National Mine Rescue, First Aid, Bench, Pre-Shift and Technician Team Contest

TECHNICIAN TEAM

2024 National Contest - Team Tech Statement

The National #1 Mine has a fresh air base established at the Liberty Submains. The Submains is a 3-entry development with intake air flowing inby in the #1, #2 and #3 entries with a return split flowing outby in the #2 entry, separated by a diagonal permanent stopping. You will need to determine the total return split airflow in the #2 entry using a vane anemometer and using a smoke tube. Area measurements for each will be different. Determine the pressure differential between the intake and return split. Record your results in the examination book provided.

The Freedom #1 Mine Rescue Team is experiencing abnormal air quality measurements with their multi-gas detector(s). You will be stationed at the fresh air base in ambient air to prepare the multi-gas detector(s) for "ready for use condition". The Freedom Team has entered the mine and will arrive at the fresh air base in 30 minutes. You will be alerted to within 5 minutes of their arrival. We appreciate your assistance.

Air Calculation Worksheet

A worksheet will be provided and is to be completed by each contestant to document final air readings for the anemometer, smoke tube and magnehelic portions of the contest.

The completed worksheet will be returned to the judge(s) at the completion of the problem.

Smoke Tube Reading

Pull 10 foot out on the tape measure in the entry and observe the time it takes for a puff of smoke to travel the length of the 10 foot tape measure in each of four quadrants;

1st quadrant 47 seconds

2nd quadrant 56 seconds

3rd quadrant 44 seconds

4th quadrant 53 seconds

Space for calculations

Total ____ /4 = average time

Distance in Feet (10)/ Average time = _____ feet per second (FPS).

FPS x 60 (seconds/minute) = _____ FPM

Entry width 24 x Entry height 15 = _____ SF (area in square feet)

Area _____ x FPM velocity _____ = _____ CFM

Anemometer Reading

Entry width 22 x Entry height 17.5 = _____ SF (area in square feet)

FPM reading 1150 + or – correction factor = _____ corrected FPM

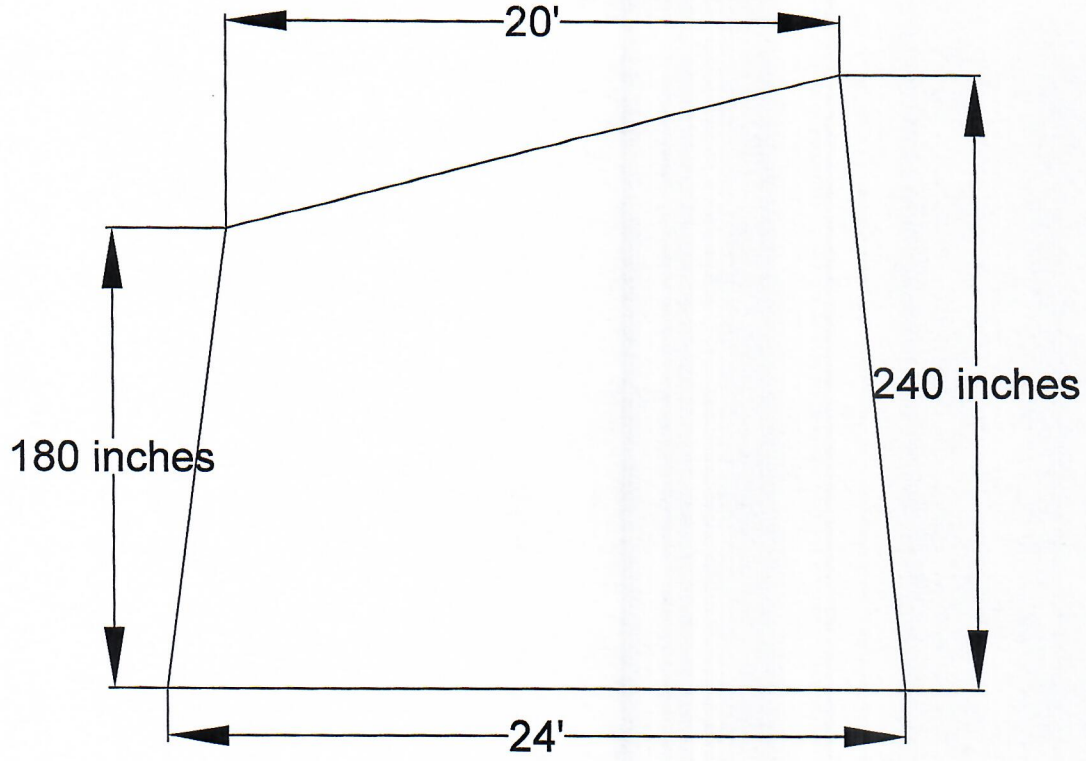
Area _____ x (corrected) FPM velocity _____ = _____ CFM

