

UNIT 1

INTRODUCTION TO BIM & REVIT MEP

Learn the fundamentals of Building Information Modeling (BIM) and get familiar with the Revit MEP interface, tools and workflow.



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UNIT OVERVIEW

This unit introduces the concept of BIM and provides an overview of Autodesk Revit MEP. You will explore the Revit interface, important tools, templates and essential features that will help you work efficiently in MEP projects.

YOU WILL LEARN

- Introduction to BIM
- Revit MEP Interface
- Project Browser
- Properties Palette
- Navigation Tools
- MEP Templates
- Keyboard Shortcuts



WHAT IS BIM?

BIM (Building Information Modeling) is a smart process of creating and managing digital representations of physical and functional characteristics of places.



WHY THIS UNIT IS IMPORTANT?

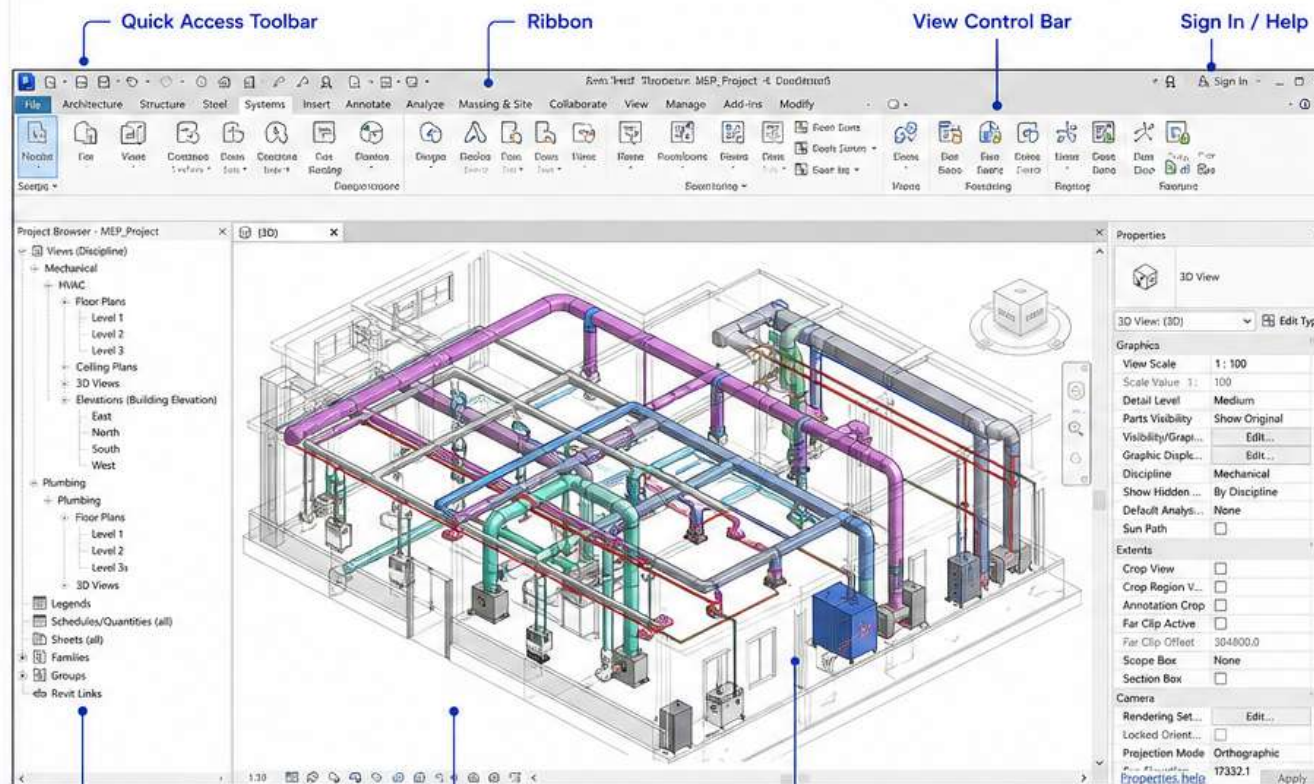
Understanding BIM and the Revit MEP interface is the first step towards efficient modeling, coordination and management of MEP projects.



OUTCOMES

- Understand BIM concepts and workflow.
- Familiarize with the Revit MEP interface.
- Navigate, organize and manage projects effectively.
- Use templates and shortcuts for productivity.

REVIT MEP INTERFACE OVERVIEW



Project Browser
Organize and access all project views, schedules, families and sheets.

Drawing Area
Create and edit MEP model in 2D and 3D views.

View Control Bar
Navigate, zoom, pan and control the views.

Properties Palette
View and edit properties of selected elements and views.

KEY TOPICS



1. INTRODUCTION TO BIM

- What is BIM?
- BIM Dimensions (3D, 4D, 5D, 6D, 7D)
- Benefits of BIM in MEP



2. REVIT MEP INTERFACE

- User Interface Overview
- Ribbon Tabs (Systems, Insert, Annotate, Analyze, etc.)
- View Control Bar
- Contextual Tabs



3. PROJECT BROWSER

- Views (Discipline)
- Schedules / Quantities
- Sheets
- Families
- Revit Links



4. PROPERTIES PALETTE

- Element Properties
- Type Properties
- Instance Properties
- Parameter Overview



5. NAVIGATION TOOLS

- Zoom, Pan, Orbit
- SteeringWheel
- ViewCube
- Section Box



6. MEP TEMPLATES

- Mechanical Template
- Plumbing Template
- Electrical Template
- Project Setup



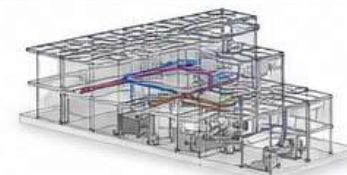
7. KEYBOARD SHORTCUTS

- Common Revit Shortcuts
- Productivity Tips
- Custom Shortcuts

NEXT UNIT >>

Unit 2: Project Setup

Learn how to set up a new MEP project, define units, levels, grids and link architectural and structural models.



UNIT 2

PROJECT SETUP

Learn how to set up a new Revit MEP project with proper units, levels, grids and linked models for efficient workflow.

