

Roof Control at Intersections

Problem Booklet

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Instructions

Read the background information on the following page. It is information you would know if you worked at the Oak Leaf Mine. Read the problem situation described at the bottom of the same page. Then answer each of the 11 questions. Do them one at a time. Don't jump ahead, but you may look back to the background information or earlier questions and answers at any time. Some questions will ask you to choose only ONE answer, while others will ask you to select as MANY answers as you think are correct. Follow the directions for each question.

After you have selected a choice to a question, look up its number on the answer sheet. Select your answer(s) to each question by **slowly** and **gently** rubbing the developing pen between the brackets on the answer sheet. A hidden message will appear and tell you if you are right. When you have finished, you will learn how to score this exercise.

Background

You and Andy are general inside laborers on the midnight maintenance shift at the Oak Leaf Mine. You each have over 15 years of underground experience, all at this mine.

The average coal seam height is 84 inches (7 ft).

Entries and crosscuts are cut 20 feet wide, on 80 foot centers.

There are 5 working sections at this mine, each having 5 entries.

The bottoms are evenly cut, but they are wet and slippery.

There is a battery powered scoop in each section.

The roof control plan specifies the use of 6 and 8 foot mechanical roof bolts to be installed 5 bolts across the entry on maximum 4 foot centers with 4 foot spacing between rows and a maximum of 4 foot from the rib.

According to the roof control plan, the diagonal intersection measurement, the total of the two diagonal measurements cannot exceed 60 feet, and neither measurement can be greater than 31 feet.

Although a single row of posts is not required in the belt entry, mine policy is that posts be set in the belt entry. They are to be set on a maximum of 4 foot centers, no more than 4 feet from the rib.

Prior to entering the mine, all employees were given a safety talk. The toolbox topic covered was the increase of roof and rib problems due to the higher humidity levels of the summer air.

Problem

You and Andy are assigned to advance the power center, the mobile equipment, and the trailing cables in the 1 Left section. See Figure 1. While walking around the section surveying your assignment, you notice spalling along the left rib of the #3 belt entry. The spalling extends from the intersection, immediately inby the power center and continues, roughly the entire length of the block. The sloughing of the rib runs from roof to bottom. You and Andy decide the loose rib needs to be scaled down.

Study Figure 1. Now turn to Question A.

Face Area
No. 3 Entry

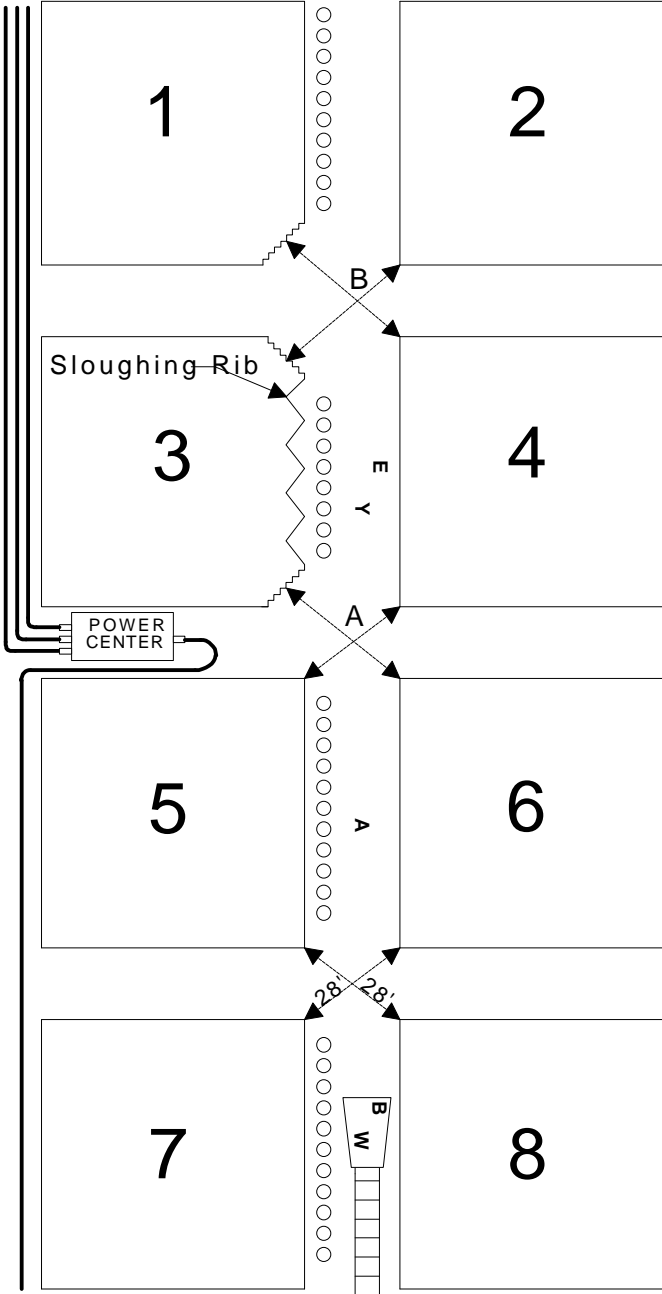


Figure 1

Question A

What is the most important thing to do before you and Andy begin barring the loose rib? (Choose only ONE unless told to "Try again.")

