Contingency plan for alternative procedures to be implemented if any cofferdam is found to perform unsatisfactorily.
 - h. Materials, location and lead time required to implement the contingency plan.
 - i. Appropriate design calculations to support proposed designs provided in the Shop Drawings.
 - j. The Water Control Plan shall incorporate Designs, Shop Drawings, and Material Specifications for all structural elements proposed.
 - k. The Control of Water Plan shall be prepared, signed, and sealed by a Professional Engineer registered in the State of Delaware with the appropriate technical expertise (hydraulic, geotechnical and/or structural engineering). Designs shall be according to recognized guidelines and standard of care for the type of system being designed.
3. Shop Drawings with supporting calculations for the Contractor-designed cofferdams and diversions shall incorporate the following design criteria:
- a. Design cofferdams to support earth pressures, water pressures, and forces associated with stream diversion flows, hydrostatic pressures, utility loads, equipment, traffic, and construction loads, including impact, and other surcharge loads in a manner that will allow the safe and expeditious construction of permanent structures, to minimize ground movement or settlement, and to prevent damage to or movement of adjacent structures and utilities.
 - b. Design cofferdams and diversions to resist the maximum loads expected to occur during the work. Cofferdams shall be able to resist full hydrostatic loads to the minimum top elevations specified herein, or indicated on the drawings.
 - c. Control of Water Plan shall include means of sealing interface between cofferdams and existing structures and subgrades, and methods to control leakage.
 - d. Include member sizing, connection details, and material selection for each structure.
 - e. Base (normal) stream flows shall be maintained at all times through the site.

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- f. The contractor is not permitted to discharge water to sewers.

Contractor submittals approved by the Engineer shall not alleviate the Contractor's responsibilities for completing the work as specified.

B. Available Information:

1. Surface water, groundwater, runoff, and other site conditions may be highly variable and difficult to accurately predict.
2. Analyses and evaluations have been performed to support the project design and are available to the contractor. These analyses and evaluations may or may not provide satisfactory information to the Contractor for developing the Water Control Plan.
3. It is solely the Contractor's responsibility to evaluate the applicability of the available information and to obtain or develop additional information as a basis for development of the Plan.
4. A gas line is located immediately upstream of each bridge culvert; therefore, sheeting (excluding existing sheeting) shall not be driven into the lakebed as part of this work. Existing sheeting shall not be driven deeper in the vicinity of the existing gas line.

C. Protection:

1. Variability of site conditions and runoff events, other measures of water control implemented, and the Contractor's progress all have a significant influence on actual risk levels. The Contractor may elect to construct cofferdams to higher elevations than shown on the Contract Drawings to provide an added level of protection against overtopping at no additional cost to the Department.
2. Protect reservoir, creek and wetlands (to remain) from any and all materials used or disturbed during the water control activities, including soils and sediment, fill, admixtures, oil and grease, loose debris, and chemicals.
3. The Contractor shall be solely responsible for any and all damage to the Work caused by floods, storms, cofferdam failure, dewatering device failure, and/or floating debris, and shall take every precaution to prevent any damage to the Work which may be caused by rain, floods, storms, and/or floating debris. The Contractor shall stage the work such that existing or new gates remain in operation during construction. The Contractor shall operate the operable gates to control the reservoir pool at normal pool EL 9.3. The contractor shall be permitted to lower the lake in advance of storm events only with permission from DelDOT.
4. The Contractor shall be responsible to repair to the satisfaction of the Engineer any damages caused to the Work (permanent or temporary) or adjacent property resulting from the Contractor's failure to provide adequate control of water. This includes replacing fill placed in the existing scour hole as part of this work, at no additional cost to the Department.
5. In the event of flooding and subsequent possibility of cofferdam or diversion structure overtopping or dewatering device failure, the Contractor shall implement measures to minimize damage to construction work.

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6. Should overtopping occur, the Contractor shall dewater and clean out the affected areas and undertake all repairs to the construction work. This work shall be completed expeditiously after the high-water event has passed.
7. Temporary cofferdams and diversion works shown on the Contract Drawings are minimums. Additional measures in those and other areas may be needed.

D. Installation:

1. The Contractor shall build, maintain, and operate cofferdams, channels, flumes, sumps, connections with existing works, and other diversion and protective works needed to divert concentrated flow and other surface water through the construction site while construction is in progress.
2. The Contractor shall furnish, install, and operate all necessary pumps, piping, cofferdams, and other facilities and equipment needed to divert concentrated flow and other surface water through the construction site while construction is in progress.
3. It is the Contractor's responsibility to maintain the existing steel sheet pile cofferdam upstream of Bridge 1-504 unless an alternative cofferdam is proposed by the Contractor at no additional cost to the Department. Conceptual stabilization of the existing system is presented on the contract drawings. The contractor shall develop, obtain approval for, and install their own stabilization plan for the existing sheeting to the satisfaction of the Engineer.

E. Removal:

1. After the cofferdam and diversion works have served their purpose, the Contractor shall remove, level, or grade such works to present a sightly appearance and to prevent any obstruction of the flow of water or any other interference with the operation of or access to the permanent works. Holes drilled or cored as part of this work shall be patched to the satisfaction of the Engineer.
2. Removal includes stockpiling, spoiling, re-use or disposal of materials used in the Control of Water program. Under no conditions shall the Contractor be allowed to dispose of any such materials in the reservoir, the creek, or the adjacent wetlands.
3. Disposal of materials shall be the responsibility of the Contractor.
4. Upon completion of the work, the existing steel sheeting located upstream of Bridge 1-504 shall be removed from the reservoir and returned to the contractor identified in the work description section above. Bulk and conventional sandbags shall become the property of the Contractor and shall be removed from the site upon completion of the work.
5. Cored uplift relief holes shall be patched using non-shrink grout upon completion of the work.

Method of Measurement:

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Measurements shall consist of confirmation by the engineer that all required cofferdams have been acceptably designed, approved, installed, maintained, and removed upon completion of the project.

Basis of Payment:

The quantity of cofferdams will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing and placing all materials, engineering, labor, equipment, and coordination necessary for cofferdam installation, preparation of signed and sealed drawings (multiple submissions if resubmissions are necessary), filling scour area, bracing of existing sheeting, sandbag cofferdams, pumping, coring, patching of all holes used for cofferdam work, drilling, plates, beams, bolts, welding, removal of existing sheeting and removal of temporary works shall be paid under lump sum item 604500 - Cofferdams.

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610512 - SELF CONSOLIDATING CONCRETE (SCC)

Description:

This work pertains to Contract T201807401 and includes the requirements for production and use of Self Consolidating Concrete (SCC) for structures. Self Consolidating Concrete shall meet the requirements of Section 610 of the State of Delaware Standard Specifications with the following modifications/additions. Structures requiring SCC are listed in the Contract Drawings.

Materials:

- A. Aggregates: Coarse and Fine Aggregates shall meet ASTM C33. The maximum size aggregate shall be 0.5-inch for SCC. Coarse Aggregate shall be nonreactive for alkali-silica reactivity (ASR) as determined by ASTM C1260 and shall be washed prior to use.
- B. Admixtures: SCC shall contain all admixtures required for conventional concrete as defined in the Contract Drawings. In addition, SCC shall contain a high range water reducing admixture conforming to ASTM C494, Type F or G, polycarboxylate-based.

Mix Design/Production Parameters:

- A. A slump flow of SCC is anticipated to be between 20 and 30 inches and shall be selected by the Contractor for placement conditions. Once established, the design slump flow shall be ± 2 inches. Concrete shall also meet the following requirements:

Test	Requirement	Tolerance
Slump-Flow Spread (ASTM C1611)	20" - 30"	± 2 "
Visual Stability Index (ASTM C1611)	0 - 1	N/A
J-Ring (ASTM C1621)	≤ 2 " difference in slump flow	N/A
Column Segregation (ASTM C1610)	$\leq 15\%$ of static segregation	N/A
Air Content (AASHTO T152)	4% -6%	N/A
Compressive Strength (AASHTO T22)	4,500 psi	N/A

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- B. The producer must perform temperature, slump flow, J-ring, and air content testing for each 50 yd³ of SCC produced. A minimum of 4 test cylinders shall be made from each SCC mix tested.

References:

- A. Material Production and Quality Control Test Methods
1. Temperature of Fresh Concrete (AASHTO T309)
 2. Slump Flow Test and Visual Stability Index (ASTM C1611)
 3. Air Content (AASHTO T152; single lift, not rodded)
 4. Unit Weight (AASHTO T121; single lift, not rodded)
 5. J-Ring Test (ASTM C1621)
 6. Column Segregation Test (ASTM C1610)
 7. Fabricating Test Specimens with Self-Consolidating Concrete (ASTM C1758)
 8. Compressive Strength Test (AASHTO T22)
 9. Making and Curing Test Specimens (AASHTO T23)

Submittals:

- A. As required by Section 610 of the State of Delaware Standard Specifications.

Construction Methods:

- A. Placement of SCC (Free Fall Method)
1. Concrete placement shall begin at the deepest section of the member. Concrete shall be deposited as closely as possible to its final place in the forms. Concrete shall not be dropped more than 5-ft vertically unless suitable equipment is used to prevent segregation. Hoppers and chutes, pipes, or "elephant trunks" shall be used as necessary to prevent segregation.

Method of Measurement:

The quantity of self-consolidating concrete will not be measured.

Basis of Payment:

This work including furnishing and placing all permanent and temporary materials, surface preparation, labor, equipment, tools, and work incidental thereto will be considered incidental to Item 610000 - Portland Cement Concrete Masonry, Class A. Payment will be at the Contract unit price 610000 - Portland Cement Concrete Masonry, Class A.

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615520 - STAINLESS STEEL SLIDE GATE

Description:

This work pertains to Contract T201807401 and includes design, materials, fabrication, testing, furnishing, and installation of vertically-mounted slide gates, wall thimbles, frames, fittings, operators, and appurtenances designed for seating or unseating head orientations.

Materials:

A. Material References:

1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
2. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
3. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
4. ASTM A380 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
5. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications
6. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
7. ASTM F594 - Standard Specification for Stainless Steel Nuts
8. ASTM D707 - Standard Specification for Cellulose Acetate Butyrate Molding and Extrusion Compounds
9. ASTM A967 - Standard Specification for Chemical Passivation Treatments for Stainless Steel Parts
10. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications
11. ASTM D3935 - Standard Specification for Polycarbonate (PC) Unfilled and Reinforced Material
12. ASTM D4020 - Ultra-High Molecular Weight (UHMW) Polyethylene

Manufacturer shall be Whipps, Inc. (370 South Athol Road, P.O. Box 1058, Athol, MA 01331, Telephone: (978)-249-7924 or approved equal. Manufacturers shall have a minimum of 25 years of experience in the design and manufacture of equipment of this type. Gates shall be designed and sealed by a Professional Engineer registered in the State of Delaware.