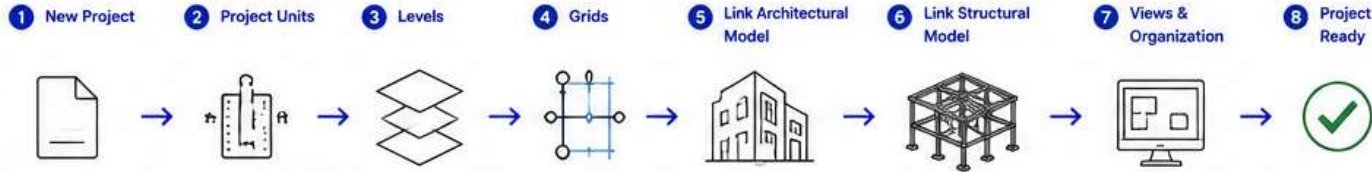
UNIT OVERVIEW

In this unit, you will learn to set up a Revit MEP project from scratch. You will define project units, create levels and grids, link architectural and structural models, and organize views for a well-structured model.

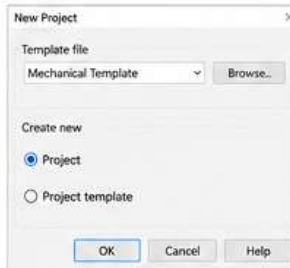
YOU WILL LEARN

- ✓ New MEP Project
- ✓ Project Units
- ✓ Levels
- ✓ Grids
- ✓ Linked Architectural Model
- ✓ Linked Structural Model
- ✓ Views
- ✓ Project Organization

REVIT MEP PROJECT SETUP WORKFLOW

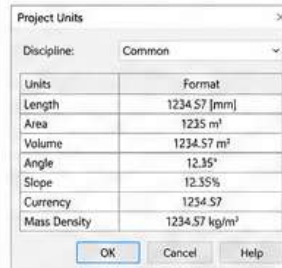


1. NEW MEP PROJECT



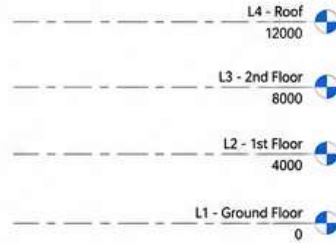
Start a new project using the Mechanical Template.

2. PROJECT UNITS



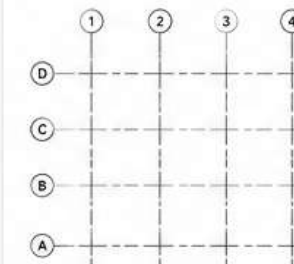
Set up project units and formats as per project requirements.

3. LEVELS



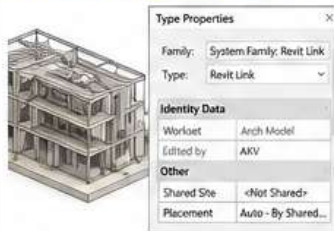
Create levels and set correct elevations for all floors.

4. GRIDS



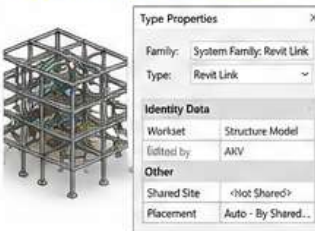
Create grids for accurate modeling and coordination.

5. LINK ARCHITECTURAL MODEL



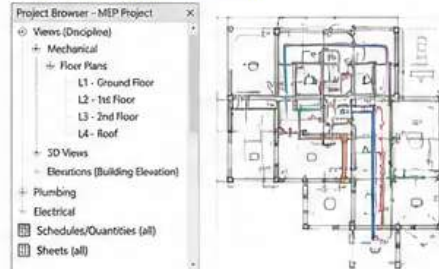
Link the architectural model to ensure coordination and reference.

6. LINK STRUCTURAL MODEL



Link the structural model for levels, grids and structural reference.

7. VIEWS & ORGANIZATION



Create and organize views, set up view templates and visibility.

8. PROJECT READY



Your MEP project is now successfully set up and ready for modeling and coordination.

KEY TOPICS COVERED

- NEW MEP PROJECT**
- Mechanical Template
 - Project Information

- PROJECT UNITS**
- Units Setup
 - Format Settings

- LEVELS**
- Create Levels
 - Elevation Settings

- GRIDS**
- Create Grids
 - Grid Naming & Spacing

- LINK ARCHITECTURAL MODEL**
- Link CAD / RVT
 - Positioning & Scaling
 - Manage Links

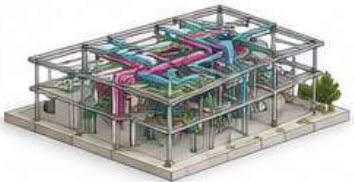
- LINK STRUCTURAL MODEL**
- Link Model
 - Positioning & Scaling
 - Manage Links

- VIEWS**
- Floor Plans
 - 3D Views
 - Elevations
 - View Templates

- PROJECT ORGANIZATION**
- Project Browser
 - View Organization
 - Worksets (Basics)

WHY PROJECT SETUP IS IMPORTANT?

A well-structured project setup ensures accuracy, coordination, and saves time in the long run. Proper levels, grids and linked models are the foundation of every successful MEP project.



TIPS

- Always start with the correct template.
- Verify units before modeling.
- Keep levels and grids aligned with architectural and structural models.



BEST PRACTICES

- Use consistent units across all linked models.
- Lock levels and grids to avoid accidental changes.
- Name levels, grids and views properly.
- Organize views and sheets from the beginning.



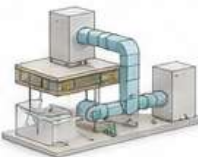
LEARNING OUTCOMES

- Understand the importance of project setup in BIM.
- ✓ Set up a new Revit MEP project correctly.
- ✓ Create levels, grids and link models efficiently.
- ✓ Organize views for smooth modeling workflow.

NEXT UNIT >>

Unit 3: HVAC Systems

Learn to create HVAC systems including air terminals, ducts, fittings, mechanical equipment and system settings.



UNIT 3

HVAC SYSTEMS

Learn how to design and model Heating, Ventilation and Air Conditioning systems in Autodesk Revit MEP.

UNIT OVERVIEW

In this unit, you will learn how to model HVAC systems including air terminals, ducts, duct fittings, mechanical equipment and accessories.

