



Sample Report Customer  
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???????, WI  
?????????

November 4, 2014

Dear Calf Manager:

Thank you for the opportunity to work on your calf barn ventilation project. Please find my ventilation proposal for your calf barn enclosed. The proposal is broken down into two parts:

1. A review of the factors necessary for the successful management of automatic feeder calf barns.
2. The barn ventilation plan including the duct design, equipment needed, where to order it from and a projected budget for the entire ventilation plan.

After you get this proposal, I would like to schedule a time to review the plan over the phone when you both have time. I am in the office all day Friday, November 7th. Most reviews last about one hour.

Thank you again for the opportunity to work on your calf barn ventilation project; your business is appreciated. If there is any way Crystal Creek® can be of service to you in the future do not hesitate to call.

Sincerely,

Ryan Leiterman, D.V.M  
Director of Technical Services  
Crystal Creek®  
715.635.4321

## The 6 Biggest Factors Affecting the Successful Autofeeder Calf Barn Management

There are multiple factors that predispose calves to getting respiratory disease. Air quality and ventilation is only 1 of the 6 components necessary for the successful management of group raised, pre-weaned calves. When calves are comingled under 8 weeks of age, the ease of disease transfer between calves increases. As a result, calf barn managers must focus on ALL of the points below to ensure proper calf health and avoid a "train wreck".

### 1. Colostrum.

- a. Test colostrum with a Brix digital refractometer prior to feeding. Feed only colostrum over 23% Brix (23% Brix = 50 grams of IgG/quart).
- b. Deliver a **minimum of 200 grams of IgG within 4 hours of birth if using a colostrum replacement supplement.**
- c. Monitor colostrum program with routine monthly testing of total protein (goal of over 5.5 g/dL) or a direct IgG AGID.

Dr. Ryan's experience: I have a client that changed their heifer calf colostrum protocol to 4 quarts of 26%+ Brix colostrum (estimated to deliver 340 grams of IgG) within 4 hours. The previous protocol of 4 quarts of 23% Brix to heifer calves yielded an average total protein of 5.5 g/dl during monthly monitoring. The new 26% Brix protocol has increased monthly average total protein levels to 5.8 g/dl. Both increased weight gains and improved health has been noted over the previous program.

### 2. Straw Bedding during cold weather (below 50 degrees F).

- a. **Add 25 lbs of dry, lofty long stem straw for every 1,000 lbs of calf body weight every day.** Providing dry, lofty bedding allows calves to nestle into the straw and keeps them warm. I strongly discourage the use of sawdust or pine shavings alone in the winter. Even with a calf jacket, calves bedded with shavings suffer from cold stress and succumb to pneumonia more often. *A successful bedding plan will often combine a bottom layer of shavings (2-4 inches) for absorbency with lots of dry long stem straw on top.*
- b. It is my humble, professional opinion that group housed calves will experience excessive respiratory disease if not raised with large amounts of dry, lofty bedding that provides thermal support.

### 3. Calories.

- a. Calves should be fed a minimum of 8 quarts (or liters) of a 13% total solids milk or milk replacer to 1) grow to meet their genetic potential and 2) provide the requisite calories to maintain body temperature during times of cold stress.

- b. Autofeeder levels commonly feed 2 to 2.2 lbs of Swift Start<sup>®</sup> High Gain per calf per day. **When you get your autofeeder up and running, we recommend monthly testing of total solids to ensure the machine is mixing and calibrated correctly. Simply take a sample of the milk replacer solution at the nipple and collect into a sample vial. Mail sample to Crystal Creek and we will test the sample free of charge.**
- c. Pre-weaned calves begin to experience cold stress at 50 degrees F.

4. Air Quality, Ventilation and Stocking Density.

- a. Group housed, pre-weaned calves should have a minimum of 40-45 square feet per calf as a measure of reducing disease transfer and its inherent impact it will have on improving air quality.
- b. Calves should not feel a draft in weather below 50 degrees F. A draft is defined as air moving faster than 50 feet per minute.
- c. The amount of fresh air that should change the volume of a barn every hour is dependent on the outside temperature.

