STATE OF DELAWARE

DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201480206.01

Varlano Park Outfall Retrofit at Leatherman's Run

New Castle County

ADVERTISEMENT DATE: July 17, 2017

COMPLETION TIME: 85 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 until 2:00 P.M. local time **August 15, 2017**

Contract No.T201480206.01

Varlano Park Outfall Retrofit at Leatherman's Run
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 this contract. This project consists of a retrofit to repair erosion from a 48" CMP from the Varlano Village Subdivision. Scope includes adding an engery dissipator structure and 200 feet of channel restoration using a step pool approach. A pedestrian bridge will need to be temporarily removed and reset, along with 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 85 Calendar Days. The Contract Time includes an allowance for 12 Weather Days It is the Department's intent to issue a Notice to Proceed such that work starts on or about January 8, 2018.

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@state.de.us, 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 until 2:00 P.M. local time August 15, 2017 unless changed via addendum.
2. QUESTIONS regarding this project are to be e-mailed to dot-ask@state.de.us no less than six business days prior to the bid opening date in order to receive a response. Please include T201480206.01 in the subject line. Responses to inquiries are posted on-line at http://www.bids.delaware.gov.
3. THE BID PROPOSAL incorporates a cd containing **Expedite**, **version 5.9a** and its installation file. Bidders are to use the cd provided to enter their bid amounts into the Expedite file. The Expedite bid file must be printed and submitted in paper form along with the cd and other required documents prior to the Bid due date and time.
4. 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.
5. 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 requirements by following the below link:** http://regulations.delaware.gov/register/september2015/final/19%20DE%20Reg%20207%2009-01-15.htm

   Please note a few of the requirements listed below;

   * At bid submission - submit with the bid a signed affidavit certifying that the Contractor has in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for their Employees that complies with this regulation;
   * Two business days prior to contract execution - The awarded Contractor shall provide to **DelDOT** copies of the Employee Drug Testing Program for the Contractor, and may submit any Subcontractor's Employee Drug Testing Program for approval;

* 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 **DelDOT** has approved the subcontractor in writing;
* Testing Report Forms shall be submitted to DelDOT monthly (forms will be provided).
* Penalties for non-compliance are specified in the regulation.

6. NO RETAINAGE will be withheld on this contract.
7. EXTERNAL COMPLAINT PROCEDURE can be viewed on DelDOT's Website at; http://www.deldot.gov/information/business/, or you may request a copy by calling (302) 760-2555.
8. PLEASE NOTE revisions to 'Equality of Employment Opportunity on Public Works' under General Notices.
9. REMINDER; A copy of your firm's Delaware Business License must be submitted with your bid.
10. **BREAKOUT SHEETS** MUST be submitted either with your bid documents; or within seven (7) calendar days following the bid due date by the lowest apparent bidder. Refer to instructions adjacent to the Breakout Sheets in this document.
11. 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.
12. **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 March 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.

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GENERAL NOTICES

SPECIFICATIONS:

The specifications entitled "Delaware Standard Specifications, for Road and Bridge Construction, August, 2016", hereinafter referred to as the Standard Specifications, Supplemental Specifications, the Special Provisions, notes on the Plans, this Bid Proposal, and any addenda thereto shall govern the work to be performed under this contract.

CLARIFICATIONS:

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

ATTESTING TO NON-COLLUSION:

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

QUANTITIES:

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

PREFERENCE FOR DELAWARE LABOR:

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

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

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (7) 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 of 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 fourth 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 Part VI., Section C., 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) 451-3423

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

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

PREVAILING WAGES FOR **HEAVY CONSTRUCTION** EFFECTIVE MARCH 15, 2017

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	22.10	19.44	42.27
BOILERMAKERS	77.62	32.12	58.92
BRICKLAYERS	47.02	23.20	24.91
CARPENTERS	53.81	53.81	42.77
CEMENT FINISHERS	43.59	24.35	18.14
ELECTRICAL LINE WORKERS	73.65	28.24	64.65
ELECTRICIANS	66.85	66.85	66.85
GLAZIERS	20.42	17.73	12.00
INSULATORS	55.48	55.48	55.48
IRON WORKERS	60.95	60.95	58.31
LABORERS	44.70	44.70	44.70
MILLWRIGHTS	69.18	69.18	55.75
PAINTERS	79.76	79.76	79.76
PILEDRIVERS	75.27	39.35	30.63
PLASTERERS	19.23	16.70	11.29
PLUMBERS/PIPEFITTERS/STEAMFITTERS	82.03	77.84	17.89
POWER EQUIPMENT OPERATORS	67.29	62.96	67.29
SHEET METAL WORKERS	30.73	19.06	17.90
SPRINKLER FITTERS	33.11	12.54	19.38
TRUCK DRIVERS	31.96	20.62	22.27

CERTIFIED: 07/05/2017 BY: _____
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

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

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

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

PROJECT: T201480206.01 Varlano Park Outfall Retrofit at Leathermans Run , New Castle County

SPECIAL PROVISIONS

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 http://www.deldot.gov/information/business/bids/asphalt_cement_english.shtml.

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

602500 - MODIFIED USBR TYPE VI IMPACT BASIN

Description:

This work consists of construction of the Modified U. S. Bureau of Reclamation (USBR) Type VI Impact Basin as indicated on the plans according to the Contract Documents and as directed by the Engineer. The impact basin shall be installed as an extension of the existing stormdrain outfall as a new outlet structure. Existing treatments (Gabions) at the outfall shall be removed for installation of the Impact Basin.

Materials:

All applicable provisions of Section 207, Excavation and Backfilling for Structures; Section 210, Furnishing Borrow Type C for Pipe Trench, Utility Trench, and Structure Backfilling; Section 302, Graded Aggregate Base Course; Section 602, Portland Cement Concrete Masonry; Section 603, Bar Reinforcement; Section 708, Drainage Inlets and Manholes; and Section 712, Riprap; shall apply except as modified herein.

Design: AASHTO Standard Specifications for Highway Bridges, 17th Ed., 2002
Concrete: Load and Resistance Factor Design Method
Reinforcing Steel: Fy = 60,000 psi

Concrete: Concrete for impact basin shall be Class A, 4,500 psi

Reinforcing Steel:

- Reinforcing steel shall conform to ASTM A 615 Grade 60. Only Grade 60 can be used on this project.
- Minimum cover for any bar shall be 2" unless otherwise noted, with the exception of bars at bottom and sides of all footings which shall have 3" minimum cover.
- For ties and stirrups: Standard ACI bending tolerances are modified to plus (+) zero inches, minus (-) normal ACI bending tolerances.

Keys: All keys are normal size.

Graded Aggregate Base Course: The material used for the graded aggregate base course underneath the impact basin shall conform to the specifications for Delaware No. 57 Stone under Section 813.

Manhole: The manhole shall conform to the specifications under Section 602.

Fence: The fence above the baffle shall conform to the specifications for Item 727003 – Chain-link fence, 4’ high except where modified in the construction plans.

Riprap Apron: The material used for the riprap apron downstream of the impact basin shall conform to the specifications for Item 707018 – Riprap R-7.

Construction:

All applicable provisions of Section 207, Excavation and Backfilling for Structures; Section 210, Furnishing Borrow Type C for Pipe Trench, Utility Trench, and Structure Backfilling; Section 302, Graded Aggregate Base Course; Section 602, Portland Cement Concrete Masonry; and Section 603, Bar Reinforcement; Section 602, Drainage Inlets and Manholes; and Section 707, Riprap; shall apply except as modified herein.

Graded Aggregate Base Course: The graded aggregate base course shall be installed on a prepared subgrade constructed in accordance to Subsection 202.06. The aggregate bedding shall be underlain by a layer of geotextile conforming to the specifications of "Geotextile, Separation." The graded aggregate material shall be placed and compacted in accordance with Section 302 to the final depth specified on the construction plans.

Impact Basin: The impact basin shall be cast-in-place. The back wall of the impact basin shall be constructed around the existing 48-inch CMP pipe using. During construction of the impact basin, stormwater discharge shall be diverted through a 36-inch diameter flexible pipe or other combination of pipes that will handle the 2-year discharge of 61 cfs. The impact basin shall be cast around the flexible pipe. The diversion pipe shall start at the junction box and pass through the 48-inch CMP pipe and the impact basin construction area. The opening of the 48-inch CMP in the junction box shall be sandbagged around the flexible pipe to prevent water from escaping around the pipe and to allow the water to pool up and into the pipe. The flexible pipe shall end in the channel downstream of the proposed riprap apron area, and the outlet shall be protected with outlet protection as illustrated on the construction plans. The channel downstream of the impact basin construction area shall be sandbagged and the dirty water pumped to a dewatering bag as illustrated on the construction plans.

Manhole: The manhole shall be installed in accordance to the specifications under Section 602.

Fence: The 4' fence over the baffle shall be constructed on the impact basin ceiling slab after construction of the impact basin. The fence shall be installed in accordance to the specifications for Item 727003 – Chain-link fence, 4' high except where modified in the construction plans.

Riprap Apron: The riprap apron shall be installed after the construction of the impact basin and shall abut the end sill of the impact basin. The channel shall be excavated as necessary to the required placement depth as noted on the construction plans. The riprap apron shall be installed after placement of the footer rocks and bottom row of top rocks of the imbricated boulder bank protection (BBR-1L and BBR-1R) and shall completely fill in the area between the two boulder walls. The riprap apron shall be installed on a prepared subgrade and a layer of geotextile conforming to the specifications of "Geotextile, Separation."

Method of Measurement:

Modified USBR Type VI Impact Basin shall not be measured.

Basis of Payment:

Modified USBR Type VI Impact Basin will be paid for under the Contract lump sum price. Price and payment will constitute full compensation for furnishing all materials, forms, and falsework; for cold weather protection; for construction of drainage openings and weepholes; for furnishing and placing anchors and bolts; and for furnishing all equipment, tools, labor, and incidentals required to complete the work. The installation of the 4' fence above the baffle will be incidental to the cost of the impact basin. The installation of the manhole will be incidental to the cost of the impact basin.

The installation of the geotextile will be paid for at the Contract unit price per square yard of "Geotextile, Separation." The installation of the Delaware No. 57 Stone for the impact basin aggregate bedding will be paid for at the Contract unit price per ton of "Delaware No. 57 Stone." Installation of backfill that is required in addition to excavated material will be paid for at the Contract unit price for cubic yards of "Borrow, Type C." The riprap apron will be paid for at the Contract unit price per Ton of "Riprap R-7."

615502 - REMOVE AND RESET PEDESTRIAN BRIDGE

Description:

This work consists of temporarily removing the pedestrian bridge for in-stream and bank protection construction, storing the bridge in an appropriate location, removing older wooden support frame structure, and resetting the bridge at the specified location and elevation after completion of in-stream and bank construction work.

Materials and Methods:

Lifting: Initial lifting of the pedestrian bridge shall follow the procedure and utilize the materials specified in the Pedestrian Bridge Lifting Plan as shown in the construction drawings. Lifting shall be conducted such that no damage is made to the bridge.

Removal of the bridge shall include removal of the helical screws which anchor the bridge at the abutment locations.

Storage: Once the bridge is successfully lifted, it shall be stored in an appropriate location within the park property. The bridge shall be stored on a flat surface where it may be stable against any sliding, rotating, falling, or movement of any kind. The surface on which the bridge is stored shall consist of a mulch bedding to ensure against damage to the bottom chord. The bridge shall be protected from damage due to striking or dropping by construction equipment.