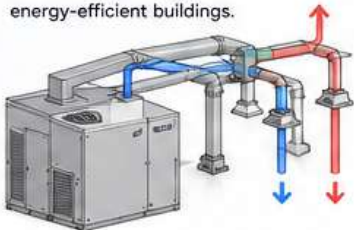
You will also learn to create HVAC systems, apply system settings and ensure proper airflow.

YOU WILL LEARN

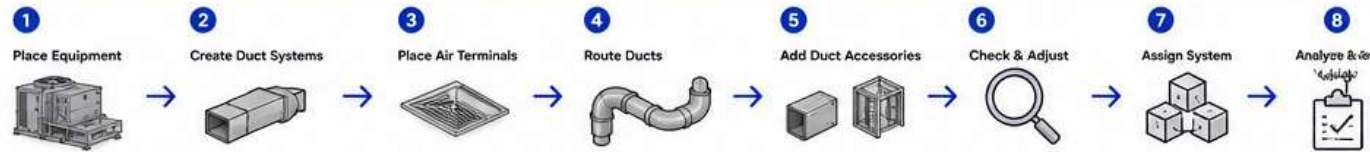
- ✓ Air Terminals
- ✓ Ducts
- ✓ Duct Fittings
- ✓ Mechanical Equipment
- ✓ Duct Accessories
- ✓ Flex Duct
- ✓ HVAC System Creation

WHY HVAC SYSTEMS ARE IMPORTANT?

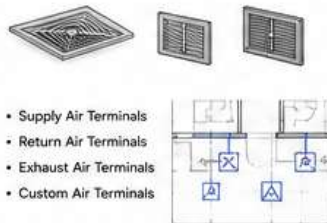
HVAC systems provide comfort by controlling temperature, humidity and air quality. Accurate modeling in Revit ensures efficient design, clash-free coordination and energy-efficient buildings.



HVAC MODELING WORKFLOW

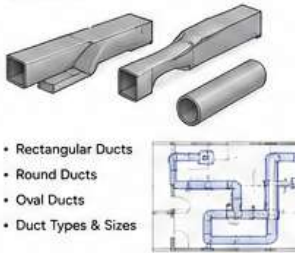


1. AIR TERMINALS



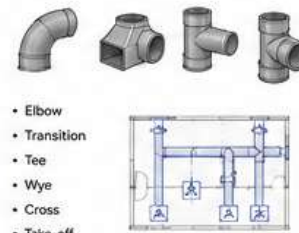
- Supply Air Terminals
- Return Air Terminals
- Exhaust Air Terminals
- Custom Air Terminals

2. DUCTS



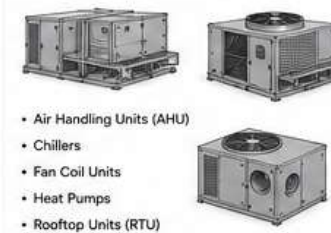
- Rectangular Ducts
- Round Ducts
- Oval Ducts
- Duct Types & Sizes

3. DUCT FITTINGS



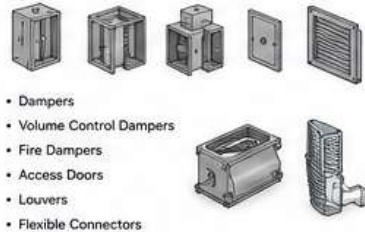
- Elbow
- Transition
- Tee
- Wye
- Cross
- Take-off

4. MECHANICAL EQUIPMENT



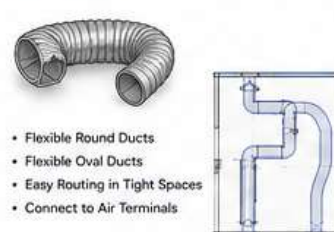
- Air Handling Units (AHU)
- Chillers
- Fan Coil Units
- Heat Pumps
- Rooftop Units (RTU)

5. DUCT ACCESSORIES



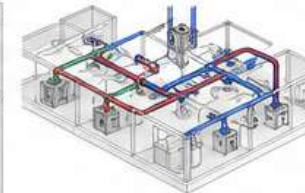
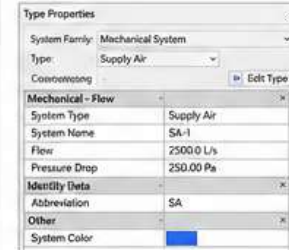
- Dampers
- Volume Control Dampers
- Fire Dampers
- Access Doors
- Louvers
- Flexible Connectors

6. FLEX DUCT



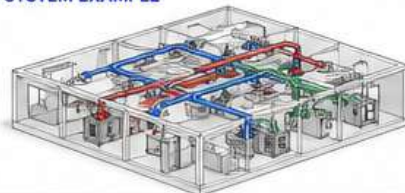
- Flexible Round Ducts
- Flexible Oval Ducts
- Easy Routing in Tight Spaces
- Connect to Air Terminals

7. HVAC SYSTEM CREATION



TYPICAL HVAC SYSTEM EXAMPLE

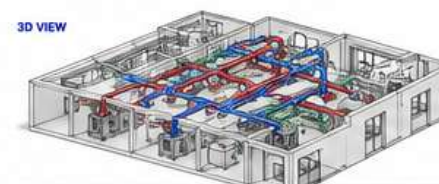
- SUPPLY AIR
- RETURN AIR
- EXHAUST AIR



PLAN VIEW



3D VIEW



KEY TOPICS COVERED

1. AIR TERMINALS

- Supply Air Terminals
- Return Air Terminals
- Placement & Settings



2. DUCTS

- Duct Types & Sizes
- Duct Properties
- Duct Routing



3. DUCT FITTINGS

- Fittings Types
- Connections
- Flow Direction



4. MECHANICAL EQUIPMENT

- Equipment Placement
- Connections
- Specifications



5. DUCT ACCESSORIES

- Dampers & Louvers
- Access Doors
- Fire Safety



6. FLEX DUCT

- Flexible Duct Types
- Routing Techniques
- Connections



7. HVAC SYSTEM CREATION

- System Types
- System Properties
- Flow Settings



TIPS

- Use correct system settings.
- Keep duct sizes consistent.
- Check system flow and pressure.
- Use filters and accessories properly.



BEST PRACTICES

- Follow standard duct routing.
- Minimize pressure losses.
- Maintain proper clearances.
- Use system colors for clarity.