Winter Ventilation Requirements: Change barn air **4 times per hour**

Spring and Fall Ventilation Requirements: Change barn air **10-20 times per hour**

Summer Ventilation Requirements: Change barn air **40+ times per hour**

**Please note that your positive pressure duct system will only meet requirements for winter ventilation. Supplemental fans will be necessary to meet warmer weather ventilation requirements.**

Dr. Ryan's experience: Many producers and industry professionals continue to use the commonly accepted 30-32 square feet per calf when designing group housing for pre-weaned calves. I believe this is an error. 30-32 square feet per calf may work for calves that do not have nose to nose contact due to individual housing, but as calves are comingled, their stocking density should decrease. Why are we as an industry using square footage standards from one style of rearing (individual pens) and applying it to another, completely different style of rearing (comingled) and expecting similar results? **My most successful autofeeder clients routinely have 40-45 square feet for each pre-weaned calf. For your barn, that would be a stocking density of 19 calves per autofeeder pen.**

5. Intranasal Vaccines are a useful tool for pneumonia prevention.

- a. Inforce 3<sup>®</sup> or TSV-2<sup>®</sup> are the two most commonly used vaccines. Successful protocols often provide a dose at birth and another dose around week 4-6 of age.
- b. Calves should not receive a vaccine in the muscle or under the skin until AFTER they are 10 weeks of age. Vaccinating calves under the skin prior to weaning often increases pneumonia and scours rates.
  - i. Dr. Simon Peek from the University of Wisconsin -Madison's School of Veterinary Medicine commented on the trend of over-vaccination in pre-weaned calves in a recent paper (cited below)...

"It would be fair to say that the majority of calf hood disease investigations (pneumonia and scours problems) with which we (UW-School of Veterinary Medicine) have been involved in recent years have been on farms that have **aggressive vaccination programs** (for pre-weaned calves)....."

6. Early Pneumonia Detection: Treatments are more successful when administered early on in the disease process. Delayed treatments often lead to repeated treatments and chronic pneumonia calves.
  - a. Automatic feeder raised calves should be evaluated for both daily milk intake as well as drinking speed. **Sick calves will often show a decreased drinking speed before they show decreased intake or outward signs of being sick.**
  - b. Every calf should be looked at daily for signs of pneumonia (droopy ears, snotty nose, crusty eyes, depressed attitude, rapid breathing, spontaneous coughing, etc).

## II. CURTAINS DURING WINTER/COLDER WEATHER

1. Your positive pressure system is designed with a variable speed fan that will meet and or exceed current cold weather ventilation recommendations. As a result, I believe you can leave all curtains closed when the weather is below 40 degrees F and rely on the positive pressure duct system and exhaust fan to maintain good air quality.
2. **Please compare the two video clips (attached in email) that demonstrates the negative effect even a slight breeze can have on reducing the effectiveness of the positive pressure duct by disrupting the air as it comes out of the duct and preventing it from getting to the calf level.**

## **Barn Ventilation Plan**

### ***Positive Pressure Duct Specifications***

Both Ducts will have the same specifications

Material: High Density Polyethylene

Color: White, Grey, Yellow, Blue, Green: Please choose color.