Resetting: The pedestrian bridge shall be reset using the same materials as described in the construction plans for lifting. Resetting shall be conducted such that no damage is made to the bridge. Resetting of the bridge shall include installation of the helical screw foundations as appropriate for resetting of the structure at the specified locations.

Method of Measurement:

Remove and Reset Pedestrian Bridge shall not be measured.

Basis of Payment:

Remove and Reset Pedestrian Bridge will be paid for under the Contract lump sum price. Price and payment will constitute full compensation for all equipment, labor, and materials (including lifting bars or straps, rigging attachments, wood spacer blocks, and storage materials) necessary to successfully remove, store, and reset the pedestrian bridge, including removal and resetting of the helical screw foundations and removal of older wooden support frame structure.

6/21/17

621500 - TEMPORARY TIMBER MAT

Description:

The item shall consist of furnishing all materials and constructing a temporary timber mat for access across the wetland area as shown on the Plans and as directed by the Engineer. All equipment shall utilize this temporary timber mat when trying to access the stockpile/staging area and the underside of the bridge.

Materials:

In accordance with Section 621 of the Standard Specifications and the following:

Timber shall have a strength and grade adequate to support the Contractor's anticipated vehicular or equipment loads. Any preservative treatment applied to the matting shall be environmentally safe for wet conditions and be preapproved by the Department.

Hardware shall be in accordance with Section 1041.05 of the Standard Specifications.

Construction Methods:

The Contractor shall submit to the Department for approval shop drawings and design calculations indicating the layout, size of members, arrangement of members and the construction methods at least two weeks prior to initiating construction. This information shall be signed and sealed by a Professional Engineer registered in the State of Delaware. A timber mat system is shown on the plans and shall be used for conceptual purposes only. The actual timber mat system utilized for the construction shall be designed for the anticipated construction loads and shall be compatible with the environment. Placement of stone within the wetland area is not permitted.

The temporary timber matting should be periodically inspected by the Contractor and any damaged or deteriorated components should be replaced. The Contractor assumes full responsibility for the load carrying capability of the system and for its anchorage, as required, to resist high water flows. No additional compensation will be granted for repairing any portion of the system damaged during naturally occurring weather events or contractor usage. The Contractor is responsible for retrieving lost mats and repairing any damage caused by naturally occurring weather events.

Basis of Payment:

The payment for the item shall be made for at the contract unit price bid per Lump Sum for "621500 - Temporary Timber Mat", which price and payment shall constitute full compensation for furnishing and placing all materials, for design, submission of signed and sealed drawings and computations, installation and removal of timber mat materials, and for all labor, equipment, tools and incidentals required to complete the work.

6/30/17

707501 - FURNISHED CASCADE MATERIAL

Description:

This work consists of furnishing, transporting, stockpiling, and placing Furnished Cascade Material in the proposed stream channel locations as indicated on the construction plans. Work items shall also include the wash-in of fine materials to fill void spaces in the placed rock matrix.

Materials:

Furnished Cascade Material shall be round, hard, durable rock, resistant to weathering and water action, and free from overburden, spoil, shale, slate and organic material. Limestone, sandstone, or other sedimentary rock materials shall not be acceptable rock material for Furnished Cascade Material.

The color of the Furnished Cascade Material shall be similar to the native rock present at the site (e.g., green/gray, brown/gray, dark gray, and/or dark brown in color). White, red, and light tan rock is not acceptable. Angular quarry rock is not acceptable.

Furnished Cascade Materials shall include the following mixture:

Distribution (by weight)	Size and Type
D_{10}	4 inch stone
D_{50}	9 inch stone
D_{84}	13 inch stone
D_{100}	18 inch stone

Stone quantities shall be determined by weight.

Furnished Cascade Material shall be washed and mixed prior to delivery to the site and shall be free of rock dust and silt. No mixing of material shall occur on-site.

The Contractor will locate potential sources for rock. The Contractor shall obtain from the quarry and submit to the Engineer a certificate verifying the rock size, weight per cubic foot, specifications, color, weight range of rock being supplied, and a sample of the rock to be supplied.

Construction:

Furnished Cascade Material shall be installed according to the construction plans. The furnished cascade material shall be used to construct the stream bed in all cascade areas and pool areas along the stream channel except in areas indicated for riprap.

The construction of cascade areas shall progress in working sections from downstream to upstream for each individual cascade section, as opposed to the overall stream construction which shall progress from upstream to downstream. The working sections shall be sized appropriately so that they can be constructed in one day or in a predicted rain free time period.

The Contractor shall excavate a work section of the stream channel to the proposed subgrade necessary for the installation of cascade material at the required depth. The finished subgrade shall not consist of mucks, organic material, or trash. The installation of the cascade and pool areas shall conform to the dimensions, grades, and details specified in the Contract Documents. Excavation for the placement of Furnished Cascade

Material and over-excavation for the removal of unsuitable materials shall conform to Item 203000 – Channel Excavation. Suitable excavated material from the existing stream bed shall be stockpiled for reuse as Salvaged Channel Bed Sand and Gravel and shall be stored separately from all other excavated or furnished materials. All areas of excavation in the stream bed requiring non-cascade material fill, as well as areas of excavation within the channel banks, shall be backfilled using Item 209009 – Borrow, Type C.

The Contractor shall place Furnished Cascade Material to the proposed channel grade as illustrated in the Contract Documents. Tolerances of the finished channel as described in this special provision shall conform to the following criteria:

Channel Surface Elevation:	±0.1 feet
Channel Width:	±0.2 feet
Channel Slope:	±0.1 percent

Furnished Cascade Material shall be placed along the proposed channel bed at a minimum depth of 1.5 feet and along the channel banks at a 2H:1V slope to a height of 1.1 to 1.3 feet measured from the toe of slope to the top of bank, as illustrated in the construction plans. Elevations of proposed floodplain terraces shall be flush with the top of the cascade bank as illustrated in the construction plans. Existing slopes along the channel that are to remain undisturbed shall be excavated just enough to lay down the cascade material to the required thickness, such that the inside edge of the cascade bank is flush with the existing slope. All measures shall be taken to minimize impact to the existing slope and to the roots of trees that are marked to be protected. The excavated portion of the slope shall then be reconstructed on top of the cascade material using backfill and seeded topsoil encapsulated with a dual layer coir blanket and coir mat, which shall be wrapped around and secured to the existing slope with wooden stakes as illustrated in the construction plans. The finished appearance of the bank shall be a continuous surface between the cascade bank and the existing slope.

Following the placement of the Furnished Cascade Material, wash-in of fine materials shall be performed to choke off the open pore space in the Furnished Cascade Material, thus allowing for stream low flows to flow along the surface of the riffle. The wash-in procedure shall involve a 1-inch lift of Salvaged Channel Bed Sand and Gravel placed on the surface of the Furnished Cascade Bed Material. The sand and gravel shall be hydraulically washed into the riffle material pore spaces using methods determined by the Contractor and approved by the Engineer. The Contractor shall select a method that is energetic enough to adequately wash material into the cascade pore spaces without causing movement of the cascade material itself. The Contractor may pump water from the Leathermans Run main stem to accomplish this if the flow entering the outfall channel is inadequate. The Contractor shall continue washing successive 1-inch lifts of the sand and gravel into the cascade material until the material no longer washes into the pore spaces / void spaces and travels down slope. Water from the dirty water pumping pits shall not be utilized for the wash-in procedure. Potable and / or chlorinated water shall not be utilized for this operation. Furnished Channel Bed Sand and Gravel shall be substituted for Salvaged Channel Bed Sand and Gravel if there is an insufficient or unsuitable supply of salvaged material to perform the work.

After the completion of the above-mentioned steps, the Contractor shall stabilize the graded slopes and floodplain terrace according to the stabilization and landscape plan.

All placed material not conforming to the specified limits shall be removed and replaced as directed by the Engineer at no additional cost.

Method of Measurement:

Furnished Cascade Material shall be measured as the cubic yards of installed material meeting this specification requirements.

Basis of Payment:

Furnished Cascade Material will be paid for at the contract unit price per cubic yard of material installed. Payment will be in full compensation for transport, stockpiling, placement, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work as specified in these Contract Documents.

Salvaged Channel Bed Sand and Gravel to be used as the fine material wash-in shall be measured and paid for under Item 707503 – Salvaged Channel Bed Sand and Gravel. Furnished Channel Bed Sand and Gravel to be used as additional fine material wash-in shall be measured and paid for under Item 707504 – Furnished Channel Bed Sand and Gravel. Water and water pumping operations for the wash-in procedure shall be incidental to the lump sum cost for Item 909005 – Stream Diversion. Excavation for full depth placement of the Furnished Cascade Material including over-excavation, as necessary, shall be paid for under Item 203000 – Channel Excavation. Backfilling of excavation areas in the stream bed requiring non-cascade material fill, as well as backfill for the coir blanket / coir mat encapsulated soil, shall be paid for under Item 209009 – Borrow, Type C. Topsoil shall be paid for under Item 908004 – Topsoil, 4" Depth. The dual layer coir blanket and coir mat shall be paid for under Item 908511 – Coir Blanket and 908504 – Coir Fiber Matting, respectively.

6/21/17

707502 - IMBRICATED ROCK STRUCTURES

Description:

This work consists of furnishing and placing imbricated boulders/rocks and geotextile to construct stream stabilization structures including the following:

Rock Sills - To be installed at:

(a) Rock Sill #1: Sta. 11+03.32
(b) Rock Sill #2: Sta. 11+43.08
(c) Rock Sill #3: Sta. 11+87.29

Boulder Bank Protection Downstream of Impact Basin (BBP-1L) - To be installed at:
Sta. 10+59.13 to Sta. 10+87.14

Boulder Bank Protection Downstream of Impact Basin (BBP-1R) - To be installed at:
Sta. 10+59.19 to Sta. 10+97.05

Boulder Bank Protection at Pedestrian Bridge (BBP-2L) - To be installed at:
Sta. 11+49.43 to Sta. 11+90.56

Boulder Bank Protection at Pedestrian Bridge (BBP-2R) - To be installed at:
Sta. 11+30.97 to Sta. 11+86.90

Materials:

Boulder/Rock Materials. Boulders/rocks for imbricated structures shall consist of rectangular flat rock and of a similar texture and color to the native rock present at the site (e.g., green/gray, brown/gray, dark gray, and/or dark brown in color) obtained from an approved source. These rocks shall not be harvested from streams or rivers outside a commercial quarry operation. All boulders/rocks shall be free from laminations, weak cleavages and will not disintegrate from the action of air, salt water and in handling and placing. Limestone, sandstone, shale, mudstone or any other sedimentary rock types are not acceptable. Concrete will not be considered as an alternative for stone. White stone is not acceptable.

Unless otherwise stated the boulders/rocks used for rock sills and boulder bank protection shall have a minimum unit weight of 170 lb/ft3. The boulders/rocks are to be rectangular in shape in accordance with the size criteria specified in the contract documents. Round, square, or triangular rocks are not to be used unless accepted by the Engineer prior to installation for a particular application on a case by case basis.

The Engineer reserves the right to reject any boulders/rocks delivered to the site that do not meet the contract specifications. The Contractor will not be eligible for any claims or compensatory payments for boulders/rocks rejected as not meeting the project requirements.

