

STATE OF DELAWARE

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DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201380204.01

LEATHERMAN'S RUN STREAM RESTORATION AT CHRISTIANA
HIGH SCHOOL

NEW CASTLE COUNTY

ADVERTISEMENT DATE: July 20, 2015

COMPLETION TIME: 89 Calendar Days

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

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 18, 2015

Contract No.T201380204.01

**LEATHERMAN'S RUN STREAM RESTORATION AT CHRISTIANA HIGH SCHOOL
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 the Leatherman's Run Project. This project consists principally of two components, (1) restoration of the Leatherman's Run Stream Channel and (2) replacement/rehabilitation of the New Castle County Sewer Main. Restoration of the stream channel is being performed by DelDOT as a part of the NPDES compliance efforts. The stream channel is proposed to be restored through incorporation of natural stream channel bed material, in-stream rock structures, grading of vertical and unstable stream banks, creation of flood-plain benched and realignment of limited segments of stream. Streambanks and riparian zones will be restored with native tree, shrub, and herbaceous plantings. Wetland areas will be enhanced through planting of a greater diversity and density of tree, shrub and herbaceous plantings and through removal of invasive species. The sewer main component of the project will include the replacement of 376 linear feet of an existing "Y" sewer-line which crosses the Leatherman's Run Channel at two locations. The associated tie-in manholes will be rehabilitated as part of the project, and other incidental construction in accordance with the location, notes and details shown on the plans and as directed by the Engineer.

COMPLETION TIME

All work on this contract must be complete within 89 Calendar Days. The Contract Time includes an allowance for 11 Weather Days. It is the Department's intent to issue a Notice to Proceed such that work starts on or about October 12, 2015.

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.
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 proposal opening date in order to receive a response. Please include T201380204.01 in the subject line. Responses to inquiries are posted on-line at <http://www.bids.delaware.gov>.
3. This project incorporates the electronic bidding system **Expedite, version 5.9a**. Bidders will find the installation file on the plan holders bid file disk. The installation file and instructions are also available on DelDOT's Website at: http://www.deldot.gov/information/business/bids/const_proj_bid_info.shtml.
4. 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. No retainage will be withheld on this contract.
6. The Department's 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.
7. **SPECIFICATIONS:** New Supplemental Specifications to the August 2001 Standard Specifications were issued November 24, 2014 and apply to this project. They can be [viewed here](#). The Department is currently updating the August 2001 Specifications for Road and Bridge Construction. Through this update, some Divisions were renumbered and some new ones were created and added. The *Specifications Note* document is for the use by the bidders to reference the new numbers to the past numbers used for bidding purposes on previous Department contracts.
8. **PLEASE NOTE** the requirements of special provision 'Changes to Project Documents During Advertisement' have moved to Supplemental Specifications, the special provision is no longer needed.
9. **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.

**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, 2001", hereinafter referred to as the Standard Specifications, Supplemental Specifications, the Special Provisions, notes on the Plans, this Bid Proposal, and any addenda thereto shall govern the work to be performed under this contract.

CLARIFICATIONS:

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

ATTESTING TO NON-COLLUSION:

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

QUANTITIES:

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

PREFERENCE FOR DELAWARE LABOR:

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

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

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:

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

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

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

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

to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

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

TAX CLEARANCE:

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

LICENSE:

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

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

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

(c) Any contractor that enters a public works contract must provide to the agency to which it is contracting, within 30 days of entering such public works contract, copies of all occupational and business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the contractor entered the public works contract the occupational or business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

DIFFERING SITE CONDITIONS,

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

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

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

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

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

Suspensions of work ordered by the engineer: If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated, customary or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

Upon receipt, the engineer will evaluate the contractor's request. If the engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers,

or subcontractors at any approved tier, and not caused by weather, the engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The engineer will notify the contractor of his/her determination whether or not an adjustment of the contract is warranted.

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

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

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

If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract.

The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.

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

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

RIGHT TO AUDIT

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

PREVAILING WAGES

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

REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION

Title 29 Del.C. §6960 stipulates;

- (b) Every contract based upon these specifications shall contain a stipulation that the employer shall pay all mechanics and laborers employed directly upon the site of the work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics. The specifications shall further stipulate that the scale of wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work, and that there may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay to laborers and mechanics employed by the employer the difference between

the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims.

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

Bidders are specifically directed to note the Department of Labor's prevailing wage regulations implementing §6960 relating to the effective date of the wage rates, at 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 No. 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

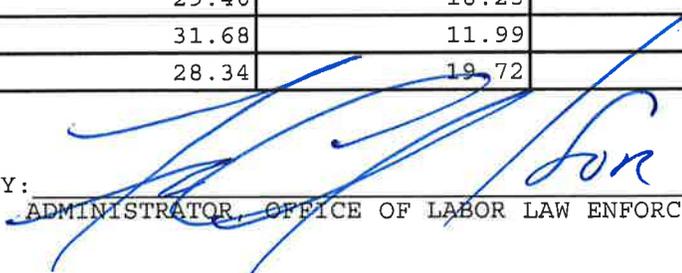
Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

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

PREVAILING WAGES FOR HEAVY CONSTRUCTION EFFECTIVE MARCH 13, 2015

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	21.14	18.60	40.43
BOILERMAKERS	73.62	30.73	56.37
BRICKLAYERS	44.98	22.19	23.83
CARPENTERS	51.86	51.86	41.22
CEMENT FINISHERS	43.00	23.30	16.00
ELECTRICAL LINE WORKERS	62.75	26.30	62.75
ELECTRICIANS	63.60	63.60	63.60
GLAZIERS	19.54	16.96	11.48
INSULATORS	53.38	53.38	53.38
IRON WORKERS	60.12	60.12	55.78
LABORERS	40.95	40.95	40.95
MILLWRIGHTS	65.23	65.23	51.80
PAINTERS	77.09	60.64	60.64
PILEDRIVERS	69.32	37.64	29.30
PLASTERERS	18.40	15.97	10.80
PLUMBERS/PIPEFITTERS/STEAMFITTERS	76.78	76.78	17.12
POWER EQUIPMENT OPERATORS	47.93	59.81	59.81
SHEET METAL WORKERS	29.40	18.23	17.13
SPRINKLER FITTERS	31.68	11.99	9.93
TRUCK DRIVERS	28.34	19.72	21.40

CERTIFIED: 7/10/15

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: T201380204-01 Leatherman Run Stream Restoration at Christiana High School - NCC, New Castle County

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

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

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

To access the Website;

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

The full Website Link is;

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

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

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

SPECIAL PROVISIONS

CONSTRUCTION ITEM NUMBERS

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

Standard Item Number:

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

Special Provisions Item Number:

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

Examples

Standard Item Number - 202000 Excavation and Embankment

202 Indicates Section Number

000 Indicates Sequential Number

Special Provision Item Number - 202500 Grading and Reshaping Roadway

202 Indicates Section Number

500 Indicates Sequential Number

NOTE:

PLEASE NOTE revised Supplemental Specifications to the August 2001 Standard Specifications were issued November 24, 2014 and apply to this project. They can be [viewed here](#) and at www.deldot.gov.

SPECIFICATIONS: The Department is currently updating the August 2001 Specifications for Road and Bridge Construction. Through this update, some Divisions were renumbered and some new ones were created and added. The *Specifications Note* document is for the use by the bidders to reference the new numbers to the past numbers used for bidding purposes on previous Department contracts.

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

202573 - TEST HOLES

Description:

This work consists of excavation of test holes to locate existing subsurface structures and utilities, prior to the start of adjacent construction activities, that may be affected by or interfere with the proposed construction at the locations shown on the plans or at locations directed by the Engineer. This work also consists of excavating test holes at proposed construction locations where excavation may impact existing facilities, known or unknown, at the construction location.

Construction Methods:

When facilities and utility lines must be discovered or exposed and identified at specified locations, the contractor shall use minimally intrusive excavation techniques, acceptable to DelDOT, that ensure the safety of the excavation, the integrity of the facility / utility line to be located, and that of other facilities which may be encountered during test hole excavation.

Excavation shall be by means of air-assisted vacuum excavation equipment manufactured specifically for the purpose.

Clear the test hole area of surface debris.

In paved areas, neatly cut and remove existing pavement, which cut shall not exceed 225 square inches (0.15 square meters) unless otherwise approved.

Excavate the test hole by the method(s) acceptable to DelDOT and noted above. The nominal diameter of the test hole shall not exceed 15 inches (375 mm) unless otherwise approved.

Where facilities are discovered or located, expose the facility / utility only to the extent required for identification and data collection purposes.

Avoid damage to lines, wrappings, coatings, cathodic protection or other protective coverings and features.

Hand-dig as needed to supplement mechanical excavation and to ensure safety.

Test hole locations may be revised, as directed or approved by the engineer, in the field as necessary to positively expose the utility or to determine the absence of facilities within the area impacted by the proposed construction.

Store excavated material for re-use or disposal, as appropriate.

Replace bedding material around exposed utility lines in accordance with owner's specifications or as otherwise directed or approved.

Backfill and compact the excavation in lifts no greater than six inches using excavated material with appropriate moisture/density control.

If test holes are excavated within paved areas that will be exposed to traffic, provide pavement restoration within the limits of the original cut using materials, compaction, and pavement thickness matching the excavated pavement material and thicknesses.

Method of Measurement:

The quantity of test holes will be measured by the number of EACH excavated.

Basis of Payment:

The quantity of test holes will be paid for at the Contract price per EACH. Price and payment will constitute full compensation for performing all the work described in these Special Provisions, as noted on the Plans, and/or as directed by the Engineer, and includes, excavation, backfill, backfilling, pavement restoration, disposal and removal, away from the site of the unsuitable materials, for all labor, tools, equipment, and incidentals necessary to complete the item.

3/26/13

601520 - 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 601 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 601.07 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 "601520 - 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.

7/16/08

712553 - IMBRICATED ROCK STRUCTURES

Description:

This work consists of furnishing and placing imbricated rocks, geotextile and riffle material backfill to construct stream stabilization structures including the following:

Rock Sill.

To be installed at:

- (a) Rock Sill #1: Sta. 12+58.5
- (b) Rock Sill #2: Sta. STA. 14+59.5
- (c) Rock Sill #3: Sta. STA. 16+13.0

Cross Vane 1 (CV-1) – To be installed at Sta. 10+74.4

Imbricated Rock Sewer Line Protection 1 (IR-1) – To be installed at Sta. 10+44.8

Imbricated Rock Sewer Line Protection 2 (IR-2) – To be installed at Sta. 12+51.0

Materials:

Imbricated Rock. Imbricated rocks 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 imbricated 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.

Imbricated Rocks shall adhere to the following dimensions. The length measurements along the rocks have an allowable tolerance as shown on the construction plans.

Imbricated Rocks Dimensions	Minimum Weight
2 ft x 3 ft x 4 ft	1.70 tons

Unless otherwise stated the imbricated rocks used for in-stream structures shall have a minimum unit weight of 170 lb/ft³. The imbricated rocks are to be rectangular in shape in accordance with the size criteria specified in the contract documents, square and triangular imbricated 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 imbricated 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 imbricated 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 imbricated 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 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 classification.
- Weight per cubic foot.
- Type of rock.
- Weight of imbricated rocks being supplied.
- Boulder quality shall meet all of the above specifications.

Imbricated rocks will be used for top rocks, footer rocks, and drop rocks on all structures here these types of rocks are specified.

Rock Sill Materials. The rock sill structures shall be constructed using imbricated rocks as defined in the construction documents. Where specified on the plan sheets, the rock sills shall also contain a series of drop rocks and footer rocks.

CV-1 Materials. CV-1 shall be constructed using imbricated rocks as defined in the construction documents. Where specified on the plan sheets, the cross vane shall also contain a series of drop rocks and footer rocks.

IR-1 Materials. IR-1 shall be constructed using imbricated rocks as defined in the construction documents. Where specified on the plan sheets, the imbricated rock sewer line protection shall also contain a series of footer rocks.

IR-2 Materials. IR-2 shall be constructed using imbricated rocks as defined in the construction documents. Where specified on the plan sheets, the imbricated rock sewer line protection shall also contain a series of footer rocks.

Furnished Riffle Materials. Furnished riffle materials for rock structures shall meet the materials presented in these specifications under SPECIAL PROVISIONS - Furnished Riffle Materials.

Geotextile. A nonwoven geotextile liner will be installed along the upstream side of the in-stream structures to prevent piping and structural failure. Geotextile materials shall be Class GS-1, non-woven and shall conform to AASHTO M 288 Class 2 or 3 Table-2 for drainage.