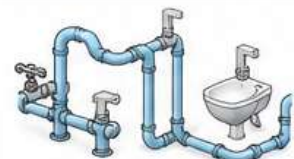
LEARNING OUTCOMES

- Design complete HVAC systems in Revit MEP.
- ✓ Apply correct components and system settings.
- ✓ Route ducts efficiently and accurately.
- ✓ Create coordinated and efficient HVAC models.

NEXT UNIT >>

Unit 4: Plumbing Systems

Learn to model plumbing systems including pipes, fixtures, fittings and sanitary networks.



UNIT 4

PLUMBING SYSTEMS

Learn how to design and model complete plumbing systems including water supply, sanitary, drainage and pipe networks in Revit MEP.

UNIT OVERVIEW

In this unit, you will learn how to model plumbing systems including fixtures, pipes, fittings and accessories. You will create water supply, sanitary and drainage systems and apply proper settings for accurate documentation.

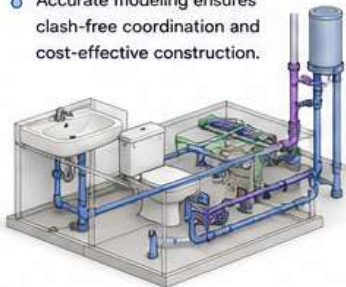
YOU WILL LEARN

- ✓ Plumbing Fixtures
- ✓ Pipes
- ✓ Pipe Fittings
- ✓ Pipe Accessories
- ✓ Sanitary Systems
- ✓ Domestic Water Systems
- ✓ Drainage Systems

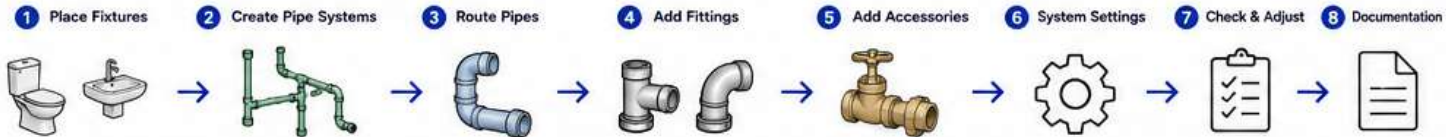


WHY PLUMBING DESIGN IS IMPORTANT?

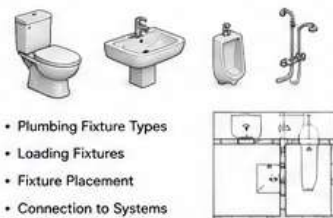
- Ensures proper water supply, waste disposal and hygiene.
- Prevents leaks, blockages and water contamination.
- Accurate modeling ensures clash-free coordination and cost-effective construction.



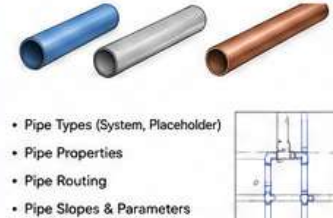
PLUMBING MODELING WORKFLOW



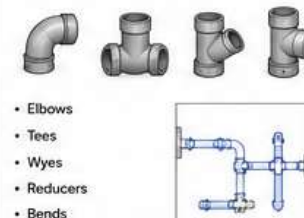
1. PLUMBING FIXTURES



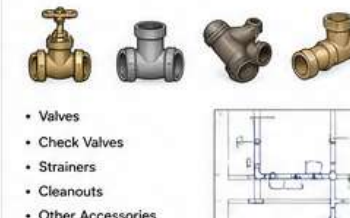
2. PIPES



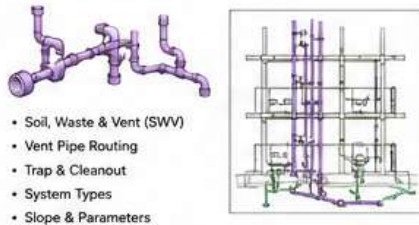
3. PIPE FITTINGS



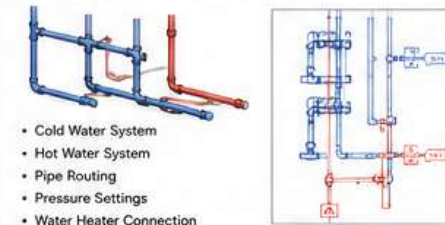
4. PIPE ACCESSORIES



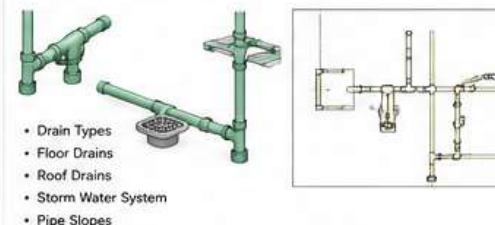
5. SANITARY SYSTEMS



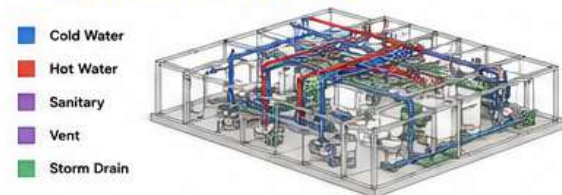
6. DOMESTIC WATER SYSTEMS



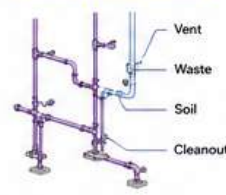
7. DRAINAGE SYSTEMS



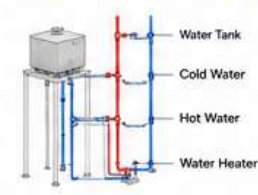
TYPICAL PLUMBING SYSTEM EXAMPLE



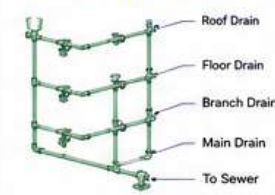
SANITARY RISER DIAGRAM



WATER SUPPLY RISER DIAGRAM



DRAINAGE SYSTEM DIAGRAM



KEY TOPICS COVERED

- #### 1. PLUMBING FIXTURES
- Fixture Types
 - Placement
 - Connection

- #### 2. PIPES
- Pipe Types
 - Properties
 - Routing

- #### 3. PIPE FITTINGS
- Fitting Types
 - Connections
 - Flow Direction

- #### 4. PIPE ACCESSORIES
- Valves
 - Strainers
 - Cleanouts

- #### 5. SANITARY SYSTEMS
- SWV Systems
 - Venting
 - Traps & Cleanouts

- #### 6. DOMESTIC WATER SYSTEMS
- Cold & Hot Water
 - Pipe Routing
 - Pressure Settings

- #### 7. DRAINAGE SYSTEMS
- Drain Types
 - Slope
 - Storm Water



TIPS

- Use correct system types.
- Maintain proper pipe slopes.
- Place cleanouts at required locations.
- Check flow, pressure and connectivity.
- Use filters for better visibility.



