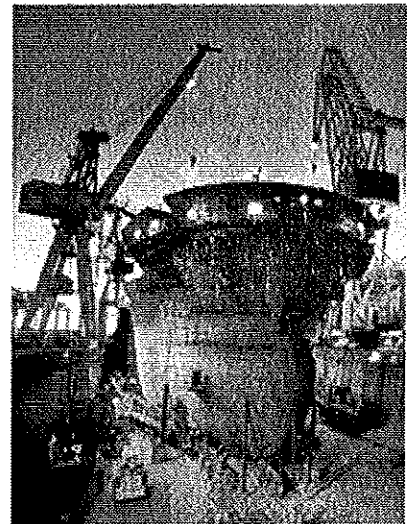
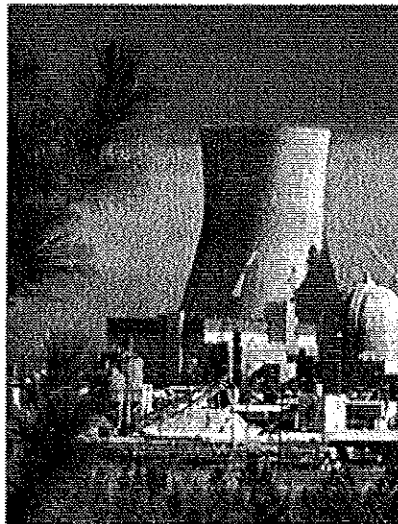
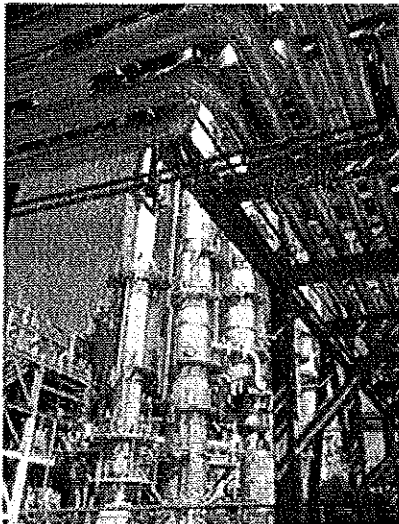


# SmartPlant 3D

## *HVAC Labs*

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Process, Power & Marine



INTERGRAPH

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## Preparation:

- 1 Restore Training Plant
- 2 Enter a Session File and set workspace to show ALL filter
- 3 Go to tools, select by filter
- 4 Open For Instructors only folder and select Equipment and Piping class filter, delete the selected objects
- 5 Go to tools select by filter, open For Instructors only folder and select Structural class filter, delete the selected objects
- 6 Activate pin point and set Active Coordinate system to Global
- 7 Go to Edit, Paste from Catalog. Open Modules, HVAC, HV Grids
- 8 Select HVAC\_CS and ok
- 9 OK on Place Macro
- 10 Key in -35 for Easting, 10 for North and 0 for Elevation
- 11 Set your Workspace to Show HVAC filter

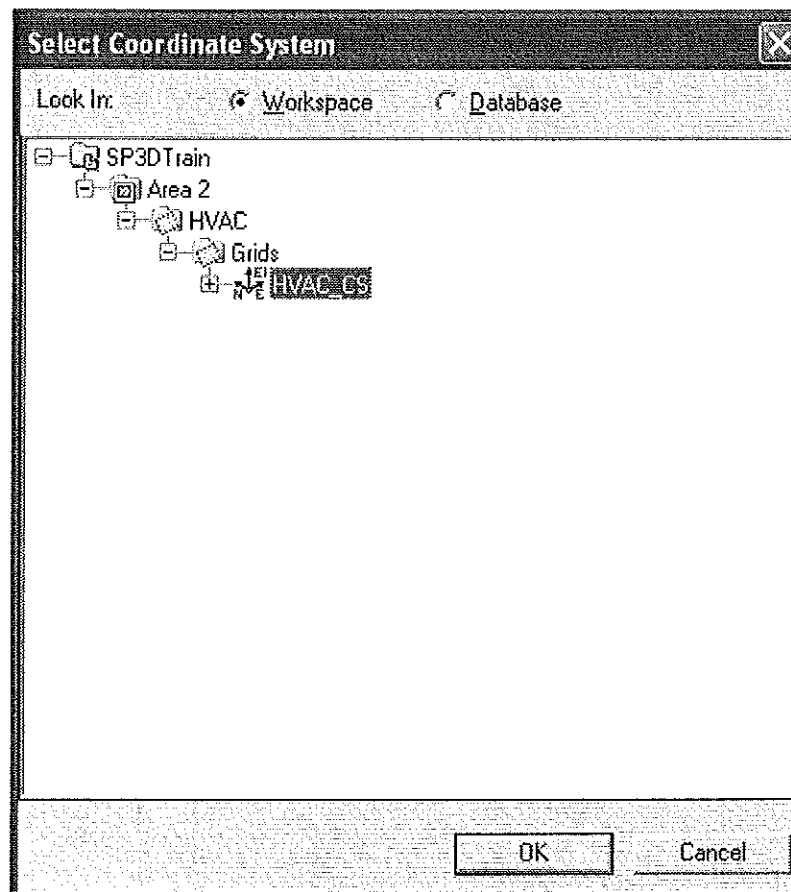
**NO LONGER  
AVAILABLE...**

GRIDS TO BE  
ADDED MANUALLY

# LAB-1: Placing Air Handling Unit

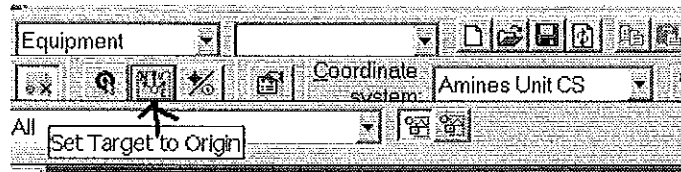
## Objective

- 1 Open a Session file with Imperial Units
- 2 Define your Workspace to Show HVAC Labs filter
- 3 If you are not in the Equipment task, then select Task -> Equipment and Furnishing
- 4 Make sure the Active Permission Group is set to *HVAC*
- 5 Activate PinPoint by Selecting Tools > PinPoint
- 6 From Ribbon Bar, select more under Coordinate systems
- 7 Expand HVAC, Grids and select HVAC\_CS



