Amend **Section 206 - Excavation and Backfill for Conduits and Structures** to read as follows:

"SECTION 206 - EXCAVATION AND BACKFILL FOR CONDUITS AND STRUCTURES

206.01 Description. This section is for:

(1) excavation to the depth and lines established for the foundations of bridges, and other structures;

(2) excavation and backfilling trenches for culverts, structural plate culverts, utility pipes (including water and sewer lines), concrete and cement rubble masonry headwalls, grouted rubble paving, hand-laid and dumped riprap;

(3) other excavation specifically designated in the contract as structure excavation;

(4) backfilling according to this section and Section 624 - Water System and Section 625 – Sewer System;

(5) disposal of surplus material from the structure excavation;

(6) bailing, draining, sheathing and the construction of cofferdams, if found necessary, and the subsequent removal of sheathing and cofferdams;

(7) work associated with dewatering activities and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) Permit for Dewatering Activities.

Excavation for structures does not include the excavation:

(1) of post holes for fences, gates, or similar items;

(2) necessary to properly set curbs, paved gutters, headers, pavement or base course forms.

206.02 Materials. Materials shall conform to the following:

Filter Material	703.18
Structure Backfill Material	703.20
Trench Backfill Material	703.21

The Contractor may use Section 313 – Controlled Low Strength Material (CLSM) in place of trench and structure backfill material subject to the Engineer's acceptance. Do not use CLSM as trench backfill when installing aluminum and aluminum coated pipe culverts. When using CLSM, the Engineer will consider CLSM as the required backfill.

206.03 Construction Requirements.

(A) General. Notify the Engineer 10 working days before excavation for structures, so that the Engineer can take cross-sectional elevations and measurements of the undisturbed ground.

Excavate foundations to the elevations according to the particular type of structure to be placed.

Do not disturb the ground below the elevations shown in the contract in structure excavation operations. When disturbing such ground below the required elevations, excavate the disturbed ground until the undisturbed ground is reached. Backfill this area with Class D concrete until the required foundation footing elevation is reached. This work shall be at no cost to the State.

Keep the foundation dry by draining, bailing, pumping, driving sheathings or constructing cofferdams and cribs.

When the material from excavation does not meet the quality requirements specified for the backfill, furnish such suitable material as required.

Use or dispose surplus and suitable material from structure excavation remaining after completing backfilling according to Section 203 - Excavation and Embankment.

(B) Cofferdams. Carry cofferdams for foundation construction well below the bottom of the footings. Brace well and as watertight as practicable. Provide the interior dimensions of cofferdams sufficient clearance for driving piles, constructing forms and, when placing no seal, to permit pumping outside the forms.

When the clearance provided in the contract between the outside line of the footing and piles or interior wall or surface is not sufficient to permit the driving of piles or building of forms, the Contractor may provide such clearance. The Engineer will consider such enlargement over one foot outside the dimensions of the footing shown in the contract for the sole purpose of expediting the work of the Contractor and is of no value to

the State. The Engineer will not include such excavation and backfill for payment.

Correct or enlarge cofferdams that are tilted or moved out of position during the process of sinking. Such work shall be at no cost to the State.

In tidal waters or in streams at a time of probable flood, vent cofferdam walls at low water elevation to insure full hydrostatic head both inside and outside the cofferdam when pouring and setting of seals.

The Engineer will not permit shoring in cofferdams that will induce stress, shock, or vibration in the permanent structure.

When permitted, cross struts or bracing may extend through foundation concrete. The Engineer will permit such struts or bracing below low water to remain in place. Remove struts or bracing above low water. Fill the volume with concrete of the same mix as that specified for the surrounding concrete.

If requested by the Engineer, submit drawings and design calculations showing the proposed method of cofferdam construction and other details left open to its choice or not fully shown on the contract for substructure work. The type and clearance of cofferdams shall be subject to acceptance.

Remove the cofferdams with sheathing and bracing to the level one foot below the streambed at no cost to the State after the completion of the substructure. Remove the cofferdam so as not to disturb or mar the finished concrete or masonry.

