37Th Annual Southwestern Regional Mine Rescue Contest

JUDGE PACKET

Field Competition Day 2

Southwestern Regional Mine Rescue Association Carlsbad, NM

April 10, 2019

Mescalero/Ruidoso, New Mexico

Mine Information
Ruidoso, NM
April 8 - 11, 2019

General
The Notso Lucky Mine is an underground single level category IV room and pillar Potash mine. The mine is owned and operated by Step Brothers Enterprises. John Notso and Jim Lucky started the mining operation in 2000. The mine was abandoned in 1990 after several seismic events collapsed one of the shafts. Previous ownership eventually filed for bankruptcy and closed the mine. The mine is located in Southern New Mexico and is active and operating at full capacity. The mine operates two 12 hours shifts per day, 5 days a week. Hours of operation are from 5 am to 5 pm on day shift and 5 pm to 5 am on night shift. All production is on the 1000' level. Ack Mikeman is VP of Operations and Richard "Woody" East is currently the Mine Manager.

Mine Access
Mine access is provided by two 14 foot diameter concrete-lined shafts. The two 14 foot shafts are known as the #1 Intake shaft and the #2 Exhaust shaft. Pillar sizes are 16 feet by 15 feet, Entries are 10 feet wide and crosscuts are 8 feet wide.

Explosives
All explosives are stored on the surface in an approved storage facility.

Electricity
Electrical service to the mine is provided by an independent electric company and enters the mine by way of the #1 shaft. Power is provided to transformers located underground and distributed to the working areas.

Gas
The mine is a category IV (applies to mines in which noncombustible ore is extracted and which liberate a concentration of methane that is not explosive nor capable of forming explosive mixtures with air based on the history of the mine or the geographical area in which the mine is located.

Communication
This is accomplished by two-way radios that are carried by mine personnel.

Ground Control
Ground control is maintained with 8 foot mechanical bolts and timbers are located in the mine for secondary support.

Materials
All materials to work the problem are located underground or on the surface.

Mining Methods
Room and pillar method is accomplished by conventional mining techniques. Material is loaded by front end loaders into haul trucks, hoisted to surface, screened and loaded to be shipped overseas.

Mine Maps
The mine maps were last updated on January 1, 2017.

Mine Equipment
The mine currently utilizes under-cutters, face drills, haul trucks, loaders, bolters, and other smaller Kubota tractors for transporting personnel.

Ventilation
The mine is ventilated by a non-reversible 100,000 cfm fan that is located on surface at the #1 shaft. The mine utilizes a blowing system; ventilation enters the mine via the #1 Intake shaft and exits the mine via the #2 exhaust shaft. There are two 6' in diameter ventilation raises known as "Vent Raise A" and "Vent raise B". Ventilation raise "B" has a non-reversible exhaust fan that was used during the development of the north portion of the mine. Fan located above the "Vent Raise B" is a 30,000 cfm fan and exhausts air to surface.

Water
No reported or historical water issues.

Notification
All federal, state and local officials have been notified.

Backup Teams
Two additional trained and fully equipped mine rescue teams are on site and are available for backup support.

TEAM BRIEFING

Ruidoso, NM Day #2

April 8 - 11, 2019

You have arrived back at the Notso Lucky Mine, Mine Manager Richard "Woody" East is onsite and was provided the following information.

Today a rehab crew of four miners were tasked to clear and support any caved or loose areas in the northern portion of the mine. At approximately 7:00 am, Front End Loader operator Johnny "blue" Walker reported to mine management that he had accidentally run over a Kubota Tractor and the Tractor caught on fire.

Mr. Walker stated that after he ran over the tractor he panicked because he did not have a fire extinguisher and decided to activate the emergency lighting system as he ran out of the mine. The emergency lighting system is designed to alert everyone in the mine that an emergency situation has occurred and the miners are trained to evacuate immediately.

Mr. Walker was sent to the hospital to be treated for smoke inhalation and will not be available for any follow-up questions.

A fresh air base has been established underground and some of the previously identified falls have been cleared and supported. The #1 shaft fan is still non-functional and awaiting parts for repair. The fan at Ventilation Raise B is currently running, Mr. Walker mentioned that he tried to shut it off when he left but the switch would not work and the fan continued to operate.

It is now 3:00 p.m. and you will be second team to enter the mine, the first team was able to examine up to the fresh air base and support additional areas of unsafe roof. If you are ready and willing, the service of your mine rescue team is needed. Your objectives are listed below and the mine manager will be available for any questions or requests. GOOD LUCK!