BEST PRACTICES

- Follow standard plumbing codes.
- Keep pipe routing simple and efficient.
- Avoid sharp bends and unnecessary fittings.
- Coordinate with all disciplines.
- Review system settings before documentation.

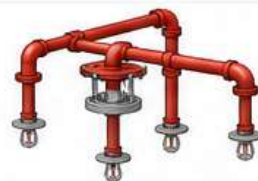


LEARNING OUTCOMES

- ✓ Create complete plumbing systems in Revit MEP.
- ✓ Model sanitary, water supply and drainage networks.
- ✓ Apply correct system settings and parameters.
- ✓ Produce accurate plumbing drawings and schedules.

NEXT UNIT >>

Unit 5: Fire Protection Systems
Learn to model fire protection systems including sprinklers, fire pipes and related components.



UNIT 5

FIRE PROTECTION SYSTEMS

Learn how to design and model Fire Protection systems including sprinklers, fire pipes and related components in Revit MEP.



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UNIT OVERVIEW

In this unit, you will learn to model complete fire protection systems including sprinklers, fire piping networks, pumps and accessories. You will apply system settings, proper routing techniques and create documentation.

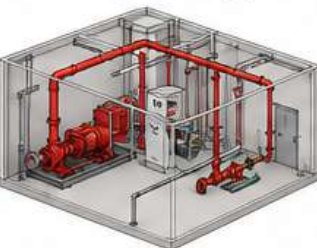
YOU WILL LEARN

- ✓ Sprinklers
- ✓ Fire Pipes
- ✓ Pipe Routing
- ✓ Fire Pump Basics
- ✓ Pipe Fittings
- ✓ Fire Protection Layout
- ✓ System Documentation

WHY FIRE PROTECTION SYSTEMS ARE IMPORTANT?



Fire protection systems save lives and property by detecting and controlling fire in the early stage. Accurate design and coordination ensure safety, code compliance and effective building operations.



TIPS

- Follow NFPA / local fire codes.
- Maintain proper pipe slopes and clearances.
- Keep sprinkler spacing accurate.
- Coordinate with Arch, Structural & MEP.
- Verify system calculations.



BEST PRACTICES

- Plan early and coordinate.
- Use correct system settings.
- Avoid unnecessary fittings.
- Maintain proper pipe support.
- Document everything clearly.



LEARNING OUTCOMES

- ✓ Model complete fire protection systems in Revit MEP.
- ✓ Apply correct components and system settings.
- ✓ Route pipes efficiently with proper slopes.
- ✓ Prepare accurate drawings, risers and schedules.
- ✓ Ensure code compliance and coordination.

NEXT UNIT >>

Unit 6: Electrical Systems

Learn to model electrical systems including lighting, power, cable trays, conduits, panels and circuits.



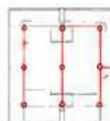
FIRE PROTECTION MODELING WORKFLOW



1. SPRINKLERS



- Sprinkler Types
- Placement & Spacing
- Heights & Offsets
- Sprinkler Parameters



2. FIRE PIPES



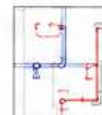
- Pipe Types
- Pipe Properties
- System Classification
- Pipe Sizing



3. PIPE ROUTING



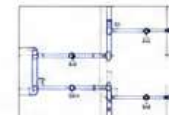
- Horizontal & Vertical Routing
- Proper Slopes
- Clearances
- Coordination with MEP



4. PIPE FITTINGS



- Elbows
- Tees
- Reducers
- Crosses
- Flanges
- Grooved Fittings

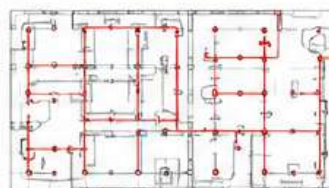


5. FIRE PUMP BASICS



- Fire Pump Types
- Pump Components
- Suction & Discharge
- Controller & Jockey Pump
- Placement & Connections

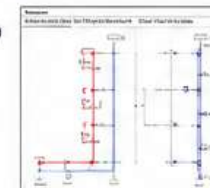
6. FIRE PROTECTION LAYOUT



- Zone Layout
- Riser Diagram
- Pipe Network
- Equipment Layout
- Coordination
- Code Compliance

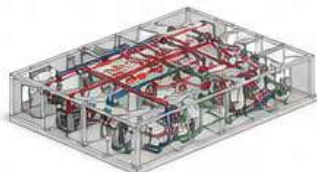
7. SYSTEM DOCUMENTATION

- Plans (Floor, RCP, Sections)
- Riser Diagrams
- Schedules
- Legends & Annotations
- Tags
- Sheet Creation

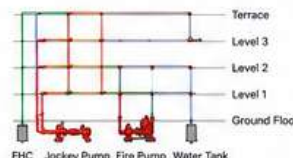


TYPICAL FIRE PROTECTION SYSTEM EXAMPLE

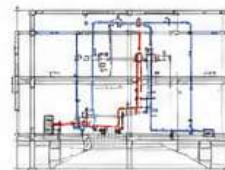
- Fire Main
- Branch Line
- Sprinkler Line
- Return / Test Line
- Drain Line



RISER DIAGRAM (EXAMPLE)



SECTION VIEW



SPRINKLER LAYOUT (RCP)



UNIT 6

ELECTRICAL SYSTEMS

Learn how to model electrical systems including power, lighting, cable trays, conduits, panels and circuits in Autodesk Revit MEP.



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UNIT OVERVIEW

In this unit, you will learn how to model electrical systems including lighting, power distribution, cable trays, conduits, devices, panels and circuits. You will apply system settings, load calculations and document the electrical design.

