

26-04-61-02

Harmon Tunnel Highwall (Bluff) Scaling Requirements

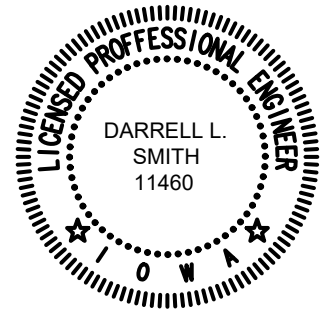
Pammel Park Road; Winterset, Iowa 50273

Madison County, Iowa



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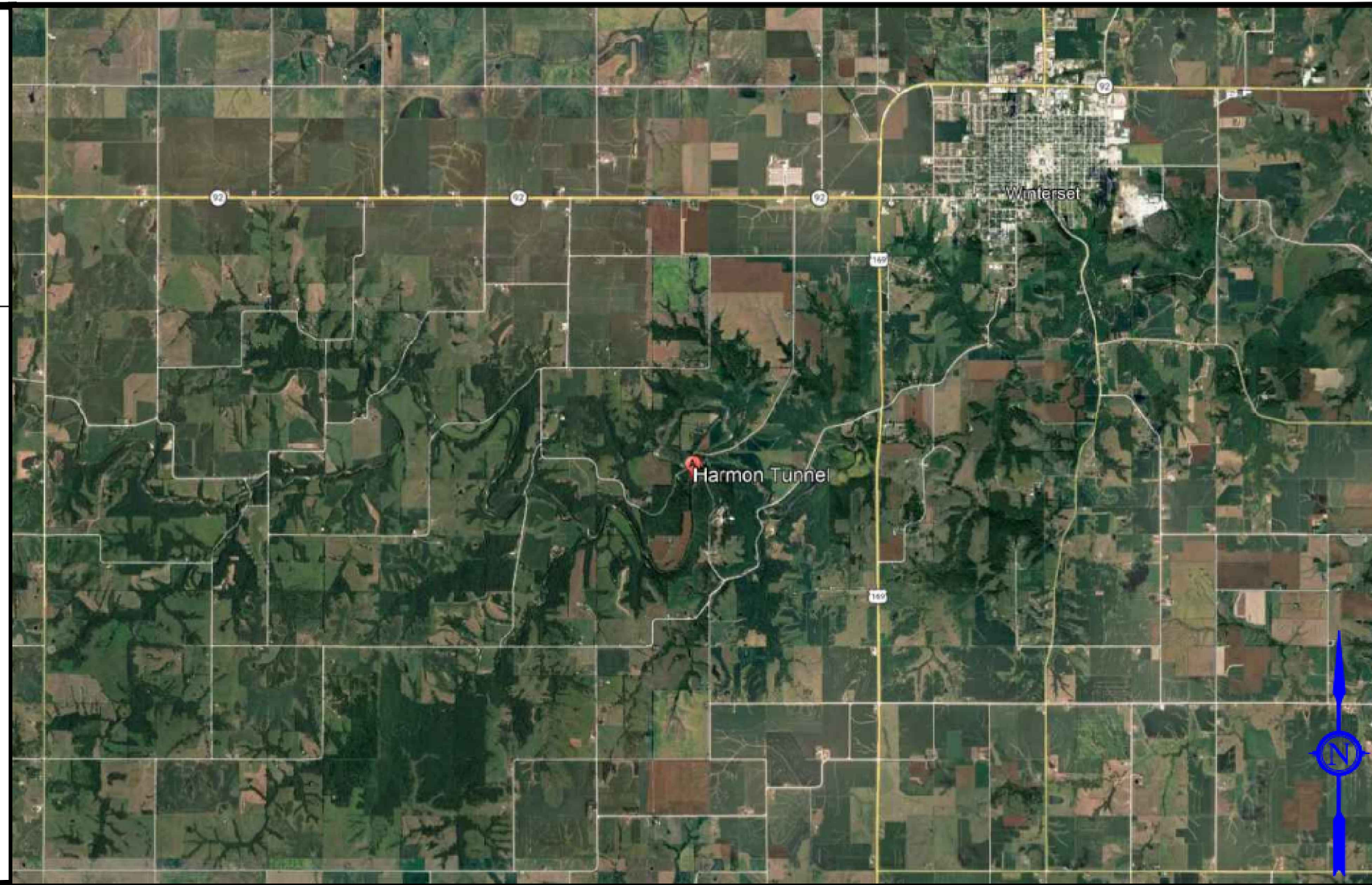


