2008 Coal Mine Rescue Rules Training

April 8, 2007

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Chief Judges

GENERAL INFORMATION FOR CONDUCTING 2008 MINE RESCUE CONTESTS

- Mine Rescue Rules were designed as a training tool for mine rescue teams. The gas levels, limits, travel distances, water levels, etc. were developed for contest purposes only. Discretion should be used in actual mine emergency situations.

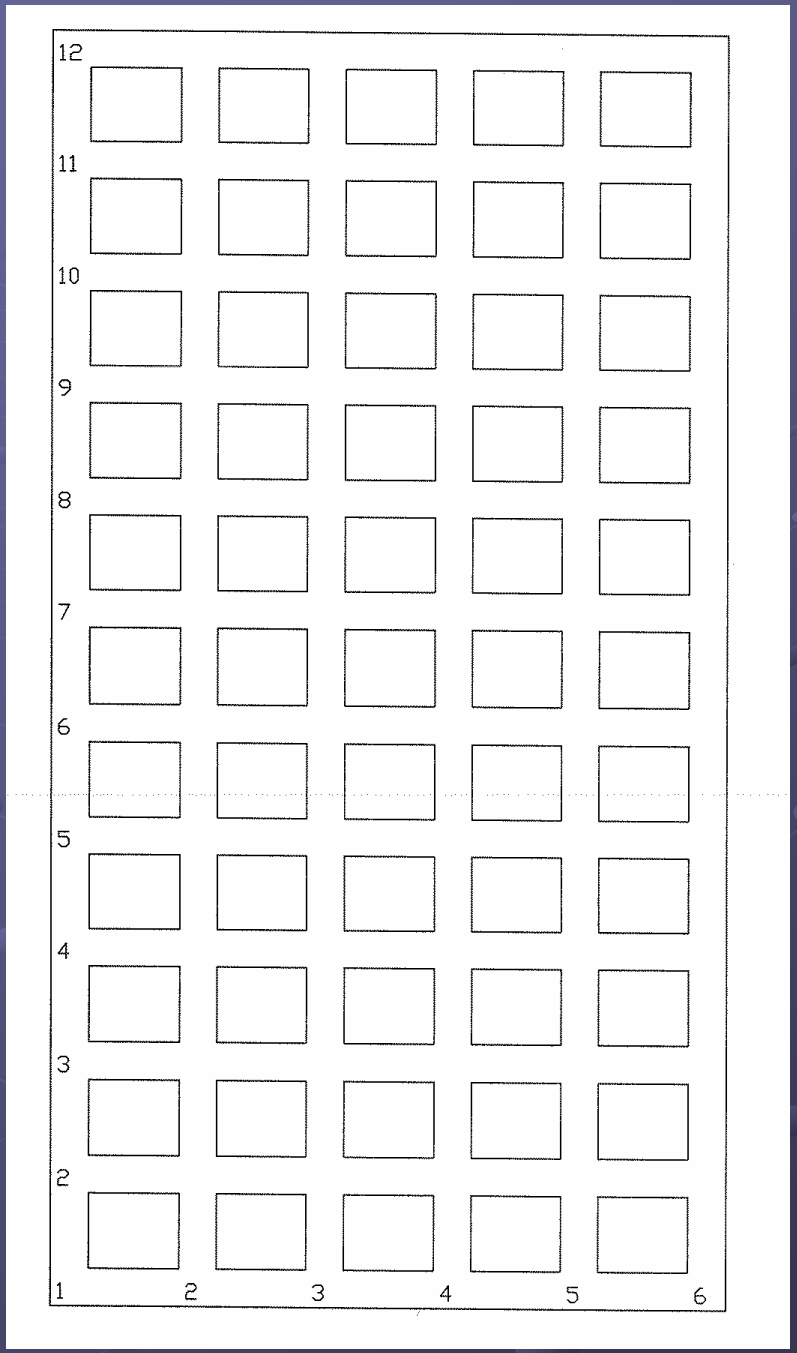
- 1. Mine rescue teams must be composed of:
  - Bonafide employees of mining companies
  - Persons who are designated or contracted by mining companies to fulfill the requirements of 30 CFR Part 49 mine rescue coverage
- 2. Isolation
  - 6:30 a.m. each day of their participation
  - Ten uniformed team members only

- 3. Teams are required to bring with them a sufficient supply of materials and apparatus accessories.
- 4. Mine Rescue Tiebreakers in order
  - B cards
  - Mine maps
  - Written examinations
  - Time cards
  - Actual time to work the problem(s)

- 5. Mine rescue teams shall be notified by posting when they may review their map and scorecards.
  - One hour for team captain, team trainer, briefing officer, and map man to report to a designated location
  - 20 minutes to review and prepare any written protests
    - Final Appeals Committee
      - No video tape recordings or photographs will be considered

- 6. Combination team
  - Three working first aid team members from the registered mine rescue team members
- Final ranking of combination teams
  - Composite of both days mine rescue scores and the first aid team's scores
  - First aid team's lowest score will be used to determine the final ranking
  - Final mine rescue ranking will be the tie breaker

- 7. The entire mine rescue problem including outby ventilation changes shall be contained in an area 6 entries wide by 12 crosscuts deep.
  - Will not be discounted for mapping or ventilation outside this area
  - Maps for working of the problems
    - 2 Blank maps (1” = 10’)
      - Team map
      - Briefing Officer map
    - 2 Maps of entire area (1” = 15’)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RULES GOVERNING 2008 MINE RESCUE CONTESTS

- 1. Minimum of 7 persons – Max of 10
  - 5 working team members
  - Briefing officer
  - Patient
  - Each member shall wear a different number (1 -10)
    - On the arm
    - At or near the shoulder
    - No. 1 assigned to the captain
  - After the clock is started:
    - 5 working members and the briefing officer only will be permitted to do work.

- Briefing Officer
  - Accompany only one participating team
  - May assist that team with any of the functions normally performed on the surface or at the fresh-air base
  - Stationed at the fresh-air base
  - Permitted to communicate with the team via telephone
  - Briefing officer's map
    - Identified by the Chief Judge
    - Shall be used for scoring purposes
    - Turned in at the completion of the problem.

- Briefing Officer
  - Remain at a designated location when the team is working inby the fresh-air base except when it is necessary to perform work outside that location in the fresh-air base
  - When required work is completed, the briefing officer must return to the designated location.

- 2. Each team shall provide its own breathing apparatus for each member of the team.
  - A breathing apparatus approved for at least two hours
    - Other approved breathing apparatus may be used on patients
  - Each team member must wear:
    - Safety boots
    - MSHA approved protective hat
    - Cap lamp (may or may not be turned on)
    - Similarly dressed
    - Self-rescuers not required for contest
    - Metal identification tag attached to his/her belt.

- 3. Each team must have its own breathing apparatus approved under either Bureau of Mines Schedule 13 or Subpart H of Part 11, Title 30, Code of Federal Regulations. Any team that anticipates using a breathing apparatus not listed in the rules must provide, at the time of registration, written instructions outlining the proper donning procedures for such apparatus.

- Breathing apparatus donning procedures listed in the rules:
  - Draeger 174, BG174, BG174A
  - Biomarine, Biopak 240S
  - Biomarine, Biopak 240 Revolution
  - Draeger BG-4

- 4. Gas testing devices
  - Approved by MSHA
  - Accurate reading for percent by volume or parts per million
  - Instruments not listed in the rules
    - Written instructions outlining the proper procedures for checking and testing with such instruments at the time of registration.

- Detecting Instruments listed in the rules:
  - CMX 270 Continuous Carbon Monoxide, Methane, and Oxygen Monitor
  - MSA Passport Personal Alarm
  - LTX 310 Multi-Gas Monitor
  - TMX 410 Multi-Gas Monitor
  - TMX 412 and ATX 620 Multi-Gas Monitors
  - CSE Explorer 4 Multi-Gas Monitor
  - ITX Multi-Gas Monitor
  - MSA Solaris
  - M40M Multi-Gas Monitor
  - MX6 iBrid Multi-Gas Monitor

- 5. Reporting to the mine entrance or fresh-air base all apparatus must be:
  - Fully assembled
  - Airtight
  - Ready to wear
  - Cylinder pressures must be within specifications of approval
  - Full practice canisters or other acceptable canisters must be in place
  - Spare apparatus are not required to be tested as part of the equipment check at the fresh-air base.
  - Each team will be responsible for the proper removal of all waste material

- 6. Portable mine rescue communications system approved by MSHA or a sound powered communication system
  - Wires or cable shall be of sufficient tensile strength to be used as a manual communication system
  - Standard signals if the communication system fails
- Wireless communication systems may be used
  - Designed and used in such a manner that the integrity of the Contest is not jeopardized
    - Determined by the Contest Director
    - Notify the Contest Director at official registration for 2008 event
    - Prohibited in the isolation area
      - Personal pagers
      - Cellular phones
      - Radios
      - Laptop computers, etc.

- 7. Each team must be under guard, in a designated location, before the start of the Contest.
  - continuously under guard until time to work the problem
  - After working problem, cannot return to the isolation area or communicate with any teams awaiting their turn to perform.
- 8. Unauthorized information
  - Disqualified
  - Discounted under Rule 37

- 9. Teams will not be permitted to furnish or make placards indicating materials or equipment and then simulate their use.

WRITTEN EXAMINATION

1. Contest Officals select 1 team member
   - 5 working team members and Briefing officer
   - One number will be drawn which will apply to all teams
   - 10 statements of fact
   - Verbatim from the contest rules
   - Each blank space shall represent a key word with no more than two consecutive blanks per statement.
   - Multiple Choice- 3 choices
   - Maximum of fifteen minutes

- 2. No written material or information into the testing area
- 3. No discussion during the written examinations

FRESH-AIR BASE PROCEDURES

- 1. The person in charge of the fresh-air base will introduce himself/herself to the team captain and briefing officer
- Teams will be allowed
  - Position their equipment (unload stretcher)
  - Lay out lifeline across the fresh-air base prior to the introduction
- A prepared statement will be read to the team
  - Questions regarding the problem or conditions in the mine will not be answered.
  - A maximum of five minutes will be allowed for discussion
  - Confined to the fresh-air base during this time period
  - A video presentation may be used in lieu of reading a prepared statement.

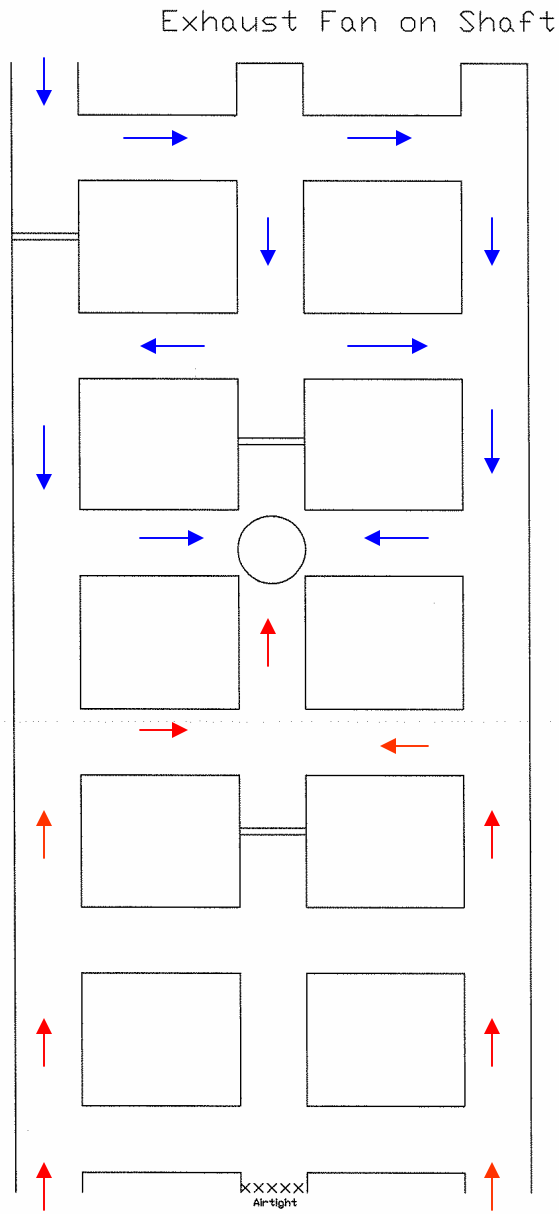
- 2. Each team will be given a written problem and maps.
  - The timing clock will be started by the team captain immediately after the team receives the blank map and problem.
  - Time required for studying the problems, checking equipment and getting under oxygen will be included in the total problem working time.

MISCELLANEOUS

- 1. To rescue people, teams may be required to:
  - Change existing ventilation
  - Energize power circuits
  - Pump water
  - Support unsafe roof if it can be done safely
  - Other methods of recovery will not be accepted (i.e. roping, hooking, etc.).
- 2. Only judges, Contest officials, news media, and working team members will be permitted in the working areas.
  - Photographers who wish to take pictures of the working teams must receive permission from the Director of the Contest.

- 3. Solid lines on a map denote actual and accurately measured workings.
  - No openings from above, below or on the same plane that are not shown on the map.
  - Dotted lines, on a map, denote projections and may or may not be accurate.
- 4. All existing ventilation or ventilation changes made by the team shall be defined by “parallel airflow.” Parallel airflow: the shortest or equivalent path that air can flow through the mine from each source.

- A source is defined as each location where air enters the mine. Air flow will take the shortest path from each source through the mine to exit and will not be affected by other independent air flow paths.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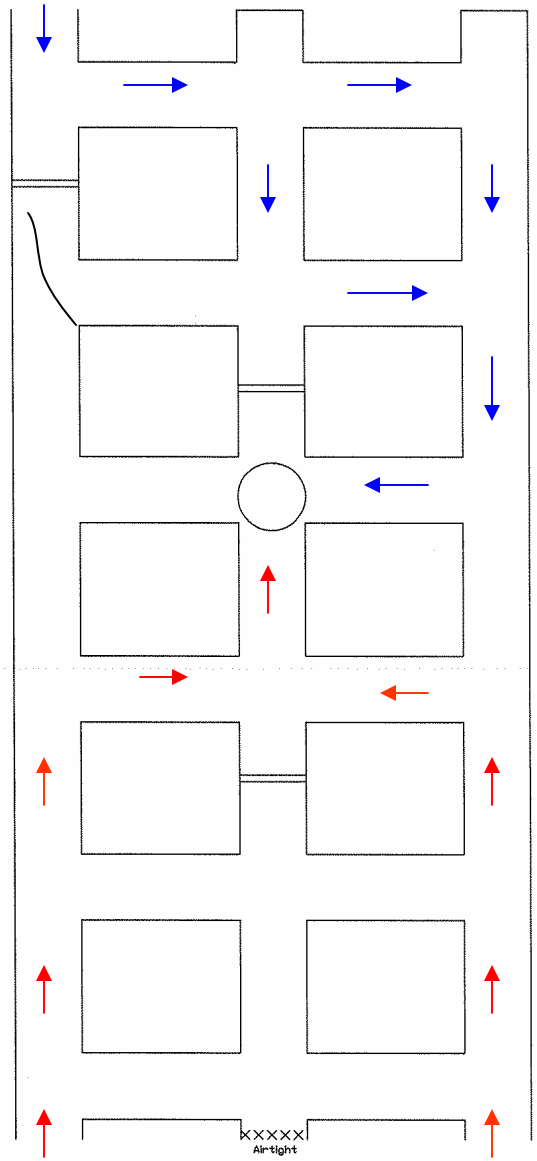
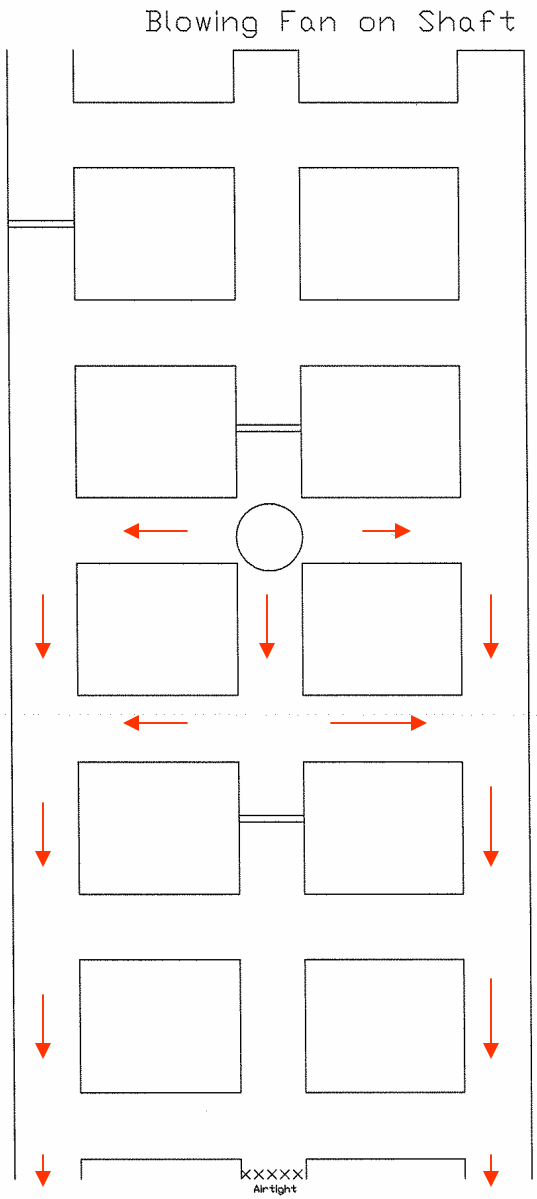
Exhaust Fan on Shaft