8 Ok on the Select Coordinate System form

9 Select Set target to Origin Option



10 Select Place Designed Equipment Command

11 From Catalog Browser select, \Equipment\Process\Horizontal Vessels\Horizontal Drum with Saddle

12 Key in 31' for East, 4' for North and 2' for Elevation.

13 Change the System to HVAC, HVAC AHU

14 Change the name to AHU-01

15 Select AHU-01 in WSE, and open its properties page

16 Switch to Definition tab and make following changes

Equipment Properties

Occurrence | Definition | Relationship | Configuration | Notes

Category: Standard

Property	Value
Part Number	AHU-01
Part Description	Air Handling Unit For HVAC
Mirror Behavior Option	Component may be mirrored
Equipment Classification 0	HVAC Equipment
Equipment Classification 1	Air Handling Unit
Equipment Classification 2	<undefined value>
Equipment Classification 3	<undefined value>
Equipment Classification 4	<undefined value>
Equipment Classification 5	<undefined value>
Equipment Classification 6	<undefined value>

- 17 Select Place Shape Command
- 18 If prompted, select AHU-01 in WSE
- 19 Select the Rectangular shape
- 20 Key in A=8, B=6 and C=4
- 21 Key in 31' for East, 4' for North and 2' for Elevation.
- 22 Change the name of the shape to AHUBOX
- 23 Select Place Nozzle Command and select the shape AHUBOX as the nozzle parent
- 24 Change the port type to HVAC Port and set the properties as shown:

Occurrence   Location   Configuration	
Category:	Port Type:
Standard	HVAC Port
Pre-defined: From catalog...	
Property	Value
End Preparation	1
Thickness	0 ft 0.25 in
Flange Width	0 ft 0.00 in
Flow Direction	Flow leaves this port
Port Depth	0 ft 0.00 in
Flange Projection Or Socket Offset	0 ft 0.00 in
Port Index	2
Reporting Requirement	
Reporting Type	
Nozzle Length	0 ft 1.00 in

Occurrence | Location | Configuration |

Category: Standard Port Type: HVAC Port Pre-defined: From catalog

Property	Value
Nozzle Length	0 ft 1.00 in
Distribution Port Type	Ducting
Distribution Port Status	AddedPort
Name	SP-01
Width	3 ft 0.00 in
Depth	2 ft 0.00 in
CornerRadius	0 ft 0.00 in
Dimension Base Outer	True
Cross Section Shape	Rectangle
Can be deleted	True

25 Switch to location tab and set the values as shown

Occurrence | Location | Configuration |

☐ DR1 measured in Active Coordinate System North Placement Type: Radial

Property	Value
N1	4 ft 0.00 in
N2	2 ft 1.00 in
OR1	270.00 deg
OR2	0.00 deg

26 Place another Nozzle with following Properties



Occurrence	Location	Configuration
Category:	Port Type:	Pre-defined:
Standard	HVAC Port	From catalog
Property	Value	
End Preparation	1	
Thickness	0 ft 0.25 in	
Flange Width	0 ft 0.00 in	
Flow Direction	Flow enters this port	
Port Depth	0 ft 0.00 in	
Flange Projection Or Socket Offset	0 ft 0.00 in	
Port Index	4	
Reporting Requirement		
Reporting Type		
Nozzle Length	0 ft 1.00 in	

Occurrence	Location	Configuration
Category:	Port Type:	Pre-defined:
Standard	HVAC Port	From catalog
Property	Value	
Nozzle Length	0 ft 1.00 in	
Distribution Port Type	Ducting	
Distribution Port Status	AddedPort	
Name	RT-01	
Width	2 ft 0.00 in	
Depth	2 ft 0.00 in	
CornerRadius	0 ft 0.00 in	
Dimension Base Outer	True	
Cross Section Shape	Rectangle	
Can be deleted	True	

