



SUBMITTAL

WIRE MESH

SYSTEM

MIDWEST ROCKFALL, INC. WORK PLAN	Project No.:	0297(8)	Item Description:	Wire Mesh Slope Protection
	Project Name:	HighGate STP	Item No:	
	Location:	HighGate , VT	Quantity / Units	2500 SF
	Prepared By:	Luke Fetzer	Date:	6/17/2013

Work Description	WORK PLANS
Sequence and Schedule	Worker will access the slope with using rope access techniques using the SPRAT method. Workers will then survey the slope for any apparent dangers or loose debris and perform scaling as directed by the engineer. Next the workers will stage rolls of mesh adjacent to the slope for the particular lifting equipment to be used .
Rope Access Method	Workers will access the slope using the SPRAT method. Safety plan attached separately
Drilling Method	Workers will utilize a Marini drill slide attached to a mini excavator. The slide will be equipped with a Atlas Copco DTH with a 4" bit. High pressure air will pass through the drill stems releasing the cuttings from the top of the hole.
Anchor Grout Placement	Workers will place tremmie tubes to each anchor, then place the grout hose directly to the end of the tremmie tube, next they will pump the grout until it reaches the top of the hole, finally workers will fill the "birds beak" using the dry pack method.

Work Description	Labor Type	QTY	Units	Units / Day	Total Days	Hours / Day	Days / Week	Reg. Hrs	O.T. Hrs	Total Hours
Wire Mesh installation	High Scaler	2,500	SF	1,250	2.0	10	2	20	0	20
	Operator	2,500	SF	1,250	2.0	10	2	20	0	20
Soil Anchors	Drill Operator	1,260	LF	150	8.4	10	5	74	10	84
TOTAL WORKING DAYS										10

Work Description	Equipment	QTY	Rental Period	Standby Hrs	Operating Hrs
Wire Mesh installation	Mini Excavator	1	0	10	40
Top Anchor installation	375 CFM air compressor/ Marini Drill Slide	1	0	10	84
Wire Mesh installation	Pneumatic Hogringer	3	0	10	40

Quantity	Units	Material Description	ASTM / AASHTO
2,500	SF	Wire Mesh	Material Data Sheets Attached Separately
		Grout	
1,260	LF	Threaded Bar and Accessories	

Description	Reference	Quality Assurance	Additional Attachments
		Field Tested Anchors	
		Certificates of Conformance	

MIDWEST ROCKFALL, INC. EMPLOYEE NAME RESUME	Project Name: HighGate STP	Employee Name: Erasto Quintero
	Project No: 0297(8)	Item No:
	Item Name: Wire Mesh/Rock Anchor	Date: 6/17/2013

RESUME NARRATIVE

Erasto Quintero has a extensive background in rockfall mitigation. Just with Midwest Rockfall he has Accumulated over 2800 hrs of rock scaling, over 35,500 lf of rock drilling, 42,000 sf of shotcrete, has helped install over 2 million sf of rockfall mesh, 650,000 sf of cable net, and has been a part of installing almost 4 miles of various rockfall fences.

PROJECT EXPERIENCE & REFERENCES				
DATE	PROJECT NAME	OWNER	CONTACT INFORMATION	WORK DESCRIPTION
Jan-2012 May-2012	Georgetown Rockfall IM 0703-368	CDOT	Jim Van Dyne 303-324-8408 4210 E. Arkansas Ave. Denver, CO	900 lf Rockfall Fence / 26,300 sf Cable Net 140 hrs Scaling
May-2012 Jun-2012	Red Mountain Pass NH 5502-070	CDOT	Ty Ortiz 303-589-0573 4210 E. Arkansas Ave. Denver,CO	300 hrs Scaling / 980 lf Rock Bolts 16,000 sf Cable Net / 25,000 lb Polyurethane
May-2012 Sep-2012	Stevens Pass 008229	WSDOT	Mike Andreini PO Box 98 Wenatchee, WA 98807	510 hrs Scaling / 1,400 LF Rock Bolts 30,100 sf Cable Net
Jan-2013 May-2013	Georgetown Rockfall IM 0703-384	CDOT	Jim Van Dyne 303-324-8408 4210 E. Arkansas Ave. Denver, CO	690 lf Rockfall Fence / 149,500 sf Cable Net 110 hrs Scaling
Oct-2007	Summit County Scaling Green Mountain	Summit County Public Works	John Polhemus 970-668-4231 PO Box 626 Frisco, CO 80401	200 Crew hrs scaling
Feb-2008	Hanging Lake Tunnel Extensometer Install	CDOT	Ty Ortiz 303-589-0573 4210 E. Arkansas Ave. Denver,CO	high angle install of 16 extensometers
Feb-2008	Miner's Mesa Rock Stabilization	City of Blackhawk	Jim Ford 303-582-2237 Black Hawk, CO	70,000 sf wire mesh 400 crew hrs scaling 60 mesh anchors
May-2008	Paonia Rockfall Fence	Private Homeowner	Brandon Glimpse 970-234-1485 31136 Lazear Rd. Hotchkiss, CO	500 lf rockfall fence
Sep-2009	Guanelia Pass	Central Federal Lands Hwy. Div.	Tony Swedin 720-284-7868 7353 S. Eagle St. Centennial, CO	400 lf rockfall fence 330 crew hrs scaling 1,100 lf dowels 80,000 cable net/ wire mesh
Aug-2010	Moran Junction Slope Remediation	WYDOT	Muareen Larson 406-233-3220 Po Box 400 Miles City, MT 59301	18,000 sf wire mesh 30 crew hrs scaling
Apr-2009	ITD Landslide	ITD	Andy Erquigua 208-465-4778 16200 N. 20th St. Nampa , ID	1,000 lf rockfall fence
Oct-2008	Summit County Scaling Dillon Dam	Summit County Public Works	John Polhemus 970-668-4231 PO Box 626 Frisco, CO 80401	200 Crew hrs scaling
Oct-2008	Dowd Junction	CDOT	Ben Arnt 303-781-9590 420 Seventh St. Glenwood Springs	80,000 sf wire mesh 110 mesh anchors
Mar-2011	Mine Adit Closure	City of Blackhawk	Jim Ford 303-582-2237 Black Hawk, CO	2,500 sf shotcrete
Nov-2011	Hyampom Road	Western Federal Lands Hwy. Div.	Steve Manning 530-222-0810 Po Box 491660	375 crew hrs scaling 180,000 sf wire mesh 300 mesh anchors
Feb-2009	Boulder Canyon Trail	Boulder Parks & Recreation	Renee Edick 303-678-6235 9595 Nelson Rd Longmont, CO	30 crew hrs scaling 14,000 sf wire mesh 30 mesh anchors
Apr-2009	US-12 West Side White Pass	WASDOT	Robert Fleming 509-930-0221 Yakima, WA	3,000 lf rock bolts 90,000 sf wire mesh 450 crew hrs of scaling 4,500 sf shotcrete

PROJECT EXPERIENCE & REFERENCES

DATE	PROJECT NAME	OWNER	CONTACT INFORMATION	WORK DESCRIPTION
Sep-2009	Trail Ridge Road	Central Federal Lands Hwy. Div.	Dennis Black 970-627-5467 Lakewood, CO	1,200 lf of historic guardwall remediation
Oct-2009	Hartford-Newbury Rockfall Mitigation	VADOT	Tom Eliassen 802-828-6916 One National Life Dr. Montpelier, VT	400 lf hybrid rockfall fence 500 crew hrs scaling 2,800 lf of rock dowels
Feb-2010	Christensted Bypass	Central Federal Lands Hwy. Div.	Better Roads Asphalt PO Box 21420 San Juan, PR 00928	45,000 sf cable net 200 crew hrs scaling 55 mesh anchors
Jun-2010	City of Georgetown Rockfall Fence	City of Georgetown	Fischer Construction 303-485-8855 7460 Weld County Rd. 1 Longmont, CO	550 lf rockfall fence
Jan-2010	Xcel Energy Road Drainage	Xcel Energy	Ken Elliott 303-571-7503 1800 Larimer St. Suite 400 Denver, CO	900 lf of high angle ditch paving high angle culvert and pipe install
Aug-2011	I-70 Rockfall Mitigation	CDOT	Jim Van Dyne 303-324-8408 4210 E. Arkansas Ave. Denver, CO	50 crew hrs scaling 102,000 sf wire mesh 14,000 sf cable net 120 lf fence 2,200 lf anchors
Apr-2010	Cabin Creek Landslide	Central Federal Lands Hwy. Div.	Kumar & Associates 303-742-9700 2390 S Lipan St. Denver, CO	install of temporary rockfall barrier install of slope monitoring system
Jul-2010	Norwood Hill Rockfall Mitigation	CDOT	Tom Allen 970-384-1442 3803 N. Main Ave. 200 Durango, CO	85,000 sf cable net 15,000 sf wire mesh 900 lf of rock bolts 450 crew hrs scaling
Jul-2010	BNSF Railroad Derailment	BNSF	Neil McCulloch 400 N 34th St. suite 100 Seattle, WA	75 crew hrs of scaling 2,300 of rock bolts 6,000 sf of shotcrete
Jul-2010	Beartooth Highway	Central Federal Lands Hwy. Div.	Grant Johns 4901 S.Windermere St. Littleton, CO	3,000 sf of veneer stone facing
Aug-2010	US-285 Rockfall Mitigation	CDOT	Brannan Sand & Gravel 2500 Brannan way Denver, CO	350 crew hrs of scaling 45,000 sf of cable net 35 cable anchors
Sep-2010	I-91 Rock Stabilization	Winterset Construction	Jason Waysville PO Box 968 Lyndonville, VT 05851	400 crew hrs scaling 2,100 lf rock dowels
Oct-2009	Summit County Scaling Green Mountain	Summit County Public Works	John Polhemus 970-668-4231 PO Box 626 Frisco, CO 80401	300 crew hrs scaling
Oct-2010	Seven Falls Rock stabilization	Harrison Western Construction	Steve Johnson 720-206-4499	55,000 sf cable net 75 mesh anchors Various high angle light replacement
Jan-2011	Walmart Slope Remediation	McCrary Construction	Bill Osbourne 803-799-8100 1280 Assembly St. Columbia, SC 29201	365,000 sf cable net 100 crew hrs scaling 900 lf of rockfall fence
Sep-2011	Moran Junction Rockfall Mitigation	Oftedal Construction	Muareen Larson 406-233-3220 Po Box 400 Miles City, MT 59301	200 crew hrs of scaling 180,000 sf wire mesh 200 mesh anchors
Dec-2010	Manilla Creek Road	WASDOT	Brandi Coliyer 509-324-6242 Spokane, WA	300 crew hrs of scaling 2,200 lf rockbolts 55,000 sf wire mesh
May-2011	I-70 Rockfall Mitigation	I-70 Rockfall Mitigation	Jim Van Dyne 303-324-8408 4210 E. Arkansas Ave. Denver, CO	1,300 lf rockfall fence 65,000 cable net 200 crew hrs of scaling 11,000 sf ring net
Aug-2011	Dix Dam Rockfall Mitigation	Kentucky Utilities	Dave Beck 859-748-4424 815 Dix Dam Rd. Harrodsburg KY	85,000 sf cable net 900 lf rockfall fence 100 crew hrs scaling 2000 lf rock dowels

MIDWEST ROCKFALL, INC. EMPLOYEE NAME RESUME	Project Name: HighGate STP	Employee Name: Luke Fetzer
	Project No: 0297(8)	Item No:
	Item Name: Wire Mesh/Rock Anchor	Date: 6/17/2013

RESUME NARRATIVE

Luke Fetzer has a extensive background in rockfall mitigation. Just with Midwest Rockfall he has Accumulated over 1800 hrs of rock scaling, over 7,500 lf of rock drilling, 72,000 sf of shotcrete, has helped install over 2 million sf of rockfall mesh, 450,000 sf of cable net, and has been a part of installing almost 4 miles of various rockfall fences.

