

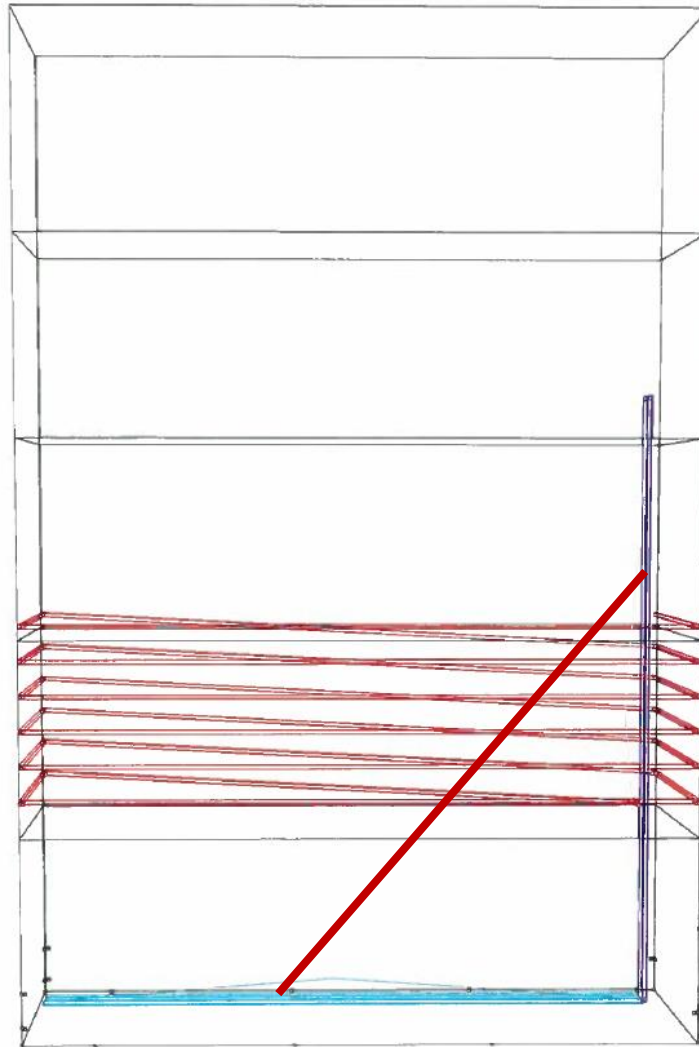
# **Two-Phase Flow Loop**

**Loop High Bay Lab at Zachry  
Engineering Center**

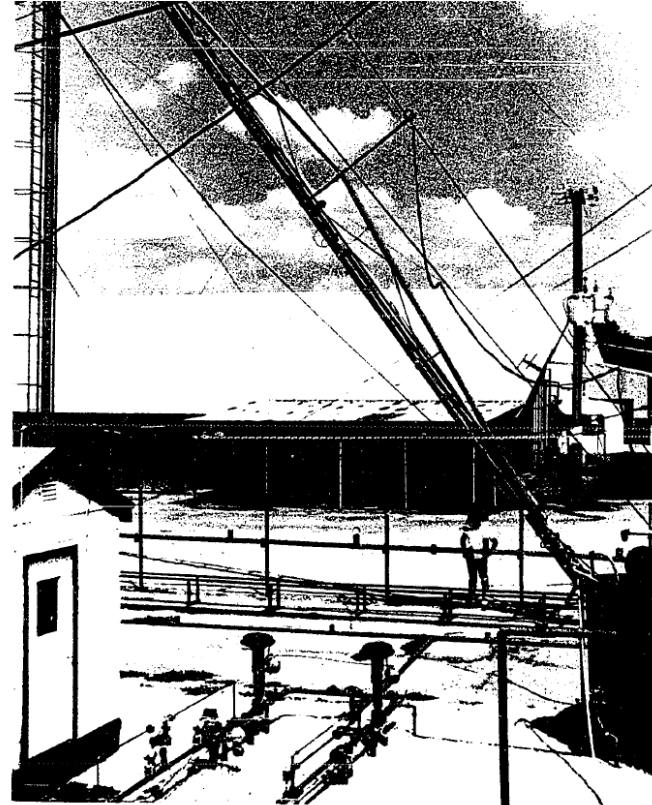
# Objective

- Built a Two-Phase Flow Loop High Bay Lab at Zachry Engineering Center, to be used for PETE 325 lab class.
- The project consists of a truss, or another rigid base, supporting three 2-in pipes. This base will be able to pivot 90 degrees, varying from horizontal to vertical position. The design originally thought that two sets of railings (one vertical and one horizontal) could be used as guiding systems and support for the main structure holding the pipes. This structure is to be built inside the stairwell of the High Bay Lab at Zachry Engineering Center. Due to space limitation, the maximum length of the base supporting the pipes should be limited to 300 inches.

# Two-Phase Flow Loop High Bay Lab at Zachry Engineering Center



# Similar Test Facility at Tulsa University



# High Bay Lab Space





# Stairwell - from 2nd floor



# High Bay Lab Stairwell



# Preliminary Quote

- This is a preliminary quote showing just the main components of the system.
  - PVC 2” pipe, valves and fittings US\$ 6,350
  - A framework to support the pipes (truss) US\$24,750
  - Ingersoll Compressor model IRN100H-OF US\$92,550



# PVC 2" pipe, valves and fittings

Vertical Section						
Item	Company	Item Number	Amount Needed	Unit Cost	Units to Purchase	Total Cost
3" Pipe (gray)	grainger	1VEV4	28'	\$59.92/10 ft	4 unit(s)	\$239.68
2" Pipe (clear)	alsco	1391-020	28'	\$120.94/10 ft	4 unit(s)	\$483.80