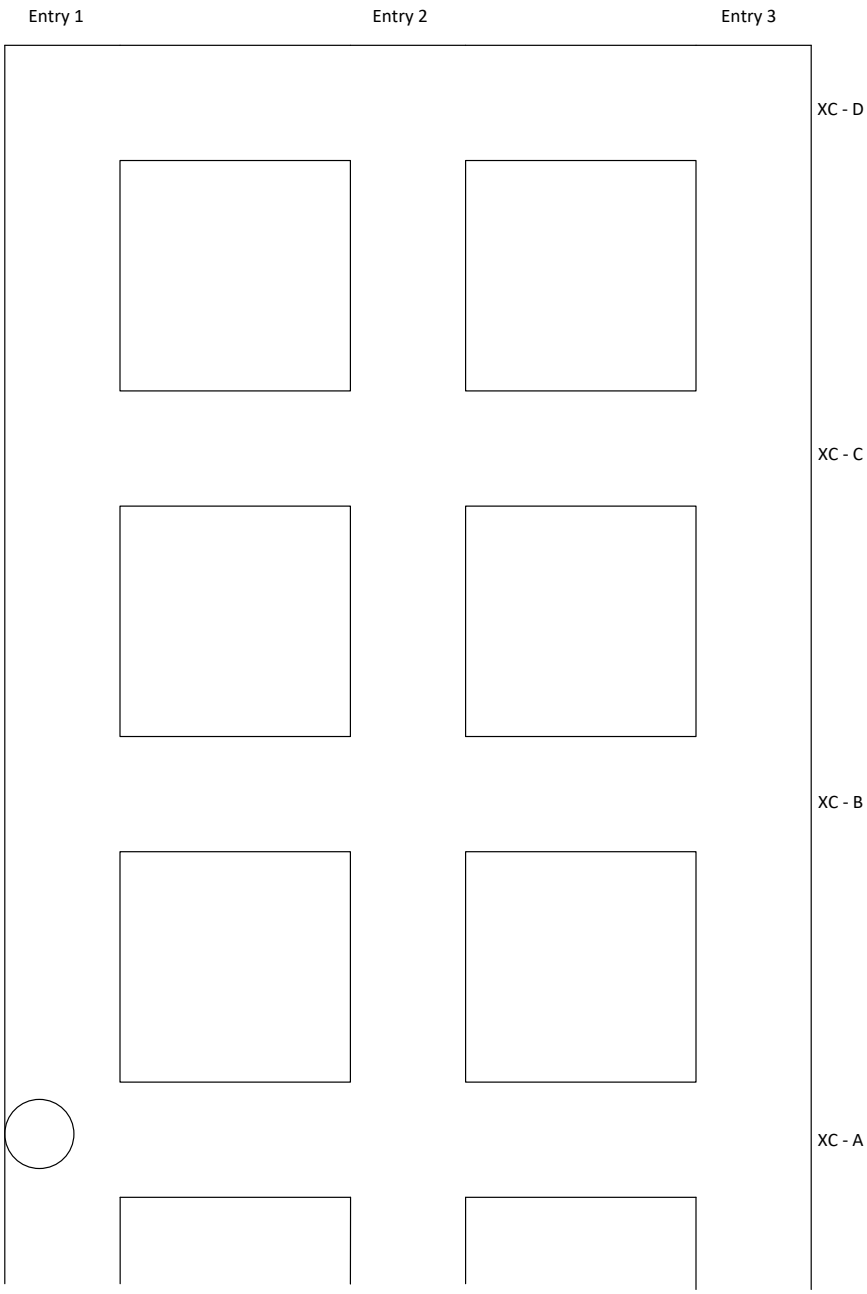
Field Problem Objectives:

- Explore all accessible areas of the mine
- Extinguish or seal all fires
- Locate all missing miners
- Bring all survivors to the fresh air base