Construction:

Rock Sill Construction Methods. Rock sill 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.

The Rock sill shall be installed in the center of the channel, meeting the station and offset measurements as shown in the construction plans. The imbricated 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.

SE non-woven geotextile filter fabric shall be placed along the front 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.

Rocks shall be seated firmly and shall not rock or rotate in place.

Rock shall be selected and placed to avoid the creation of voids. Voids that are unavoidable are to be chinked and filled using cobbles and riffle material. The contractor is 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.

Furnished riffle material shall be installed over top of the geotextile liner to bring the excavated channel bed to grade.

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

Cross Vane CV-1 Construction Method. CV-1 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.

CV-1 shall be constructed with two principal components, one arm extending from IR-1 and another arm pivoting from IR-1 and tapering downstream forming a broad "V" shaped structure. CV-1 shall be installed as shown in the contract documents.

Geotextile filter fabric shall be placed along the front face of the arms 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 Department. Filter cloth shall be keyed-in, placed and trimmed to avoid exposed edges upon completion of construction.

The placement of the cross vane shall immediately follow the fabric placement. The rock shall be firmly placed as level as possible on each layer of rock.

Rocks shall be seated firmly and shall not rock or rotate in place.

Rock shall be selected and placed to avoid the creation of voids. Voids that are unavoidable are to be chinked and filled using cobbles and riffle 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 0.2 feet of the elevations specified on the construction drawings.

Salvaged or furnished riffle material shall be installed over top of the geotextile liner to bring the excavated channel bed to grade.

Salvaged or furnished riffle material shall be placed between the streambanks and the vane arms. The area shall be graded to produce a flat cross-section relative to the vane arms. The backfill shall be sloped in the stream direction at the same pitch as the vane arms.

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

IR-1 Construction Method. IR-1 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.

Imbricated rock shall be placed so that they abut the existing concrete sewer protection encasement upstream of CV-1.

Geotextile filter fabric shall be placed along the front face of the imbricated rocks 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 Department. Filter cloth shall be keyed-in, placed and trimmed to avoid exposed edges upon completion of construction.

The placement of imbricated rocks shall immediately follow the fabric placement. The rock shall be firmly placed as level as possible on each layer of rock.

Rocks shall be seated firmly and shall not rock or rotate in place.

Rock shall be selected and placed to avoid the creation of voids. Voids that are unavoidable are to be chinked and filled using cobbles and riffle 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 0.2 feet of the elevations specified on the construction drawings.

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

IR-2 Construction Method. IR-2 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.

Imbricated rocks shall be placed so that they abut the existing concrete sewer protection encasement upstream of Rock Sill #1 (RS-1).

Geotextile filter fabric shall be placed along the front face of the imbricated rocks 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 Department. Filter cloth shall be keyed-in, placed and trimmed to avoid exposed edges upon completion of construction.

The placement of imbricated rocks shall immediately follow the fabric placement. The rock shall be firmly placed as level as possible on each layer of rock.

Rocks shall be seated firmly and shall not rock or rotate in place.

Rock shall be selected and placed to avoid the creation of voids. Voids that are unavoidable are to be chinked and filled using cobbles and riffle 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 0.2 feet of the elevations specified on the construction drawings.

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

Method of Measurement and Basis of Payment:

Boulder structures will be measured and paid for at the Contract unit price as specified per structure type below:

Imbricated Rock Structures shall be measured and paid for at the contract unit price per ton.

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 imbricated rocks, including top, footer, and drop rocks; excavation; 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.

Furnishing and placement of furnished riffle material are not accounted for under this provision. Furnishing and placement of furnished riffle material are covered under and will be paid under SPECIAL PROVISION - Furnished Riffle Materials.

Geotextile, Class GS-1, non-woven shall be measured and paid for at the Contract unit price per square yards of fabric used to install structures.

3/2/15

712554 - FURNISHED RIFFLE BED MATERIAL

Description:

This work consists on furnishing, stockpiling, and placing Furnished Riffle Bed Material in the proposed stream channel locations as indicated on the construction plans.

Materials:

Furnished Riffle Bed 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 Riffle Bed Material.

The color of the Furnished Riffle Bed 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 Riffle Bed Materials shall include the following mixture:

Distribution (by weight)	Size and Type
33%	Standard 1 ½ in. Sieve (45mm to 50mm) stone
33%	Standard 4 in. Sieve (75mm to 100mm) stone
33%	5 in. (127mm) to 8 in.(203mm) stone

Stone quantities shall be determined by weight.

Furnished Riffle Bed 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 ft³, specifications, color, weight range of rock being supplied, and a sample of the rock to be supplied.

Construction:

Furnished Riffle Bed Material shall be installed according to the construction plans for individual structures.

The construction of the riffle areas shall progress in working sections from downstream to upstream (for individual riffle areas only, the overall stream construction shall commence 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 bank stabilization treatments and riffle areas. The finished subgrade shall not consist of mucks, organic material, or trash. Excavation for the installation of the riffle areas shall conform to the dimensions, grades, and details specified in the Contract Documents. No excavations shall remain open or unstabilized during non-work hours (i.e. evenings, weekends, and holidays).

The Contractor shall place Furnished Riffle 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 ft.
Channel Width:	±0.5 ft
Channel Slope:	±0.1 percent

Following the placement of the Furnished Riffle Material, wash-in of fine materials shall be performed to choke off the open pore space in the Furnished Riffle Bed Material, thus allowing for stream low flows to flow along the surface of the riffle. The wash-in procedure shall involve a 6-in. lift of Salvaged Channel Bed Sand and Gravel placed on the surface of the Furnished Riffle Bed Materials. 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 riffle pore spaces without causing movement of the riffle material itself. The Contractor shall continue washing successive lifts of the sand and gravel into the riffle material until the material no longer washes into the pore spaces / void spaces and travels down slope. Wash water to be utilized in the procedure should be pumped from the upstream clear water diversion point, a smaller pump than utilized for the clear water pumping operations may be desired for this operation so as to allow for settlement and wash-in of the fines and so as to not cause movement of the Furnished Riffle Bed Material. 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 streambanks 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 Riffle Material will be measured based upon the cubic yardage of material furnished to the site and installed.

Basis of Payment:

Furnished Riffle Material shall 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 Sand and Gravel or Contingent Furnished Channel Sand and Gravel used as the fine material wash-in shall be measured and paid for as Items 700000D and 700000E. Water and water pumping operations for the wash-in procedure shall be incidental to the lump sum cost for Item 909005 - Stream Diversion.

3/2/15

712555 - HEAVY BACKFILL

Description:

Heavy Backfill is a rock enhanced mixture of backfill consisting of 10% R-4 riprap, 20% bank run gravel and 70% salvaged subsoil/furnished by volume for use in reconstruction of streambanks. The work consists of placement of a mixture of R-4 riprap, Bank Run Gravel, and salvaged subsoil or furnished borrow placed with a top layer of furnished topsoil to be used as backfill for reconstruction of channel banks. The rock enhancement is utilized to better mimic the rock content of natural stream banks and to increase the long-term erosive resistance of the banks. Heavy Backfill shall be utilized in all areas of channel bank reconstruction and general fill.

Materials:

The materials to be used in the construction of the heavy backfill shall conform to the following:

R-4 Riprap shall conform to Section 712 – Riprap.

Bank run gravel shall have the following aggregate test requirements:

- (a) Maximum Sodium Sulfate Soundness (ASTM C88) : 12%
- (b) Maximum Los Angeles Abrasion (ASTM C131): 50%
- (c) Gradations: The Bank Run Gravel shall conform to the following table of gradation.

Sieve Size	Percent Passing Each Sieve by weight by Weight
2-1/2 inch	100
1 inch	90-100
1/2 inch	60-100
No. 10	35-90
No. 40	20-55
No. 200	5-25

Salvaged subsoil shall consist of native soil materials excavated from the project site. It shall be of uniform composition. It shall be harvested from the project site cut areas. Soil shall not be harvested from any on-site areas outside of the construction limits. Soils having the following properties shall be excluded from use:

- (a) Material with a maximum dry weight less than 90 lb/cu. ft.
- (b) Material with a liquid limit greater than 50
- (c) Material containing frozen material, rubbish, or organic matter such as leaves roots, grass, or sewage.

Furnished borrow shall conform to Section 209 – Borrow for Borrow Type A. Furnished borrow shall be primarily composed of native soils and shall not be a crushed stone derivative.

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

	Minimum Percent	Maximum Percent
Passing No. 10 (2.0 mm and retained on No. 200 (75 mm) sieve)		
Sand	15	65
Passing No. 200 (75 mm) sieve		
Sand	10	60
Silt	5	40

Existing topsoil salvaged from the project shall be utilized, where it meets the criteria for Furnished Topsoil and the above.

Limestone, sandstone, or other sedimentary rock materials shall not be utilized as a component of Heavy Backfill.

Construction:

The stream shall be diverted and the construction area dewatered as shown on the erosion and sediment control plans. This may include sandbag diversions and pump around techniques.

The R6 riprap, gravels, and salvaged subsoil or furnished borrow shall be thoroughly mixed prior to placement as backfill.

Heavy Backfill placed below the Furnished Riffle Bed Material shall be placed in one (1) foot lifts along the bed of the channel, extending from edge of bank to edge of bank, and compacted. Successive lifts shall be placed and compacted to fill from the sub-grade up to the bottom elevation for placement of the Furnished Riffle Bed Materials and for grading of the pool areas.

Heavy backfill placement for reconstruction of the channel banks shall be coordinated with placement of the Coir Mat and Coir Blanket materials. After initial placement of the Coir Blanket and Mat as specified in Item 908511, place the heavy backfill, shape and compact to form the streambank areas. Place 2-inches of topsoil in all specified planting areas to meet final lines and grades and as specified in the Stream Restoration Seeding specification. Topsoil shall not be placed over the Heavy Backfill in exposed areas below the baseflow line, as shown on the Construction Plan Profile Sheets. Upon completion, the bank surface shall be an evenly graded soil surface free from stones, clods, or debris. The streambank surface shall be prepared and seeded in accordance with Item 908510. The coir blanket and matting shall then be wrapped along the face of the final stream bank, placed immediately after seeding operations have been completed. Placement of the Coir Blanket and Coir Matting shall be completed and secured as specified for Items 908504 and 908510.

For all other areas of Heavy Backfill, topsoil shall be placed to a depth of 2-inches covering the planted surfaces of the heavy backfill, as specified on the Construction Plans for areas of Wet Meadow Seed Mix or Riparian Buffer Seed Mix.

Any excavation voids existing along the edges of the completed slope and channel protection should be backfilled with topsoil and compacted.

Method of Measurement:

Heavy backfill for construction will be measured based upon the cubic yardage of material placed.

Basis of Payment:

Heavy Backfill shall be paid for at the contract unit price per cubic yard of placed material. The payment will be full compensation for furnishing all R-4 riprap, Bank Run Gravel, furnished borrow, Borrow Type A, salvaging, sorting, and stockpile of backfill materials, and field mixing, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Placement of 2-inch depth topsoil shall be measured and paid for under Item 908002. Coir Matting, Coir Blanket, and Seeding shall be measured and paid for under Items 908504, 908511, and 908510.

712556 - SALVAGED CHANNEL BED SAND AND GRAVEL MATERIAL

Description:

The work consists of placement of a salvaged mixture of sand and gravel at the specified locations pool to restore the channel bed. Work items will include sorting, separate stockpiling, and placement salvaged streambed material as shown on the Contract Drawings. Salvaged Channel Bed Sand and Gravel is specified for use in the reconstruction of channel pool beds and as a fine material wash-in for reconstructed channel riffle beds.

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 outside of the limits of construction. The salvaged material shall consist of a mixture of silt, sand, and gravel; with the silt (or finer gradation) component not to exceed 35% of the total mixture. The salvage material is to generally be excavated from the top 8-inches of stream riffles and the top 24-inches of channel bars. 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 Sand and Gravel shall be stockpiled separately from other excavation materials or any furnished materials.

Placement and arrangement of the sand and gravel material shall conform to the location and detail as specified in the Contract Documents.

Pool bed areas shall be filled with 8-inches of salvaged channel sand and gravel, in all areas of general channel bed fill or if unsuitable material is present in the pool location.

Salvaged Channel Bed Sand and Gravel shall be utilized as a fine material wash-in for choking of voids in riffle areas. Installation of the fine material wash-in shall follow the specifications for Item 712554 - Furnished Riffle Bed Material.

In the event of insufficient material found on-site, the contractor shall use furnished material as described for Item 712557 - Furnished Channel Bed Sand and Gravel.