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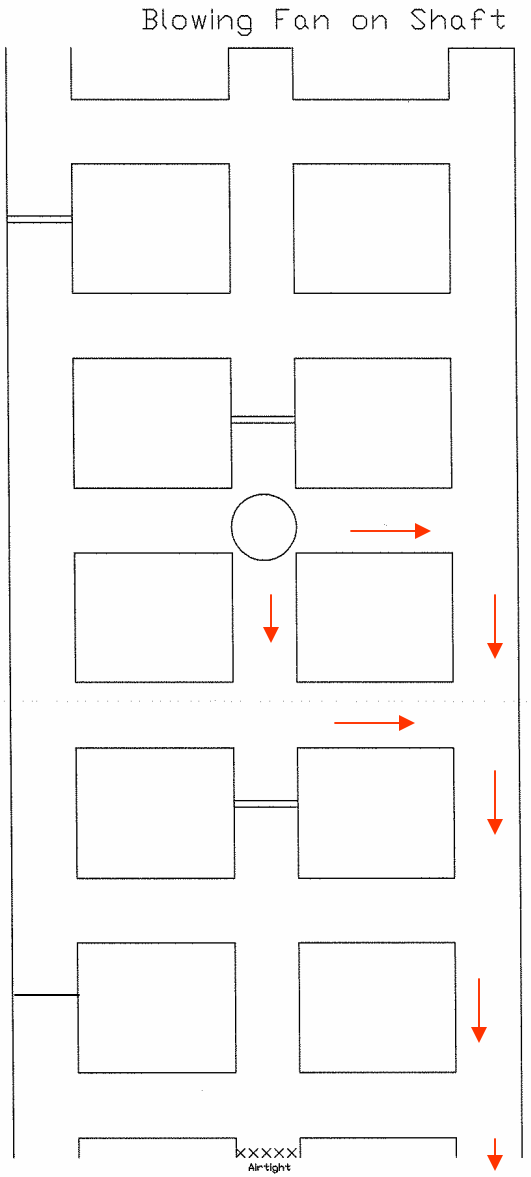
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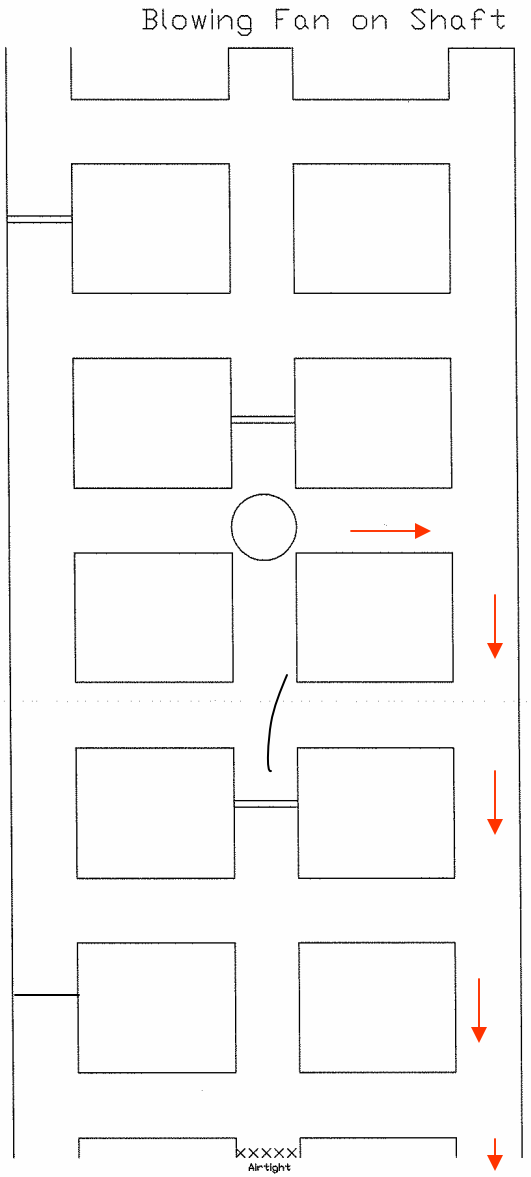
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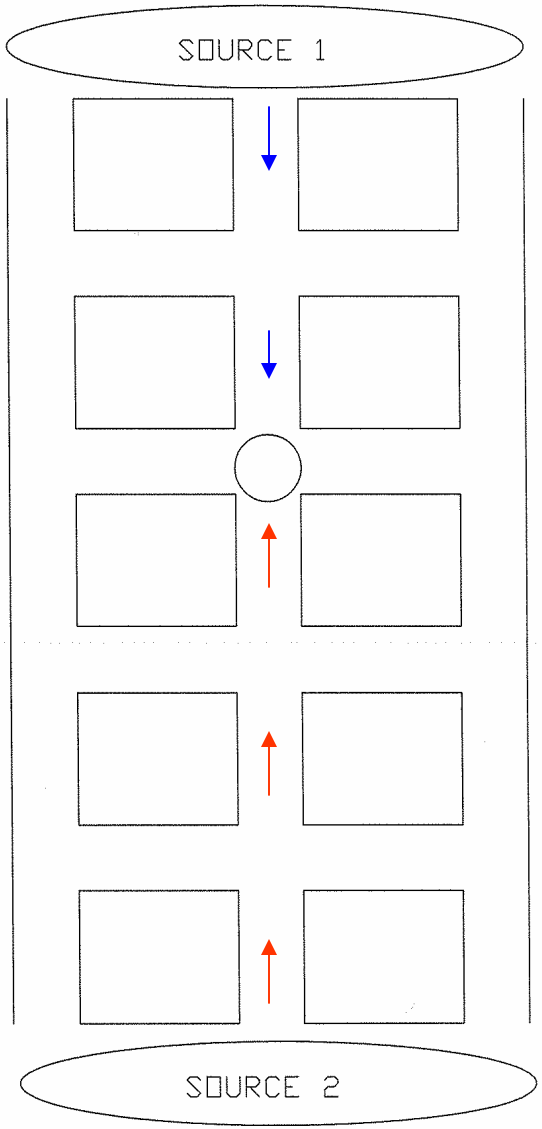

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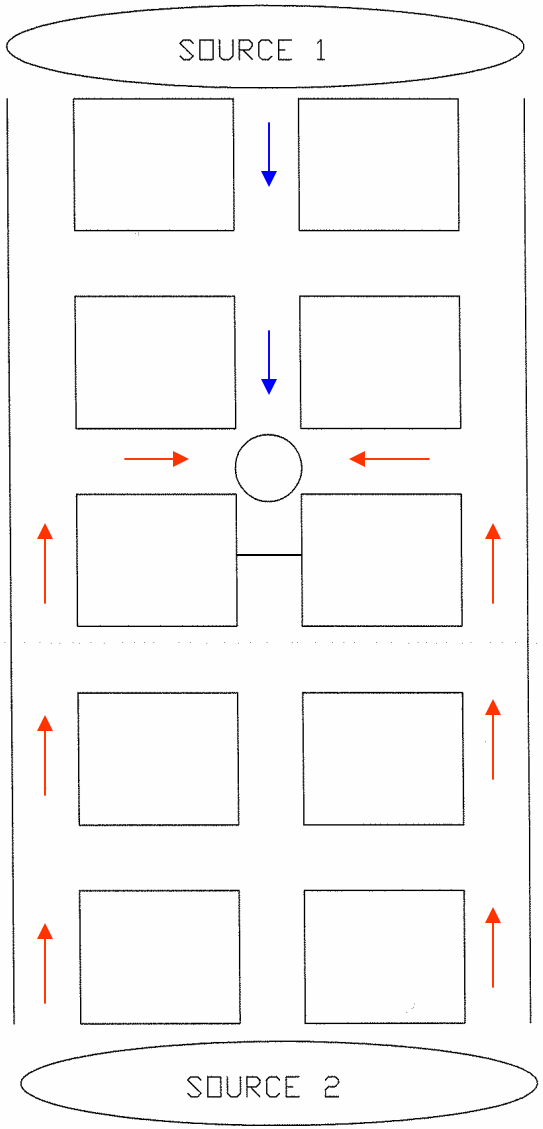

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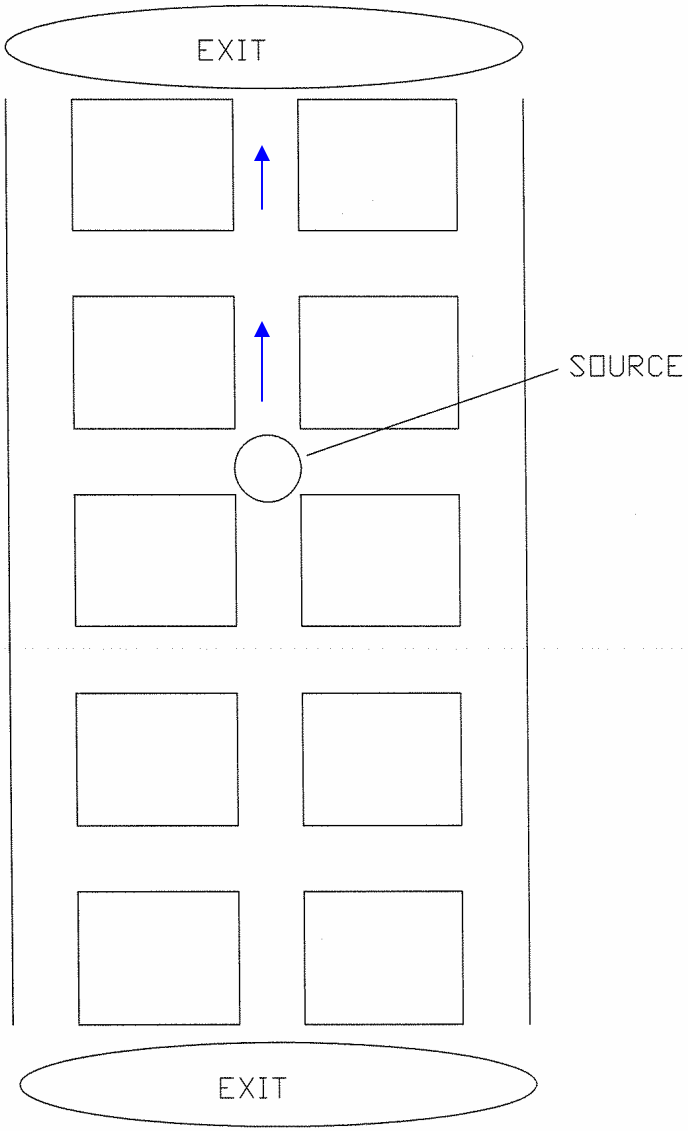

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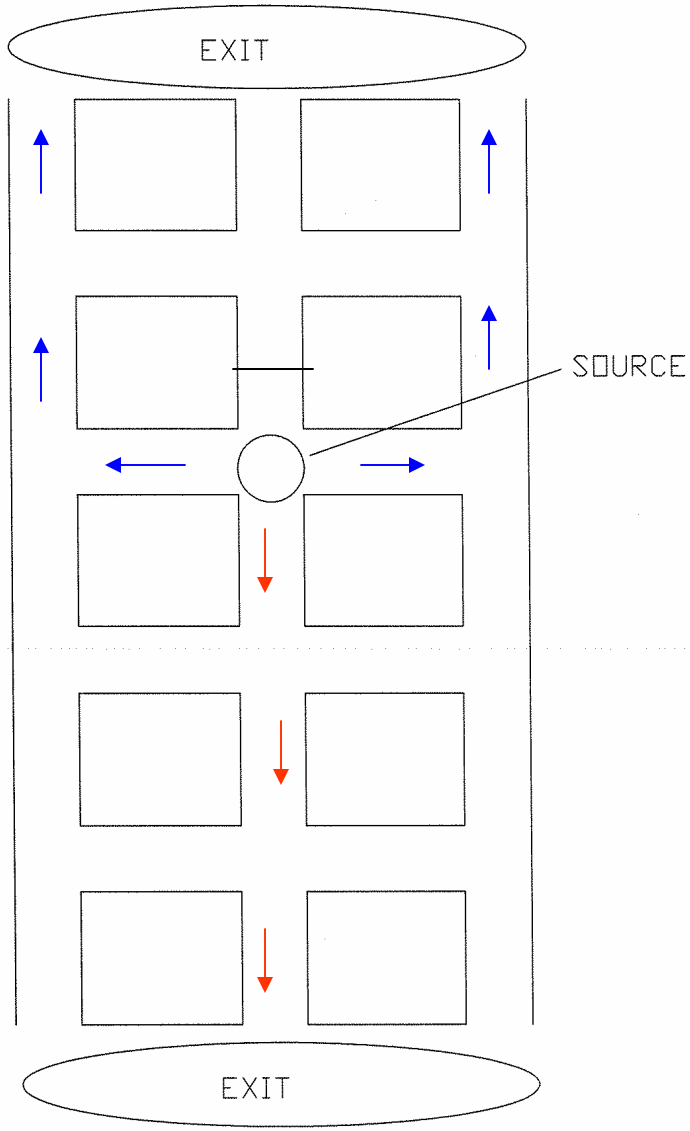

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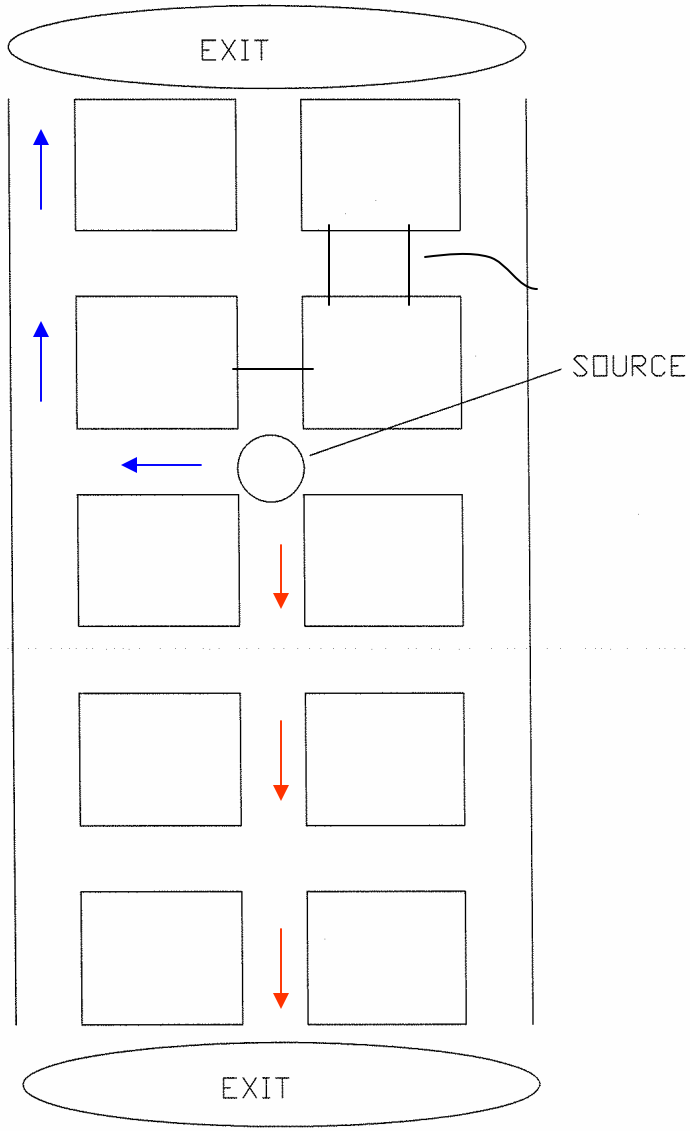