Switch to Location tab and set

Occurrence | Location | Configuration |

☐ DR1 measured to Active Coordinate System North

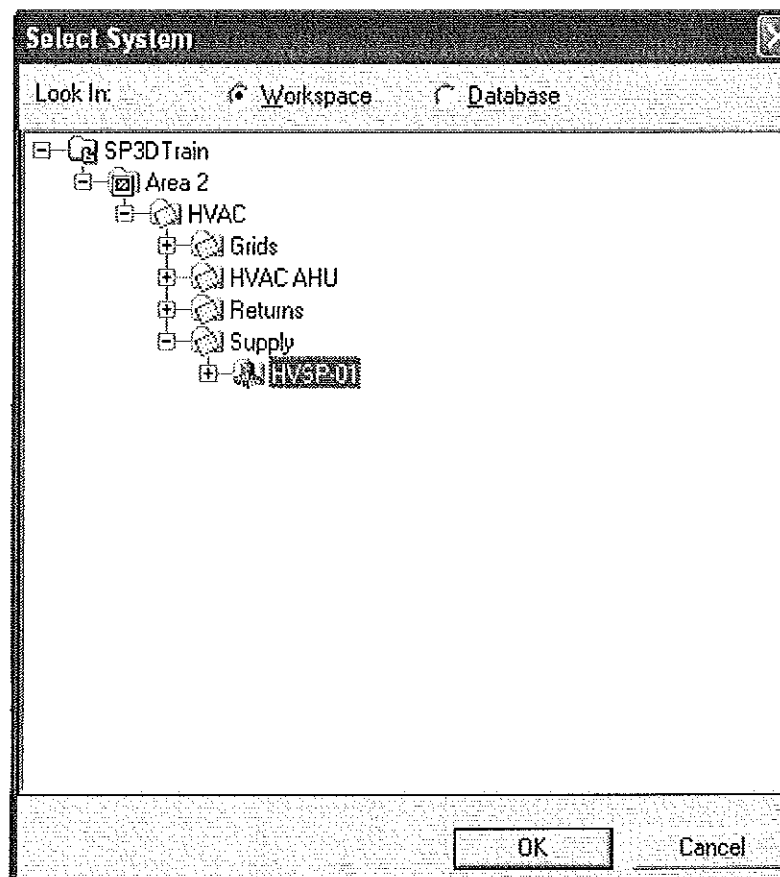
Placement Type: Axis

Property	Value
N1	8 ft 1.00 in
N2	0 ft 0.00 in
DR1	0.00 deg
DR2	0.00 deg

n°

## LAB-2: Basic Duct Routing

- 1 Open a Session file with Imperial Units
- 2 Define your Workspace to Show HVAC LABS filter
- 3 Switch to HVAC task
- 4 Activate PinPoint by Selecting Tools > PinPoint
- 5 Select Route Duct command
- 6 Select Port SP-01 on AHU-01 as the starting point
- 7 Change the system as shown



- 8 Change the rest of the properties as shown

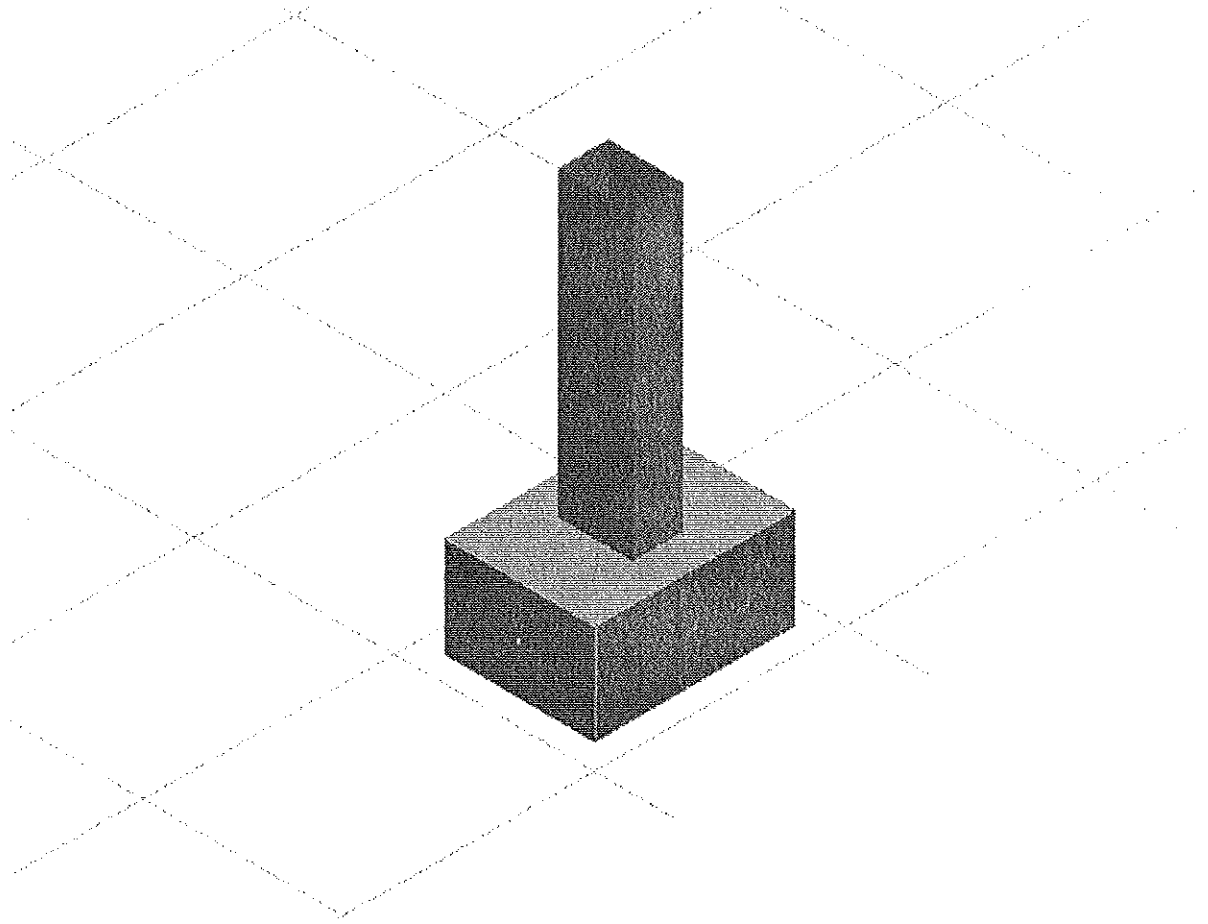
**New Duct Run**

General |

Category:

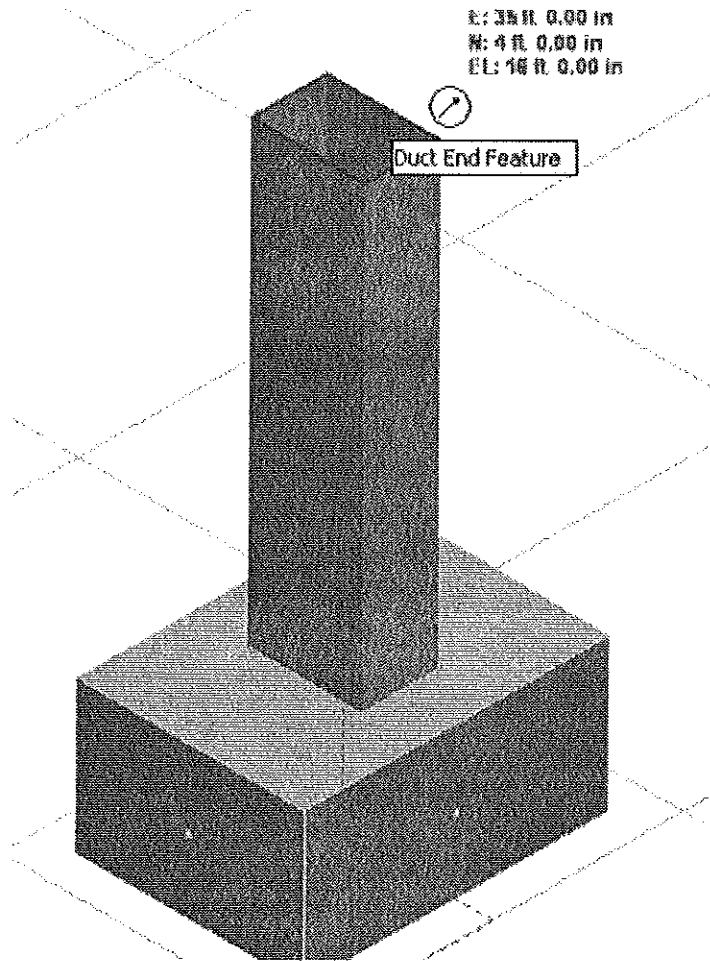
Property	Value
System	HVSP-01
Name	
NameRule	DefaultNameRule
Specification	Spec-1
Max. Recommended Velocity	0.00 ft/s
Max. Recommended Pressure Loss	0.00 ksf
Material	Steel - High Strength Carbon-AH32
Thickness	0 ft 0.12 in
Insulation Material	Not Insulated
Insulation Thickness	

- 9 System picks the Width and Depth from the Port.
- 10 Route to Elevation 16'
- 11 Your view should resemble this

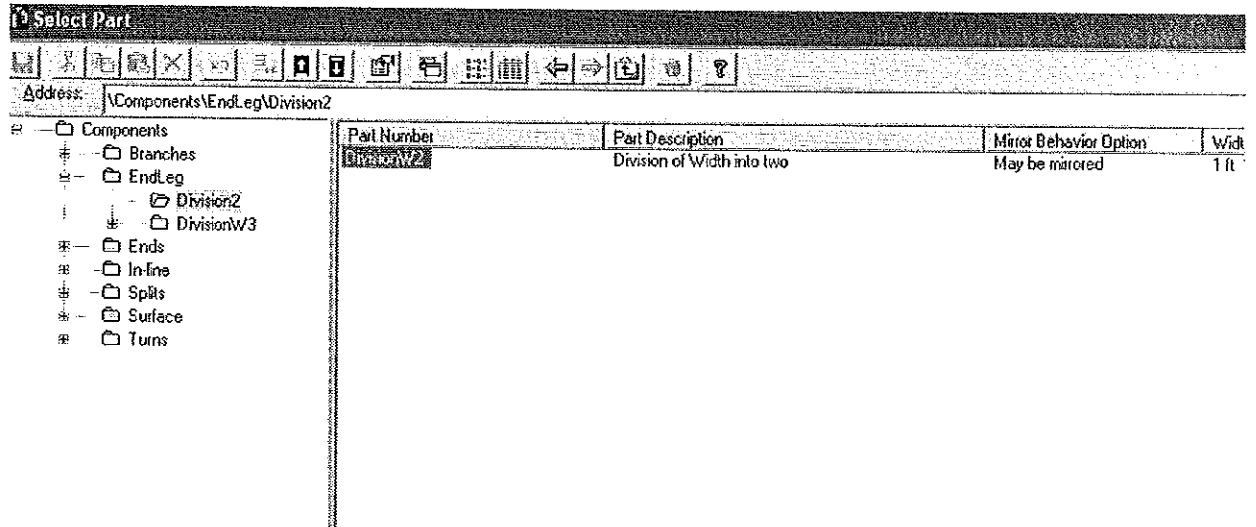


## LAB-3: Inserting Duct Divisions

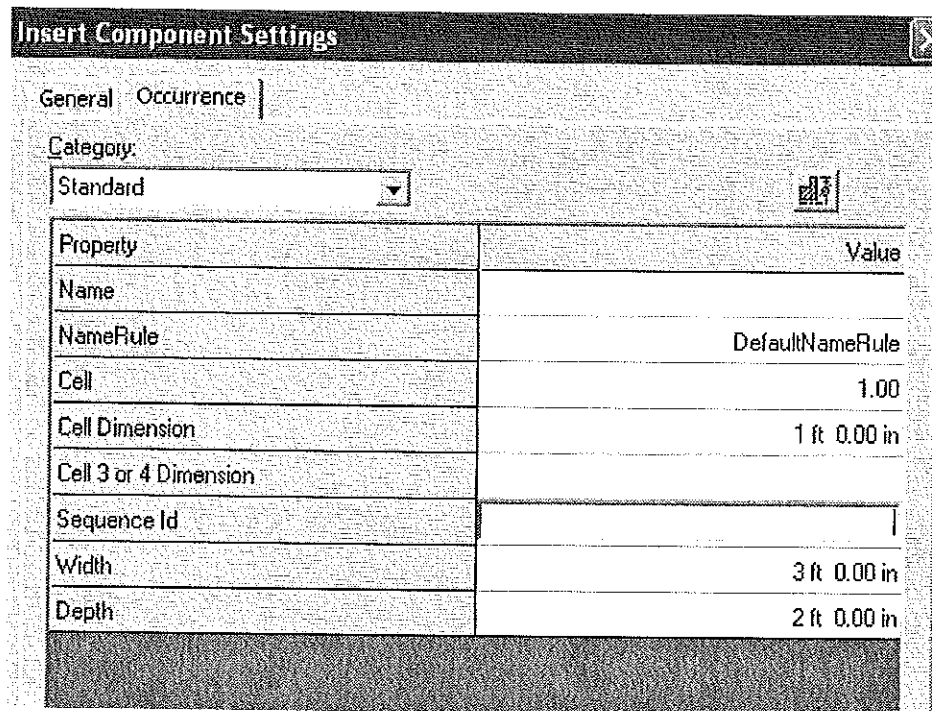
- 1 Select insert Inline Component Command
- 2 Select the End Feature of Vertical Duct