Prior to the start of work on this item, the Contractor shall submit a construction schedule, including source of supply of boulders/rocks, to the Engineer for review. No work shall be performed until the Engineer has approved this schedule. The Contractor will locate potential source for the boulders/rocks. The Contractor and Engineer will jointly visit the site to determine whether the rock meets the specified requirements. The Contractor will not be granted an extension of time or extra compensation due to delay caused by sampling, testing, approval or disapproval of boulder material under the requirements of these specifications. The Contractor shall obtain from the quarry and submit to the Engineer a certificate verifying the following:

- Boulder/rock classification
- Weight per cubic foot
- Type of boulder/rock
- Weight of boulders/rocks being supplied
- Boulder/rock quality shall meet all of the above specifications

Boulders/rocks will be used for top rocks, footer rocks, drop rocks, and cutoff rocks on all structures where these types of rocks are specified.

Rock Sill Materials. The Rock Sill structures shall be constructed using boulders/rocks as defined in the construction documents. Where specified on the plan sheets, the Rock Sills shall also contain a series of drop rocks, footer rocks, and cutoff rocks.

Boulders/rocks for Rock Sill structures shall adhere to the following dimensions. The length measurements along the rocks have an allowable tolerance as shown on the construction plans.

Boulder / Rock Dimensions	Minimum Weight
1 ft x 3 ft x 4 ft	0.85 tons

Boulder Bank Protection (BBP-1L and BBP-1R) Materials. BBP-1L and BBP-1R shall be constructed using boulders/rocks as defined in the construction documents. Where specified on the plan sheets, the boulder bank protection shall also contain a series of footer rocks and cutoff rocks.

Boulders/rocks for Boulder Bank Protection structures shall adhere to the following dimensions. The length measurements along the rocks have an allowable tolerance as shown on the construction plans.

Boulder / Rock Dimensions	Minimum Weight
2 ft x 3 ft x 4 ft	1.70 tons

Boulder Bank Protection (BBP-2L and BBP-2R) Materials. BBP-2L and BBP-2R shall be constructed using boulders/rocks as defined in the construction documents. Where specified on the plan sheets, the boulder bank protection shall also contain a series of footer rocks and cutoff rocks.

Boulders/rocks for Boulder Bank Protection structures shall adhere to the following dimensions. The length measurements along the rocks have an allowable tolerance as shown on the construction plans.

Boulder / Rock Dimensions	Minimum Weight
2 ft x 3 ft x 4 ft	1.70 tons

Geotextile. A nonwoven geotextile liner will be installed along the upstream side of the Rock Sills and the side adjacent to the bank of the Boulder Bank Protection structures to prevent piping and structural failure. Geotextile materials shall be Geotextile, Separation and shall conform to AASHTO M 288 Class 2 or 3 Table-2 for drainage.

Construction:

Boulder/Rock Construction Methods. Boulder/rock structures shall be installed according to the sequence of construction, the plans and details, the following specifications, and as directed by the Engineer. All field changes to structure dimensions and elevations must be approved in writing by the Department prior to installation.

Boulders/rocks shall be seated firmly and shall not rock or rotate in place. Boulders/rocks shall be selected and placed to avoid the creation of voids. Voids that are unavoidable are to be chinked and filled using cobbles and furnished cascade material. It is preferred not to chink visible layers.

The outer rock surface shall be even and present a generally neat appearance. Surface elevations or individual rocks within the finished installations shall be within 0.1 ft of the elevations specified on the construction drawings.

Placed stone not conforming to specifications shall be removed and replaced as directed by the Engineer at no additional cost to the Department.

Rock Sill Construction Methods. The Rock Sill shall be installed in the center of the channel, meeting the station, offset, and angle measurements as shown in the construction plans. The boulders/rocks along the length of the sill shall be set at the proposed invert elevation and shall be set in a manner that provides a low saddle area at the center of the structure.

Rock Sill #2 at Sta. 11+43 shall be constructed such that the shortest distance from the downstream edge of the top rocks to the upstream edge of the pedestrian bridge deck is a minimum of 4 feet.

Geotextile, Seperation shall be placed along the upstream face of the entire structure and extending under the stream bed upstream and along the toe of bank. Geotextile torn or damaged shall be replaced at the Contractor's expense in a manner acceptable to the Engineer. Filter cloth shall be keyed-in, placed and trimmed to avoid exposed edges upon completion of construction. Furnished cascade material shall be installed over top of the geotextile liner to bring the excavated channel bed to grade.

Boulder Bank Protection (BBP-1L and BBP-1R) Construction Methods. BBP-1L and BBP-1R shall be constructed along the left and right banks of the channel downstream of the Modified USBR Type VI Impact Basin. The upstream-most boulders shall abut the apron of the Impact Basin. The boulders shall begin with two layers of top rocks and one layer of footer rocks at the upstream end and decrease in number of stacked layers at the downstream end in a manner consistent with the Construction drawings. The bottom layer of top rocks shall be placed such that the inside face of the boulder is flush with the toe line of the proposed channel and set such that the bottom of the boulder is located 1 foot below the toe elevation.

Two layers of boulders (including one layer of top rocks and one layer of footer rocks) shall extend along the outside edge of the right floodplain terrace to protect the toe of slope along this edge for a distance shown on the Construction drawings. The top rocks shall be placed such that the inside face of the boulder is flush with the toe line of the floodplain terrace and set such that the bottom of the boulder is located 0.1 feet below the toe elevation.

Geotextile, Separation shall be placed along the face of the entire structure on the side adjacent to the bank, and extending underneath the entire width of the footer rocks. Geotextile torn or damaged shall be replaced at the Contractor's expense in a manner acceptable to the Engineer. Filter cloth shall be keyed-in, placed and trimmed to avoid exposed edges upon completion of construction. The placement of the boulder bank protection shall immediately follow the fabric placement.

Boulders/rocks shall be firmly placed as level as possible on each layer of rock. Compacted backfill shall be used to fill the excavated area between the boulders/rocks and the bank. The top-most layer of rock shall be overlaid by soil encapsulated with a dual layer of coir blanket and coir mat. The extent of overlay shall be 1.5 feet along the width (median axis) of the rock. The backfill shall be sloped in the stream direction at the same pitch as the boulder bank protection structure. In the areas where the structure increases or decreases in stacked layers, the backfill slope shall achieve a smooth transition between successive rocks in the stream direction.

Boulder Bank Protection (BBP-2L and BBP-2R) Construction Methods. BBP-2L and BBP-2R shall be constructed along the left and right banks of the channel in the area upstream, under, and downstream of the pedestrian bridge. The structure includes the right floodplain terrace toe protection upstream of the bridge, bank protection under the bridge, protection of the right bank of the channel from the bridge to the Rock Sill at Sta. 11+87, and the left floodplain terrace toe protection downstream of the bridge. All areas of boulder bank protection shall be tied in together seamlessly.

Two layers of boulders (including one layer of top rocks and one layer of footer rocks) shall be placed along the downstream end of the outside edge of the right floodplain terrace to protect the toe of slope along this edge for a distance shown on sheet CP-01 of the Construction drawings. The top rocks shall be placed such that the inside face of the boulder is flush with the toe line of the floodplain terrace and set such that the bottom of the boulder is located 0.2 feet below the toe elevation.

Three layers of boulders (including two layers of top rocks and one layer of footer rocks) shall be placed along the left and right banks of the channel underneath the pedestrian bridge, starting from Rock Sill #2 down to approximately 12 feet downstream of the bridge on the left bank (measured along the centerline of the channel), and down to Rock Sill #3 on the right bank. The upstream end of the boulders shall abut Rock Sill #2 and shall be placed around the cutoff rock. The downstream end of the boulders shall abut Rock Sill #3 on the right bank and shall be placed around the cutoff rock. The bottom layer of top rocks shall be placed such that the inside face of the boulder is flush with the toe line of the proposed channel and set such that the bottom of the boulder is located 1 foot below the toe elevation.

Two layers of boulders (including one layer of top rocks and one layer of footer rocks) shall extend along the outside edge of the left floodplain terrace to protect the toe of slope along this edge for a distance shown on sheet CP-01 of the Construction drawings. The top rocks shall be placed such that the inside face of the boulder is flush with the toe line of the floodplain terrace and set such that the bottom of the boulder is located 0.2 feet below toe elevation.

Geotextile, Separation shall be placed along the face of the entire structure on the side adjacent to the bank, and extending underneath the entire width of the footer rocks. Geotextile torn or damaged shall be replaced at the Contractor's expense in a manner acceptable to the Engineer. Filter cloth shall be keyed-in, placed and trimmed to avoid exposed edges upon completion of construction. The placement of the boulder bank protection shall immediately follow the fabric placement.

Boulders/rocks shall be firmly placed as level as possible on each layer of rock. Compacted backfill shall be used to fill the excavated area between the boulders/rocks and the bank. The top-most layer of rock shall be overlaid by soil encapsulated with a dual layer of coir blanket and coir mat. The extent of overlay shall be 1.5 feet along the width (median axis) of the rock. The backfill shall be sloped in the stream direction at the same pitch as the boulder bank protection structure. In the areas where the structure increases or decreases in stacked layers, the backfill slope shall achieve a smooth transition between successive rocks in the stream direction.

Method of Measurement:

Imbricated Rock Structures shall be measured per ton of imbricated rock installed. Geotextile, Separation shall not be measured.

Basis of Payment:

Imbricated Rock Structures will be paid for at the Contract unit price per ton of imbricated rock installed. Payment will include furnishing, transporting, installing and maintaining the materials as specified on the Contract Drawings or as directed by the Engineer in the field.

Payment shall also include transport, stockpiling and placing of all boulders/rocks, including top, footer, drop, and cutoff rocks; installation and for all material, labor, equipment, tools, and incidentals necessary to complete the work as specified in these Special Provisions and on the Contract Drawings.

Geotextile, Separation shall not be measured and shall be incidental to the unit price of Imbricated Rock Structures.

Furnished Cascade Material shall be measured and paid for as Item 707501 - Furnished Cascade Material. Excavation for placement of imbricated rock structures shall be measured and paid for under Item 203000 - Channel Excavation. Backfill for the coir blanket / coir mat encapsulated soil shall be measured and paid for under Item 209009 - Borrow, Type C. Topsoil shall be measured and paid for under Item 908002 - Topsoil, 4" Depth. The dual layer coir blanket and coir mat shall be measured and paid for under Items 908511 - Coir Blanket and 908504 - Coir Fiber Matting.

6/20/17

707503 - SALVAGED CHANNEL BED SAND AND GRAVEL

Description:

This work consists of placement of a salvaged mixture of sand and gravel for use as a fine material wash-in for the proposed cascade channel bed. Work items will include sorting, separate stockpiling, and wash-in process after placement of the furnished cascade material.

Materials:

The materials to be used as Salvaged Channel Bed Sand and Gravel shall be in-situ salvaged Sand and Gravel from the channel work zone.

Materials shall be salvaged from the existing channel bed within the limits of construction. Material shall not be salvaged from outside of the limits of construction. The salvaged material shall consist of a mixture of silt, sand, and gravel; the silt (or finer gradation) component shall not exceed 35% of the total mixture. The salvage material is to be excavated from the top 6 inches (approx.) of the stream bed and the top 12 inches of any sand/gravel bars within the channel. Excavation limits may be increased or decreased based upon the suitability of the material encountered. The Engineer shall determine the suitability of material and may provide limitations to the salvage excavation depths during field inspections.