Team Map Day 2

Team Name: _____

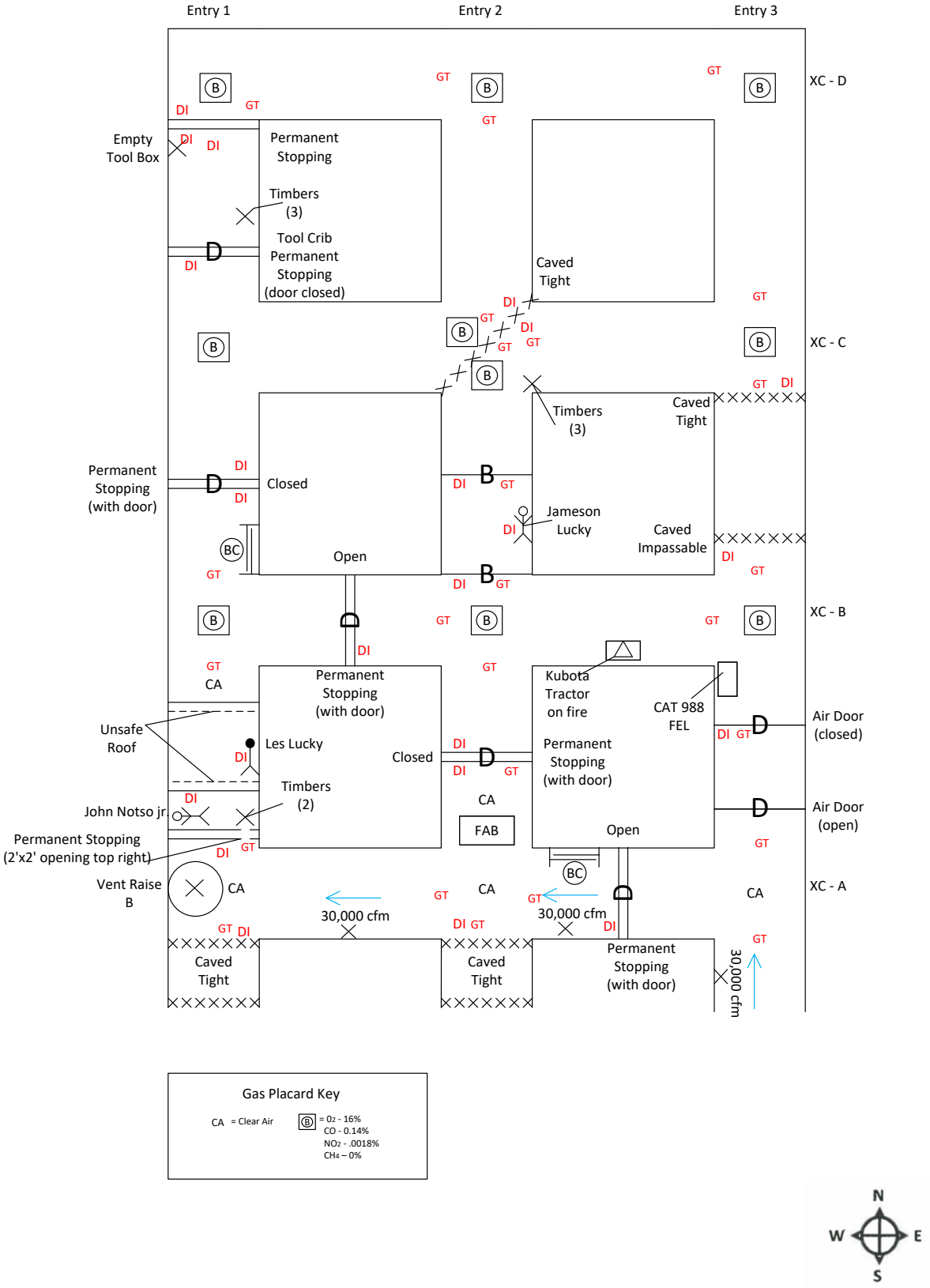
Team Draw # _____



Problem Map Day 2

Team Name: _____

Team Draw # _____



Southwestern Regional Mine Rescue Contest 2019
Day #2 Field Problem Solution
(See Solution Maps)

Fresh Air Base

The teams will arrive at the FAB and have introductions, the team will also be informed that they will be able to string out their communication line but will not be able to check functionality until they have started the clock. Once the clock has been started the team will receive all of their maps and information.

Note: Throughout the field problem, while advancing and at the intersections the team will check for loose ground (loose roof or rib).

Team Stop #1

Teams will explore the FAB area and all openings. Just behind and in front of the FAB location the team will identify "clear air". At the intersection of XC-A and Entry 2, the team will find "caved tight" to the south, stretching east the team will find "brattice cloth and brattice frames(1)", a placard indicating the direction and quantity of airflow and a "permanent stopping (with door)" it will be open.

Team Stop #2

The team will continue exploration west in XC-A until they reach the intersection of Entry 1. While traveling, the team will find a placard showing the direction and quantity of air flow "30,000 cfm". At the intersection the team will identify "vent raise B", "clear air" placard, to the south they identify "caved tight" and north they identify a "permanent stopping (2'x2' opening top right)".

Team Stop #3

The team will continue their exploration east in XC-A until they reach the intersection of Entry 3. The team will identify a placard for "clear air" and a placard showing the direction and quantity of airflow "30,000 cfm". Stretching north the team will identify a set of air doors the first "air door" is open and the second "air door" is closed. Conditions are unknown beyond the second air door, the team will need to air lock their way in. This can be accomplished by utilizing the first air door to airlock the team in.

Note: If the team does not erect an air lock and they allow ventilation to enter the mine into XC-B, they will pull air though Entry 1 and endanger both miners in this area.

Team performing an act that may result in death or injury of survivor(s). (50 discounts) each infraction per Judge No.1 – UG Rule #18(b)

Team Stop #4

The team will explore north in Entry 3, until they reach the intersection of XC-B. Along the way the team will identify "CAT 988 FEL", at the intersection they will identify a "B" gas placard (See map for concentrations). Stretching north the team will identify "caved impassable".

Team Stop #5

The team will continue exploration west to the next intersection. Along the way they identify "Kubota Tractor on fire", it will be necessary for the teams to utilize two team members with two fire extinguishers (2/3 sweeping method) in order to extinguish the obstacle fire. Done correctly this method will extinguish the fire and the team will examine around the tractor.