YOU WILL LEARN

- ✓ Electrical Fixtures
- ✓ Lighting Fixtures
- ✓ Power Devices
- ✓ Cable Trays
- ✓ Conduits
- ✓ Electrical Panels
- ✓ Circuit Creation
- ✓ System Settings
- ✓ Load Calculation Basics
- ✓ Electrical Documentation

WHY ELECTRICAL SYSTEMS ARE IMPORTANT?

Well-designed electrical systems ensure safety, reliability and efficiency of power distribution and lighting in a building. Accurate modeling helps in load management, coordination and cost estimation.

ELECTRICAL MODELING WORKFLOW



1. ELECTRICAL FIXTURES



- Device Types (Switches, Sockets)
- Floor Boxes
- Junction Boxes
- Connection and Placement

2. LIGHTING FIXTURES



- Lighting Types
- Photometric (IES) Files
- Placement & Alignment
- Light Distribution Basics

3. POWER DEVICES



- Power Outlets
- Switches & Isolators
- Transformers
- UPS & Generators

4. CABLE TRAYS



- Tray Types (Ladder, Perforated, Wire Mesh)
- Tray Fittings
- Routing Techniques
- Support & Spacing

5. CONDUITS



- Conduit Types (RMC, PVC, EMT)
- Conduit Fittings
- Routing & Connections
- Conduit Fill Calculation

6. ELECTRICAL PANELS



- Panel Types
- Panel Placement
- Panel Parameters
- Feeder Connections

7. CIRCUIT CREATION

Circuit Number	Circuit Name	Load (VA)	Phase
L1-1	Lighting 1	1200	1
L1-2	Lighting 2	900	1
P1-1	Power 1	1800	1
P1-2	Power 2	1500	1

- Create Circuits
- Add Loads to Circuits
- Balance Load
- Circuit Naming & Numbering

8. SYSTEM SETTINGS

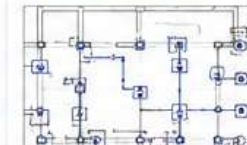
- Voltage & Phase
- Wiring Types
- Number of Poles
- Demand Factor
- Circuit Naming

9. LOAD CALCULATION BASICS

Load Type	Connected Load (VA)	Demand Factor	Demand Load (VA)
Lighting	5000	1.00	5000
Power	8000	0.80	6400
HVAC	6000	1.00	6000
Others	2000	1.00	2000
Total	21000		19400

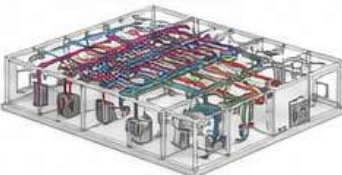
- Connected Load
- Demand Factor
- Total Demand Load
- Panel Load Summary

10. DOCUMENTATION

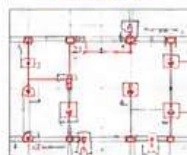


- Plans, Sections, Elevations
- Annotations & Tags
- Legends
- Schedules & Quantities

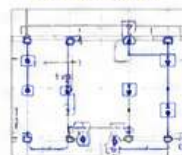
TYPICAL ELECTRICAL SYSTEM EXAMPLE



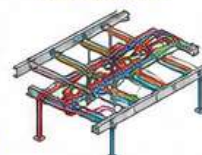
POWER LAYOUT



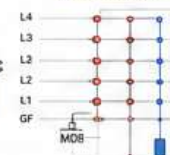
LIGHTING LAYOUT



CABLE TRAY LAYOUT



RISER DIAGRAM



PANEL SCHEDULE (EXAMPLE)

Panel	Voltage (V)	Phase	MCCB (A)	No. of Wires
MDR	415	3Ph	630	42
DB-1	415	3Ph	160	24
DB-2	415	3Ph	125	18
DB-3	415	1Ph	63	12



TIPS

- Follow standard codes (NEC/IE/AS).
- Keep circuit loads within panel ratings.
- Use consistent naming & numbering.
- Coordinate with other MEP disciplines.
- Regularly check system warnings.



BEST PRACTICES

- Plan before routing.
- Maintain proper clearances.
- Use correct cable tray elevations.
- Balance loads across phases.
- Validate model before documentation.

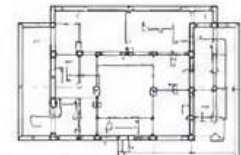


LEARNING OUTCOMES

- ✓ Create and manage electrical systems efficiently in Revit MEP.
- ✓ Model lighting, power, cable trays, conduits and panels.
- ✓ Create circuits and perform basic load calculations.
- ✓ Produce coordinated drawings, schedules and documentation.

NEXT UNIT >>

Unit 7: Documentation & Schedules
Learn to create drawings, annotations, schedules, sheet setup and quantity take-off in Revit MEP.



KEY TOPICS COVERED



1. ELECTRICAL FIXTURES

- Device Types
- Placement & Connection



2. LIGHTING FIXTURES

- Lighting Types
- IES Files & Placement



3. POWER DEVICES

- Outlets, Switches, Isolators
- Transformers, UPS



4. CABLE TRAYS

- Tray Types
- Routing & Supports



5. CONDUITS

- Conduit Types
- Routing & Fittings



6. ELECTRICAL PANELS

- Panel Types
- Parameters & Placement



7. CIRCUIT CREATION

- Create & Manage Circuits
- Load Assignment



8. SYSTEM SETTINGS

- Electrical Settings
- Voltage, Phase, Poles



9. LOAD CALCULATION BASICS

- Connected & Demand Load
- Load Summary



10. DOCUMENTATION

- Plans & Schedules
- Legends & Tags

UNIT 7

DOCUMENTATION & SCHEDULES

Learn how to create professional MEP documentation, annotations, tags, schedules, and quantity take-offs in Revit MEP.



TRAINING

UNIT OVERVIEW

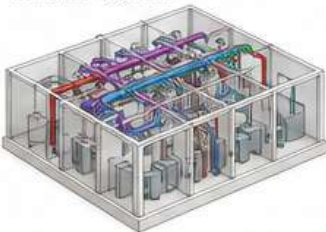
In this unit, you will learn how to create construction documentation for MEP systems including plans, sections, elevations, annotations, tags, schedules, and quantity take-offs. You will also learn how to create sheets and organize project drawings.

YOU WILL LEARN

- Plans
- Sections
- Elevations
- Annotations
- Tags
- Schedules
- Quantity Take-Off
- Sheet Creation

WHY DOCUMENTATION IS IMPORTANT?