- 3 Under Part, select more
- 4 Select DivisionW2 as shown



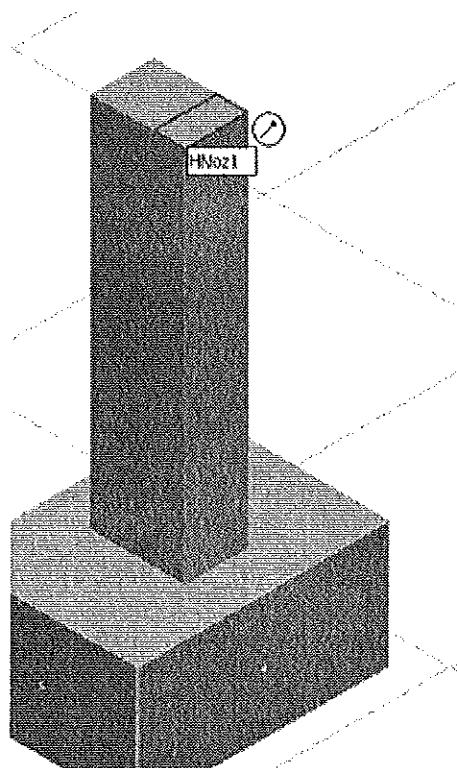
- 5 OK on the form
- 6 Select the properties icon from the ribbon bar
- 7 Change the properties as shown



- 8 Select Finish to place the component

## LAB-4: Inserting Transitions

- 1 Select Insert Transition command
- 2 Select the smaller section at the end of duct as shown

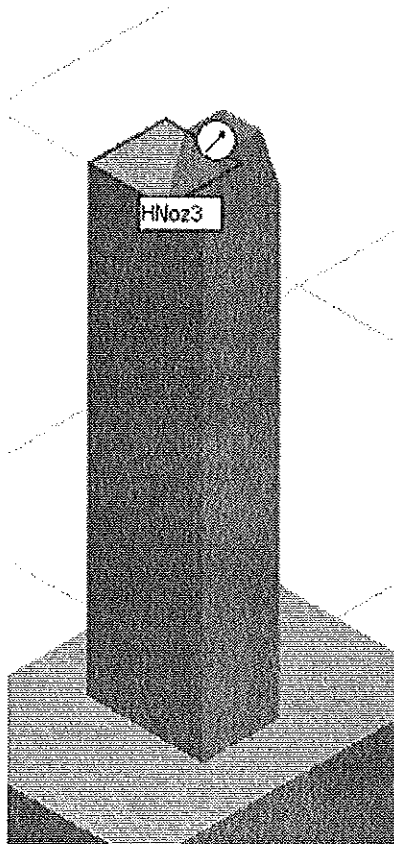


- 3 On the new duct run form, keep the properties same as previous lab
- 4 Change the size to 1' X 1'
- 5 Change the length to 1' 6"
- 6 Finish placing the transition