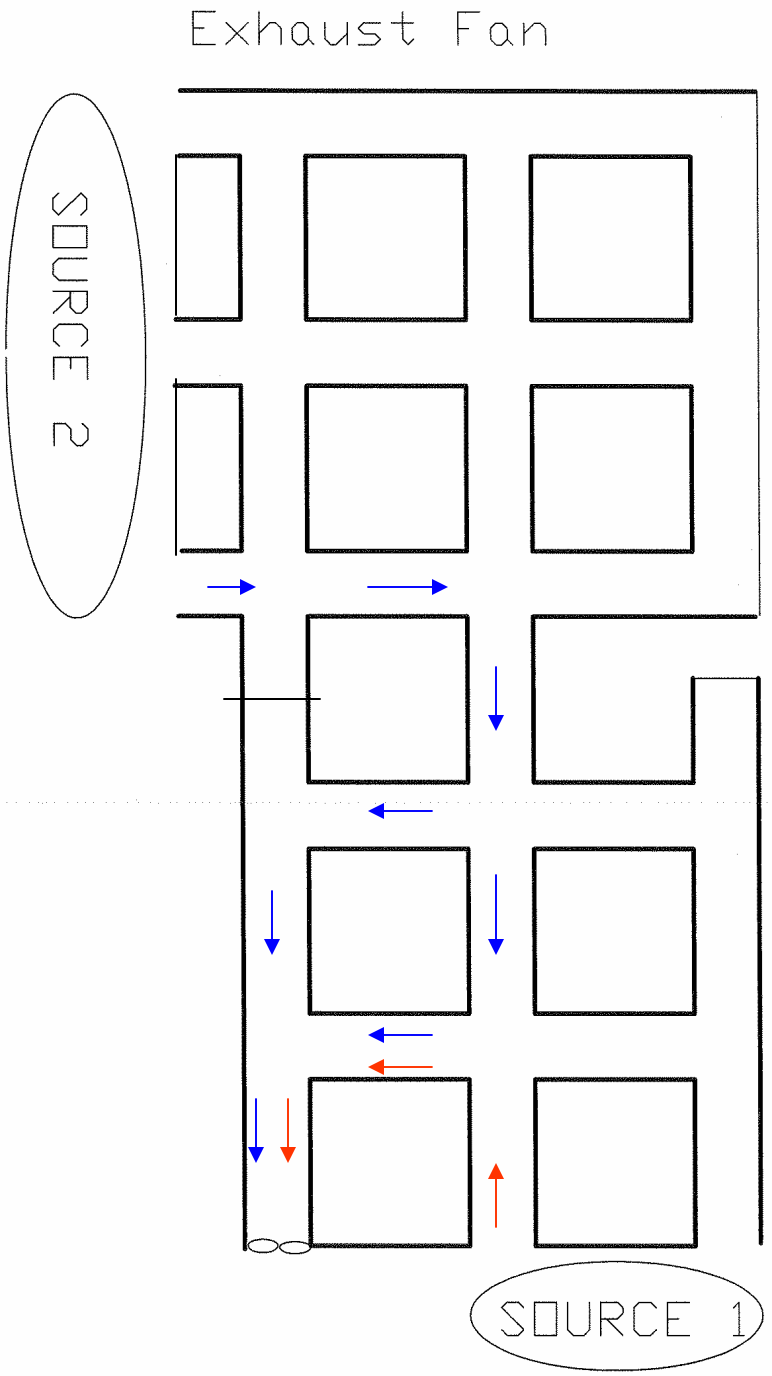
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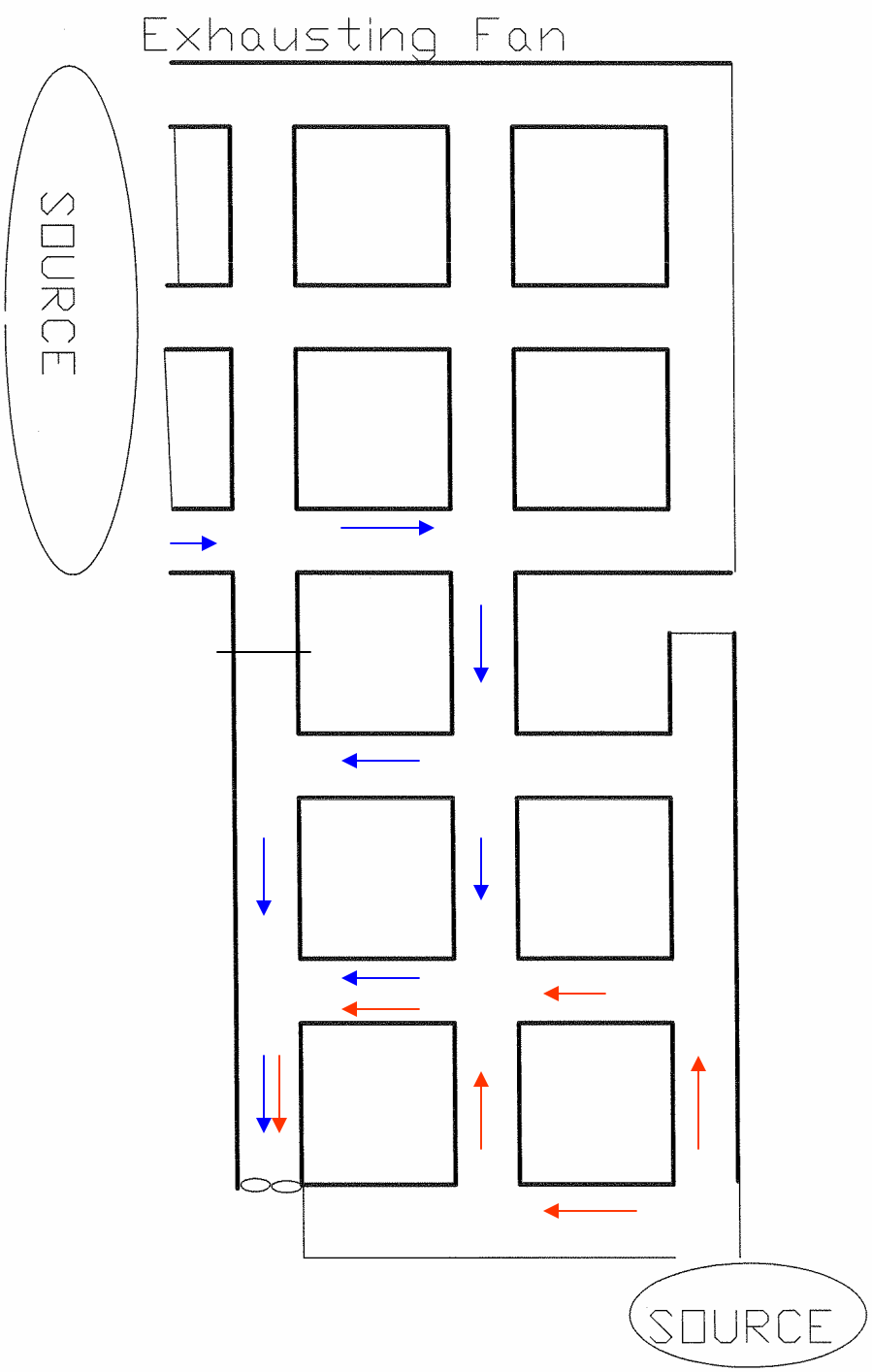
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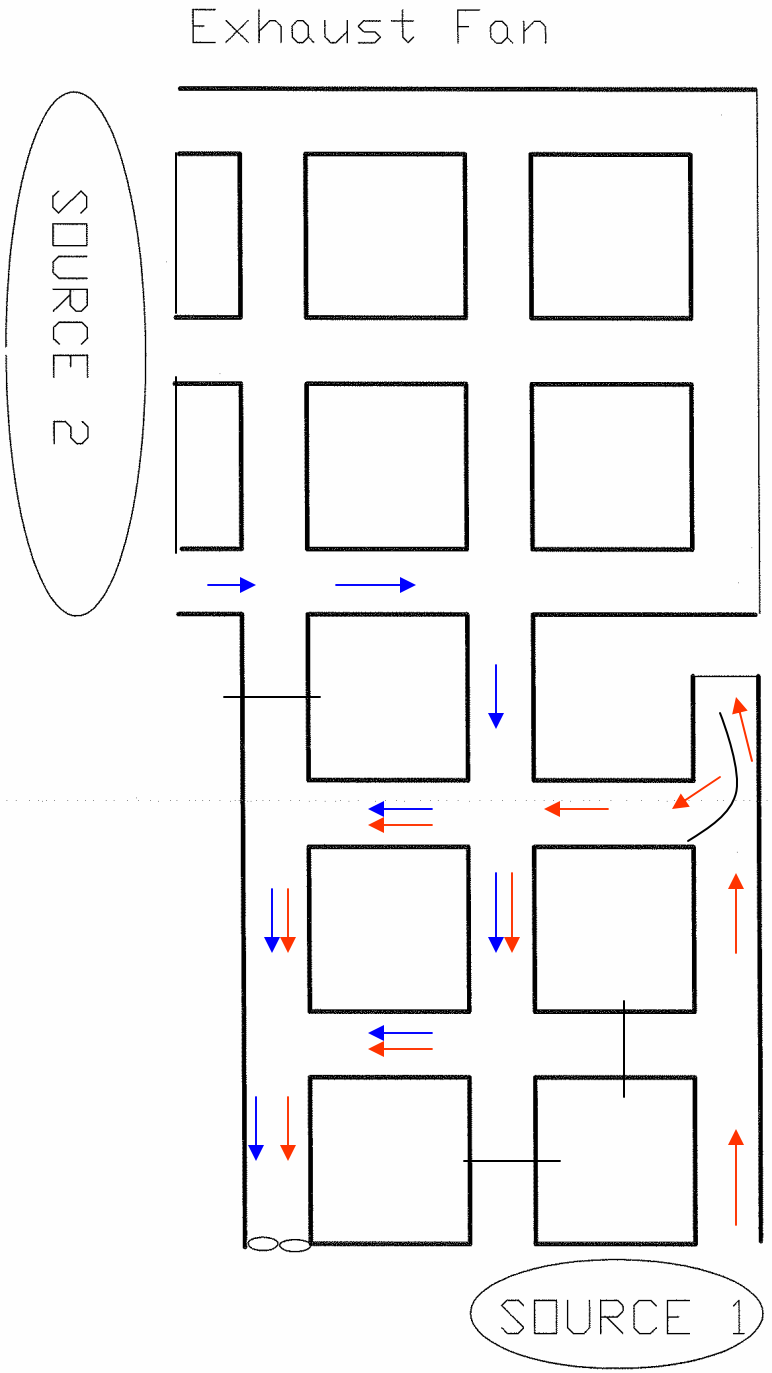
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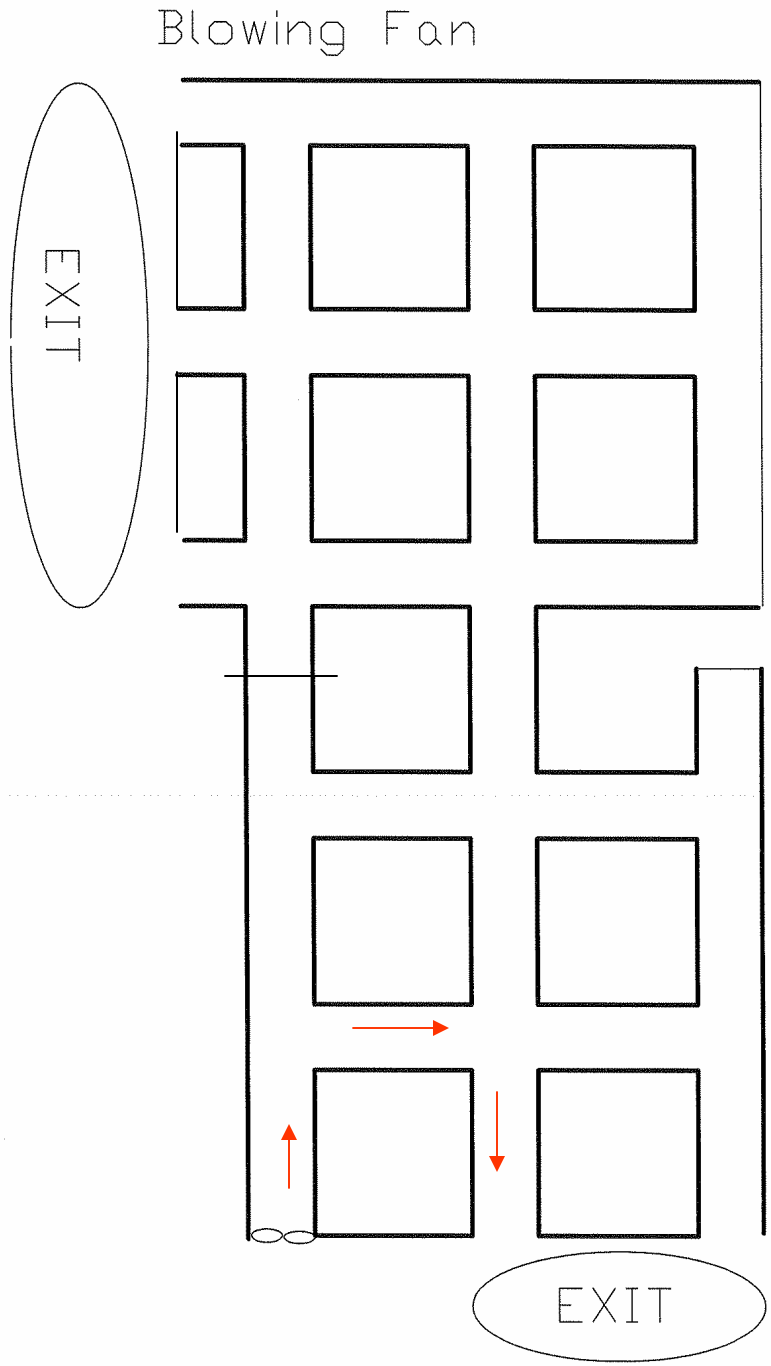
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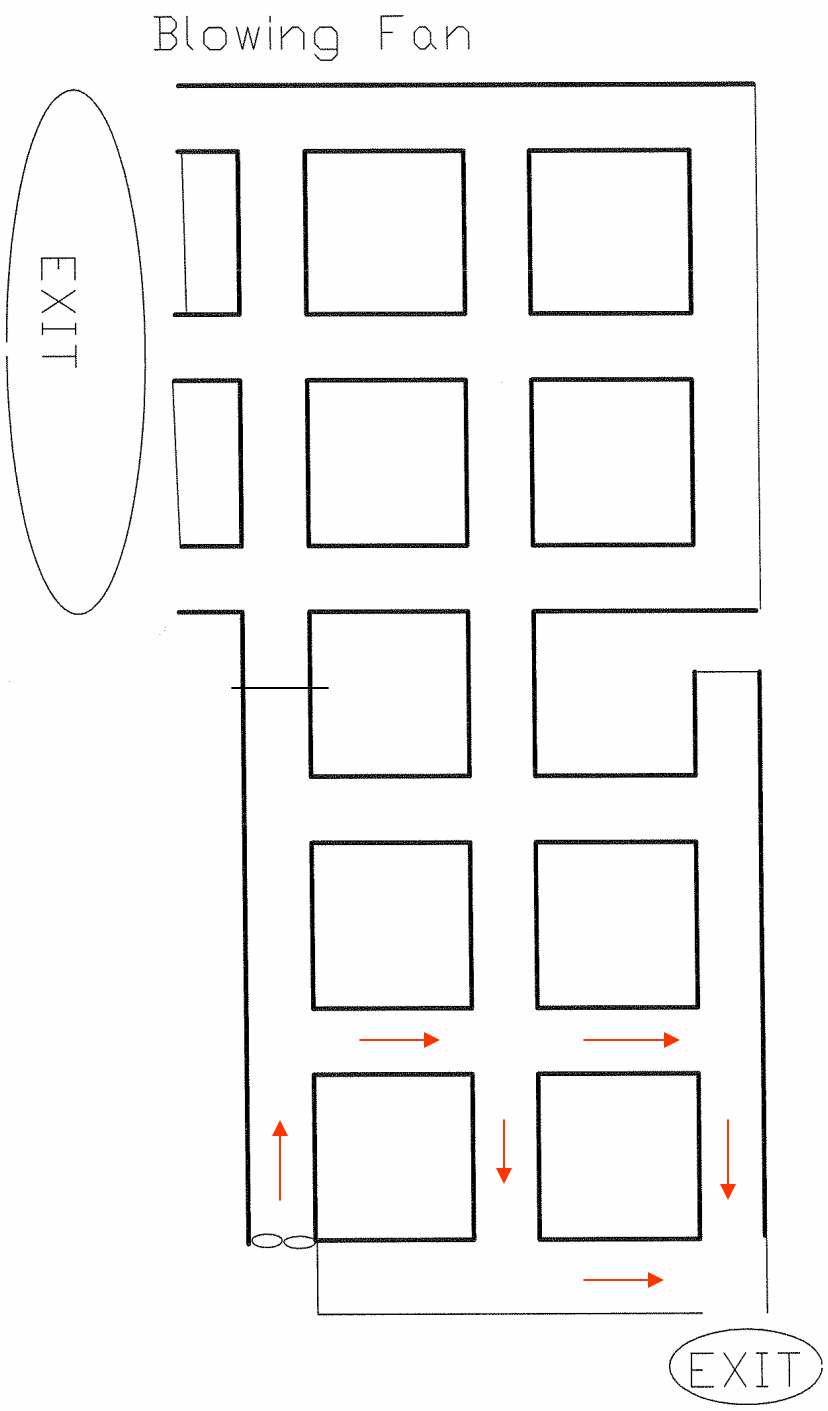
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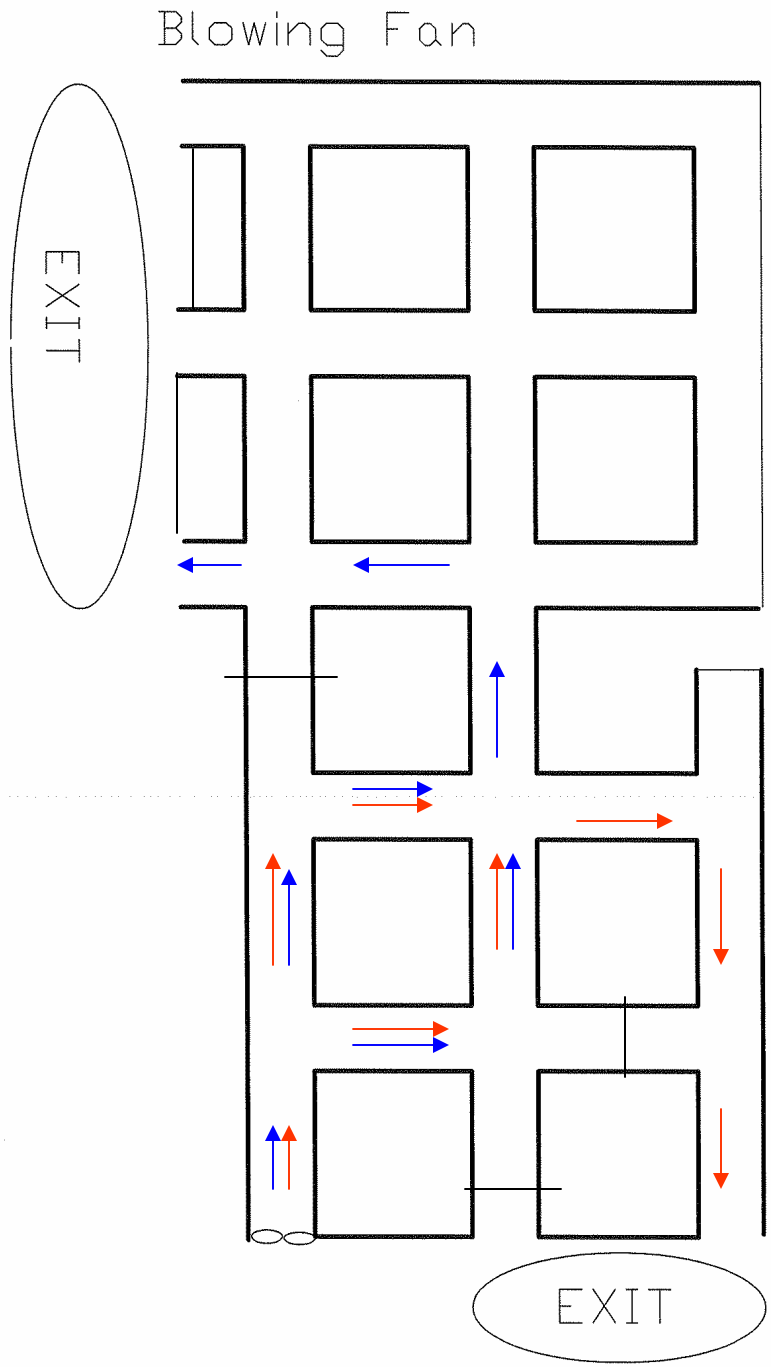
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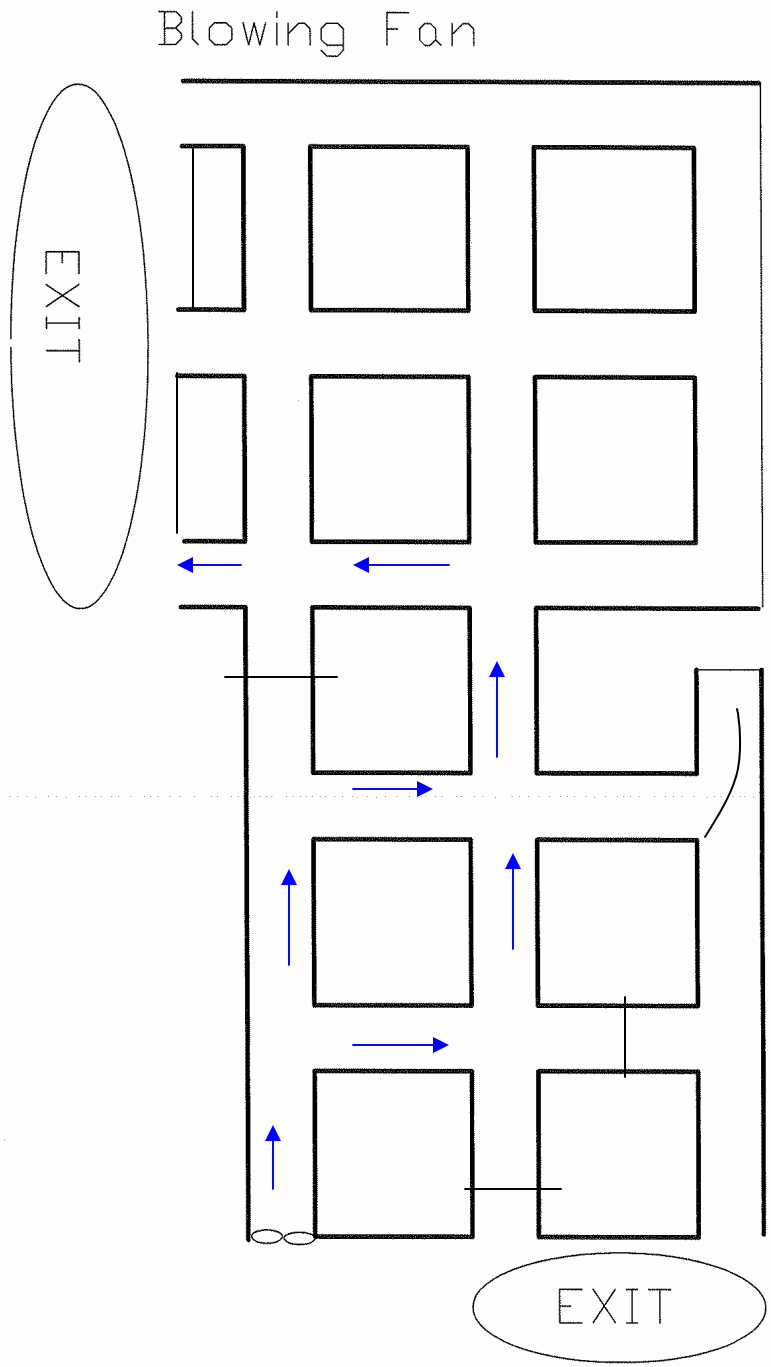
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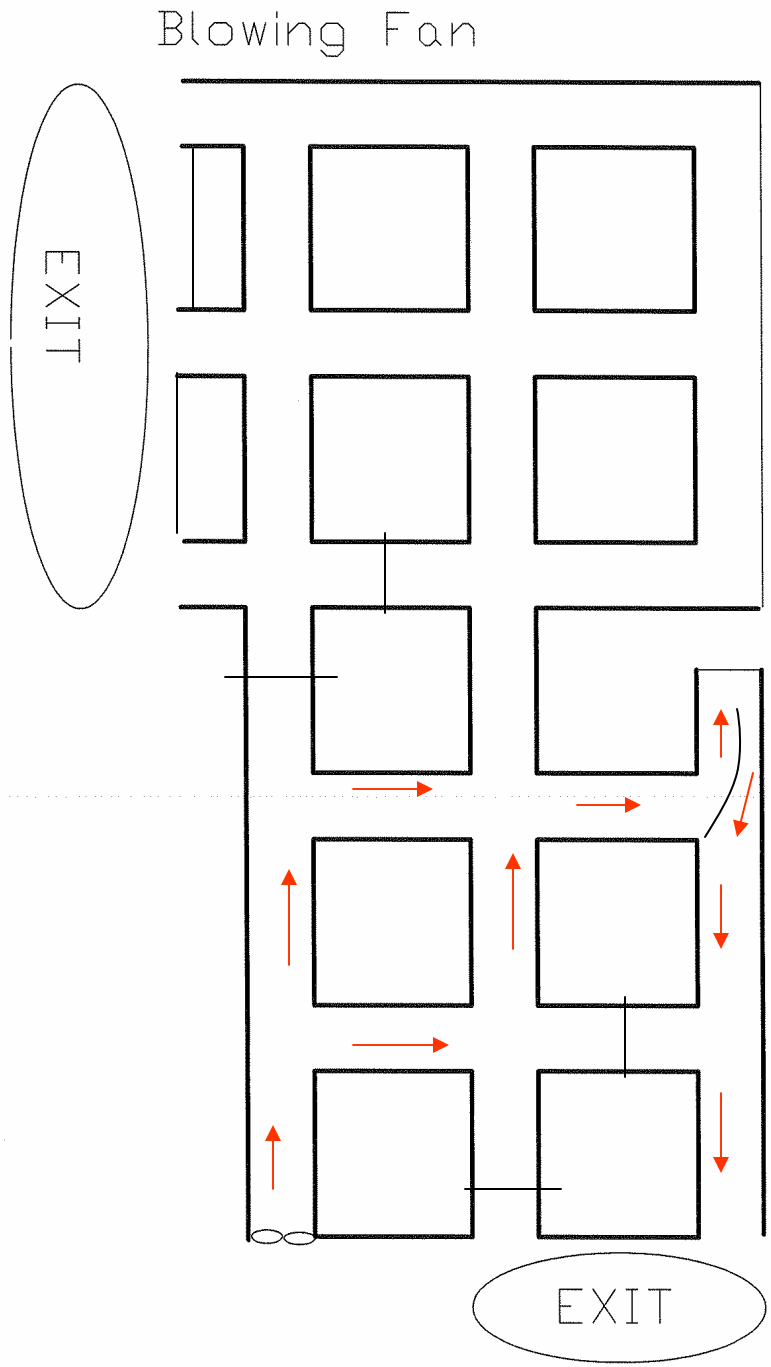
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INTERPRETATIONS OF A CARDS