2" 90° Elbow (socket x socket)	grainger	6NG10	1 unit(s)	\$5.57/unit	2 unit(s)	\$11.14
3" 90° Elbow (socket x socket)	grainger	1VFE3	1 unit(s)	\$9.15/unit	2 unit(s)	\$18.30
2" Union (socket x socket)	grainger	11W265	3 units(s)	\$15.10/unit	4 unit(s)	\$60.40
3" Union (socket x socket)	grainger	1V5B5	3 units(s)	\$34.14/unit	4 unit(s)	\$136.56
2" Coupling (socket x socket)	grainger	6NG57	4 units(s)	\$7.03/unit	4 unit(s)	\$28.12
3" Coupling (socket x socket)	grainger	1VFG7	4 units(s)	\$12.50/unit	4 unit(s)	\$50.00
						\$1,028.00
Horizontal Section						
Item	Company	Item Number	Amount Needed	Unit Cost	Units to Purchase	Total Cost
2" Pipe (gray)	grainger	6MV25	275'	\$23.64/10 ft	28 unit(s)	\$661.92
2" Pipe (clear)	alsco	1391-020	175'	\$120.95/10 ft	18 unit(s)	\$2,177.10
2" 90° Long Sweep Elbow (socket x socket)	grainger	1WJZ1	24 unit(s)	\$3.89/unit	30 unit(s)	\$116.70
2" Union (socket x socket)	grainger	11W265	12 unit(s)	\$15.10/unit	16 unit(s)	\$241.60
2" Coupling (socket x socket)	grainger	6NG57	36 unit(s)	\$7.03/unit	40 unit(s)	\$281.20
						\$3,478.52
General Supplies						
Item	Company	Item Number	Amount Needed	Unit Cost	Units to Purchase	Total Cost
Cam and Groove Coupling (aluminum)	grainger	26W643	6 unit(s)	\$49.62/unit	6 units(s)	\$297.72
Hose (25')	grainger	53XV12	2 unit(s)	\$203.36/unit	2 units(s)	\$406.72
Primer (PVC, oil based, 32 oz.)	grainger	4HFE6	10 unit(s)	\$12.91/unit	10 units(s)	\$129.10
Cement (PVC, clear)	grainger	39AN77	10 unit(s)	\$13.51/unit	10 units(s)	\$135.10
Wye Joint	grainger	1WJT8	2 unit(s)	\$3.70/unit	4 unit(s)	\$14.80
						\$983.44
Contingency	15%					\$823.49
					<b>Total</b>	<b>\$6,313.45</b>