Methods of Measurement:

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

Basis of Payment:

Salvaged Channel 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.

3/2/15

712557 - FURNISHED CHANNEL BED SAND AND GRAVEL

Description:

Furnished Channel Sand and Gravel shall be used as a substitute for Salvaged Natural Channel Bed Sand and Gravel, in the event that insufficient quantities of suitable material are present on site for the installation items outlined for item 712556. The furnished material is proposed bed creation in pool sections to a depth and dimensions shown on the Contract Drawings and for fine material wash-in for choking of void spaces in riffle areas.

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 20% native channel silt, 30% gravel with a size distribution ranging from a No. 8 sieve up to 1 inches, and 50% sand. 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 bed rock 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, unless otherwise approved by the Engineer.

Construction:

Placement of the Furnished Channel Sand and Gravel shall comply with the specifications for Item 712556 - Salvaged Channel Bed Sand and Gravel.

Method of Measurement:

Furnished Channel Bed Sand and Gravel will 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, as necessary. Payment will be full compensation for furnishing, transport, stockpiling, mixing, excavation, placement, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

3/2/15

727547- REMOVAL OF FENCE

Description:

This work consists of the removal, wholly or in part, and salvaging of chain link fence components, backfilling of cavities caused by post removal. The fence to be salvaged is shown on the plans.

Construction Methods:

The Contractor shall remove the wire fabric and roll it in a manner that avoids damage. The steel posts shall be removed from the ground and the concrete removed such that the posts are not damaged during the removal.

Method of Measurement:

The chain link fence designated on the plans to be removed will be the number of linear feet measured in-place prior to removal.

Basis of Payment:

The chain link fence that is satisfactorily removed will be paid for at the contract unit price per linear foot. Price and payment will constitute full compensation for the removal of the fence, furnishing material and backfilling of cavities.

3/22/2010

735500 - MULCH ACCESS ROADS

Description:

This work shall consist of constructing stabilized maintenance 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 has been milled and screened to a maximum 4 inch particle size. Shredded hardwood mulch shall not be composted. Shredded Hardwood 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 routes shall be as shown on the Contract Documents. Prior to constructing access routes, the Limits of Construction shall be flagged or staked by the contractor and field reviewed by the Engineer. Minor changes to alignment may be necessary based on changed field conditions or to avoid unnecessary impacts to natural resources / trees. The Engineer shall then give the Contractor authorization to proceed with construction of access routes.

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 shown on the plans.

The access route 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 along access routes Shredded Hardwood Bark Mulch may remain in place to a maximum depth of two inches. Shredded Hardwood Bark Mulch that is removed shall become the property of the Contractor. Compacted Shredded Hardwood Bark Mulch that remains onsite shall be scarified at the direction of the Engineer.

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

Method of Measurement:

Mulch Access Routes shall be measured as the square yardage of access route 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 shall be paid for at the Contract unit price per square yard of access route. 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 to a two inch depth.

737523 - PLANTINGS

737.01 Description.

This work consists of furnishing and planting specified plants, shrubs, and trees and the replacement and cultural care of the material.

MATERIALS.

737.02 Plant Material.

- a. *Quality.* All plants shall be true to type and nomenclature and typical of their species or variety. They shall have a normal habit of growth with well-developed branch systems and vigorous root systems. They shall be sound, healthy, and vigorous plants, free from defects, disfiguration, injury, disease of any kind, insect eggs, borers, and any infestation. All plants shall be nursery grown. They shall have been growing under similar climatic conditions to those of the locality of the Project for at least two years prior to planting. All plant material shall have been grown in a soil that is similar to this area and shall not have been grown in a muck type soil or other foreign type. It shall be the responsibility of the Contractor to inspect the plants before removal from the nursery where they have been grown to make sure that the plants meet these requirements. All plants shall be freshly dug, and no heeled-in or cold storage plants will be accepted, with the exception of plant material delivered prior to planting as outlined in Subsection 737.14.
- b. *Measurements.* All plants shall conform to all sizes and measurements specified in the Plant List. Plants that conform to the requirements specified in the Plant List but do not have a normal balance between height and spread will not be accepted. Where any requirement or exact measurement is omitted, the plants furnished shall be normal for the species and variety as listed in AAN's "USA Standards for Nursery Stock". Plants for use where symmetry is required shall be matched as close as possible. All plants shall be measured for height and spread with the branches in their normal position. The trunk diameter of all trees shall be taken 6" (150 mm) above the ground level for up to and including 4" (100 mm) diameter sizes, and 12" (300 mm) above the ground level for larger sizes. The height of the branches on the tree trunks need not be as specified if the required height can be obtained by pruning the lower branches without leaving unsightly scars and damaging the trunk. No pruning of branches for this effect shall be done before delivery to the site unless approved. Plants larger in size than specified may be used. Larger plants, when selected for use over that which is specified, shall be dug with an earth ball or root spread proportionate to the increased size. With plants smaller than specified, credit shall be offered to the Department for approval. The basis of a credit shall be the average wholesale value based on the difference between the specified size and the next smaller size. The average wholesale value shall be substantiated with written submissions in accordance with Subsection 737.02 (e).
- c. *Inspection.* The Contractor shall be responsible for all certificates of inspection of plant materials that may be required by Federal, State, or other authorities to accompany shipment of plants. The Contractor shall furnish complete information as to the location of all plants which it intends to supply and use. The right is reserved to inspect, tag, and approve all plants at the source of supply. This inspection and tagging shall not in any way eliminate the right of rejection at the site. All plants must be inspected and approved before they are planted. Any plants placed without prior inspection at the site will be rejected at the discretion of the Engineer. The Plant materials shall be protected according to best horticultural practice while in transit in such a way as to prevent the drying or possible desiccation of plant tissue. All plant material arriving at the site with broken or loose balls, or dry or insufficiently developed roots, and plants which are weak or thin, damaged or defective, or which do not comply with the specifications, will not be accepted. The Engineer reserves the right to reject all stock that is found to be unsatisfactory. All plant material determined as unsatisfactory by the Engineer shall not be planted under any circumstances and shall be removed from the Project site by the close of the working day. Failure on the part of the Contractor to comply with any of the above procedures will require an immediate suspension of all work.

- d. *Nomenclature.* Plants shall conform to the nomenclature of "Standard Plant Names" as accepted by the American Joint Commission of Horticulture Nomenclature, 1942 Edition. Names of varieties not included shall conform to names accepted in nursery trade. Size and grading shall conform to those listed in AAN's "USA Standards for Nursery Stock". No substitution will be permitted except by written permission of the Engineer.
- e. *Availability.* The Engineer, after receiving written request from the Contractor for substitution, will verify and establish the non-availability of the specified plant and size to this satisfaction. Upon determining that a substitution is justified, the Contractor will be directed to provide certification in the form of five letters from five independent growers who list the specified plant form in their most current catalog, stating that the item in question is not available as specified.
- f. *Experience.* Under Special Condition No. 22 of the U.S. Army Corps of Engineers 404 Permit, it is stipulated that: *The mitigation and post-planting monitoring plans shall be developed and implemented by a firm with demonstrated expertise in wetland creation activities.*

Therefore, the firm that does the actual planting and seeding of the mitigation site shall possess a record of successful wetland woody and wetland herbaceous and seeding programs that have received final approval by the U.S. Army Corps of Engineers, or have on-site staff personnel who have managed successful wetland woody and herbaceous planting and seeding programs that have received final approval by the U.S. Army Corps of Engineers. At the request of the Department, information indicating compliance with this "Special Condition" shall be forwarded within 14 days.

737.03 Trees. Trees shall have straight trunks according to their habit of growth and shall be well branched and rooted. Shade trees of standard variety shall have a single leader and shall be branched at 6 to 8' (1.8 to 2.4 m) height unless otherwise directed.

737.04 Shrubs. Shrubs shall be well branched, with full and compact growth and have ample well branched root systems capable of sustaining vigorous plant growth.

- a. *Woody Shrub Cuttings* Cuttings shall be fresh 24" (600 mm) long stems of woody plants. Each cutting shall have a living terminal bud (end bud). Prior to installation, the cutting shall be kept cool and moist to prevent desiccation of the material. Degraded, rotting, or dried out material will not be accepted.

737.05 Ground Cover and Herbaceous Perennials.

Ground cover shall be one year old, container grown plants, unless otherwise approved or specified in the Contract documents and shall have been growing for at least six months in the size specified as verified by the Department's inspection representative. Herbaceous plant material shall be at least six months old and shall have been growing for at least three months in the size specified unless otherwise detailed in the plans, and as verified by the Department's inspection representative.

737.06 Soil Mix.

- a. *Topsoil.* Planting topsoil shall consist of natural surface soil from well drained areas from which no topsoil has previously been stripped. The topsoil shall be free of subsoil, heavy clay, hard clods, weeds, roots, sticks, toxic substances, or any other extraneous material. The topsoil shall have a pH range of from 5.5 to 6.8 and contain not less than 2% nor more than 10% organic matter. The topsoil shall exhibit the following grading analysis:

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

The Contractor shall take the necessary action to ensure that the topsoil meets the sieve analysis, acidity, and organic matter requirements. A certificate of analysis of soil samples shall be provided to the Engineer and approved prior to delivery of topsoil to the Project site.

- b. *Peat Moss and Peat Humus.*
 - i. *Peat Moss. Peat moss shall be from sphagnum peat bogs. All peat moss shall be shredded, not dusty, and free of twigs, stones, hard lumps, roots, or any other undesirable materials. All peat moss must be moistened before using, but not watered to a saturated or puddled, unworkable condition. Peat moss shall show an acid reaction of 3.5 to 5.5 pH. The Contractor shall provide written certification from the manufacturer that the peat moss was obtained from sphagnum peat bogs.*
 - ii. *Peat Humus. Peat humus shall be a natural peat or peat humus from fresh water saturated areas, consisting of sedge, sphagnum, or reed peat and be of such physical condition that it passes through a 2" (12.5 mm) sieve. The humus shall be free from sticks, stones, roots, and other objectionable materials. Samples taken at the source of supply shall have the following analysis:*

<i>Acidity Range</i>	<i>4.0 to 7.5 pH</i>
<i>Minimum Water Absorbing Ability</i>	<i>200% by weight on oven-dry basis</i>
<i>Minimum Organic Content</i>	<i>60% when dried at 221 EF (105 EC)</i>

- c. *Composted leaf mulch free of wood, metallic substances, glass or other contaminates may be used in lieu of peat moss or peat humus.*

737.07 Fertilizer. Fertilizer shall be a 20-10-5 analysis or approved equal in accordance with the following minimum guaranteed analysis:

Total Nitrogen (N)	20.00%
Derived from urea-formaldehyde	
7.0% water soluble nitrogen	
13.0% water insoluble nitrogen	
Available Phosphoric Acid (P2O5)	10.00%
Derived from calcium phosphate	
Soluble Potash (K2O)	5.00%
Derived from potassium sulfate	
Combined Calcium (Ca)	2.60%
Derived from calcium phosphate	
Combined Sulfur (S)	1.60%
Derived from ferrous and potassium sulfates	
Iron (expressed as elemental Fe)	0.35%
Derived from ferrous sulfate	

The fertilizer shall be formulated in tablet form weighing a minimum of 20g per tablet.

The fertilizer shall conform to all State and Federal regulations. The Engineer will require the Contractor to furnish an affidavit from the vendor or a testing laboratory as to the available nutrients contained therein.

Fertilizer shall be furnished in new, clean, sealed, and properly labeled packages or containers. Fertilizer failing to meet the specified analysis may be used as determined by the Engineer, providing sufficient materials are applied to comply with the specified nutrients per unit of measure.

737.09 Mulch. Mulch shall be shredded hardwood bark or wood chips, or an approved equal as accepted by the Engineer. All mulching materials will be visually inspected by the Engineer prior to delivery at the planting site and shall conform to the following requirements:

- a. Shredded hardwood bark shall be from a deciduous hardwood source and be mechanically ground to a maximum size of 6" (150 mm). In addition, the bark shall be relatively free of bark fines dust and shall exclude all foreign and toxic substances.
- b. Wood chips must be stockpiled for at least one year prior to placement as verified by the Department's inspection representative and shall not contain leaves, twigs, wood shavings and sawdust, or any foreign or toxic substances. In addition, loose, non-pelletized fertilizer with analysis in accordance with Subsection 737.07 shall be applied at the rate of 0.5 lb/yd² (0.25 kg/ m²) prior to wood chip placement.

Only one of the above mulches will be selected and approved for use throughout the entire Project, and written certification for the above listed requirements of the mulch shall be submitted by the Contractor.