- 1. For each incorrect answer on written examination. ___1
- 2. Failure to examine gauges and apparatus at not more than 20 minute intervals.
  - One point for each minute or fraction thereof___1
  - Time goes from completion of the last person during the previous apparatus check to the completion of the last person checked during the current apparatus check

- 3. Failure to complete the problem in the calculated time, for each five minutes overtime, or fraction thereof___1
  - The calculated time will be determined by averaging the working time of all teams participating in the Contest.
  - The working time will start when the team captain starts the clock at the fresh-air base
  - Working time ends when captain stops the clock
    - Maps must be submitted to the judges
    - No work will be permitted on the map after the timing device has been stopped

- 4. When submitted to the map examiners, conditions and/or objects marked on the team map in any area of the mine not explored by the team, each infraction___1
  - Conditions and/or objects that are in advance of the point that the captain has traveled shall not be recorded on the map, except for the following conditions when they extend from rib to rib:
    - Unsafe roof
    - Caved areas
    - Water over knee deep
    - This also includes inextinguishable fires.
  - Objects or conditions passed by the team in the same opening or intersection shall be marked on the map.

- 5. Failure to locate and record accurately (verbatim) on the team map objects/conditions that should have been found and were indicated to be in the mine, for each omission ___2
  - Verbatim
    - Same sequence
    - not stacked or oriented like the card
    - Symbols are not acceptable to replace wording
      - “ cannot be substituted for the word inches
      - Legend symbols can be used for wording on placards

- Do not have to map objects/conditions that are initially found in the fresh-air base.
- This discount shall be assessed for all objects/conditions that are not mapped in an area of the mine that the team should have explored if the problem had been worked systematically and correctly or for mapping objects/conditions not found in the mine.
- Objects/conditions located in areas of elongated unsafe roof, unsafe rib, and areas where unsafe roof extends diagonally from rib to rib must be mapped if passed by the team.

- The legend shall be used by all teams to mark their respective mine maps.
  - Objects/conditions not covered by the legend will be written in by the team and the location of the object/condition indicated by the symbol "X".
  - The team may place any additional information on the mine map concerning objects/conditions found in the mine if it does not adversely affect the legibility of the items/conditions required to be mapped.
- The marked map as submitted by the team will be compared with the problem and key map by the map examiners.
  - 6 foot tolerance
  - Center point to center point

- Team fails to explore the entire mine
  - FPA except at locations where the following objects/conditions are encountered:
    - **Faces**
    - **Caved areas**
    - **Water over knee deep**
    - **Unsafe roof across an opening**
    - **Seals**
    - **Stoppings**
    - **Barricades**
    - **Closed regulators**
    - **Inextinguishable fires**

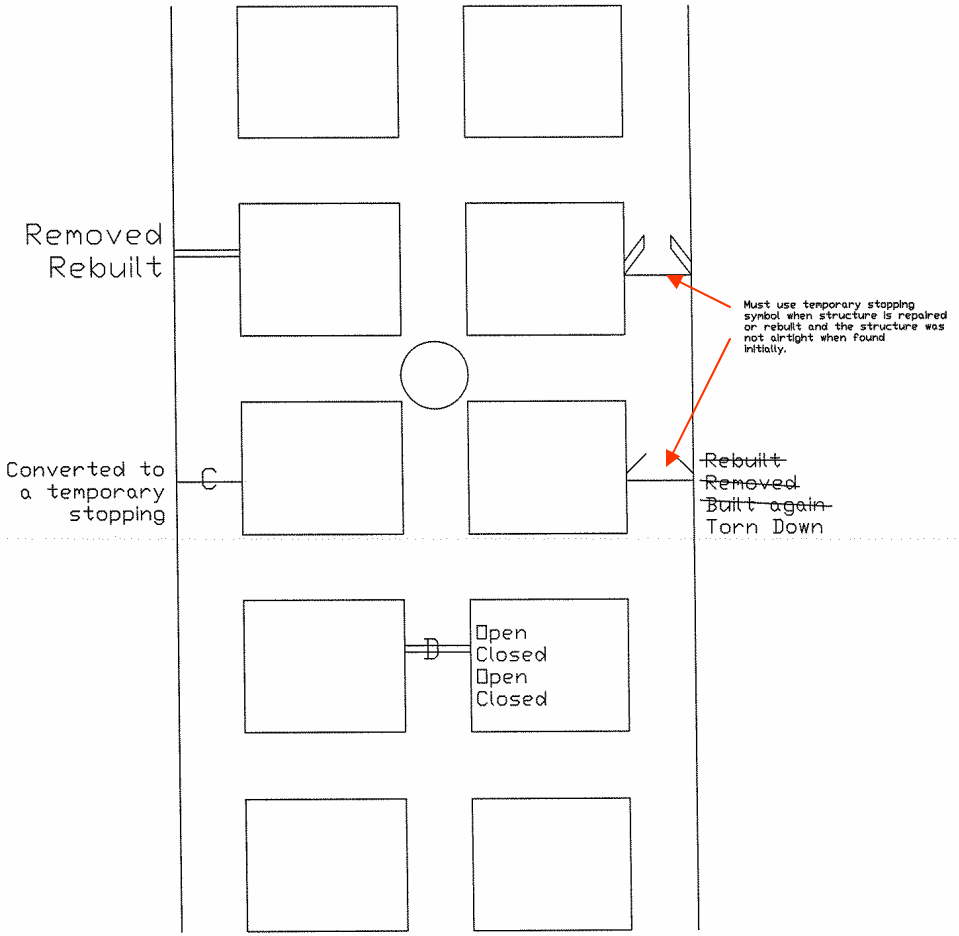
- Information found on notes in lunch boxes, at barricades and any other location must be recorded on the map
- Patient statements and notes given to team do not need to be on map

- A placard indicating person but cannot be reached
  - Mapped as an X with the word person written out
  - Changed to body or live person symbol if reached in conjunction with original X

- The following changes need to be noted on the mine map to indicate the conditions left in the mine and the fresh-air base:
  - **Changes to ventilation structures**
  - **Victims removed from the mine**
  - **Electrical circuits energized or de-energized**
  - **Fires extinguished**
  - **Ignition sources relocated**
  - **Water pumped**
  - **Roof supports installed**
- **Areas reentered by team**
  - **Smoke cleared**
  - **Gases removed**
  - **Permanent changes in direction of ventilation**
- A single placard which denotes the start and end of any condition requires only one symbol to be mapped.