1. Nothing. The #3 entry is the belt entry, and roof conditions are constantly monitored so the roof and rib are probably OK.
2. Place danger signs at both ends of the rib.
3. Visually examine the rib and sound the roof.

Question B

You and Andy decide to start scaling the rib. What steps should you take before beginning to scale down the rib? (Select as MANY as you think are correct.)

4. Call the shift foreman to inform him of the condition.
5. Gather shovels to clean up the coal, and slate bars to begin barring.
6. Remove the posts running along the rib where you are going to begin scaling.
7. Set up a plan of action with Andy, so that you each know exactly what the other person is going to do.

When you have made your selection(s) do the next question.

Question C

After barring the rib, you and Andy take a short break before continuing your work. Everything has gone well and a large amount of loose coal has accumulated along the rib line. What steps should be taken first? (Select as MANY as you think are correct.)

8. Use the scoop to clean up the loose coal along the entire rib.
9. Re-inspect the roof and rib, paying particular attention to the newly exposed roof area.
10. Rock dust the area where the rib has been barred down.
11. Set temporary roof supports, if needed, and call the shift foreman to inspect the area.
12. Measure the distance between the rib and the first bolt to see if the distance is more than four feet.

When you have made your selection(s) do the next question.

Question D

After barring the rib, you determine the entry is still in compliance. The foreman asks you to check the diagonal measurements of the outby intersection to see if it is still in compliance with the roof control plan. If it is not in compliance, he tells you to fix the problem.

You find the two diagonal measurements to be 28 feet and 32 feet (see A on Figure 1). Is the intersection in compliance with the roof control plan? (Choose only ONE unless told to "Try again.")

13. You don't have enough information to make this decision at this time.
14. Yes, the intersection is in compliance with the roof control plan.
15. No, the intersection is not in compliance.

Question E

What is your best option to bring the intersection into compliance? (Choose only ONE unless told to "Try again.")

16. Set posts at the four corners of the intersection to minimize the area of the intersection.
17. Overbolt the intersection with bolts at least one foot longer than normal.
18. Build a crib on the outby corner of the #3 pillar.
19. Create an artificial pillar corner by setting posts on the corner of the #3 pillar to restore compliance.

Question F

You choose to build a crib on the outby corner of the #3 pillar. When it is finished, you measure the intersection and find that it is now in compliance. You measure the diagonals at the next inby intersection. Each leg is 31 feet (see B on Figure 1). Is this intersection in compliance with the roof control plan? (Choose only ONE unless told to "Try again.")

- 20. You don't have enough information to make this decision at this time.
- 21. Yes, the intersection is in compliance with the roof control plan.
- 22. No, the intersection is not in compliance.

Question G

What are some options for bringing this intersection into compliance? (Select as MANY as you think are correct.)

- 23. Set posts across the mouth of the crosscut between the #1 and #3 pillars.
- 24. Overbolt the intersection with bolts at least one foot longer than normal.
- 25. Build a crib on the outby corner of the #1 and the inby corner of the #3 pillar.
- 26. Create artificial corners on the outby corner of the #1 pillar and the inby corner of the #3 pillar by setting posts.

When you have made your selection(s) do the next question.

Question H

After bringing both intersections into compliance, you continue your assigned job. Once you find a situation which could effect the roof control plan, what additional safety precautions should be taken? (Select as MANY as you think are correct.)

- 27. You should inform other people in the section of this condition and tell them to closely monitor the situation.
- 28. You should walk along the safest looking rib.
- 29. You should begin barring down the loose rib coal all across the section.
- 30. You should visually examine all of the entries and pay particular attention to any additional potential hazards such as roof slips, clay veins, tripping hazards, etc.
- 31. The fireboss/foreman should periodically measure the width of the entries and diagonals and report any major changes.

When you have made your selection(s) do the next question.

On your answer sheet, please answer the following three questions:

Question I

Other than rib falls, list three causes of intersections being out of compliance.

Question J

What procedures could you use at your operation to bring an intersection into compliance with the roof control plan? List at least three.

Question K

Why is it important to maintain the roof control plan in intersections?

End of Problem

Scoring your performance

1. Count the total number of responses you colored in that were marked "correct". Write this number in the first blank on the answer sheet.
2. Count the total number of incorrect responses you colored in. Subtract this number from 16. Write the difference in the second blank on the answer sheet.
3. The best score is 31.