737.10 Stakes, Guys, and Related Materials. Staking and guying shall be as per the Standard Construction Details or alternate method approved by the Engineer.

- a. *Tree Stakes.* Hardwood stakes shall be at least 2" by 2" (50 by 50 mm) rough sawed to the length required. Stakes shall be free from knots, rot or other defects that impair strength.
- b. *Guying straps.* Guying straps shall be one and one-half to two inches (1.5-2.0") wide, of polymer or nylon construction, with grommets at both ends to accept wire or heavy twine.
- c. *Anchoring systems.* Anchors for guy wire shall be malleable iron or aluminum alloy with 3000 lb (13 kN) holding capacity designed to be inserted with a driving rod to a depth specified by the manufacturer. The anchor assembly shall be designed to turn, once located at the proper depth, at a right angle to the line of force applied. All manufacturers' recommendations shall be followed for installing ground anchoring systems.

737.11 Water. Conform to the requirements of Section 803.

CONSTRUCTION METHODS.

737.12 Planting Periods. Plant during the following planting period with the exceptions as noted:

Balled or Burlapped and Potted or Container Grown Plant Material:
March 1 to May 15; September 1 to November 30:

- (1) All planting of broadleaf evergreens during the fall season shall be completed by November 1.
- (2) All material planted from May 16 to August 31 must be treated with an approved antitranspirant in a manner recommended by the manufacturer, and written approval for moving plants within this period must first be obtained from the Engineer.
- (3) Woody Shrub Cuttings Install as dormant materials between October 30 and December 1 or between March 1 and April 1.

The above mentioned periods may be extended or reduced according to weather and soil conditions at the time and upon written request from the Contractor to the Engineer for approval. Planting outside the planting window does not relieve the contractor of his guarantee. The Engineer reserves the right to stop planting operations at any time.

The Contractor shall not plant when weather conditions are unfavorable for proper work or when the soil is in a frozen condition.

737.13 Soil Mixture. Soil mixtures for the various plantings shall consist of the following:

- a. *All Plants Except Ericaceous Material.* For each cubic yard (cubic meter) of baled peat moss, or approved equal, add from 43 to 54 yd³; (43 to 54 m³) of planting topsoil.
- b. *Ericaceous Plants.* For each cubic yard (cubic meter) of baled peat moss, or approved equal, add from 36 to 45 yd³; (36 to 45 m³) of planting topsoil. If peat humus is furnished in lieu of peat moss in the above mix, the mixture shall be based in the proportion of 1.8 yd³; (1.8 m³) of peat humus for each cubic yard (cubic meter) bale of peat moss specified for the above soil mix. Other approved equal materials shall be mixed according to manufacturer's printed recommendations which shall be submitted to the Engineer for written approval.

The above soil mixtures shall be mixed as specified in an area approved by the Engineer. No mix shall be prepared prior to notification of the Engineer at least 48 hours in advance of the mixing operation. Where ground covers or herbaceous perennials are specified, the soil mix may be mixed in place providing the existing topsoil conforms to the requirements of subsection 737.06.

The fertilizer as specified in accordance with Subsection 737.07 shall be placed according to the following requirements:

- a. *Balled and Burlapped, or Container Stock.* Position the plant in the hole, and backfill no higher than halfway up the root ball. Place the recommended number of tablets evenly around the perimeter of and immediately adjacent to the root ball. Complete the backfilling, tamping, and watering.
- b. *Small Ground Cover Plants and Herbaceous Perennials.* Position the plant in the hole, and backfill no higher than halfway up the root ball. Place the recommended number of tablets evenly around the perimeter of and immediately adjacent to the root ball. Complete the backfilling, tamping, and watering.
- c. *Trees.* Use one 20 g tablet for each 1/2" (13 mm) of tree trunk diameter based on size specified for planting.
- d. *Shrubs.* Use one 20 g tablet for each 12" (300 mm) of height or spread based on size specified for planting.
- e. *Ground Cover and Herbaceous Perennials.* Use one 20 g tablet for each plant.

No backfill shall be placed in any pit until the excavation has been inspected. Excess excavated material shall be removed from the Project site.

737.14 Digging and Handling. All precautions customary in good trade practice shall be taken in preparing plants for transplanting. Plants transplanted with workmanship that fails to meet the highest standards will be rejected. All balled and burlapped plants shall have firm, natural balls of earth of ample proportions and diameter not less than as specified in AAN's "USA Standards for Nursery Stock". Plants with cracked, broken, or crushed balls, which occur either before or during planting operations, will be rejected or shall be removed from the site immediately. All plants shall be handled so that roots are adequately protected and moist at all times. Material that cannot be planted immediately after delivery shall be adequately protected by covering with canvas, wet straw, burlap, moss, or other suitable material and kept covered until ready to be planted. Trees should not be planted with frozen earth balls. Containerized plant material shall be growing in the specified size container for at least six months and shall not display signs of being root bound or unnatural ratio of planting medium vs. root mass.

737.15 Location of Plants. Plants shall be located as indicated on the Plans, but may be shifted to avoid utilities subject to the approval of the Engineer. No excavation shall commence until locations are approved.

737.16 Planting. All trees and shrubs shall be planted in pits as detailed on the Standard Construction Details. Pits shall not be excavated with vertical sides. Pits shall be of such a depth that, when planted and settled, the crown of the plant shall bear the same relation to finished grade as it did to soil surface in its place of growth. With the approval of the Engineer, the Contractor may elect to plant wetland grown containerized shrubs on small mounds raised no more than 2" (50 mm) above the final grading elevation shown on the Plans.

Open plant pits shall not be allowed overnight in residential areas or in any location where it is determined by the Engineer to pose a potential hazard to pedestrians or traffic.

All backfill topsoil shall be covered with a waterproof material after mixing. Pits shall be backfilled with specified soil mix and compacted firmly under ball of roots to establish a firm foundation. Plants shall be set in the center of pits in a vertical position so that the crown of the plant is level with the finished grade after allowing for watering and settling of soil. The "Soil Mixture" shall be carefully and firmly worked and tamped under and around the base of the ball to fill all voids. When partially backfilled and compacted, the burlap and any wire baskets shall be removed from the sides and tops of the balls and cut away to prevent air pockets, but no burlap shall be pulled from under the balls. All burlap, wire baskets and other containers shall be removed from the jobsite at the end of the workday. The balance of the planting hole shall be filled with the planting mixture and a ring of earth shall be formed around the plant to produce a dish for watering. All plants shall be thoroughly watered immediately after planting as directed by the Engineer. This initial watering shall mean complete saturation of all backfill in the pits and beds during the same day of planting. Care shall be taken during all planting operations to ensure that no excavated material is dumped on any grassed area unless a suitable type of matting or protective underlay is used. The Contractor shall be responsible for all damage to any grassed, planted, or other landscaped area caused by its operations and shall repair any damage so caused in a manner satisfactory to the Engineer.

Ground cover and herbaceous perennial areas shall be prepared by rototilling to a minimum depth of 10" (250 mm). The mixing of peat moss, peat humus, or approved equal may be performed separately in order to obtain the proportion of ground cover or herbaceous perennial soil mixture as specified. Beyond the minimum excavation as stated above for soil mixing, the root system of the plant shall determine the actual depth for

individual plant excavation. Plants shall be backfilled with the soil mixture and compact firmly around roots. All areas shall have a smooth and uniform grade and a minimum of 2" (50 mm) of approved mulch.

- a. *Pruning.* All plants shall be pruned immediately after planting or transplanting to remove all injured or dead wood. All trees inspected and tagged at the nursery shall conform to AAN Standards, and any subsequent pruning by the Contractor shall in no way alter the natural habit or shape of the plant. All pruning shall be done with sharp tools by workers skilled in this operation. All cuts shall be made flush, leaving no stubs. On all cuts over 3/4" (19 mm) in diameter and bruises or scars on the bark, the injured cambium shall be traced back to living tissue and removed; wounds shall be smoothed and shaped so as to preserve the branch bark ridge.
- b. *Watering.* Plants shall be watered on the same day as planting unless otherwise approved by the Engineer. Quantity of water per plant shall be as detailed in Section 737.17.
- c. *Mulching.* Trees and shrubs shall be mulched with at least a 4" (100 mm) cover of mulch. Mulch shall be placed the same day of planting, unless otherwise approved by the Engineer.
- d. *Wire baskets, nylon binding and treated burlap* shall be cut away and removed from the top half of the root ball.
- e. *Staking and Guying.* Unless approved by the Engineer, all staking and guying specified shall be completed the same day as planting and mulching.
- f. *Cleaning Up.* Throughout the course of planting, excess and waste materials shall be immediately removed from the site, seeded areas kept clean, and all precautions taken to avoid damage to existing structures, trees, shrubs, plants, and grass. When planting in an area that has been otherwise completed, the area shall, upon completion of the planting, be immediately and thoroughly cleared of all debris, rubbish, subsoil, and all waste materials removed from the site. All ground surfaces shall be raked smooth. All sodded areas disturbed as a result of construction shall be repaired by the Contractor.

737.17 Plant Establishment. The plant establishment period for all planting shall begin immediately after all planting and replacements (as specified under Section 737.16, Planting) are complete and acceptable to the Engineer. The plant establishment period will consist of one full growing season during which time the Contractor shall be responsible for all work necessary to keep the plants in a live and healthy condition. A growing season is defined as the period from May 1 through September 30. If the Contractor completes all planting (as specified under Planting) by May 1, the inspection will be held on or about October 1 of that year. In the event the Contractor does not complete all planting by May 1, the inspection will be held on or about October 1 of the following year. All replacement plant material determined to be necessary at the inspection must then be approved at the replacement plant source by October 15. At this time, the Engineer will direct the Contractor to replace those plants determined to be dead or unhealthy by December 1. The Contractor will notify the Engineer in writing that all replacement planting has been accomplished. The Engineer will conduct an inspection within 15 days after such notification to determine the acceptability of the replacements. If all replacements are determined satisfactory by the Engineer, the Contractor will be relieved of all further responsibility for care and replacement.

All planting areas shall be kept free of weeds and grass during the life of the Contract. The Contractor may utilize a pre- or post-emergent herbicide to control such grass and broadleaf weeds incidental to the cost of planting and be totally responsible for the proper use and placement of any such herbicide. As requested in writing by the Engineer, the Contractor shall be responsible to weed within all plant beds and within the saucer limits of individual plants, beginning 10 calendar days after the date of notification. The Contractor shall prune and apply insecticides or fungicides as required, repair or replace stakes and guy wires, tighten guy cable or wire and repair plant saucer washouts when and as specified by the Engineer.

Any plants that settle below or rise above the desired finished grades shall be reset at the proper grades. If dead or unhealthy plants are discovered, they shall be removed within 10 calendar days and replaced with the next appropriate planting season. All replacements shall be plants of the same kind, size and quality as originally specified in the Contract and they shall be furnished, planted, mulched, guyed, watered, etc. as specified herein for new plant material. The Contractor shall warrant all plant material against defects including death and unsatisfactory growth, except for defects resulting from incidents beyond the Contractor's control, such as vehicular impacts or vandalism. Submission of appropriate police reports or other approved evidence verifying the cause of the damage shall be required to relieve the Contractor of responsibility for replacement. The cost of the above described work shall be incidental to Section 737, Planting.

Contractor shall be required to water all major and minor trees, shrubs and all herbaceous beds bi-weekly during the period from June 15 through October 1. Watering, once initiated, shall continue without interruption until all plants on the project have been watered. Payment shall be per 1,000 gals of water applied and shall be based on the following schedule: Major trees-15 gals per tree, minor trees-10 gals per tree, shrubs-5 gals per shrub, perennials-10 gals per 100 square feet of planting bed. Water used for this item shall meet the requirements of Section 803 of the Standard Specifications. Tree watering bags, if utilized, shall be filled as a part of the watering operation; payment shall be as detailed herein. Tree watering bags shall remain the property of the contractor and shall be removed prior to final inspection.

737.18 Method of Measurement. The quantity of planting will not be measured.

737.19 Maintenance Bond. Upon Substantial Completion of the Work, the Contractor shall furnish to the Department a Maintenance Bond on the form provided by the Department for item 737523 - Planting. The Maintenance Bond shall meet the following requirements:

A sum equal to 100% of the value of all Planting Items paid to the Contractor, as detailed in the Breakout Sheet; All signatures are original signatures, in ink, and not mechanical reproductions or facsimiles of any kind; The Contractor is the named principle; Section 737.17 – Plant Establishment Work items associated with this section requires completion after substantial completion of the Project. The term of the Maintenance Bond will be for a period of one full growing season, as defined in the section, beyond the completion of permanent planting Work; and, Written by a Surety or insurance company that is in good standing and currently licensed to write surety bonds in the State of Delaware by the Delaware Department of Insurance.