- Ventilation structures such as stoppings, doors, etc. that are initially located and mapped, will remain on the map and any removal of such structure will be reflected by a notation such as removed. If rebuilt in the same location, a notation, such as rebuilt, will suffice. If a check curtain is converted to a temporary stopping, a notation indicating such will suffice.
- All newly erected, intact and airtight structures built by the team, except for frames erected for a line curtain, will be considered to be temporary stoppings. Regardless of their use or intention (i.e. ventilation, airlock, seals, regulators, etc.) they shall be treated and mapped as a temporary stopping.

Mapping Notations



- After the clock is stopped, the judge’s final ventilation map shall be confirmed on the field with the team captain.

Mapping

Items to be mapped
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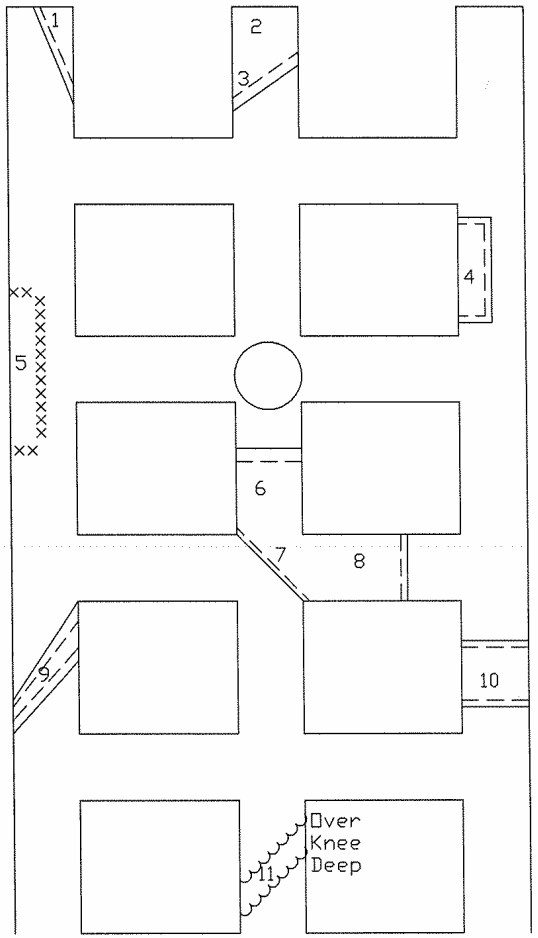

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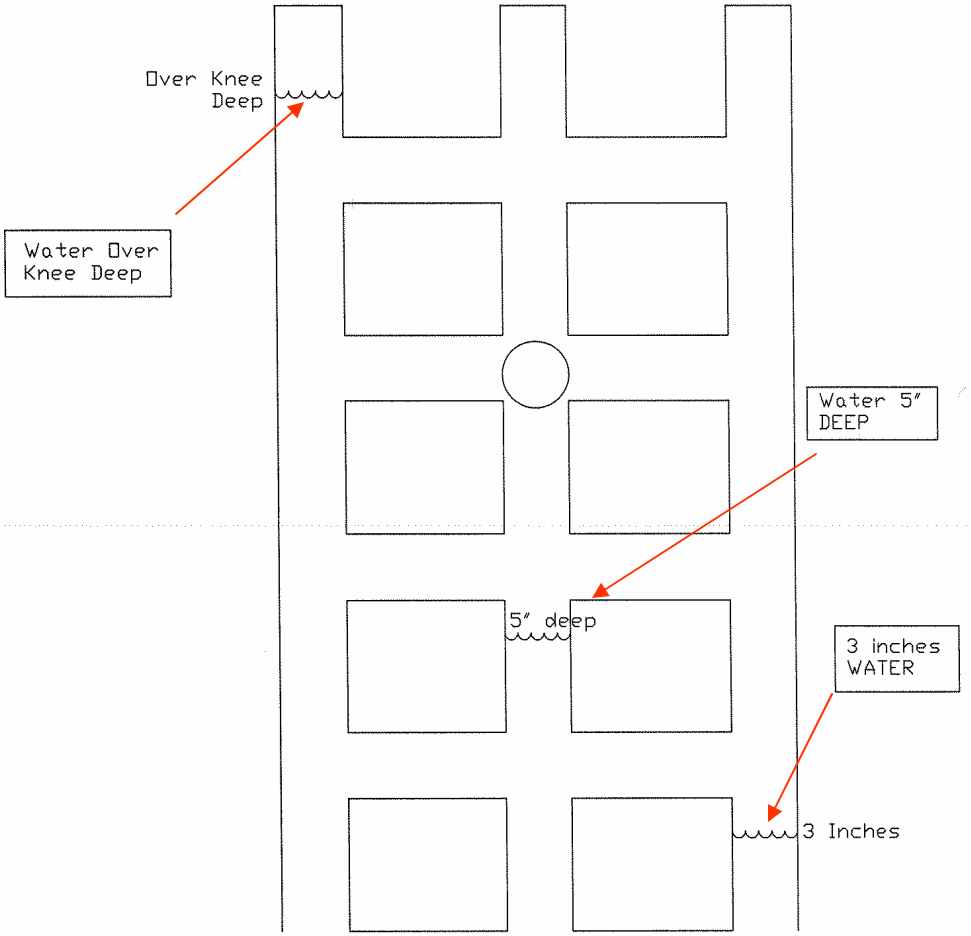
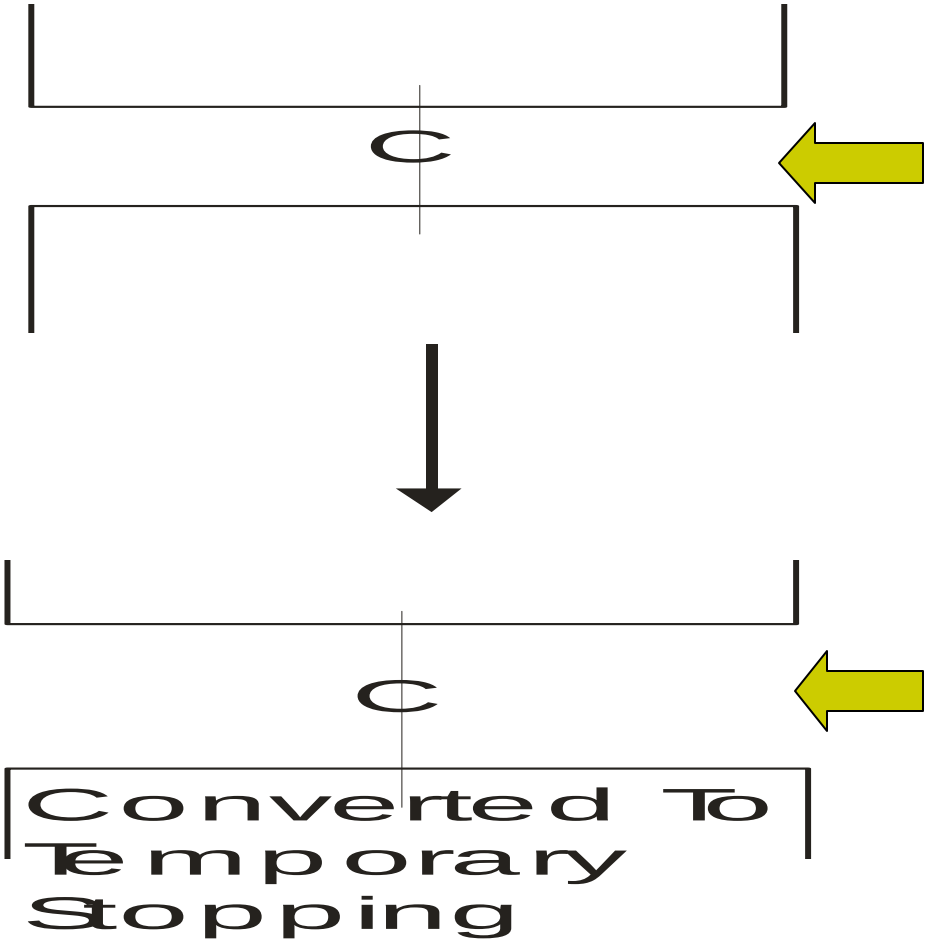
Mapping Water



Converting a Check Curtain



- 6. Failure to locate and record on the briefing officer's map all objects/conditions, as described below, that should have been found and were indicated to be in the mine, for each omission --- 1

- The following objects/conditions as left in the mine must be located on the briefing officer's map:
  - Locations of persons/bodies
  - Intact ventilation structures
  - Smoke
  - Gases
  - Caved areas
  - Unsafe roof
  - Water over knee deep
  - Ignition sources
  - Areas reentered by team
    - Smoke cleared
    - Gases removed

- Briefing Officer map:
  - Shall use legend
  - May have additional information if does not adversely affect legibility of requirements
  - Objects/conditions
    - Shown in correct entries, crosscuts and openings
    - Orientation does not apply
    - Verbatim does not apply
    - 6 foot tolerance does not apply

INTERPRETATIONS OF B CARD

- A. Apparatus
- 1. Apparatus improperly assembled, each apparatus___ 3
  - Failure to fasten covers, snaps, etc.
  - Full practice canisters or other acceptable canisters must be in place and used in the apparatus.

- 2. Apparatus improperly adjusted to the wearer, each person___1
  - Patient must have apparatus on and properly adjusted, even if on stretcher.
  - This ONLY applies to shoulder straps, chest straps, and head straps that are not properly fastened, are twisted or rolled
- 3. Failure to follow prescribed procedures for going under oxygen, each person, excluding patient___3
  - This will depend on type of apparatus used.

- 4. Apparatus part or parts worn or deteriorated so as to be dangerous to the wearer, each person___8
  - Holes that are in the breathing tubes and straps that break after the wearer goes inby the fresh-air base are discounts.
- 5. Oxygen supply of team members over specified limitations___2
  - Prior to starting work

- 6. Failure of captain to examine gauges, apparatus, and to have his/her gauges, apparatus examined before entering the mine, each apparatus___2
- 7. Failure to make proper apparatus examination during any required apparatus check, each infraction___1
  - Gauges (Checked and protected)
    - Put back in protective holder
  - Facepiece
  - Hoses
  - Protective Cover Secure
  - Assurance team member is all right
    - Verbal response will suffice

- 8. Not wearing goggles in conjunction with an SCSR when smoke is encountered, each patient, each infraction___2
- 9. Team members breathing external air inby the fresh-air base, each team member, each infraction (excluding patient)___10

- 10. Team not following proper procedure in case of apparatus failure, each infraction___6
  - Must proceed to fresh-air base immediately
  - Procedure for returning simulated malfunctioning apparatus to use
    - Take apparatus off
    - Set it on the ground at FAB
    - Put it back on
      - Follow prescribed procedures for going under oxygen

- 11. Failure to properly protect patient, secure patient to stretcher, cover patient with blanket, or placing patient on stretcher in such a way as to foul proper operation of apparatus, each omission___2
  - Dropping the patient.
  - Secured to stretcher (2 bandages or straps)
    - Trunk of body
    - Legs
    - Covered with blanket from the neck to and including the feet
    - Do not crimp airhoses
    - Bandages or straps fastened perpendicular to body
  - Unconscious patients must be brought to the fresh-air base on stretchers.

B. Auxiliary Equipment and Testing Devices

- 12. Failure to take necessary equipment and gas-detecting devices to work the problem, each omission ___2
  - Must take detectors underground
  - Detectors can be turned off once tested

- 13. The following equipment must be tested after the clock is started and before the entire team goes underground or inby the fresh-air base _____2
  - Stretchers
    - Unloaded and unfolded to be tested
    - Team member in prone position with arms extended
      - With apparatus on
    - Both ends lifted simultaneously
  - Communication system
    - Between team and briefing officer
  - Fire extinguishers
    - Visually
  - Gas detecting instruments
    - After testing, gas detecting instruments may be turned off during working of problem

- 14. Equipment failing to function properly upon testing, if not corrected before entering the mine, each infraction ___4
- 15. Failure to secure extra approved breathing apparatus or device to stretcher___2

C. Communication and Signaling

- 16. Failure to arrange standard lifeline pull signals___3
  - After the clock is started
  - Arrange with judge handling lifeline
  - Before the entire team goes underground or inby the fresh-air base

- 17. Failure to give proper notification to the briefing officer with lifeline or communication system of team's intentions, each infraction___1
  - Must report intentions to the briefing officer
    - 1 pull – Stop
    - 2 pulls – Advance
    - 3 pulls – Retreat
    - 4 pulls – Help
  - If lifeline breaks
    - Immediately repair or
    - Return to fresh-air base
  - Improper signals would apply only to signals transmitted between the No. 5 team member and the briefing officer.

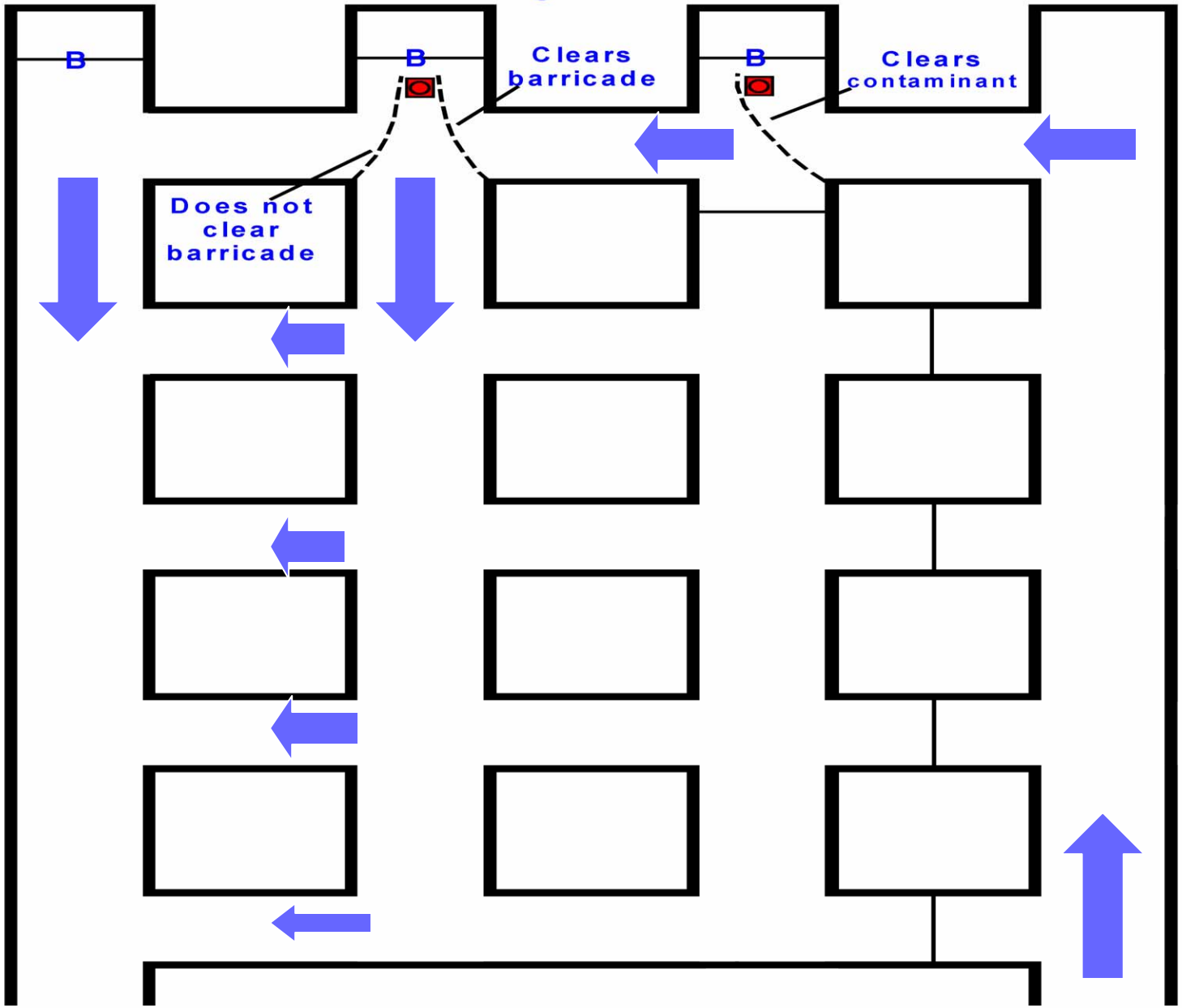
- All team members must hold or be attached to the team lifeline while traveling.
- Lifeline
  - Not more than 28 feet
  - Nonextendable tagline not more than 36 inches

- 18. The team must notify the briefing officer and obtain his or her permission before ventilation changes are made or power circuits energized___2
  - Ventilation changes will be considered as starting, stopping, or redirection of the air current or changes of the constituents.
    - Boreholes cannot be used for ventilation purposes
  - Removal of contaminants
    - Line curtain within 5 feet of extent of contaminant
    - If extent < 5 feet inby rib line curtain must break imaginary line of rib

- Existing check curtain
  - Must be converted to temporary stopping to direct ventilation
- Pumping water
  - Contest officials must change placards to indicate water has been lowered

- Ventilation changes by the back-up team(s)
  - A minimum of two minutes
  - No additional work or team moves
    - Making apparatus check not work
    - Reviewing the map will not be considered work
  - Once the change has been submitted
    - The team cannot stop or change the request.
  - Each additional requst for change will require an additional two minutes.
  - All changes must be initialed by a member of the team.

