



convention

# BIM for Engineering

Session ID

Wednesday; May 2,2007; 1:30-3:00

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# Acknowledgements/Credits

- Autodesk
- BIMform.org
- International Alliance for Interoperability



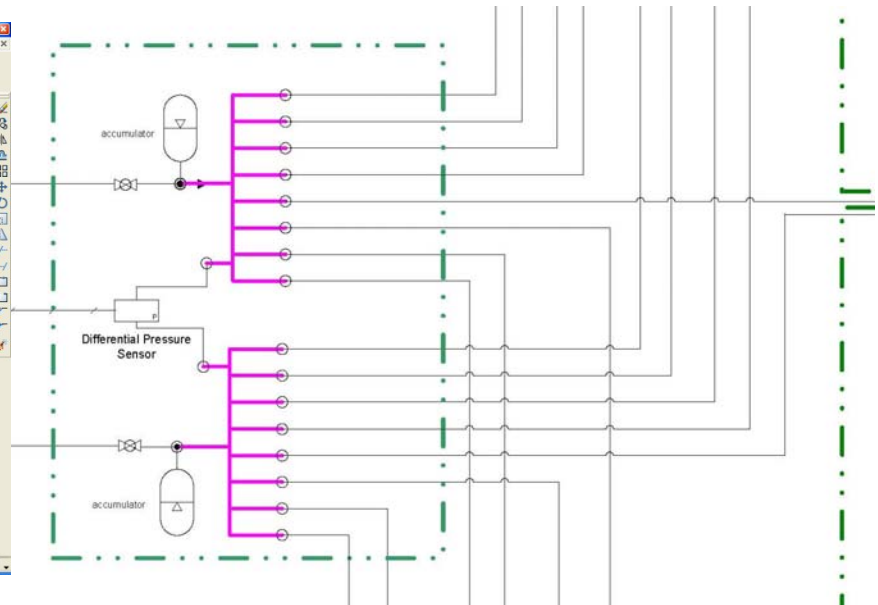
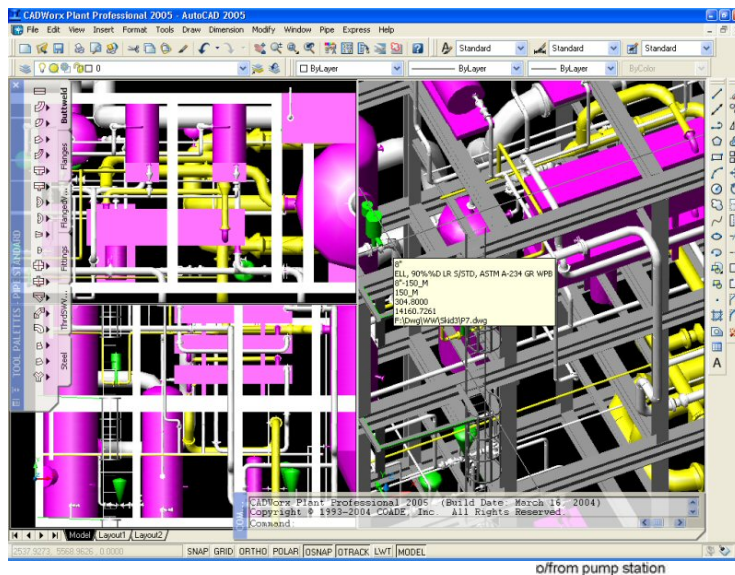
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# Learning Objectives

1. Difference between 2 dimensional drafting and BIM as related to MEP/FP
2. Benefits of BIM's interactive and dynamic coordination
3. Benefits to Architect when MEP consultants use BIM
4. Benefits to Owners when MEP consultants use BIM