737.20 Basis of Payment.

The quantity of planting will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing and placing all materials, including plants, soil mixes, and mulch; for protecting plants after digging and prior to planting; for staking, excavating plant pits, pruning, and guying; for the cultural care of the plants until the completion and acceptance of all landscape work; for disposing of excess and waste materials; for replacement planting; for cleanup; for repairs to plant material, tree protection, wire, or staking; for repairs to damaged grassed, planted, or other landscaped area due to the Contractor's operations; for ensuring that topsoil meets the sieve analysis, acidity, and organic matter requirements; for applying sufficient materials to fertilizer that originally failed to meet the specified analysis; for using pre- or post-emergent herbicide to control grass and weeds; for the work outlined under Subsection 737.17; and for all labor, equipment, tools and incidentals required to complete the work. The quantity of watering will be paid for in accordance with the price bid for, "Watering," as detailed on the breakout sheet. Payment shall be by the M/Gal (1,000 gallons) of water applied at each watering operation.

The breakout sheet attached to the proposal shows all plant material and the anticipated amount of water proposed for this Contract. The Contractor shall fill in the per each unit price and the cost (unit price times the proposed quantity) for each item listed. The lump sum price bid for 737523 - Planting shall be the sum of the total cost for all species and sizes listed. The Department reserves the right to delete from the Contract the furnishing and installing of one or more of the species and/or sizes listed and the right to add or subtract from the quantity of each species and size listed. The lump sum to be paid will be adjusted in accordance with the Contractor's unit prices as required above. There will be no extra compensation to the Contractor if such additions and/or deletion are made. Watering item shall be paid separately for watering completed at the bid price indicated on the Breakout Sheet.

Payment for the planting as described above may be processed if, in the opinion of the Engineer all work required, except that specified under Subsection 737.17 is satisfactorily completed. No partial payment will be made for any living plant until and unless planted in accordance with these specifications. No additional payment will be made for using plants larger than specified. On contracts where assessment of time is in working days, the Contractor will be charged working days while engaged in actual planting and directly related work such as plant pit excavation, staking, wrapping, and mulching. The Contractor will not be charged time for indirectly related work such as watering, weed control, pruning, and other responsibilities as described under Subsection 737.17. The cost to remove and replace plants that settle below or rise above the desired finished grades, or that die or are unhealthy as described in Subsection 737.17 shall be the responsibility of the Contractor.

737525 - LIVE STEM STAKING

Description:

Live Stem Staking consists of furnishing all live stakes, labor, materials, equipment, transportation, storage and the proper installation of the materials by approved methods, as hereinafter specified, in the locations shown on the Plans or as directed by the Engineer.

Definitions:

The word "live stake" is used as a term to describe stem cuttings from saplings of willow and other plants that will root and establish following the installation of the live stakes.

Materials:

All parent plants shall be true to type and nomenclature and typical of their species or variety. They shall have a normal habit of growth with well-developed branch systems and vigorous root systems. They shall be sound, healthy and vigorous plants, free from visible defects, disfiguration, injury, recognizable disease of any kind, insect eggs, borers and any infestation.

All plants shall conform to all sizes and measurements detailed in these specifications or as indicated on the plans. Cuttings shall be a minimum of 0.5 inch (13 mm) in width and a maximum of 2 inches (50 mm) in width at the basal end. Length of the stakes is variable depending on whether rip-rap is utilized, as in a Joint Planting Application. Without rip-rap placement, the stakes shall be a minimum of 2 feet (0.6 m) in length and a maximum of 3 feet 6 inches (1 m). Longer stakes may be utilized for the installation and then trimmed once installed. If rip-rap is placed, the length of the cuttings shall be increased by the corresponding depth plus 4 inches (100 mm).

Live stakes shall have the side branches cleanly removed and the bark intact. The basal ends (root end) shall be cut at an angle, 30-45 degrees. The apical end (stem side) should be square cut, flat cut perpendicular to the stem length. Unless indicated on the Plans, cuttings shall be of wood that is 1-2 years in age.

All stock shall be tagged with the date of harvest. The Contractor shall furnish complete information as to the genetic origin of all plant stock, by county and state. The Contractor shall make every effort to obtain plant materials whose genetic origin is the Delmarva Peninsula. Stock sources are limited to Delaware, New Jersey, Maryland and Pennsylvania. The Contractor should be aware that more than one vendor may be required to obtain all the necessary plant materials.

For all plants, A Synonymized Checklist of the Vascular Flora of the United States, Canada and Greenland: Volume II - the Biota of North America (Kartesz and Kartesz, University of North Carolina Press, 1980, or later edition) shall be the authority for the plant names. No compensation shall be made for materials or the cost of installation for plant species that are not specified.

All shipping materials, equipment, planting tools, planting bags, water containers and tubs, tarps and incidentals necessary to complete the item shall be subject to approval by the Engineer. Sub-standard, defective or damaged tools and items, as solely determined by the Engineer, shall not be used and shall be removed from the site by the close of the working day.

Immediately following harvesting, the live stakes shall be packed in wet sphagnum moss, wrapped in wet burlap or 3-ply craft paper and tied closed at both ends of the wrap. Alternatively, the live stakes shall be packed in sealed 3-ply kraft-polyethylene bags, or sealed polyethylene bags inside wax-impregnated cardboard boxes. With prior written approval of the Engineer, other shipping materials may be authorized or the materials may be placed in buckets of water with no more than twenty percent of the cutting exposed to the air.

The live stakes shall be packed and marked in shipping containers in such a way as to allow quick and easy identification of the materials. Each container shall be clearly labeled with source of the stock, species, quantity, harvest date, and packing date.

Unacceptable live stakes shall be culled at the source before being packed or transported. No substitutions for any materials shall be made unless agreed to in writing by the Department. With the approval of the Department, plants larger in size than specified may be utilized, but such plants shall not increase the Contract price.

Water required for the plant stock and to maintain the proper moisture levels in the planting bags or storage tub shall be freshwater free from toxic substances and chemicals injurious to vegetation. Salt or brackish water shall not be used. All water sources are subject to approval by the Department.

Sphagnum peat moss shall be at a minimum 90% organic material with a minimum of 75% of the organic content being derived from the genus *Sphagnum*.

Burlap shall be jute burlap with a dry weight of approximately eight (8) ounces per square yard (0.27 kg per square meter). New jute burlap shall be soaked in water for a minimum of 24 hours prior to wrapping the stock.

Construction Methods:

Harvest and installation of the live stakes shall be between the period of Nov 15 and February 15, or as shown on the Plans. Live stakes shall not be installed in frozen soils. Following harvest, all materials shall be installed within 48 hours, preference is for installation on the day of harvest. During this time, the stock shall be kept cool, moist, in a shaded place and outside of any heated facilities or the wind.

Unless indicated on the Plans, live stakes shall be installed at a density of 1 stake per 6.25 square feet of treatment area (0.6 square meters), a stake placement on approximate 2.5 foot centers (0.75 meters). A triangle spacing pattern, providing offset centers and staggered spacing, shall be used in the installation of the live stakes.

The live stake shall be tamped into the ground at right angles to the slope, bud end (up). If no rip-rap is placed, four-fifths of the length of the live stake shall be installed into the ground and soil firmly packed after installation. An iron or metal bar can be used to make a pilot hole in the soil and puncture any underlying blanket. Drive the stake into the ground with a dead blow hammer (hammer head sand or shot filled). Where no rip-rap is utilized 20-inches (0.5 meters) of the stake shall be driven into the soil or 80% percent of the length of the stake, whichever is longer. Under a Joint Planting Application, a minimum of 24-inches (0.6 meters) of the stake shall be driven into the soil. When driving the stakes, utilize a block of wood to cover the square cut end. Trim any damage section of the stake off. Immediately following insertion of the stake, the ground shall be tamped around the stake. Do not split stakes during installation, any split stakes shall be removed and replaced without compensation to the Contractor. At least 2 buds should remain exposed above the soil or rip-rap line and the exposed stake should be no more than 6-inches (150 mm) in length above the rip-rap or soil line, trim excess material if required. Because trimming may be required, the Contractor is encouraged to utilize longer stakes than specified and then trim the stakes once installed.

Acceptance shall also be based on obtaining the appropriate density and pattern of live stem staking placement. If the pattern and required densities are not achieved, the Engineer may elect not to accept any segment of installation. Stakes found loose in the soil will not root and shall be rejected by the Engineer.

There is no plant establishment period for Live Stem Staking.

Method of Measurement:

The quantity of live stem staking will be measured as the number of each live stem stake installed and accepted.

Basis of Payment:

The quantity of live stem staking will be paid for at the Contract unit price per each for the various items of the planting schedule. Price and payment will constitute full compensation for furnishing all plants, cold storage space, labor, materials, tools, equipment, tree shelters, water and incidentals necessary to complete the item.

9/12/01

753516 - SANITARY SEWER SYSTEM

Description:

This work consists of furnishing all materials including pipes with all required fittings with bends Wyes, clean-outs, etc., and installing sanitary sewer in accordance with these Special Provisions, Delaware Standard Specifications, and requirements of the Standard Specifications of the Utility Owner (New Castle County). In case of any conflict between the notes and details on the Plans; Special Provisions; Standards and Specifications of the Utility Owner; the Standards and Specifications of the Utility Owner shall prevail. The Contractor shall obtain the Standards and Specifications of the Utility Owner and study for materials cost before submitting the bids. The Utility Owner of the sanitary sewer is New Castle County.

General Requirements:

All work shall be subject to inspection and subsequent approval/disapproval of the Engineer and the representative of the Utility Owner; and the Contractor shall be required to correct the discrepancies at his/her expense.

Included in this work are the connections of all proposed sanitary sewer services to the existing Town sanitary sewer system and the de-commission of the existing septic system. All modifications to such services, as required by the present Standards and Specifications of the Utility Owner and all relocations of such services necessary to avoid conflicts with utilities and highway drainage facilities are included in the work. Since the exact locations of the conflicts cannot be determined prior to trench excavation operations, the Contractor must coordinate and schedule any required relocation efforts of each sanitary sewer connection on an individual basis with the Utility Owner and the property owner.

It is of prime importance that the Contractor, in the performance of his/her work, does not disrupt the operation of the existing sanitary sewer facilities in any manner or at any time, without the expressed prior approval of the Utility Owner. The Contractor shall construct, maintain and remove, following construction, such temporary bypasses as may be required during construction to maintain sanitary sewer facilities in service.

Any and all emergency repairs required during the period of this Contract shall be the responsibility of the Contractor. In the event the Utility Owner is unable to contact the Contractor for the immediate emergency repair items of work, or in the event the Contractor does not take action when contacted within a reasonable length of time, the Utility Owner reserves the right to attend to any and all emergency repair work items and to resubmit the costs directly to the Contractor for complete payment.

The installation requirements for the sanitary sewer system shall be a combination of Jack and Bore and open-cut.

Materials:

The requirements for the materials as applicable to the Contract are as noted below, unless otherwise stated on the Plans and/or required by the Utility Owner of the sewer system. The Contractor shall verify the compatibility of these materials specifications with the Utility Owner before placing order for the Contract.

1. The minimum service lateral size is 8 inches.
2. Where gravity flow sanitary sewers cross above or less than 18 inches below waterlines, or approximately parallel water lines within ten feet horizontally, the main shall be encased with 6 inches of 3,500 psi concrete.
3. Sanitary laterals shall be placed on a minimum bed 4 inches of Delaware #57 stone to approximately 4 inches over the pipe.

Open-Cut Materials

The Polyvinyl Chloride Pipe (PVC pipe) suitable for non-pressure drainage of sewage and fittings shall conform to the applicable requirements of ASTM D3033 Type PSP, and/or ASTM D3034 Type PSM, and pipe shall be of SDR-35 or SDR-41 or SDR-42 of the nominal size required by the Plans and as

manufactured by Johns-Manville, Certainteed O-ring, or as required/approved by the Utility Owner. All the pipe and fittings shall be free from defects and the defective materials as determined by the Engineer or the Owner shall be rejected and replaced.

Warning tape for sanitary sewer shall be printed polyethylene plastic tape with a metallic core, manufactured specifically for warning and identification of buried utility lines. The tape shall be of a roll type, 2" (50 mm) minimum width, and color coded for sewer (green), with warning and identification imprinted in bold black letters continuously and repeatedly over entire length of tape. The code and letter color shall be permanent and unaffected by moisture and other substances contained in trench backfill materials. Imprinted on the tape shall be "Caution, Buried Sewer Line Below", or a similar message as approved by the Engineer.