Length: 69 feet

Diameter: 20 inches

Suspension: Triple (a cable at 9:00, 12:00 and 3:00) for optimum support

Zippered End Cap: Yes

Anticondensation Holes: YES

#### **Hole Configuration On The Ducts:**

0-30 feet: East Duct

1.3 inch hole at 4:00

0.75 inch hole at 4:30

Spaced 13.5 inches on center

0-30 feet: West Duct

1.3 inch hole at 8:00

0.75 inch hole at 7:30

Spaced 13.5 inches on center

30-70 feet: Both Ducts

1.3 inch hole at 4:00

0.75 inch hole at 4:30

0.5 inch hole at 6:00

0.75 inch hole at 7:30

1.3 inch hole at 8:00

Spaced 7 inches on center

#### **System Dynamic Performance Predictions**

Aperture Ratio: 0.95

Static Pressure: 0.15 inches water

Barn Volume Changes Per Hour: 7.6

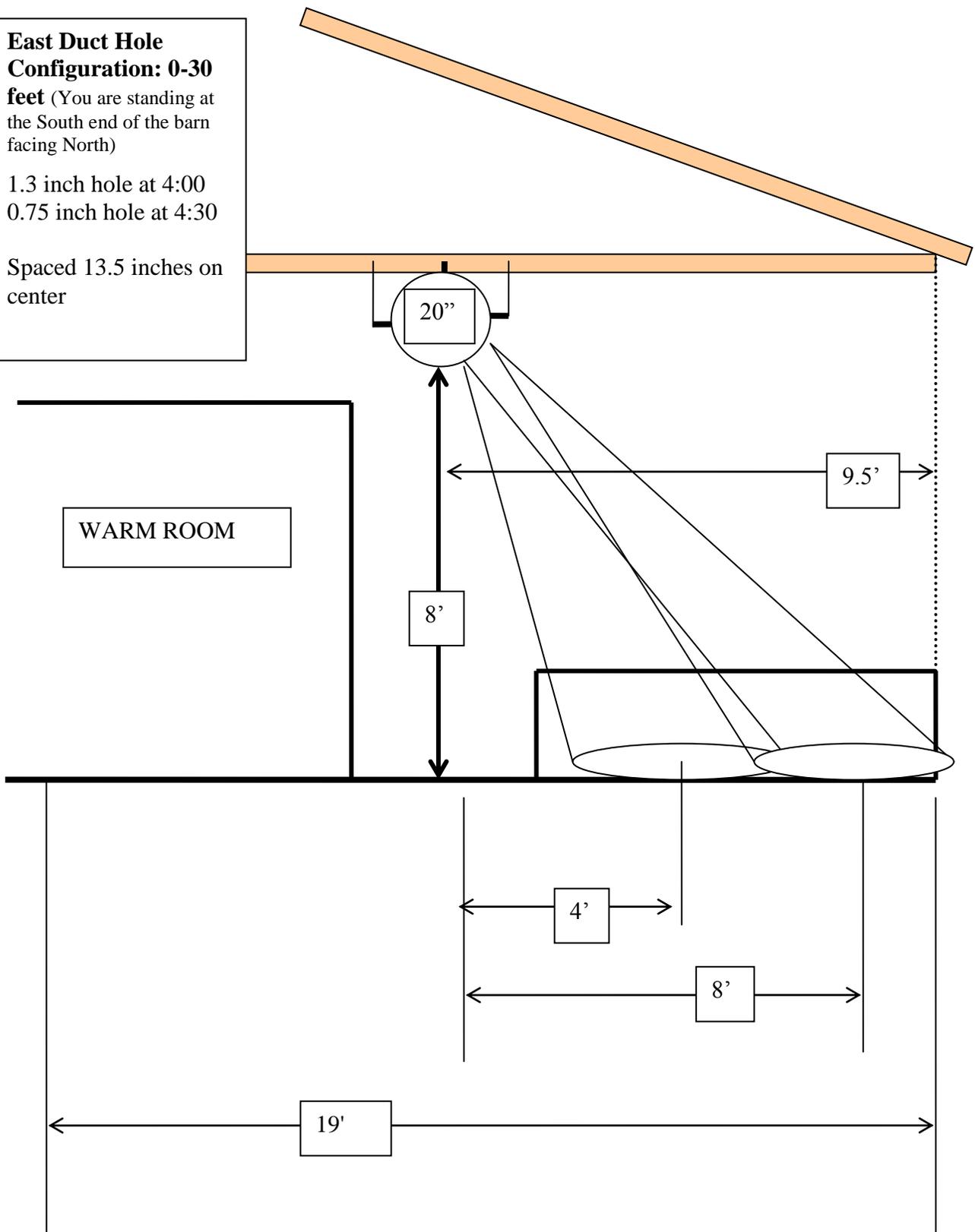
Estimated CFM at dynamic static pressure: 2,389 CFM x 2 fans = 4,778 CFM

Estimated number of pre-weaned calves: 64

Estimated CFM per calf individual pen calf: 50-25 depending on speed fan is running

Estimated CFM per calf group auto-feeder: 80-40 depending on speed fan is running

**East Duct Hole Configuration: 0-30 feet**  
(You are standing at the South end of the barn facing North)  
1.3 inch hole at 4:00  
0.75 inch hole at 4:30  
Spaced 13.5 inches on center



WARM ROOM

20"