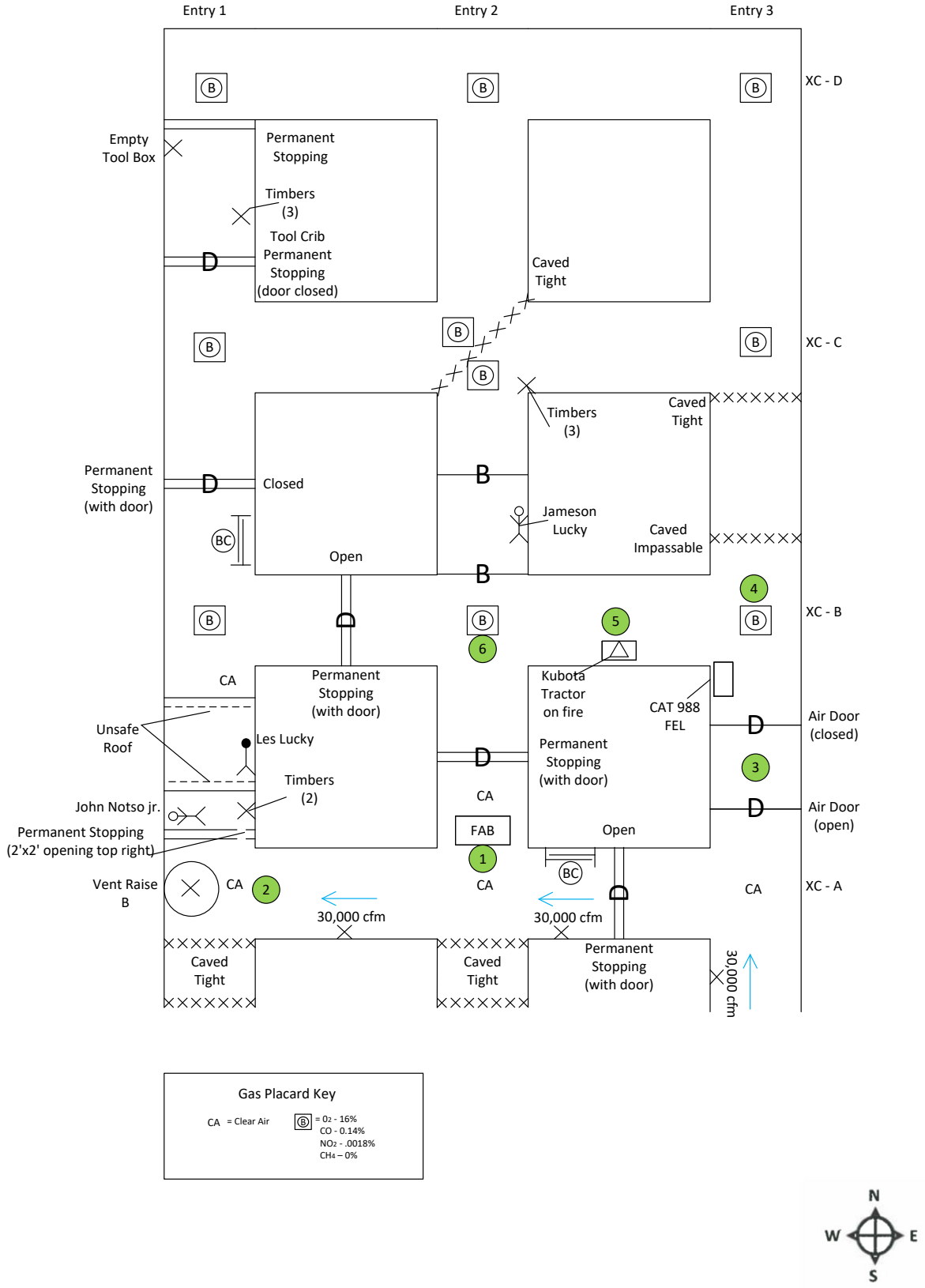
Team Stop #6

The team will continue exploration west until they reach the intersection of Entry 2. The team will identify a "B" gas placard. Stretching south the team will identify "permanent stopping (with door)" the door will be closed. Stretching west the team will identify a "permanent stopping (with door)" that will be open. North in Entry 2, the team will identify a "barricade", knocking on the barricade the team will identify a missing survivor inside. The miner will provide the following information: "Help me! I've barricaded myself in here on both sides and the air in here is ok. I'm not injured but I can't stay in here any longer". Due the concentrations outside of the barricade the team will need to clear the area in front of the barricade in order to enter and rescue the survivor.

Solution Map Day 2

Team Name: _____

Team Draw # _____



Team Stop #7

The team will continue exploration west until they reach Entry 1. The team will identify a "B" gas placard, stretching north the team will identify "brattice cloth and brattice frames (1)", and a "permanent stopping (with door)" the door will be closed. Stretching south the team will identify a "clear air" placard and "unsafe roof". under the unsafe roof the team will visually identify another missing miner. The team will not have the means to support the unsafe roof but they will have examined enough area to isolate a ventilation path to clear the barricade and enter the area to rescue the missing survivor.

Ventilation Change to enter the Barricade (See attached map)

The team will request a ventilation change, once granted the following steps will be required to clear the area in front of the Barricade.

- Close the door between XC-B and Entry 1 & 2
- Build Temp stopping in XC-B and Entry 3 in front of the caved impassable
- Relocate the FAB to east side of the permanent stopping in XC-A
- Open the door in entry 2 between XC-A & XC-B
- Open both air doors
- Close the door in XC-A between Entry 2 & 3
- (Optional) build temp stopping in entry 1 in front of damaged permanent stopping

Note: Ventilation path is indicated by blue arrows on the map and will clear gases in front of the barricade.

Note: Upon reentry into areas cleared of smoke and toxic or dangerous gasses, teams shall make gas tests rib to rib at all openings along the route they travel.