I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY CERTIFIED REGISTERED PROFESSIONAL ENGINEER BY THE INTERNATIONAL INSTITUTE OF BUILDING ENCLOSURE CONSULTANTS

Darrell Smith 06/5/2026

DARRELL SMITH, P.E
 LICENSE NUMBER 11460 20_26
 PAGES OR SHEETS COVERED BY THIS SEAL

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TITLE SHEET / INDEX

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 Pammel Park Road; Winterset, Iowa 50273
 Madison County, Iowa

Rev.	Date	By	Description

Drawn By: DJH Date: 5/15/26
 Approved By: Date:

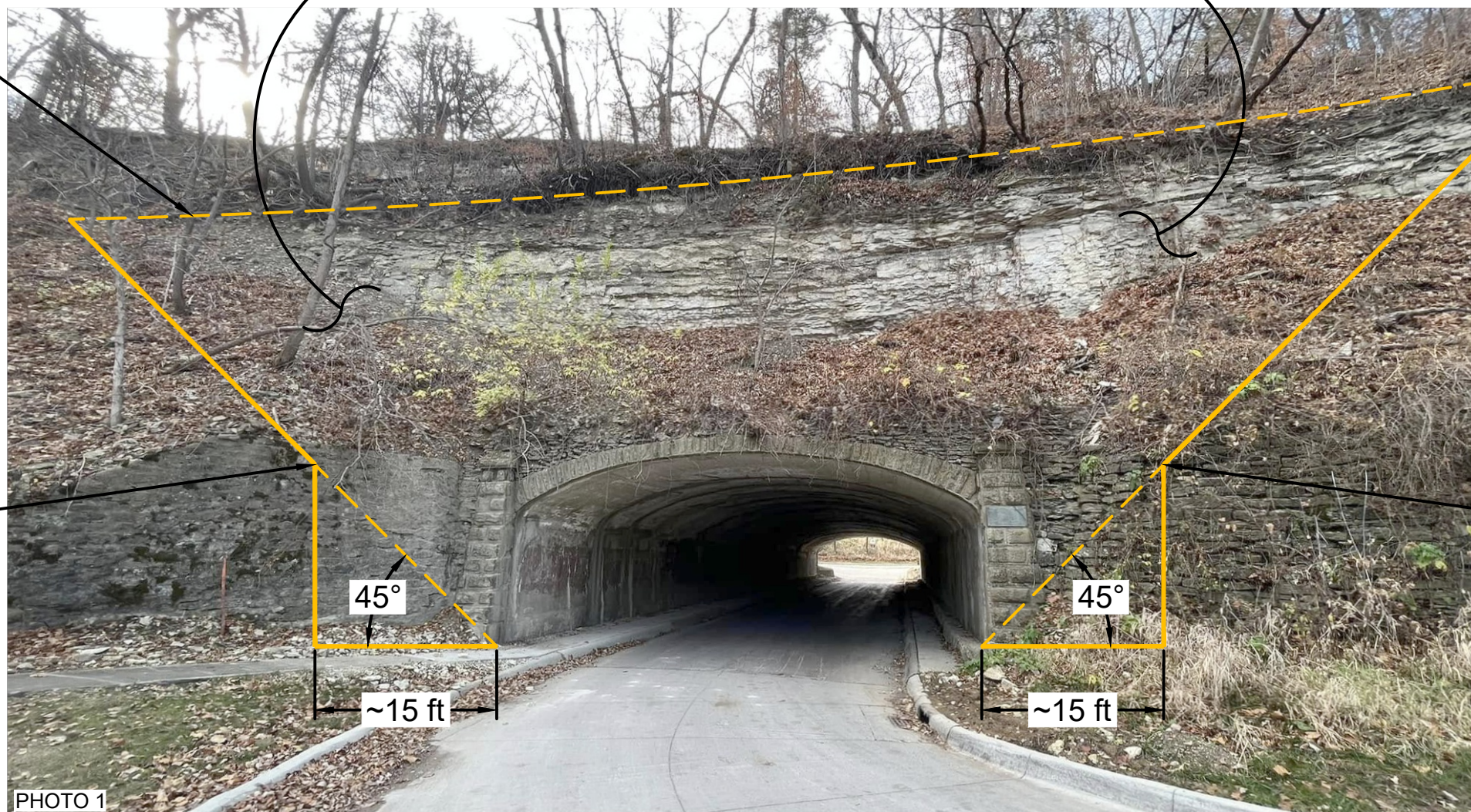
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 ON 11 X 17 SHEET