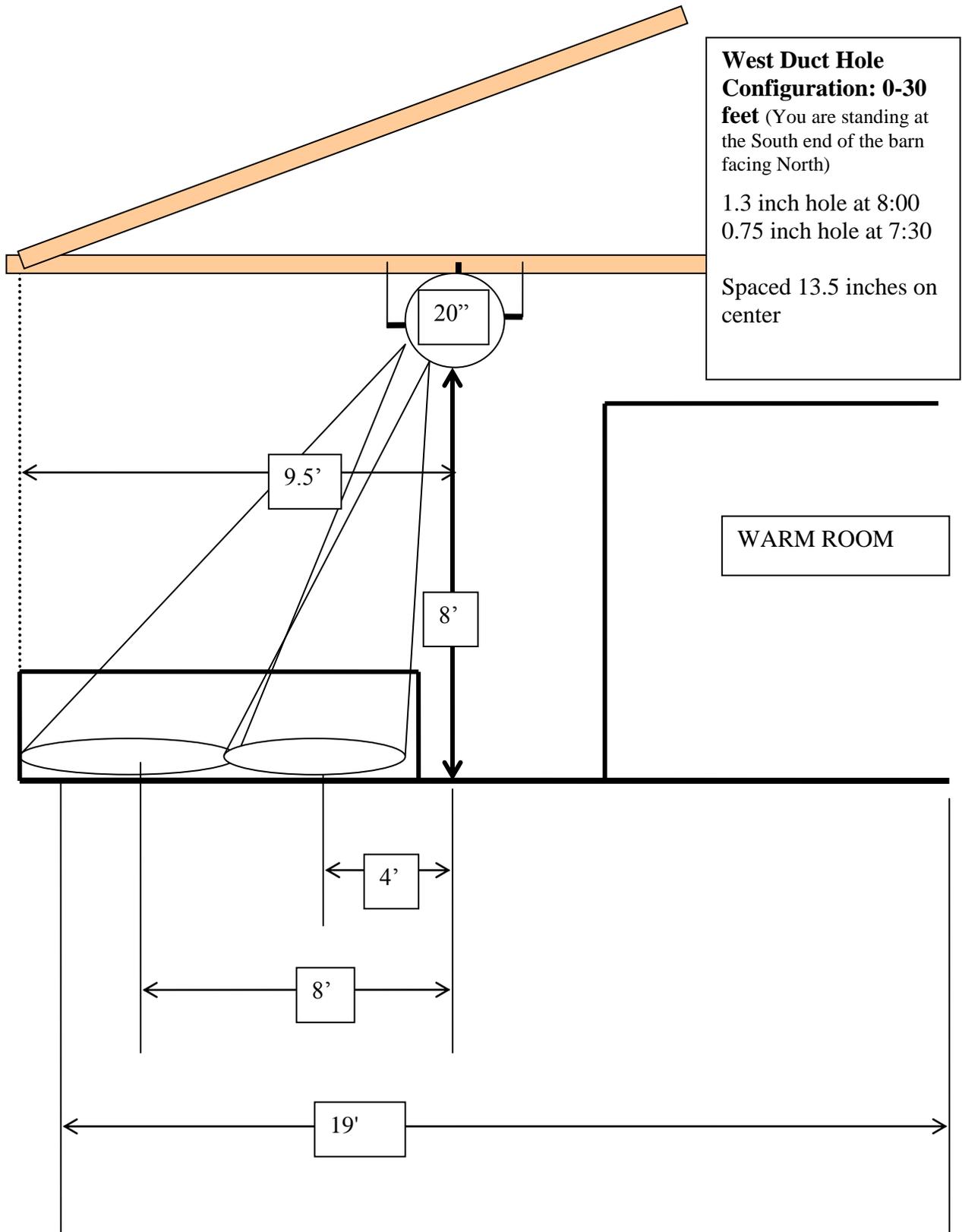
8'

9.5'

4'

8'