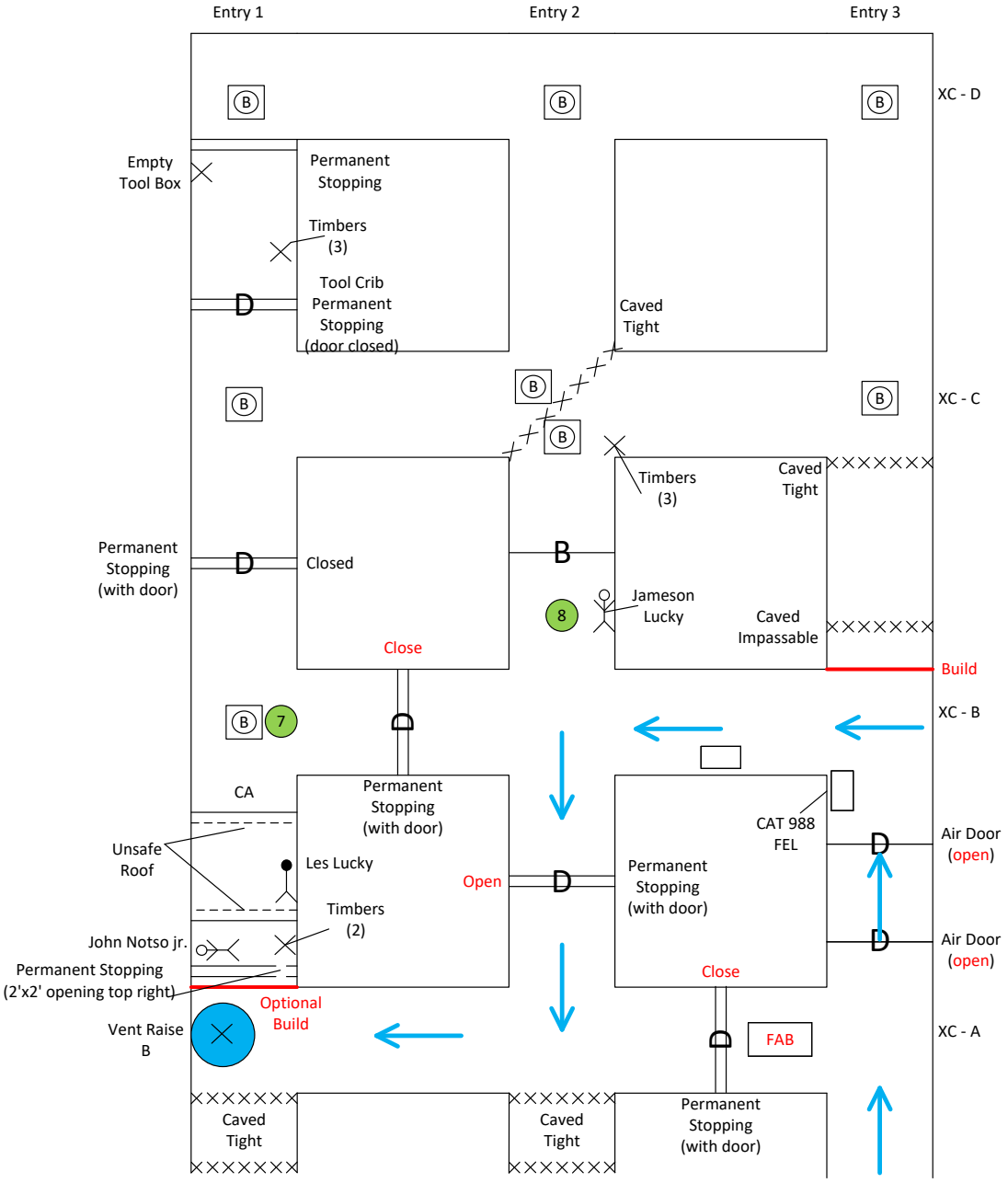
Team Stop #8

The team knows the conditions inside of the shop and they know that the survivor has barricaded himself on both sides, they will elect to remove the barricade and enter to assess the miner. Once they enter they will find "Jameson Lucky", he is unharmed and can walk out with the team. The team will take the survivor to the FAB. The team will likely restore ventilation to its original state by closing the door in entry 2 and using the air doors to airlock in to continue exploration.

Ventilation Change #1
Enter the Barricade

Team Name: _____

Team Draw # _____



Gas Placard Key

CA = Clear Air

B = O_2 - 16%
CO - 0.14%
NO_2 - .0018%
CH_4 – 0%

Ventilation Change #1

- Close door between XC-B and Entry 1 & 2
- Build Temp Stopping XC-B and Entry 3
- Relocate FAB to east side of the permanent stopping in XC-A
- Open door Entry 2 between XC-A & XC-B
- Open both Air Doors
- Close the door in XC-A between Entry 2 & 3
- (Optional) Build temp stopping in Entry 1

Note: Ventilation path is indicated by blue arrows on the map and will clear gases in front of the barricade

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Team Stop #9
The team does not know the condition beyond the northern barricade, so they will need to airlock into the area. The team will build and examine north in Entry 2 until they reach the intersection of XC-C. The team will identify a "B" gas placard, "caved tight" that extends across the entire intersection, and "timbers (3)". The team now has the minimum number of roof supports to access the miner in the unsafe roof. The team will retreat to Entry 1.

Team Stop #10
Utilizing the roof support techniques as outlined in the contest rule book, the team will install three timbers and assess the missing miner. The team will identify "Les Lucky", upon examination the team will discover that the miner is deceased. The team will also visually identify another miner just beyond the unsafe roof but they will not have the means to support the remaining area in order access the miner. The team will retreat to XC-C and continue exploration.