B. Slide Gate and Accessory Requirements:

TABLE 1: Slide Gate Requirements

Quantity Required	5 – See Sizes and Locations in Table 2
Slide Gate Model	Whipps, Inc. Series 900
Frame Assembly and Retainers	Stainless Steel, Type 316L, ASTM A240
Slide and Stiffeners	Stainless Steel, Type 316L, ASTM A240
Stem	Stainless Steel, Type 316, ASTM A276
Stem Cover	Stainless Steel, Type 316, ASTM A276 and Clear Polycarbonate ASTM D3935
Locking Gearbox Cover	Stainless Steel, Type 316, ASTM A276
Anchor Studs	Stainless Steel, Type 316, ASTM A276
Fasteners and Nuts	Stainless Steel, Type 316, ASTM F593/F594
Operator extension components (sprockets, chains, driveshafts)	Stainless Steel, Type 316, ASTM A276
Invert and Frame Seals	Neoprene or EPDM ASTM D2000
Seat/Seals and Facing for Slide	Ultra-High Molecular Weight Polyethylene (UHMW) ASTM D4020
Lift Nuts	Bronze ASTM B584
Pedestals and Wall Brackets	N/A
Operator Housing	Cast aluminum
Frame Type	Flanged, Self-Contained
Installation Type	Weir, Dual Slide (split leaf); both bottom and top movement slides – See Table 2
Closure	Resilient Invert Seal
Opening Geometry	See Table 2
Design Seating Head (ft)	20 ft
Design Unseating Head (ft)	N/A
Type of Actuator	Geared Lift Mechanism w/ DNREC
Accessories	Stainless Steel Slotted Rising Stem Protective Sleeve (Cover) and Indicator
Finish	Mill finish for areas unaffected by fabrication. Stainless steel welds shall be sandblasted with virgin non-ferrous media, and passivated in accordance with ASTM A380

TABLE 2: Slide Gate Dimension

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Location (Bridge Number and Position*)	1-504 Left	1-504 Center	1-504 Right	1-407 Left	1-407 Right
Actuator Side	Left	Left With Extension	Right	Left with extension	Right with extension
Disc movement type	Bottom	Bottom	Bottom	Upper	Upper
Normal Position of Gate	Closed / Weir	Closed / Weir	Closed / Weir	Closed / Weir	Closed / Weir
Design Head (ft of water)	15	15	15	15	15

**Position assumes one is looking downstream.*

All components of the gate shall be designed to withstand the maximum head indicated in the gate schedule in the seating and unseating directions and the maximum output of the hoist. The design stresses shall not exceed the lesser of 40% of the yield strength or 25% of the ultimate strength of the materials for maximum load conditions. The minimum thickness of the slide plate, its reinforcing members, and all structural components of the guide, frame, and thimble shall be ¼".

C. Components:

1. **Frame:** Constructed of structural members formed with stainless steel plate conforming to ASTM A240, and welded to form a rigid one-piece frame. All cuts and welds shall be sandblasted with virgin non-ferrous media and passivated in accordance with ASTM A380 to remove weld burn and scale, and to protect the base metal. The frame shall extend to accommodate the entire height of the slides when the slides are in the fully opened position. Provide a yoke across the top of the frame resulting in a one-piece rigid assembly. Yoke shall be formed by structural members and be designed to allow removal of the slide. The Yoke shall be sized to withstand normal operating loads as well as the maximum hoist output. The Yoke deflection shall not exceed 1/360 of the gate width or a maximum of ¼", whichever is less at maximum operating load. The invert shall be a stainless steel angle welded to the bottom of the guides to the seating surface for the flush bottom seals attached to the disc. Frames shall be square and true with stiffening gussets as necessary to resist distortion under the anticipated loads. The structural portion of the frame that incorporates the seat/seals shall be formed into a one-piece shape for rigidity. Guide members that consist of two or more bolted structural members are not acceptable. Guide member designs where water loads are transferred through the assembly bolts are specifically not acceptable.
2. **Slide:** A flat plate reinforced with structural or formed members conforming to ASTM A240, to limit its deflection under design loads to the lesser of 1/720 of the gate span or 1/16". Vertical stiffeners shall be welded on the outside of the horizontal stiffeners for additional reinforcement. When required to maintain proper plate stress and deflection, intermediate vertical gussets shall be provided. Dual Disc (split leaf) gates shall be designed to perform as structurally independent elements, while maintaining a watertight seal between the discs throughout the range of gate motion.
3. **Seals:** Seat and seals shall be included to meet the leakage requirements specified herein and to prevent metal-to-metal contact between slide and frame. Seals shall be affixed with stainless steel

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hardware to accommodate high velocities and cycling of the gate. Arrangement with seals that are force fit or held in place with adhesives is unacceptable. Gates that utilize rubber "J" seals or "P" seals exposed to flow through the gate orifice (e.g., on the sides and bottoms of the gate discs) are not acceptable. P seals are acceptable between dual slide gate discs.

4. Stems: Stem threads shall be Acme Type. Stems shall be designed to transmit in compression a minimum of 2 times the rated output of the hoist at 40 pounds effort on the crank or handwheel. The L/r ratio of the unsupported stem shall not exceed 200, where L is the unsupported length of the stem between stem guides, and r is the stem radius of gyration. Stem guides, where required to limit the unsupported stem length, shall be UHMW Polyethylene or bronze bushed.
5. Stem Covers: Rising stems shall be provided with stainless steel schedule 40 or thicker pipe sliplined with clear polycarbonate tubing conforming to ASTM D3935 and D707. The stainless pipe shall include vertically oriented slots on 2 sides with a minimum width of 3/4" along the length of the pipe to provide visual inspection of the stem threads and to protect the stem from contamination. Slotting through the stainless steel may be discontinuous to maintain structural integrity of the protective cover. A stainless steel cap with vent holes shall be provided to prevent condensation. "Open" and "Closed" markings shall be included with a rule type indicator at appropriate heights on the cover.
6. Actuator: Bench stands or floor stand hoists shall be sized to permit operation of the gate under the full operating head with a maximum effort of 40 pounds on the crank or hand wheel. A limiting nut shall be provided on the stem above each actuator; it shall be adjusted to prevent over-closing of each gate. The hoist nut shall be manganese bronze conforming to ASTM B584 / C86500. The hoist nut shall be supported on roller bearings. Lubrication fittings shall be provided for lubrication of hoist bearings without disassembly of the hoist. Suitable seals shall be provided to prevent entry of foreign matter. The direction of hand wheel or crank direction shall be clearly and permanently marked on the hoist. An arrow with the word "OPEN" shall be permanently attached or cast onto the operator to indicate the direction or rotation to open the gate. Operator nut/shaft shall be located at a convenient height and location to permit operation utilizing the specified portable electric actuator(s) (see Actuator Offsets and Extensions). A hand crank shall be provided for each gate, and shall match the DNREC operator nut dimensions.
7. Actuator Offsets and Extensions: Mechanisms intended to permit offset actuation, or actuator extensions, shall be constructed with a minimum factor of safety of 3 applied to the anticipated loads. Components comprising offset actuators or actuator extensions shall be made of Type 304 or higher grade of stainless steel when available. Gearboxes shall include corrosion resistant housing, shaft seals, and lubrication fittings or ports permitting lubrication without disassembly. Chain drive systems are not permitted. Offset actuators and extensions shall utilize gearboxes, drive shafts, shaft support bearings, and jaw couplings with material selection strongly considering the potential for corrosion protection, and dissimilar metal reactions. Jaw type or other applicable couplings shall be provided on drive shafts with the potential for misalignment either during operation, or after installation.
8. Portable Power Actuator: Two portable electric actuators shall be provided by the contractor and given to the Owner. Actuators shall feature a reversible 110v, 60hz single-phase motor, auto clutch (to prevent over torqueing), and adjustable height tripod mounting. Adjustable tripod limits shall permit operation of all new gates on site in accordance with the manufacturer's recommendations. The actuator shall be capable of opening and closing 3 gates on site in consecutive order, without stopping, and without overheating. Adapter to connect the actuator to the gate lift input shaft

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(geometry to match recent DNREC installations) shall be provided. Weight of the assembled (tripod and electric operator) shall not exceed 65 lb.

9. Locking Actuator Cover: A fabricated stainless steel locking cover shall be provided on the gearbox output shaft to prevent unauthorized operation. The location of the standard size padlock (to be coordinated with the Owner) shall be protected from view and tampering. Minimum member thickness shall be 3/16 inch. All cuts and welds shall be sandblasted with virgin non-ferrous media and passivated to remove weld burn and scale, and to protect the base metal.
10. Fasteners: All necessary attaching bolts, studs, and anchors shall conform to ASTM A276 Type 316 stainless steel and have a minimum diameter of 1/2 inch unless otherwise indicated. Tamper-resistant fasteners (Torx Insert style or approved equal) shall be used where specified. Provide 2 tamper resistant bit keys matching the fasteners selected. All threaded components shall be coated with anti-seize lubricant suitable for use with stainless steel, by FASTORQ (makers of FastLUBE AG) or approved equal.
11. Mounting: The gate shall be attached to the frame with Type 316 stainless steel bolts or studs and nuts in accordance with ASTM F593 and F594, respectively. A conventional gasket made of EPDM rubber or equivalent material shall be provided and installed to seal the gate frame to the gate mounting frame or wall thimble. Gate frame shall be mounted on a grout pad where a separate mounting frame or wall thimble is not provided. Fasteners shall be drilled and epoxy grouted stainless steel. Grout shall be Sika 212 or equal, or as directed by the gate manufacturer.

The manufacturer shall use all due and customary care in preparing items for shipment to avoid damage in handling or in transit. Particular care shall be taken to see that the parts are completely closed and locked in position before shipment. Parts that are to be embedded in concrete may be shipped separately if requested by the Contractor. Slide gates 24 inches and larger shall be securely bolted or otherwise fastened to skids in such a manner that they may be safely handled.

Submittals:

- A. The Contractor shall submit to the Engineer for approval detailed shop drawings and data required to handle, assemble, and install the slide gate and accessories including all operating components and boxout requirements. Attention should be given to potential conflicts between the mounting bolt locations and the mounting frame stiffener plates. Shop drawings and data shall demonstrate compliance with the provisions of the plans and specifications. Shop Drawings shall also detail the attachment of the slide gate frame to the mounting frame.
- B. Field Measurements: Perform field measurements as required by 615521 Metal Fabrications, and coordinate with this specification. If adjustments to the specified dimensions appear to be required, report the discrepancies to the engineer for clarification. If adjustments are required, they shall be adjusted at no additional cost to the owner. Payment for this item is considered incidental to 763501.
- C. The Contractor shall submit to the Engineer an affidavit from the manufacturer of compliance with all applicable provisions of these Specifications.
- D. The Contractor shall submit to the Owner a Warranty for a duration of no less than 1 year. The warranty shall guarantee the equipment and installation to be free of defects in material and workmanship from the date of

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first operation. The Contractor shall agree to repair or replace all defective parts or installations during the warranty period.

- E. The Contractor shall submit to the Engineer for review the manufacturer's installation, operation, and maintenance procedures. These items shall be contained in an Operations and Maintenance manual detailing the following for each type of gate supplied:
1. Installation procedures and materials
 2. Operation procedures and materials
 3. Maintenance procedures and materials
 4. Frequency of specific maintenance tasks
 5. Troubleshooting guide
 6. Record drawings including materials list and standards

Construction Methods:

- A. Verify existing conditions before starting work.
- B. Coordinate with special provision 615521.
- C. Coordinate location and rotation of gate operator to avoid conflict with adjacent structures.

Installation of all components shall be in accordance with the installation procedures supplied by the manufacturer. It shall be the Contractor's responsibility to handle, store, and install the fabricated frames, gates, and accessories in accordance with the manufacturer's drawings and recommendations.

Care shall be taken to avoid warping the gate frame and to maintain tolerances between seating faces. All gates, stems, and operators shall be plumbed, shimmed, and accurately aligned.

During construction, the surfaces of the gate and mounting frames shall be covered or otherwise protected from contamination or damage. Any damage that occurs to the gate or mounting frames in storage or handling shall be corrected prior to installation or operation and testing of the gate.

After the entire assembly of gates has been installed, adjusted, and properly lubricated, each slide shall be operated for one complete cycle, open-close-open or close-open-close.

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A field leakage test shall be performed by the Contractor after installation. The manufacturer shall be notified of the test in sufficient time to enable them to have a representative present at the test. After all adjustments have been made and the mechanisms properly lubricated, each slide gate shall be run through one complete cycle as a final check on proper operation before starting the leakage test. Seating and unseating head shall be measured from the top surface of the water to the center of the gate. The gate leakage, when subjected to specified heads, shall not exceed 0.05 gallons per minute per foot of perimeter. It is the responsibility of the Contractor to design and install a temporary means of collecting and monitoring gate leakage during this test and any subsequent tests required as a result of a failed test.

Method of Measurement:

The quantity of slide gates will not be measured.

Basis of Payment:

Slide gates will be paid for at the Contract lump sum price for slide gates. Price and payment shall constitute full compensation for all gates, operators, operator extension systems, operator offset systems, portable actuators and accessories, labor, materials, tools, workmanship, installation, coatings, testing, adjustment, repair, re-testing, delivery, fasteners, seals, temporary works, and all other items of work necessary to complete the required installation.