Concrete for the thrust blocks shall meet the requirements of Section 812, Class B of Standard Specifications. Thrust blocks and clean-outs shall be constructed in accordance with the Standard Detail Drawings of the Owner or as directed. Borrow Type C and sand for backfilling when required by the Contract and specified on the Plans shall conform to the respective requirements of Sections 210 and 804 of the Standard Specifications. Concrete required for the work shall be Class B, and shall conform to the requirements of Section 812.

Unless shown otherwise on the Plans or required by the owner, all commercial, industrial, and residential connections shall be constructed of the same class of material as the sewer mains to which they are connected. Minimum grade and size of the lateral pipes shall be as required by the Owner's Standards and Specifications.

Special Requirements:

The Contractor's attention is directed to the following special requirements:

- A. Service Connection
 - 1. Connections to the existing service pipe shall be made using flexible couplings. All flexible couplings shall conform to ASTM C425. Joint deflection limits and lateral connections shall meet the maximums indicated in ASTM C12 and C425.
 - 2. The slope of the existing lateral toward the newly installed sewer main shall be maintained at the existing percent. For reconstructed laterals, a minimum slope of two percent (2%) or as specified by the Utility Owner is required.
 - 3. Connection of new service to the existing manhole shall be made by coring through the existing Utility Owner's manhole and installing proper drop connection as detailed in the plan set.
- B. Restoration
 - 1. Restoration of Manholes
 - a. The Contractor shall restore all manholes and associated surface areas to their original condition or as required by the Utility Owner and specified in the description of work.
 - b. Restoration of the Manhole shall be done as follows:
 - i. For restorations less than or equal to three inches grout shall be used. The grout design mix shall meet or exceed 500 psi (3,447 kPa) compressive strength at 28 days.
 - ii. The Contractor may, with the approval of the Utility Owner, incorporate grout additives to improve flow properties, provided that the minimum compressive strength requirements are met.
 - iii. For restorations greater than three inches concrete shall be used. Concrete shall be as specified in the Contract Documents.
 - 2. Restoration of Pits
 - a. The Contractor shall restore all lateral, launching and receiving pits and associated surface areas to their original condition or as required by the Utility Owner and specified in the description of work.
 - b. Prior to backfilling lateral and launching and receiving pits the Contractor shall ensure that the new pipe is properly supported and on the required grade. Stone or other suitable material, approved by the Utility Owner, shall be used immediately under the new pipe as support in order to avoid sagging after backfill and compaction.

Construction Methods:

All pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the completed work is accepted.

The excavation and backfill for the pipe shall be performed in accordance with the applicable requirements including backfill requirements of Section 612 of the Delaware Standard Specifications, unless otherwise modified on the Plans, or in conflict with the requirements of the Utility Owner. If there is a conflict between the Delaware Standard Specifications (including these Special Provisions) and the Specifications of the Utility Owner, the latter will prevail. The Contractor is advised to obtain and be fully acquainted with the applicable specifications of the Utility Owner. The pipe shall be installed at the locations and to the lines, grades, and dimensions shown on the Plans or as directed by the Engineer.

During backfill of the sewer the Contractor shall install the specified warning tape at a depth of 8" (200 mm) to 12" (300 mm) below finished grade or as directed and approved by the Engineer/Owner.

No pipe shall be laid upon a foundation into which frost has penetrated nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation, unless the minimum length of open trench and promptness of refilling are observed.

Sheeting and bracing required for trenches shall be removed to the elevation of the conduit, but no sheeting will be allowed to be pulled, removed, or disturbed below the conduit. Sheeting and bracing shall meet OSHA requirements.

Before lowering into the trench, the pipe shall be inspected for defects. All cracked, chipped, or broken pipe shall be discarded. The ends and interior of the pipe shall be clean. Belled ends shall be laid upgrade. Handling of the pipe shall be accomplished in a manner that will not damage the pipe. The joint shall be made in the manner recommended by the manufacturer. Care shall be taken not to buckle or disturb previously laid pipe.

Pipe shall be laid accurately to the staked line and grade. All service connections shall be installed as indicated on the Drawings to the curb. Where existing service sewers are to be connected, suitable fittings and adapters shall be provided by the Contractor.

Pipe shall be cleaned of all foreign matter, and water shall be kept out of trenches until joints have been completed. When work is not in progress, open ends of pipe and fittings shall be securely closed to keep foreign matter and animals from entering.

Each joint shall be inspected to ensure that it is properly made before backfilling is done. Care shall be taken to prevent any dirt or foreign matter from entering the open end of the pipe. Where it is necessary to cut pipe, such cuts shall be neatly made in an approved manner. The laid pipe shall be true to line and grade and, when completed, the sewer shall have a smooth and uniform invert. No section of gravity sewer, including service connections shall have an adverse grade which would pond water in the invert of the sewer.

Connections to pipe stubs of a different pipe material shall be made with MEGA-LUG series 1100 or approved equal. Connectors must be approved by the Engineer prior to installation.

Connections to pipe stubs of a different pipe material, if made beyond the back of sidewalk or other concrete or paved surface, shall be made with a suitable connector. Connectors must be approved by the Engineer prior to installation. Connection of all piping, other than bell and spigot connections, within the roadway, street and sidewalk areas, shall be made per MEGA-LUG series 1100 or approved equal.

Connections to existing sewer mains, service connections, and manholes shall be made in such a manner so as to not damage the existing facility. Such connections shall be made so that no projections or rough surfaces occur within the pipe.

Locations of the sewer laterals are approximate and may be changed by the ENGINEER. Relocating of the sewer lateral will not add extra cost to the Utility Owner or State, unless either of the following conditions result:

1. The relocation results in an increase in the length of the lateral; or,
2. A change in construction methods is required from the change.

If the Contractor believes that the Work at the new location(s) will result in a substantive change, the Contractor shall notify the Engineer prior to beginning the changed Work. The Engineer will evaluate the request and if the relocation is warranted, the change in Work shall be authorized.

Where gravity flow sanitary sewers cross above or less than 18 inches below waterlines, or approximately parallel water lines within ten feet horizontally, the sewer pipe shall meet the requirements of ductile iron pipe or HDPE or PVC pressure pipe.

Contractor shall decommission the existing on-site septic system in accordance with the Utility Owners and State specifications. Decommission of the septic system is incidental to the cost of installing the new sanitary sewer system.

EMERGENCY REPAIRS TO DAMAGED UTILITIES

- A. Known or Field Located Utilities - In the event that the Contractor or his Subcontractor during the execution of the work breaks any known or field located pressure or gravity main causing the disruption of service and/or an eminent hazard, it shall be the responsibility of the Contractor/Subcontractor to immediately notify the Utility Owner at the designated emergency telephone number and immediately undertake measure to repair the damaged utility. To that effect the Contractor/Subcontractor shall ascertain prior to initiating the work that the necessary repair parts, tools, equipment, and labor are on ready and available onsite to complete the repair work without delays. The Utility Owner personnel and Engineer shall witness the repair work.
- B. If the Contractor/Subcontractor estimates or determines that he is not going to be able to restore service within a less than two-hour period, the Contractor shall immediately contact the Utility Owner's manager to initiate repair.
- C. The Utility Owner will undertake the repair work and will back charge the Contractor. The Utility Owner will submit an itemized bill within 30 calendar days from the occurrence of the event.
- D. Unknown or Inaccurately Located Utilities - If the utility was not field located or it was inaccurately located in accordance with the prescribed procedures under the Miss Utility One-Call guidelines and the Contractor/Subcontractor cause a line break during the execution of the work, the same notification procedure as above must be followed. The Utility PCU Operations will undertake the repair work at no cost to the Contractor.

FIELD TESTING

- A. The Contractor and Utility Owner shall after the existing system is completely replaced perform inspection of the pipe exterior at launch, receiving pits as well as service connections after line is pressurized. The newly installed pipe shall be visibly free of defects, which may affect the integrity or strength of the pipe. If in the opinion of the Utility Owner such defects exist, the pipe shall be repaired or replaced at the Contractor's expense.
- B. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness shall not be used and must be removed from the site.

Acceptance Testing:

Prior to the request for inspection by the Engineer, it shall be the Contractor's responsibility to examine all completed pipe lines to insure that they are laid to the proper alignment and grade and free from foreign material. After this has been done to the satisfaction of the Engineer, he/she will order tests to be made on all portions of the sewers built under the Contract.

The Contractor shall cooperate and furnish all assistance necessary to perform the tests as specified herein and as further required and directed by the Engineer and the representative of the Owner.

- A. Pressure Testing
Sanitary sewer mains shall be air tested after all laterals, have been installed. The Contractor shall furnish all labor, materials, tools and equipment necessary to perform all tests as directed by, or under the direction of the Engineer/Utility Owner. The Contractor shall repair or replace all sections of sanitary sewer failing to meet testing requirements. The sanitary sewer shall be air tested holding 5 psi for 15 minutes with no allowable leakage. Sanitary force mains shall be air tested holding 50 psi for 5 minutes with no allowable leakage, or may be determined by Engineer.

B. CCTV Inspections

1. The Contractor shall perform post installation internal television inspections of the installed sanitary main. Each reach of sewer shall have audio description with appropriate stationing of services indicated. The data and stationing are to be on the video. All such inspections shall be performed by personnel trained in locating breaks, obstacles and service connections by closed circuit color television.
2. Post construction video tapes are to be submitted to the Engineer and Utility Owner for review prior to final payment. Should any portion of the inspection tapes be of inadequate quality or coverage, as determined by the Utility Owner, the Contractor will have that portion video-taped at no additional expense to the State or Utility Owner. All original video tapes remain property of the Utility Owner. The Contractor may, at the discretion of the Utility Owner retain second copy.

The Contractor shall not make connections to existing sanitary sewers until after the final inspection and tests have been approved. All material and labor required for tests shall be furnished by the Contractor and the cost thereof included in the prices bid for installing sanitary pipe. Water for leakage test shall be furnished by the Contractor.

Basis of Payment:

Price and payment for the Sanitary Sewer System shall be included as part of the lump sum bid price for Item 753516 which shall constitute full compensation for furnishing and installing sanitary sewer pipes; bends, wyes, clean-outs, warning tape including valves and related fittings including concrete thrust blocks in the sewer line excavation and connection to the existing manhole, backfill and the decommission of the existing septic system are incidental to the cost of the items.

A breakout sheet attached to the Proposal lists the different elements of work or materials involved in completing this item. The Contractor shall fill in a unit price to install each item and the cost (unit price times the proposed quantity). The Lump Sum cost for Item 753516, shall be derived from the total sum of the cost of all items listed.

The Owner reserves the right to delete from the Contract one or more items listed and the right to add or subtract from the quantity of each item. The total price to be paid will be adjusted in accordance with the Contractor's unit prices as required above. There will be no extra compensation or increase in unit prices in the breakout sheet if such additions and/or deletions are made to the quantities.

7/1/15

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.

3/27/15

763645 – DE-MOBILIZATION AND RE-MOBILIZATION

Description:

This work consists of all operations necessary for the disassembling, reassembling and resetting up of the Project, including the movement of personnel and equipment from and back to the Project site (as necessary), maintaining the Contractor's offices, shops, plants, storage areas, and sanitary facilities, as well as the maintenance of traffic scheme implemented at the time of de-mobilization. This work may also include other work and operations which must be performed prior to resuming work on compensable items of work at the Project site. This item of work also includes maintaining the required bonds and insurance, and all other items required to resume work at the Project site.

This item will be used only in the event the Contractor is issued a written temporary suspension of work from the Engineer. This temporary suspension of work is specifically related to preventing the work that would begin in subsequent phases after Phase 2. Subject to the Engineer's approval, the Contractor may work on Contract items that can be completed under the Phase 2 maintenance of traffic scheme during this temporary suspension of work if such work does not conflict with the safe operation of the traffic controls in place for the phase, or with work begin completed by the Bridge Contractor at the time. No modification to the Phase 2 maintenance of traffic scheme will be allowed. Reference the **Notice to Contractors** section in this Bid Proposal for more information.

This temporary suspension of work will be limited to 60 days.

Materials:

Such materials as are required to disassemble, reassemble and reset up the Project that are not to be a part of the completed work required by the Contract documents shall be the responsibility of the Contractor. The determination of the adequacy of the Contractor's facilities shall be made by the Contractor, subject to local or State laws and regulations.

Construction Methods:

All work done in disassembling, reassembling and resetting up of the site shall be completed in a safe and workmanlike manner. The Contractor shall maintain the maintenance of traffic scheme for Phase 2 as shown on the Plans for the duration of the temporary suspension of work.