Team Stop #11
The team will explore east in XC-C until they reach Entry 3. The team will identify a "B" gas placard and to the south they will identify "caved tight".

Team Stop #12
The team will continue exploration north in Entry 3 until they reach the intersection of XC-D. The team will identify a "B" gas placard.

Team Stop #13
The team will continue exploration west in XC-D until they reach Entry 2. The team will identify a "B" gas placard.

Team Stop #14
The team will continue exploration west in XC-D until they reach Entry 1. The team will identify a "B" gas placard and to the south they will identify a "permanent stopping". The team will retreat to Entry 2 in XC-D.

Team Stop #15
The team will continue exploration south in Entry 2, until they reach the intersection of XC-C. The team will identify a "B" gas placard and "caved tight" that extends across the entire intersection.

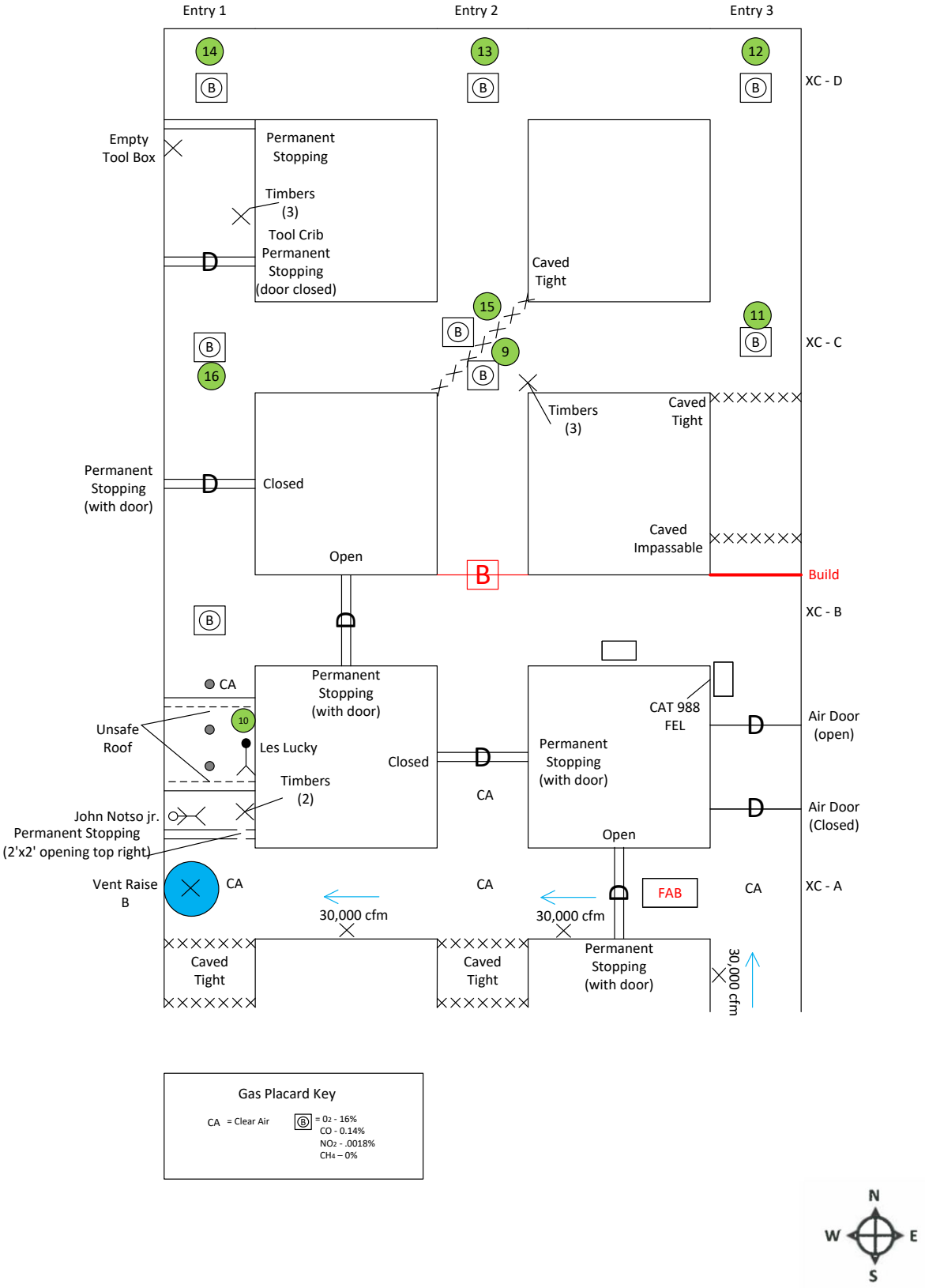
Team Stop #16
The team will continue exploration west in XC-C until they reach Entry 1. The team will identify a "B" gas placard, to the north the team will identify "tool crib permanent stopping with door" the door will be closed. When the team knocks on the door they will receive no response. Stretching south the team will identify the backside of the permanent stopping and tie-in to this point.

The team has explored all accessible areas to this point and based on the gas concentrations, the team will need to ventilate the area first. Since conditions behind the door are unknown, the team will need to build an airlock in order to enter the tool crib.

Problem Map Day 1
Continued

Team Name: _____

Team Draw # _____



Ventilation Change to enter the Tool Crib (See attached map)

The team will request a ventilation change, once granted the following steps will be required to clear the area in front of the Barricade.