Space for calculations

Magnehelic gauge

Record dial reading _____ Positive _____ Negative _____

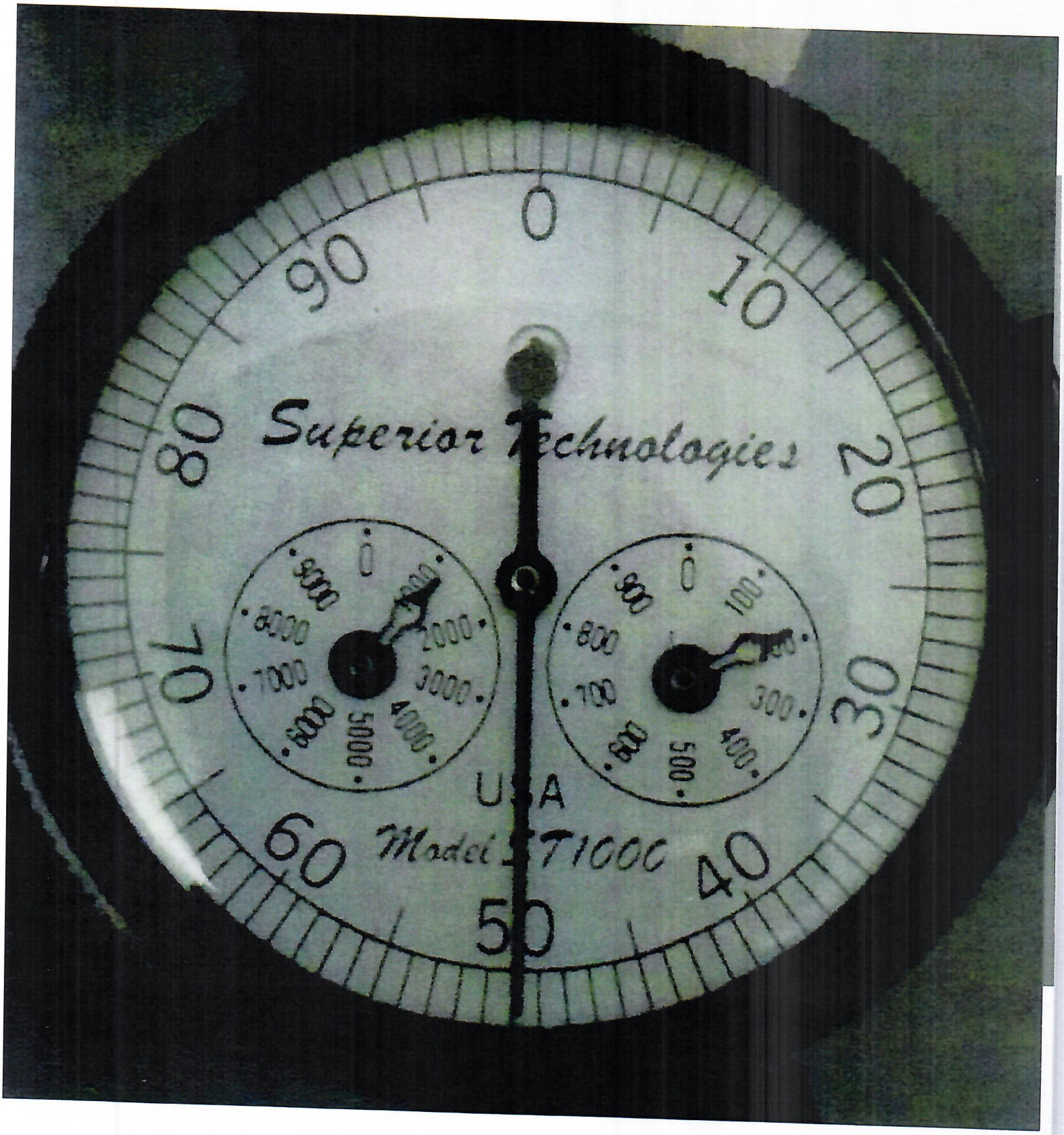
ANEMOMETER PARAMETERS



Air Measurement Station

Reading (fpm)	Correction	Reading (fpm)	Correction
50	+15	500	-5
75	+15	550	-8
100	+14	600	-10
125	+14	700	-15
150	+14	800	-20
175	+13	900	-25
200	+12	1000	-30
250	+11	1200	-35
300	+10	1400	-45
350	+5	1600	-50
400	0	1800	-60
450	-2	2000	-65