Construction:

Salvaged Channel Bed Sand and Gravel shall be stockpiled separately from other excavation materials or any furnished materials.

Salvaged Channel Bed Sand and Gravel shall be utilized as a fine material wash-in for choking of voids in the Furnished Cascade Material. Installation of the fine material wash-in shall follow the specifications for Item 712501 - Furnished Cascade Material.

In the event of insufficient material found on-site, the contractor shall use furnished material as described for Item 707504 - Furnished Channel Bed Sand and Gravel.

Methods of Measurement:

Salvaged Channel Bed Sand and Gravel shall be measured based upon the cubic yards of material placed.

Basis of Payment:

Salvaged Channel Bed Sand and Gravel shall be paid for at the Contract unit price per cubic yard of material installed. Payment shall be full compensation for all sorting, stockpiling, hauling and installation and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Initial excavation of the material shall be included in the measurement and contract unit price for Item 203000 - Channel Excavation.

6/20/17

707504 - FURNISHED CHANNEL BED SAND AND GRAVEL

Description:

Furnished Channel Bed Sand and Gravel shall be used as a substitute for Salvaged Channel Bed Sand and Gravel for the fine material wash-in for choking of void spaces in the Furnished Cascade Material, in the event that insufficient quantities of suitable Salvaged Channel Bed Sand and Gravel are present on site. This wash-in process is described in the special provision for Item 707501 - Furnished Cascade Material.

Materials:

The materials to be used as Furnished Channel Bed Sand and Gravel shall conform to the following:

Furnished streambed material consists of sand and gravel with some natural bed silts. The material composition shall be 5% native channel silt, 20% sand, and 75% gravel with a size distribution ranging from a No. 8 sieve up to 3 inches diameter. Material quantities are to be determined by weight. The silt component of the mixture shall be salvaged from channel and stream bank excavation materials deemed otherwise unsuitable as Salvaged Channel Bed Sand and Gravel.

The color of the furnished channel bed sand and gravel material shall be similar to the native rock present at the site. Rock materials shall be round, hard, durable rock, resistant to weathering and water action, and free from overburden, spoil, shale, slate and organic material. Limestone, sandstone, or other sedimentary rock materials shall not be utilized as a component of Furnished Channel Bed Sand and Gravel.

The color of the furnished gravel material shall be similar to the native rock present at the site (e.g., green/gray, brown/gray, dark gray, and/or dark brown in color). White, red, and light tan rock is not acceptable. Angular quarry rock is not acceptable.

Disturbance of channel bed areas outside of the channel reconstruction area for harvesting of streambed materials is strictly prohibited.

Construction:

Placement of the Furnished Channel Bed Sand and Gravel shall comply with the specifications for Item 707503 – Salvaged Channel Bed Sand and Gravel.

Method of Measurement:

Furnished Channel Bed Sand and Gravel shall be measured based upon the cubic yards of material delivered and installed.

Basis of Payment:

Furnished Channel Bed Sand and Gravel shall be paid for at the contract unit price per cubic yard of material installed. Payment shall be full compensation for furnishing, transport, stockpiling, mixing, excavation, placement, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

6/20/17

720556 - BOLLARD

Description:

This work consists of furnishing and installing a concrete perimeter bollard in accordance with the construction plans and details and as directed by the Engineer.

Submittals:

The Contractor shall submit working drawings in accordance with Section 105.04 of the DelDOT Standard Specifications. The working drawings shall provide plans and details to scale showing reinforcement, dimensions, finishes, etc. in accordance with the manufacturer's specifications.

Product Data: Submit fabricator's specifications, data and instructions for manufactured materials and products. Include mix designs, certifications and laboratory test reports as required.

Samples: Submit for approval of Color and Finish.

Materials and Construction Methods:

All work for this item shall be in accordance with the following ASTM specifications:

ASTM: A 185-97 --- Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
A 615-01a ---Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
C 33-02a ---Specification for Concrete Aggregates
C 140-01a ---Method of Sampling and Testing Concrete Masonry Units
C 150-02 ---Specification for Portland Cement

The bollard shall be a 10"x10" square concrete bollard with a steel reinforced concrete foundation. All materials and construction methods shall be in accordance with manufacturer's specifications.

The manufacturer shall carefully pack the product for shipment free from stains and other deleterious material. After delivery, the Contractor shall be responsible for storing the product on non-staining wood skids or pallets and protect and store product from weather and soiling with waterproof non-staining covers or enclosure, but allow air to circulate around product, to prevent damage. Materials that are damaged or lost shall be repaired or replaced by the Contractor at no additional expense to DelDOT.

Materials include the following:

Cement: ASTM C 150, Type II Portland Cement
Color Admixtures as required
Aggregate: ASTM C 33
Reinforcing Bars: ASTM A 615, grade 40

General Requirements:

The manufacturer must be a firm presently specializing in the manufacture of the type of product shown on the drawings and in continuous production for the last five years. Work shall be warranted from one year from date of delivery for defects in materials and workmanship.

Method of Measurement:

The quantity of bollards will be measured as the actual number of bollards installed and accepted.

Basis of Payment:

The quantity of bollards will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing and placing all materials, including concrete, reinforcing steel, excavation, backfilling, disposing of the surplus material, for all labor, tools, equipment and necessary incidentals to complete the work.

6/20/17

763501 - CONSTRUCTION ENGINEERING

1) **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.

2) 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 [3mm+2ppmxD] 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.

3) 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 subcontracting 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:

4) 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 [Square root of number of miles in the level run] (0.01 m times [square root of number of kilometers]). The Horizontal Control precision ratio shall have a minimum precision of 1:20,000 feet (1 meter per 20,000 meters or 1:20,000) 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.

(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 (3.0-meter) 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) 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.

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 (6.1 meter) intervals through wetland areas. In open field and yard areas that have been identified as wetlands, 3 foot (one meter) wooden grade stakes shall be driven into the ground at approximate 20 foot (6.1 meter) intervals and tied with the flagging.

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 stakes 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.

(h) 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.

5) 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 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).

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 DelDOT 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. DelDOT 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.

    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 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 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 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.

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.

763598 - FIELD OFFICE, SPECIAL I

Description:

The field office work shall consist of furnishing, erecting, equipping, maintaining, and removing a singlewide modular office and adjacent parking area. The Contractor shall submit a specific location layout drawing and construction details for the proposed field office and its parking area for approval by the Engineer. The field office and parking area shall be for the exclusive use of Department Officials, Engineers, Designers, North Region Construction (NRC) Personnel, Consultants, and Inspectors.

The field office structure shall be free of asbestos and/or other hazardous materials. The field office and its parking area shall be constructed and installed in accordance with all applicable city, county, state, and federal codes. The Contractor shall be responsible for obtaining all required licenses and permits for installation and placement of the field office and its parking area. The costs of obtaining such licenses and permits to be incidental to the "Field Office, Special" Item. The field office shall be available for use by the Department continuously throughout the duration of the project.

Construction and Equipment:

The field office shall be new and have a minimum floor space of 600 square feet with minimum exterior dimensions of 50'-0" length by 12'-0" width. The floor to ceiling height shall be nominal 8'-0". The exterior walls, ceiling, and floor shall be insulated. The field office shall be of weather-proof construction, tightly floored and roofed, constructed with an air space above the ceiling for ventilation, supported above the ground, safely secured to its support if the support is an inground anchored foundation or otherwise by tie-downs to the ground, and fully skirted with rigid watertight covering overlapping the bottom of the exterior siding to the existing ground.

The Contractor shall provide entries to the field office by constructing a stair and deck platform with canopy at each exterior door. These entries shall be fabricated using treated dimension lumber, be constructed with hand and safety railing, be designed to last the life of the Contract, and conform to the requirements of the Architectural Accessibility Board and other federal, state and local boards, bodies and/or courts having jurisdiction in the Contract limits.

The Contractor shall construct and maintain an all weather parking area adjacent to the office of at least 2500 square feet and having a minimum of 10 functional parking spaces striped for full size cars. All weather pathways from the parking area to the entrances of the field office shall also be constructed and maintained. This parking area and entrance pathways shall have a minimum of 2" type "C" hot mix on top of minimum 6" graded aggregate subbase. Snow and/or ice shall be removed from the parking area and from the entrance pathways to the field office within 12 hours after each occurrence. Costs for furnishing, placing, and maintaining the aggregate base and hot mix, and for snow and/or ice removal, to be incidental to the Field Office, Special" Item.

The ground area 30'-0" from around the perimeter of the field office to the field office shall be landscaped and maintained. If the earthen grounds do not have a stand of weed free grass, the surface of this area shall be loosened to a depth of 4" and a satisfactory seedbed shall be prepared free of debris and extraneous matter. The area shall be seeded to a healthy stand of grass or sodded, after which the area shall be watered, mowed, and trimmed a minimum of three times a month during the growing seasons. Cost for this landscaping and maintenance to be incidental to the "Field Office, Type I Special" Item.

The field office shall have full carpeting, kitchenette facilities, and interior and exterior paneling, lighting, and plumbing fixtures. The field office shall have a minimum of two (2) exterior doors, each door having a passage and a deadbolt lock. These door locks shall be keyed and at least 2 complete sets of keys shall be supplied to the Engineer's representatives. The exterior doors shall be insulated or have storm doors. The field office shall have a minimum of six (6) windows, each window having a minimum glass area of 1150 square inches and a horizontal mini-blind covering the full glass area. The windows shall be insulated or have storm windows. All windows shall be equipped with a locking device. All doors and windows shall have screens installed and repaired when damaged.

At least two (2) outside water service connections shall be provided at the field office. Each water connection shall have a 3/4" frost proof hose bib with vacuum breaker and shall include 100 linear feet of 5/8" minimum diameter reinforced, industrial or commercial grade, soft rubber hose per connection.

The field office shall be provided with sufficient natural and artificial light and shall be adequately heated and cooled to provide comfortable working conditions.

The field office shall have satisfactory lighting, electrical outlets, heating equipment, exhaust fan, and air-conditioning connected to an operational power source. Plan and drawing areas shall have individual fluorescent lights situated over their worktables. Replacement fluorescent lights shall be furnished as required. Electrical current, water, and any fuel for heating equipment shall be furnished and the cost of such shall be borne by the Contractor. Maintenance of the heating, exhaust fan, and air-conditioning equipment shall be provided for by validated service contracts for the length of the Contract. These service contracts shall allow a Department authorized project person to deal directly with the service organization to request repair.

The Contractor shall furnish and maintain two fire extinguishers and provide one lighted "Exit" sign for each exterior passage door. Fire extinguisher(s) may be chemical or dry power and shall be UL Classification 10-B:C(min.) and shall be suitable for Types A:B:C fires. A commercial or industrial type first aid and safety kit suitable for project conditions and hazards (including snakebite) shall be provided and maintained to full capacity on a monthly basis.

The Contractor shall provide an alarm system for field office security with electronic, direct connection to a security service provider. The security system shall have interior motion, window, and entrance detectors and built in manual fire alarm. All windows of the field office shall be covered with steel bar grids as a deterrent to forced entry. The Contractor shall provide validated monitoring and service contracts for the length of the Contract. These contracts shall allow a Department authorized project person to deal directly with the security service provider to request service and/or repair.