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615521 - METAL FABRICATIONS

Description:

This work pertains to Contract T201807401 and includes the requirements for furnishing, delivering and storing of miscellaneous metal fabrications including threaded rods, anchor bolts, hardware, gate frames, trashrack guides, trashracks, bar grate, access ladder, and all associated mounting plates and brackets for the gate and trashrack systems not aforementioned but shown on the contract drawings.

Qualifications:

Structural stainless steel fabrication shall be performed by an organization with a minimum of 10 years of verified experience in structural stainless steel fabrication of equivalent magnitude.

Quality Assurance:

The Contractor shall comply with the requirements of Specification Section 106 *Material Quality and Testing Requirements*.

Fabricate structural metal members in accordance with the latest AISC Code of Standard Practice.

Welding inspection shall be in accordance with AWS D1.6/D1.6M:2010. All fillet welds shall be 100% visually inspected. All partial and complete penetration welds shall be 100% Magnetic Particle inspected. Upon request, inspection records shall be submitted to the Engineer.

References:

- A. American Society for Testing and Materials (ASTM) Standards
 - 1. ASTM A6/A6M-11 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 - 2. ASTM A36 - Standard Specification for Carbon Structural Steel
 - 3. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Services and Other Special Purpose Applications

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4. ASTM A194 - Standard Specification for Carbon and Alloy-Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
5. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
6. ASTM A262 - Practice for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steel
7. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
8. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
9. ASTM A380 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
10. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
11. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
12. ASTM F594 - Standard Specification for Stainless Steel Nuts
13. ASTM A967 - Standard Specification for Chemical Passivation Treatments for Stainless Steel Parts

B. American National Standards Institute (ANSI)

1. ANSI/ASME B1.1 - Unified Inch Screw Threads
2. ANSI Z49.1 - Safety in Welding and Cutting

C. American Welding Society (AWS)

1. AWS D1.1 - Structural Welding Code - Steel
2. AWS D1.6 - Structural Welding Code - Stainless Steel
3. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination

D. American Iron and Steel Institute (AISI)

1. AISI - Standards for Stainless Steel

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- E. American Institute of Steel Construction (AISC)
 - 1. AISC - Code of Standard Practice
 - 2. AISC - Manual of Steel Construction
 - 3. AISC - Steel Design Guide 27 - Structural Stainless Steel

Submittals:

The contractor shall submit the following for approval and with the additional requirements as specified for each:

- A. Shop Drawings:
 - 1. Provide, within 20 working days of Notice to Proceed, detailed, dimensioned shop drawings and data for all miscellaneous structural metal fabrications referenced by this section.
 - a. Indicate on the drawings all dimensions and clearances, profiles, sizes, connection attachments, connections, size and type of fasteners, and accessories. Bill of material shall include the number, kind, size, length, weight and assembly mark of each member including bolts and all fittings.
 - b. Field Measurements: Check actual dimensions of existing or proposed construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on shop drawings. Coordinate work with 615520 Stainless Steel Slide Gate. If adjustments to the specified dimensions appear to be required, report the discrepancies to the engineer for clarification. If adjustments are required, they shall be adjusted at no additional cost to the owner. Payment for this item is considered incidental to 763501.
 - c. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths and provide welding sequence when important.
 - d. Provide in electronic file format.
- B. Provide certified copies of mill test reports showing chemical and physical properties of all materials referenced by this section.
- C. Weld passivating solution cut sheet.

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D. Qualifications:

1. The fabricator shall submit documentation of 5 separate jobs in the last 10 years indicating equivalent experience in the fabrication of similarly sized structural stainless steel components for approval by the Engineer.

E. Welder's Certificates:

1. Submit certification for welders employed on the work, verifying AWS qualification for appropriate welding processes proposed.

F. Welding Inspectors:

1. Upon request, submit certification for welding inspectors employed on the work, verifying AWS qualification within the previous 12 months.

G. Welding procedures and welding inspection records.

H. As-built drawings of all structural fabrications including but not limited to gate frames, mounts, brackets, and trashracks.

Materials:

All materials provided shall be free from mill scale, flake rust and mill pitting. Metal that is bent by shearing or punching must be straightened prior to use. Holes shall be drilled or punched for bolts and screws. Exposed edges of work shall be ground smooth. Joints exposed to weather shall be constructed to exclude water. Material shall be formed to required shapes and sizes, with true curves, lines and angles. The manufacturer shall use all due and customary care in preparing finished fabrications for shipment to avoid damage in handling or in transit. Finished fabrications shall be loaded in such a manner that they may be transported and unloaded without being overstressed, deformed, or otherwise damaged.

- A. Unless otherwise indicated, materials shall meet the latest issue of ASTM Specifications relevant to the materials in question.

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- B. Welding Materials: AWS D1.1 and D1.6; type required for materials being welded, unless otherwise specified on the contract drawings. Shall be free from oil, grease, carbon or other contamination.
- C. Weld Passivation Solution: Product specifically manufactured for the passivation of stainless steel grades specified. Used as directed by the manufacturer and ASTM A380.
- D. Stainless Steel Members:
1. Pipe per ASTM A312 (or A790 if applicable to the type of stainless steel specified). Schedule number or outside diameter and nominal wall thickness as shown.
 2. Plate per ASTM A240.
 3. Bars and Shapes per ASTM A276.
 4. Joints exposed to reservoir water shall be formed or sealed with an approved sealant to prevent water penetration.
 5. Material for Trashracks:
 - a. Type 2205. Dimensions as shown on the Drawings.
 6. Material for Fish Passage Trashrack, Ladder, and Floor Grate Mounting:
 - a. Type 304L. Dimensions as shown on the Drawings.
 7. Material for gate and trashrack mounting frames and anchor rods:
 - a. Type 316L. Dimensions as shown on the Drawings.
- E. Finish: Mill finish. All cuts, scrapes, and welds shall be cleaned of contamination, weld scale and burn, etc. and passivated. Ease exposed edges to small uniform radius.
- F. Abrasives and Tooling: While not part of the final work product, tooling and abrasives used to form the final work product shall be specifically designed for application with stainless steel, and free of iron. These consumables are generally non-ferrous and shall be virgin (i.e., not previously used on other material types).
- G. Hardware: This includes concrete anchors, and all other mounting hardware
1. Concrete Anchors:
 - a. Stainless steel Anchors in accordance with ASTM F593. Hilti HAS-R 316SS or approved equal

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- b. Epoxy: Hilti HIT-RE 500 V3 or approved equal
 - 2. Mounting Hardware:
 - a. Cap screws, studs, ANSI/ASME B1.1, ASTM F593, Group 2, Type 316 or 316L
 - b. Nuts, ASTM F 594, Group 2, Type 316 or 316L
 - c. Saddle clips, Group 2, Type 316 or 316L
 - 3. Anti-seize Lubricant:
 - a. All threaded components shall be coated with anti-seize lubricant suitable for use with stainless steel, by FASTORQ (makers of FastLUBE AG) or approved equal.
- H. Grout Leveling Pads / Fill for Existing Blockouts:
- 1. Shall be non-shrink cementitious grout, chloride-free, meeting USACE Specification CRD C-621 and ASTM C1107 (Grade C). Grout shall be SikaGrout 212, Five Star EZ Cure Contractor's Grout, or approved equal.
 - 2. Mating surfaces shall be free of loose or deleterious materials that would otherwise inhibit bond.
- I. Bar Grating:
- 1. Welded, rectangular bar grating with serrated surface. Type 304 Stainless Steel, 1 inch by 3/16 inch members with overall dimensions as indicated on the contract drawings. Anchorage to structure shall be accomplished using Type 304 Stainless Steel hardware (saddle clips, nuts, bolts, anchors as indicated on the contract drawings).

Construction Methods:

- A. Construction Tolerances:
- 1. Squareness: 1/16 inch maximum difference in diagonal measurements.
 - 2. Maximum Misalignment of Adjacent Members: 1/16 inch.
 - 3. Maximum Bow: 1/8 inch in 48 inches.
 - 4. Maximum Deviation from Plane: 1/16 inch in 48 inches.

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B. Welding (Shop and Field):

1. Meet codes for Arc and Gas Welding in Building Construction of the AWS and AISC for techniques of welding employed, appearance, quality of welds made, and the methods of correcting defective work.
2. Preheat and Interpass Temperature: Perform preheating as required by the appropriate AWS specification for the base metal and welding process being used, and to prevent buckling.
3. Welding Surfaces: Free from loose scale, rust, grease, paint, and other foreign material; except mill scale may remain, which will withstand vigorous wire brushing with non-ferrous, virgin stainless steel brush.
4. A light film of linseed oil shall be disregarded.
5. Do not weld when temperature of base metal is lower than zero degrees F.
6. Finished members shall be true to line and free from twists.
7. Prepare welds and adjacent areas such that there are:
8. No undercutting or reverse ridges on the weld bead.
9. No sharp peaks or ridges along the weld bead.
10. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead. Remove weld splatter.
11. Final welds shall be cleaned using virgin, non-ferrous abrasives and passivated using an approved solution in accordance with the manufacturer's recommendations, and ASTM A380.
12. Passivation is defined as the removal of exogenous iron or iron compounds from the surface of a stainless steel by means of a chemical dissolution, most typically by a treatment with an acid solution that will remove the surface contamination but will not significantly affect the stainless steel itself.
13. Cleaning and passivation of stainless steel fabrications shall be conducted as the last step after fabrication.

C. Testing:

1. All welds shall be 100% visually inspected. At least 10% of the items in any similarly fabricated group shall be randomly selected and tested. If a defective weld is found in the sample, a further 10% shall be tested; and if a defect is found in the further sample, all items welded in the same group or by the same process shall be tested. Accordingly, at least one full penetration

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butt-welded specimen shall be 100% ultrasonically tested, and one sample of each of the other weld types shall be magnetic particle or dye penetrant tested.

2. All stainless steel shall be checked for susceptibility to intergranular attack. Tests shall include Practices A, B, and E within ASTM A262. Detailed procedures for the tests shall be submitted to the Engineer for approval prior to start of work. Practice A shall be used only for acceptance of materials but not for rejection of materials, and shall be used for screening material intended for testing in Practice B and Practice E. The maximum acceptable corrosion rate under Practice B shall be 0.004 inch per month, rounded off to the third decimal place. If the certified mill report indicates that such test has been satisfactorily performed, the fabricator is not required to repeat the test. Material passing Practice E shall be acceptable.

D. Inspection During Fabrication:

1. The Fabricator shall electronically notify DeIDOT and the Engineer when they intend to fabricate each portion of the proposed work so inspections may be made at the fabricator's facility.

E. Surface Preparation:

1. Surfaces shall be prepared prior to mounting of metal fabrications.

2. Existing Surface Preparation shall include:

a. Chipping, grinding or otherwise removing concrete or buildup to produce a uniform, planer, level or vertical surface (as required) free of concrete fins, protrusions, biologic, or mineral buildup.

b. Final cleaning of the surface shall be completed using high pressure (3000 psi to 5000 psi) pressure washer spray with a rotary (turbo) nozzle. The finished surface shall be free of loose or otherwise deleterious or bond-inhibiting materials.

F. Installation:

1. Install items plumb and level where appropriate, accurately fitted, free from distortion or defects. Completed installations shall be rigid, substantial, and neat in appearance.

2. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments, or placement of concrete.

3. Examine surfaces for defects which would impair installation and perform surface preparation to the satisfaction of the Engineer.

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4. Perform field welding in accordance with AWS and this specification.
5. Obtain approval prior to site cutting or making adjustments not scheduled.
6. Erect structural elements in accordance with applicable portions of AISC Code of Standard Practice, except as modified.
7. Install commercially manufactured products in accordance with manufacturer's recommendations.
8. Grout used for leveling plates, other structural members, and filling existing blockouts shall be installed in accordance with manufacturer's recommendations, and shall fill the annulus between the intended objects fully and completely. Provide temporary ports where required to facilitate inspection or placement of grout. Obtain port location approval from the Engineer prior to performing the work. After grouting is completed, the Contractor shall remove the grouting equipment and supplies from the site, including unused materials and wastes that are unsightly or would interfere with efficient operation of others. Clean concrete surfaces of any contaminants or loose materials prior to placing grout.
9. Make field joints butt tight, flush, and hairline. Joints exposed to water shall be formed or sealed with an approved sealant to prevent water penetration.