(C) Foundation Treatment. Uncover the rock fully when footing concrete or masonry is to rest upon rock. Remove the surface to a depth sufficient to expose sound rock. Level off the rock roughly or cut and roughen to approximate horizontal and vertical steps.

Grout seams in rock under pressure. The Engineer will pay the cost as extra work according to Subsection 104.03 – Extra Work.

Do not disturb the bottom of the excavation when not using piles and footing concrete or masonry is to rest on an excavated surface other than rock. Do not make the final removal of the foundation material to grade until just before placing the concrete or masonry.

Complete the excavation for piers and abutments to the bottom of the footings before driving piles therein. Remove excess materials

remaining in the excavation after pile driving to the elevation of the bottom of the footings.

The Engineer will permit excavating a sufficient distance below the bottom of the footing as shown on the contract at no cost to the State when using piles. When the ground has risen above plan grade after driving the piles, remove the surplus material at no cost to the State. When the surface of the ground is below plan grade after driving the piles, backfill and compact to the plan grade with acceptable material at no cost to the State.

(D) Inspection. When the Engineer needs to determine the character of the foundation material, dig test pits and make test borings and foundation bearing tests. The Engineer will pay the cost according to Subsection 104.03 – Extra Work.

Notify the Engineer for inspecting and accepting the elevation and character of the foundation before placing concrete or masonry in the footing whenever completing the structure excavation to the foundation grade of a footing.

(E) Structure and Trench Backfill. Do not deposit material in fills until the test samples imply that the concrete has developed a strength required in Subsection 503.03(E) – Loading against the back of:

(1) concrete abutments,

(2) piers,

(3) concrete retaining walls, or

(4) the outside walls of concrete box culverts

Cure the test samples under conditions similar to those affecting the structure. Continue backfilling so that excessive unbalanced loads are not introduced against the structure.

Place backfill material in uniform horizontal layers not exceeding 8 inches in loose thickness before compaction. Moisten and compact each layer of backfill until obtaining a relative compaction of not less than 95%. The Engineer may reduce compaction requirement of 95% in situations where such compaction is not feasible such as in footings located in running streams or in swampy areas. The Engineer will be the sole judge of the degree of reduction. Backfill the footings with rockfill instead of the 95% compaction requirement in stream beds subject to appreciable scour.

When the Engineer cannot use the field density test, compact each layer of backfill with vibratory or suitable equipment on granular backfill material. Test methods to decide maximum densities and relative compaction according to Subsection 106.09 – Special Test Methods.

Do not use water containing an excessive quantity of salt or other deleterious substances for compaction of structure and trench backfill for metal pipes.

The Engineer will not permit compaction of backfill material by ponding or jetting.

When required, make sufficient fill at culverts and bridges ahead of other grading operations to permit public traffic to cross. Compact structure backfill at the following areas to a relative compaction of not less than 90%:

(1) Oversized drains not beneath surfacing;

(2) Footing for slope protection, slope paving, and aprons;

(3) Headwalls, endwalls, and culvert wingwalls;

(4) Retaining walls except portions under surfacing and crib wall;

(5) Inlets in median areas or in traffic interchange loops;

(6) Footings not beneath surfacing;

(7) Other locations where the plans show 90% relative compaction for structure backfill.

(F) Filter Material. Place filter material for backfill at bridge abutments, and retaining walls according to the contract.

Make the subgrade as impervious as possible by pneumatic tamping where the material is placed. Compact the filter material thoroughly in layers with the backfill.

(G) Dewatering Activities. If excavation or backfilling operations requires dewatering, and the Contractor elects to discharge dewatering effluent into Waters of the United States or existing drainage systems, the Contractor shall obtain a National Pollutant Discharge Elimination System (NPDES) Activity Dewatering Permit from the Department of

Health, Clean Water Branch (DOH-CWB). Do not begin dewatering activities until the DOH-CWB has issued a Notice of General Permit Coverage (NGPC). Dewatering operations shall be according to the conditions in the NGPC. Submit a copy of the NPDES Activity Dewatering Application and Permit to the Engineer.