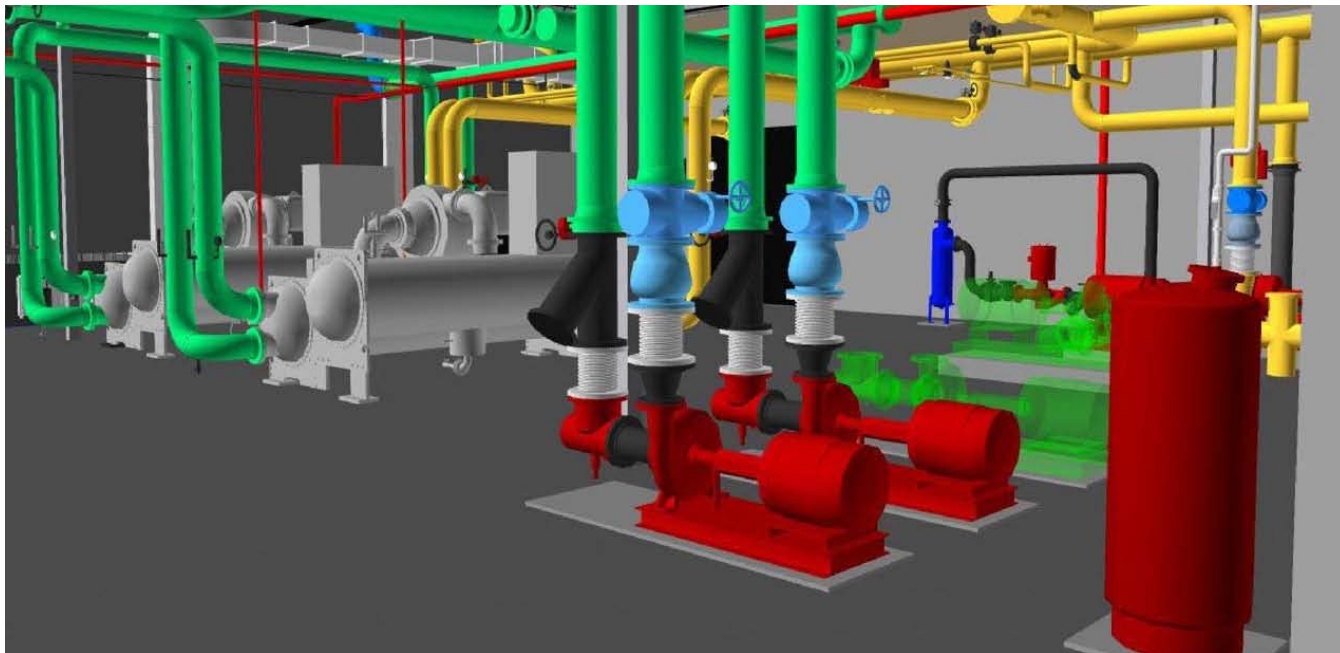
# 2D Drafting

- Electronic Drafting Board
- Depict MEP systems with graphic symbols
- Static MEP Production Methods
  - Separate programs for load calculations, energy analysis, lighting calculations etc.
  - Manual input for equipment schedules
- Other Static Programs
  - Separate Cost Estimating Programs
  - Separate Facilities Management Programs



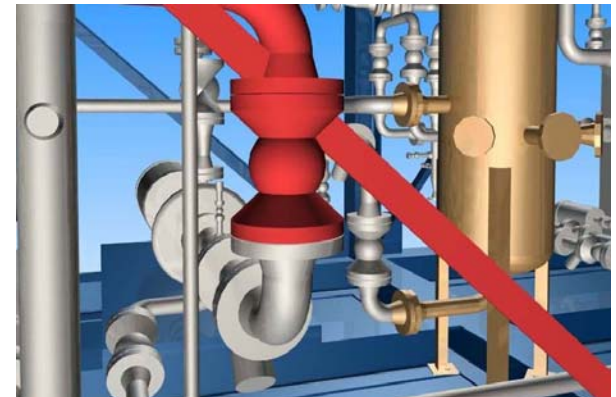
# 3D Drafting

- Added another dimension to 2D drafting
- Remained a Static MEP production method
- Some interference checking with add on programs



# Building Information Modeling (BIM)

- Digital Building Model
- 3D Graphical Objects
- Graphical objects contain design criteria
- Design Criteria allows dynamic & interactive data exchange (Interoperability)
- Dynamic & Interactive MEP Production Methods
  - Interactive programs for load calculations, energy analysis, lighting calculations etc.
  - Automatic input for equipment schedules
- Other Interactive Programs
  - Cost Estimating
  - Facilities Management



# Benefit of BIM's Interoperability

- 7D Modeling Concept
  - 3<sup>rd</sup> Dimension: Space Model
  - 4<sup>th</sup> Dimension: Time
  - 5<sup>th</sup> Dimension: Cost
  - 6<sup>th</sup> Dimension: Procurement
  - 7<sup>th</sup> Dimension: Operations
- 3D Model improves Coordination, Quality of design, Transfer of information
- 4<sup>th</sup> D saves time by improving Design and Construction Process
- 5<sup>th</sup> D saves Money
- 6<sup>th</sup> D Improves Procurement Processes (future)
- 7<sup>th</sup> D Improves the Operational Life Cycle (future)

# Benefits to Architects

- Real Time analysis of Alternate Design Strategies
  - “What If” Scenarios, early in the project development
  - Dynamic data exchange analyzes effect on MEP systems
    - Equipment size
    - MEP Space requirements
    - Energy requirements - Sustainable Design (LEED)
- Improve Coordination
  - Dynamic interference checks
  - Interactive sharing of MEP systems data
    - Equipment sizes
    - Equipment weights
- Model provides intuitive feel for MEP space requirements in early design phases ( Improved Visualization)



# Benefits to Owner

- Optimize Building Lifecycle (Project Quality)
  - Design: Optimize Space, Equipment Size, Energy Consumption
  - Construction: Optimize Cost, Schedule
  - Facilities Management: Optimize building operation
- Central Repository of Building Information
  - Record Retention, Reduce Information loss
  - Facilities Management
- Optimize Construction Cost (Bottom Line Benefit)
  - Provide analysis of changes
  - Improve construction pricing
  - Reduce RFIs and Change Orders
  - Increase speed of Construction
  - Analyze Value Engineering Impacts



# Evaluation

## Speakers

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