Method of Measurement:

The item De-Mobilization and Re-Mobilization will not be measured for payment.

Basis of Payment:

The item De-Mobilization and Re-Mobilization will be paid for at the Contract Lump Sum price. Price and payment will constitute full compensation for all labor, materials, equipment, tools, and incidentals required to complete the work as specified. Payment of the Contract lump sum price for De-Mobilization and Re-Mobilization will not be made more than once and will be pro-rated for the duration of the temporary suspension of work, based on a maximum 60 day period, as stated above. The cost to maintain the required insurance and bonds, and any other expenses incurred to de-mobilize and re-mobilize from the site will be included in this item. Cost to maintain the maintenance of traffic scheme implemented during the time covered by the De-Mobilization and Re-Mobilization period will be incidental to this item, except for compensable Contract items to be paid for per a time basis. These items will be measured and paid for as specified in the Special Provisions.

07/26/10

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 4 mm (No. 8 gauge) steel wire, bent U-shaped or square top with a throat width of 25 mm to 50 mm (1 inch to 2 inches), with an effective minimum driving depth of 200 mm (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.

1/31/2015

908510 - STREAM RESTORATION SEEDING

Description:

This work shall include furnishing, seeding, and establishment of Riparian Buffer Seed Mix, Wet Meadow Seed Mix, Native Site Restoration Seed Mix, and a cover crop of temporary stabilization seed.

Materials:

a. Riparian Buffer Seed Mix

Common Name (<i>Latin Name</i>)	OVERALL MIX SEED RATE	Min. 30 LBS/AC PLS
	LBS/AC PLS	% OF MIX
Ticklegrass (rough bentgrass) (<i>Agrostis scabra</i>)	0.6	2.0%
Fox sedge (<i>Carex vulpinoidea</i>)	3.6	12.0%
Deer-tongue grass (<i>Dichanthelium clandestinum</i>)	9.6	32.0%
Riverbank wild rye (<i>Elymus riparius</i>)	4.5	15.0%
Virginia wild rye (<i>Elymus virginicus</i>)	7.5	25.0%
Soft rush (<i>Juncus effuses</i>)	0.9	3.0%
Path rush (<i>Juncus tenuis</i>)	0.3	1.0%
Switchgrass, 'carthage' (<i>Panicum virgatum</i> , "carthage")	1.5	5.0%
Green bulrush (<i>Scirpus atrovirens</i>)	1.5	5.0%

b. Wet Meadow Seed Mix

Species Name Common/ (<i>Latin</i>)	OVERALL MIX SEED RATE:	20 LBS/AC
	LBS/AC PLS	% OF MIX
Big bluestem, 'niagara' (<i>Andropogon gerardii</i> , 'niagara')	3.8	19.0%
Swamp milkweed (<i>Asclepias incarnata</i>)	0.4	2.0%
Lurid sedge (<i>Carex lurida</i>)	2.4	12.0%
Fox sedge (<i>Carex vulpinoidea</i>)	2.0	10.0%
Showy tick-trefoil (<i>Desmodium canadense</i>)	0.4	2.0%
Deer-tongue grass (<i>Dichanthelium clandestinum</i>)	1.0	5.0%
Virginia wild rye (<i>Elymus virginicus</i>)	4.0	20.0%
Joe-pye-weed (<i>Eupatorium fistulosum</i>)	0.3	1.5%
boneset (<i>Eupatorium perfoliatum</i>)	0.4	2.0%
Ox-eye sunflower (<i>Heliopsis helianthoides</i>)	0.4	2.0%
Soft rush (<i>Juncus effusus</i>)	0.6	3.0%
Great blue lobelia (<i>Lobelia siphilitica</i>)	0.1	0.5%
Wild bergamot (<i>Monarda fistulosa</i>)	0.3	1.5%
switchgrass, 'carthage' (<i>Panicum virgatum</i> , "carthage")	3.0	15.0%
Narrow-leaf blue-eyed grass (<i>Sisyrinchium angustifolium</i>)	0.1	0.5%
Blue vervain (<i>Verbena hastata</i>)	0.8	4.0%

c. Native Site Restoration Seed Mix

Species Name Common/ (<i>Latin</i>)	OVERALL MIX SEED RATE:	45 LBS/AC
	LBS/AC PLS	% OF MIX
Autumn bentgrass (<i>Agrostis perennans</i>)	9.0	20.0%
Big bluestem (<i>Andropogon gerardii</i>)	9.0	20.0%
Bushy bluestem (<i>Andropogon glomeratus</i>)	4.5	10.0%
Bottlebrush grass (<i>Elymus hystrix</i>)	2.25	5.0%
Creeping red fescue (<i>Festuca rubra ssp. Rubra</i>)	11.25	25.0%
Little bluestem (<i>Schizachyrium scoparium</i>)	6.75	15.0%
Purpletop (<i>Tridens flavus</i>)	2.25	5.0%

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, Wet Meadow Seed Mix, and Native Site Restoration 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 – 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, Wet Meadow and Native Site Restoration 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, Wet Meadow Seed Mix, and Native Site Restoration 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	

	Minimum Percent	Maximum Percent
Passing No. 10 (2.0 mm and retained on No. 200 (75 mm) sieve)		
Sand	15	65
Passing No. 200 (75 mm) sieve		
Sand	10	60
Silt	5	40

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. The seeded soil shall be stabilized using Coir Matting and straw mulch; Coir Matting and Coir Blanket; or straw mulch 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.

Straw mulch shall be applied at a rate of 4000 lb/ac. Small grain straw shall be uniformly and evenly applied immediately after seeding has been completed. Hand placement of straw or the used of an approved mechanical blower shall be used to apply the straw. Straw mulch applied by blowers shall provide a loose depth of not less than ½ nor more than 2". Ninety-five percent of the blown and shredded straw mulch shall be 6" or more in length when in place. Placed straw shall not be crimped, tracked or disked into the soil in areas to be overlain by coir mat. Straw shall be crimped in all areas not overlain by matting. Straw mulch placement shall be placed at the locations as noted in the plans or as directed by the Engineer. 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 will be paid for at the Contract unit price per square yard. Price and payment will 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 2-inch depth topsoil shall be measured and paid for under Item 908002. Coir Mat, Coir Blanket, and straw mulch shall be measured and paid for under Items 908504, 908511, and 735541.

3/2/15

908511 - COIR BLANKET

Description:

This work item shall include installation of Coir Blanket along the edge of the re-constructed stream banks in conjunction with Coir Fiber Matting, 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 Matting in the final condition. For temporary anchoring of the Coir Blanket, if necessary, wire staples shall be utilized. Staples shall consist of 4 mm (No. 8 gauge) steel wire, bent U-shaped or square top with a throat width of 25 mm to 50 mm (1 inch to 2 inches), with an effective minimum driving depth of 200 mm (8 inches).

Certification:

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

Construction Methods:

The Coir Blanket shall be placed in a single row running parallel to the centerline of the channel. The blanket will cross-sectionally extend from the 1-foot key-in below the stream bank soil and wrap around the face of the soils extending to 4 to 5-feet beyond the top of stream bank. 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 Matting below the Coir Blanket at the key-in point.

After initial placement of the Coir Blanket and Mat, place Heavy Backfill then shape and compact to form the streambank areas, place 2-inches of furnished topsoil and perform final grading. Upon completion, the bank surface shall be a smooth soil surface free from stones, clods, or debris. The streambank surface shall be prepared and seeding in accordance with Item 908510. The blanket and matting shall then be wrapped along the face of the final stream bank, placed immediately after seeding operations have been completed. The blanket and matting shall be laid smoothly and securely upon the seeded bed. 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 finished surface shall result in the Coir Blanket in contact with the soil surface and the Coir Matting overlaying the blanket.

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. In areas where streambank backfill is not specified, the Blanket shall be secured along the bottom of the slope by trenching 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.

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 will be measured in linear feet of stream bank covered with an 8-foot wide roll. 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.

Basis of Payment:

The quantity of Coir Blanket will be paid for at the Contract unit price per linear foot. 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 Matting, Topsoil, Heavy Backfill, and Seeding shall be measured and paid for as Items 908504, 908002, 712555, and 908510.

3/2/15

UTILITY STATEMENT
STATE CONTRACT # T201380204
P3E# N/A
F.A.P # N/A
LEATHERMANS RUN RESTORATION AT CHRISTIANA HIGH SCHOOL
NEW CASTLE COUNTY

The following utility companies maintain facilities within the contract limits:

Delmarva Power & Light, Distribution
Delmarva Power & Light, Transmission
Delmarva Power & Light, Gas
New Castle County – Sewer
Verizon Delaware, LLC
Windstream Communications
Comcast

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

- **New Castle County – Sewer:** The aforementioned utility maintains underground facilities within the area of proposed work. The sanitary sewerline is planned for rehabilitation at the same time as the stream work as shown in the construction plan set and in accordance with the County's specifications and details. Stationing and type of work perform are listed below:

Station	Offset	Type of Work	Calendar Days
10+00 .00	29.00 RT	Sewerline Replacement	8 days
10+06.92	22.56 RT	Concrete Encasement	Concurrent
10+82.90	8.12 LT	Sewerline Replacement	6 days
12+41.45	62.15 LT	Manhole Replacement	Concurrent
12+60.59	17.52 RT	Manhole Replacement and Concrete Encasement	Concurrent
12+52.18	17.58 LT	Concrete Encasement	Concurrent

Any other adjustments and/or relocations of County's owned sewer facilities shall be performed by the State's contractor in accordance with the respective agencies' standard specifications as directed by the District Engineer after a minimum of seven (7) calendar days advanced notice from the State contractor.

- **Delmarva Power & Light, Distribution:** The aforementioned utility maintains overhead facilities along I-95 within the project limits with no apparent conflicts.

The aforementioned utility maintains overhead facilities along Chapman Road within the project limits. The overhead lines are situated +/- 30-feet above the construction entrances and should not provide a conflict 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.

- **Delmarva Power & Light, Transmission:** The aforementioned utility maintains overhead facilities along I-95 within the project limits with no apparent conflicts.

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.

- **Delmarva Power & Light, Gas:** The aforementioned utility maintains underground facilities along Chapman Road right-of-way within the project limits. An 8-inch gas line crosses the proposed construction entrance (SCE) located 30-feet to the east of the Chapman Road culverts. The depth of the gas line is unknown. The Contractor shall dig utility test holes and locate the gas line prior to excavation for establishment of the SCE. Once located, the gas line shall be protected and the SCE placement adjusted as directed by the Engineer.

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, LLC:** The aforementioned utility maintains overhead facilities along Chapman Road within the project limits. The overhead lines are situated +/- 20-feet above the construction entrances and should not provide a conflict 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.

- **Windstream Communications:** The aforementioned utility maintains overhead fiber optic facilities along Chapman Road and along I-95 within the project limits. The overhead lines are situated +/- 20-feet above the construction entrances and should not provide a conflict 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:** The aforementioned utility maintains overhead facilities along Chapman Road within the project limits. The overhead lines are situated +/- 20-feet above the construction entrances and should not provide a conflict 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 2001. The Contractor shall contact Miss Utility (1-800-282-8555) two working days prior to any excavation. The Contractor is responsible for the support and protection of all utilities when excavating. The Contractor is responsible for ensuring proper clearances, including safety clearances, from overhead utilities for construction equipment. The Contractor is advised to check the site for access purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. 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.

Angel Collazo	DPL Distribution	302-454-4370
Matthew Parkhurst	DPL Transmission	302-454-4475
Eric Laramore	NCC Special Services	302-395-5741

George Zang
Steven Mosher
Ted Waugh
Dustin Velcuff

Verizon
Comcast
DPL Gas
Windstream Comm

302-422-1238
302-420-0400
302-429-3706
501-748-4434

5. As outlined in Chapter 3 of the DeIDOT 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

5-13-15
Date

APPROVED AS TO FORM BY:


Utilities Section, DeIDOT

6/1/15
Date

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201380204

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

LEATHERMAN'S RUN STREAM RESTORATION AT CHRISTIANA HS

NEW CASTLE COUNTY

Certificate of Right-of-Way Status – 100%

Status - 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 necessary real property interests have been acquired in accordance with current FHWA/State directives covering the acquisition of real property; and,

All necessary rights-of-way, including control of access rights when pertinent, have been acquired including legal and physical possession; and,

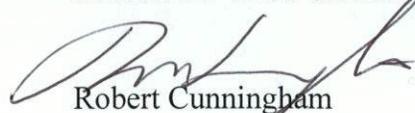
All project rights of way are currently available in accordance with the project right-of-way plans; and,

Any residential displaced individuals or families have been relocated to decent, safe and sanitary housing, or adequate replacement housing has been made available in accordance with the provisions of the current Federal Highway Administration (FHWA) directive(s) covering the administration of the Highway Relocation Assistance Program; and,

All occupants have vacated the lands and improvements; and,

The State has physical possession and the right to remove, salvage, or demolish any improvements acquired as part of this project, and enter on all land.