Correction chart to be used for contest



Anemometer Reading 2024

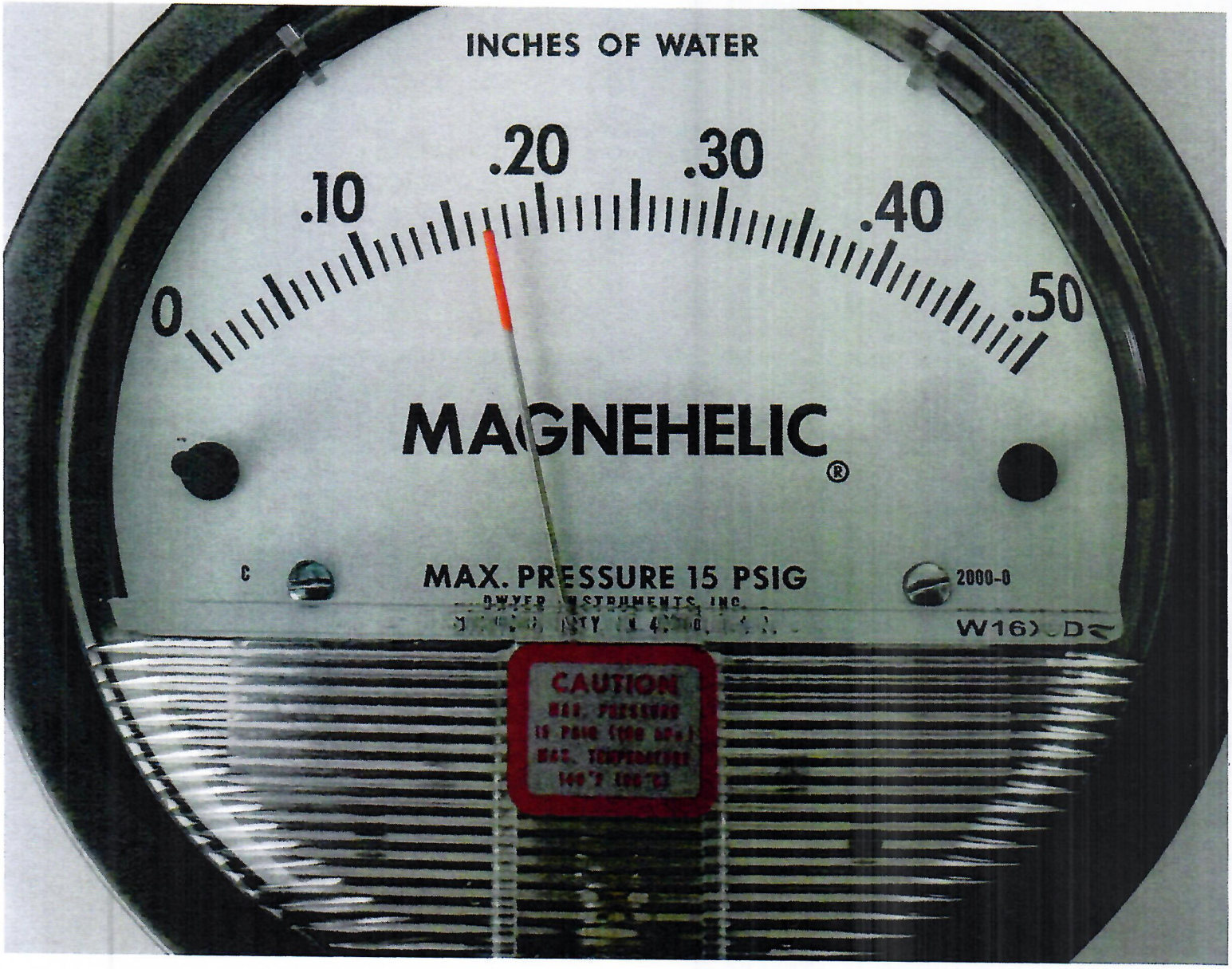
Nat'l Smoke Tube Variables - 2024

1st Quadrant	47 seconds
2nd Quadrant	56 seconds
3rd Quadrant	44 seconds
4th Quadrant	53 seconds