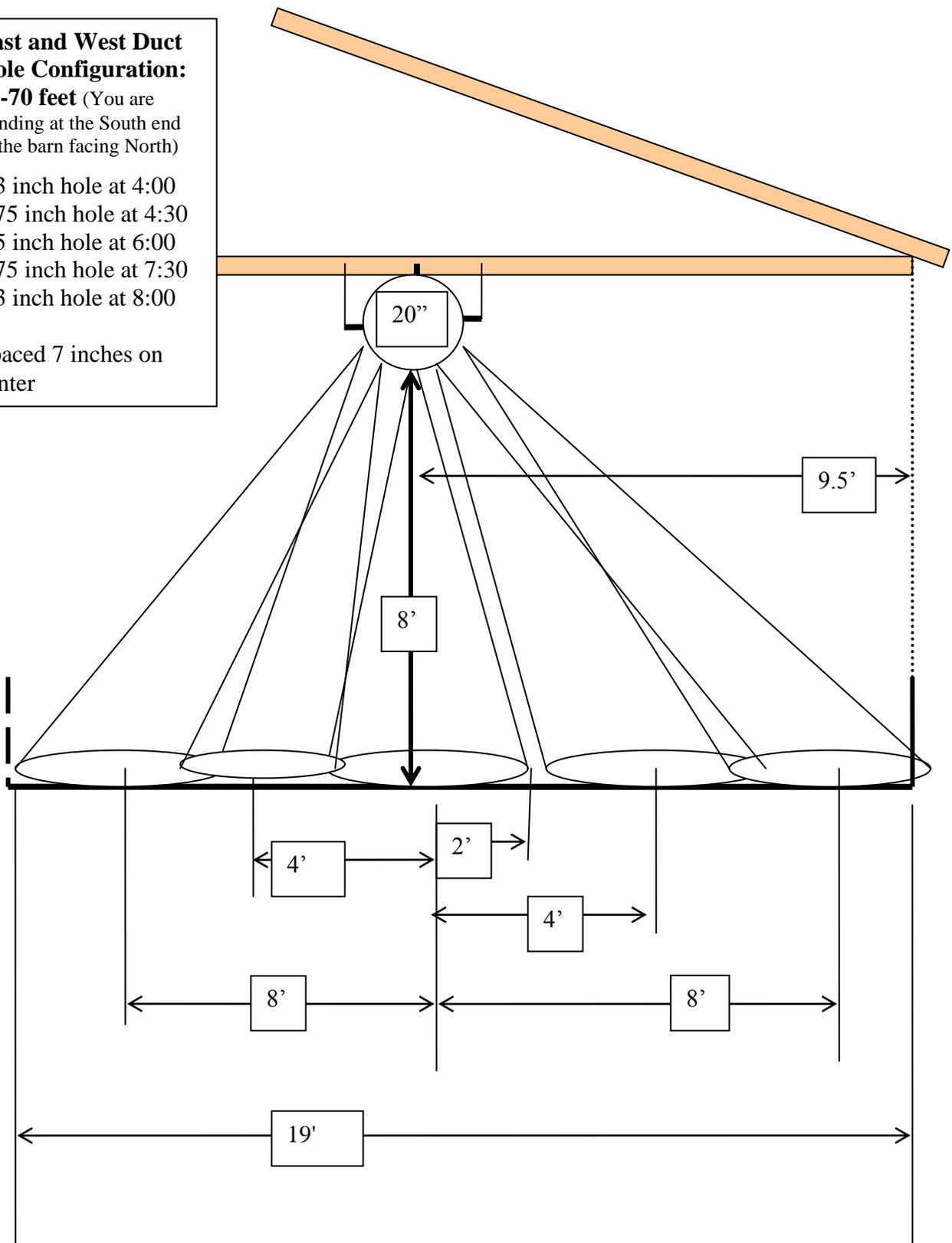
19'

