

SLOPE RATING FORM – SITE INFORMATION

ITALICIZED DATA CATEGORIES REQUIRED FOR FULL RATING

| | | | | | |
|---|--|--|--|---|--|
| Management Area: | | | | Date: | |
| Hazard Type (select all that apply within one of the categories): | | Rockfall Planar Wedge Toppling Raveling/Undermining Rock Avalanche Indeterminate Rock Failures Differential Erosion | | Landslide Above, Below, or Across Route Translational Rotational Debris Flow Shallow Slump Erosional Failure | |
| Road/Trail No.: | | <input type="radio"/> Trail <input type="radio"/> Road | | Road/Trail Class: | |
| Beginning Mile Marker: | | Ending Marker: | | Rater: | |
| Begin Lat. (xx.xxxxx): | | End Lat. (xx.xxxxx): | | Weather: | |
| Coord.: Long. (-xxx.xxxxx): | | Coord.: Long. (-xxx.xxxxx): | | Datum: | |
| Coord.: Long. (-xxx.xxxxx): | | Coord.: Long. (-xxx.xxxxx): | | AADT: | |
| Length of Affected Road/Trail (ft): | | Slope Height (rock) /Axial Length (slide) (ft): | | Slope Angle (°): | |
| Sight Distance (ft): | | Usable Roadway/Trail Width (ft): | | Speed Limit (mph): | |
| Ditch Width (ft): RANGE <small>ROCKFALL</small> | | Ditch Depth (ft): RANGE <small>ROCKFALL</small> | | Ditch Slope (H:V): RANGE <small>ROCKFALL</small> | |
| Blk Size (ft)/Volume (cy): <small>ROCKFALL</small> | | Annual Rainfall (in): RANGE | | Sole Access Route <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| Fixes Present <input type="checkbox"/> Yes <input type="checkbox"/> No | | Photo # Range: | | | |
| Comments: | | | | | |

PRELIMINARY RATING

| Category Rating | 3 | 9 | 27 | 81 | Score |
|---|---|--|---|--|---------------------------|
| A. Landslide – Roadway Width Affected | 0-5 Percent | 6-25 Percent | 26-50 Percent | 51-100 Percent | |
| B. Landslide – Slide/Erosion Effects | Visible crack or slight deposit of material / minor erosion | 1 inch offset, or 6-inch deposit of material / major erosion will affect travel in < 5 yrs | 2-inch offset or 12-inch deposit/ mod. erosion impacting travel annually | 4-inch offset or 24-inch deposit/ severe erosion impacting travel consistently | |
| C. Landslide – Roadway Length Affected | 25 ft | 100 ft | 225 ft | 400 ft | <i>CALC</i> |
| D. Rockfall – Ditch Effectiveness <small>(consider launch features)</small> | Good | Moderate | Limited | No Catchment | |
| E. Rockfall – Rockfall History | Few Falls | Occasional Falls | Many Falls | Constant Falls | |
| F. Rockfall – Block Size or Volume per Event | 1 ft or 3 yd ³ | 2 ft or 6 yd ³ | 3 ft or 9 yd ³ | 4 ft or 12 yd ³ | <i>CALC</i> |
| G. All – Impact on Use | Full use continues with minor delay | Partial use remains Use modification required, short (3 mi/30 min.) detour available | Use is blocked – long (>30 min) detour available or less than 1 day closure | Use is blocked – no detour available or closure longer than 1 week | |
| H. All – AADT / Usage / Economic or Recreational Importance (highest rating applies) | 50 Rarely Used Insignificant economic / rec. importance | 200 Occasionally used Minor economic / rec. importance | 450 Frequently used Moderate economic / rec. importance | 800 Constantly used Significant economic / rec. importance | <i>CALC FOR AADT ONLY</i> |
| LANDSLIDES TOTAL (A+B+C+G+H) | | | | | <i>CALC</i> |
| ROCKFALL TOTAL (D+E+F+G+H) | | | | | <i>CALC</i> |

Preliminary Rating Good (15-21 pts) | Fair (22-161 pts) | Poor (>161 pts)
 Sites rated as Fair or Poor receive detailed evaluation (complete back page)