Clearing Barricade



- 19. Failure to take lifeline or other communication system into the mine___10
- 20. In air clear of smoke, none of working team members having hold of lifeline___2
  - Does not apply on the surface or at the fresh-air base unless otherwise required by the Rules.
- 21. In smoke, any team member not having hold of lifeline, telephone line, or having either firmly attached to his/her person, each infraction___2
  - All team members must be in air clear of smoke before any team member drops lifeline.

D. Gas and Roof Testing

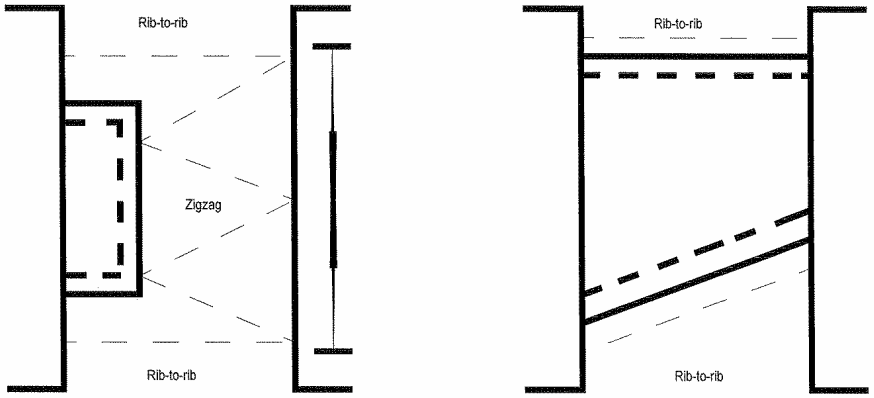
- 22. Failure of captain to test the roof, face, and/or ribs by the sound and vibration method, each infraction ___2
  - Unsafe roof
  - Caved areas
  - Prior to building a temporary stopping
  - Building frames for a line curtain
  - Rebuilding a stopping that is completely destroyed
  - Converting an existing check curtain to a temporary stopping
  - Faces

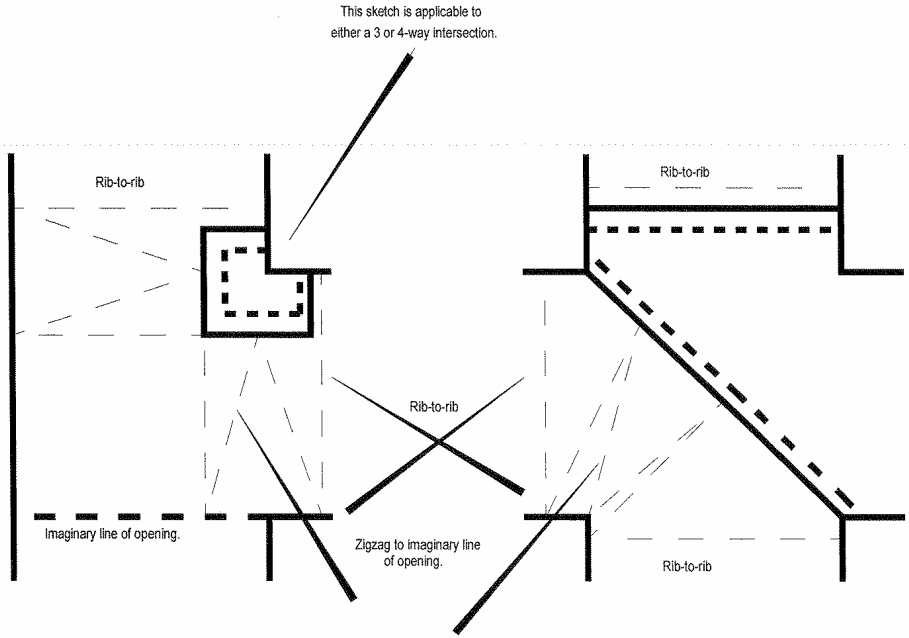
- No team member may perform work or move into any area during a team stop until the captain makes the appropriate roof examination for that area.
  - Sound and vibration method or
  - Visual by Captain's physical presence
  - Sound and vibration method immediately for unsafe roof
    - In intersection
    - On imaginary line of intersection
    - Team members can be in intersection
  - If it can be done safely, all roof tests shall be made from rib to rib, and the face, roof, and each rib at faces of places.

- No sound and vibration method required for
  - Overhanging brows
  - Unsafe ribs
- Proper way to make roof tests along an extended area of unsafe roof
  - Roof tests from rib to rib at the outby end
  - Zigzag between the edge of the unsafe roof and the adjacent rib
  - Rib to rib at the inby end
  - See Figure 1(a) and 1(b)
- If an example is not shown in the rules then a zigzag test will be sufficient.

Figure 1(a)

PROPER METHOD OF ROOF TESTING

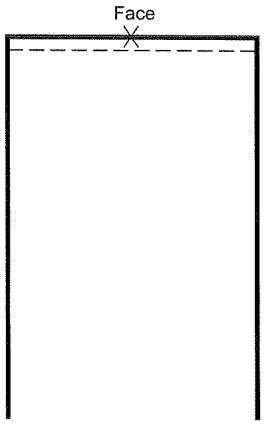




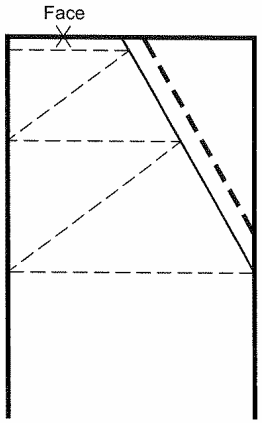
33

Figure 1 (b)

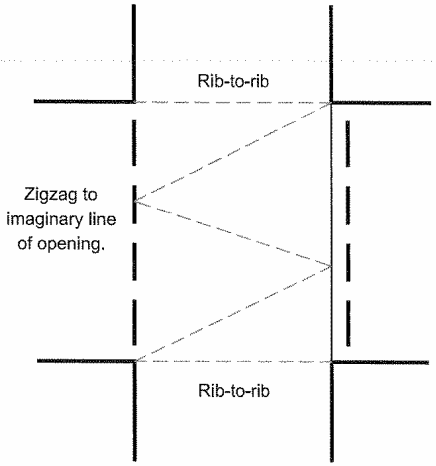
PROPER METHOD OF ROOF TESTING (cont.)



Face, Roof, and Ribs Tested.



Face, Roof, and Rib at Face.



This sketch is applicable to either 3-way or 4-way intersection.

- Prior to extinguishing a fire, roof and rib tests shall be made from rib to rib.
  - Perpendicular to direction of team travel
  - Must be made by the captain
  - Once team advances or retreats from area
    - Subsequent roof and rib tests must be made prior to each time a team member(s) travels through the area where the fire was located
  - Roof and rib test must be made at all fires, including inextinguishable fires.

- 23. Failure to make necessary gas tests where required, each omission___2
  - Each team stop that is required by the problem during initial exploration in unexplored areas and the following normal areas
    - **All mine entrances**
    - **Entrances to sections of the mine to be explored**
    - **Faces**
    - **Walls of overcasts or undercasts**
    - **Stoppings**
    - **Ventilation doors**
    - **Barricades**
    - **Seals, (if intact and airtight)**
    - **All fires**
    - **Sample pipes or tubes in airtight seals (valves must be opened before testing if closed)**
    - **Open boreholes**
    - **Exhaust fans**
  - Apparatus checks are not normal areas to be tested

- B. Gas tests shall be made in each opening to an intersection before the team advances from that intersection.
  - Do not need to be rib to rib
  - In the opening within 25 feet from the original stopping point of the captain or No. 5 team member if conditions permit.
- C. Must check all entrances to the area to be explored prior to entire team going underground or inby fresh-air base
  - Captain cannot advance more than 25 feet inby

- D. The constituents of the air enclosed by separations intended or indicated to be airtight will be considered unknown and must be determined by the Captain before other team members enter such area.
  - If stopping has hole in it a gas test is not required prior to entry

- E. When smoke is encountered, it will be considered to extend to a placard stating the “end of smoke” or a separation intended or indicated to be airtight.
- If carbon monoxide, methane, or oxygen deficiency is found in an opening containing a separation intended or indicated to be airtight, the gas will be considered to extend to the airtight separation or to a placard indicating a change in the gas constituents. If carbon monoxide, methane or oxygen deficiency is encountered in other locations, it will be considered to extend to the next normal area to be tested for that gas, depending on direction of team travel, at which time the continuance or discontinuance of the gas will be determined by placards or by results of the tests. See Figure 4.

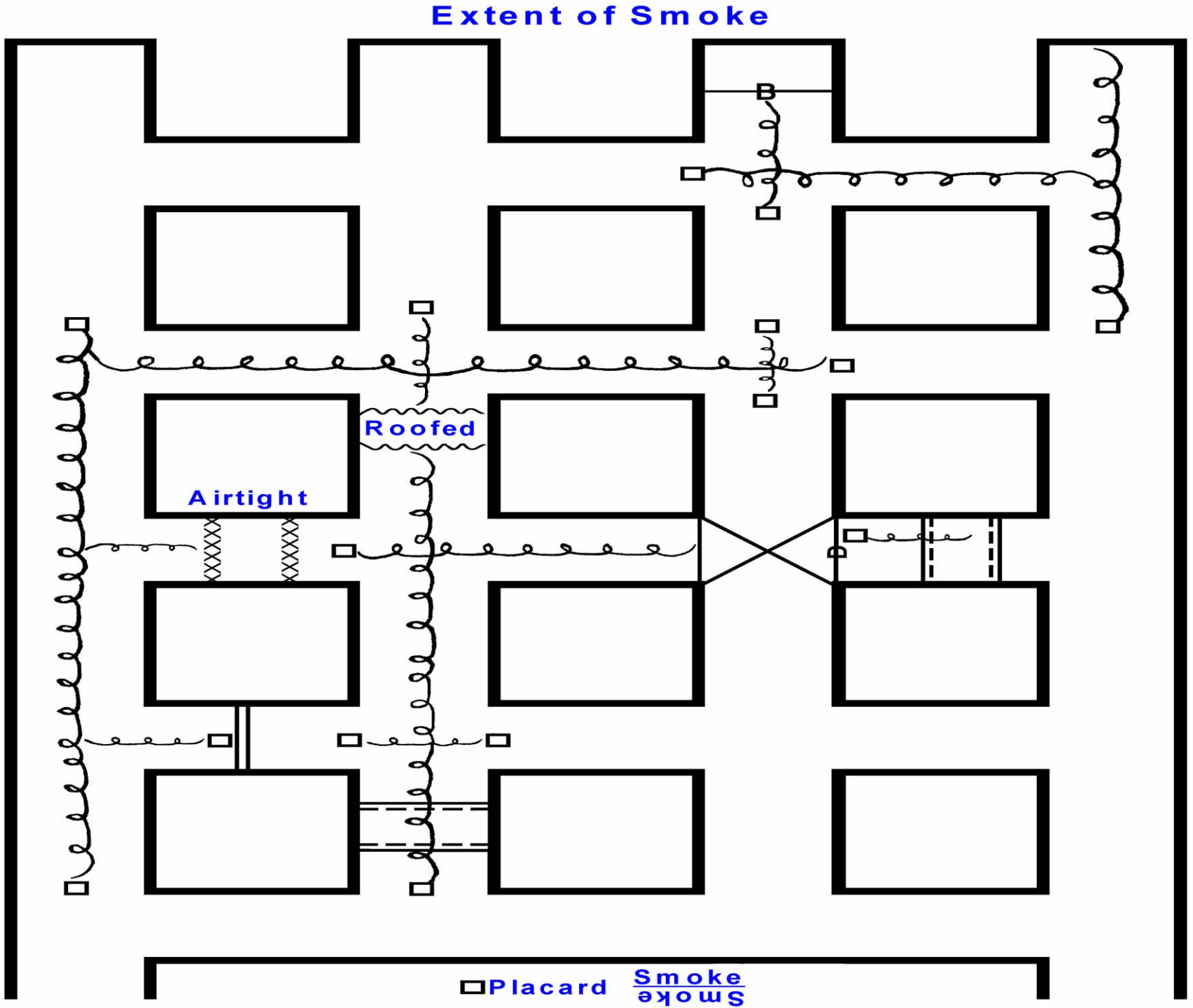
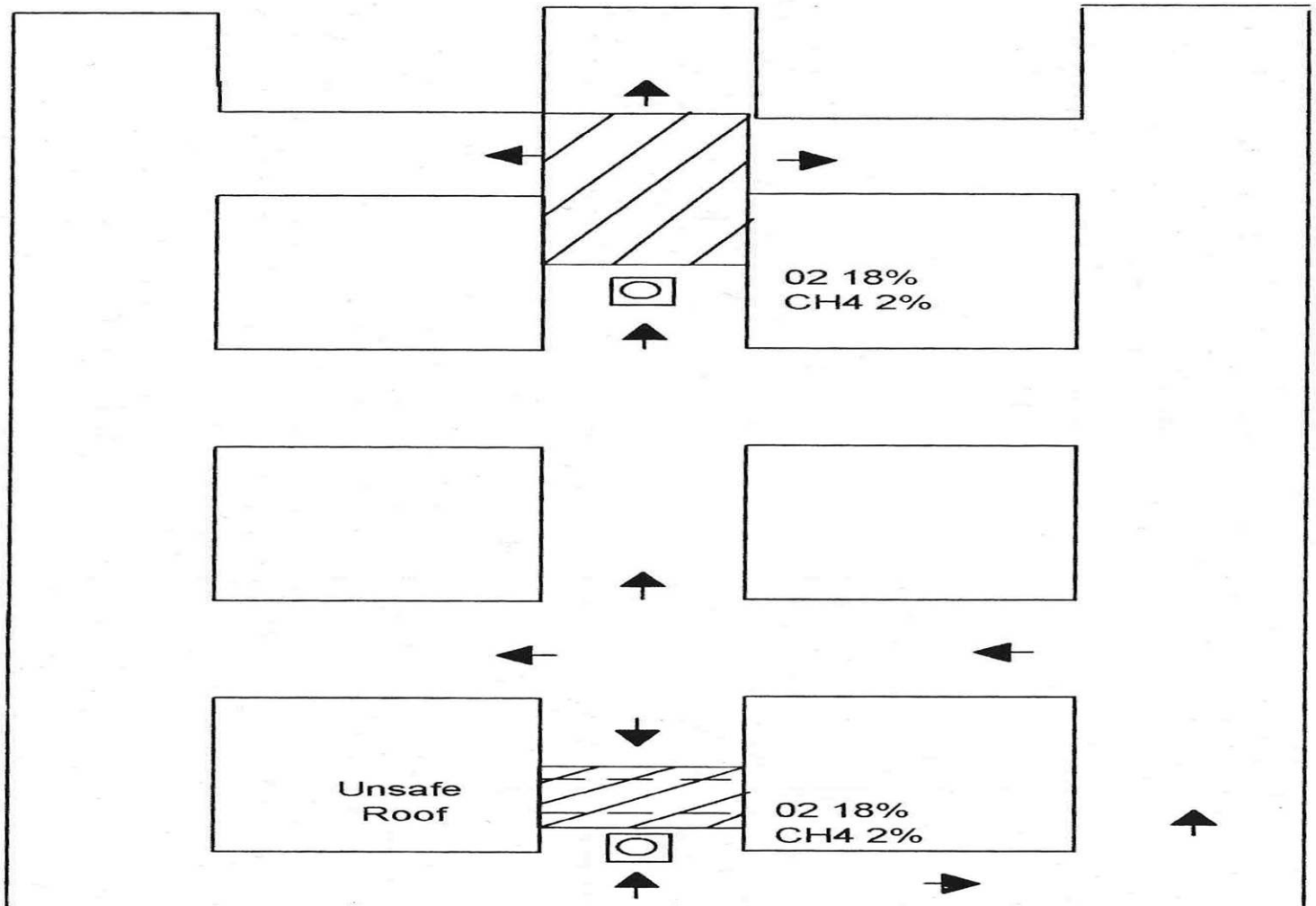