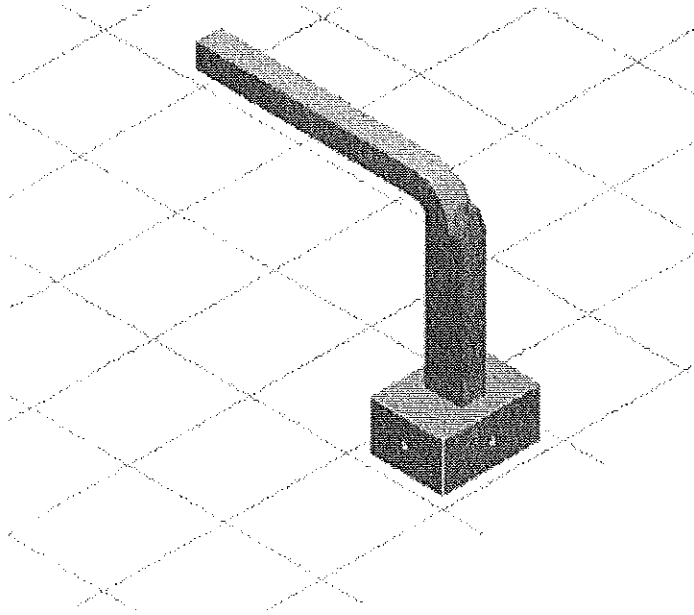


## LAB-5: Duct Routing with Bends and Branches

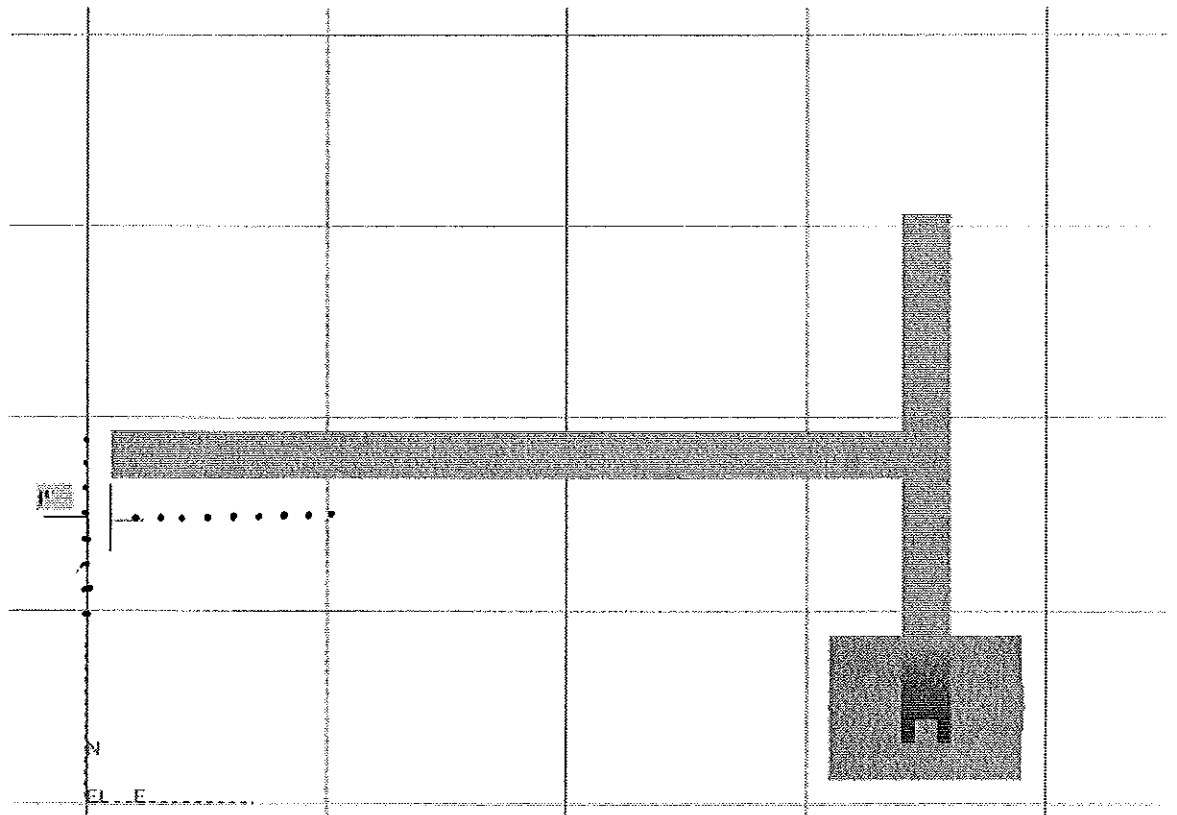
- 1 Select Route Duct command
- 2 Select the bigger end of the duct end



- 3 Keep all the properties same as previous lab
- 4 Change the angle to 90 in the ribbon bar
- 5 Key in 20' for length
- 6 Route the duct in North direction as shown

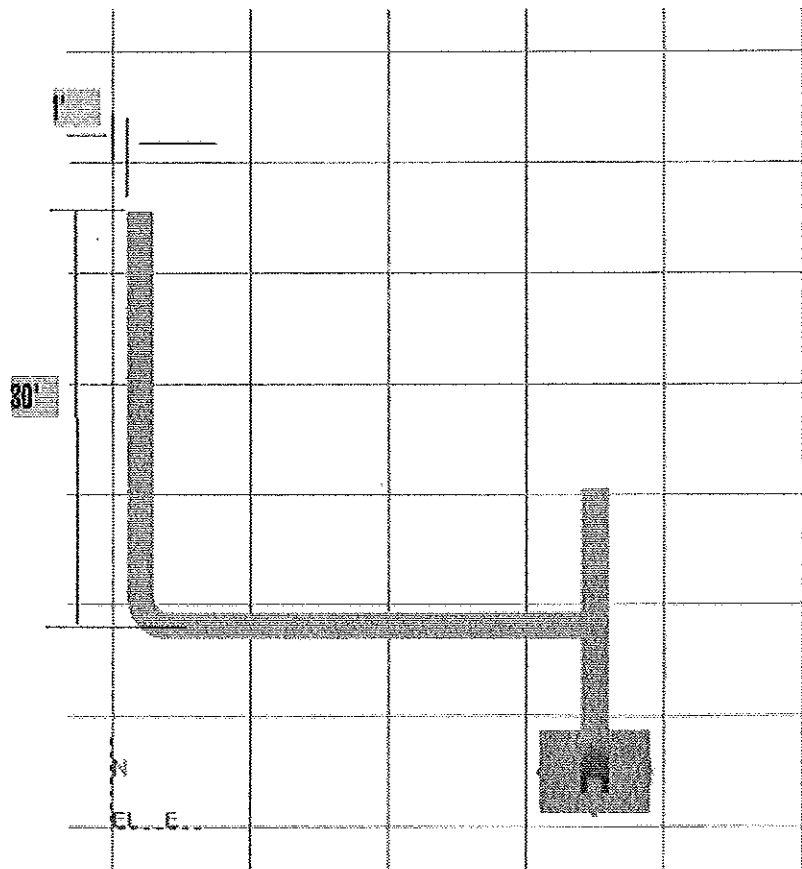


- 7 When finished, right click to cancel the command
- 8 Place the target at the end of Duct placed in previous step
- 9 Select Route Duct command
- 10 Key in -10 for North and highlight the duct straight feature, left click to start the new run at this location
- 11 Keep the same properties on new duct run form. Ok
- 12 Change the size to 2' X 2'
- 13 Route the duct west as shown