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AREA TO BE SCALED IN ACCORDANCE WITH THE ATTACHED SPECIFICATIONS PREPARED BY ECS

EXTEND SCALING AS NECESSARY ABOVE TOP OF HIGHWALL



ZONE OF INFLUENCE LIMITS

ZONE OF INFLUENCE LIMITS

NORTHEAST ENTRANCE



DANGEROUS FALL ROCK DEBRIS

SOUTHWEST ENTRANCE

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EXTEND SCALING AS NECESSARY ABOVE TOP OF HIGHWALL

ZONE OF INFLUENCE LIMITS

ZONE OF INFLUENCE LIMITS



PHOTO 3

SOUTHWEST ENTRANCE



PHOTO 4

DANGEROUS FALL ROCK DEBRIS



NORTHEAST ENTRANCE

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HARMON TUNNEL HIGHWALL (BLUFF) SCALING REQUIREMENTS TEMPORARY REPAIRS

Pammel Park Road; Winterset, Iowa 50273
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- I. DESCRIPTION** - This work includes the removal of loose or potentially unstable disjointed spalled/ exfoliated bedrock fragments and talus above/ around both tunnel portal highwalls (within the zone of influence as depicted in these Drawings) by manual, mechanical or chemical (non-explosive) methods. Includes removal and disposal of all spoil resulting from the highwall scaling operation and all loose material located in the area between the 'zone of influence' and the tunnel pavement. Blasting is not permitted.
- II. SUBMITTALS** - Prepare and submit a detailed project Work Plan to the Iowa Department of Natural Resources (Owner) and ECS Midwest (Consultant) at least ten (10) working days prior to beginning the scaling work. Include the following information in the Work Plan:
- Schedule.** Outline the proposed construction sequence and schedule.
 - 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.
 - 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.
 - 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.
 - 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 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. The complete and thorough protection of the stacked stone retaining walls, tunnel arches, and all other historic/ architectural elements of the tunnel is imperative for this project.
 - Traffic Control.** Follow the Work Zone Traffic Control Plan requirements provided in the contract including any Iowa DOT Section 8030 special provisions. It is our understanding that the tunnel will be closed to traffic during this construction sequence. Existing road signs will be modified as required for construction access and 'Roadway Closed' for other traffic. Any proposed changes or additions to the traffic control plan must meet the current Iowa DOT Temporary Traffic Control Guidelines (including changes) and be approved by the Consultant and Owner.
 - Protection Plan.** Describe methods and procedures to be used to protect personnel and the public from all harm, and all adjacent tunnel facilities, and structures from damage. Include provisions to protect the adjacent roadway 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 solely responsible for restoring, repairing, or recompense for any damage or injury caused by this work. Suggested protection methods include wood shoring and use of heavy protection blankets. Protection plan shall be submitted to Consultant and IDNR for review and comments. Contractor is solely responsible for providing protection.
 - Emergency Management Plan.** Contractor shall succinctly describe and outline the plan of action for a 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 restrictions.
 - The contractor's proposed Work Plan submission must be approved in writing by the authorized Iowa Department of Natural Resources and/or Iowa DOT representative(s) prior to beginning any scaling work.