The Contractor shall furnish and maintain an adequate supply of cold potable water, a minimum 23 cubic foot new refrigerator, and a minimum 900-watt new microwave oven. Maintenance of the potable water supply equipment, refrigerator, and microwave shall be provided for by validated service contracts for the length of the Contract. These service contracts shall allow a Department authorized project person to deal directly with the service organization to request repair.

Suitable indoor toilet facilities, conforming to the requirements of the State and Local Boards of Health or of other bodies or courts having jurisdiction in the area, shall be provided. When separate facilities for men and women are not available or required, a sign with the wording "Rest Room" (letter heights 1" minimum) shall be placed over the doorway and an adequate positive locking system shall be provided on the inside of the doorway to insure privacy. The facility(s) shall be maintained by the Contractor to be clean and in good working condition and shall be stocked by the Contractor with adequate lavatory and sanitary supplies at all times during the period of the Contract.

The Contractor shall be responsible for performing or for making arrangements for all necessary telephone connections and/or for their maintenance; for providing a new telephone equipment system, for payment of all connections and the new telephone system equipment and its installation; and for final disconnection of the telephones.

The field office telephone system shall have a total of 5 lines consisting of 2 direct single lines with call forward busy feature, 2 dedicated computer use line with broadband connection for either DSL or cable, and 1 dedicated facsimile line and have 5 key sets consisting of 1 master key set having privacy feature, and 4 four-button key sets having privacy feature (1 set which may be for wall mounting), all for the official and exclusive use of the Engineer and other representatives of the Department. Arrangement shall be made to allow a Department authorized project person to deal directly with the telephone company to report outages and/or request repair. Monthly billings for the field office telephone system shall be received and paid by the Contractor. A copy of each bill shall be forwarded to the Project Resident for reimbursement on the subsequent contract pay estimate. The reimbursement will be for the amount of the bill only and shall not include any additional mark-up or profit.

For all other utilities, the Contractor shall be responsible for performing or for making arrangements for all necessary utility connections and/or for their maintenance; for payment of all utility connections, installations, service fees and bills; and for final disconnection of utilities.

The field office interior shall be furnished by the Contractor. The Contractor shall provide new and maintain the following office furnishings, all which are to be approved by the Engineer prior to installation in the field office. Placement of these furnishings shall be as directed by the Engineer. 6 full size office desks each with filing drawer and fully adjustable ergonomic design swivel chair with armrests and five leg base having wheel casters, 1 computer station with acoustical panels having minimum 60 NRC rating for privacy screen and fully adjustable ergonomic design swivel chair with armrests and five leg base having wheel casters, 1 large conference table for a minimum of 12 people with surrounding chairs with armrests, 2 folding tables minimum 6'-0" by 3'-0" each with ergonomic design straight back chair with armrests, 1 work table, 1 supply cabinet, 2 rough plan racks, 2 legal size filing cabinets with 4 drawers, 2 legal size fire-resistant filing cabinets with lock and key with 4 drawers and meeting fire underwriters' approval for not less than one hour test, 2 book shelves minimum 3'- 6" by 4'- 6", 3 vertical surface legal size three compartment pockets, 2 dry erase boards minimum 4' by 3' each with markers and erasers, and 2 cork bulletin boards minimum height 3' by 2'. These office furnishings will remain the property of the Contractor at the conclusion of the project.

The Contractor shall also furnish new and maintain the following office equipment, all which are to be approved by the Engineer prior to installation in the field office. The required equipment will enable the Department to synchronize project record keeping and office functions. The equipment shall be delivered in working and useable condition:

4 heavy-duty calculators having extra large 12-digit fluorescent display, full size keyboard with contoured keys, two-color ribbon printer, and AC powered;

1 compact plain paper copying machine and cabinet with stationary platen, bypass feeding, and dual loading cassette system with cassettes for letter, legal, and ledger size paper. Copy machine to have zoom and preset reduction and enlargement features, automatic two (2) sided copying, automatic document feeder with minimum 30 sheet capacity, and 20 bin collator with automatic stapling capacity;

1 desktop model, compact facsimile machine with automatic paper cutter, 10-sheet feeder, halftones with 16 levels of gray, 50-number auto dialing, answering machine hook-up, large LCD readout, date and time stamp, and advanced telephone features;

1 DVD camcorder with on-screen programming, full-range auto focus, high-speed shutter, high-resolution, bookmark search, time-lapse recording, rechargeable batteries and charger, tripod, and protective carrying case;

1 integrated color monitor and DVD/VHS cassette recorder having minimum 20" screen, automatic on/play/rewind/stop, remote, full range speaker, and digital auto tracking;

1 micro cassette recorder, having fast playback, voice-activated system, three-digit tape counter, silent auto-stop and pause, two tape speeds, one-touch and follow-up, built-in condenser microphone, cue and review, and rechargeable with combination battery charger/AC adapter;

1 telephone answering machine having all-digital recording, 14 minute message capacity, selectable message time, voice prompt assistance, day/time stamp, call screening, two-digit LED message indicator, toll saver, power failure memory back-up, and message interrupt from any station; and

2 digital cameras with minimum 1/2.7" 4.0 mega pixel, 3X optical / 6X precision digital zoom, 12-bit DXP A/D conversion, 2.5" 123K pixel LCD display, 5-mode program AE and each with dual media slots, SXGA/XGA/VGA image resolution, E-mail mode. Also intelligent flash with red-eye protection, MPEG movie mode, clip motion, light metering, TEXT mode (GIF), playback zoom and resize, white balance, lithium battery system and in-camera picture effects, memory stick/card (minimum 256MB) capability, and storage case.

Consumables as required to manage the business of the project shall be provided for all office equipment for the length of the Contract. These consumables shall be furnished on request and shall include but not be limited to paper, tapes, ribbons, rolls, toner, cleaning kits, microcassette tapes and batteries, answering machine cassettes, camera batteries and memory sticks and/or discs, DVD and CD R/RW media, etc.

Maintenance of all office equipment shall be provided for by a validated service contract for the length of the Contract. This service contract shall allow a Department authorized project person to deal directly with the service organization to request repair.

Included in the unit price bid per month for the Field Office on this project will be two (2) IBM compatible Microcomputer Systems both which will be furnished and maintained by the Contractor for use by the Engineer. The specified computer systems will synchronize the construction management functions of the Department to monitor, report, and perform the accounting of the project work. The computer systems and all their related equipment specified below shall be furnished new and remain the property of the Contractor at the conclusion of the Contract. A detailed listing of the proposed computer systems and all their related equipment to be provided by the Contractor shall be submitted for approval by the Engineer prior to furnishing the Microcomputer Systems. The Microcomputer Systems shall be Laptop Computer Systems each with docking station. Each of the two (2) Microcomputer Systems shall consist of:

Central Processing Unit (CPU) – Lap Top

Pentium M processor, 740 (1.7 GHz) or better with integrated USB 2.0 and IEEE 1394 ports (firewire) and wireless networking included,

Minimum 1.0 GB RAM with expansion capability to at least 3.0 GB and clock/calendar card equivalent, and

Microsoft "Windows® XP Professional" operating system;

Memory (Storage)

CD/DVD +/- RW with double layer write capability, and 100GB hard drive minimum, integrated Ethernet 10/100, and internal modem. Included software shall support double layer media writing and automatic backup of data;

Monitor (Cathode Ray Tube)

Monitor for docking station and docking station - Super Video Graphics Adapter (SVGA) minimum. 19" minimum diagonal visual area flat panel with .26 dot pitch capable of multiple frequency 256 color graphics and at least 1024 pixel resolution. Swivel base with low radiation and eyestrain protection, brightness and contrast control and

Laptop - shall have 15.4” display minimum;

Color Graphics Card

Card must be SVGA AGP interface with 64 MB onboard video memory having maximum resolution of at least 1280x720 with at least 16 bit color and video control hardware and software;

Keyboard

Keyboard shall be ergonomic, enhanced layout minimum with keyboard interface cable;

Printers

LaserJet HP 2550N network capable printer or latest model with 64 MB minimum total memory having up to 600 dpi resolution and using HPL6 printer language with all necessary software and cables for proper operation; and a HP Desk Jet color printer or latest model with photo quality print capability and with all necessary software, equipment, and cables for general operation as well as connection and sharing on a local network;

Scanner

A HP6100 color scanner with HP5770 ScanJet ADF (or equivalent brand) with all necessary software, equipment, and cables for general operation as well as connection and sharing on a local network;

Software

The latest version programs for application management (operating system), word processing, spreadsheet, and anti-virus shall be provided with all user manuals. Upgrades, maintenance, and full technical support by the manufacturer shall be provided for the length of the Contract. The required software will enable the Department to synchronize accounting and record keeping functions between the project, District, and Department offices. A list of programs to be provided shall be submitted to the Engineer for approval. Software, other than for application management and anti-virus, is to be delivered unopened to the Department's administrative office. All software is to be compatible with and for use to run on "Windows® XP Professional". The required applications software follows and is to be latest version unless noted:

office suite - "Microsoft® Office XP Professional",
antivirus - "McAfee® Total Protection for Small Business,
software supporting creation of DVD +/- R/RW disks (supporting double layer media writing) and DVDR and DVDRW disks using DVDRW drive, for example: Ahead Nero, Roxio DVD/CD Creator, or some equivalent product. Note: software commonly included as part of the standard CDRW upgrade/standalone package is acceptable if included with the unit;

Related Equipment

Wireless networking hub/router (802.11g or better) with all associated hardware (adapters, cables, etc) and soft to enable wireless networking and internet connection sharing for all office computers and printers,

An electrical outlet with dedicated circuit for the main computer unit,

An optical mouse with proper driving software having complete Microsoft emulation,

An internal 56/28.8/14.4 fax modem with MNP5 error checking and complete Hayes emulation having high-speed 14.4 fax capability and regular data transmission between 2400 and 56 baud, with the latest version proper driving software,

Necessary cables for proper operation,

An uninterruptible power supply (UPS) units for protection from power loss or fluctuation, minimum of 6 outlets, adequate to provide a minimum of 30 minutes backup power for an orderly shut down of the computer system with software and connections for automatic system shutdown,

24 bit Sound Blaster compatible PCI soundcard with quality desktop speakers,

A combination surge, spike, and noise protection device with receptacles for all peripherals (may be in combination with the UPS power supply),

A wrist rest suitable for use with the furnished keyboard,

Cleaning kits for disk drives,

An anti-glare filter with grounding wire suitable for use with the furnished monitor, and

All cards, hardware, and operating, anti-virus, and equipment software to be fully installed and operational;

Maintenance and Service

Maintenance of all specified equipment and components shall be provided for by a validated service agreement for the length of the Contract. Maintenance (upgrades, replacement, full technical support) for each software application shall be provided for by validated maintenance agreement for the length of the Contract. These agreements shall allow an authorized project person to deal directly with the service organization to request repair or the maintenance organization to request assistance; and

Supplies

Consumables as required to manage the business of the project shall be provided for the Microcomputer Systems for the length of the Contract. These consumables shall be furnished on request and include but not be limited to 3-1/2" double sided high density micro floppy diskettes, compatible diskettes for provided digital cameras and memory stick media, DVDR and DVDRW media compatible supporting operational minimum to maximum speed of the DVD/RW drive unit, cut sheet paper and labels compatible with the printers, hardware and screen cleaners, and toner cartridges.