PROJECT EXPERIENCE & REFERENCES				
DATE	PROJECT NAME	OWNER	CONTACT INFORMATION	WORK DESCRIPTION
Sep-2007	Tricon Engineering Exploratory Drilling	NCDOT	Tri-Con Engineering 336-668-0093 Boone, NC	350LF Exploratory Drilling
Sep-2007	CDOT Rockfall Fence Testing	CDOT	Ty Ortiz 303-589-0573 4210 E. Arkansas Ave. Denver, CO	30 crew hrs scaling 95,000 sf cable net 800 lf rockbolts 4,750 shotcrete
Mar-2009	PENNDOT Rockfall Fence Relocation	PENNDOT	Jarred Musser 412-462-9300 Po Box 98100 Pittsburgh, PA	1,100 lf of Rockfall fence
Oct-2007	SH 67 Rockfall Mitigation	PW Construction	Melissa Levison 843-388-2027 Cripple Creek, CO	404 crew hrs scaling 30 mesh anchors 18,000 sf wire mesh
Oct-2007	Summit County Scaling Green Mountain	Summit County Public Works	John Polhemus 970-668-4231 PO Box 626 Frisco, CO 80401	200 Crew hrs scaling
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MAC.RO. SYSTEMS—Rock Mesh B600P METAL COMPOSITE GRID (Patent Pending)

Product Description

Rock Mesh B600P is a woven composite product made of steel wire and metallic ropes woven together during the production of the hexagonal double twisted wire mesh. The metallic ropes are used in place of the conventional selvedge wire and are also inserted longitudinally in the woven mesh. Metallic ropes are also inserted in the cross direction of the double twist of the mesh and secured to the edge ropes during the production (B – bi oriented).

The composite is particularly suitable for rockfall protection as a drapery system for surface or soil veneer slope stability. The weaving of the ropes inside the steel mesh is creating a cable panel of 2 ft (0.61 m) by 2 ft (0.61 m). This cable is secured using the wire mesh connection strength.

The steel wire used in the manufacture of the Rock Mesh B600P is heavily galvanized and PVC coated. Besides our standard gray, the PVC coating is also available in black, tan and brown.

The metallic hexagonal wire mesh has the same characteristics of the one used in the production of gabions. The double twist provides a high resistance to the thrust and impact of rocks avoiding the propagation of wire ruptures. The wire mesh has two functions: protecting the area from smaller rock and a connecting device for the rope panel of 2 ft (0.61 m) by 2 ft (0.61 m).

Wire

All tests on wire must be performed prior to manufacturing the mesh.

- 1. Tensile strength:** the wire used for the manufacture of mesh shall have a maximum tensile strength of 75,000 psi (515 MPa) according to ASTM A641/A641M-03. Wire tolerances (Table 3) are in accordance with ASTM A641/A641M-03.
- 2. Elongation:** Elongation shall not be less than 12%, in accordance with ASTM 370. Test must be carried out on a sample at least 12 in. (25 cm) long.
- 3. Zinc Coating:** minimum quantities of zinc shown at Table 3 meet the requirements of ASTM A641/A641M-03, Class III.
- 4. Adhesion of Zinc:** the adhesion of the zinc coating to the wire shall be such that, when the wire is wrapped six turns around a mandrel having four times the diameter of the wire, it does not flake or crack when rubbing it with the bare fingers.

P.V.C. (Polyvinyl Chloride) Coating for Wire

The technical characteristics and the resistance of the PVC to aging should meet the relevant standards. The main values for the PVC material are as follows:

- The initial property of the PVC coating shall be in compliance with ASTM A975-97 section 8.2.
- Prior to UV and abrasion degradation, the PVC polymer coating shall have a projected minimum durability of 60 years when tested in accordance with *UL 746B Polymeric Material—Long Term Property Evaluation* for heat aging test.

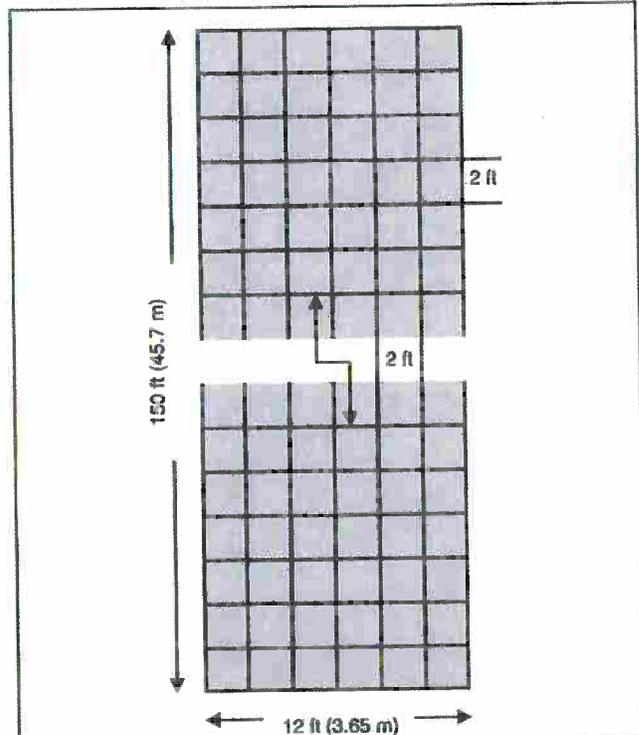


Figure 1



Figure 2

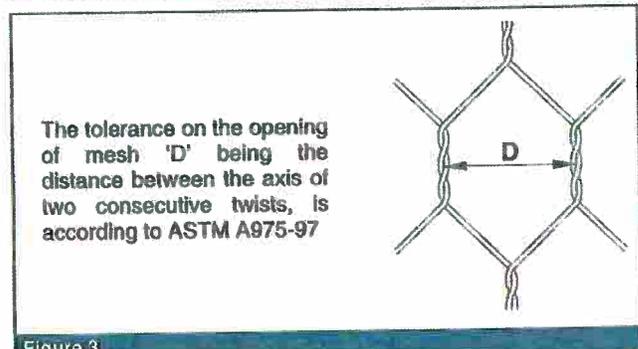


Figure 3

Table 1—PVC Coated Steel Rope Specifications

Drawn steel ropes type 7 x 19	ASTM A1023
Internal diameter nominal	1/4 in. (6.35 mm)
External with PVC diameter nominal	5/16 in. (8 mm)
Galvanized steel	ASTM A1023
Minimum breaking load of the rope	7000 lb. (31.1 kN)
Tolerances	ASTM A1023

Table 2—Standard Products

Type	Length ft. (m)	Width ft. (m)	Longitudinal Rope Spacing ft. (m)	Transversal Rope Spacing ft. (m)
Rock Mesh B600P	150 (45.7)	12 (3.65)	2 (0.61)	2 (0.61)

Table 3—Standard Wire Mesh

Mesh type		8 x 10
Wire mesh	ø in. (ø mm)	0.106 (2.70)
Wire+PVC diameter	in. (mm)	0.146 (3.7)
Wire tolerances	(±) ø in. ((±) ø mm)	0.004 (0.1)
Zinc minimum quantity	oz/ft ² (gr/m ²)	0.30 (244)
Longitudinal and transversal rope	ø in. (ø mm)	0.312 (7.94)

PVC coating is available in four colors:



Figure 5

Table 4—Product Tensile Strength Per Cable Mesh Opening

Longitudinal minimum tensile strength	B600P	93 kN/m
Transversal minimum tensile strength	B600P	93 kN/m

Quantity Request

When requesting a quotation, please specify:

- number of units,
- color,
- type of coating.

EXAMPLE: No. 100 black B600P rock mesh units, wire diameter 0.146 in., galvanized and PVC coated.

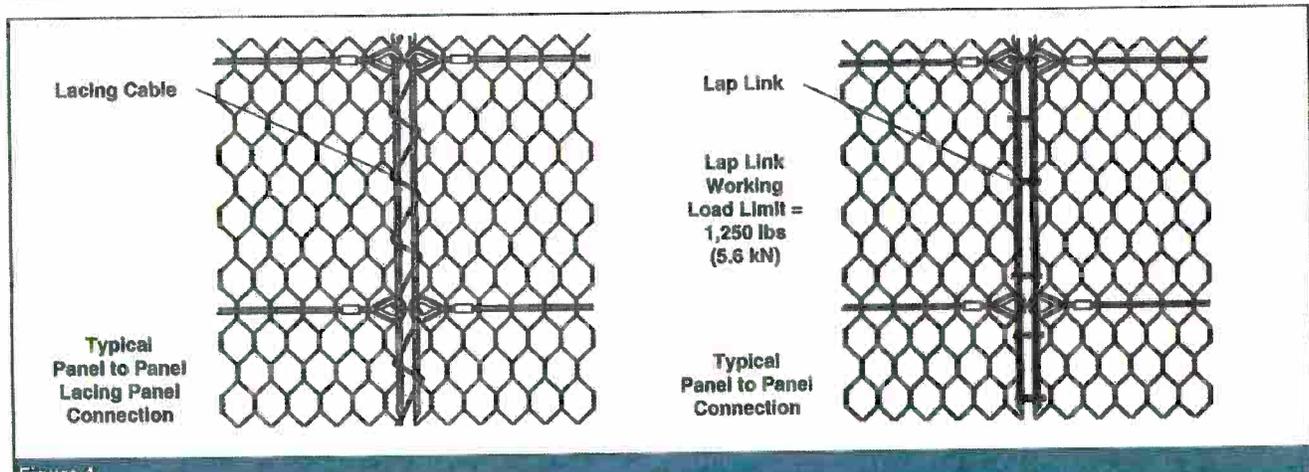


Figure 4

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WILLIAMS
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Grade 75 All-Thread Rebar

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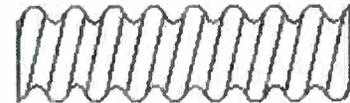
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Structural Properties	
Minimum Yield	Ultimate Tensile
75 KSI (517 MPa)	100 KSI (689 MPa)
Typical Elongation in 8" bar	
7%-9%	



Unique Thread Form

R61 Grade 75 All-Thread Rebar - ASTM A615

Bar Desig. & Nominal Dia.	Minimum Net Area Thru Threads	Minimum Ultimate Strength	Minimum Yield Strength	Nominal Weight	Approx. Thread Major Dia.	Part Number
#6 - 3/4" (20 mm)	0.44 in ² (284 mm ²)	44 kips (196 kN)	33 kips (147 kN)	1.5 lbs./ft. (2.36 Kg/M)	7/8" (22.2 mm)	R61-06
#7 - 7/8" (22 mm)	0.60 in ² (387 mm ²)	60 kips (267 kN)	45 kips (200 kN)	2.0 lbs./ft. (3.04 Kg/M)	1" (25.4 mm)	R61-07
#8 - 1" (25 mm)	0.79 in ² (510 mm ²)	79 kips (351 kN)	59.3 kips (264 kN)	2.7 lbs./ft. (3.94 Kg/M)	1-1/8" (28.6 mm)	R61-08
#9 - 1-1/8" (28 mm)	1.00 in ² (645 mm ²)	100 kips (445 kN)	75 kips (334 kN)	3.4 lbs./ft. (5.06 Kg/M)	1-1/4" (31.8 mm)	R61-09
#10 - 1-1/4" (32 mm)	1.27 in ² (819 mm ²)	127 kips (565 kN)	95.3 kips (424 kN)	4.3 lbs./ft. (5.50 Kg/M)	1-3/8" (34.9 mm)	R61-10
#11 - 1-3/8" (35 mm)	1.56 in ² (1006 mm ²)	156 kips (694 kN)	117 kips (521 kN)	5.3 lbs./ft. (7.85 Kg/M)	1-1/2" (38.1 mm)	R61-11
#14 - 1-3/4" (45 mm)	2.25 in ² (1452 mm ²)	225 kips (1001 kN)	169 kips (750 kN)	7.65 lbs./ft. (11.8 Kg/M)	1-7/8" (47.6 mm)	R61-14
#18 - 2-1/4" (55 mm)	4.00 in ² (2581 mm ²)	400 kips (1779 kN)	300 kips (1335 kN)	13.6 lbs./ft. (19.6 Kg/M)	2-7/16" (61.9 mm)	R61-18
#20 - 2-1/2" (64 mm)	4.91 in ² (3168 mm ²)	491 kips (2184 kN)	368 kips (1637 kN)	16.7 lbs./ft. (24.8 Kg/M)	2-3/4" (69.9 mm)	R61-20
#24 - 3" (76 mm)	6.82 in ² (4400 mm ²)	682 kips (3034 kN)	511 kips (2273 kN)	24.0 lbs./ft. (35.8 Kg/M)	3-3/16" (81 mm)	R61-24
#28 - 3-1/2" (89 mm)	9.61 in ² (6200 mm ²)	960 kips (4274 kN)	720 kips (3206 kN)	32.7 lbs./ft. (48.6 Kg/M)	3-3/4" (95.0 mm)	R61-28

Sizes

All-Thread Rebar is available in 11 diameters from #6 (20 mm) through #28 (89 mm). Most diameters are available in continuous lengths up to 50' (15.2 m).