Extent of Smoke
Roofed
Airtight
Placard
Smoke

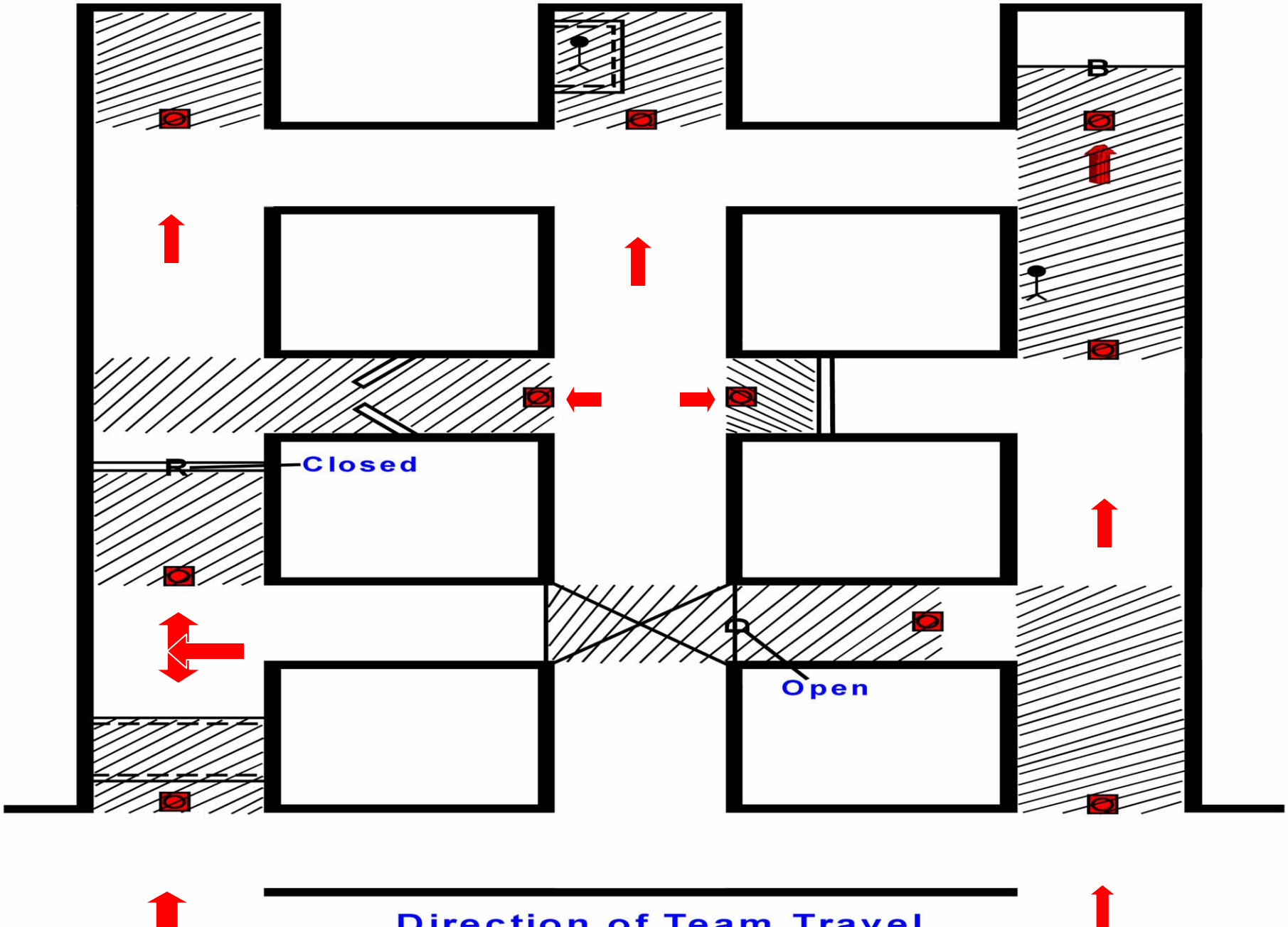
Figure 4

EXTENT OF GAS SKETCH



Direction of Team Travel affects extent of gas found.
Arrows indicate team travel after gas is found.
Diagonal lines indicate extent of gas.

Extent of Gases



- F. Areas in which gas tests have been performed need not be retested when a team re-enters the area unless ventilation has been changed.
  - Includes subsequent ventilation changes
  - At the location of all placards where any gases were encountered on the initial exploration
  - Prior to the entire team passing the placard
  - Tests are not required at other locations upon re-entry
- Areas that are affected by ventilation changes but not re-entered by a team need not be retested.

- 24. Improper procedure when testing with gas detectors, testers, and indicators, ___2
  - METHANE - Detector shall be held at eye level or higher
  - CARBON MONOXIDE - Detector shall be held at chest (between neck and waist) level
  - OXYGEN DEFICIENCY - Detector shall be held below the waist level
  - Verbally identify each test
  - Must be 3 distinct tests
    - “Sweep” is not acceptable

E. Miscellaneous

- 25. Failure of team captain to legibly mark date, initials, and team number on the check board at mine portal or fresh-air base or to start timing device promptly after receiving the problem and map, each omission___2
  - Team number means working position drawn for contest

- 26. Captain's legible date and initials ON:
  - Barricades
  - Stoppings
  - Ventilation doors
  - Seals
  - Regulators
  - Walls of overcasts and undercasts
  - Check curtains converted to stoppings
  - Team built stoppings
    - Each location where they are constructed
      - After the building process has begun
      - Before the clock is stopped or the stopping is moved.

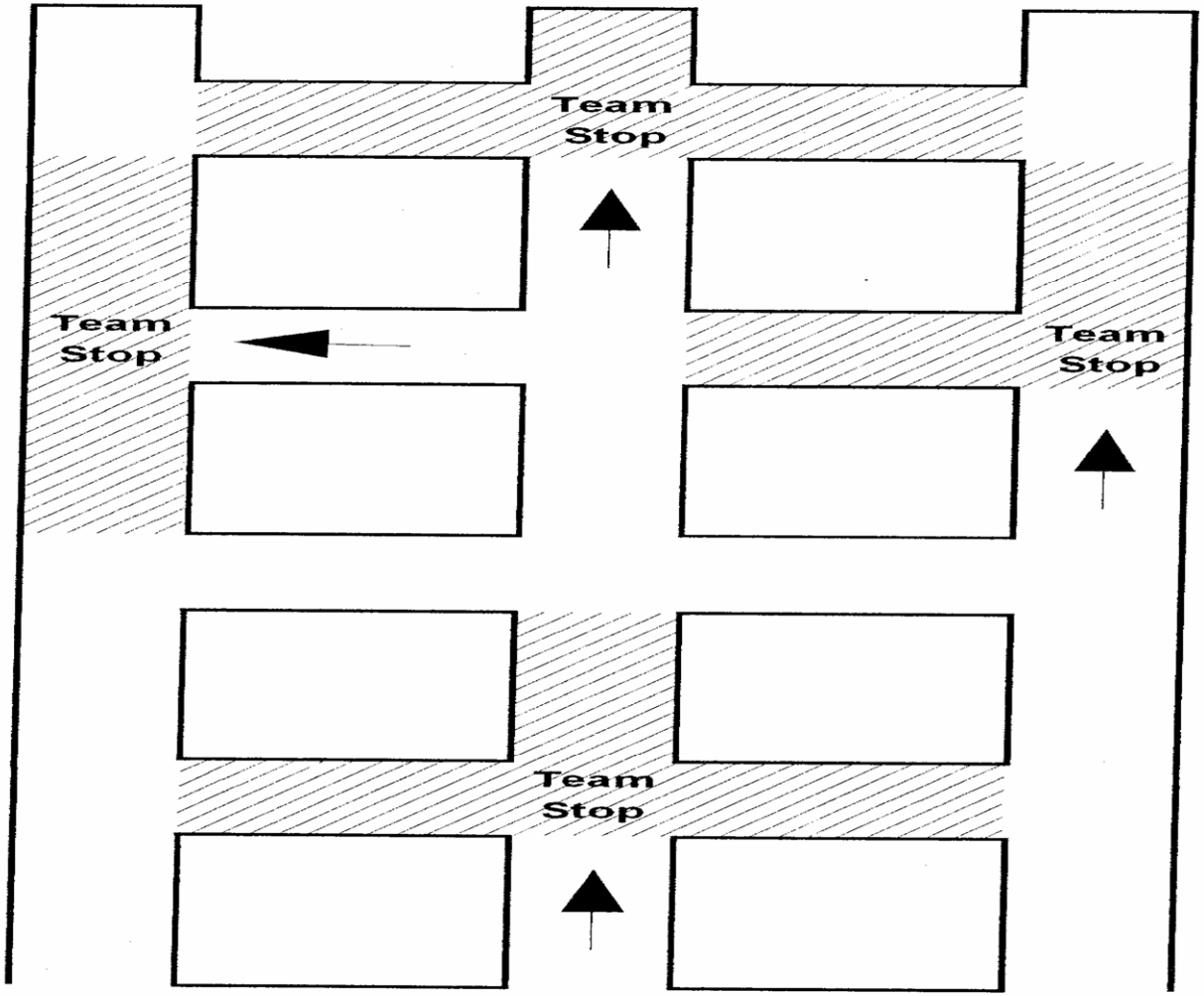
- Captain's legible date and initials AT:
  - Location of all faces
  - Bodies
  - Live persons
  - Points where objects/conditions prohibit further travel in that direction
- Must be marked during initial exploration
- Date means correct month, day, and year

- 27. Failure of teams to stop within 50 feet of the fresh-air base to check team members and apparatus___4
  - All team members underground or inby the fresh-air base
  - Affected apparatus upon initial re-entry inby the fresh-air base after such apparatus has been repaired or changed.
  - Within 50 feet of the bottom of the air shaft.

- 28. Any team member traveling more than 25 feet from the captain or No. 5 team member's original stopping point, each infraction___2
  - If crosscuts less than 25 feet
    - Limited to imaginary line of next intersection
  - Removed staggered crosscuts

Figure 5

Example of Initial Exploration Under Rule 29



- 29. Captain or other team member who acts to endanger self or patient, each occurrence___5
  - Travel under unsafe roof, unsafe rib, or overhanging brow.
  - Travel into or through water over knee deep
  - Passing a fire in the same opening or intersection the team is traveling without first extinguishing the fire
  - Not immediately retreating to the fresh-air base when the manufacturer's warning device of the apparatus is activated.

- Removing any roof support that is set, whether found or installed by the team
- Ventilating an unexplored area with irrespirable air when the location of a potentially live person is unknown.
  - An unaccounted for person is considered to be a potentially live person
  - In-between considered explored if team explores:
    - All side of overcasts or undercasts
    - All ends of ventilation tubes
    - Bottom of shafts

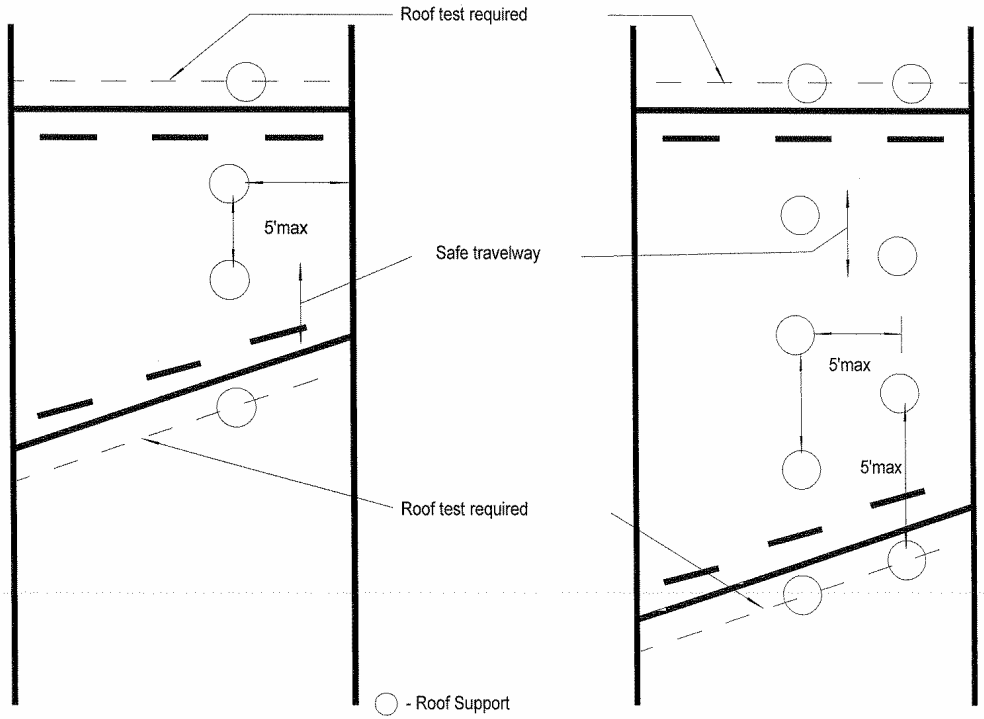
Setting Roof Supports

- See Figures 2 and 2(a)
- Both ends of the unsafe roof have been previously tested by sound and vibration method
  - Set first timber outby unsafe roof
  - Set additional timbers in unsafe roof at no more than five foot intervals
  - Set last timber inby unsafe roof before any other work is done or team members pass through the area

- Neither end of the unsafe roof has been examined by the sound and vibration method
  - Test roof on outby end of unsafe roof
  - Set first timber outby unsafe roof
  - Set additional timbers in unsafe roof at no more than five foot intervals
  - Set last timber inby unsafe roof
  - Test roof on inby end of unsafe roof before any other work is done or team members pass through the area
- Outby/inby verbiage is interchangeable depending on the direction the unsafe roof is approached.

Figure 2

EXAMPLES OF PROPER METHODS OF SETTING ROOF SUPPORTS



5' maximum width travel way may be established between one row of supports and a safe rib or between two rows of supports.

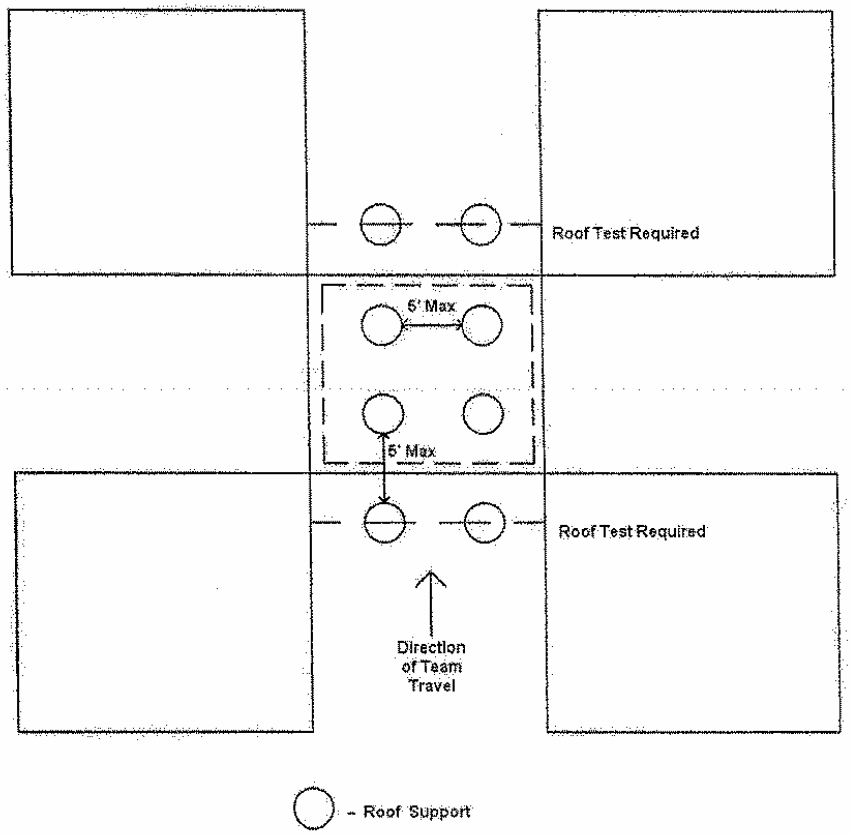
No roof test required IN area of unsafe roof.

Simulate setting support by standing in proper location and then placing on floor.

If the unsafe roof is less than 5 feet in length, a minimum of three supports must be set; one on each end and one under the unsafe roof.