Maintenance of the field office including its adjacent parking area, for the time required, shall consist of maintenance and/or replacement of all provided items, security system, furniture and equipment, computer systems, providing lavatory supplies, providing trash containers and waste baskets, providing entrance mats at each door, providing replacement items for lighting fixtures, maintaining all utilities, providing satisfactory and sanitary janitorial and waste disposal services twice a week, providing cleanup of trash and debris on the parking lot and landscaped area once a week, and shall be included in the monthly unit cost.

The Contractor shall provide and deliver a current copy of all validated field office, equipment, and computer maintenance, service, assistance and/or monitoring agreements and/or contracts as mentioned hereinabove to the Department's administrative office on or before the first day the field office is ready for use.

Method of Measurement:

This item will not be measured but will be paid for on a monthly basis. Partial months will be paid at the rate of 0.033 months per day.

Basis of Payment:

The field office will be paid for on a unit price bid per month, which price shall be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment and incidentals necessary to maintain the field office and its adjacent parking area and restore the field office area and adjacent parking area to match the original site condition. No separate payment will be made for costs involved for removing hazardous material or underground tanks to install these offices or the parking area.

Payment will be made only for the actual number of months that the office is acceptably provided by the Contractor.

The field office shall be ready for use not later than thirty (30) calendar days after the date of the fully executed Contract and before construction operations begin.

3/3/08

908500 - MULCH ACCESS ROADS

Description:

This work shall consist of constructing temporary stabilized construction mulch access roads at the locations indicated on the plans according to the Contract Documents and as directed by the Engineer.

Materials:

The materials to be used in the construction of the mulch access road shall conform to the following:

Shredded Hardwood Bark Mulch, which shall consist of natural wood and bark from hardwood trees that have been milled and screened to a maximum 4 inch particle size. Shredded Hardwood Bark Mulch shall not be composted. Shredded Hardwood Bark Mulch may be either produced onsite using available waste hardwood or purchased from offsite vendors. Onsite trees utilized for Shredded Hardwood Mulch must be approved by the Engineer.

Construction:

Construction of mulch access roads shall be completed as shown on the Contract Documents. Prior to constructing mulch access roads, the Limits of Construction shall be flagged or staked by the contractor and field reviewed by the Engineer. Minor changes to the alignment may be necessary based on changed field conditions or to avoid unnecessary impacts to natural resources / trees and man-made features such as playgrounds and park signs. The Engineer shall then give the Contractor authorization to proceed with construction of access roads.

The Contractor shall verify that all required materials delivered to the site comply with the Contract Specifications. The locations for the mulch access road are a shown on the plans.

The mulch access road shall consist of a minimum depth of 12 inches of Shredded Hardwood Bark Mulch on existing grade. Shredded Hardwood Bark Mulch shall be replenished as directed by the Engineer during the construction period to maintain the minimum dimensions, or as directed by the Engineer at no additional cost to the Department.

Upon completion of construction activities, the mulch access road shall be removed completely. All mulch and geotextile shall be removed at the end of construction. Shredded Hardwood Bark Mulch that is removed shall become the property of the Contractor. Where impacted by the access road and construction activities, the asphalt walking path shall be repaired to existing conditions as illustrated in the construction plans.

MAINTENANCE. The mulch access road shall be maintained as needed and as directed by the Engineer through the completion of the project. The mulch portions of the access road shall be maintained at 12 inches depth at all times during active construction.

Method of Measurement:

Mulch Access Roads shall be measured as the square yards of access road installed to a standard 12-inch depth. Maintenance repairs and replenishment of mulch shall not be measured and shall be considered incidental to the original installation dimensions.

Basis of Payment:

Mulch Access Roads shall be paid for at the Contract unit price per square yard of access road. Payment shall include full compensation for all furnished or field manufactured Shredded Hardwood Bark Mulch, and all material, labor, equipment, tools, and incidentals necessary to complete the work. The payment will be full compensation for all installation, maintenance, and ultimate removal of the shredded hardwood bark mulch. Repair of the asphalt walking path shall be paid for under Item 301001 - Graded Aggregate Base Course, Type B and ITEM 401001 - Bituminous Concrete, Type C, 115 Gyrations, PG 64-22 (Carbonate Stone).

6/20/17

908504 – COIR FIBER MATTING

Description:

This work consists of stabilizing the streambanks using Natural Fiber Matting, as shown on the Miscellaneous Stream Details, at the locations shown on the Plans, and as directed by the Engineer.

Materials:

Natural Fiber Matting. The Natural Fiber Matting shall be equivalent to Nedia KoirMat 900 or BioD-Mat 90, consisting of machine produced matting of degradable natural fibers meeting the following minimum specifications:

Material:	Woven Coir matting
Minimum Thickness:	0.30 inches
Minimum Weight:	25 oz/SY
Maximum Allowable Water Velocity:	16 ft/sec
Maximum Open Area:	40%

Anchoring Devices. Staple or Anchor Stake – as indicated on the plans, or as recommended by the mat manufacturer and approved by the Representative. Staples shall consist of No. 8 gauge steel wire, bent U-shaped or square top with a throat width of 1 inch to 2 inches, with and effective minimum driving depth of 8 inches. Anchor Stakes shall consist of a 12" long, 1" x 2" hardwood notched stake.

Certification:

The Contractor shall furnish the Engineer with a specification and source of the Natural Fiber Matting for review and approval two (2) weeks prior to intended use. The specifications furnished to the Engineer shall be equivalent to Nedia KoirMat 900 or BioD-Mat 90.

Construction Methods:

Grading, Topsoil and Seeding shall be completed before the soil stabilization matting is installed. The bank surface shall be a smooth soil surface free from stones, clods, or debris. The matting shall be placed within 24 hours after seeding operations have been completed. Matting shall be laid smoothly and securely upon the seeded bed in the direction of water flow. Ensure full contact of the matting with the topsoil and that the matting is free of tears, folds, holes, or other inconsistencies in its final placement. Stretching shall be avoided.

The matting shall be rolled lengthwise along the streambank. The matting shall be secured throughout using staples placed every two (2) feet on center, except as indicated for matting overlap and along the edges of the matting.

Where more than one width of matting is required, the ends of each strip shall overlap at least one (1) foot for both vertical and horizontal overlaps. Overlapping shall be done with the upslope matting overlapping the downslope matting and the upstream matting overlapping the downstream matting. The overlapped mat shall be firmly fastened in place with anchor stakes driven vertically into the soil and flush with the surface. Anchor stakes shall be placed a maximum of two (2) feet on center along overlapping matting.

The Contractor shall secure the edges of the matting along the slope by excavating a six (6)-inch deep trench and securing the edge of the matting within the trench with anchor stakes placed every two (2) feet on center. The trench shall then be backfilled and tamped. The matting shall extend a minimum of one (1) foot beyond the limits of grading at the top of the slope, or to a location along the slope indicated by the Engineer.

Along the bottom of the slope, the matting shall be secured by trenching the mat a minimum of one (1) foot below the channel invert and securing with anchor stakes placed every two (2) feet on center. The trench shall be backfilled with channel bed material and tamped.

The matting shall be secured along the toe of slope along Rock Toe Protection, Step-pool Crest, and Step-pool Pool locations by extending the matting down one (1) foot vertical and securing with anchor stakes as shown on the details. The anchor stakes shall be placed every two (2) feet on center.

If any area of the Natural Fiber Matting degrades before the disturbed area is fully stabilized, the Contractor shall replace the matting and reseed the affected area at the Contractor's expense.

Method of Measurement:

The quantity of Natural Fiber Matting will be measured in square yards of actual surface covered along the surface of the treated area. The payment will be full compensation for furnishing and placing mat, staples, stakes, and for all material, labor, tools, and incidentals necessary to complete the work.

Basis of Payment:

The quantity of Natural Fiber Matting will be paid for at the Contract unit price per square yard. Price and payment will constitute full compensation for ground preparation, furnishing and installing all materials, labor, equipment and other incidentals necessary to complete the work.

6/30/17

908505 - COIR BLANKET

Description:

This work item shall include installation of Coir Blanket along the edge of the re-constructed stream banks and along graded slopes and floodplain terraces in conjunction with Coir Fiber Matting as a dual layer, as shown on the soil stabilization details, at the locations shown on the plans, and as directed by the Engineer.

Materials:

Coir Blanket: The blanket shall consist of a 100% coconut fiber matrix stitched between biodegradable cotton netting, or similar. The Coir Blanket shall be equivalent to Nedia C400B, or approved equal. The Coir Blanket shall be supplied with a minimum of 8-foot width by 100-foot long rolls. The blanket shall meet the following minimum specifications:

Material:	Non-Woven Coir matting
Minimum Thickness:	0.3 inches
Minimum Weight:	11 oz/SY

Anchoring Devices: The Coir Blanket shall be secured in place by the anchoring devices for the Coir Fiber Matting in the final condition. For temporary anchoring of the Coir Blanket, if necessary, wire staples shall be utilized. Staples shall consist of No. 8 gauge steel wire, bent U-shaped or square top with a throat width of 1 inch to 2 inches, with and effective minimum driving depth of 8 inches.

Certification:

The Contractor shall furnish the Engineer with a specification and source of the Coir Fiber Matting for review and approval two (2) weeks prior to intended use.

Construction Methods:

Dual layer coir blanket/mat encapsulated soil. The Coir Blanket shall be placed as a dual layer with Coir Fiber Matting, in a single row running parallel to the channel bank.

Dual layer coir blanket/mat on graded slopes and floodplain terraces. The Coir Blanket shall be placed as a dual layer with Coir Fiber Matting.

To ensure proper key-in and anchoring of the Coir Blanket and Mat, the dual layer of material shall be placed along the proper limits of stream bank grading, prior to backfilling of the stream banks. The blanket and matting shall be laid across the channel, with only the key-in portion of the materials placed in final positions. The blankets shall be laid with the Coir Fiber Matting below the Coir Blanket at the key-in point.

The blanket shall be rolled lengthwise along the streambank. The blanket shall be secured throughout using staples placed every two (2) feet on center, except as indicated for blanket overlap and along the ends of the blanket.

If any area of the coir fiber material degrades before the disturbed area is fully stabilized, the Contractor shall replace the blanket and reseed the affected area at the Contractor's expense.

Method of Measurement:

The quantity of Coir Blanket shall be measured in square yards of material placed.

Basis of Payment:

The quantity of Coir Blanket shall be paid for at the Contract unit price per square yard for placed and secured Coir Blanket. The payment will be full compensation for furnishing and placing of blanket, staples, stakes, and for all material, labor, tools, and incidentals necessary to complete the work. Price and payment will constitute full compensation for ground preparation, furnishing and installing all materials, labor, equipment and other incidentals necessary to complete the work.

Coir Fiber Matting, Topsoil, and Stream Restoration Seeding shall be measured and paid for as Items 908504, 908002, and 908510.

6/30/17

908506 - STREAM RESTORATION SEEDING

Description:

This work shall include furnishing, seeding, and establishment of Riparian Buffer Seed Mix.