CONSTRUCTION - Proceed according to the approved Work Plan and schedule. The work will remove loose, exfoliated or unstable disjointed rocks, boulders, large projecting rock blocks, and overhangs from the slope as indicated on the ECS drawings and as directed by the Consultant and/or Owner. Contractor shall supply all materials, equipment, and labor required to perform the work.

- Prevent damage to adjacent roadway facilities and tunnel components, any existing rockfall protection structures and appurtenances, and any adjacent or local private facilities. Repair or replace any pavement, guiderail, 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 State of Iowa. The complete protection of the stacked stone retaining walls, tunnel arches, and all other historic architectural elements of the tunnel is imperative for this project. Contractor is solely responsible for providing protection.
- Provide adequate means to protect all personnel and surrounding property from injury and/or damage during rock scaling and all other activities. Submit methods of protecting workers to the Consultant and Owner 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 conversely the failure to exercise) control on the part of the Owner and Consultant shall in no way relieve the Contractor of responsibility for any injury or damage.
- During rock removal, provide sufficient qualified personnel for fully staffed scaling crews at all times.
- 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. Blasting is not allowed.
- Perform scaling as required to provide safe conditions after completion. Provide, operate and maintain telecommunication inspection equipment to allow for both audio and video communication between each rock scaling crew to effectively communicate the slope conditions, or issue alerts regarding unstable conditions.
- Rock scaling will start at the top of the slope and proceed downward toward the tunnel/ roadway, thereby removing all loose rocks and unstable blocks as the work progresses.
- 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 as directed by the Consultant or Owner. Submit corrective action plan and analysis to Consultant and Owner 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 Consultant and Owner. All work for corrective action resulting from damages from activities not directed or approved by the Consultant and/or Owner will be conducted at no additional cost to the Owner.
- Do not remove fragments/ pieces of rock that will result in undercutting of overlying material. Submit a corrective action plan to the Consultant and Owner 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, Owner and Consultant review, and implementation of the plan.
- Remove any overhanging rock as directed by the Consultant and/or Owner.
- Trim vegetation on the slope face and top of slope to the limits shown on the drawings or as directed by the Consultant and /or Owner. Cut trees to a height of not more than four inches above the ground line.

u. If chemical expansion agents are used, store securely until use. Handle and use all chemicals according to the manufacturer's instructions.

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

w. 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 IDNR/ IDOT directives. The frequency of removal will not exceed one fifteen-minute period per two hours unless longer or more frequent periods are to maintain a safe and efficient worksite, as directed and/or approved by the Consultant.

x. 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 Consultant and/or Owner during or upon completion of each portion of rock scaling.

y. Scaling and/or removal of rock that is required to be carried out below or beyond the grades shown on the plans, below or beyond the limits established by the Consultant shall be provided to Consultant prior to such operations for review and approval. If required a change order for such will be prepared for additional cost to the contract. Bedrock or other materials removed for the convenience of the contractor are at the contractor's expense.

III. GENERAL

Be advised that rattlesnakes are known to be located near the active construction area and are a protected species in Iowa

IV. MEASUREMENT AND PAYMENT

LUMP SUM COST FOR EACH;

a. Mobilization.

Lump sum price for Mobilization shall include includes preparatory work, operations performed, or costs incurred prior to beginning work on the various items on the project site. Includes

- The movement of personnel, equipment, and supplies to the project site.
- The establishment of offices, buildings, and other facilities necessary for the project.
- Bonding, permits, or other expenses incurred prior to construction.

b. Scaling.

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.

Lump sum price for Scaling includes the cost of furnishing all the materials, tools, equipment, labor, and incidentals necessary to complete the scaling work. This item includes the removal of all scaled rock materials, 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.

c. Scaled Material Disposal.

Lump sum 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 approved disposal site. Disposal of rock debris from the project will be the contractor's responsibility. There will not be a designated disposal location provided.



SPECIFICATIONS

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