G. Performance:

1. Material fabrications shall perform in accordance with design requirements for the specified service life.

H. Storage:

1. Material shall be stored out of contact with the ground, and ferrous metals in such manner and location as to minimize deterioration. Material shall be stored on supports above ground and shall be protected from damage by traffic or other contractor operations. Loose materials including plates, anchor bolts, nuts, and washers shall be received properly packaged and labeled. The contractor is responsible for securing the site during construction and protecting materials from theft.

Method of Measurement:

Measurements shall consist of confirmation by the Engineer that all required metal fabrications have been acceptably designed, approved, installed, protected, and tested upon completion of the project.

Basis of Payment:

Metal Fabrications shall be paid for at the Contract lump sum price. Price and payment will constitute full compensation for furnishing and placing all permanent and temporary materials, surface preparation, labor, equipment, tools, and work incidental thereto.

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624504 - HYDROPHILIC WATERSTOP

Description:

This work pertains to Contract T201807401 and consists of furnishing and installing hydrophilic waterstops at the locations shown on the plans, as specified herein and as directed by the Engineer.

Note: These Special Provisions replace Subsection 1049.03 of the Standard Specifications.

Materials:

Hydrophilic Waterstop shall be a single component polyurethane hydrophilic waterstop such as Hydrotite by Greenstreak or equal. Waterstop shall have a delay coating to inhibit initial expansion due to moisture present in fresh concrete. Waterstop shall swell upon hydration with water so as to form a tight compression-type seal between concrete elements. Waterstop shall not be subject to degradation by the concrete mixture, nor shall it stain or otherwise discolor the concrete.

Water Swelling Sealant shall be single component hydrophilic sealant such as Leakmaster by Greenstreak or equal to secure waterstop to dry concrete and seal joints as shown on the plans.

Provide cyanoacrylate adhesive (super glue) for all waterstop splices.

Construction Methods:

Waterstop shall be installed in all locations shown on the plans. Waterstop shall be applied in temperatures between 50 and 90 degrees F.

- A. Joint surfaces shall be clean, sound, free of loose particles, dust, laitance, oils, and other contaminants prior to installation of waterstop.
- B. Attach waterstop to dry or damp (with no presence of standing water) and hardened concrete with sealant.

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- C. Wait at least 2 hours before placing fresh concrete.
- D. Maintain minimum cover of 4 inches of concrete around waterstop.
- E. Splice waterstop with cyanoacrylate adhesive.
- F. Install waterstop in strict accordance with manufacturer's instructions.

All waterstop exhibiting considerable swelling prior to confinement in the joint shall be replaced with new waterstop at no additional cost to the Department.

Method of Measurement:

The quantity of Hydrophilic Waterstop will not be measured.

Basis of Payment:

This work including all labor, materials, equipment, and incidentals will be considered incidental to the cost of concrete. No additional compensation will be made for this work.

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763501 - CONSTRUCTION ENGINEERING

Description:

This work consists of construction lay out including; stakes, lines and grades as specified below. Subsection 105.10 Construction Stakes, Lines and Grades of the Standard Specifications is voided.

Based on contract plans and information provided by the Engineer, the Contractor shall stake out right-of-way and easements lines, limits of construction and wetlands, slopes, profile grades, drainage system, centerline or offset lines, benchmarks, structure working points and any additional points to complete the project.

The Engineer will only establish the following:

- (a) Original and final cross-sections for borrow pits.
- (b) Final cross-sections: Top and bottom pay limit elevations for all excavation bid items that are not field measured by Construction inspection personnel. The Contractor shall notify the Engineer when these pay limit elevations are ready and allow for a minimum of two calendar days for the Engineer to obtain the information.
- (c) Line and grade for extra work added on to the project plans.

Equipment. The Contractor shall use adequate equipment/instruments in a good working order.

He/she shall provide written certification that the equipment/instrument has been calibrated and is within manufacturer's tolerance. The certification shall be dated a maximum of 9 months before the start of construction. The Contractor shall renew the certification a minimum of every 9 months. The equipment/instrument shall have a minimum measuring accuracy of $[3\text{mm}+2\text{ppmxD}]$ and an angle accuracy of up to 2.0 arc seconds or 0.6 milligons. If the Contractor chooses to use GPS technology in construction stakeout, the Contractor shall provide the Engineer with a GPS rover and Automatic Level for the duration of the contract. The GPS rover shall be in good working condition and of similar make and model used by the Contractor. The Contractor shall provide up to 8 hours of formal training on the Contractor's GPS system to a maximum of four Engineer's appointees (DELDOT Construction Inspectors). At the end of the contract, the Engineer will return the GPS rover to the Contractor. If any of the equipment/instruments are found to be out of adjustment or inadequate to perform its function, such instrument or equipment shall be immediately replaced by the Contractor to the satisfaction of the Engineer. Choosing to use GPS technology does not give the contractor authority to use machine control.- Construction Engineering (GPS) Machine Control Grading shall only be used if noted in the General Notes in the plan set outlining the available files that will be provided to the Contractor and "the Release for delivery of documents in electronic form to a contractor" are signed by all parties prior to delivery of any electronic files. Only files designated in the General Notes shall be provided to the contractor. If machine control grading is allowed on the project see the "machine control" section of this specification. GPS technology and machine control technology shall not be used in the construction of bridges.

Engineering/Survey Staff. The Contractor shall provide and have available for the project an adequate engineering staff that is competent and experienced to set lines and grades needed to construct the project. The engineering personnel required to perform the work outlined herein shall have experience and ability compatible with the magnitude and scope of the project. Additionally, the Contractor shall employ an engineer or surveyor licensed in the State of Delaware to be responsible for the quality and accuracy of the work done by the engineering staff. When individuals or firms other than the Contractor perform any professional services under this item, that work shall not be subject to the sub contracting requirements of Subsection 108.01 of the Standard Specifications. The Contractor shall assume full responsibility for any errors and/or omissions in the work of the engineering staff described herein. If construction errors are caused due to erroneous work done under Construction Engineering the Contractor accepts full responsibility, no matter when the error is discovered. Consideration will not be given for any extension of contract time or additional compensation due to delays, corrective work, or additional work that may result from faulty and erroneous construction stakeout, surveying, and engineering required by this specification.

Construction Methods:

Performance Requirements:

- (a) Construction Engineering shall include establishing the survey points and survey centerlines; finding, referencing, offsetting the project control points; running a horizontal and vertical circuit to verify the precision of given control points. Establishing plan coordinates and elevation marks for culverts, slopes, subbase, subsurface drains, paving, subgrade, retaining walls, and any other stakes required for control lines and grades; and setting vertical control elevations, such as footings, caps, bridge seats and deck screed. The Contractor shall be responsible for the preservation of the Department's project control points and benchmarks. The Contractor shall establish and preserve any temporary control points (traverse points or benchmarks) needed for construction. Any project control points (traverse points) or benchmarks conflicting with construction of the project shall be relocated by the Contractor. The Contractor as directed by the Engineer must replace any or all stakes that are destroyed at any time during the life of the contract. The Contractor shall re-establish centerline points and stationing prior to final cross-sections by the Engineer. The Vertical Control error of closure shall not exceed 0.035 ft times. The Horizontal Control precision ratio shall have a minimum precision of 1:20,000 feet of distance traversed prior to adjustment.
- (b) The Contractor shall perform construction centerline layout of all roadways, ramps and connections, etc. from project control points set by the Engineer. The Contractor using the profiles and typical sections provided in the plans shall calculate proposed grades at the edge of pavement or verify information shown on Grades and Geometric sheets.
- (c) The Contractor shall advise the Engineer of any horizontal or vertical alignment revisions needed to establish smooth transitions to existing facilities. The Contractor must immediately bring to the attention of the Engineer any potential drainage problem within the project limits. The Engineer must approve any proposed variation in profile, width or cross slope.

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- (d) The Contractor shall establish the working points, centerlines of bearings on bridge abutments and on piers, mark the location of anchor bolts to be installed, check the elevation of bearing surfaces before and after they are ground and set anchor bolts at their exact elevation and alignment as per Contract Plans. Before completion of the fabrication of beams for bridge superstructures, the Contractor shall verify by accurate field measurements the locations both vertically and horizontally of all bearings and shall assume full responsibility for fabricated beams fitting and bearing as constructed. After beam erection and concurrently with the Department project surveyors or their designated representative, the Contractor shall survey top of beam elevations at a maximum of 10-ft stations and compute screed grades. These shall be submitted to the Engineer for review and approval before the stay in place forms are set. Construction stakes and other reference control marks shall be set at sufficiently frequent intervals to assure that all components of the structure are constructed in accordance with the lines and grades shown on the plans. The Contractor will be responsible for all structure alignment control, grade control and all necessary calculations to establish and set these controls.

- (e) The Contractor, using contract plans, shall investigate proposed construction for possible conflicts with existing and proposed utilities. The Contractor shall then report such conflicts to the Engineer for resolution. All stakes for utility relocations, which will be performed by others, after the Notice to Proceed has been given to the Contractor, shall be paid for under item 763597
 - Utility Construction Engineering.

- (f) The Contractor shall be responsible for the staking of all sidewalk and curb ramp grades in accordance with the plans and the Departments Standard Construction Details. The Contractor shall review the stakeout with the Engineer prior to construction. The Engineer must approve any deviation from plans, Department Standard Construction Details and Specifications in writing. The Contractor shall be responsible for any corrective actions resulting from problems created by adjustments if they fail to obtain such approval.

- (g) The Contractor shall be responsible for the staking of all drainage inlets in accordance with the plans and the Department Standard Construction Details. The offsets and top of grate elevations need to be calculated for each type of drainage inlet specified in the contract plans by the Contractor in order to line up the drainage inlet's flow line with the specified curb or ditch flow line as shown in the Contract Documents. The Engineer must approve any deviations from plans, Department Standard Construction Details and Specifications in writing. The Contractor shall be responsible for any corrective actions resulting from problems created by adjustments if they fail to obtain such approval.

- (h) If wetland areas are involved and specifically defined on the Plans the following shall apply:
 - i. It is the intent of these provisions to alert the Contractor, that he/she shall not damage or destroy wetland areas, which exist beyond the construction limits. These provisions will be strictly enforced and the Contractor shall advise his/her personnel and those of any Subcontractor of the importance of these provisions.

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- ii. All clearing operations and delineation of wetlands areas shall be performed in accordance with these Special Provisions. Before any clearing operation commences the Contractor shall demarcate wetlands at the Limits of Construction throughout the entire project as shown on the Plans labeled as Limits of Construction or Wetland Delineation to the satisfaction of the Engineer.
 - iii. The material to be used for flagging the limits of construction shall be orange vinyl material with the wording "Wetland Boundary" printed thereon. In wooded areas, the flagging shall be tied on the trees, at approximate 20-foot intervals through wetland areas. In open field and yard areas that have been identified as wetlands, 6 foot posts shall be driven into the ground at approximate 50-foot intervals and tied with the flagging. The flagging shall extend approximately 12 inches in length beyond the post. Posts shall be oak with cross sectional dimensions of 1 ½ inches to 2 inches by 1 ½ inches to 2 inches or ¼ inch rebar.
 - iv. If the flagging has been destroyed and the Engineer determines that its use is still required, the Contractor shall reflag the area at no cost to the Department. If the Contractor, after notification by the Engineer that replacement flagging is needed, does not replace the destroyed flagging within 48 hours, the Engineer may proceed to have the area reflagged. The cost of the reflagging by the Engineer will be charged to the Contractor and deducted from any monies due under the Contract.
 - v. At the completion of construction, the Contractor shall remove all posts and flagging.
 - vi. The Contractor shall be responsible for any damages to wetlands located beyond the construction limits, which occurs from his/her operations during the life of the Contract. The Contractor shall restore all temporarily disturbed wetland areas to their preconstruction conditions. This includes restoring bank elevations, streambed and wetland surface contours and wetlands vegetation disturbed or destroyed. The expense for this restoration shall be borne solely by the Contractor.
- (i) Whenever the Engineer will be recording data for establishment of pay limits, the Contractor will be invited to obtain the data jointly with the Engineer's Survey Crew(s) in order to agree with the information. If the Contractor's representative is not able to obtain the same data, then the information obtained by the Engineer shall be considered the information to be used in computing the quantities in question.