Materials:

a. Riparian Buffer Seed Mix

Common Name (*Latin name)*	OVERALL MIX SEED RATE	Min. 30 LBS/AC PLS
	LBA/AC PLS	% OF MIX
Virginia Wildrye (*Elymus virginicus*)	7.5	25%
Riverbank Wildrye (*Elymus riparius*)	7.5	25%
Autumn Bentgrass (*Agrostis perennans*)	7.5	25%
Deertongue (*Dicanthelium clandestinum*)	4.5	15%
Soft Rush (*Juncus effusus*)	0.6	2%
Fox Sedge (*Carex vulpinoidea*)	0.6	2%
Swamp Milkweed (*Asclepias incarnata*)	0.3	1%
Mist Flower (*Eupatorium coelestinum*)	0.3	1%
Boneset (*Eupatorium perfoliatum*)	0.3	1%
New England Aster (*Aster novae-angliae*)	0.3	1%
Cardinal Flower (*Lobelia cardinalis*)	0.3	1%
Tall White Beardtongue (*Penstomen digitalus*)	0.3	1%

Seeding rates shall be supplied on the basis of 100% Pure Live Seed (PLS) per acre. Seed tags to be supplied at the time of delivery shall indicate the LBS/AC PLS for each individual species. Seed quantities shall be adjusted for each species in the mix to meet the 100% LBS/ AC PLS rate listed in the tables above. Individual seed species shall have a maximum weed seed percentage of 0.75-percent, a minimum purity of 95-percent, and a minimum percentage germination of 90-percent.

All seed shall be fresh, clean, from new crop seed, and delivered to the site in original unopened tagged packages in accordance with the Delaware Code and respective State laws.

All areas of Riparian Buffer Seed Mix shall be overlain by a temporary seed of Common Oat (Avena sativa) or Grain Rye (Secale cereal) applied at a rate of 30 LBS/AC. The temporary seed mix shall be broadcast seeded separately after placement of the permanent seed and shall not be mixed with the permanent seed mixtures during broadcast seeding. The temporary seed shall have a maximum weed seed percentage of 0.15-percent, a minimum purity of 98-percent, and a minimum percentage germination of 90-percent.

The seed mixes above shall be free of prohibited weed species listed in DelDOT Standard Specification 908. No Johnsongrass (Sorghum halapense), Canada Thistle (Cirsium arvense), Burcucumber (Sicyos angulatus),

Giant Ragweed (Ambrosia trifida), and Texas Amaranth (Amaranthus palmeri) shall be allowed under the maximum allowable percentage of weed seeds and in accordance with Section 1, Chapter 24, Title 3 of the Delaware Code. In accordance with Title 3, Chapter 15 of the Delaware Code, Seeds and its associated regulations, seed designated as Noxious Weeds by the Delaware Department of Agriculture shall not be part of the allowable percentage of weed seeds in any quantity.

Permanent Grass Seeding - Wet Ground (PGS-WG) and Permanent Grass Seeding - Dry Ground (PGS-DG) shall follow requirements of Section 908.

Construction:

This work shall consist of preparing the seed bed, broadcast seeding, and watering for establishment in accordance with Section 908 of the Supplemental Specifications with changes to methods as shown on the plans.

Seed tags will be removed from the seed bags prior to seeding by the inspector and seed tags shall indicate the pounds per acre of pure live seed (LBS/AC PLS) of the supplied mix. Seed mixes will conform to the 908.02.C.3 (a) Materials Seeding section for Grass and Agricultural Seeds or as indicated on the plans. Manufacturer's guidelines will be submitted to the Engineer prior to installation. The Contractor shall be responsible for performing all work necessary to achieve and maintain an acceptable seed bed prior to seeding as directed by the Engineer at no additional cost to the Department.

Application of the Riparian Buffer seeding mix shall only occur between the following dates: March 1st to May 1st and September 1st to October 31st.

No lime, fertilizer or other amendments shall be added to the mix.

Topsoil shall be placed to a depth of 2-inches in all areas specified for seeding with Riparian Buffer Seed Mix. All topsoil placement and grading shall be completed before seeding. All topsoil shall meet the requirements of Section 908 and the following:

1. Topsoil shall contain no less than 3-percent and no more than 10-percent organic matter as determined in accordance with AASHTO T 194.
2. Topsoil shall have an acidity range of pH 6.0 to pH 7.5.
3. The method of testing topsoil shall be in accordance with the requirements of AASHTO T 88, Modified; AASHTO T 89, Method B; and AASHTO T 90; and shall meet the following gradation requirements:

Gradation Requirements

Sieve Size	Minimum Percent Passing by Weight
2" (50 mm)	100
No. 4 (4.75 mm)	90
No. 10 (2.00 mm)	80

Areas to be seeded shall be maintained at approved grades and shall not be smooth rolled. The seed bed shall be prepared by tilling, discing, or harrowing the finished grade to a depth of 3-inches. For areas, if grading or placement of topsoil has just been completed and the soil is loose and friable, not eroded or crusted, surface raking only may be permitted at the approval of the Engineer. Soil seeded with Riparian Buffer Seed Mix shall be stabilized using Coir Fiber Matting and Coir Blanket as specified on the Contract Landscape Plans.

In areas where herbicide has been applied, but where no other treatment has been specified, the Contractor, using a weed trimmer or other suitable method approved by the Engineer, will cut existing vegetation to a minimum of 2 in. and a maximum height of 6 in.; will remove all excess debris to an extent approved by the Engineer; and will then perform seed establishment as applicable for that area.

Permanent seed will be applied by broadcast spreader in two passes in opposite directions in order to assure uniform distribution. Broadcast rates for the seed mixtures vary and shall follow the recommendations of the seed supplier. A carrier, sand or similar, may be added to the permanent seed mixtures to ensure even distribution of the broadcast seeds. The carrier shall be mixed with the seed at a rate recommended by the seed supplier. Temporary seed mix shall be applied in a separate pass after spread of the permanent seed. The seed bed shall be completed by a final shallow raking (1/4-inch) or scarification of the soil surface with a chain link fence to ensure adequate seed - soil contact. Seed shall be incorporated to a depth not more than 1/4 in.

Water for establishment shall be applied by spraying or sprinkling at a rate of 25,000 gallons per acre or 0.57 gallons per square foot. Water for establishment shall include three (3) separate waterings. The first watering shall occur within 72 hours of seed placement, subsequent watering shall be spaced seven (7) days apart. Watering periods may be adjusted at the discretion of the Department based upon local weather conditions.

No Maintenance Bond is required for this work.

Acceptance of 908510- Stream Restoration Seeding shall be made six (6) - weeks after the first watering of the seed mix area.

Method of Measurement:

Seeding shall be measured based upon the square yards of surface area of acceptably placed permanent seed.

Basis of Payment:

The quantity and type of seeding shall be paid for at the Contract unit price per square yard. Price and payment shall constitute full compensation for preparing the ground; for furnishing and placing all materials including seed; for watering, and for all labor, equipment, tools, and incidentals required to complete the work. Furnishing, placement and establishment of Temporary Seed shall be incidental to the unit price per square yard of the permanent seed mixtures.

Placement of 4-inch depth topsoil shall be measured and paid for under Item 908003. Coir Fiber Matting and Coir Blanket shall be measured and paid for under Items 908504 and 908511.

6/20/17

911500 - PLANTINGS, TUBELINGS

Description:

This work shall consist of furnishing and installation of tubelings of the species specified and at locations as shown on the Contract Documents.

Tubelings shall be installed from March 1 to May 15 or from September 1 to November 30. Installation of live materials outside of this planting window may only occur during the dormancy season at the approval of the engineer.

Materials:

Tubelings shall consist of grown cuttings of *Cornus amomum* (Silky Dogwood) and *Viburnum dentatum* (Southern Arrow-wood). Materials shall be purchased from a nursery specializing in the production of similar materials and shall include confirmation of species. Each tubeling shall have a minimum root volume of 6 to 10 cubic inches.

Construction:

Handling. Tubelings shall be transported in climate-controlled conditions to ensure against temperatures greater than 50°F. Tubelings stored on site shall be kept moist, shaded, and protected against desiccation. Materials stored offsite shall be refrigerated and kept moist. In no case shall non-refrigerated materials be stored longer than five (5) calendar days.

During installation, tubelings shall be kept damp by heeling into moist mulch until ready for use. Cuttings shall be inspected for signs of desiccation, including but not limited to blackening of cut ends and lengthwise wrinkling of bark, and all unsuitable materials shall be appropriately discarded.

Installation. Tubelings shall be installed by alternating between the two species, in rows along the channel banks as shown in the Contract Documents. Tubelings shall be installed in one row along channel banks with coir blanket/mat encapsulated soil over furnished cascade material, and three rows along channel banks with a floodplain terrace as shown in the construction plan details. All tubelings shall be placed at a spacing of 1.5 feet on center. On banks with three rows, the row closest to the channel thalweg shall be planted at the top of the low bank in the soil adjacent to the cascade material. The second row shall be planted along the outside edge of the floodplain terrace (toe of slope). The third row shall be placed 1 vertical foot from the second row in a staggered pattern to the second row. With the approval of the Engineer, the Contractor shall achieve the specified spacing by preparing holes using a pointed digging bar, rebar, or other similar implements to achieve both the 6-10 inches of depth as well as the diameter required for each cutting. Tubelings shall be installed vertically into the bank with the root crown level with existing ground or slightly higher. The Contractor shall firmly backfill by hand, all voids surrounding all tubelings, hand tamping the soil tightly against each cutting without damaging the roots or plant. Tubelings shall be watered the equivalent of a 3 inch diameter container at 0.15 gallon per event.

Method of Measurement:

Tubelings shall be measured per each live tubeling planted.

Basis of Payment:

Tubelings will be paid for at the Contract unit price per each live tubeling installed. The payment will be full compensation for furnishing, transporting, storing, watering, and planting, and for all material, labor, equipment, tools, and incidentals necessary to complete this work.

6/20/17

UTILITY STATEMENT

DATE: 03/06/2017
STATE CONTRACT # T201480206
P3E# N/A
F.A.P # N/A
VARLANO PARK OUTFALL RETROFIT AT LEATHERMANS RUN
NEW CASTLE COUNTY

The following utility companies maintain facilities within the contract limits:

NCC Special Services – Sewer
AT&T
Verizon Delaware
Comcast Cable of NCC

The following is a breakdown of the utilities involved, adjustments and/or relocations as required (all stations, offsets, lengths and calendar days are approximate)

- **NCC Special Services – Sewer:** The aforementioned utility maintains underground facilities along Varlano Park area within the project limits and represents a conflict with the proposed stabilized construction entrance and/or staging stockpile area. The Contractor shall excavate test pits along the NCC Special Services – Sewer as shown in the contract documents, before installing stabilized construction entrance.

  Any adjustments and/or relocation to the aforementioned Company's existing facilities will be done concurrently with the project construction by the State contractor's forces as necessary after a minimum of seven (7) calendar days advanced notice from the State contractor.

- **AT&T:** The aforementioned utility maintains an inactive AT&T coaxial cable underground within the project limits. The Contractor shall excavate test pits along the AT&T facility as shown in the contract documents, before installing stabilized construction entrance. The Contractor shall notify AT&T at least 72 hours in advance of any excavation near the AT&T underground facilities and during the test pitting operation. Contact Mr. Jay Everly at (610) 328-6465 or (215) 279-4199 to schedule work in this area.

  Any adjustments and/or relocation to the aforementioned Company's existing facilities will be done concurrently with the project construction by the Company's forces as necessary after a minimum of seven (7) calendar days advanced notice from the State contractor.

- **Verizon Delaware:** The aforementioned utility maintains underground facilities laid perpendicular to the outfall pipe outside of the project limits. These underground facilities have no apparent conflicts with construction activities.