Proper documentation communicates design intent clearly, reduces errors on site, ensures coordination among trades and is essential for construction, approvals and facility management.



TIPS

- Use View Templates for consistency.
- Keep annotations clean and readable.
- Use correct scales for each view.
- Check views and tags before issuing.
- Export schedules for coordination.



BEST PRACTICES

- Follow company standards.
- Organize sheets logically.
- Use clear naming conventions.
- Coordinate with all disciplines.
- Issue updated drawings regularly.



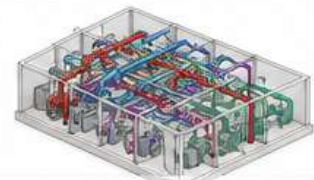
LEARNING OUTCOMES

- Create accurate and coordinated MEP documentation.
- Annotate, tag and schedule MEP elements efficiently.
- Generate quantity take-offs for estimation.
- Prepare sheets for construction and approvals.

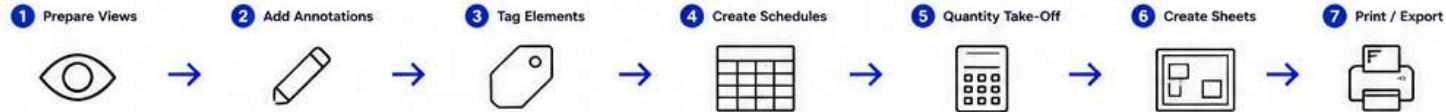
NEXT UNIT >>

Unit 8: MEP Coordination

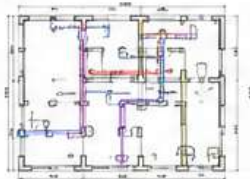
Learn how to coordinate MEP models, detect clashes, use worksharing, copy monitor and collaborate effectively.



DOCUMENTATION WORKFLOW

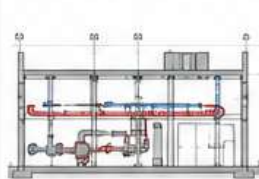


1. PLANS



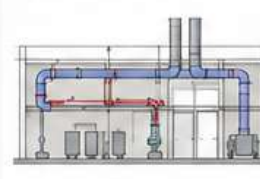
- Floor Plans (HVAC, Plumbing, Electrical)
- Ceiling Plans
- Working Plane & View Range
- View Templates

2. SECTIONS



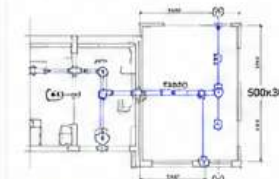
- Building Sections
- Section Box
- Crop Region
- Coordination in Sections

3. ELEVATIONS



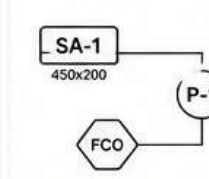
- Elevation Views
- Interior Elevations
- Height & Level Control
- MEP Coordination

4. ANNOTATIONS



- Dimensions
- Text & Notes
- Detail Lines
- Symbols & Legends

5. TAGS



- Tag by Category
- Tag All
- Material Tags
- Multi-Category Tags

6. SCHEDULES

<Duct Schedule>				
A	B	C	D	E
System	Type	Size	Length	Flow (L/s)
Supply Air	Rectangular	500x250	12.5 m	850
Supply Air	Rectangular	400x200	8.3 m	550
Return Air	Rectangular	450x200	10.2 m	620
Exhaust Air	Rectangular	350x200	9.1 m	430

- Duct Schedules
- Pipe Schedules
- Electrical Schedules
- Fixture Schedules
- Material Schedules
- Custom Schedules

7. QUANTITY TAKE-OFF

<Pipe Fitting Schedule>				
Family	Type	Size	Count	Length (m)
Elbow 90°		25 mm	18	12.6
Elbow 90°		32 mm	24	18.4
Tee		25 mm	10	—
Tee		32 mm	12	—
Union		25 mm	6	—

- Material Take-Off
- Quantity by Category
- Length, Area & Volume
- Parts Count
- Filter & Sorting
- Export to Excel

8. SHEET CREATION



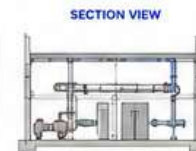
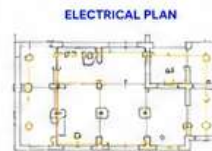
- Create New Sheets
- View Placement
- Title Block & Sheet Setup
- Sheet Organization
- View Alignment
- Revisions & Issue

9. TITLE BLOCK & PROJECT INFO



- Title Block Types
- Project Information
- Sheet Numbering
- Revision Management

TYPICAL DOCUMENTATION EXAMPLES



Type	Mark	Description	Watt	Count
L1		LED Panel Light	18 W	24
L2		LED Downlight	12 W	36
E1		Exhaust Fan	40 W	6
P1		Power Point	—	28



UNIT 8

MEP COORDINATION

Learn how to coordinate MEP models with architectural and structural models, detect clashes, use worksharing and collaborate effectively in Revit MEP.

UNIT OVERVIEW

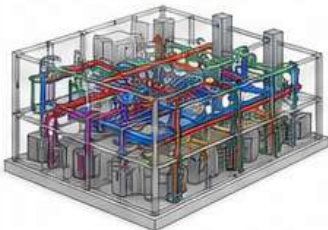
In this unit, you will learn how to coordinate MEP models with other discipline models, detect and resolve clashes, use Copy/Monitor, Worksharing and collaboration tools to ensure a coordinated and clash-free BIM model.

YOU WILL LEARN

- ✓ Linked Models
- ✓ Clash Detection
- ✓ Interference Check
- ✓ Copy / Monitor
- ✓ Worksharing
- ✓ Coordination Views
- ✓ BIM Collaboration

WHY MEP COORDINATION IS IMPORTANT?

Coordination reduces clashes, rework and delays on site. It improves constructability, accuracy and collaboration across all disciplines, ensuring smooth project delivery.



TIPS

- Always coordinate regularly.
- Use correct Worksets & Filters.
- Keep models updated.
- Communicate and resolve clashes early.
- Document every coordination step.



BEST PRACTICES

- Follow BIM Execution Plan (BEP).
- Use standard naming conventions.
- Maintain model accuracy.
- Review and close clashes systematically.
- Collaborate across disciplines.