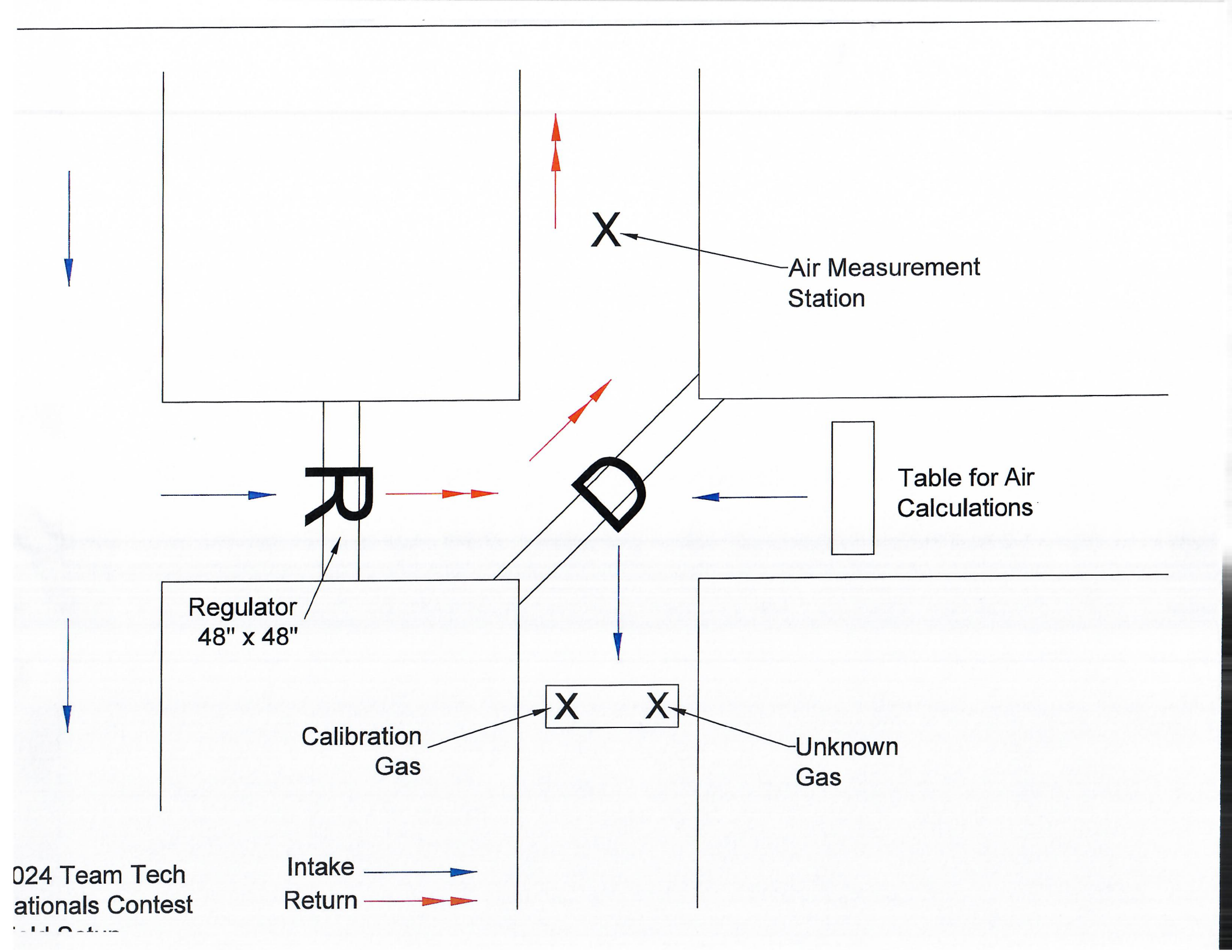
Nat'l Smoke Tube Area – 2024

Height = 15 feet

Width = 24 feet



Magnehelic Reading



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