Any adjustments and/or relocation to the aforementioned Company's existing facilities will be done concurrently with the project construction by the Company's forces as necessary after a minimum of seven (7) calendar days advanced notice from the State contractor.

- **Comcast Cable of NCC:** The aforementioned utility maintains underground facilities laid perpendicular to the outfall pipe outside of the project limits. These underground facilities have no apparent conflicts with construction activities.

  Any adjustments and/or relocation to the aforementioned Company's existing facilities will be done concurrently with the project construction by the Company's forces as necessary after a minimum of seven (7) calendar days advanced notice from the State contractor..

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 purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.

2. The Contractor shall work in accordance with Delaware Code (see 16 Del C. §7405B for the *Overhead High Voltage Line Safety Act*), the United States Occupational Safety and Health Administration (OSHA), and the National Electric Safety Code. This requires notification to the public utility and mutually agreeable measures be implemented by any person intending to carry on any function, activity, work or operation within dangerous proximity of high voltage overhead lines. Close coordination with public utility companies owning overhead lines is required and must take place prior to commencement of any work. At a minimum, a distance of 10'-0" must be maintained from all energized distribution lines and a distance of 20'-0" must be maintained from all energized transmission lines.

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.

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 or legal holidays.

David Clark	**NCC Special Services**	**302-395-5705**
Jay Everly	**AT&T**	**610-328-6465**
George Zang	**Verizon Delaware**	**302-422-1238**
Knol McRae	**Comcast Cable of NCC**	**302-661-4462**
Keith Allridge	**Comcast Cable of NCC**	**717-776-1073**

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 highway contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.

DIVISION OF MAINTENANCE AND OPERATIONS

PREPARED AND RECOMMENDED BY:

Justin Lennon, Parsons Brinckerhoff — Date: 3/6/17

APPROVED AS TO FORM BY:

Utilities Section, DelDOT — Date: 16 Mar 2017

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201480206

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

VARLANO PARK OUTFALL RETROFIT AT LEATHERMAN'S RUN

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

Robert Cunningham
Chief, Right of Way

May 5, 2017

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

JENNIFER COHAN
SECRETARY

May 15, 2017

ENVIRONMENTAL REQUIREMENTS

FOR
State Contract No. T201480206
Federal Aid No.: N/A

Contract Title: Varlano Park Outfall Retrofit at Leathermans Run

In accordance with the procedural provisions for implementing the National Environmental Policy Act of 1969, as amended, the referenced project has been processed through the Department's Environmental Review Procedures and has been classified as a Level C/ Class II Action.

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 #27, CENAP-OP-R-2017-183-85, issued 4/25/17, expires 3/18/22
- Delaware Department of Natural Resources and Environmental Control (DNREC) Wetlands & Subaqueous Lands Section (WLSL) – This project is consistent with Delaware Code Chapter 72, § 7217, Special Exemption (a) - concurrence received 3/9/16, no expiration
- 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

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 be 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) Sheet.

1. Specifically, please note the environmental requirements as indicated in the following notes:
   - Monitoring – See EC note 2(C).
   - Stream Restoration and Slope Riprap Treatment – See EC note 4.
   - Protection of Resources – See EC note 6.
   - Plantings – See EC note 7.

2. DelDOT Environmental Studies Section (302) 760-2264 must be notified if there are any changes to the project methods, footprint, materials, or designs, to allow the Department to coordinate with the appropriate resource agencies (COE, DNREC, and SHPO), for approval.

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RAILROAD STATEMENT
For

State Contract No.: T201480206

Federal Aid No.:

Project Title: Varlano Park Outfall Retrofit at Leatherman's Run

The following railroad companies maintain facilities within the contract limits:

- ☐ Amtrak
- ☐ CSX
- ☐ Delaware Coast Line
- ☐ East Penn
- ☐ Maryland & Delaware
- ☐ Norfolk Southern
- ☐ Wilmington & Western
- ☑ None

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

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, attached, 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

1/25/16
DATE

BID PROPOSAL FORMS

CONTRACT T201480206.01

UNLESS OTHERWISE DIRECTED, SUBMIT ALL FOLLOWING PAGES TO:

DEPARTMENT OF TRANSPORTATION
BIDDERS ROOM (B1.11.01)
800 BAY ROAD
DOVER, DELAWARE 19901

Identify the following on the outside of the sealed envelope:

- Contract Number T201480206.01

- Name of Contractor

CONTRACT ID: T201480206.01 PROJECT(S): T201480206

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 GENERAL					
0010	201000 CLEARING AND GRUBBING	LUMP	LUMP			
0020	203000 CHANNEL EXCAVATION	724.000 CY				
0030	204000 TEST HOLE	4.000 CY				
0040	209004 BORROW, TYPE C	193.000 CY				
0050	301001 GRADED AGGREGATE BASE COURSE, TYPE B	22.000 CY				
0060	302005 DELAWARE NO. 57 STONE	47.000 TON				
0070	401001 BITUMINOUS CONCRETE, SUPERPAVE TYPE C, 115 GYRATIONS PG 64-22 (CARBONATE STONE)	18.000 TON				
0080	602500 MODIFIED USBR TYPE V IMPACT BASIN	1.000 EACH				
0090	615502 REMOVE AND RESET PEDESTRIAN BRIDGE	LUMP	LUMP			

CONTRACT ID: T201480206.01 PROJECT(S): T201480206

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0100	621500 TEMPORARY TIMBER MAT	LUMP	LUMP			
0110	707016 RIPRAP, R-5	7.000 TON				
0120	707018 RIPRAP, R-7	70.000 TON				
0130	707501 FURNISHED CASCADE MATERIAL	122.000 CY				
0140	707502 IMBRICATED ROCK STRUCTURES BOULDER BANK PROTECTION	360.000 TON				
0150	707502 IMBRICATED ROCK STRUCTURES ROCK SILL	62.000 TON				
0160	707503 SALVAGED CHANNEL BED SAND AND GRAVEL	25.000 CY				
0170	707504 FURNISHED CHANNEL BED SAND AND GRAVEL	19.000 CY				
0180	708002 GEOTEXTILES, SEPARATION	371.000 SY				
0190	708003 GEOTEXTILES, RIPRAP	95.000 SY				
0200	720556 BOLLARD	2.000 EACH				

CONTRACT ID: T201480206.01 PROJECT(S): T201480206

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0210	727000 CHAIN LINK FENCE	247.000 LF				
0220	727006 TEMPORARY CONSTRUCTION FENCE	1862.000 LF				
0230	762000 SAW CUTTING, BITUMINOUS CONCRETE	38.000 LF				
0240	763000 INITIAL EXPENSE/DE-MOBILIZATION	LUMP	LUMP			
0250	763501 CONSTRUCTION ENGINEERING	LUMP	LUMP			
0260	763598 FIELD OFFICE, SPECIAL I	4.300 EAMO				
0270	801000 MAINTENANCE OF TRAFFIC	LUMP	LUMP			
0280	810001 TEMPORARY WARNING SIGNS AND PLAQUES	170.000 EADY				
0290	813001 TEMPORARY BARRICADES, TYPE III	50.000 LFDY				
0300	905001 SILT FENCE	565.000 LF				
0310	906002 DEWATERING BAG	1.000 EACH				

CONTRACT ID: T201480206.01 PROJECT(S): T201480206

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0320	908003 TOPSOIL, 4" DEPTH	3650.000 SY				
0330	908014 PERMANENT GRASS SEEDING, DRY GROUND	2542.000 SY				
0340	908015 PERMANENT GRASS SEEDING, WET GROUND	720.000 SY				
0350	908023 STABILIZED CONSTRUCTION ENTRANCE	38.000 TON				
0360	908500 MULCH ACCESS ROAD	995.000 SY				
0370	908504 COIR FIBER MATTING	821.000 SY				
0380	908505 COIR BLANKET	695.000 SY				
0390	908506 STREAM RESTORATION SEEDING	383.000 SY				
0400	909005 STREAM DIVERSION	LUMP	LUMP			
0410	911000 PLANTINGS	LUMP	LUMP			
0420	911500 PLANTINGS, TUBELINGS	416.000 EACH				
	SECTION 0001 TOTAL					
	TOTAL BID					

BREAKOUT SHEET INSTRUCTIONS

BREAKOUT SHEET(S) MUST BE SUBMITTED EITHER WITH YOUR BID DOCUMENTS; OR WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE BID DUE DATE BY THE LOWEST APPARENT BIDDER.

BREAKOUT SHEETS ARE TO BE SUBMITTED TO DELDOT'S CONTRACT ADMINISTRATION AS SHOWN BELOW. BREAKOUT SHEETS CANNOT BE CHANGED AFTER AWARD. THE DEPARTMENT WILL REVIEW THE FIGURES SUBMITTED ON THE BREAKOUT SHEET(S) TO ENSURE THEY MATCH THE RESPECTIVE LUMP SUM BID AMOUNT(S). MATHEMATICALLY INCORRECT BREAKOUT SHEETS WILL BE RETURNED FOR IMMEDIATE CORRECTION.

BREAKOUT SHEETS MAY BE SUBMITTED;

VIA E-MAIL TO: DOT-ASK@STATE.DE.US
SUBJECT: **T201480206.01** Breakout Sheet

OR MAILED TO: DELDOT
CONTRACT ADMINISTRATION
PO BOX 778, DOVER, DE 19903

'BREAKOUT SHEET' AND THE PROJECT NUMBER MUST APPEAR ON THE ENVELOPE.

BREAKOUT SHEET - 1 **CONTRACT NO. T201480206.01**

Item 911000 - PLANTING

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	1499	SY	MULCHING, 3" DEEP	$	$
2	9	EA	WHITE OAK, 1.25" MIN. CALIPER	$	$
3	8	EA	PIN OAK, 1.25" MIN. CALIPER	$	$
4	4	EA	DOWNY SERVICEBERRY, 1.25" MIN CALIPER	$	$
5	23	EA	SHADBLOW SERVICEBERRY, 3-FT. MIN HEIGHT	$	$
6	24	EA	BLACKHAW VIBURNUM, 3-FT. MIN. HEIGHT	$	$
7	25	EA	AMERICAN HOLLY, 3-FT. MIN. HEIGHT	$	$
8	2475	GAL	WATERING	$	$

TOTAL I TEM 911000 - PLANTING $_____

(LUMP SUM BID PRICE FOR ITEM 911000 - PLANTING)

"ATTENTION"

TO BIDDERS

BREAKOUT SHEET(S) MUST BE SUBMITTED EITHER WITH YOUR BID DOCUMENTS; OR WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE BID DUE DATE BY THE LOWEST APPARENT BIDDER.

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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 that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor 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.

CERTIFICATION
Contract No. T201480206.01

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	No.	Date	No.	Date	No.	Date	No.	Date
_____		_____		_____		_____		_____	

BIDDERS MUST ACKNOWLEDGE RECEIPT OF ALL ADDENDA

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

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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 _____

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

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____ _____
Title

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

Notary Seal

_____
Notary

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That:_____

of_____ in the County of _____and State of _____

as **Principal**, and _____ of _____ in the County of

_____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware ("**State**"), are held and firmly bound unto the **State** in the sum of _____

_____Dollars ($_____), or _____ percent not to exceed _____

_____ Dollars ($_____) of amount of bid on Contract No. T201480206.01, to be paid to the **State** for the use and benefit of its Department of Transportation ("**DelDOT**") 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 **DelDOT** 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 **DelDOT**, 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