SLOPE RATING FORM – DETAILED SLOPE HAZARD RATING

| Category Rating | | 3 | 9 | 27 | 81 | Score | | | |
|--|--|---|---|---|---|--|---|----------------------------|--|
| I. All – Slope Drainage | | Slope appears dry or well drained; surface runoff well controlled | Intermittent water on slope; mod. well drained; or surface runoff moderately controlled | Water usually on slope; poorly drained; or surface runoff poorly controlled | Water always on slope; very poorly drained; or surface water runoff control not present | | | | |
| J. All – Annual Rainfall | | 0-10" | 10-30" | 30-60" | 60"+ | | | | |
| K. All – Slope Height (rockfall) / Axial length of slide (landslide) | | 25 ft | 50 ft | 75 ft | 100 ft | CALC | | | |
| Select One Unstable Slope Type | Landslides/ Erosion (add A, B, C) | L. Thaw Stability (cold climates) | | Unfrozen/Thaw Stable | Slightly Thaw Unstable | Moderately Thaw Unstable | Highly Thaw Unstable | | |
| | | M. Instability-Related Maint. Frequency | | Every 10 years | Every 5 years | Every 2 years | Every year | | |
| | | N. Movement History | | Minor movement or sporadic creep | Up to 1 inch annually or steady annual creep | Up to 3 inches per event, one event per year | >3" per event, >6" annually, more than 1 event per year (includes all debris flows) | | |
| | Rockfalls (add D, E, F) | O. Rockfall-Related Maint. Frequency | | Normal, scheduled maintenance | Patrols after every storm event | Routine seasonal patrols | Year-round patrols | | |
| | | Geologic Character | Case 1 | P. Structural Condition | Favorable | Random | Adverse Discontinuous | Adverse Continuous | |
| | | | | Q. Rock Friction | Rough/Irregular | Undulating | Planar | Clay infilled/Slickensided | |
| | | Case 2 | R. Structural Condition | Few differential erosion features | Occasional differential erosion features | Many differential erosion features | Major differential erosion features | | |
| | | | S. Diff. in Erosion Rates | Small difference | Moderate difference | Large difference | Extreme difference | | |
| | T. LANDSLIDE HAZARD TOTAL (A+B+C+I+J+K+L+M+N) | | | | | | CALC | | |
| | U. ROCKFALL HAZARD TOTAL (D+E+F+I+J+K+O+(greatest of P+Q or R+S)) | | | | | | CALC | | |
| DETAILED RISK RATING | | | | | | | | | |
| V. Route Width or Trail Width | | 36 ft 14 ft | 28 ft 10 ft | 20 ft 6 ft | 12 ft 2 ft | CALC | | | |
| W. Human Exposure Factor | | 12.5% of the time | 25% of the time | 37.5% of the time | 50% of the time | CALC if AADT avail | | | |
| X. % of Decision Sight Distance (Judge avoidance ability on trails) | | Adequate, 100% of low design value | Moderate, 80% of low design value | Limited, 60% of low design value | Very Limited, 40% of low design value | CALC for roads | | | |
| Y. Right of Way (R/W) Impacts (If Left Unattended) | | No R/W implications | Minor effects beyond R/W | Private property, no structures affected | Structures, roads, RR, utilities, or Parks affected | | | | |
| Z. Environmental/Cultural Impacts if Left Unattended | | None/No potential to cause effects | Likely to effect/No hist. prop. affected | Likely to adversely affect/Finding of no adverse effect | Current adverse effects/Adverse effect | | | | |
| AA. Maintenance Complexity | | Routine effort/In-House | In-House Maint./Special project | Specialized equip./contract | Complex/Dangerous effort/location/contract | | | | |
| BB. Event Cost | | \$0-2k | \$2-25k | \$25-100k | >\$100k | | | | |
| CC. RISK TOTALS: (G+H+V+W+X+Y+Z+AA+BB) | | | | | | CALC | | | |
| TOTAL USMP SCORE: LANDSLIDES (T+CC) OR ROCKFALL (U+CC) | | | | | | CALC | | | |
| Total USMP Score Good (< 200 pts) Fair (200 - 400 pts) Poor (> 400 pts) | | | | | | | | | |

For the directly measurable categories, use the following formulas to **calculate the exponent value (x) for the scoring formula $y = 3^x$** . This will allow the calculation of a precise score for the category measurement and development of category scoring tables.

C. Length of roadway affected exponent:

$$x = \sqrt{\frac{\text{length affected}}{25}}$$

F. Block size or the volume exponent formula:

$$\begin{aligned} \text{block size } x &= \text{block size} \\ \text{volume } x &= \left(\frac{\text{yds}^3}{3}\right) \end{aligned}$$

H. AADT exponent formula:

$$x = \sqrt{\frac{\text{AADT}}{50}}$$

K. Slope height/axial slide length exponent formula:

$$x = \frac{\text{slope height}}{25}$$

V. Width exponent formula:

$$x = \frac{44 - \text{Road width (ft)}}{8} \text{ for vehicles, or } x = \frac{18 - \text{Trail width (ft)}}{4} \text{ for trail traffic}$$

W. Human exposure factor exponent formula for roads and trails:

$$x = \frac{\left(\frac{\text{AADT}}{24} \times \text{slope length (miles)} \times 100\right)}{\text{speed limit or walking speed}}}{12.5}$$

X. Percent decision sight exponent formula:

$$x = \frac{120 - \left(\frac{\text{measured sight distance}}{\text{AASHTO decision sight distance}} \times 100\right)}{20}$$