1. SCALING (revised 2-2-2022)

Description. Remove and dispose of all loose or detached blocks of rock, masses of soil, and other debris that constitute or could constitute a road hazard from the identified areas on the plans or as directed by the Project Manager. The use of a Pre-qualified Rock Slope Stabilization Contractor is required for this work. Perform all work in a manner that minimizes exposure of the public, construction personnel, and equipment to hazardous or potentially hazardous conditions. Provide all materials, equipment and labor necessary to perform this work.

Submittals. Submit an electronic copy (PDF format preferred) of a General Scaling Plan at the Pre-Construction Conference for approval by the Project Manager. The General Scaling Plan must include:

A detailed Work Plan for each slope scaled. The Work Plan must include, but is not limited to, the following:

The proposed construction/scaling sequence and schedule.

The types of equipment and tools to be utilized in the work.

The number of scaling crews to be employed on the project and their anticipated work schedule. Each scaling crew must consist of a minimum of one working foreman and two scalers. Maintain the same crew size(s) at all times. Any crew member who must leave the site, for any reason, must be replaced immediately by an equally qualified replacement crew member.

A Removal and Disposal Plan for scaling debris generated from the scaling operations.

A Scaling Traffic Control Plan including provisions to protect the roadway, traffic, adjacent facilities, and existing utilities. This plan must be compatible with the overall Traffic Control Plan and Sequence of Operations for the project.

A Rockfall Protection Plan that includes provisions for protecting the roadway during non-working hours against rockfalls, rollouts, etc.

The Project Manager will approve or reject the Contractor’s General Scaling Plan submittal within 15 calendar days after receipt of a complete submission. Do not begin scaling work until the submittal requirements are satisfied and found acceptable to the Project Manager. Deviations from the approved submittals must be re-submitted for approval. No adjustment in contract time will be allowed due to incomplete submittals.

Materials. Vacant.

Construction Requirements.

Do not begin scaling until all provisions of the approved General Scaling Plan have been implemented.

Conduct scaling on all slopes as directed by the Project Manager in accordance with the approved General Scaling Plan.

Provide a working foreman to oversee the crew of scalers during all scaling work.

Do not perform scaling without the scaling foreman on-site.

Do not perform scaling activities under traffic unless MDT approved safety measures are in place.

If scaling activities have the potential for damaging the roadway and/or adjacent facilities, provide appropriate protective devices, in accordance with the approved General Scaling Plan prior to beginning scaling activities.

Perform scaling using standard hand scaling bars, portable hydraulic wedges, air pillows, light explosives, trim blasting, cracking agents, or other mechanical means. Other hand tools in addition to scaling bars may be used provided they have a demonstrated effectiveness to perform the required work. The use of power equipment, such as walking excavators, slushers, cranes with a drag scaling system, etc. must be approved by the Project Manager prior to use.

 If cracking agents are used, provide a detailed plan, including type of cracking agent, MSDS sheets, manufacturer’s technical data, hole spacing, loading sequence, and additional information for protecting traffic during the time period when the cracking agent is deployed, chemically active, and in use as a scaling method.

If explosives are used, the applicable requirements of Section 204 must be met.

Begin scaling activities a nominal 25 feet behind the slope crest, moving toward the slope crest, and proceeding downward, removing all loose or detached blocks of rock, masses of soil, and other debris or hazards as the work progresses. When blasting is required, the explosive force must be sufficient to dislodge the hazard, but not damage the adjacent slope. If drilling blast holes is required as part of the removal process, drill the holes parallel to the slope face.

Upon completion of the first scaling pass, the resultant new face will be inspected by the Project Manager to determine if scaling has been completed. If other hazards are identified that require removal, continue to scale the slope until the scaling has been completed to the satisfaction of the Project Manager.

Rockfall protection must be in place during non-working hours. Rockfall protection must be in accordance with the approved General Scaling Plan.

Remove all scaling debris produced during scaling operations from the site(s) and dispose of the material as directed by the Project Manager.

Method of Measurement. Scaling is measured by the man/crew hour. Measurement will occur from the time a scaler or scaling foreman is equipped and begins ascending the slope until the scaler or scaling foremen has descended the slope. Measurement is also made for the scaling foreman for time spent at the base of the slope when it is necessary for him to act as a spotter for a crew of at least two scalers working on the slope.

Basis of Payment. The unit price per man/crew hour for Scaling is full compensation for all labor, equipment, access, rigging, disposing of scaled debris, and materials necessary to perform the work. If power equipment (walking excavator, slusher, drag scaling system, etc.) is used for scaling, an hourly pay rate may be negotiated at the discretion of the Project Manager. No separate measurement or payment will be made for repair to the roadway and associated structures damaged during the scaling operation, or scaling debris cleanup.