- Open the door in Entry 1 between XC-B and XC-C
- Build Temp stopping in Entry 1 and XC-B to protect the unexplored area
- Open the door in entry 2 between XC-A & XC-B
- Utilize 2 set of stoppings to build diagonal across the intersection in Entry 2 and XC-B
- Open both air doors in Entry 3
- Close the door between Entry 2 & 3 in XC-A

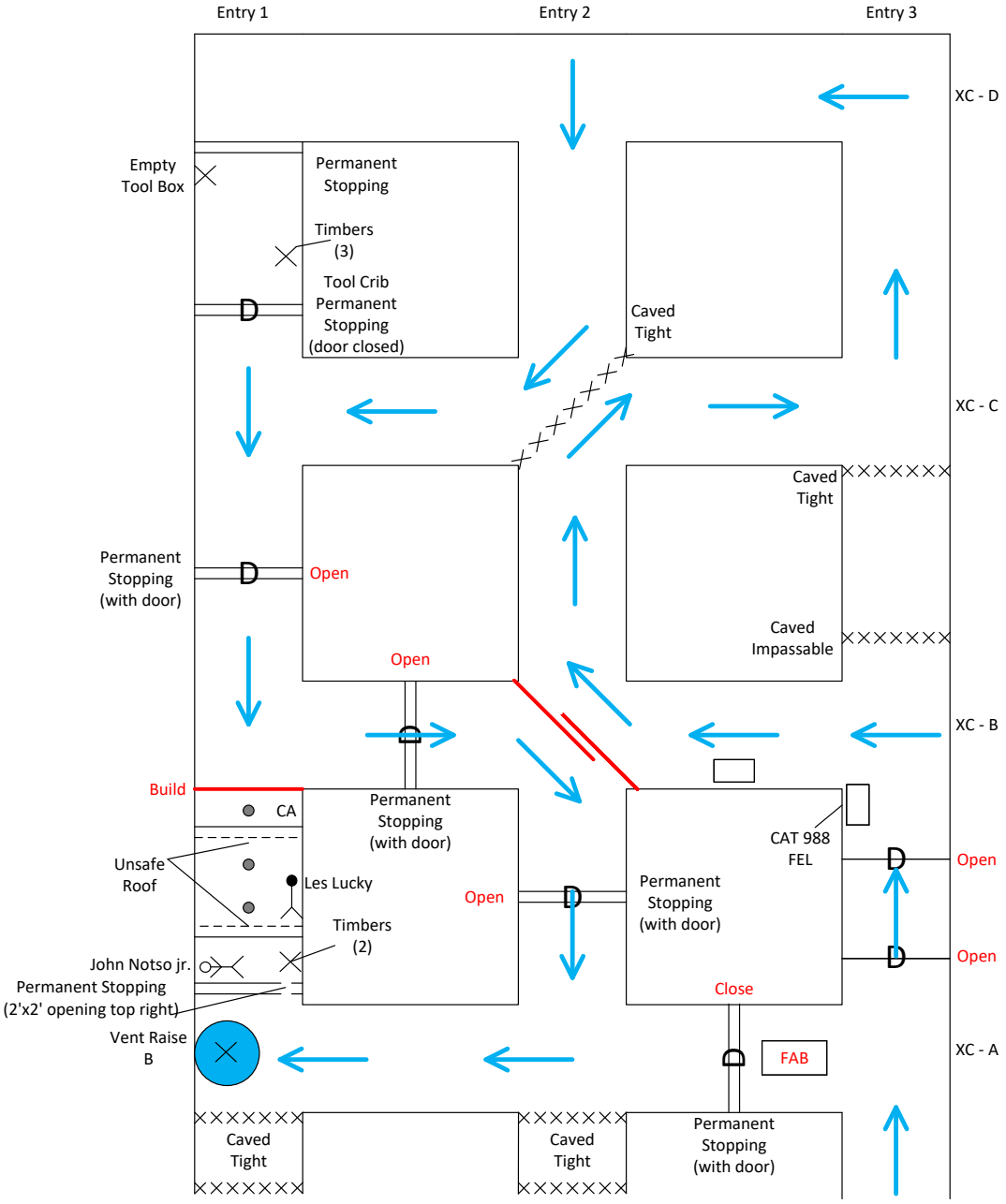
Note: Ventilation path is indicated by blue arrows on the map and will clear gases in front of the barricade.

Note: Upon reentry into areas cleared of smoke and toxic or dangerous gasses, teams shall make gas tests rib to rib at all openings along the route they travel.

Ventilation Change #2
Enter Tool Crib

Team Name: _____

Team Draw # _____



Gas Placard Key

CA = Clear Air

Ⓑ = O_2 - 16%
CO - 0.14%
NO_2 - .0018%
CH_4 – 0%

Ventilation Change #2

- Open the door in Entry 1 between XC-B & XC-C
- Build Temp Stopping in Entry 1 and XC-B to protect the unexplored area
- Open door Entry 2 between XC-A & XC-B
- Utilize 2 stoppings to build diagonal across the intersection in Entry 2 and XC-B
- Open both Air Doors in Entry 3
- Close Door between Entry 2 & 3 in XC-A

Note: Ventilation path is indicated by blue arrows on the map and will clear gases in front of the tool crib.