Submittals. All computations necessary to establish the exact position of all work from the control points shall be made and preserved by the Contractor. All computations, survey notes, electronic files, and other records necessary to accomplish the work shall be made available to the Department in a neat and organized manner at any time as directed by the Engineer. The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor and any necessary correction to the work shall be made as soon as possible. The Contractor shall furnish the Engineer with such assistance as may be required for checking all lines, grades, and measurements established by the Contractor and necessary for the execution of the work. Such checking by the Engineer shall not

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relieve the Contractor of his/her responsibility for the accuracy or completeness of the work. Copies of all notes must be furnished to the engineer at the completion of the project.

The Contractor shall submit any of the following at the Engineer's request:

- (a) Proposed method of recording information in field books to ensure clarity and adequacy.
- (b) A printout of horizontal control verification, as well as coordinates, differences and error of closure for all reestablished or temporary Control Points.
- (c) A printout of vertical control verification, with benchmark location elevation and differences from plan elevation.
- (d) Sketch of location of newly referenced horizontal control, with text printout of coordinates, method of reference and field notes associated with referencing control - traverse closure report.
- (e) Description of newly established benchmarks with location, elevation and closed loop survey field notes - bench closure report
- (f) All updated electronic and manuscript survey records.
- (g) Stakeout plan for each structure and culvert.
- (h) Computations for buildups over beams, screed grades and overhang form elevations.
- (i) A report showing differences between supplied baseline coordinates and field obtained coordinates, including a list of preliminary input data.
- (j) Any proposed plan alteration to rectify a construction stakeout error, including design calculations, narrative and sealed drawings.
- (k) Baseline for each borrows pit location.
- (l) Detailed sketch of proposed overhead ground mounted signs or signals showing obstructions that may interfere with their installation.
- (m) Copies of cut sheets.

Machine Control Grading

This Section of the specification shall only be used if machine control is authorized for use on the project.

Description:

This specification contains the requirements for grading operations utilizing Global Positioning Systems (GPS).

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Use of this procedure and equipment is intended for grading the subgrade surface; it is not intended for the use in constructing final surface grades.

The Contractor may use any manufacturer's GPS machine control equipment and system that results in achieving the grading requirements outlined in section 202 of the standard specifications. The Contractor shall convert the electronic data provided by the Department into the format required by their system. The Department will only provide the information outlined in this document and no additional electronic data will be provided.

The Contractor shall perform at least one 500 foot test section with the selected GPS system to demonstrate that the Contractor has the capabilities, knowledge, equipment, and experience to properly operate the system and meet acceptable tolerances. The engineer will evaluate and make the determination as to whether additional 500 foot test sections are required. If the Contractor fails to demonstrate this ability to the satisfaction of the Department, the Contractor shall construct the project using conventional surveying and staking methods.

Materials:

All equipment required to perform GPS machine control grading, including equipment needed by DeIDOT to verify the work, shall be provided by the Contractor and shall be able to generate end results that are in accordance with the requirements of Division 200 - EARTHWORK of the Standard Specifications.

Construction:

A. DeIDOT Responsibilities:

1. The Department will set initial vertical and horizontal control points in the field for the project as indicated in the contract documents, (plans set). If the Contractor needs to establish new control points they shall be traversed from existing control points and verified to be accurate by conventional surveying techniques.
2. The Department will provide the project specific localized coordinate system.
3. The Department will provide data in an electronic format to the Contractor as indicated in the General Notes.

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- a. The information provided shall not be considered a representation of actual conditions to be encountered during construction. Furnishing this information does not relieve the Contractor from the responsibility of making an investigation of conditions to be encountered including, but not limited to site visits, and basing the bid on information obtained from these investigations, and the professional interpretations and judgments of the Contractor. The Contractor shall assume the risk of error if the information is used for any purpose for which the information is not intended.
- b. Any assumption the Contractor makes from this electronic information shall be at their risk. If the Contractor chooses to develop their own digital terrain model the Contractor shall be fully responsible for all cost, liability, accuracy and delays.
- c. The Department will develop and provide electronic data to the Contractor for their use as part of the contract documents in a format as indicated in the General

Notes. The Contractor shall independently ensure that the electronic data will function in their machine control grading system.

- 4. The Files that are provided were originally created with the computer software applications MicroStation (CADD software) and INROADS (civil engineering software). The data files will be provided in the native formats and other software

formats described below. The contractor shall perform necessary conversion of the files for their selected grade control equipment. The Department will furnish the Contractor with the following electronic files:

- a. CAD files
 - i. Inroads -Existing digital terrain model (.DTM)
 - ii. Inroads -Proposed digital terrain model (.DTM)
 - iii. Microstation -Proposed surface elements - triangles
 - b. Alignment Data Files:
 - i. ASCII Format
- 5. The Engineer shall perform spot checks of the Contractor's machine control grading results, surveying calculations, records, field procedures, and actual staking. If the Engineer determines that the work is not being performed in a manner that will assure accurate results, the Engineer may

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order the Contractor to redo such work to the requirements of the contract documents, and in addition, may require the Contractor to use conventional surveying and staking, both at no additional cost to the Department.

B . Contractor's Responsibilities

1. The Contractor shall provide the Engineer with a GPS rover and Automatic Level, for use during the duration of the contract. At the end of the contract, the GPS rover and Automatic Level will be returned to the Contractor. The Contractor shall provide a total of 8 hours of formal training on the Contractor's GPS machine control system to the Engineer and up to three additional Department appointees per rover.
2. The Contractor shall review and apply the data provided by the Department to perform GPS machine control grading.
3. The Contractor shall bear all costs, including but not limited to the cost of actual reconstruction of work, that may be incurred due to application of GPS machine control grading techniques. Grade elevation errors and associated corrections including quantity adjustments resulting from the contractor's use of GPS machine control shall be at no cost to the Department.
4. The Contractor shall convert the electronic data provided by the Department into a format compatible with their system.
5. The Contractor's manipulation of the electronic data provided by the Department shall be performed at their own risk.
6. The Contractor shall check and if necessary, recalibrate their GPS machine control system at the beginning of each workday in accordance with the manufacturer's recommendations, or more frequently as needed to meet the requirements of the project.
7. The Contractor shall meet the accuracy requirements as detailed in the Standard Specifications.
8. The Contractor shall establish secondary control points at appropriate intervals and at locations along the length of the project. These points shall be outside the project limits and/or where work is performed. These points shall be at intervals not to exceed 1000 feet. The horizontal position of these points shall be determined by conventional survey traverse and adjustments from the original baseline control points. The conventional traverse shall meet or exceed the Department's Standards. The elevation of these control points shall be established using differential leveling from the project benchmarks, forming a closed loop. A copy of all new control point information including

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closure report shall be provided and approved by the Engineer prior to construction activities. The Contractor shall be responsible for all errors resulting from their efforts and shall correct deficiencies to the satisfaction of the Engineer and at no additional cost to the Department.

9. The Contractor shall provide stakes at all alignment control points, at every 500 foot stationing, and where required for coordination activities involving environmental agencies and utility companies at the Contractor's expense. Work that is done solely for utility companies and that is beyond the work performed under item 763501 - Construction shall follow and be paid for under item 763597 -Utility Construction Engineering.
10. The Contractor shall at a minimum set hubs at the top of finished grade at all hinge points on the cross section at 500 foot intervals on the main line and at least 4 cross sections on side roads and ramps as directed by the engineer or as shown on the plans. Placement of a minimum of 4 control points outside the limits of disturbance for the excavation of borrow pits, Stormwater Management Ponds, wetland mitigation sites etc. These control points shall be established using conventional survey methods for use by the Engineer to check the accuracy of the construction.
11. The Contractor shall preserve all reference points and monuments that are identified and established by the Engineer for the project. If the Contractor fails to preserve these items the Contractor shall reestablish them at no additional cost to the Department.
12. The Contractor shall provide control points and conventional grades stakes at critical points such as, but not limited to, PC's, PT's, superelevation points, and other critical points required for the construction of drainage and roadway structures.
13. No less than 2 weeks before the scheduled preconstruction meeting, the Contractor shall submit to the Engineer for review a written machine control grading work plan which shall include the equipment type, control software manufacturer and version, and proposed location of the local GPS base station used for broadcasting differential correction data to rover units.
14. The Contractor shall follow the guidelines set forth in the "Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques" and follow a minimum of Second Order Class 1, (2-I) classification standards.

Automated equipment operations have a high reliance on accurate control networks from which to take measurements, establish positions, and verify locations and features. Therefore, a strong contract control network in the field which is the same or is strongly integrated with the project control used during the design of the contract is essential to the successful use of this technology with the proposed Digital Terrain Model (DTM). Consistent and well designed site calibration for all machine control operations (as described below under Contract Control Plan) are required to ensure the quality of the contract deliverables. The Contract Control Plan is intended to document which horizontal and vertical control will be held for these operations. Continued incorporation of the

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Base Station(s) as identified in the Contract Control Plan is essential to maintaining the integrity of positional locations and elevations of features. The Contract Control Plan shall be submitted to the Department for review and approval by the Departments Survey Section 3 weeks prior to the start of any machine control work. The Contractor shall operate and maintain all elements of the Machine Grade Control continuously once the operations begin until otherwise approved by the Engineer.

Contract Control Plan:

The Contractor shall develop and submit a Contract Control Plan for all contracts which use Machine Control Grading. Contract control includes all primary and secondary horizontal and vertical control which will be used for the construction contract. Upon the Contractor's completion of the initial survey reconnaissance and control verification, but prior to beginning primary field operations, the Contractor shall submit a Contract Control Plan document (signed and sealed by the Delaware licensed Land Surveyor or Delaware Professional Engineer who oversees its preparation) for acceptance by the

Engineer, which shall include the following:

1. A control network diagram of all existing horizontal and vertical control recovered in the field as contract control.
2. Include a summary of the calculated closures of the existing control network, and which control has been determined to have been disturbed or out of tolerance from its original positioning.
3. An explanation of which horizontal and vertical control points will be held for construction purposes. If necessary include all adjustments which may have been made to achieve required closures.
4. An explanation of what horizontal and vertical control (including base stations) was set to accomplish the required stakeout or automated machine operation. Include how the position of these new control points was determined.
5. Describe the proposed method and technique (technology and quality control) for utilizing the control to establish the existing and/or proposed feature location and to verify the completed feature location and/or measured quantity.
6. A listing of the horizontal and vertical datums to be used and the combined factor to be used to account for ellipsoidal reduction factor and grid scale factor.

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7. If the Contractor chooses to use machine control as a method of measuring and controlling excavation, fill, material placement or grading operations as a method of measuring and controlling excavation, fill, material placement or grading operations, the Contractor Control Plan shall include the method by which the automated machine guidance system will initially be site calibrated to both the horizontal and vertical contract control, and shall describe the method and frequency of the calibration to ensure consistent positional results.

8. Issues with equipment including inconsistent satellite reception of signals to operate the GPS machine control system will not result in adjustment to the "Basis of Payment" for any construction items or be justification for granting contract time extension.

Method of Measurement:

The quantity of Construction Engineering will not be measured.

Basis of Payment:

Payment will be made at the Lump Sum price bid for the item "Construction Engineering". The price bid shall include the cost of furnishing all labor, equipment, instruments, stakes and other material necessary to satisfactorily complete the work as herein described under this item for all roads and structures that are a part of the contract. Adjustment in payment will be made for the deletion or addition of work not shown in the contract documents.

Monthly payment will be made under this item in proportion to the amount of work done as determined by the Engineer.

8/22/2019

763508 - PROJECT CONTROL SYSTEM DEVELOPMENT PLAN

763509 - CPM SCHEDULE UPDATES AND/OR REVISED UPDATES

Description:

The Contractor shall plan, schedule and construct the Project by using a Critical Path Method Project Schedule (CPM) meeting the requirements of these specifications. Use the CPM for coordinating and monitoring the Work specified in the Contract Documents including all activities of Subcontractors, vendors, suppliers, utilities, railroads, the Department, and all other parties associated with the construction of the Contract. Include all Work in the CPM; including but not limited to submittals, major procurement, delivery, and construction activities. Include all activities, including bid items, quantified in the Contract Documents. Base the CPM upon the entirety of the Contract Documents. Utilize CPM software that generates files compatible with Primavera P6 Project Management Release: 7.0.0.