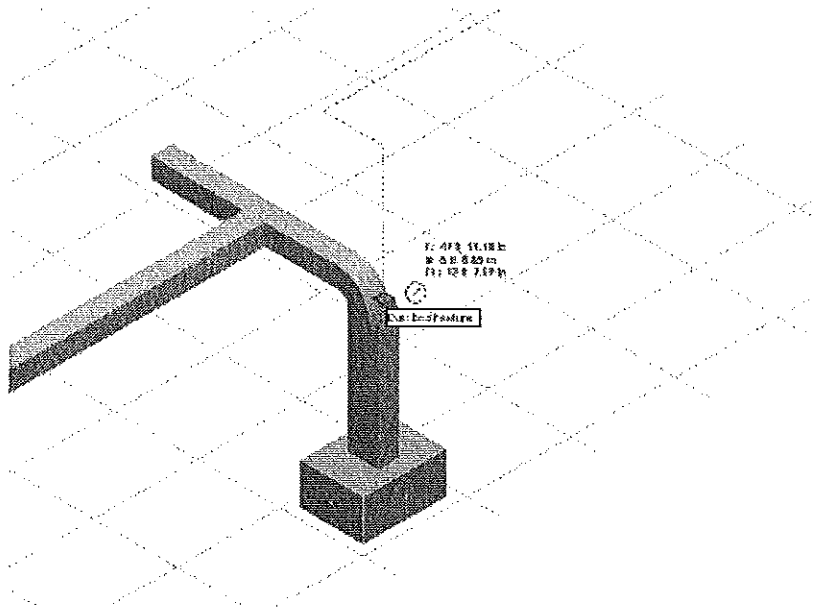


## LAB-6: Cardinal Point Routing

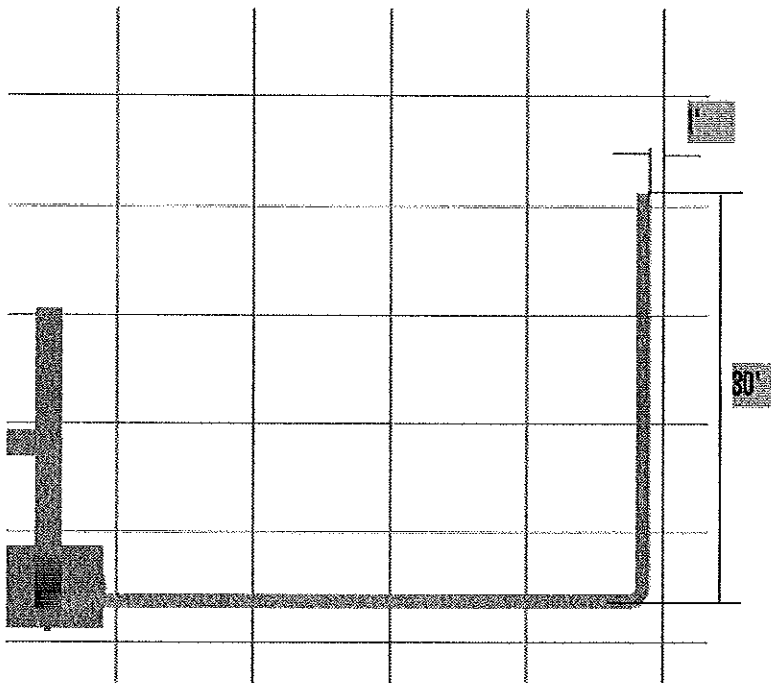
- 1 Route Duct as shown using appropriate Cardinal point  
Note: Make Sure you keep the plan plane lock on



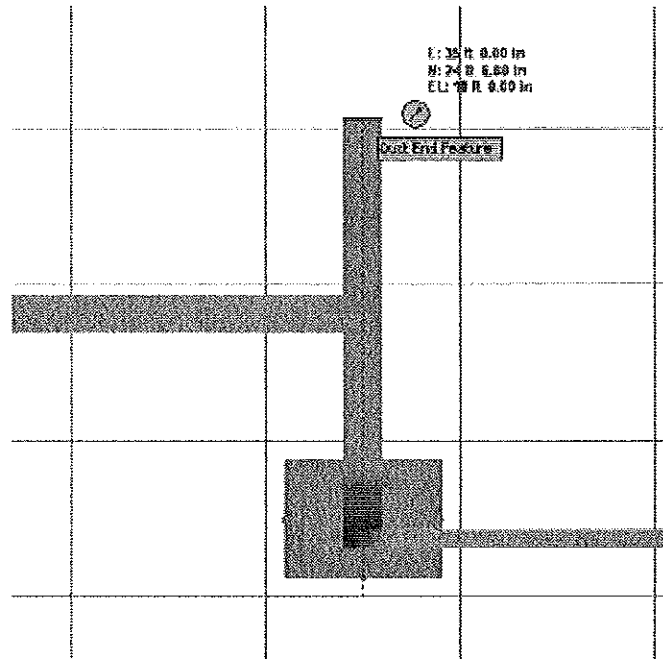
- 2 Right click to cancel the route command
- 3 Select Route Duct command
- 4 Define the end if transition as the starting point



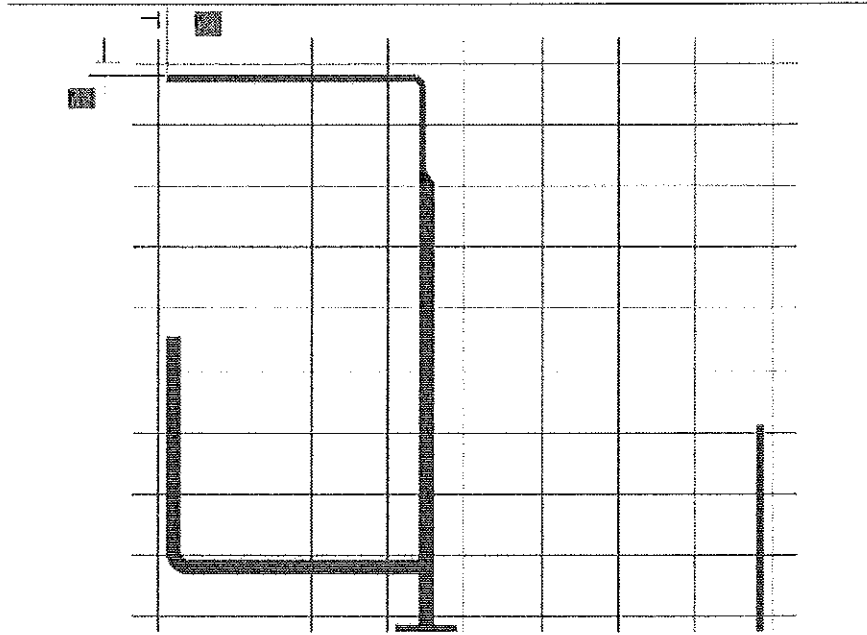
- 5 Keep the same properties as above labs. Change the angle to 90
- 6 Route as shown