Threads

Williams Grade 75 All-Thread Rebar has a cold rolled, continuous, rounded course thread form. Because of the full 360° concentric thread form, Williams All-Thread Rebar should only be bent under special provisions. Williams special thread (deformation) pattern projects ultra high relative rib area at 3 times that of conventional rebar. This provides for superior bond performance in concrete. Threads are available in both right and left hand. Grade 80 is available upon request.

Welding

Welding of All-Thread Rebar should be approached with caution since no specific provisions have been included to enhance its weldability. Refer to ANSI/AWS D1.4 for proper selections and procedures.

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Protection](#)



Williams Grade 75 and 150 KSI All-Thread-Bar soil nail components create an in-situ reinforcement system for the stabilization of excavations and slopes during top-down construction. Oversized holes of 4" to 10" in diameter are drilled and the centralized soil nail component is placed. The drill hole is then tremie grouted with Williams Wil-X-Cement grout. After the drill hole grout is cured, the soil nails may be torque tensioned against the protective shotcrete face to a slight load if desired.

Suggested working loads on common soil nails should not exceed 60% of the bar's ultimate strength. Pull out capacity is a function of drill hole diameter, depth, over burden stress and the angle of internal friction of the in-situ soil. Field tests are recommended to establish necessary bond lengths. However, typical anchorages in granular soils have yielded pull out strengths of 2-10 kips per foot of embedment on lengths over 10 feet.

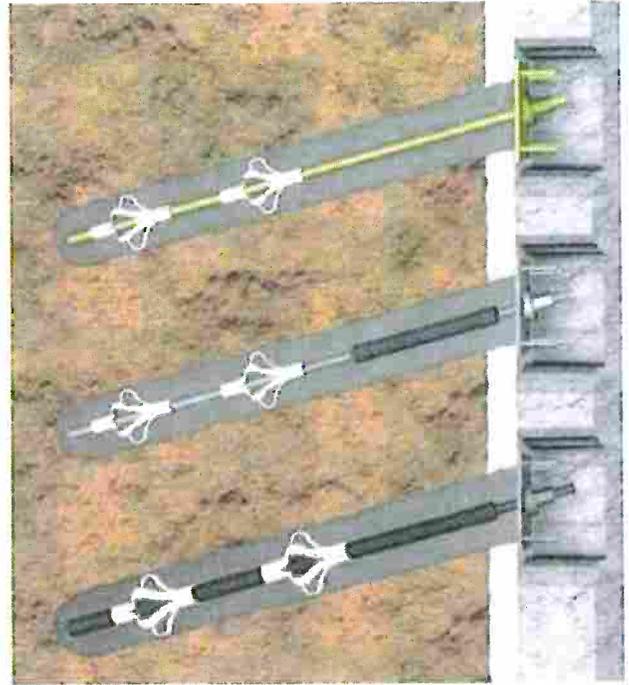
Williams All-Thread Soil Nails Offer:

- Rugged thread with precision fit for durability and ease of use.
- 360° of concentric thread for unmatched grout to bar bond.
- Mechanical stop-type couplers able to develop 100% of the bar's tensile capacity for the most reliable bar to bar connections available.
- Grades 75 and 150 KSI with full circular effective areas.
- Several options of corrosion protection including epoxy coating, galvanizing, cement grout and multiple corrosion protection for both temporary and permanent use.
- Manufacturing versatility unmatched by any soil nail supplier in North America.
- Connection abilities with structural and non-structural wall face attachments.



Cross Section of factory grouted duct and bar.

For a detailed breakdown of the parts and components involved in soil nailing, click on the image to the right.



Bars Associated with Soil Nails

For bar selection, Williams offers two continuously threaded bars. The Grade 75 All-Thread Rebar is available in lengths up to 50' for all diameters, and the 150 KSI All-Thread-Bar is available up to 50' in length for 1", 1-1/4" and 1-3/8" and up to 25' in length for 1-3/4" diameter. Also available is the Williams / MAI Hollow Bar system.



[Soil Nail Information](#)

[Parts & Accessories](#)

[Installation Equipment](#)

[Case Histories](#)

[Corrosion Protection](#)

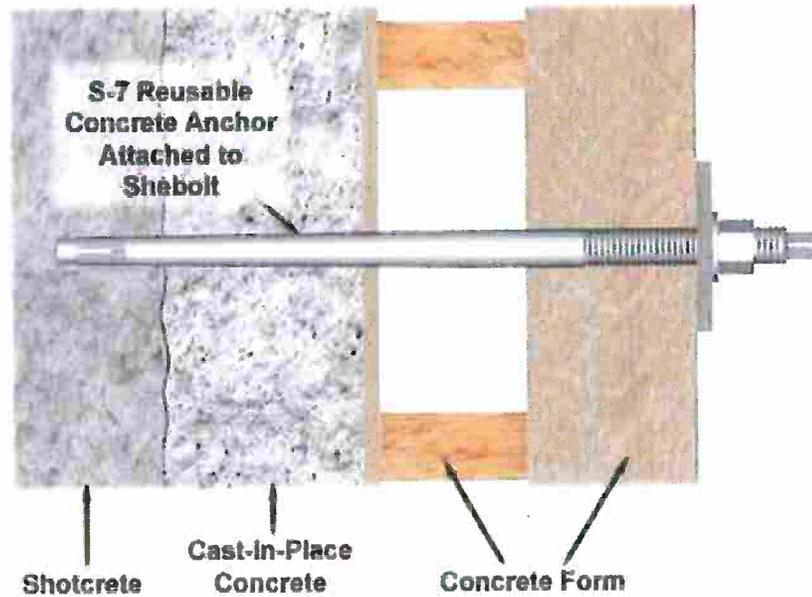
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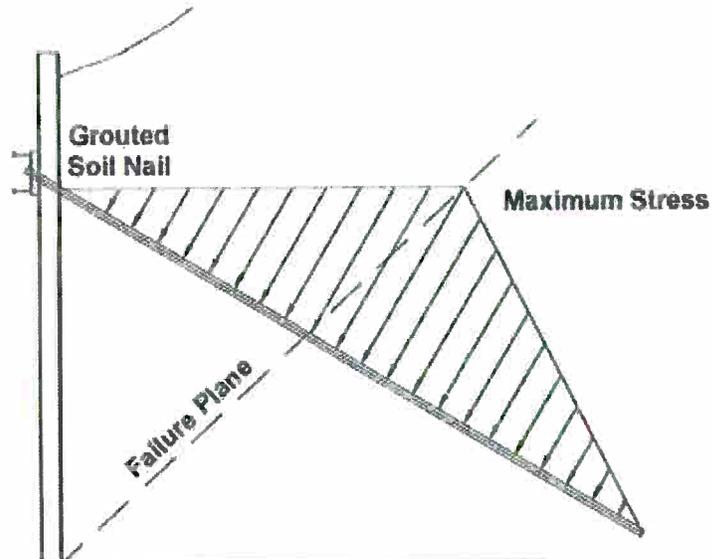
One Sided Wall Forming

Williams offers an extensive line of concrete forming hardware that can be used in conjunction with soil nails for permanent wall forming. Williams offers she-bolts and coupling systems capable of developing 100% of the bar strength.



Stress Distribution of a Soil Nail

As the soil loads the grouted nail, the stress starts at the back of the nail behind the active zone failure plane and reaches a maximum stress at the failure plane. The stress dissipates from the failure plane through the active zone to the flexible front fascia. The shotcrete fascia can be very thin, as there is very little force at the face.



Soil Nail Specifications



PORTLAND CEMENT

PRODUCT No. 1124-31, -47, -94

DIVISION 3
Cement 03 05 00

PRODUCT DESCRIPTION

QUIKRETE® Portland Cement is a high quality Portland cement meeting ASTM C 150 Type I.

PRODUCT USE

QUIKRETE® Portland Cement is used for making high strength repair mortars, concrete and for any other applications requiring Type I Portland cement. In many locations the product also meets ASTM C 150 Type II. Consult your supplying plant to confirm compliance with ASTM C 150 Type II.



SIZES

- QUIKRETE® Portland Cement
 - 31 lb (14 kg) bags
 - 47 lb (21.3 kg) bags
 - 94 lb (42.6 kg) bags
 - 40 kg (88 lb) bags
 - 42 kg (93 lb) bags

YIELD

• Yield depends on application. For concrete mixes: Five to six 94 lb (42.6 kg) bags of QUIKRETE® Portland Cement is typically used with appropriate proportions of sand and gravel to produce 1 cu. yd. (0.8 m³) of concrete.

TECHNICAL DATA

QUIKRETE® Portland Cement complies with ASTM C 150 Type I and in many locations also complies with ASTM C 150 Type II. The product is used in a variety of construction materials. Typical mix designs for some applications are listed below:

Concrete Mix

- 1 Part QUIKRETE® Portland Cement
- 2 Parts QUIKRETE® All-Purpose Sand (ASTM C-33)
- 3 Parts QUIKRETE® All-Purpose Gravel (ASTM C-33)

Mortar Mix (Type S, per ASTM C-270)

- 1 Part QUIKRETE® Portland Cement
- 1/2 Part QUIKRETE® Hydrated Lime -Type S
- 3-1/2 to 4-1/2 Parts QUIKRETE® Masonry Sand (ASTM C-144)

Scratch and Brown Coat Stucco Mix (per ASTM C-926)

- 1 Part QUIKRETE® Portland Cement
- 1/2 Part QUIKRETE® Hydrated Lime (Type S)
- 4-1/2 to 6 Parts QUIKRETE® Washed Plaster Sand (ASTM C-897)

INSTALLATION

Installation methods are specific for each type of product.

PRECAUTIONS

The following points apply to all products made from Portland cement:

- Protect from freezing for at least 24-48 hr.
- Use the minimum amount of water necessary to achieve the desired consistency. Adding too much water will weaken the product.
- Keep the product damp for several days to obtain proper curing.

WARRANTY

The QUIKRETE® Companies warrant this product to be of merchantable quality when used or applied in accordance with the instructions herein. The product is not warranted as suitable for any purpose or use other than the general purpose for which it is intended. Liability under this warranty is limited to the replacement of its product (as purchased) found to be defective, or at the shipping companies' option, to refund the purchase price. In the event of a claim under this warranty, notice must be given to The QUIKRETE® Companies in writing. This limited warranty is issued and accepted in lieu of all other express warranties and expressly excludes liability for consequential damages.

The QUIKRETE® Companies
One Securities Centre
3490 Piedmont Rd., NE, Suite 1300, Atlanta, GA 30305
(404) 634-9100 • Fax: (404) 842-1425

* Refer to www.quikrete.com for the most current technical data, MSDS, and guide specifications



EMERGENCY CONTACT INFORMATION

In the event of an emergency, immediately contact 911, Midwest Rockfalls' Project Manager and company senior management. If necessary, relocate to a place of refuge or safety to make these calls. Be prepared to provide the following information at a minimum:

- 1) Identify the type of emergency (include description of the nature, source and extent of the emergency if possible).
- 2) The name of the caller.
- 3) The location of the emergency and caller.
- 4) Explain and describe what type of assistance may be necessary.
- 5) Remain on the line until told to hang up by the emergency operator.