Scheduling Representative:

Designate a scheduling representative prior to submission of the Original Critical Path Method Project Schedule (OCPM). The scheduling representative is the person primarily responsible for development and maintenance of the CPM schedule; the Contractor's representative in all matters regarding the schedule; and the Contractor's designated attendee for all schedule related meetings. The scheduling representative shall also be knowledgeable of the status of all parts of the Work throughout the duration of the Project. Replacement of the scheduling representative will require written approval from the Engineer.

Submit the qualifications of the scheduling representative to the Engineer for approval. This approval is required before the OCPM will be accepted. The scheduling representative shall have at least three years of verifiable experience for preparing and maintaining CPM project schedules on Contracts of similar size and complexity.

Critical Path, Project Completion Date, and Float:

The critical path is defined as the series of activities in a CPM that has the longest path in time. The submitted activity sequence and durations must generate a CPM with only one critical path. Divide Project wide activities such as Maintenance of Traffic, Construction Engineering, or Temporary Erosion Control that, by their nature, generate long durations and complement other activities into "establish" and "conclude" activities to prevent this type of Work from occupying a significant portion of the critical path.

The project start date, or initial data date, of the original CPM shall be the first chargeable day of Work. Nonproductive Work and administrative activities may begin and/or end prior to the project start date. The

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Original CPM must use all of the Contract Time and contain a critical path containing exactly zero float. Early completion schedules are not permitted. The schedule ending date of the Original CPM that uses all of the Project Time is the contract completion date.

Total Float is the difference between the schedule's finish date and the contract completion date. Free float is the difference in time between an activity's early finish and late finish. Free float is a shared commodity for the use of the Department and the Contractor and is not for the exclusive use or benefit of either party. Both parties have the full use of free float until depleted.

Submittal of the OCPM; the Start of Work and the Schedule of Record:

Complete and submit the proposed original CPM schedule (OCPM) database and the written narrative (WN) within 30 calendar days after Contract is Awarded. The WN is a description of any elements of the Schedule that deviate from the proposed construction sequence shown in the Contract Documents. Submit the OCPM in CPM format fully compatible with Primavera P6 Project Management Release: 7.0.0 by email or CD ROM as a single compressed database in CPM format.

The Engineer will complete the review of the OCPM within 30 calendar days after submittal. If required, a Joint Review Conference will be convened at which time the Engineer and Contractor may make corrections and adjustments to the proposed OCPM. If a revision is necessary due to the Engineer's review or the Joint Review Conference, submit the proposed revision within seven calendar days after receiving the Engineer's review comments or within seven calendar days after the date of the Joint Review Conference, whichever is the latest. Make revisions in accordance with the requirements for the OCPM. The Engineer will respond to the revised OCPM within seven calendar days after receipt. Clearly identify each submittal and resubmittal for clarity by labeling "2nd Draft", "3rd Draft", etc.

Do not start any Work until the OCPM is accepted. If the Engineer is ready to issue a Notice to Proceed but the OCPM is not yet accepted, the Engineer may issue the NTP and start Contract Time, but forbid Work to begin until the OCPM is accepted. The Engineer may partially accept a OCPM and allow Work to begin if the required corrections to the OCPM are minor, but the Engineer will not accept submittals that do not show the complete schedule. The Engineer will not pay any estimates until the OCPM is partially accepted. Once the OCPM is partially accepted, the Engineer will pay the first estimate. If the Contractor fails to make a good faith effort to address the Engineer's comments before the second estimate is due for payment, the Engineer will not pay the second estimate until a good faith effort is made by the Contractor to comply. The Engineer may not withhold an estimate payment if, within the estimate period in question, the Engineer has failed to provide timely review comments in response to the Contractor's submittal. The Engineer may, however, withhold the payment of subsequent estimates if the Contractor fails to make a good faith effort to address the Engineer's comments. Upon issuance of the Notice to Proceed, the start date utilized in the OCPM will be adjusted to comply with the first chargeable day of Work. Any delay in starting Work caused by the acceptance of the OCPM by the Engineer will not be considered as a basis for any adjustment in the Contract amount or time. For Contracts that have fast-tracked starts, the Engineer and the Contractor may agree to alter the response times and approval dates listed above.

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Upon notification that the OCPM has been accepted, the corrected copy will become the CPM of record. The CPM of record shall be the Contractor's work plan for completing the entire Contract as specified in the Contract Documents.

Requirements for the OCPM:

The format of the OCPM database shall be the precedence diagram method with days as the planning unit and shall be based on Calendar Days. Use the Department's partially predetermined coding structure (CS) that is furnished by the Engineer.

Activity Sequencing. Activity sequence must be logical and representative of the Contractor's order of the Work. Successors and predecessors determine the schedule logic or activity sequence. A given activity cannot start until all of the given activity's predecessors have been completed. Use only finish to start dependency relationships (links); do not use lag times without approval from the Engineer. The Engineer may request that the Contractor resequence the activities to reflect realistic job logic. When scheduling using multiple resources, each resource unit shall have a corresponding activity. Durations of activities include all the time necessary to complete the activity including, but not limited to, Contractor's non-work periods (other than those shown on the calendars), reasonably foreseeable inclement weather, weekends and holidays. Base schedule calculations on retained logic, contiguous durations, and total float as finish float.

Activity Resources. Sequence activities to reflect resource apportionment. Logically connect and code each activity to reflect the crew (resource) performing the operation. Submit a summary list of crews, their crew codes, and their operation(s) with each schedule submission, unless unchanged. Identify responsibility for each activity. Identify Subcontractors, DBE's, utilities and Work performed by others that affects the Schedule.

Breakdown and Durations of Activities. An individual activity is required for each construction element or each activity not under the control of the Contractor that affects the sequence or progress of the Work. The Engineer reserves the right to require additional breakdown of the Work activities at any time. Each activity must be identified by a name, symbol and coding, and shall have a duration, sequence, responsibility and resource(s). Choose activity names that are descriptive and identify single construction elements. Activity symbols, or ID's, shall be unique and systematic.

Activity types must be either "task", "start milestone", or "finish milestone". Do not use "hammock" type activities. Date constraints, float and duration constraints, and/or flags for activities are not permitted.

Assign a reasonable duration to each activity representative of its scope. Durations may not exceed 14 calendar days unless approved by the Engineer. Determine the duration of each activity by using productivity rates based on Calendar Days.

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Include the preparation and approval of Working Drawings as activities. Include phasing (staging) milestones as activities. Correlate phasing milestones with the sequence of construction provided in the Contract Documents. Use a separate start and finish milestone activity to delineate each phase (stage).

Utility Work. Include all Work performed by utilities on the Project as activities in the OCPM. Include each utility item of Work shown in the Contract’s Utility Statement as an activity. Durations for utility activities shall be the same as the durations shown in the Utility statement for each activity unless otherwise approved by the Engineer.

Calendars. Assign a calendar to each activity in the schedule. Use a minimum of 6 calendars, when applicable: (1) Full Schedule; (2) Permit Requirements; (3) Winter Condition; (4) Concrete Work; (5) Asphalt Paving Work; and (6) Nighttime Asphalt Paving Work. Use additional calendars if needed. Calendar non-work periods shall reflect the average Delaware weather history for the jobsite and the restrictions identified in the Contract Documents. The Contractor may choose perform Work during an activity’s calendar non-work period at no additional cost to the Department if weather conditions are favorable for such Work and the Work does not violate a set forth in the Contract Documents. The maximum allowable non-work period for each calendar is set forth below. The Contractor may choose to shorten non-work periods at his/her discretion.

CALENDAR	MAXIMUM NON-WORK PERIOD
Full Schedule	None
Winter Condition	December 1 through March 15
Concrete Work	December 1 through March 15
Asphalt Paving	November 15 through March 15
Nighttime Asphalt Paving	October 15 through April 30

Written Narrative (WN). Provide a written narrative (WN) as part of the OCPM explaining the following:

- (a) Relationships between activities not obviously identified
- (b) Equipment usage and limitations.
- (c) Manpower usage and limitations.
- (d) Use of additional shifts and overtime.
- (e) Activity codes, abbreviations, and activity identification system.
- (f) All calendars utilized in the CPM and the basis of determining each non-work period
- (g) All abbreviations.
- (h) Use of calendars.

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- (i) Any other conditions that affect the schedule and are not readily discernible in the database.

CPM Updates:

Provide monthly updates to the CPM of record. Meet with the Engineer once a month prior to submitting the update to review the status of the schedule's activities. Prepare an updated list of activities showing all of the actual start and actual finish for each of the schedule's activities so that both parties can agree on the dates. Use the dates that were agreed upon in the meeting to status the CPM of record and submit the updated schedule to the Engineer for approval. Assign a unique file name to each update (Number/version). The data date of the update shall be the next day after the end of the update period. As part of the monthly update, submit a written description that identifies any delays or disruptions to the schedule experienced during the period of an update, any change in manpower or equipment, and any potential delays to the completion date of the schedule.

Do not include any revisions to the CPM without prior approval. Failure to submit complete updates in a timely manner may result in the withholding of estimates by the Engineer. The Engineer agrees to refrain from withholding estimates unless the Contractor is habitually late in providing updates, is more than four weeks late in submitting an update or has failed to submit an update that is part of a resolution to a serious problem that must be addressed immediately.

Revisions to the Schedule of Record:

Revisions are defined as any changes to the database other than status updates, log entries and moving the data date. Discuss any proposed revisions to the CPM verbally with the Engineer. If the revision is minor in nature, the Engineer may allow the revision to be included on the next Update of the CPM. If the Engineer determines that the revision is not minor in nature, submit the proposed revision for review and approval prior to deviating from the approved CPM. When a revision to the CPM is required due to changes in the Contract initiated by the Engineer, immediately contact the Engineer to discuss the changes. The Engineer may allow a deviation from the approved CPM for specific mitigating activities.

The Engineer may direct the Contractor to revise the schedule of record at the Contractor's expense if: the critical path has less than minus ten (-10) Calendar Days of total float due to the Contractor's failure to perform the Work in accordance with the schedule; the Contractor requests to re-sequence the Work; and/or the Contractor has performed a significant amount of Work out of sequence. The Engineer may direct the Contractor to revise the schedule for any other reason; and such a revision will be paid at the unit cost for a CPM Revision.

The Engineer will review and respond to the proposed revision within 7 Calendar Days after receipt. Resubmit, if required, within seven calendar days after receipt of the Engineer's review comments. The Engineer reserves the right to reject any proposed revision that adversely impacts the Department, utilities, or other concerned parties.

Extensions of Contract Time and/or Incentive/Disincentive Dates.

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Make requests for extension of Contract time in writing and subject to the notice and timeliness of submission provisions as provided for elsewhere in the Contract. Requests for an extension of Contract time or change in an incentive/disincentive date will be evaluated by the Engineer's analysis of the CPM of record and any proposed revision submitted. Include in the request a written narrative of the events that impacted the schedule and a detailed explanation of why the Contractor cannot meet the requirements of the schedule of record. Only delays to activities that affect the Contract completion date or will be considered for an extension of Contract time. Only delays to activities that affect the completion duration of an incentive/disincentive period will be considered for an extension of an incentive/disincentive completion date. The extension of the specified Contract completion date or incentive/disincentive date will be based upon the number of Calendar Days the Contract completion date or incentive/disincentive date is impacted as determined by the Engineer's analysis. The Engineer and Contractor may agree to defer the analysis of a potential impact to the schedule until the completion of the activities that are affected. Such a deferment does not relieve the Contractor of his/her duty to identify potential impacts to the schedule in the applicable schedule updates.

All requests for extensions of Contract Time must be supported by the most recent CPM Update. If, within a reasonable period of time, the Contractor fails to make a good faith effort to produce an acceptable CPM update and uses an unacceptable CPM update to support a request for a time extension, the Contractor loses the right to receive that time extension; and/or the right to receive compensation for that delay caused in whole or in part by the Engineer.

