ROCK SLOPE SCALING

I. DESCRIPTION – This work is removal of loose or potentially unstable disjointed rocks on slopes by manual, mechanical or chemical (non-explosive) methods. Includes removal and disposal of all spoil resulting from the rock slope operation and all pre-scaling material located in the area between the rock slope and the pavement. Bleasting is not permitted.

II. SUBMITTALS – Prepare and submit a detailed project Work Plan to the Representative at least ten working days prior to beginning the scaling work. Include the following information in the Work Plan:

(a) Schedule. Outline the proposed construction sequence and schedule.

(b) Equipment. List the types of equipment and tools to be used for the work and for accessing the work area. Include any power equipment, such as excavators, hydraulic and pneumatic hammers, drills, cranes, and drag scaling systems, etc.

(c) Qualifications of Personnel. Provide documentation that each rock slope scaling foreman and all personnel conducting work or activities related to scaling operations have performed satisfactory work on three similar projects within the last five years. All personnel must have a minimum of two years of full-time experience in rock slope stabilization that includes rock scaling.

(d) Crews. Indicate the anticipated number of planned scaling crews to be employed on the project. A crew is defined as one scaling foreman, and a minimum of two scalers.

(e) Material Control and Removal. Describe the scaling sequence for the project, intended direction and fall area for rock debris generated from the slope, frequency and method of rock debris removal, and disposal plan for all rock debris generated from the slope scaling work, and any rock debris currently along and adjacent to the toe of the slope. Include provisions to protect adjacent roadway facilities and components, and any local private facilities.

(f) Traffic Control. Follow the Work Zone Traffic Control Plan requirements provided in the contract, including any Section 901 special provisions. Any proposed changes or additions to the traffic control plan must meet the current Publication 213, Temporary Traffic Control Guidelines (including changes) and be approved by the Representative. Any planned traffic stoppage interval through the work zone must be limited to a maximum duration of fifteen minutes, and all traffic must be cleared in both directions before any subsequent traffic stoppages are permitted.

(g) Protection Plan. Describe methods and procedures to be used protect personnel and the traveling public from all harm, and all adjacent facilities, and structures from damage. Include provisions to protect adjacent roadway facilities and components, and any local private facilities. Protect the environment by minimizing erosion, preventing sedimentation from entering streams or waterways, and any other environmental impacts. Contractor is responsible to restore, repair, or recompense for any damage or injury caused by this work.

(g)(h) Emergency Management Plan. Describe the plan of action for possible worker injury. Also describe the plan of action for potentially large rocks or rock masses scaled onto the roadway that are not removable within the time limit restriction for traffic specified in the traffic control plan.
The Work Plan submission must be approved acknowledged in writing by the Representative prior to beginning any Scaling work.

III. CONSTRUCTION – Proceed according to the approved work plan and schedule. The work will remove loose or unstable disjointed rocks, boulders, large projecting rock blocks, and overhangs from the slope as indicated on the plans and as directed by the Representative. Supply all materials, equipment, and labor required to perform the work.

(a) Provide any and all necessary protective devices to prevent damage to adjacent roadway facilities and components, any existing rockfall protection structures and appurtenances, and any adjacent or local private facilities. Repair or replace any pavement, guide rail, signage, structures, property or other components, public or private utilities, and any local private properties or facilities damaged due to the scaling work, at no expense to the Department. Provide adequate means to protect motorists and surrounding property from injury and/or damage during rock scaling and all other activities. Submit methods of protecting motorists to the Representative for approval two weeks prior to excavation. The Contractor is solely responsible for injury to persons or damage to property that may result from this work. The exercise of or failure to exercise control on the part of the Representative shall in no way relieve the Contractor of responsibility for any injury or damage.

(b) Provide a scaling crew with a minimum of three qualified scalers, during all periods of rock scaling, one of whom is the scaling foreman. During rock removal, provide sufficient qualified personnel staff to allow fully staffed scaling crews at all times.

(c) Conduct slope scaling and prepare finished rock slope surface using manual, mechanical or chemical (non-explosive) methods and equipment including the use of scaling bars, winching, drag scaling, air bags, hydraulic jacks, and chemical expansive agents (non-explosive demolition agents), power equipment, such as excavators, hydraulic and pneumatic hammers, drills, cranes, etc.