Figure 2a

EXAMPLE OF PROPER METHOD OF SETTING ROOF SUPPORTS THROUGH UNSAFE ROOF INTERSECTION



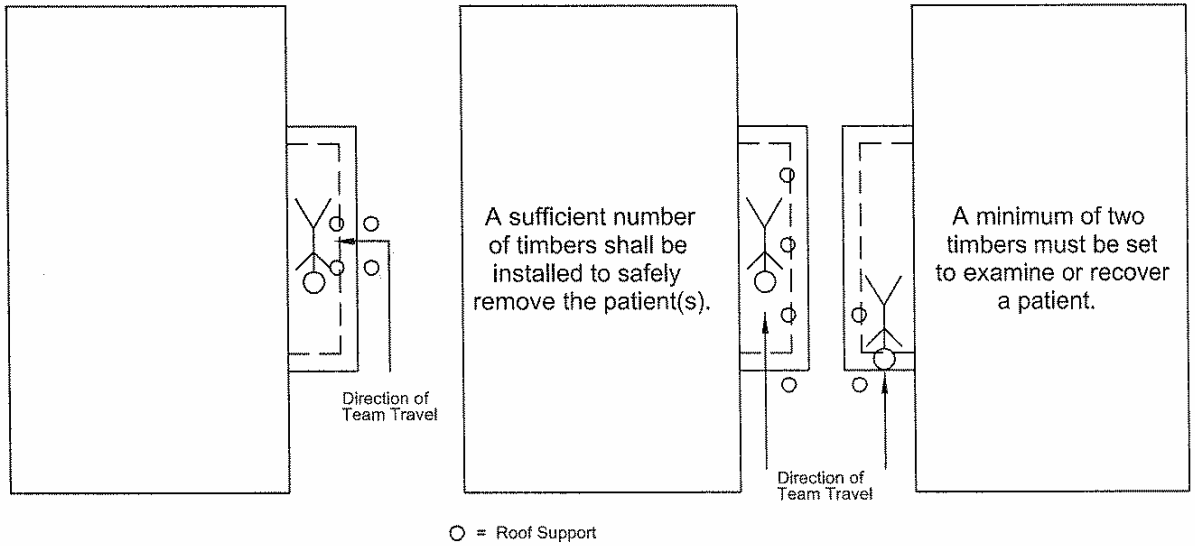
- 30. Any act by a team which may result in an explosion of an explosive air/gas mixture___30
  - An explosive mixture is moved over an ignition source.
  - Continuing exploration after conditions are found to indicate an imminent explosion is possible by the presence of an explosive mixture and evidence of fire
    - Visual acknowledgment of a fire
    - Smoke
    - Carbon monoxide above 10 ppm
    - Energized electrical equipment, energized circuits (including all batteries except cap light batteries) or energized cables found in an explosive mixture
    - When a withdraw situation exists at an intersection, the team can go to any location they have already explored at that stop, prior to exiting the mine. The key phrase in this paragraph is “at that stop.”
    - A team must continue to explore if it knows there is a continuous nonexplosive separation between the explosive mixture and the evidence of fire or energized cables.

- An explosive mixture is moved over an unexplored area.
- An explosive mixture is moved over energized electrical equipment, energized electrical circuits (including all batteries except cap lamp batteries) or energized cables. Energizing electrical equipment, electrical circuits, or cables in an explosive mixture, or moving any of the above ignition sources into an explosive mixture.
- Explosive mixture
  - Methane 5 – 15% inclusively
  - Oxygen is 12.1 percent or greater
  - Both methane and oxygen must be shown on placard

- 31. Failure to locate missing persons, each omission___10
  - The team must stop and the captain examine, by touching with his or her hand, all missing persons (live persons or body) prior to any team member passing the location of the missing person.
    - Not a team stop for gas testing
  - If the Captain cannot physically examine a missing person located under elongated unsafe roof due to a lack of roof support, a team stop will not be required.
  - If roof support is provided, bodies located under unsafe roof must be examined before the clock is stopped and after all missing persons have been accounted for.

Figure 3

PROPER INSTALLATION OF ROOF SUPPORT TO RECOVER A PATIENT LOCATED UNDER AN AREA OF ELONGATED UNSAFE ROOF



- 32. Failure to bring live person to the fresh-air base, each omission___20
- 33. Failure to properly protect a live or potentially live person(s), each omission___10
  - Proper protection must be used on persons exposed to or found in irrespirable atmospheres.
    - Less than 19.5 percent oxygen
    - Carbon monoxide in excess of 50 PPM
    - Smoke
  - Conscious person – Self Rescuer may be used
    - Simulation of donning not permitted
  - Unconscious person – An approved breathing apparatus or device with full face piece.

- 34. Failure to remove irrespirable atmosphere___30
  - Outby an airtight barricade before breaching
  - Immediately outby an airtight ventilation structure when verbal contact is made with patient.
- 35. The atmosphere for the briefing officer shall remain respirable. This cannot be achieved by the use of an apparatus.___10
  - Cannot be relocated at the fresh-air base

- 36. All five team members running while advancing or retreating, total___4
- 37. Team member talking to or receiving information from an unauthorized person without permission of the judges, each infraction___5
- 38. Failure to follow proper procedure when putting apparatus on patient, each infraction___2
  - Unconscious patient - No mask tightness test

- 39. Assistance lent by supposedly unconscious patient, each infraction___2
- 40. Teams leaving patient unattended, each infraction___6
  - A team member must be within 10 feet of the patient

- 41. Failure to remove patient(s) promptly to the fresh-air base, each infraction___6
  - Either by visual or verbal contact
  - When a team reaches a patient(s) (visual contact)
    - Exploring ahead of the location will be limited to 25 feet in any direction.
    - May perform any function during this team stop.
    - May not continue to explore while retreating with the patient, unless required by the problem design.
  - May continue to explore if necessary for its own or the patient's safety
    - Patient shall be removed as soon as means or materials are available
    - May perform any functions during team stops

- 42. Failure to erect temporary stopping (airlock) when necessary, each infraction___6
  - Before breaching airtight separations, where conditions on the other side are unknown, such as:
    - Stoppings
    - Doors
    - Seals
    - Barricades
    - Closed regulators
    - Removing water roofed
  - When retreating out of a barricade or coming back through a stopping where an airlock has been erected, it will not be necessary to airlock on the way out if this will not change any existing ventilation.

- Person behind the barricade, stopping, etc.
  - No airlock for “airtight”
- An airlock is formed by erecting a temporary stopping at a location(s) that will provide the equivalent airtight separation as the airtight structure or condition breached by the team. An equivalent airtight separation would require an airlock built for each airtight structure removed within one crosscut. An equivalent airtight separation must also be maintained when pumping water roofed.

- If the water roofed is in an entry or crosscut one build is required; a 3-way intersection two builds are required; a 4-way intersection three builds are required. If there are two sides blocked, one airlock is needed. If there are three sides blocked, two airlocks are needed. If four sides are blocked, three airlocks are needed. This is the minimum requirements for a solid line map and may not prevent air movement on a dotted line map.

- 43. Failure to erect temporary stopping, reasonably airtight, each infraction___2
  - Fastened at the top and sides
  - At the bottom when a bottom board is provided
  - All straps properly fastened
  - A structure must be completely dismantled prior to moving from one location to another

- 44. Failure of team to explore or examine workings systematically and thoroughly, each omission___4
  - Inaccessible: All areas of the mine where team travel is blocked by one or more of the following conditions:
    - Seals
    - Unsafe roof rib to rib
    - Inextinguishable fires
    - Water over knee deep
    - Caved areas

- Opening: Any entry or mining that was performed off an entry, room, or crosscut that may or may not connect to another entry, room, or crosscut.
- Crosscut: An opening that connects two entries.
- Contaminant: Any one or more of the following:
  - Smoke
  - Carbon monoxide above 10 PPM
  - Methane above one percent
  - Less than 19.5 percent oxygen

- Unless blocked, teams must advance in the contaminated entry or in entries adjacent to the contaminated entry. When a contaminated entry and adjacent entries are blocked, teams may explore/advance in other nearest accessible entries. However, the team will be discounted if it fails to return to the contaminated or adjacent entry at the first open crosscut, and if not blocked, make all further explorations in the contaminated or adjacent entries before advancing into other areas of the mine.

- If the team encounters contaminants in multiple entries, the team has the option of which entry to examine first. As the team advances into a contaminated entry and subsequently encounters a placard indicating that all contaminants are cleared prior to reaching an intersection, the team must stop (prior to the captain passing the placard(s)) and make further advances in the other contaminated or adjacent entry.

•When advancing in an entry and an intersection is encountered with open crosscuts on both sides, the team would be required to tie across into the contaminated crosscut first unless the team is required to return to a contaminated entry.

•If the team encounters a contaminant in both crosscuts, the team has the option of which crosscut to examine first. As the team advances into a contaminated crosscut and subsequently encounters a placard indicating that all contaminants are clear prior to reaching an intersection, the team must stop (prior to captain passing the placard(s)) and make further advances in the other contaminated crosscut.

- Passing or failing to explore an open crosscut.
  - Team would be required to travel into this opening and tie across into the next intersection. Teams cannot advance from this intersection before tying outby unless the outby entry is blocked. Teams advancing inby an opening to a point that the No. 5 team member is at or inby the inby rib line will be considered to have passed that opening. If a contaminant is found in an open crosscut, teams would be required to tie across in this crosscut after accessible outby areas have been explored.

- Where crosscuts are blocked, the No. 5 team member may not advance beyond the inby corner of the second crosscut before the team ties across and/or behind into all accessible areas outby that crosscut. After the accessible areas outby are completely explored to the side where the two crosscuts were determined, the team will be permitted to explore the original entry until it encounters the second crosscut to the other side. This may require building an airlock or ventilation controls such as a stopping, door, etc., or returning to the fresh-air base, and exploring into other entries at the discretion of the team and according to the conditions of the mine.
  - This rule requires team to make all accessible areas outby the second crosscut limit (this would include all sides of areas that are inaccessible such as caved, etc.).

- Inaccessible areas need not be explored unless the team has explored all accessible areas and there are unaccounted for persons or an explosive mixture to be moved through the inaccessible (unexplored) areas.
  - Teams will be required to pump water or support the roof to explore the inaccessible areas in these cases, if the necessary materials are provided in the problem.
- Exploration behind seals is not necessary unless required by the problem

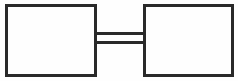
- 45. Only the ventilation material provided will be permitted to be used during the working of the problem. Erected walls of overcasts/undercasts cannot be removed or altered by the team. An overcast cannot be rebuilt as an overcast if completely destroyed, but if the materials from the destroyed overcast are on the field they can be used to build temporary stoppings. Other structures located on the course shall be completely disassembled when moved to other locations.___10
- 46. Less than five team members completing problem, each person___8

- 47. Failure to examine lunch pails, each infraction___2
  - Lunch pails under unsafe roof need not be examined unless teams enter the area.
- 48. Any act by a team member that violates the intent of the problem design layout, each location___10
  - Traveling into or passing materials through areas indicated to be impassible by placards or intended to be impassible by the physical condition indicated.
    - Examples of such areas would include, but not be limited to, caved areas, ribs, faces, water roofed, etc.

- Isolating equipment, or other energized electrical components with structures other than those depicted in the legend will not be acceptable.
- Ventilation structures built by the team may only be placed perpendicular across an entry, crosscut, or opening, or diagonally from corner to corner at intersections. (Exception: Brattice frames and brattice cloth may be used to erect a line curtain which can only extend from a face or barricade to the outby intersection.)
- Team members holding up brattice cloth in an attempt to clear a contaminant shall be discounted under this rule and the contaminant shall not be cleared.

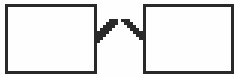
- 49. Failure to comply with other written adopted National Rules not covered in Discount Sheets, each infraction___2
- 50. Failure of team to follow written instructions provided to the team for working of the Contest problem___15

MINE MAP LEGEND



PERMANENT STOPPING

Stopping intact, airtight (No indication of opening(s) or leakage).

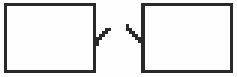


PERMANENT STOPPING NOT INTACT, NOT AIRTIGHT

Condition noted on placard must be shown on the map.

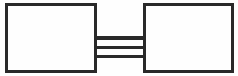
TEMPORARY STOPPING

Stopping intact and airtight, this symbol must be used for all newly erected, intact and airtight, structures built by the team.



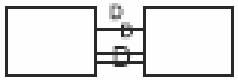
TEMPORARY STOPPING NOT INTACT, NOT AIRTIGHT

Condition noted on placard must be shown on the map.



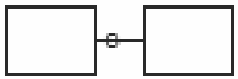
SEAL

If the seal is equipped with devices such as sampling tubes or water traps, or is damaged, leaking, or destroyed, that particular device or condition must be noted beside the symbol.



DOOR

Can be shown by itself or in ventilation controls. However, the type and size (if indicated by placard) and "open" or "closed must be written out.

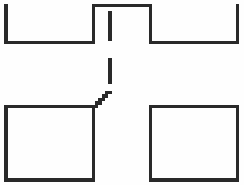


CHECK CURTAIN

Condition noted on placard must be shown on the mine map.

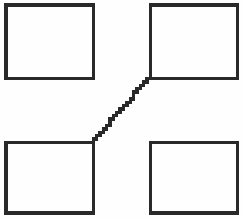
LINE CURTAIN

Designated curtain provided for removing contaminant or explosive gases. Hand held by the team.



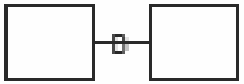
LINE CURTAIN INSTALLED

The full extent of the line curtain shall be shown. If the line curtain is partially or completely down, it must be noted beside the symbol. Can not be folded or rolled up.



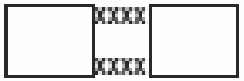
DIAGONAL

Temporary stoppings used to form a diagonal in an intersection, shall extend from corner to corner.



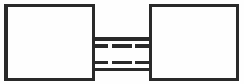
BARRICADE

If the placard indicates that the barricade is damaged, leaking, or destroyed, that particular condition must be noted beside the symbol.



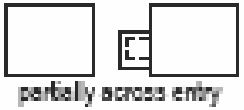
CAVED

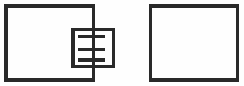
Caved areas are not considered airtight unless the placard states "airtight" and it will have to be written out on the map ("airtight") beside the symbol.



UNSAFE ROOF

Placard must state "unsafe roof". Any other condition designated must be noted beside the symbol. Outline size if indicated by placard or markings



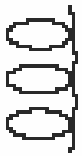


UNSAFE RIB OR OVERHANGING BROW

Project over ribline and area on map.

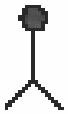
WATER

Symbol indicates start and end of water or changes in depth of water. Write out depth(s) as shown on placard.



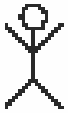
SMOKE

Write out "light" or "dense" if indicated on placard; draw in entire extent of smoke.



BODY

Indicate position of head and feet as body is found. If the word "body" is on the placard, show symbol for body and denote the additional information that is shown on the placard.



LIVE PERSON

Write out condition indicated on the placard, such as conscious, unconscious, walking, etc., indicate position if lying down.

BRATTICE FRAMES

BRATTICE CLOTH

PLACARD INDICATING GAS MIXTURE

Write out gas name or symbol and state percent or PPM if shown on placard.

AIR MOVEMENT

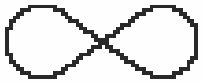
Write out quantity if shown on placard.

FIRE

Write out "smoldering", "raging", etc., if shown on placard. The fire symbol must be placed over the object on fire.

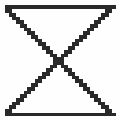
FARTHEST POINT OF ADVANCE IN ENTRY, ROOM, OR CROSSCUT

This symbol should only be used where areas inby the farthest point of advance will not be explored.



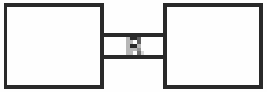
FAN

Write out conditions of fan as indicated by placard.



OVERCAST OR UNDERCAST

This symbol is to be used for placards indicating "overcast/undercast" or "overcast wall". If the overcast or undercast is damaged, leaking, or destroyed that particular condition must be noted beside the symbol.



REGULATOR

The particular condition must be noted beside the symbol.

The letter "R" can overlap the parallel lines.

LOCATION OF ANY OTHER OBJECTS, CONDITIONS, OR EQUIPMENT

Write the name of the object, condition, or equipment by the symbol. This also includes faces if indicated by a placard.

ANY ROOF SUPPORT INSTALLED BY THE TEAM

NOTE: Two maps will be provided to each team. The scale on the maps will be 1 inch is equal to 10 feet.

Blank Reference Map