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Team Stop #17

The team will build an airlock in order to enter the tool crib. When the team explores the tool crib, they will identify “timbers (3)” and an “empty tool box”. The team now has the remaining necessary timbers in order to support the unsafe roof and access the final missing miner. The team will retreat to XC-B in Entry 1.

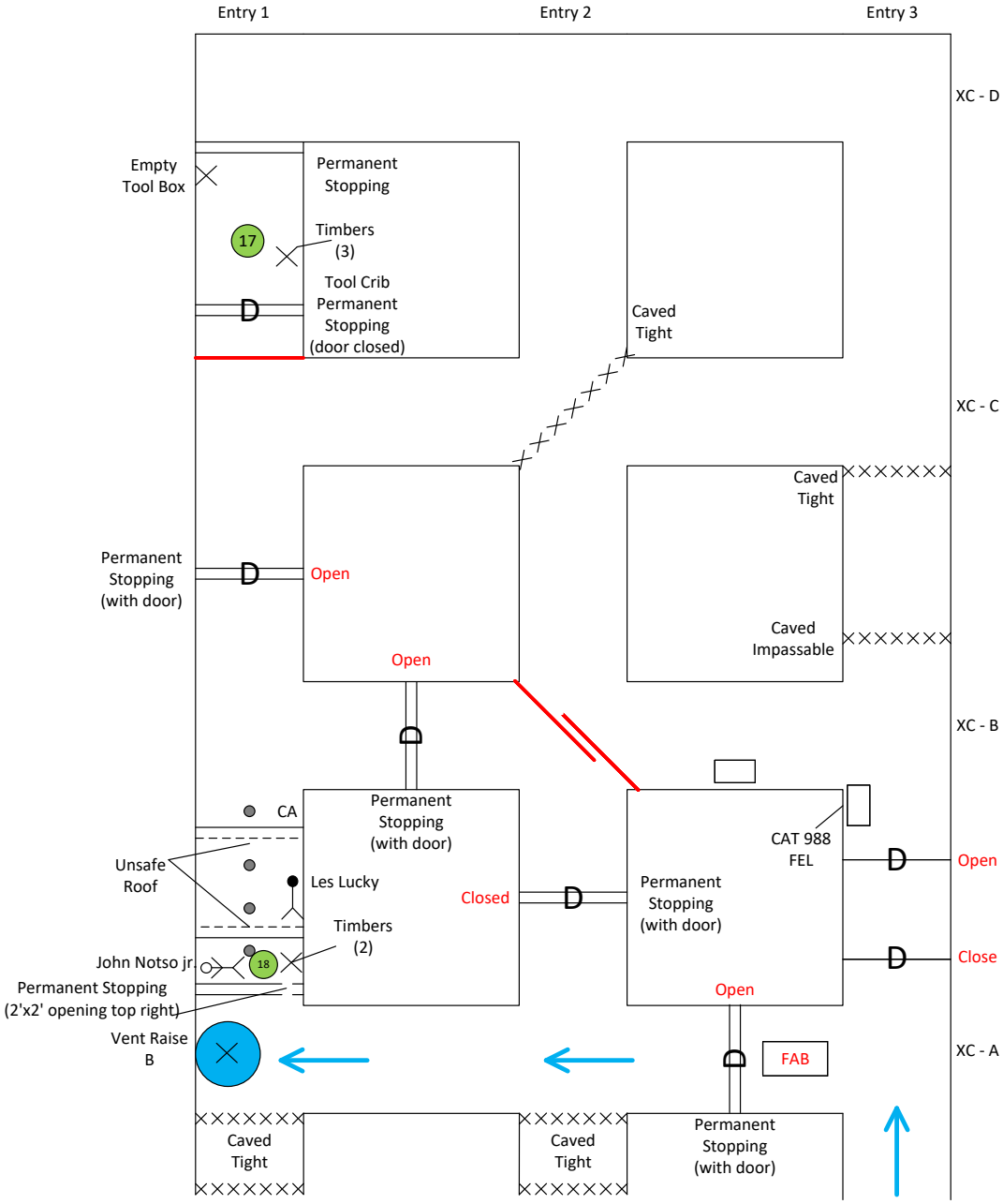
Team Stop #18

The team will only need one more timber to support the area of unsafe roof and access the final missing miner. The team will identify “timbers (2)” and the backside of the “permanent stopping”. The team will identify “John Notso Jr.”, the miner will be unconscious and the team will need to provide full face respiratory protection and place the miner on a backboard. The team will take the miner to FAB, transfer care over to EMT’s and stop the clock. THE END!

Ventilation Change #2
Enter Tool Crib

Team Name: _____

Team Draw # _____



Ventilation Change #2

- Open the door in Entry 1 between XC-B & XC-C
- Build Temp Stopping in Entry 1 and XC-B to protect the unexplored area
- Open door Entry 2 between XC-A & XC-B
- Utilize 2 stoppings to build diagonal across the intersection in Entry 2 and XC-B
- Open both Air Doors in Entry 3
- Close Door between Entry 2 & 3 in XC-A

Note: Ventilation path is indicated by blue arrows on the map and will clear gases in front of the tool crib.

Placard Map Day 2

Team Name: _____

Team Draw # _____