# Quote for the Project Structure



P.O. Box 25  
Henderson, KY 42419  
ph. (270) 830-8512  
fax (270) 228-4551  
www.pttg.com

Job Number: FH-070066  
Order Date: November 8, 2017  
PO Number:  
Shipping Terms: FOB Henderson, KY  
Shipping Method: Truck

## Bill To:

Texas A & M University  
901G Richardson Building  
College Station, TX 77843-3116  
Ibere Alves,  
979-845-2263  
ibere.alves@tamu.edu

## Job Site/Ship To Location:

New Zachery Bldg  
Zachery Bldg  
College Station, TX 77843  
  
979-845-2263  
ibere.alves@tamu.edu  
, Brazos County

PAYMENT TERMS: 25% Deposit, 75% Upon Completion

LEAD TIME: 8-10 Weeks ARO Approved Drawings

Qty	Item	Unit Price	Total
1	<b>FH-070066-A</b> The project consists of a truss supporting (3) 2" pipes. The base will pivot 90 degrees varying from horizontal to vertical position. The two sets of railings (one vertical and one horizontal) will be used as guiding system and support for the main structure holding the pipes. This structure is to be built inside the stairwell of a new building. Due to space limitation, the maximum length of the base supporting the pipes should be limited to 25'.	\$24,750.00	\$24,750.00

Allstate Tower is the same company that construct a similar structure at LSU

# Compressor Selected

[Industries Served](#)[Document Library](#)[Parts & Accessories](#)[Contact Us](#)[OUR COMPANY & BRANDS](#)[COMPRESSOR SYSTEMS](#)[POWER TOOLS](#)[LIFTING & MATERIAL HANDLING](#)

[Home](#) > [Ingersoll Rand Air Compressors and Services](#) > [Oil-Free Air Compressors](#) > [Nirvana Variable Speed Oil-Free Rotary Screw Air Compressors 55-75 kW](#)

[< Back to product list](#)

## Nirvana Variable Speed Oil-Free Rotary Screw Air Compressors 55-75 kW

[View all models](#)

Click to enlarge



Nirvana oil-free air compressors, with a matching variable speed inverter and hybrid permanent magnet (HPM®) motor, provide unparalleled energy efficiency at all speeds along with superb reliability. They deliver ISO 8573-1:2010 Class 0 certified 100% oil-free air for the most critical applications. There are no motor bearings, pulleys, belts, couplings or motor shaft seals to wear out, leak or need replacing. Nirvana will lower your operating costs with its dynamic efficiency -- a truly transcendent technology!

[Request a Quote](#)[Request Service](#)[Request Parts](#)

EMAIL PRINT SHARE

[Features](#)[Model Specifications](#)[Documents](#)[Parts & Accessories](#)

# Quote for the Compressor



## Quote Summary

Quote #: 1-755AJG3

All amounts are displayed in USD

Product Description	Qty	Unit Price	Extended Price	Sub Total
IRN100H-OF/SS ACAC 460V NIRVANA OIL FREE	1	\$92,550.00	\$92,550.00	

**Total Quote Price: \$92,550.00**

Delivery : Stock Mocksville, NC  
Payment Terms : Net 30 w/ Acct  
FOB : Exworks  
Freight Terms : Prepay & Add  
Freight : TBD

Pricing and availability is subject to change without notice.

Upon submission of your order, please include the following information: payment terms, preferred payment method, purchase order number, tax status (if exempt please include a copy of your tax exemption certificate with your order). For US, please remit all payments to Ingersoll Rand, 15768 Collections Center Drive, Chicago, IL, 60693. For Canada, please remit all payments to Faire Remise A, C/O T10223C PO Box 4918 STN A, Toronto, ONTARIO M5W 0C9, Canada. Also, please be aware that Ingersoll Rand accepts payment via credit card, and EFT.