Midwest Rockfall, Inc. Senior Management:

Ryan Fetzer at: 303-288-4970 (office)
 303-870-2372 (cell)

Project Manager & Superintendent

Luke Fetzer at: 303-870-3751 (cell)

Police:

120 1st Street
Swanton, VT 05488
(802) 868-4100

Fire Department:

Highgate
Highgate Center, VT 05459
(802) 868-7722

Closest Major Hospital: 133 Fairfield Street
St. Albans, VT 05478
(802) 524-5911

Midwest Rockfall, Inc.

Site Specific Health & Safety Plan

Project Name:

Date Prepared: 6-17-13

Project Location: Highgate, VT

INTRODUCTION

Purpose of the Site Health and Safety Plan (HASP)

The purpose of this site health and safety plan (HASP) is to protect the health and safety of Midwest Rockfall employees and personnel, and prevent accidents on this project. Accident prevention and control of hazards is the result of a well-designed and executed health and safety program. This HASP is to be used in coordination with other Midwest Rockfall written safety programs as they apply to the specific work tasks performed on this project.

Scope of Work

The project involves installing a wire mesh slope stabilization system under a bridge abutment in Highgate, VT

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Much of the work performed at height will take place with employees working from an aerial lift or a suspended personnel platform (man lift) placed into position by the mobile crane, or by personnel using personal rope access systems who have tied off to anchor posts or by other appropriate anchors. Midwest Rockfall personnel have contacted the manufacturer of the post material concerning the appropriateness of using the posts as fall protection anchor points, and have obtained approval from the manufacturer to do so.

Scope of the HASP

This HASP applies to all Midwest Rockfall employees working onsite at this project location, and/or subcontractors contracted directly to Midwest Rockfall (if any) for the purpose of assisting Midwest Rockfall to accomplish the stated scope of work.

HASP References to the Midwest Rockfall Written Safety Manual

References are made throughout this HASP to existing written safety programs found in the Midwest Rockfall Written Safety Manual. As one example, this HASP requires that all tools, material handling equipment, heavy equipment, and personal protective equipment etc., be inspected prior to use before beginning work each day. Such inspections are to be documented on a weekly basis, using the pertinent forms found in applicable existing written Midwest Rockfall safety programs. As another example, while this HASP provides guidance concerning safe work practices for the types of tasks

identified or that can be reasonably anticipated based on the scope of work, it is not intended to provide exhaustive coverage of every topic contained herein.

Often, further guidance and more detailed information can be obtained directly from the applicable Midwest Rockfall written safety programs. Users of this HASP must have readily available and be prepared to reference, the Midwest Rockfall Safety Manual as necessary and where such use is indicated by this HASP. Using both documents in a coordinated manner will help to assure optimal performance in the arena of safe work practices and to remain accident free at project workplaces.

Requirements

As a condition of employment, all Midwest Rockfall personnel assigned to this project will abide by the requirements identified by this HASP; any additional requirements identified by various Midwest Rockfall written health and safety programs that may apply to the types of work tasks being performed; and also to all applicable federal, state, and local requirements such as those established by OSHA, EPA, DOT, or similar agencies.

Implementation and Modification of the HASP

Onsite Midwest Rockfall management personnel, the designated Site Health and Safety Officer (SHSO), and each employee or subcontractor engaged in working at the site will implement this HASP. All personnel will read and become familiar with the requirements identified by this HASP, and shall sign the enclosed log as verification of having done so. Daily tailgate safety briefings will be held each morning before beginning work, to include discussion of safe work practices associated with the specific work tasks to be performed on that day. Supervisory personnel will ensure that weekly safety meetings are held and documented for the purpose of providing ongoing safety awareness and training related to specific hazards either actually encountered, or with the potential to be present at this site.

This plan may be modified to address newly encountered conditions as necessary, or in the event any plan deficiencies are detected throughout the course of this project. The Site Superintendent will conduct a daily inspection of the workplace to identify hazardous conditions. All personnel working at the site are not only encouraged but are required, to bring hazardous conditions they encounter to the attention of their immediate supervisor. Supervisory personnel and the SHSO will conduct a review and evaluation of the reported hazardous condition, and if necessary will modify this HASP appropriately to adequately address the hazardous condition.

Approval of the HASP

The following persons have approved this Site Health & Safety Plan:

President: Ryan Fetzer

Phone Number: Office: 303-288-4970

Project Manager: Luke Fetzer

Phone Number: Cell: 303-870-3751

PROJECT SITE DESCRIPTION AND LOCATION

General Site Description and Location

The site is identified as consisting of the hillside, ledge, and slopes in Highgate, VT

PROJECT ORGANIZATION AND PERSONNEL RESPONSIBILITIES

Organization and Safety Responsibilities

The following personnel are designated to carry out the stated job functions for the site:

*NOTE: One person may carry out more than one job function.

Project Manager: Luke Fetzer

Site Health & Safety Officer: David Alvarado
(*Also Designated Project Competent Person)

*** NOTE: Competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.**

Project Manager

- Fully support the HASP by participating in its development, directing its implementation in the field, and assisting in its review and evaluation for effectiveness.
- Provide leadership to ensure and maintain personnel interest and participation in the HASP and other applicable safety policies and programs of Midwest Rockfall as necessary for the safe completion of project work.
- Will ensure adequate funding is made available to adequately address safety concerns on their projects.
- Be familiar with project work tasks and operations so unsafe conditions can be immediately recognized, discussed if necessary, and corrected.

- Participate in safety meetings, training, and related activities; and ensure that weekly safety meetings are held and documented.
- Ensure accidents and near misses are investigated to determine root causes, implement appropriate corrective actions, and assure accident reports are prepared as necessary.
- Share and disseminate investigation findings with their peers as appropriate, to prevent recurrence of similar accidents or near misses on other projects.
- Assist and cooperate with outside inspection agencies.

Project Superintendents / Supervisors

- Set a positive safety example.
- Enforce requirements of the HASP and applicable Midwest Rockfall written safety programs.
- Provide accident prevention recommendations and information to their project manager and employees alike.
- Conduct daily safety inspections at their assigned work sites, and document such inspections weekly using the form provided at Appendix A of this HASP.
- Review and coordinate with the SHSO all plans affecting safety.
- In coordination with the SHSO, conduct accident investigations, secure accident report statements from employees and witnesses, complete accident report forms, and follow up with the project manager to assure First Report of Injury is promptly filed with insurance carrier (no more than 24-hours after occurrence).
- Implement and monitor corrective actions identified on accident reports.
- Ensure employees receive the necessary safety training to safely perform their work tasks.
- Notify management immediately of all mishaps and near misses.
- Provide safe work places.
- Know the safe work practices, procedures, and requirements that apply to their work areas.
- Analyze jobs and work tasks for hazards.

- Brief employees on safe work practices to follow, and hazards to avoid.
- Exercise control over hazardous operations to make sure the job is done safely.
- Ensure that weekly safety meetings are organized, conducted, and documented.
- Hold daily “tailgate” job safety briefings with their employees prior to beginning work each day.
- Correct any identified hazards.
- Enforce company policies.
- Enforce the use of required personal protective equipment (PPE).
- Maintain adequate supplies of on-site first-aid kits, fire extinguishers, PPE, and all other safety-related equipment as necessary for safe completion of the work.

Site Health And Safety Officer (SHSO)

- Set a positive safety example.
- Advise Management on safety matters related to this project.
- Conduct daily safety inspections at their assigned project site.
- Conduct and document weekly inspections of personal fall arrest systems, using the form found at Appendix B of this HASP.
- Analyze jobs and work tasks for hazards.
- Assist with implementation of this HASP and applicable safety programs.
- Monitor effectiveness of this HASP and applicable safety programs as they apply to project work tasks.
- Conduct accident investigations, secure accident report statements from employees and witnesses, complete accident report forms, and follow up with the project manager to assure First Report of Injury is promptly filed with insurance carrier (no more than 24-hours after occurrence).
- Monitor and require use of appropriate PPE.
- Ensure employees have received the appropriate level of safety training for the work tasks they’re assigned to.

- Organize, conduct, and document weekly safety meetings.
- Assist supervisors with daily tailgate job safety briefings as needed.

Other Employees and Project Crew Members

- Comply with requirements of this HASP and all safety standards on which they have been trained.
- Report any unsafe conditions or suspected hazards to their supervisor.
- Use personal protective equipment when and where required.
- Inspect all PPE, tools, and equipment before using; and report any unsafe conditions identified during the inspection process to their supervisor.
- Immediately report any injury or near miss to their Supervisor (and in no case more than 24-hours after occurrence).
- Protect yourself, your fellow employees, and the general public from accidents and injuries.
- Participate in all required training, safety meetings, and job safety briefings.

EMERGENCY PROCEDURES AND CONTINGENCY PLAN

Emergency Medical Care

First aid equipment is available on-site at the following location:

Project Supply Trailer

For non-life threatening injury or illness that requires more than administration of simple first aid, transport victim (**who will be accompanied by a supervisor**) to: Northwest Medical Center. The hospital's Emergency phone number is (802) 524-5911. Approximate distance to the medical center is 40 miles from the project site, and approximate travel time by vehicle is estimated at 47 minutes from the project.

For life threatening injury or illness call the emergency dispatch center at 911. The **Flight For Life dispatch center** can also be activated by calling 911, at a minimum, provide the following information: 1) name and identity of caller and victim; 2) geographic location where the injury occurred; 3) nature and severity of injury or illness as understood by the caller; 4) identify treatment that has been provided to the victim on-

site; and 5) current status of the injured or ill party (e.g. victim appears to be in shock, experiencing breathing difficulty, facial discoloration detected, etc.). The caller should carefully listen to and follow all instructions provided by the 911 emergency dispatch center, and the connection should not be broken or terminated until told to do so by the 911 operator.

Site Security

Physical barriers may need to be erected on the site at the work area as necessary to:

1. Prevent the exposure of unauthorized, unprotected people to the site hazards;
2. Reduce off-site release of potentially harmful or hazardous contaminants;
3. Avoid an increase in hazards from vandals or other persons seeking unauthorized entrance to the work area site;
4. Prevent theft of property; and
5. Avoid interference with safe working procedures.

All fenced project sites and work areas with gates will be kept locked during non-work hours. The Project Site Superintendent is responsible for the accurate accounting of all contractors and visitors on site at response effort work areas, at any given time. External communications systems will be available during working hours to contact outside agencies as necessary, (i.e. telephone, radio-telephone).

Emergency Procedures (May Be Modified As Indicated For Incident)

On-site personnel will use the following standard emergency procedures. The Project Manager will be notified of any on-site emergencies. The Project Manager and Project Superintendent will be responsible for ensuring that appropriate procedures are followed. All employees not designated to provide response services such as rescue or first aid/CPR, are instructed to immediately evacuate the work area in case of a fire alarm or audible/verbal notification of an injury or other emergency. The route of evacuation used depends on the nature and source of the emergency. The Project Superintendent, Site Supervisor, and SHSO may remain in the affected work area if safe to do so, for the express purpose of determining the source, nature, extent, and severity of the emergency.

All personnel are directed to the primary emergency evacuation meeting place, unless the nature of the situation makes the use of the primary meeting place unacceptable. If this is the case, all personnel are directed to gather in the secondary meeting place. The designated primary meeting place is the project supply trailer, and the secondary meeting place is the grounds just outside the entrance to the site. The senior employee present at the meeting place will conduct a headcount to assure that all employees have safely evacuated the work site in response to the emergency. Employees are to be informed not to obstruct emergency response vehicles, and made aware of the hazards of being struck by response equipment or other vehicle traffic.

