Make the following Section a part of the Standard Specifications:

"SECTION 672 – ANCHORED WIRE MESH SYSTEM

672.01 Description. The work contained in this section of the technical specifications consists of furnishing, transporting and constructing a slope stabilization system in accordance with the contract documents and the manufacturer's standards and requirements. The system shall be installed at the location(s) shown on the design drawings approved by the Engineer.

The anchored wire mesh system has been designed to withstand the static and dynamic forces generated from rocks or soil moving under the permanently installed system. The manufacturer shall be regularly engaged in the manufacturing of slope stabilization systems, having a documented experience with the manufacturing of slope stabilization systems used in similar application and capacity. The manufacturer shall supply written evidence demonstrating certification of a quality assurance program.

672.02 Materials. All materials for the anchored wire mesh system shall conform to the following requirements.

(A) High Strength Wire Mesh. The high strength wire mesh shall be woven construction and shall be diamond shaped. The high strength wire mesh shall be made with 4-mm (0.157-inch) diameter wire, and the ends of each wire shall be formed into a loop and shall be twisted. The loops of the wire mesh shall be fastened together to prevent unraveling of the mesh. The wire shall be alloyed high strength carbon steel wire with a minimum tensile strength 1,770 N/mm^2 (256,000 psi). The wire shall be galvanized with a Zinc/Aluminum coating with a minimum weight of 125 g/m^2 (0.410 oz/ft^2). The coating shall be 95% Zinc and 5% Aluminum.

The size of the wire mesh opening shall be 83 mm by 137 mm ($\pm$3.25 inches by $\pm$5.5 inches) ($\pm$ 5%), and the depth of the mesh shall be 15 mm $\pm$ 1 mm (0.59 inches).

(B) Compression Claws (Press Claws). The compression claws (also known as press claws) shall be 6-mm (0.24-inch) diameter carbon steel bar and hot dipped galvanized with a minimum layer thickness of 85 microns (µm). Type 1 compression claws (press claws) shall be used to fasten the meshes together, and Type 2 compression claws (press claws) shall be used to fasten the mesh to the boundary ropes.

(C) Spike Plates. The spike plates shall be made from 10-mm (0.4-inch) thick steel and shall be hot dipped galvanized with a minimum layer thickness of 85 microns (µm). The spike plate shall be diamond shaped with a width of 190 mm (7.5 inches) and a length of 330 mm (13 inches).

(D) Boundary Ropes. Boundary ropes shall have a diameter of 0.5 inches (12 mm) and shall be PVC coated (color shall be black unless directed otherwise by the Engineer). The rope shall be 6 by 19 construction (or equivalent), independent wire rope core (IWRC) and galvanized with a minimum breaking strength of 23,940 pounds. The rope shall meet Federal Specification RR-W-410D or equivalent including galvanizing.

(E) Drilled Holes. Drill the holes for the grouted soil/rock anchors (including the anchors for the boundary ropes) in accordance with the minimum dimensions (diameter and depths) shown in the design drawings. The Contractor shall submit deviations from the dimensions shown on the design drawings for acceptance by the Engineer. The Engineer will not permit blasting for installation of the drilled holes.

(F) Grouted Soil/Rock Anchors. The grouted soil/rock anchors shall consist of 1.25-inch diameter high strength Grade 75 solid threaded bar installed in a minimum 4-inch diameter drilled hole filled with non-shrink grout. Alternatively, grouted soil and/or rock anchor consisting of hollow threaded bar with outside and inside diameters of 1.5 and 0.75 inches, respectively, and minimum yield load capacity of 90 kips may be used. The length of the grouted soil/rock anchors shall be in accordance with the design drawings.

(G) Supplemental (Short) Anchors. Where required (not shown on design drawings), supplemental (short) anchors may be installed in between the grouted soil/rock anchors shown on the design drawings. Supplemental (short) anchors are installed to provide a neat appearance for the anchored wire mesh system only and serve no structural function. The supplemental (short) anchors shall be 1.25-inch diameter high strength Grade 75 solid threaded bar. Where installed by the Contractor, the length of the supplemental (short) anchors shall be at least 5 feet in length.

(H) Grout. The grout shall be non-shrink, non-metallic, non-gaseous and shall have a minimum unconfined compressive strength of 4,000 psi or greater.

(I) Color Coating. All components of the anchored wire mesh system, such as the high strength steel wire mesh, compression claws (also known as press claws), and spike plates shall have a powder coating of black pigmentation. The pigmented powder shall be applied using an electrostatic spray gun or equivalent process. The other exposed parts of the anchored wire mesh system that has not been powder coated shall have an applied coating of rubberized paint (color shall be black unless otherwise directed by the Engineer) for aesthetic purposes.

(J) Miscellaneous Materials. All miscellaneous material associated with the anchored wire mesh slope stabilization system shall be hot-dipped galvanized. The vendor of the anchored wire mesh system shall supply the appropriate components, such as wire rope clips, thimbles, etc., for use with a PVC coated wire rope.

672.03 Pre-Construction Requirements. The Contractor shall submit eight (8) copies of the layout and detailed drawings to the Engineer for review and acceptance. The submittal shall be prepared by the manufacturer of the anchored wire mesh slope stabilization system. The submittal also shall include samples of the materials with the powder coating and color(s) of the high strength wire mesh for selection and acceptance by the Engineer prior to placing an order for the anchored wire mesh system. The Engineer shall have 10 days to review the submittal and provide written comments and acceptance of the submittal. Fabrication of the anchored wire mesh system shall not begin until the submittal has been reviewed and accepted by the Engineer. The cost for the manufacturer's assistance and drawings required in the submittal shall be included in the cost of the anchored wire mesh system.