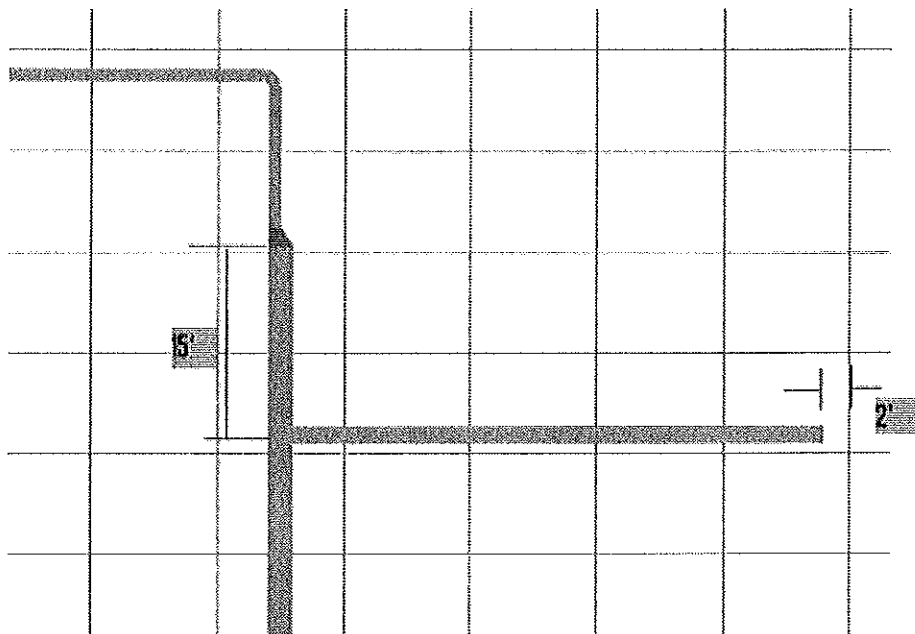
- 7 Select the Route Duct Command
- 8 Start at the center 2' X 2' duct as shown



- 9 Route North 40'
- 10 Place a Transition to 1' X 1', Length of transition 1' 6" keeping Bottom and East Flat. Continue Routing from the Transition as Shown

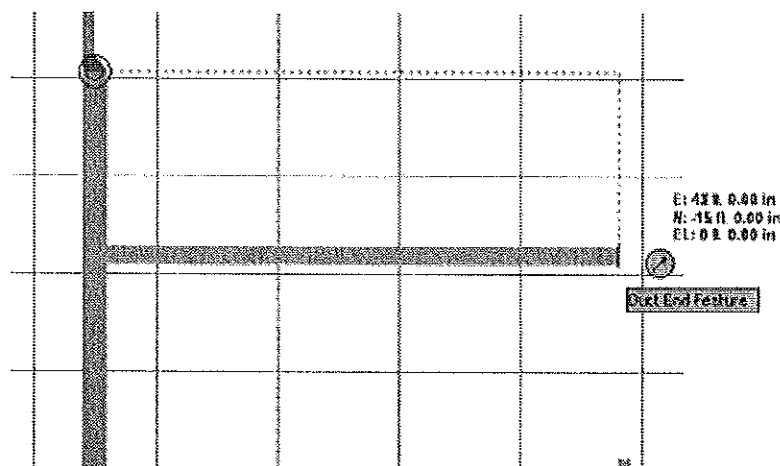


11 Route a 1' 6" X 1' 6" Branch as shown

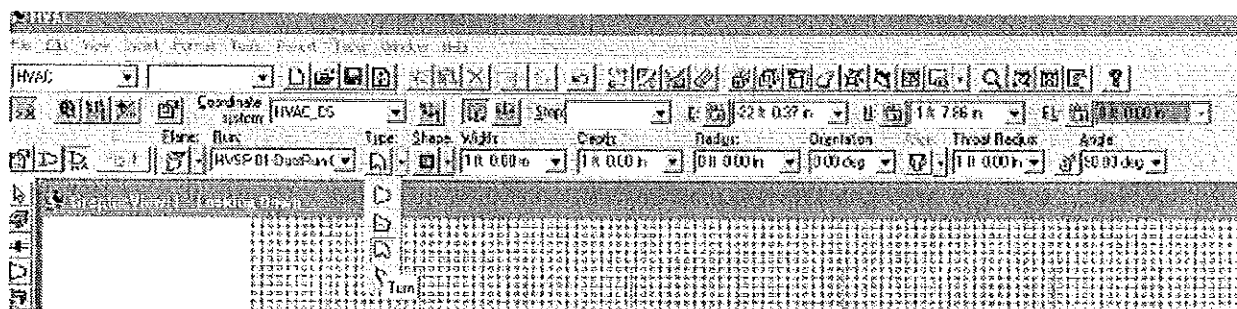


## LAB-7: Placing Reducing Elbows

- 1 Select Place Transition command
- 2 Select the End Feature of Branch duct placed in previous step



- 3 Change the type to turn



- 4 Change the width and depth to 1'
- 5 Change the Throat Radius to 1'
- 6 Change the angle to 90
- 7 Point the elbow in North direction and click in the middle of elbow
- 8 Finish to place the elbow
- 9 Route 20' from elbow as shown