Personal Injury

Upon notification of injury, the designated emergency signal will be sounded. All site personnel will assemble at the support zone located at the supply trailer. Upon notification of an injury in the work zone, the Project Manager and Project Superintendent, in coordination with the Site Health & Safety Officer will assess the nature and severity of the injury. If possible to safely do so, crew members will enter the work zone to evacuate the injured person(s). If rescue is not possible for crew members, or as otherwise may be required, a rescue team will be summoned to enter the work zone to evacuate the injured person(s). The nature of the injury and status of the injured person(s) will also be evaluated to the extent possible, prior to any movement of the injured person(s) to a support or safety zone. The appropriate first aid will be initiated, evacuation of the injured will begin if necessary, and the hospital emergency staff will be apprised of the situation. Re-entry to the work zone will not be permitted until the cause of the injury is determined and the situation is resolved.

If the injury has increased the risk to other workers, at the sound of emergency signal all personnel will have moved to the safety support zone for further instruction. Activities at the work site will stop, and employees will not reenter the work zone until the increased risk has been eliminated or minimized.

Accident Reporting and Recordkeeping

The SHSO in coordination with the Project Superintendent will prepare an accident report in accordance with existing procedures of Midwest Rockfall, within 24-hours of the occurrence. They will also assure that the following are in the report where appropriate or as otherwise indicated:

- Relevant exposure data (man-hours worked, etc.);
- An accident investigation is conducted and its results are compiled and tabulated, any necessary internal company reports are finished, and assure that occupational injury/illness logs are updated as necessary (OSHA 300, 301 etc.); and
- Provide immediate notification to designated client representatives of all major accidents.

The Project Manager shall ensure that accident investigation findings are shared with their peers and other company management as appropriate, to prevent a recurrence of the accident or near miss event.

Fire/Explosion

Upon notification of a fire or unplanned explosion on-site, the designated emergency signal will be sounded, and all personnel at the site will assemble at a predetermined designated location to obtain a personnel headcount. Fire department/professional responders will be notified by calling 911, and all applicable personnel will assist with emergency procedures as determined by the Project Manager and Site Superintendent, or

move to a safe distance from the involved area if said personnel are not qualified to assist emergency efforts.

Personal Protective Equipment Failure

Should any site worker experience a failure or alteration of protective equipment that affects the protection factor, that person will immediately stop the work to evaluate the situation and correct any deficiencies identified. Resumption of work will not be permitted until the cause of the failure is determined and the situation is resolved.

Other Equipment Failure

Should any other equipment on-site fail to operate properly, the Project Manager and Site Superintendent will determine the effect of this failure on continuing operations. Should it be determined that the failure has a deleterious effect of the safety of site personnel; all personnel will stop work and occupy the support or safety zone until the situation is evaluated and resolved.

SHOULD AN ON-SITE EMERGENCY RESULT IN THE EVACUATION OF THE SITE, RE-ENTRY WILL NOT BE PERMITTED UNTIL THE FOLLOWING HAVE BEEN ACCOMPLISHED:

1. The conditions resulting from the emergency have been evaluated and corrected;
2. All hazards associated with the emergency have been assessed;
3. The HASP has been reviewed and updated as indicated or found necessary; and
4. Site personnel have been briefed on any changes made to this HASP.

FIRE PROTECTION PLAN

This Plan implements requirements of OSHA found at 29 CFR 1910.38, and provides instructions for an effective fire protection plan and emergency reactions. This Plan applies to all project employees. The Plan's objective is to eliminate potential causes of fire and provide for emergency procedures in case of fire or other emergencies (as described at the Section entitled Emergency Procedures under Fire/Explosion). A copy of this Plan will be maintained at the project work site.

Responsibilities

Supervisors/SHSO

- Inspect work sites daily for potential fire hazards.
- Practice fire prevention procedures with employees.
- Practice fire reaction procedures to ensure all employees are totally familiar with the plan.
- Ensure compliance with smoking and open flame rules.

- Ensure assigned work areas are free of fire hazards before employees leave each day. Good housekeeping habits will help control fire hazards.
- Control quantities and maintain adequate storage for flammable liquids.
- Ensure fuels are stored and carried in approved self-locking containers.

Anyone Who Discovers a Fire Is Responsible For

- Notifying the Project Manager with all details.
- Making every attempt to alert all personnel in the area.
- Ensuring that the area is evacuated.
- Remaining at a safe distance from the fire while keeping in the same vicinity after reporting a fire emergency in order to direct professional fire fighters to the fire's location.
- Directing available personnel to apply temporary fire control measures until the fire department arrives. This would apply ONLY if they are trained, the fire is small, and does not present a hazard to the personnel involved.
- Using suitable fire extinguishers to control the fire but do not place yourself in harm's way.

Electrical

- All electrical service and equipment installations must conform to the National Electric Code as defined by the National Fire Protection Association Standards.
- Ensure all electrical plugs and receptacles are in good condition.
- Do not use deteriorated wiring and cords, or cracked and broken plugs.
- Unplug all unnecessary electrical equipment.
- Ground all electrical equipment properly.

Flammable and Combustible Liquids

- Ensure that dispensing and storage units, such as tanks and drums, are suitably **grounded** at all times.
- Placing gasoline and other flammable or combustible petroleum products in plastic or glass containers is prohibited.
- Never use flammable gases or liquids for any reason other than the intended purpose.
- To prevent dangerous accumulations of explosive vapors, combustible and flammable liquids must be stored, dispensed, or used only where there is adequate ventilation.
- Use self-closing type gas cans.
- Identify flammable storage facilities and individual storage cabinets and lockers as "**Flammable - Keep Fire Away.**"

Compressed Gas Storage

- Store compressed flammable gas cylinders in designated locations only.
- Separate stored oxygen and acetylene gas cylinders by a 1-hour fire rated wall or by a 20-foot distance to prevent mixing.
- Store all full or empty compressed gas cylinders in an upright position, firmly secured, and with the dome cap in place.
- Report any real or suspected leaks of a compressed gas cylinder to the Project Manager for immediate action.
- Alarm others verbally.
- Call the Fire Department/professional fire fighters from a safe location.
- Evacuate all personnel to at least 700 feet upwind from the affected area.

Fire Extinguishers

- Do not use a fire extinguisher(s) for any purpose other than fire fighting.
- Fire extinguishers must be inspected prior to commencing project work, in their work areas at least monthly thereafter.
- Never remove fire extinguishers from their designated locations except to control or extinguish fires.

SITE CONTROL AND SANITATION PLAN

To minimize the physical transport of hazardous material such as silica dust from the work site to unaffected areas away from construction activities, and to reduce the possibility of exposure of support personnel to the contaminants that may be present, the following control procedures will be implemented if hazardous materials may be present at a specific work area of the project site.

Site Access and Egress

The Project Superintendent will control site access during construction activities. Work zones will be designated by the SHSO, as appropriate, and as described below. Control points will be established to regulate access to the work area. Visitors to the site will be required to sign a visitor's log and will receive a general safety briefing prior to entering work areas.

Site Communication

Successful communications between field teams in the exclusion zone and contact with personnel in the support zone is essential. The following communications system will be available during work activities at project sites. On-site communications may include cell phones or hand-held radios, and these may be assigned to individuals or assigned for use in performance of specific work tasks. Personnel using cell phones or radios will be instructed in the operation of the equipment before it is used. Hand signals may be used to supplement on-site communication, or for tasks where hand-held radios are not used. Site personnel will be instructed, before work begins, in the use of the following signals.

<u>Signal</u>	<u>Definition</u>
Hands clutching throat	Out of air/difficulty breathing
Hands on top of head	Need assistance
Thumbs Up	OK/I'm alright/I understand
Thumbs Down	No/negative
Arms waving upright	Send backup support
Grip partners' wrist	Exit area immediately

To summon help from off-site, a telephone, cellular phone, or two-way radio must be on-site and in operable condition. Work must not begin until a primary means of off-site communications has been established and determined operable. A systems check must be done daily before work activities commence. The systems check establishes that the equipment is in proper working condition, and that the equipment is not interfering with frequencies of nearby activities, or other communication sources.

A backup or secondary means of off-site communications must also be designated before work begins. Secondary communications may include telephone, cellular phone, and/or two-way radios that are not used for primary means. Discussion of primary and secondary communications will be part of the daily safety briefing.

Coordination With Other Contractors

Other contractors at response effort project sites and work areas, may include subcontractors working for Midwest Rockfall or independent contractors with their own scope of work. It is essential that coordination occur between all contractors working at Midwest Rockfall work places. This is necessary to assure that exposure to hazards posed to Midwest Rockfall employees, and caused by other contractors are eliminated or minimized to the greatest extent possible. Contractors shall share information with each other concerning all known or suspected hazards that subject their own employees or others to hazardous conditions. This requirement to share information includes exchanging material safety sheets (MSDSs) when introducing hazardous chemical products onto a project site and work place area.

Designation of Work Zones

In an area where silica dust or other hazardous materials may be present, and in areas where silica dust may be encountered during work activities, work zones will be established to prevent or minimize exposure to hazards. Boundaries will be established as best as practicable to reduce migration of contaminants into clean areas. Clean work sites do not require the use of site zones (i.e. if no activities are occurring that have potential to generate silica dust). These 3 zones shall be designated as:

1. Support Zone (SZ) – clean zone (project supply trailer).
2. Contamination Reduction Zone (CRZ) – decontamination and staging zone where employees will remove PPE and clothing such as disposable coveralls when used

(area employees enter immediately upon stopping their project work task, begin moving toward the supply trailer, and clear all other work task areas).

3. Exclusion zone (EZ) – work zone, area of contamination.

The zones will be identified during safety briefings and will be clearly marked by traffic cones, fencing, barricades, signs, or other suitable means. Site entrance and exit shall be through controlled access pints established for each work location.

Workers on site in the exclusion zone engaged in work activities as described above with the potential for exposure to hazardous materials, shall use the buddy system at all times. During such work activities with potential for hazardous material exposure, and to include all investigation, sampling, monitoring, and remedial activities in potentially contaminated areas, the buddies will be dressed out in the same level of personal protection. At all times, lines of sight contact will be kept between buddies. Employees and all field personnel must watch each other for signs of exposure to the various site hazards. Visual indications of adverse effects include, but are not limited to:

- Changes in complexion and skin discoloration.
- Changes in coordination.
- Changes in demeanor.
- Excessive salivation and pupillary response.
- Changes in speech pattern.

All employees and project site personnel shall be instructed to inform each other of non-visual effects of exposure, such as:

- Headaches.
- Dizziness.
- Nausea.
- Blurred vision..
- Cramps or muscle spasms.
- Irritation of eyes, skin, or respiratory tract.

Support Zone

There will be at least one portable toilet available on site for use by team members. Potable bottled water has also been imported to the site, and employees will have adequate amounts of drinking water available. Enough water is to be made available for employees to wash hands and faces during the course of the workday as necessary, and prior to leaving the work site at the end of each work shift.

The project site should be kept as clean as the nature of the work allows but must be kept free and clear of debris, trash, scrap, spills or other extraneous materials that could create a health hazard or cause an accident. Proper layout, spacing and arrangement of equipment, facilities, and machinery are essential to good housekeeping allowing orderly operation and avoiding congestion.

THE SUPPORT ZONE SHOULD BE EQUIPPED WITH THE FOLLOWING:

- First aid station.
- Office supplies if needed to accomplish project work objectives.
- Personal hygiene washing facility.
- Restroom/portable toilet.
- Clothes changing station.
- Eating, drinking, and break areas.
- Parking areas.

Contamination Reduction Zone (CRZ)

The Contamination Reduction Zone serves as a buffer area between the contaminated work areas and the clean areas; the purpose of the CRZ is to prevent casual access to the Exclusion Zone, and is where decontamination procedures take place.

Personnel and equipment decontamination will be conducted primarily in the Contamination Reduction Zone (CRZ). The CRZ will be equipped with the equipment necessary to perform decontamination functions. The site Health and Safety Officer shall determine the decontamination configuration for this zone.