RIGHT OF WAY SECTION


Robert Cunningham
Chief of Right of Way

May 5, 2015



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

JENNIFER COHAN
SECRETARY

April 15, 2015

ENVIRONMENTAL REQUIREMENTS

FOR

State Contract No. T201380204

Federal Aid No.: N/A

Contract Title: Leathermans Run Restoration at Christiana High School

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. The following special provisions have been developed to mitigate and/or minimize impacts.

PERMIT REQUIREMENTS:

The construction work that will occur to replace Bridge 1-032, New Castle County, Delaware 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. The permit coordination for this project is complete. Written authorization from the permitting agencies is not required and paperwork for on-site posting is not anticipated. As such, the construction work that will occur as part of the Leatherman Run Restoration at Christiana High School project is authorized under the permits/exemptions listed below:

REQUIRED PERMITS AND APPROVAL STATUS:

- U.S. Army Corps of Engineers (COE) - Nationwide Permit (NWP) #27 - CENAP-OP-R-2014-01021-64 (NWP 27), *issued 3/30/15, expires 3/18/17*

- Delaware Department of Natural Resources and Environmental Control (DNREC) – Delaware Code Chapter 72, Section 7217, Special Exemption (b), as amended by Senate Bill 186. – fyi email sent 3/26/14 - **concurrence received 3/28/14**
- New Castle County Floodplain - Floodplain Approval #20150057 – *Issued 2/9/15 expires (180 days) 8/8/15 – EXTENSION PENDING*

SPECIFIC REQUIREMENTS:

Compliance with all requirements of the permits is the responsibility of the contractor, who will follow all special conditions or requirements as stated within those permits. The contractor will be subject to penalties, fines, and the risk of shut down as mandated by laws governing permitting agencies if such conditions and requirements are violated or ignored. Therefore, all special conditions, general requirements, and/or other required provisions specified within the permits must be followed. Those obligations are indicated or listed within the permit package, which can be obtained from the DelDOT Contract Administration Office.

Additional requirements by DelDOT not specified within the permits, but listed below, are also the responsibility of the contractor. Noncompliance with these requirements may result in shut down of the project at the contractor's expense.

1. The contractor shall employ measures during construction to prevent spills of fuels or lubricants. If a spill should occur, efforts shall be undertaken to prevent its entry into wetlands, aquatic, or drainage areas. Any spills entering wetlands, aquatic, or drainage areas shall be removed immediately. The Division of Water Resources (DNREC), Wetlands & Aquatic Protection Branch, 302-739-4691, shall be notified of any spill(s) within six (6) hours of their occurrence. That office will determine the effectiveness of spill and contamination removal and specify remediation efforts as necessary.
2. All construction debris, excavated material, brush, rocks, and refuse incidental to the work shall be placed either on shore above the influence of flood waters or on some suitable disposal site approved by the department.
3. The disposal of trees, brush, and other debris in any stream corridor, wetland surface water or any drainage ditch is prohibited.
4. There shall be no stockpiling of construction materials or temporary fills in wetlands or subaqueous lands unless otherwise specified on project plans and approved by permitting agencies that govern them. It is the contractor's responsibility to coordinate and secure those additional permits/amendments in deviating from the plan.
5. Construction debris shall be kept from entering adjacent waterways, wetlands, ground cover, or drainage areas. Any debris that enters these areas shall be removed immediately. Netting, mats, or establishing confined work areas in stages may be necessary to address these issues.

6. Refuse material resulting from routine maintenance of worker equipment and heavy machinery is prohibited from being disposed or deposited onto or into the ground. All used oils and filters must be recycled or disposed of properly.
7. Use of harmful chemical wash water to clean equipment or machinery is discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. It shall not be deposited or disposed of in waterways, streams, wetlands, or drainage areas.
8. The contractor shall follow all requirements as indicated in the Environmental Compliance Sheet. It is 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 Environmental Compliance Sheet.

1. Specifically, please note the environmental requirements as indicated on sheet 24 in:
 - Note #4 for the Stream Restoration and Slope Riprap Treatment.
 - Note #5 for Contractor Access.
 - Note #6 for Clearing in Wetland Areas
 - Note #7 for Plantings
2. The contractor shall pay special attention to the Special and General Conditions contained within the DNREC and Corps permits. For convenience, the main concerns for this project are highlighted below:
 - USACE shall be notified at least 10 days prior to the commencement of authorized work by completing and signing the *Commencement Form*. USACE shall also be notified within 10 days of the completion of the authorized work by completing and signing the *Completion Form*.
 - A sanitary sewer line is planned for rehabilitation at the same time as the stream work; however, work items related to the utility work are to be performed by New Castle County and permitted separately. The USACE permit covers the combined project footprint and impact areas necessary for all work items, however,

responsibility for the utility line replacement and all related permit conditions will be the responsibility of the County.

- USACE mitigation for project impacts – the construction activities for restoration of Leatherman Run are proposed to result in net increases in aquatic resource function and services.
 - The contractor shall access the stream from the NE corner and the N Staging area and access road only. Access beyond the LOC is strictly prohibited.
 - All equipment traversing wetlands shall be supported on Timber Mats as shown in the plans.
3. 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.



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

SHAILEN P. BHATT
 SECRETARY

RAILROAD STATEMENT

For

State Contract No.: T201380204

Federal Aid No.:

Project Title: Leatherman's Run Stream Restoration at Christiana High School

The following railroad companies maintain facilities within the contract limits:

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

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 DeIDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DeIDOT'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 DeIDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DeIDOT's Railroad Program Manager at (302) 760-2183.

Approved As To Form:

Robert A. Perrine
 DeIDOT Railroad Program Manager

12/22/2014

DATE

BID PROPOSAL FORMS

CONTRACT T201380204.01

CONTRACT ID: T201380204.01

PROJECT(S): T201380204

All figures must be typewritten.

CONTRACTOR : _____

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

SECTION 0001 STREAM RESTORATION

0010	201000 CLEARING AND GRUBBING	LUMP		LUMP		
0020	202573 TEST HOLES	EACH	1.000			
0030	203000 CHANNEL EXCAVATION	CY	447.000			
0040	601520 TEMPORARY TIMBER MAT	LUMP		LUMP		
0050	712022 RIPRAP, R-6	TON	162.000			
0060	712553 IMBRICATED ROCK STRUCTURES	TON	303.000			
0070	712554 FURNISHED RIFFLE BED MATERIAL	CY	195.000			
0080	712555 HEAVY BACKFILL	CY	209.000			
0090	712556 SALVAGED CHANNEL BED SAND AND GRAVEL MATERIAL	CY	89.000			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201380204.01

PROJECT(S): T201380204

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0100	712557 FURNISHED CHANNEL BED SAND AND GRAVEL	89.000 CY				
0110	713002 GEOTEXTILES, SEPARATION	88.000 SY				
0120	713003 GEOTEXTILES, RIPRAP	180.000 SY				
0130	727007 CHAIN-LINK FENCE, 8' HIGH	582.000 LF				
0140	727008 TERMINAL POSTS FOR 8' CHAIN-LINK FENCE	2.000 EACH				
0150	727011 RESET CHAIN-LINK FENCE	18.000 LF				
0160	727014 CONSTRUCTION SAFETY FENCE	3.000 LF				
0170	727547 REMOVAL OF FENCE	5.000 LF				
0180	735500 MULCH ACCESS ROAD	188.000 SY				
0190	737523 PLANTINGS	LUMP	LUMP			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201380204.01

PROJECT(S): T201380204

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0200	737525 LIVE STEM STAKING	420.000				
		EACH				
0210	741002 TREE REMOVAL 11" TO 14.9"	2.000				
		EACH				
0220	741003 TREE REMOVAL 15" TO 18.9"	14.000				
		EACH				
0230	741004 TREE REMOVAL 19" TO 24.9"	3.000				
		EACH				
0240	743000 MAINTENANCE OF TRAFFIC			LUMP		
		LUMP				
0250	743024 TEMPORARY WARNING SIGNS AND PLAQUES	180.000				
		EADY				
0260	763000 INITIAL EXPENSE			LUMP		
		LUMP				
0270	763501 CONSTRUCTION ENGINEERING			LUMP		
		LUMP				
0280	763645 DE-MOBILIZATION AND RE-MOBILIZATION			LUMP		
		LUMP				
0290	905001 SILT FENCE	1502.000				
		LF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201380204.01

PROJECT(S): T201380204

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0300	905002 REINFORCED SILT FENCE	174.000 LF				
0310	906002 DEWATERING BAG	4.000 EACH				
0320	908003 TOPSOIL, 4" DEPTH	4654.000 SY				
0330	908014 PERMANENT GRASS SEEDING, DRY GROUND	2340.000 SY				
0340	908023 STABILIZED CONSTRUCTION ENTRANCE	67.000 TON				
0350	908504 COIR FIBER MATTING	3215.000 SY				
0360	908510 STREAM RESTORATION SEEDING	4654.000 SY				
0370	908511 COIR BLANKET	1213.000 LF				
0380	909002 SANDBAG DIVERSION	235.000 CF				
0390	909005 STREAM DIVERSION	LUMP	LUMP			
	SECTION 0001 TOTAL					

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201380204.01

PROJECT(S): T201380204

All figures must be typewritten.

CONTRACTOR :

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

SECTION 0002 SANITARY SEWER REPLACEMENT

0400	753516 SANITARY SEWER SYSTEM	LUMP	LUMP		
	SECTION 0002 TOTAL				
	TOTAL BID				

CANNOT BE
USED FOR
BIDDING

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: **T201380204.01** 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 - I
ITEM 737523 - Planting**

CONTRACT NO. T201380204.01

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	10	SY	Mulching	\$	\$
2	17	EA	<i>Acer rubrum</i> , Red Maple, 1.25" caliper	\$	\$
3	16	EA	<i>Nyssa sylvatica</i> , Black Gum, 1.25" caliper	\$	\$
4	18	EA	<i>Platanus occidentalis</i> , American Sycamore, 1.25" caliper	\$	\$
5	18	EA	<i>Quercus phellos</i> , Willow Oak, 1.25" caliper	\$	\$
6	26	EA	<i>Alnus serrulata</i> , Smooth Alder, 30"	\$	\$
7	26	EA	<i>Aronia prunifolia</i> , Purple Chokeberry, 30"	\$	\$
8	26	EA	<i>Sambucus canadensis</i> , Elderberry, 30"	\$	\$
9	26	EA	<i>Viburnum nudum</i> , Possumhaw, 30"	\$	\$
TOTAL ITEM 737523 - Planting \$					
(LUMP SUM BID PRICE FOR ITEM 737523)					

USED FOR
BIDDING

BREAKOUT SHEET - 2
ITEM 753516 - Sanitary Sewer System

CONTRACT NO. T201380204.01

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	1	LS	Mobilization / Demobilization	\$	\$
2	100	LF	Sanitary Sewer Mains and Fittings (8" DIP)	\$	\$
3	300	LF	Sanitary Sewer Mains and Fittings (16" DIP)	\$	\$
4	3	EA	Core Drill into Existing Manhole	\$	\$
5	1	EA	Manhole Channel Improvements	\$	\$
6	1	LS	Sanitary Sewer Bypass Pumping	\$	\$
7	5	CY	Select Fill	\$	\$
8	1	LS	Well Pointing	\$	\$
9	70	CY	Sanitary and Storm Sewer Concrete Encasement	\$	\$
10	380	LF	CCTV Inspection	\$	\$
11	1	LS	Contingency Work Allowance	\$	\$
TOTAL ITEM 753516 - Sanitary Sewer System \$					
(LUMP SUM BID PRICE FOR ITEM 753516)					

BIDDING

"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.

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: **T201380204.01** 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.

CERTIFICATION
Contract No. T201380204.01

The undersigned bidder, _____
whose address is _____
and telephone number is _____ hereby certifies the following:

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

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

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

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

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

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

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

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

BIDDERS MUST ACKNOWLEDGE RECEIPT OF ALL ADDENDA

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



AFFIRMATION:

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

YES _____ NO _____ if yes, please explain _____

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

CANNOT BE USED FOR BIDDING

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. T201380204.01, 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