(d) Perform scaling only in the presence of the Representative. Provide, operate and maintain telecommunication inspection equipment to allow for both audio and video communication between the Representative and each rock scaling crew to effectively communicate adequately analyze the slope conditions, or issue alerts regarding unstable conditions.

(e) Rock scaling will start at the top of the slope and proceed downward toward the roadway, removing all loose rocks and unstable blocks as the work progresses.

(f) Do not excavate material that will disturb intact rock, compromise the stability of the rock face or slope, or disturb or damage the toe of slope unless such work is deemed necessary by the Department to meet project objectives or correct a more serious condition and is directed by the Representative. Submit corrective action plan remediation scheme and analysis to Representative for review and approval for cases where intact rock has been disturbed, stability of the rock face has been compromised, or toe of slope is damaged. The submission for design and corrective action must satisfactorily demonstrate adequacy to resolve and correct the problem as determined by the Department. All work for corrective action resulting from damages from activities not directed or approved by the Department will be conducted at no additional cost to the Department.

(g) Do not remove pieces of rock that will result in undercutting of overlying material. Submit a corrective action plan to the Representative for review and approval to correct any excessive undercutting,
damage or instability caused by the scaling work. Preparation of the corrective action plan shall be at no cost to the Department and no adjustments in contract time will be allowed as the result of preparation, Department review, and implementation of the plan.

(h) Remove any overhanging rock as directed by the Representative.

(i) Trim vegetation on the slope face and top of slope to the limits shown on the drawings or as directed by the Representative. Cut trees to a height of not more than four inches above the ground line.

(j)(k) If chemical expansion agents are used, store securely until use. Handle and use all chemicals according to the manufacturer’s instructions.

(k) All rocks and debris displaced during scaling must be removed completely from the slope in order to permit inspections by the Representative to determine if rock scaling has been completed satisfactorily. Remove additional rock identified during inspections at the direction of the Representative. All rock scaling activities will cease during any inspections necessary for the Department to evaluate scaling activities, check the progress of work or assess stability of the slope or an individual rock block or mass.

(l) Remove all rock and debris produced during the rock slope scaling operation as well as existing debris at the base of the slope and dispose of in accordance with Section 105.14. At a minimum, The frequency of removal will not exceed one fifteen minute period per two hours unless longer or more frequent periods are necessary be according to the work plan, but may be more frequent as directed by the Representative if necessary to maintain a safe and efficient worksite, as directed and/or approved by the Representative or permit the Representative to safely inspect work.

(m) Any rock on the cut face that is loose, hanging, deemed to be unsafe or unstable, or that creates a potentially dangerous situation, will be removed or stabilized to the satisfaction of the Representative during or upon completion of each portion of rock scaling.

Scaling and/or removal of rock carried out below or beyond the grades shown on the plans, below or beyond that established by the Representative, or for the convenience of the contractor is at the contractor’s expense.

IV. MEASUREMENT AND PAYMENT –

(a) Scaling. Hour. Measured on crew-hour basis. A crew is defined as one qualified scaling foreman and a minimum of two qualified scalers. Payable as Scaling includes time when all crew members are physically on the slope preparing to scale or performing the scaling. Payable as Scaling includes time ascending the slope, descending the slope, actively scaling, and on-slope standby during clean-up or when necessary for the safe conduct of traffic. Intermittent on-slope standby time up to fifteen minutes is permitted to may be needed to allow clean-up of scaled rocks at the base of the slope. Standby time exceeding fifteen consecutive minutes is not payable, unless approved by the Representative.

Unit price for Scaling includes the cost of furnishing all the materials, tools, equipment, labor, and incidentals necessary to complete the scaling work, removal of all scaled rock debris, and includes any on-ground support personnel and equipment actively supporting scaling operations such as Work Zone Traffic Control, means and methods required to protect motorists and property from falling rock, removal of vegetation, and revegetation of disturbed areas as directed.
(b) Scaled Material Disposal. Cubic Yard.

Pay quantity is determined by measuring the truck bed volume used to haul the rock sealed material, and the cumulative haul count, as approved by the Representative. Only fully loaded trucks will be included in the cumulative haul count.

Unit price for Scaled Material Disposal includes all costs of excavating, loading, hauling and disposal of existing debris, cut trees, and scaled rock materials, to the waste site.