Exclusion Zone (EZ)

The Exclusion Zone is the work area where contaminated materials are actively being handled, disturbed, or moved, and where high concentrations of contaminants can potentially be present.

Access into the Exclusion Zone is controlled and monitored at a single point of entrance and egress. The Site Superintendent will monitor all entry into the Exclusion Zone. Persons not properly trained for the work and/or who have no specific business in the Exclusion Zone will not be permitted access.

The Exclusion Zone boundary can be modified as site conditions and activities change. The Site Health and Safety Officer shall make changes in the boundary, with approval by the Project Manager and Project Superintendent. The following considerations are useful in determining the boundary of the Exclusion Zone:

- Location of contaminated material.
- Distances necessary to prevent contamination spread during performance of tasks.
- Distances required for personnel and equipment transit.
- The total area required for site operations.
- Probable or actual weather and meteorological conditions.
- Site topography and work area layout.

Personal Hygiene and General Decontamination Procedures

Practice good personal hygiene to avoid unnecessary exposure. Hand-washing facilities will be located at each worksite in order to minimize worker exposure. If no permanent washing facility is available, employees will be afforded ample use of antibacterial hand sanitizer. Lockers, poly bags, or other means of suitable storage will be provided for employees to store uncontaminated clothing. Employees should practice good personal hygiene and always wash their hands before eating, smoking, applying cosmetics etc. Midwest Rockfall will ensure that adequate supplies of antibacterial hand sanitizer or soap are available for employee use.

Workers should change out of work clothes contaminated with silica dust or any other hazardous contaminants before they leave the jobsite. Wearing work clothes home that may have been contaminated can expose others to the hazard. Work clothes should not be cleaned by blowing or shaking. They should be vacuumed with a HEPA filter vacuum before removal. Locate eating/lunch areas away from exposed areas. Workers are instructed to park their cars away from work areas where they will not be contaminated.

Potable Water

The following rules apply for all field operations:

- An adequate supply of potable water will be provided at each work site.
- Portable containers used to dispense drinking water shall be capable of being tightly closed, and shall be equipped with a tap dispenser. Water shall not be drunk directly from the container, unless the containers are packaged and designed for such individual use (e.g. separate 6- to 12-ounce plastic bottles, etc.).
- Containers used for drinking water shall be clearly marked and not used for any other purpose.
- Disposable cups will be supplied; both a sanitary container for unused cups and a receptacle for disposing of used cups shall be provided.

Non-potable Water

If present, outlets for non-potable water shall be identified to clearly indicate that the water is unsafe and is not to be used for drinking, washing, or cooking purposes. There shall be no cross-connection (open or potential) between potable and non-potable water systems. Non-potable and potable water systems shall be separated so as to minimize confusion and possible cross-contamination.

Toilet Facilities

Toilet facilities shall be made available for employees. If permanent toilet facilities are not available (i.e., the work site is more than 500 feet from a building with an accessible toilet), and mobile crews do not have access to a vehicle, then portable chemical toilet(s)

will be provided. One portable chemical toilet is available on this project site for use by employees.

Trash Collection

Trash collected from the site will be segregated into potential hazardous waste or construction debris. Labeled trash receptacles will be set up in the CRZ and in the SZ and will be placed in a secure location.

Lighting

Work will be conducted during daylight hours only, however emergency lighting in the form of handheld torches are available on-site for emergency use.

PROJECT JOB HAZARD ANALYSIS / ACTIVITY HAZARD ANALYSIS

Job or activity hazard analysis (JHA) is also referred to as job safety analysis (JSA), and is part of many existing accident prevention programs. In general, JHA breaks a job down into basic steps, and identifies the hazards associated with each step. The JHA also prescribes controls for each hazard. A JHA is usually prepared as a table or chart listing these steps, hazards, and controls. Perform and complete a JHA if one is not available, before beginning work activities.

A condensed summary of the project hazard analysis findings and hazard control measures identified and described below are included in tabular format at Table 1 of this HASP. Reference to various Midwest Rockfall written safety programs that apply to specific work tasks is made throughout this section of the HASP. All supervisory personnel have been assigned a user name and password, and supervisors can access the entire Midwest Rockfall Safety Manual online as needed at the company website: rockandco.com.

References to JHAs are found throughout the Midwest Rockfall Safety Manual. Typically they are discussed as part of the training supervisors and employees receive on specific topics, and identified in sections of the safety and health plan manual covering fall protection, personal protective equipment, scaffolding etc. Therefore, conducting a JHA should not be a new process for most Midwest Rockfall employees. The following possible actions must be considered when recommendations and hazard controls are developed for the prevention, reduction, or elimination of hazards:

- Avoiding, eliminating, or reducing deficiencies by engineering design, material selection or substitution;
- Isolating hazardous substances, components, and operations from other activities, areas, personnel, and incompatible materials;
- Incorporating "fail-safe" principles where failures would disable the system or cause a catastrophe through injury to personnel, damage to the equipment, or inadvertent operation of critical equipment;

- Relocating equipment/components so that personnel access during operation, maintenance, repair or adjustment shall not result in exposure to hazards such as chemical burns, electrical shock, electromagnetic radiation, cutting edges, sharp points, or toxic atmospheres;
- Providing suitable warning and notes of caution concerning required personnel protection in operation, assembly, maintenance, and repair instructions (e.g. lockout/tagout measures);
- Providing distinctive markings on hazardous components, equipment, or facilities;
- Requiring use of personal protective equipment when other controls do not reduce the hazard to an acceptable level;
- Monitoring exposure to insure that engineering controls effectively reduce the hazard; and
- Training employees to recognize hazards and take appropriate precautionary measures.

Physical & Mechanical Hazards - Overview

Physical hazards include loose rock and debris (potential for falling objects overhead/up gradient), and also danger of slips, trips, and falls. **Fall hazards are significant** on this project. Physical hazards at this project site also include the potential use of explosives and blasting agents; personnel and/or materials lifted/transported by material handling equipment; air compressors, airlines, and compressed air; heavy equipment in use such as drills, forklifts/power industrial trucks (PITs) or other material handling equipment used onsite to perform the functions of a PIT such as skid steers; vehicle and equipment movement in material staging areas; and passing vehicle traffic on the adjacent stretch of I-91.

Housekeeping will play an important role in accident and injury prevention on this project, and care must be taken to regularly police the work areas to minimize potential for slip, trip, and fall hazards. For more detailed discussion on certain of these physical hazards, refer to the sections below entitled “Mechanical Hazards – Overview,” and the accompanying discussions on specific pieces of equipment.

Housekeeping

All work areas should be kept as clean as the nature of the work allows, but must be kept free and clear of debris, trash, scrap, spills or other extraneous materials that could create a health hazard or cause an accident. Proper layout, spacing and arrangement of equipment, facilities, and machinery are essential to good housekeeping, allowing orderly operation and avoiding congestion.

Noise Exposures

Whenever employees are working in environments where power tools are used, heavy equipment is operating nearby, blasting operations are occurring, or other similar noise sources are present, employees may be exposed to hazardous sound levels and noise. All

of these noise sources may be present at this project site. If additional guidance is necessary, consult the Midwest Rockfall written Hearing Conservation Program.

Engineering controls should be attempted first to reduce noise emitted from equipment and work operations. If it is determined that noise exposure above 85 dB(A) are present, engineering controls should be evaluated and implemented where possible to reduce the noise exposure before administrative controls are initiated. Some examples of engineering controls include:

- Noise reducing baffles
- Compartmentalization
- Installing noise reducing gears
- Installing rubber pads under machinery

After engineering controls are evaluated for effectiveness or feasibility, administrative controls should be considered to reduce noise exposure. Administrative controls include restricting exposure time for affected employees. If exposure time cannot be regulated and controlled due to the nature of the work and project delivery schedule, then appropriate hearing protection shall be provided.

Personal protective equipment (PPE), such as earplugs or muffs, may be used to reduce the amount of noise exposure. Each plug or muff has a noise reduction factor (NR) as evaluated by ANSI Standards (S3.19 - 1974 or Z24.22 - 1957). For example, if a work area has an ambient noise exposure of 96 dB(A), the hearing protectors should be rated 6 NR or better to be effective. In accordance with OSHA requirements, for each work location at this project site with noise exposures of 85 to 89 dB(A) Midwest Rockfall will provide hearing protectors for the employee's optional use if requested. Noise exposures at 90 dB(A) or above on this project require the mandatory use of hearing protection. Appropriate hearing protection will be selected in accordance with requirements identified by the written Midwest Rockfall Conservation Program.

Traffic Control and Work Area Protection

Traffic control is a serious safety concern as the work is being performed in close proximity to, or actually on the highway. Midwest Rockfall has contracted out the performance of traffic control measures to another contractor. One or two lanes of the highway will be temporarily closed during certain operations such as when the aerial lift or crane is positioned outside the jersey barriers, but will remain fully open to public passage during other times. Employees must remain vigilant with respect to passing vehicle traffic or nearby operating heavy equipment. An example traffic control layout for lane closures on a multiple lane highway is attached at Appendix G of this HASP; see the actual permit issued for traffic control and lane closure procedures for additional information.

At the work zone, impact injuries from equipment or construction materials or from flying or falling objects are constant dangers. Personal protective equipment is an

excellent defense against these and other hazards. The types of personal protective equipment necessary to protect workers may include hardhats, safety glasses, work boots, hearing protection and high visibility or conspicuity garments. The American National Standards Institute (ANSI) has promulgated a standard for high visibility clothing, and all work performed by Midwest Rockfall employees or contractors will conform to ANSI requirements.

Hazards include vehicles and equipment faced by workers in a work zone located in, on, or next to highways and streets. In addition to these major hazards, each work zone must be evaluated for hazards related to or caused by the following factors:

- Work site location.
- Road type.
- Speed limit.
- Time of day.
- Weather conditions.
- State and local regulations.
- Length of time at work site.

Hazard controls include remaining alert for hazards and passing traffic at all times. A successful worker in these situations possesses extensive knowledge of correct procedures, employs good judgment, and uses foresight. The core concepts of safely working within or adjacent to highway work zones are:

- Recognize the existing and potential hazards present.
- Understand the proper defense(s).
- Act in time to correct deficiencies when they are identified.
- Remain alert at all times to the surroundings.

Specific Mechanical Hazards

Mechanical hazards include various pieces of equipment in use at the site, such as an air compressor; heavy equipment such as the drill rig; and material handling equipment such as a forklift and/or skid steer. If additional guidance is necessary, consult the Midwest Rockfall written program that applies, such as the Drilling Safety, and Powered Industrial Truck Safety Programs. In NO CASE are passengers allowed on heavy equipment unless they occupy a seat designed for that purpose and the seat is equipped with a seat belt. Equipment and vehicle occupants MUST wear seat belts at all times. Equipment operators will wear hearing protection at all times while operating equipment. Only employees with a valid driver license are authorized to operate motor vehicles on company business.

Each piece of equipment is to be inspected daily before use by the operator, and such inspections will be documented weekly using the appropriate inspection forms provided at appendices to this HASP, or found in the respective written Midwest Rockfall safety programs that apply.

Drill Rigs

To assure that employees engaged in drilling operations are and remain safe with respect to drilling operations, compliance with the requirements identified by the Midwest Rockfall written Drilling Safety Program is mandatory at this project site. Observe and follow the requirements of any other written Midwest Rockfall safety programs that may apply or be necessary to safely perform drilling work, such as the Crane and Critical Lifts or Excavation & Trenching Safety programs, etc. Drill rigs used on this project will be inspected daily before use by the drill operator. Daily inspections will be documented once a week using the Drill Inspection Form found at Appendix C of this HASP. During drilling operations employees are to add water to control the generation of dust; this is done either manually by direct application down the borehole, or mechanically fed by pumping water directly through the drill stem. Dust from horizontal drilling needs to be controlled with water, vacuum filters, or a combination of both. Drills are equipped with an air compressor, see the following section below of this HASP entitled "Drill Mounted Air Compressors and Airlines" for additional information.