Final As Built Schedule.

Submit a final CPM Schedule database within 14 Calendar Days of Substantial Completion. Failure to submit a final CPM Schedule may result in the withholding of estimates by the Engineer.

Method of Measurement:

The Project Control System will be measured in two items. The item, "Project Control System Development Plan" will be lump sum. The item "CPM Schedule Updates and/or Revised Updates" will be measured one each per update that is submitted and accepted.

Basis of Payment:

The item, "763508 – Project Control System Development Plan" will be paid at the Contract's lump sum bid price on the next monthly estimate after completion of the requirements of the Project Control System Development Plan, which includes the approval of the Original CPM Schedule. Price and payment will constitute full compensation for preparing the CPM database, acquiring the necessary software, attending all scheduling meetings with the Department, submitting and resubmitting all documents and for all labor, tools, equipment and incidentals necessary to complete the Work.

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The item, "763509 – CPM Schedule Updates and/or Revised Updates" will be paid at the Contract unit price per each approved CPM schedule update as described above. Price and payment will constitute full compensation for preparing, submitting and resubmitting all CPM updates, for attendance at all scheduling meetings with the Department, for preparing and reviewing a list of actual start and actual finish dates with the Engineer, and for all labor, tools, Equipment and incidentals necessary to complete the Work.

2/11/2015

801500 - 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.

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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

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- 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

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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 403 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 817031 - Removal of Pavement Striping.

Contract No. T201807401.01

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 817 of Delaware Standard specifications and the Delaware MUTCD. Payment for temporary pavement striping shall be made at the unit price bid for item 817 - 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:

Contract No. T201807401.01

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 100 pounds 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 100 pounds 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

Contract No. T201807401.01

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.

10/5/16



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

800 BAY ROAD
P.O. Box 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

UTILITY STATEMENT

January 21, 2020

STATE CONTRACT # T201807401

P6 # 18-07401

**SILVER LAKE DAM REPAIRS (MIDDLETOWN)
NEW CASTLE COUNTY**

The following utility companies may own and/or maintain facilities within the project limits:

**Chesapeake Utilities
Delmarva Power Electric Distribution
New Castle County Dept. of Special Services
Verizon Delaware LLC**

The following is a breakdown of the Utilities involved, adjustments and/or relocations as required:

CHESAPEAKE UTILITIES

Chesapeake Utilities maintains gas facilities within the project limits.

Existing Chesapeake Utilities Facilities:

- Chesapeake Utilities maintains a 4" polyethylene gas main under Silver Lake on the left (west) of the construction alignment. The gas main appears to be close to the outside of the wing walls and not within the area of construction.

The contractor shall be aware that Chesapeake Utilities has requirements while working near Chesapeake Utilities pipelines. These requirements are general in nature and not specific. These requirements are not intended to be all-inclusive. Actual field conditions may change the requirements. Contractor should contact Chesapeake Utilities and consult with their engineer prior to initiating construction and abide by all Federal, State, and Local rules and regulations.

Please coordinate construction activity with your assigned line locator according to the general guidelines below. Your line locator can help determine if additional contacts are required with Chesapeake Utilities Engineering Department before start of excavation activity.

1. It shall be the contractor's responsibility to use the Miss Utility One Call System.



2. It shall be the contractor's responsibility to contact and coordinate with Chesapeake Utilities before starting any construction above or near the pipeline. Chesapeake Utilities may elect to have standby personnel on the job site during construction activity.
3. It shall be the contractor's responsibility to contact and coordinate with Chesapeake Utilities before moving heavy equipment above or near the pipeline. Chesapeake Utilities may require extra cover, berm or ramp, timber mats, etc. These measures are to be determined by Chesapeake Utilities depending on field conditions.
4. If the pipeline is exposed and suspended, it shall be the responsibility of the contractor to coordinate with Chesapeake Utilities the appropriate supporting measures. These measures are to be determined by Chesapeake Utilities depending on field conditions.
5. If the pipeline is exposed, it shall be the responsibility of the contractor to protect the pipeline from construction activity and the traveling public.
6. A minimum clearance of 12" shall be maintained between Chesapeake Utilities' pipeline and other underground utilities and structures. If this cannot be maintained, Chesapeake Utilities shall determine an appropriate means of protection to the pipeline.

IN EVENT OF PIPELINE EMERGENCY, CALL TOLL FREE 1-800-427-2883.

There are no anticipated impacts to these gas facilities.

Chesapeake Utilities' review is based upon information contained in DelDOT's Final Plans for contract T201807401, received on 09/11/2019, and all data available as of this date.

No additional Chesapeake Utilities involvement is anticipated.

No existing gas facilities can be taken out of service.

These facilities will remain in place and active during the duration of this contract.

DELMARVA POWER ELECTRIC

Delmarva Power maintains aerial and underground facilities within the project limits.

Delmarva Power maintains the following aerial facilities within the project limits:

1. Delmarva Power maintains a 3-phase aerial facilities along the east (right) side of Silver Lake Road throughout the project limits.

Anticipated Delmarva Power Relocations:

1. Delmarva Power does not anticipate any relocations or adjustments to their facilities within the project limits.

Delmarva Power's review is based upon information contained in DelDOT's Final Plans for contract T201807401, received on 09/11/2019, and all data available as of this date.

For exact location of electric facilities, please contact Miss Utility at (800) 282-8555.

16 Del. C. § 7405B requires notification to and mutually agreeable measures from the public utility from any person intending to carry on any function, activity, work or operation within dangerous proximity of any high voltage overhead lines. All contractors/other utilities must also maintain a distance of 10'-0" from all aerial energized lines.

No existing electric facilities will be taken out of service.

These facilities will remain in place and active during the duration of this contract.

NEW CASTLE COUNTY DEPT. OF SPECIAL SERVICES

New Castle County Department of Special Services owns and maintains sanitary sewer facilities within the limits of the project.

1. NCC maintains an 8" C.I. pipe in the center of the East bound travel lane of Silver Lake Rd within the project limits.

New Castle County Department of Special Services anticipates the State's contractor to perform the following construction:

Temporary support for the existing 8" sanitary sewer main.

1. The State's contractor is to install the temporary support system per the construction drawings.
2. The State's contractor is to install the permanent support system per the construction drawings.

NCC does not anticipate relocating their existing facilities as required by the engineer.

Any relocations/adjustments to any existing underground facilities shall be arranged, if necessary, with the owners and performed by the state's contractor during the construction of the highway project. The time to complete any additional relocations/adjustments will depend on the nature of the work.

No existing electric facilities will be taken out of service.

These facilities will remain in place and active during the duration of this contract.

VERIZON OF DELAWARE LLC

Verizon of Delaware Inc. maintains the following aerial facilities within the project limits:

1. Verizon maintains aerial facilities along the East side of Silver Lake Rd within the project limits.

Verizon of Delaware Inc. maintains the following buried/underground facilities within the project limits:

1. Verizon maintains one buried cable along the East side of Silver Lake Rd from Pole #MA46A/P3/J/678 extending South beyond the project limits.
2. Verizon maintains one buried cable along the East side of silver Lake Rd from Pole #MA46A/P7/J/674 extending North beyond the project limits.

Anticipated Verizon Relocations:

1. Verizon does not anticipate any relocations or adjustments to their facilities within the project limits.

Verizon's review is based upon information contained in DelDOT's Final Plans for contract T201807401, received on 09/11/2019, and all data available as of this date.

No existing Verizon facilities can be taken out of service.

These facilities will remain in place and active during the duration of this contract.

GENERAL UTILITY NOTES

Outside of the companies and facilities discussed above, no additional utility involvement is anticipated. Should any conflicts be encountered as a result of the contractor's means and methods during construction requiring adjustment and/or relocation, the necessary relocation work shall be accomplished by the respective utility company and funded by the State's Contractor as directed by the District Engineer. The State Contractor shall coordinate any potential conflicts with utility companies and provide adequate notice prior to performing work. Any utility conflicts that are not readily discernable shall be coordinated by the State Contractor once the conflict is recognized. The time to complete any relocations/adjustments found to be necessary during construction of the highway project will depend on the nature of the work.

Once the State's contractor has given the Utility the advance notice required above, it is the responsibility of the State's contractor to have the work area prepared and accessible for the Utility to perform the tasks listed above. If the site conditions are not ready and the state contractor has given notice to the utility on when the work is to be accomplished, the State's Contractor shall be responsible for any extra cost incurred by the utility company and the State Contractor shall also be responsible for any time delays. Between when the required notice is given to the Utility and when the work is performed and completed, the coordination and scheduling of the Utility is the sole responsibility of the State's Contractor. All costs related to the coordination and scheduling of the utilities is incidental to the contract.

Any adjustments and/or relocations of municipally owned sewer or water facilities shall be performed by the State's Contractor in accordance with the respective agency's standard specifications as directed by the District Engineer. The State contractor shall coordinate any potential conflicts of municipally owned sewer or water facilities with facility owners and provide adequate notice to the municipally and to the District Engineer prior to performing work.

GENERAL NOTES

1. The Contractor's attention is directed to Section 105.09 Utilities, Delaware Standard Specifications, August 2016. 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 and operating purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. The information shown in the Contract Documents, including the Utility Statement and the Utility Schedule contained herein, concerning the location, type, and size of existing and proposed utilities, their locations, and construction timing has been compiled by the preparer based on information furnished by each of the involved Utility Companies. It shall be the responsibility of the State's Contractor to verify all information and coordinate with the Utility Companies prior to and during construction, as specified in Section 105.09 of the Standard Specifications.
3. 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 unless the delay is caused by the Contractor's delay in having the site conditions ready for the utility relocation work after the Contractor has provided the advance notice that the site conditions would be ready for the utility relocation work. The contractor's means and method of construction are not taken into account when known utility conflicts are identified. If the Contractor's means and method of construction create a utility conflict, the Utility Statement will prevail in discussions with the utility and the Contractor. The State's Contractor shall be responsible for any costs associated with any temporary outages; holding, bracing and shielding of utility facilities; temporary relocations; or permanent relocations that are not specifically identified in this utility statement or shown in the contract plan set.

4. **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, nights or legal holidays.**

Garth Jones	Chesapeake Utilities	gjones@chpk.com	302-213-7455
Angel Collazo	Delmarva Power – Elec.	angel.collazo@delmarva.com	302-454-4370
Dave Clark	NCC Dept. of Spec. Serv.	dccclark@nccde.org	302-395-5705
Shawn Lane	Town of Middletown, Electric	slane@middletownde.org	302-378-5143
George Zang	Verizon Delaware, LLC	george.w.zang@verizon.com	302-422-1238

5. **As outlined in Chapter 3 of the DelDOT Utilities Manual, individual utility companies are responsible for obtaining all required permits from municipal, State and federal government agencies and railroads. This includes but is not limited to water quality permits/DNREC Water Quality Certification, DNREC Subaqueous Lands/Wetlands permits, DNREC Coastal Zone Consistency Certification, County Floodplain permits (New Castle County only), U.S. Coast Guard permits, US Army Corps 404 permits, sediment and erosion permits, and railroad crossing permits.**
6. **Individual utility companies are required to restore any areas disturbed in conjunction with their relocation work. If an area is disturbed by a utility company and is not properly restored, the Department may have the State's Contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.**
7. **16 Del. C. § 7405B requires notification to and mutually agreeable measures from the public utility operating the electric line for any person intending to carry on any function, activity, work or operation within dangerous proximity of any high voltage overhead electric lines. All contractors/other utilities must also maintain a minimum distance of 10'-0" from all energized lines. Additional clearance may be required from high voltage transmission lines.**
8. **Any existing facilities that are comprised of hazardous materials will be removed by the Utility Company unless otherwise outlined in the contract documents or language above. Any existing facilities containing hazardous materials will be purged by the Utility Company unless otherwise outlined in the contract documents or language above.**

DIVISION OF TRANSPORTATION SOLUTIONS

Deborah L. Kukulich
Utilities Section, DelDOT
Deborah.Kukulich@delaware.gov

January 21, 2020
Date

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201807401

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

SILVER LAKE DAM REPAIRS

NEW CASTLE COUNTY

Certificate of Right-of-Way Status – 100%

Level 1

As required by 23 CFR, Part 635, and other pertinent Federal and State regulations or laws, the following certifications are hereby made in reference to this highway project:

All project construction or work shall be performed within existing rights of way and permanent easements; and

All necessary real property interests, including control of access rights when pertinent, were acquired as part of previous highway projects, and include legal and physical possession; and,

This project does not cause any persons to be displaced as defined in 49 CFR, Part 24; and,

The State has the right to remove, salvage, or demolish any improvements or personal property that may be located within project limits.

