[PROJECT TITLE]

[PROJECT DESCRIPTION]

[MULTIPLE SEAM PARAMETERS]
Interburden Thickness..............100 (ft)
Previous Mining..................Gob Solid Layout
Vertical Position..................Active UNDER Previous
Active Seam Mining Mode...........Analysis of Longwall Pillar Stability

[PREVIOUS SEAM PARAMETERS]
Seam Thickness..........................6 (ft)
Width of Gob............................620 (ft)
Age of Workings.......................10 years

[ACTIVE SEAM PARAMETERS]
CMR..................................45

[ALPS DATA]
Entry Height...............................5 (ft)
Depth of Cover.............................590 (ft)
Panel Width................................1000 (ft)
Entry Width..............................20 (ft)
Number of Entries......................3
Crosscut Spacing.......................100 (ft)
Center to Center Distance $1........100 (ft)
Center to Center Distance $2........100 (ft)

[ALPS DEFAULT PARAMETERS]
In Situ Coal Strength...................900 (psi)
Abutment Angle..........................21 (deg)
Unit Weight of Overburden.............162 (pcf)

[AMSS Output]

[MULTIPLE SEAM PILLAR STABILITY FACTORS]
Development Stability Factor............2.48
TAILGATE Loading......................1.12

Tailgate pillar SF is less than the suggested value of 1.13
The pillar design may be inadequate to prevent a major multiple seam interaction. Consider incre

[PREDICTED CONDITIONS]
Development: GREEN: A major interaction is unlikely.

Tailgate: YELLOW: A major interaction should be considered likely unless a pattern of supplemental roof support (cable bolts or equivalent) is installed. Rib instability is also likely.

In addition to installing a pattern of roof support, the likelihood of a major interaction may be reduced by increasing the pillar size by changing the entry spacing, the crosscut spacing, and/or the pillar width.

[WARNING MESSAGES]

[CALCULATED STRESSES]
Single seam development stress..........1740 (psi)
Multiple seam stress .................. 586 (psi)
Total vertical stress (Development) .................. 2327 (psi)
Tailgate abutment stress .................. 2102 (psi)
Total vertical stress (Tailgate Loading) .................. 4429 (psi)

[SUGGESTED CRITICAL INTERBURDEN AND STRESS]
Critical Interburden for Development .................. 96 (ft)
Allowable Total Vertical Stress .................. 2457 (psi)
If a pattern of supplemental roof support is installed, then:
Critical Interburden for Development .................. 30 (ft)
Allowable Total Vertical Stress .................. 5822 (psi)

Critical Interburden for Tailgate Loading .............. 170 (ft)
Allowable Total Vertical Stress .................. 2457 (psi)
If a pattern of supplemental roof support is installed, then:
Critical Interburden for Tailgate Loading .............. 83 (ft)
Allowable Total Vertical Stress .................. 4947 (psi)

[ALPS STABILITY FACTORS - STANDARD GEOMETRY]

<table>
<thead>
<tr>
<th>Classic ALPS</th>
<th>ALPS (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Loading</td>
<td>3.31</td>
</tr>
<tr>
<td>Headgate Loading</td>
<td>2.27</td>
</tr>
<tr>
<td>Bleeder Loading</td>
<td>1.72</td>
</tr>
<tr>
<td>** Tailgate Loading</td>
<td>1.27</td>
</tr>
<tr>
<td>Isolated Loading</td>
<td>1.14</td>
</tr>
</tbody>
</table>

[ALPS STABILITY FACTORS - STANDARD GEOMETRY - MULTI SEAM CONDITIONS]

<table>
<thead>
<tr>
<th>Classic ALPS MS</th>
<th>ALPS (R) MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Loading</td>
<td>2.48</td>
</tr>
<tr>
<td>Headgate Loading</td>
<td>1.84</td>
</tr>
<tr>
<td>Bleeder Loading</td>
<td>1.47</td>
</tr>
<tr>
<td>** Tailgate Loading</td>
<td>1.12</td>
</tr>
<tr>
<td>Isolated Loading</td>
<td>1.02</td>
</tr>
</tbody>
</table>

[ALPS PILLAR LOAD BEARING CAPACITY]

PILLAR #1
for Pillar Width (ft) .................. 80.0
and Pillar Length (ft) .................. 80.0
Width/Height Ratio .................. 16.00
Unit Pillar Strength (psi) .................. 5760
Pillar Load Bearing Capacity (lbs) / (ft) of gate entry ....... 5.31E+07

Unit Pillar Strength (R) (psi) .................. 5760
Pillar Load Bearing Capacity (R) (lbs) / (ft) of gate entry ... 5.31E+07

PILLAR #2
for Pillar Width (ft) .................. 80.0
and Pillar Length (ft) .................. 80.0
Width/Height Ratio .................. 16.00
Unit Pillar Strength (psi) .................. 5760
Pillar Load Bearing Capacity (lbs) / (ft) of gate entry ....... 5.31E+07

Unit Pillar Strength (R) (psi) .................. 5760
Pillar Load Bearing Capacity (R) (lbs) / (ft) of gate entry ... 5.31E+07

TOTAL PILLAR SYSTEM LOAD BEARING CAPACITY [ALPS Classic]
Total Load (lbs) / (ft) of gate entry ........ 1.06E+08
TOTAL PILLAR SYSTEM LOAD BEARING CAPACITY [ALPS (R)]

Total Load (lbs) / (ft) of gate entry: \(1.06 \times 10^8\)

To view the distribution of Unit Pillar Loading
select 'View Plots->Settings->Unit Pillar Loading'
To view the distribution of Load Bearing Capacity
select 'View Plots->Settings->Load Bearing Capacity'

<table>
<thead>
<tr>
<th><strong>Development Loading</strong></th>
<th>32,076,000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Headgate Loading</strong></td>
<td>46,829,970</td>
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<tr>
<td><strong>Bleeder Loading</strong></td>
<td>61,583,930</td>
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<tr>
<td><strong>Tailgate Loading</strong></td>
<td>83,882,200</td>
</tr>
<tr>
<td><strong>Isolated Loading</strong></td>
<td>93,024,470</td>
</tr>
</tbody>
</table>

| **[ALPS MULTIPLE SEAM LOADS ON PILLAR SYSTEM]** (lbs) / (ft) of gate entry |
| MS Development Load            | 37,480,950 |
| MS Headgates Load              | 50,883,680 |
| MS Bleeder Load                | 64,286,410 |
| **MS Tailgate Load**           | 84,692,940 |
| MS Isolated Load               | 93,024,470 |