Potential hazards posed by drilling operations can include electrocution by encountering overhead or buried power lines; crushing accidents due to drill rig overturning, mast collapse, rigging, or other failures; crushing associated with improper loading and unloading of drill rigs from transport trailers; falls from the rig itself, or falls into excavations; inhalation hazards when mixing drilling fluids or concrete, and rock dust generated by the drilling operation (primarily free silica dust); skin absorption hazards posed by concrete and grout, or possible other chemical products used at the drilling site; slope failure, slides, or highwalls collapsing next to drilling operations; contact with rotating parts, nip points, or pinch points; struck by flying chips, sparks, or other materials; struck by failed or disconnected airlines, hydraulic hoses, or pressurized air and hydraulic fluids; burns from internal combustion engines; and hazardous atmospheres created by exhaust from such internal combustion engines.

Potential hazard controls for drilling operations can include identifying and remaining well clear of electrical hazards; observing proper drill rig maintenance and operation to avoid overturning, mast collapse, rigging hazards and other failures. If the drill is equipped with outriggers – use them! Use proper trailer loading and unloading procedures to load and off-load drills; use proper PPE (dust masks or respirators) if necessary to minimize potential inhalation hazards; read and follow directions when mixing concrete, grout, or other drilling fluids; use wet methods to control the generation of free silica when rock drilling or boring through concrete; wear gloves and boots to protect against chemical hazards when preparing concrete and grout mixtures (to prevent skin contact and absorption); do not wear loose fitting clothing, jewelry, or other objects that could be caught by rotating equipment and remain in the clear at all times; keep all factory installed machinery guards in place while using equipment; wear proper PPE to guard against flying chips, sparks, or other materials; and inspect machinery prior to use to identify loose hoses, connections, etc. Do not operate drill rigs with pressurized lines

that appear to exhibit a failed condition or that failure is imminent; and avoid contact with heated or hot parts on internal combustion engines.

Drill Mounted Air Compressors and Airlines

Employees should exercise caution and avoid the exhaust manifold of the drill and/or air compressor. Operating temperatures can be quite hot, and serious burns can result from inadvertent contact with the exhaust manifold or exhaust pipe. The operator will inspect the air compressor and associated airlines, hoses, etc. on a daily basis before each use. Refer to the Drill Operating or Owners Manual for guidance concerning inspections on the specific air compressor installed on any given drill.

Employees must be made aware of the hazards posed by compressed air, and will take care not to allow direct skin contact with compressed air (which could then be injected directly into the bloodstream). Employees must be cautioned to keep the air compressor supply hoses and lines straight as possible and untangled (which could pose a potential slip, trip, and fall hazard to employees), and to remain aware of the hose's position and location during all operations requiring the use of compressed air. Use of compressed air to clean skin or clothing is strictly prohibited.

Awareness of compressed air hose positions at all times will also help to assure that hoses are not inadvertently severed (such by operating equipment or sharp edges, etc.) during use. The use of minimal numbers of hoses facilitates keeping them from becoming tangled with equipment and fall arrest systems during the work. Employees must exercise care to properly and securely attach all hose fittings and connectors so that joints do not come apart while pressurized, which would potentially pose a serious hazard to employees involved in the work, as well as to any bystanders.

Forklift or Skid Steer Used As A PIT

Other mechanical hazards include the PIT and/or similar equipment used for material handling at the site. Forklift operations are to be carried out only by an authorized powered industrial lift truck operator who has been issued a current Operator's Certificate, to be carried on their person at all times while operating a PIT. The operator of any piece of mobile equipment must exercise caution to avoid injury to themselves, their co-workers, or bystanders. Workers at the site must remain vigilant and aware of the position of operating pieces of equipment at all times and remain in the clear.

Each piece of equipment is to be inspected daily prior to use, and any defects that affect operator or observer safety requires that the piece of equipment be repaired prior to use. Forklifts used on this project will be inspected daily before use by the operator. Daily inspections will be documented once a week using the PIT Inspection Form found at Appendix D of this HASP.

Potential hazards posed by PIT's include tip overs; falling loads; overloading of equipment; impact with other pieces of equipment; piercing of containers; rolling off shoulder of access roads; chemical contact - battery acid; and fires during refueling

Potential hazard controls for PIT operations include control of equipment keys; authorized fueling & recharge areas; proper palletizing of material; clearly identified travel lanes; equipment warning lights; seat belts; and use of mounted fire extinguishers. Turn off the engine, remove the key, place all controls in neutral, and apply parking brake whenever the PIT is unattended, or out of the operator's line of sight.

Aerial Lifts

It is the policy of Midwest Rockfall that all employees will be properly trained on the safe use and operation of aerial lifts before they are assigned to operate such equipment, and the use of appropriate fall protection is mandatory whenever an employee operates an aerial lift. Aerial lifts used on this project will be inspected daily before use by the operator. Daily inspections will be documented once a week using the Aerial Lift Inspection Form found at Appendix E of this HASP.

Employees in the bucket, platform, or basket of any aerial lift device shall wear hard hats and full body harnesses at all times, with a lanyard attached to an engineered anchor point. Other personal protective items may be required based on the job conditions encountered, such as safety eyeglasses, hearing protection, and gloves.

Hazards posed by aerial lifts at the site may include: falls, electrocution, overhead obstructions, poorly maintained equipment, dropped or falling objects, and exceeding rated limits for the lift, or any lift component. Employees not directly involved in the lift operation should be cautioned to remain clear of aerial lifts at all times.

Hazard controls will consist of using appropriate fall protection systems, maintaining a minimum of 10-feet clearance from high voltage lines, inspecting the work area first prior to operating the aerial lift to identify any overhead or ground level obstructions, regularly inspecting the aerial lift prior to using it, assuring any defects or problems are promptly corrected, maintaining all tools, equipment, or materials securely inside the confines of the bucket, and do not exceed manufacturer rated load capacities.

Explosives and Blasting Agent Hazards

Explosives may be used to accomplish a portion of the project objectives, including installation of fence posts installed at depth below ground surface. Whether primary blasting, secondary blasting such as block holing, mud-capping, other explosive method, or any combination thereof is used to accomplish project objectives, all such work and blasting activity shall be performed in a manner consistent with requirements established by 29 CFR 1926 Subpart U (1926.900 – 1926.914). Radio transmitters within 100 feet of electric blasting caps, in other than original containers, shall be de-energized and effectively locked.

Only a licensed explosive technician will perform any actual blasting operations. Before any blasting takes place, the blaster will issue a Midwest Rockfall Blasting Permit as found at Appendix F of this HASP, conduct a safety briefing to inform all persons present

(workers and observers) of the safety precautions that need to be observed as the blasting takes place. He/she will then assure that before a blast is fired a loud warning signal will be given, made certain that all surplus explosives are a safe distance away and secured, that all persons and vehicles are at a safe distance or under/behind sufficient cover, and that adequate warning has been given.

The blaster shall take special precautions in the loading, delaying, initiation, and confinement of each blast. Prominent display of adequate signs warning against the use of mobile radio transmitters on all roads within 1,000 feet of blasting operations is required. If the 1,000-foot distance creates an operational handicap, alternative provisions may be employed. If alternative methods are used, a description of the alternative methods shall be reduced to writing and certified as meeting all necessary requirements by the competent person (i.e. the blaster). As stated above, the blaster will ensure that all mobile radio transmitters less than 100 feet away from electric blasting caps, in other than original containers, shall be de-energized and effectively locked.

Potential Fall Hazards

Significant fall hazards are present on this project due to the nature of the work, which can include work performed in aerial lifts and suspended personnel platforms, and potentially high angle work performed on ropes. Use of personal fall arrest systems (PFAS), and/or fall protection equipment will be necessary to safely accomplish project objectives. Use of PFAS equipment will be required for work positioning of employees at height, and to assist and safeguard employees as they install or position materials and equipment at height.

All employees are responsible for inspecting their assigned PFAS and equipment prior to each use and periodically throughout the day. Safety equipment showing any signs of mildew, torn or frayed fabric or fiber, burns, excessive wear, or other damage or deterioration which could cause failure shall be permanently removed from service. All fall protection equipment shall be properly maintained and stored when not in use. This includes keeping dry and out of sunlight, away from caustics, corrosives or other materials that could cause defects.

The SHSO will conduct and document weekly inspections of all PFAS equipment used on site, using the PFAS Inspection Form found at Appendix B. If additional guidance is needed, consult the Midwest Rockfall written Fall Protection Program. Appropriate fall protection equipment will be selected in accordance with requirements identified by the written Midwest Rockfall Fall Protection Program.

Fall Protection Policy Statement

It is the policy of Midwest Rockfall to take all practical measures possible to prevent employees from being injured by falls. We will take the necessary steps to eliminate, prevent, and control fall hazards. The first priority is given to the elimination of fall hazards. If a fall hazard cannot be eliminated, effective fall protection will be planned,

implemented, and monitored to control the risks of injury due to falling.

Midwest Rockfall policy requires that all personnel working on Midwest Rockfall job sites, including subcontractors, be protected from falling 100% of the time through the use of an appropriate fall protection system. 100 % fall protection means an employee is protected from falling at all times the employee is engaged in activities at elevations of 6-feet or more above a lower level. 100% fall protection can generally be provided through the use of guardrail systems, safety nets, personal fall arrest systems, positioning device systems, warning line systems, controlled access zones, safety monitoring systems, covers, or a combination thereof.

All employees exposed to potential falls from heights will be trained to minimize the exposures. Fall protection equipment will be provided and its use required by all employees on projects where work is performed at height. Project Managers, Superintendents, and Supervisors will be responsible for implementation of a fall protection plan on their respective jobsites.

Fallen Worker Rescue Considerations and Plan

One of the keys to any successful rescue is proper crisis management, starting with the rescuer's ability to remain calm during an emergency situation. This will assist each individual's ability to properly think and thus follow the key steps to proper rescue. A rescue plan should discuss all aspects from equipment to leadership roles in the event of an emergency. The Project Superintendent shall be in charge and render final decisions concerning rescue procedures, and he/she shall work in concert with the SHSO, Project Supervisor, and crew members to evaluate site conditions in making such determinations.

It is obvious that rescue equipment plays an important part in the rescue plan. It is important to establish and maintain a rescue kit on site that contains all the necessary tools used during a rescue. Equally important is to ensure that every time someone is working at height, the rescue kit is available on site close to the work activity. Possible rescue devices that may comprise a rescue kit would include rescue anchors, extra rope, sked stretcher, raising or ascent device(s), lowering or descent device(s), cable slings, carabiners, extendible pole, rescue cradle, and rescue rope ladder. The rescue kit should never be used except in the event of an emergency, thereby assuring that all components are present in the kit and ready to use in the event of an emergency. Midwest Rockfall has a 110-foot ladder truck available onsite for rescues performed at height, well equipped with safety and fire suppression supplies. And remember, it may be difficult to adhere to a rescue plan, but do your best to remain calm and focused on the plan.

Evacuation of a fallen or injured worker can be accomplished either by Midwest Rockfall employee team members (a team rescue), or by professional rescue personnel, possibly with help from team members (assisted rescue). The decision on whether to use a professional rescue service is a team decision, based on the circumstances of the specific emergency. It is believed that Midwest Rockfall team members can provide for team rescue in most circumstances based on the anticipated work conditions present at the project site. The type of rescue (i.e. ascent or descent) will be determined by the team

members based on evaluation of site conditions and other pertinent factors at the time an incident occurs.

The Project Superintendent must assess the: 1) SAFETY SITUATION; 2) MEDICAL SITUATION; and 3) TECHNICAL SITUATION in that order. Aid and evacuation of a fallen coworker or an accident victim can only be performed if the rescuer is not exposed to significant life-threatening danger. The Project Superintendent should first assess the **safety situation**. If unsafe conditions are identified, the rescue can only safely proceed when the hazards are eliminated or protected against.