RIGHT OF WAY SECTION



**Monroe C. Hite, III
Chief of Right of Way**

September 26, 2019



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

JENNIFER COHAN
SECRETARY

March 6, 2020

STIPULATED

ENVIRONMENTAL REQUIREMENTS

FOR

State Contract No. T201807401

Federal Aid No.: N/A

Contract Title: Silver Lake Dam Repairs

Due to the nature of the proposed construction activities that are to occur at Silver Lake Dam, permits are required for the temporary and permanent impacts to the waterway associated with the project. 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, are listed below. These requirements are the responsibility of the contractor and are subject to risk of shut down at the contractor's expense if not followed.

PERMIT REQUIREMENTS:

The proposed construction work for this project requires permit approval from the agencies listed below. It is the responsibility of the contracting agency -- the Delaware Department of Transportation, Division of Transportation Solutions -- to obtain the necessary permits to ensure that the contractor complies with the requirements and conditions established by the regulatory agencies. Written authorization from the permitting agencies is required and paperwork for on-site posting is anticipated. The proposed work for this project will be authorized under the permits listed below:

REQUIRED PERMITS AND APPROVAL STATUS:

- U.S. Army Corps of Engineers (USACE) – Nationwide Permit #3 Pre-Construction Notification required - **PENDING**
- Delaware Department of Natural Resources and Environmental Control (DNREC) Wetlands & Subaqueous Lands Section (WLSL) – **PENDING**

- Delaware Coastal Zone Management (CZM) – Issued – Project is not located in a Critical Resource Water
- DNREC Water Quality Certification (WQC) - Issued – Project is not located in a Critical Resource Water
- New Castle County Department of Land Use Floodplain Permit - **PENDING**

SPECIFIC REQUIREMENTS:

Compliance with all requirements of the permits is the responsibility of the contractor, who 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 conditions and requirements 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, are also the responsibility of the contractor. Noncompliance with these requirements may result in shut down of the project 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 the 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. Construction debris shall be kept 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. Refuse material resulting from routine maintenance of worker equipment and heavy machinery 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. Use of harmful chemical wash water to clean equipment or machinery is discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. It shall not be deposited or disposed of in waterways, streams, wetlands, or drainage areas.
8. The contractor shall follow all requirements as indicated in the Environmental Compliance Sheet. It is the contractor's responsibility to ensure that workers also follow this requirement. As part of the restrictions, please note the timetables reflected in the contract for the in-stream/water work for endangered species protection.
9. Fill material shall be free of oil and grease, debris, wood, general refuse, plaster and other pollutants, and shall contain no broken asphalt.

ENVIRONMENTAL COMPLIANCE SHEET:

The contractor shall pay special attention to specific construction requirements as indicated in the US Army Corps of Engineer and DNREC Subaqueous Lands Permit as well as the Environmental Compliance (EC) Note and Plans (page 22).

1. Specifically, please note the environmental requirements as indicated in the following notes:
 - Natural Resource Issues – See EC Sheet note #2.
 - Fisheries – No in-water work between March 1 and June 30 (inclusive) unless cofferdam is installed/removed before/after restriction window. No in-water work beyond limits of cofferdam March 1 – June 15. If fish ladder is functional (not inhibited by cofferdams installed outside of restriction window and flows), no in-water work December 1-31 and ladder must remain in operation March 1-June 15 and December 1-31.
 - Cultural Resources – See EC Notes #3 A-B.
 - Pond Bottom Restoration – See EC Sheet Note #4.
2. DelDOT Environmental Studies Section 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 at (302) 760-2264 or DOT_EnvironmentalStudies@delaware.gov.



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

JENNIFER COHAN
 SECRETARY

RAILROAD STATEMENT

For

State Contract No.:T201807401

Federal Aid No.:N/A

Project Title: Silver Lake Dam Repairs (BR 1-504 & BR 1-407)

The following railroad companies maintain facilities within the contract limits:

- | | |
|--|---|
| <input type="checkbox"/> Amtrak | <input type="checkbox"/> Maryland & Delaware |
| <input type="checkbox"/> CSX | <input type="checkbox"/> Norfolk Southern |
| <input type="checkbox"/> Delaware Coast Line | <input type="checkbox"/> Wilmington & Western |
| <input type="checkbox"/> East Penn | <input checked="" type="checkbox"/> None |
| <input type="checkbox"/> Delmarva Central | |

DOT Inventory No.: N/A No. Trains/Day: N/A Passenger Trains (Y / N): N/A

In accordance with 23 CFR 635, herein is the railroad statement of coordination (check one):

- No Railroad involvement.
- Railroad Agreement unnecessary but railroad flagging required. The contractor shall follow requirements stated in the DelDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DelDOT's Railroad Program Manager at (302) 760-2183.
- Railroad Agreement required. The necessary Railroad Agreement is pending. The Contractor cannot begin work until the Agreement is complete and fully executed. Railroad related work to be undertaken and completed as required for proper coordination with physical construction schedules. The Contractor shall follow requirements stated in the DelDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DelDOT's Railroad Program Manager at (302) 760-2183.

Approved As To Form:

Robert A. Perrine
 DelDOT Railroad Program Manager

23 July 19

DATE

BID PROPOSAL FORMS

CONTRACT T201807401.01

UNLESS OTHERWISE DIRECTED, SUBMIT ALL FOLLOWING PAGES TO:

DEPARTMENT OF TRANSPORTATION
BIDDERS ROOM
800 BAY ROAD
DOVER, DELAWARE 19901

Identify the following on the outside of the sealed envelope:

- Contract Number T201807401.01
- Name of Contractor



Proposal Schedule of Items

Proposal ID: T201807401.01

Project(s): T201807401

Contractor: _____

SECTION: 0001 ALL ITEMS

Alt Set ID: Alt Mbr ID:

All figures must be typewritten

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	201000 CLEARING AND GRUBBING	LUMP SUM	LUMP SUM			
0020	202000 EXCAVATION AND EMBANKMENT	25.000 CY				
0030	207000 STRUCTURAL EXCAVATION	13.000 CY				
0040	207021 STRUCTURAL BACKFILL, (BORROW TYPE C)	12.000 CY				
0050	211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP SUM	LUMP SUM			
0060	301001 GRADED AGGREGATE BASE COURSE, TYPE B	14.000 CY				
0070	401014 SUPERPAVE TYPE B, PG 64-22	41.000 TON				
0080	401021 SUPERPAVE TYPE BCBC, PG 64-22	25.000 TON				
0090	604500 COFFERDAMS	LUMP SUM	LUMP SUM			
0100	610000 PORTLAND CEMENT CONCRETE MASONRY, CLASS A	32.000 CY				
0110	610007 PORTLAND CEMENT CONCRETE MASONRY, SUPERSTRUCTURE, CLASS A	38.000 CY				



Proposal Schedule of Items

Proposal ID: T201807401.01

Project(s): T201807401

Contractor: _____

SECTION: 0001 ALL ITEMS

Alt Set ID: Alt Mbr ID:

All figures must be typewritten

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0120	610008 PORTLAND CEMENT CONCRETE MASONRY, PARAPET, CLASS A	7.000 CY	_____	_____	_____	_____
0130	611001 BAR REINFORCEMENT, EPOXY COATED	12,797.000 LB	_____	_____	_____	_____
0140	613001 SILICONE-BASED ACRYLIC CONCRETE SEALER	7,400.000 SF	_____	_____	_____	_____
0150	613004 WATERPROOFING MEMBRANE, TRAFFIC BEARING	713.000 SF	_____	_____	_____	_____
0160	615520 STAINLESS STEEL SLIDE GATE	LUMP SUM	LUMP SUM		_____	_____
0170	615521 METAL FABRICATIONS	LUMP SUM	LUMP SUM		_____	_____
0180	628011 CRACK SEALING BRIDGE DECKS, APPROACH SLABS, SIDEWALKS, ETC	35.000 LF	_____	_____	_____	_____
0190	628041 DEEP SPALL REPAIR	31.000 CF	_____	_____	_____	_____
0200	628070 DRILLING HOLES AND INSTALLING DOWELS	292.000 EACH	_____	_____	_____	_____
0210	707017 RIPRAP, R-6	10.000 TON	_____	_____	_____	_____



Proposal Schedule of Items

Proposal ID: T201807401.01

Project(s): T201807401

Contractor: _____

SECTION: 0001 ALL ITEMS

Alt Set ID: Alt Mbr ID:

All figures must be typewritten

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0220	762000 SAW CUTTING, BITUMINOUS CONCRETE	50.000 LF	_____	_____	_____	_____
0230	763000 INITIAL EXPENSE/DE-MOBILIZATION	LUMP SUM	LUMP SUM		_____	_____
0240	763501 CONSTRUCTION ENGINEERING	LUMP SUM	LUMP SUM		_____	_____
0250	763508 PROJECT CONTROL SYSTEM DEVELOPMENT PLAN	LUMP SUM	LUMP SUM		_____	_____
0260	763509 CPM SCHEDULE UPDATES AND/OR REVISED UPDATES	11.000 EAMO	_____	_____	_____	_____
0270	801500 MAINTENANCE OF TRAFFIC, ALL INCLUSIVE	LUMP SUM	LUMP SUM		_____	_____
0280	803001 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	10.000 EADY	_____	_____	_____	_____
0290	811001 FLAGGER, NEW CASTLE COUNTY STATE	40.000 HOUR	_____	_____	_____	_____
0300	811013 FLAGGER, NEW CASTLE COUNTY, STATE, OVERTIME	10.000 HOUR	_____	_____	_____	_____
0310	817013 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	194.000 LF	_____	_____	_____	_____



Proposal Schedule of Items

Proposal ID: T201807401.01

Project(s): T201807401

Contractor: _____

SECTION: 0001 ALL ITEMS

Alt Set ID: Alt Mbr ID:

All figures must be typewritten

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0320	907017 COMPOST FILTER LOGS	86.000 LF	_____	_____	_____	_____
0330	908004 TOPSOIL, 6" DEPTH	90.000 SY	_____	_____	_____	_____
0340	908014 PERMANENT GRASS SEEDING, DRY GROUND	90.000 SY	_____	_____	_____	_____
0350	908017 TEMPORARY GRASS SEEDING	90.000 SY	_____	_____	_____	_____
0360	908020 EROSION CONTROL BLANKET MULCH	210.000 SY	_____	_____	_____	_____
Section: 0001			Total:		_____	
			Total Bid:		_____	

CANNOT BE USED FOR BIDDING

Contract No. T201807401.01



**AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor Name: _____

Contractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED, NOTARIZED, AND RETURNED WITH YOUR BID.

(This form is required from the prime contractor only, not required from subcontractors)

CERTIFICATION
Contract No. T201807401.01

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

MUST INSERT DATE OF FINAL QUESTIONS AND ANSWERS ON WEBSITE: _____



AFFIRMATION:

Within the past five (5) years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES _____ NO _____ if yes, please explain _____

Agreement to Accept Retainage

"Bidder acknowledges that if its Performance-Based Rating as defined in 29 Del.C. §6962 and section 2408 NEW of Title 2 of Delaware's Administrative Code is below the required minimum threshold, as a condition to bid, Bidder acknowledges, consents and agrees to the Department withholding retainage of up to 5% from the monies due at the time of each progress payment under the contract."

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

Corporate Seal By: _____
Name of Bidder (Organization)
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 bound unto the **State** in the sum of _____
Dollars (\$ _____), or _____ percent not to exceed _____
Dollars (\$ _____) of amount of bid on Contract
No. T201807401.01 , 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