206.04 Method of Measurement.

(A) Structure Excavation. The Engineer will measure structure excavation per cubic yard. The limits for payment shall be according to the contract or as specified by the Engineer.

In the case of excavation for bridge, retaining wall, culvert headwalls, and other structures, no deduction in pay quantities will be made where the Contractor does not choose, subject to the Engineer's acceptance, to excavate material that is outside the limits of the actual structure but within the limits of excavation shown in the contract.

The Engineer will not measure beyond the limits of concrete neat pour lines.

The lower limit for payment of structure excavation for foundations for bridges, retaining walls, culvert headwalls, and other structures shall be the bottom of the completed foundations.

When specified by the Engineer to increase the depth of structure excavation below the depth shown in the contract, the Engineer will measure the material removed to a depth of not more than three feet below said depth at the contract price per cubic yard for structure excavation.

The Engineer will measure for the removal of material from depths greater than three feet below said depth as extra work according to Subsection 104.03 - Extra Work. The Contractor has the option of measuring the material removed at the contract price per cubic yard for structure excavation before the excavation is made.

The Engineer will not make compensation for the:

(1) removal and disposal of material that may come into an excavation from outside the designated limits;

(2) the removal and disposal of swell material resulting from the driving of piles in an excavation;

(3) furnishing and placing backfill material in an excavation that is below the designated grade.

The Engineer will not include such quantities in the quantities of structure excavation to be paid for.

The upper limit for payment of structure excavation shall be the original ground surface before the start of construction operations with the following exceptions:

(1) When structure excavation is done within the roadway excavation area or ditch and channel excavation area, the upper limit shall be the planes of the bottom and side slopes of said areas excavated shown on the contract or as specified by the Engineer.

(2) When structure excavation is made in new embankments, the upper limit shall be the planes of the new embankment at the elevation shown in the contract or specified by the Engineer for construction ahead of doing the required structure excavation. The upper limit shall be the surface of the embankment at the time the excavation is made.

Except for culverts, the lateral limits for payment of structure excavation including cement rubble masonry and concrete headwalls shall be the vertical surfaces one foot outside the neat lines of the footings.

For culverts, except for structural plate culverts, the lateral limits for payment of structure excavation shall be 18 inches outside the external limits of the pipe. For structural plate culverts, the lateral limits for payment shall be three feet outside the external limits of the pipe.

The lateral limits for payment of structure excavation for a battery of two or more culverts (culverts placed next to each other and intended to serve as a unit), except for structural plate culverts, shall be 18 inches outside the external limits of the two outer pipes. The lateral limits for payment of structure excavation shall be three feet outside the external limits of the two outer pipes for structural plate culverts.

For culverts and structural plate culverts, the lower limits for payment shall be the bottom elevation of the bed course material, and the upper limits shall be the existing ground.

For culverts and structural plate culverts in embankment fill, the lateral, lower, and upper excavation limits shall be measured after the embankment is completed according to Section 603.03(A).

The Engineer will not apply these requirements where the spaces between the pipes permit the use of compacting equipment such as power rollers. Treat each pipe as a single culvert where using such equipment.

The Contractor shall remove soft, spongy, or unsuitable material from the width equal to the span or diameter of the culvert plus one diameter outside the lateral limits of the culvert when encountering such material.

When using CLSM for backfill, the trench width may be reduced to the outside diameter or span of the culvert plus six inches on each side for culverts less than or equal to 42 inches in diameter or span, and 12 inches on each side for culverts greater than 42 inches in diameter or span.

(B) Structure Backfill. The Engineer will measure structure backfill for bridge abutments, wingwalls, retaining walls and structural plate culverts per cubic yard. Compute the quantities based on the following limits:

(1) Bridge Abutments, Wingwalls and Retaining Walls.

(a) The lower limit shall be the top of the completed footings.