After addressing safety concerns, the Project Superintendent must assess the **medical situation** and severity of any injuries, and apply first aid techniques if possible. In all accidents, two basic medical situations are possible: 1) the victim suffered severe traumatic injuries and will be unable to assist in the rescue; or 2) the victim suffered minor traumatic injuries and can be of some assistance in the rescue.

When severe traumatic injury has occurred, the Project Superintendent must determine whether the victim has a pulse and is breathing. If the victim can be safely lowered to the ground, begin CPR or rescue breathing as appropriate. If that can't be done, then attempts to render first aid in an unfavorable position should be made. After restoring breathing and a pulse, bleeding (if present) is treated and the severity of other injuries or potential injuries is assessed. If the Project Superintendent concludes that a team rescue is impossible without causing permanent injury or death, attempt to help and stabilize the victim to the extent possible for a protracted wait. Depending on the seriousness of the injuries, the victim may need to be placed in a sked stretcher. The team members will supply intermittent first aid until professional help arrives.

Minor traumatic injury such as crushed fingers or severe bruises to arms or legs, may leave the victim in a mild state of shock and unable to proceed without assistance. Before a team rescue is attempted, the rescue team must first assess the nature of the injuries. If there is any doubt as to the severity of the injuries, the victim's ability to continue or assist, or the rescuer's ability to conduct the rescue, professional rescue help should be summoned.

After addressing safety and medical situations, the Project Superintendent must assess the **technical situation**. This assessment is performed to determine the technical feasibility of the intended rescue, identify the technical means (equipment such as ropes, descent devices etc.) necessary to accomplish the rescue, and determine if the appropriate equipment is available to perform the rescue. This step is facilitated by ready access to a well thought out and adequately equipped rescue kit.

Airborne Respirable Silica Dust

To prevent the generation of airborne respirable silica dust during drilling operations, the Project Superintendent will ensure that "wet methods" are used. Employees should be instructed to use wet methods to control silica dust wherever possible by applying

adequate amounts of water. Dust from horizontal drilling needs to be controlled with water, vacuum filters, or a combination of both. If incidental dust is encountered the drill operator and crew must use P-100 dust masks or air purifying half-mask respirators equipped with HEPA cartridges, to be determined by the actual conditions encountered onsite. If the need to use respirators arises, respirator selection will be accomplished in accordance with the Midwest Rockfall written Respiratory Protection Program. Additional information concerning the control of silica dust hazards can be obtained by consulting the written Midwest Rockfall Silica Exposure Control Plan.

During any cement or grout mixing activity (primarily use of pre-mixed cement dispatched to the site is anticipated), employees must be cautioned to add dry cement or grout mix slowly into the vessel where mixing takes place. Slowly pouring dry mixtures into the mixing container will help to minimize generation of respirable air borne silica dust. Further discussion of respirable silica dust is provided below in the section below entitled "Chemical Hazards."

Chemical Hazards

Potential chemical hazards include primarily the cement or grout; and petroleum products used at the site for equipment refueling, lubrication, and maintenance. Employees have received training on the hazards of respirable silica dust such as that which may be present in cured cement if disturbed, or bags of Portland mix (in dry or powdered form) as they are added to water, and are aware of the potential need for respiratory protection while mixing cement to produce useable product. They will use caution while slowly pouring and mixing the cement, and mixing will be performed in a manner that minimizes the generation of any dust.

During rock or concrete drilling operations to install bolts, fasteners, or fixtures such as the fence posts, employees are instructed to add water down the borehole to control the generation of dust. Usually this can be accomplished by pumping water through the drill stem and/or using a hand-held spray applicator bottle to moisten cement and wet the material to be drilled as needed. Employees must be instructed to practice good personal hygiene, and to remove any silica dust present on the skin or clothing. NEVER use compressed air for this purpose. Only moist, damp, or wet methods can be used to clean clothing or skin.

If necessary based on actual conditions encountered at the site, employees shall be provided with disposal coveralls that are to be removed before employees leave the worksite to prevent carrying silica dust off-site. Contaminated coveralls will be disposed of properly in sealed containers, and in accordance with applicable requirements. Wet cement poses skin hazards, due to the caustic nature of the product. Care must be taken to avoid skin/eye contact when cement is wet. Severe burns can result from contact with wet cement. Material safety data sheets (MSDSs) for all chemical products used at the site are to be maintained on file in the project office, and are available for review and use by employees as necessary.

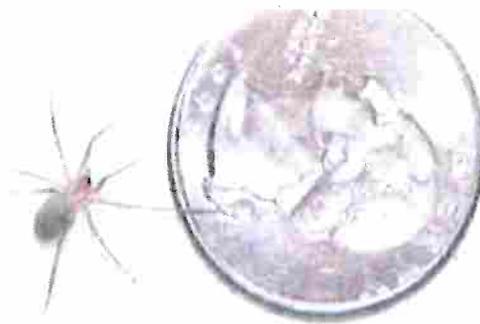
Employees are cautioned to avoid skin contact with petroleum derivatives, practice good personal hygiene if contact occurs, and be vigilant for signs and symptoms of over exposure including rash or irritated skin.

Biological Hazards

Biological hazards may include potential for encountering black widow or brown recluse spiders (common in fields, wood piles, construction-disturbed areas, and dark recesses or places that receive no direct sunlight), scorpions, mosquitoes (West Nile Virus), and rattlesnakes when in season. Wear clothing that covers as much of the body as possible, and use a bug repellent that contains Deet to ward off mosquitoes. Employees are cautioned to be aware of their surroundings, and also their foot and hand placement at all times to avoid contact with any of these hazards. To facilitate employee recognition of the spiders and scorpions, see the photos below:



Brown Recluse – Enlarged



Brown Recluse – Size Comparison



Black Widow Spider

First Aid for Spider Bites

Wash the affected area and irrigate the wound, apply ice or cool compresses, and seek medical attention immediately. Brown recluse bites attack the skin and soft tissue; serious loss of skin can result. Black widow bites affect the musculature, and can result in muscle spasms. For this condition, muscle relaxants and pain medication may prove helpful. Antivenin is available to treat both types of spider bites.

Rattlesnakes

There are no infallible rules for expedient identification of poisonous snakes in the field, because the guidelines all require close observation or manipulation of the snake's body. It is believed that rattlesnakes during this time of year in the Rocky Mountains are hibernating in dens, and should not pose a threat. However, the best strategy is to on the lookout for any snakes, and leave all snakes alone if encountered.



Rattlesnake

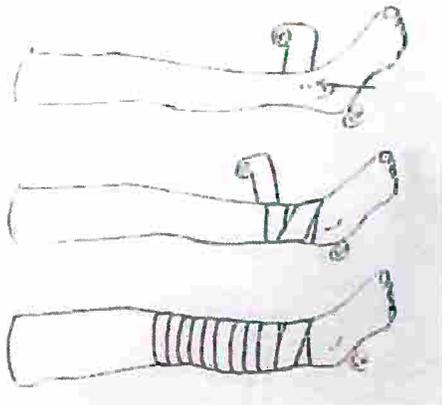
Walk carefully and watch where you step and place your hands. Step onto logs rather than over them before looking and moving on. Do not tease, molest, or harass snakes. Snakes cannot close their eyes. Therefore, you cannot tell if they are asleep. Some snakes will attack aggressively when cornered or guarding a nest. Use sticks to turn logs and rocks, and wear proper footgear, particularly at night. Be calm when you encounter serpents. Snakes cannot hear and you can occasionally surprise them when they are sleeping or sunning. Normally, they will flee if given the opportunity. Use extreme care if you must kill snakes for safety. Where the danger and presence of such snakes can be reasonable anticipated, workers shall be issued and wear PPE, such as “bite-proof” leather leggings to protect against bites.

First Aid Treatment for Rattlesnake (Pit Viper) Snakebites

General support/reassurance; keep the victim calm; move the individual away from the snake, if possible; do not try to kill the snake—two people being bitten is worse and you cannot aid the first victim (note: amputated snake heads can still bite as a reflex).

- Minimize all activity.
- All jewelry, rings, bracelets and watches should be removed immediately.
- Do not incise the wound as this causes more tissue damage.
- Do not use electrical shock at the bite site as that has been shown not to work.
- Sawyer extractor kits are controversial. Studies on pigs have shown little to no effect, while others recommend to only use the suction device if you can reach the victim in the first 3 minutes.
- Do not suction with your mouth as the bacteria in your mouth will most likely cause more harm.
- Apply cool compresses, not ice.

- The Australian wrap method has proven benefit. Please see diagram below. Do not wrap too tightly, but similar to wrapping a sprain.
- Wrapping and splinting is very important. Immobilize the extremity, maintain the extremity at heart level, do not elevate above heart level.
- Do not use Anti-venom in the outdoors. Many have anaphylactic type reactions from the anti-venom.
- Transport, transport, transport.
- Call ahead if possible to the ER. Many emergency rooms do not stock anti-venom and they may need to fly anti-venom in.



Wrapping

PERSONAL PROTECTIVE EQUIPMENT & SELECTION

Selection of all appropriate PPE will be made in accordance with requirements identified by the applicable Midwest Rockfall written safety program, such as the Fall Protection, Personal Protective Equipment, or Respiratory Protection programs, or other programs that may apply. Based on evaluation of the potential hazards anticipated onsite, the following levels of personal protection have been designated for the applicable work areas and tasks. All workers onsite will at all times wear an approved hardhat, high visibility vest, work boots, and long pants (no shorts).

Safety glasses and hearing protection will be worn when and if conditions warrant. If an eye hazard exists, eye protection is indicated and required. If a conversation carried on at arms length requires the speaker to raise his/her voice to be heard over background noise, hearing protection is indicated and required. Equipment operators will wear hearing protection at all times when they are operating pieces of heavy equipment, and employees working within 20-feet of operating pieces of heavy equipment are also required to wear hearing protection. Gloves will be provided to employees as needed, and the selection of gloves will be based on the actual hazards encountered on the site. Work gloves will be worn for hand protection associated with most work tasks at the project site; however, rubber gloves may be required for cement and grout mixing or other tasks where employees have potential for skin exposure to caustic substances.

If necessary based on actual conditions encountered at the site, employees shall be provided with disposal coveralls that are to be removed before employees leave the worksite to prevent carrying silica dust off-site. Contaminated coveralls will be disposed of properly in sealed containers, and in accordance with applicable requirements.

Whenever workers are working at a height greater than six (6) feet, they shall wear and use fall protection equipment appropriate to the task at hand, as well as the gear prescribed for work at ground level (e.g. hardhat, work boots).

Respiratory protection may be required for certain work tasks, such as rock or concrete drilling operations, or cement and grout mixing. It is anticipated that using dust collection systems, wet methods, and work practice controls will minimize and/or eliminate the need for respiratory protection. P-100 dust mask face pieces, and MSA half-mask Comfo Classic respirators equipped with HEPA cartridges are the only types of respiratory protection approved for use on this project. With regard to P-100 dust mask face pieces, no other types such as N-95, P-95, or R-95 are approved for use.

All employees are trained and qualified on the care, use, storage, and limitations of their assigned PPE intended for use at the site. Employees such as drill operators that may potentially be required to wear air purifying negative pressure respirators are current and medically qualified to do so, have received appropriate training, and have been fit-tested for their assigned respirator.

ENFORCEMENT

Constant awareness of and respect for fall hazards, and compliance with this site-specific HASP are considered conditions of employment at Midwest Rockfall. Management reserves the right to issue appropriate disciplinary actions for employee failure to follow the requirements of this HASP and applicable company written health and safety program requirements, up to and including termination. Non-compliance with the 100% fall protection policy will not be tolerated.

Midwest Rockfall - SAFETY MEETING / TRAINING / SITE VISITATION LOG

Location:	Date:
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Topics Discussed: My signature below acknowledges I have read this site health and safety plan (HASP) for the, Highgate, VT
understand the hazards present at the site, and how to implement hazard controls and precautions identified by this HASP.

Print Name	Signature	Position & Company