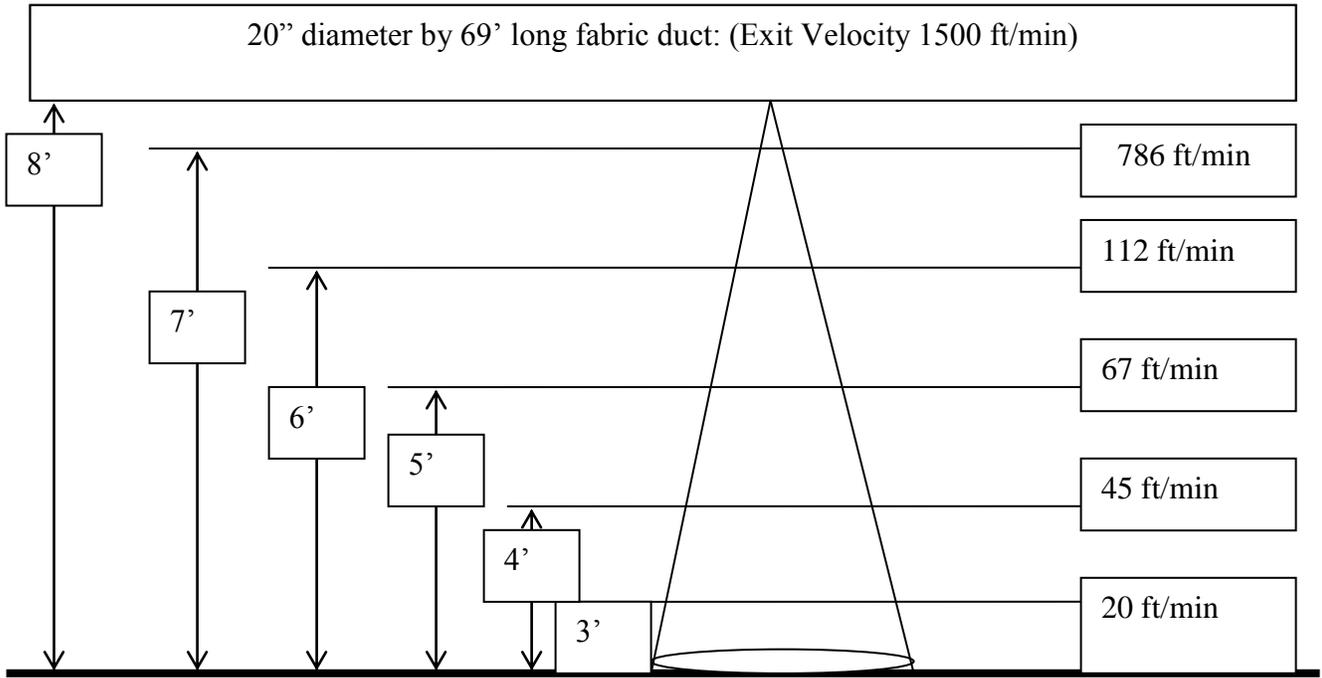


**East and West Duct Hole Configuration:**  
**30-70 feet** (You are standing at the South end of the barn facing North)

1.3 inch hole at 4:00  
 0.75 inch hole at 4:30  
 0.5 inch hole at 6:00  
 0.75 inch hole at 7:30  
 1.3 inch hole at 8:00

Spaced 7 inches on center





## Fan Equipment Needed

### Duct Fans

16 inch stainless steel variable speed Canarm duct fan from Farmtek (Item #CF1742, order 2).

### Variable Speed Modulating Thermostat

Phason VTC-1D variable temperature control (Item# CF1859, order 2). This thermostat works very nicely with Canarm variable speed tube and exhaust fans. This controller can handle 10 amps of draw so it should be able to run both the existing exhaust fan (assuming its variable speed) and duct fan at the same time.

### Weather Hoods

Canarm Polyethylene weather hood: (Item#CF1830 for fans under 18 inches in diameter, order 2 for the duct fans).

### Exhaust Fans

16 inch Canarm brand exhaust fan with aluminum louver shutter with 2,370 CFM. (Farmtek Item # CF1760, order 2).

## Farmtek Contact Information

### Sales Department

From USA and Canada: 1.800.FarmTek (1.800.327.6835)

Hours: Monday-Friday 7:30am-5:30pm CT, Saturday 8:00am-3:00pm CT

### Fax Orders

From USA and Canada: 1.800.457.8887

## ***Project Material Cost Estimates***

### **Crystal Creek® Costs**

Positive Pressure Duct and Exhaust Design: \$1,500.00

Positive Pressure Duct **and all duct Installation Hardware**: \$2,715.19

(Shipping on the duct is included in these estimates)

Subtotal: \$4,215.19

### **Fan Equipment Costs**

16 inch stainless steel Canarm tube fan:  $\$389.00 \times 2 = \$778.00$

Polyethylene weather shields for tube fan:  $\$112.75 \times 2 = \$225.50$

Phason variable speed controller:  $\$295.00 \times 2 = \$590.00$

16 inch Canarm Exhaust Fan:  $\$369.00 \times 2 = \$738.00$

Subtotal: \$2,331.50

<b>Total Project Estimate: \$6,546.69</b>
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