(b) The upper limit for payment shall be the finished grade or the bottom of the pavement structure when under the roadway area.

(c) The lateral limits shall be one foot outside the neat line of the footings. The limits whichever is at a greater distance from the backface in a direction normal to the wall stems shall be the vertical plane:

1. one foot outside the heel of the footing, or

2. five feet from the backface measured at the top.

The Engineer will deduct the volume of filter material measured within the limits of payment for structure backfill for bridge abutments, wingwalls, and retaining walls from the pay quantities of structure backfill.

(2) Structural Plate Culverts.

(a) The lower limit shall be the grade line or elevation designated in the contract or ordered specified by the Engineer for the lower outside surface of the culverts.

(b) The upper limit shall be one foot above the top of the culverts.

(c) The lateral limits shall be the vertical surface one foot 36 inches outside the lateral limits of the culverts.

The Engineer will deduct the volume occupied by the structural plate culvert within the limits of payment for structure backfill for structural plate culvert from the pay quantities of structure backfill.

The lateral limits for payment for structure backfill for a battery of two or more culverts placed adjacent to each other and intended to serve as a unit, shall be 36 inches outside of the external limits of the two outer pipes. The Engineer will not apply these requirements where the spaces between the pipes permit the use of compacting equipment such as power rollers. The Engineer will treat each pipe as a single culvert where the Contractor uses such equipment is used.

The lateral limits shall be the vertical surface one diameter outside the lateral limits of the culverts for areas of soft, spongy or unsuitable material.

(C) Structure and Trench Backfill for Culverts. The Engineer will not measure structure and trench backfills for culverts other than structural plate culverts.

(D) Filter Material. The Engineer will measure filter material per cubic yard. The Engineer will compute the quantities from the dimensions shown in the contract or as specified by the Engineer.

206.05 Basis of Payment.

(A) Structure Excavation. The Engineer will pay for the accepted structure excavation at the contract unit price per cubic yard complete in place.

The price includes full compensation for excavating for structures and culvert trenches; keeping the foundation dry, placing and compacting surplus structure excavation in roadway embankments or disposing of the material along the roadway, providing cofferdams, notifying the Engineer

for inspecting and accepting the elevation and character of the foundation; backfilling culvert trenches except for structural plate culverts; backfilling culvert trenches with CLSM except for structural plate culverts; furnishing and applying water for the compaction of structure backfill; testing the samples; placing backfill material in uniform horizontal layers; moistening and compacting each layer of backfill; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

If required, the price includes preparing an NPDES Dewatering Activities Permit application; obtaining a NPDES Permit Application (CWB-NOI Form G) from the Department of Health, Clean Water Branch; installing, operating, monitoring, and maintaining the dewatering activities; removing all equipment and facilities from the site; restoring the site to its original condition; and furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will deduct the cost from the progress payment for citations received by the Department of Health for non-compliance with the NGPC.

(B) Structure Backfill for Bridge Abutments, Wingwalls, Retaining Walls, and Structural Plate Culverts. The Engineer will pay for the accepted structure backfill for bridge abutments, wingwalls, retaining walls, and structural plate culverts at the contract unit price per cubic yard complete in place.

The price includes full compensation for using suitable material for backfilling structures and trenches; furnishing and applying water for the compaction of structure backfill; testing the samples; placing backfill material in uniform horizontal layers; moistening and compacting each layer of backfill; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

(C) Structure and Trench Backfill for Culverts. The Engineer will not pay for structure and trench backfill for culverts other than structural plate culverts. The cost shall be incidental to Structure Excavation.

(D) Filter Material. The Engineer will pay for the accepted filter material at the contract unit price per cubic yard, complete in place. The price includes full compensation for tamping the subgrade; furnishing, and placing the backfill material in uniform horizontal layers; moistening and compacting each layer; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	Pay Unit
Structure Excavation for _____	Cubic Yard
Structure Backfill for _____	Cubic Yard
Filter Material	Cubic Yard"

END OF SECTION