The Contractor shall submit an affidavit certifying that the high strength wire mesh meets the project specifications. The affidavit shall be signed by an official authorized to certify on behalf of the manufacturer and shall be accompanied by a mill certificate that verifies physical properties were tested during manufacturing and lists the manufacturer's quality control testing. If the affidavit is dated after award of the contract and/or is not specific to the project, the supplier shall attach a statement certifying that the affidavit addressed to the wholesale company is representative of the material supplied.

The Contractor shall have a qualified and experienced representative from the high strength wire mesh manufacturer available on an as-needed basis during the construction. The representative shall visit the site for consultation at least once during construction.

Calibration curves for anchor testing apparatus including jack, pressure gauge, and load cell shall be submitted to the Engineer for review and acceptance.

672.04 Construction Requirements.

(A) General. As part of the construction requirements, a technical representative from the manufacturer of the anchored wire mesh system shall be present on the site for a minimum of two (2) days during the initial installation of the anchored wire mesh system at no additional cost to the State. All materials for the anchored wire mesh system shall be properly marked by the manufacturer in order for the Contractor to identify the components easily with the drawings to minimize installation time.

The anchored wire mesh system installation shall consist of the following steps. Installation of the anchored wire mesh system also shall follow the manufacturer's recommendations. Where discrepancies exist between the technical specifications of the Special Provisions and the manufacturer's recommendations, the Contractor shall notify the Engineer immediately. The Engineer will provide additional guidance for proceeding with the work upon consultation with the manufacturer's technical representative to resolve the discrepancies.

In general, the following steps shall be followed during the installation of the anchored wire mesh system.

(1) The Contractor shall excavate the slope in stages with no more than 10 feet height (measured along slope surface) exposed at a time and remove all brush, debris and loose rock in accordance with the contract documents. The excavated slope surface shall be smooth with inclination as shown on the design drawings. The Contractor shall exercise care during excavation in accordance with the requirements under Section 671 – Slope Scaling.

(2) The Contractor shall locate the grouted soil/rock anchors on the slope as shown on the design drawings. Prior to installation of the grouted soil/rock anchors, form hollows of at least 8 inches deep (generally 8 to 12 inches deep) at each grouted soil/rock anchor.

(3) The grouted soil/rock anchors shall be installed in accordance with the design drawings and specifications. The Contractor shall install supplemental (short) anchors in the areas where a smooth slope surface is not achieved in order to push the anchored wire mesh against the ground.

(4) Install the required grouted soil/rock anchors for the boundary ropes at the locations shown on the design drawings. The boundary ropes serve no structural purpose because the boundary ropes are used to pull the edge of the anchored wire mesh tight against the slope (for a neat appearance).

(5) After complete installing all required grouted soil/rock anchors, tested and accepted by the engineer, plant hydro-mulch seeding on face of the slope prior to placement of the erosion control matting. Hydro-mulch in accordance with Section 641 – Hydro-mulch Seeding.

(6) Lay the erosion control matting on the slope by unrolling down the slope in accordance with Section 663 - Erosion Control Matting and Manufacturer's recommendations.

(7) Lay the high strength wire mesh on the slope by unrolling down the slope. The rolls can be shortened or lengthened as necessary by removing or adding sections, respectively. Overlap the mesh panels by a minimum of one mesh. Fasten the overlapped mesh panels with two (2) Type 1 compression claws (press claws) at each mesh.

The compression claws (press claws) are installed with one claw directly above the loop and one directly below the loop. For obstructions, such as trees that are not removed, cut the wire mesh, bend the cut wire mesh pieces back, and secure in place with aluminum clamps (follow manufacturer's recommendations).

(8) Install the required boundary ropes and fasten the wire mesh to the boundary ropes with Type 2 compression claws (minimum of one compression claw at each mesh). Tighten the boundary ropes and pull tight against the ground or slope.

(9) Place the spike plates onto the anchors. Using a hydraulic wrench supplied by the manufacturer, tighten the nuts and push the spike plates and wire mesh into the hollows in order to tension the anchored wire mesh to at least 36 kips. Torque the nuts to the values in accordance with the manufacturer's recommendations.

(B) Pre-Production and Production Verification Testing of Grouted Soil/Rock Anchors. Pre-production verification testing shall be performed in the presence of the Engineer prior to installation of production anchors to verify the Contractor's installation methods and anchor pullout resistance.

Perform a pre-production verification test at the location provided by the Engineer. Pre-production verification test anchor will be sacrificial and not incorporated as production anchors.

(C) Proof Testing of Grouted Soil/Rock Anchors. Perform proof testing on a minimum of 10 percent of grouted soil/rock anchors. Perform the proof tests at the locations and elevations selected by the engineer after installation to verify anchor pullout resistance. Provided the proof test does not fail at the maximum testing load and meet the acceptance criteria, the proof test anchors may be incorporated as production nails.

672.05 Measurement. The Engineer will measure the anchored wire mesh system per square feet.

672.06 Payment. The Engineer will pay for the accepted anchored wire mesh system at the contract unit price per square feet complete in place. The Engineer will not pay for grouted soil/rock anchors separately.

The price shall be full compensation for furnishing and installing materials, labor, equipment, tools, and incidentals necessary to complete the anchored wire mesh system including grouted soil/rock anchors at the locations shown on the design drawings.

Pay Item	**Pay Unit**
Anchored Wire Mesh System	Square Feet"

END OF SECTION 672