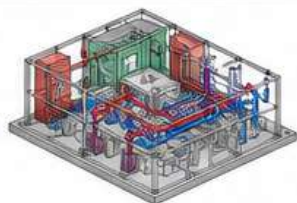
LEARNING OUTCOMES

- ✓ Coordinate MEP models with other disciplines.
- ✓ Detect, review and resolve clashes effectively.
- ✓ Use Copy/Monitor, Worksharing and coordination tools.
- ✓ Create coordination views for project communication.
- ✓ Collaborate and manage BIM workflows efficiently.

NEXT UNIT >>

Unit 9: Residential Building MEP Project

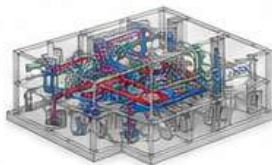
Apply your skills to a complete residential project including HVAC, Plumbing, Electrical and Fire Protection systems.



MEP COORDINATION WORKFLOW

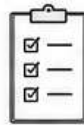


1. LINKED MODELS



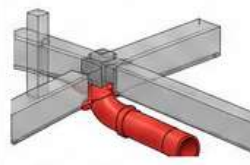
- Link Architectural Model
- Link Structural Model
- Manage Links
- Reload Latest
- Link Display Settings

2. MODEL CHECK SETUP



- Project Base Point
- Shared Coordinates
- Levels & Grids
- Units & Origin
- View Range
- Categories & Filters

3. CLASH DETECTION



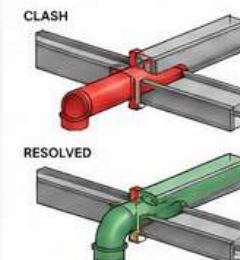
- Clash Types
- Hard Clash
- Soft Clash
- Clearance Clash
- Run Clash Detective
- Select Categories
- Set Tolerance

4. REVIEW CLASHES

Clash Detective							
Test 1							
Name	Status	Clashes	New	Active	Reviewed	Approved	Resolved
Test 1	Clash	56	56	0	0	0	0
Clashes							
Clash#	Status	Distance	Grid Location				
Clash1	New	-25 mm	Level 2 : HVAC Ducts				
Clash2	New	-18 mm	Level 2 : Cable Tray				
Clash3	New	-12 mm	Level 1 : Pipe				
Clash4	New	-8 mm	Level 1 : Duct Fitting				

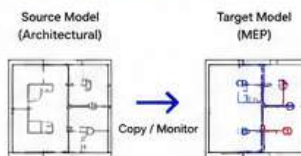
- Review Clash Results
- Isolate Clashes
- Add Comments
- Assign Status (New / Active / Reviewed)
- Export Clash Report

5. RESOLVE CLASHES



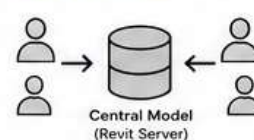
- Adjust Duct / Pipe / Tray Route
- Change Level / Offset
- Change Size or System
- Coordinate with Other Discipline
- Re-run Clash Test

6. COPY / MONITOR



- Copy Elements from Linked Model
- Monitor Changes Automatically
- Update Manually or Automatically
- Maintain Model Consistency

7. WORKSHARING



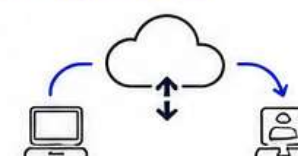
- Worksets
- Borrow Elements
- Synchronize with Central
- Manage Permissions
- Audit & Compact

8. COORDINATION VIEWS



- Create Coordination Views
- Section Boxes
- Filters & Visibility
- Temporary Hide / Isolate
- Save View for Sharing

9. BIM COLLABORATION



- Share Models
- Collaboration for Revit (C4R)
- BIM 360 / ACC Integration
- Issues Management
- Communication & Feedback

KEY TOPICS COVERED

- 1. LINKED MODELS**
 - Link Types
 - Manage Links
 - Visibility Control
- 2. CLASH DETECTION**
 - Clash Detective
 - Settings & Tolerance
 - Clash Results
- 3. INTERFERENCE CHECK**
 - Interference Report
 - Clearance Check
 - System Validation
- 4. COPY / MONITOR**
 - Copy Elements
 - Monitor Changes
 - Update Options
- 5. WORKSHARING**
 - Worksets
 - Synchronize
 - Permissions
- 6. COORDINATION VIEWS**
 - View Setup
 - Filters
 - Visibility
- 7. BIM COLLABORATION**
 - Model Sharing
 - Issues
 - Coordination

UNIT 9

RESIDENTIAL BUILDING MEP PROJECT

Apply Revit MEP skills to complete a residential building project including HVAC, Plumbing, Electrical, Lighting, Fire Protection and complete documentation.

UNIT OVERVIEW

In this unit, you will work on a complete Residential Building MEP Project from start to finish. You will model HVAC, Plumbing, Electrical, Lighting and Fire Protection systems and create schedules, quantities and full construction documentation.

YOU WILL LEARN

- ✓ HVAC System Modeling
- ✓ Plumbing System Modeling
- ✓ Electrical System Layout
- ✓ Lighting Design
- ✓ Fire Protection System
- ✓ Schedules & Quantities
- ✓ Documentation & Sheets
- ✓ Project Coordination

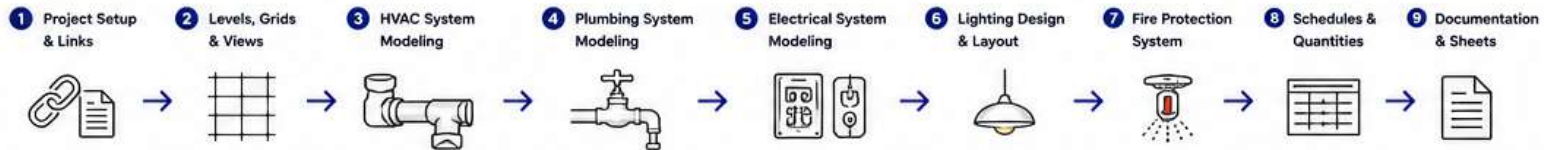
PROJECT OVERVIEW

Project Type : G+2 Residential Building
Plot Size : 30 ft x 40 ft
Built-up Area : ~2400 sq.ft
Levels : Ground + 2 Floors
Deliverables : Complete MEP Model with Documentation

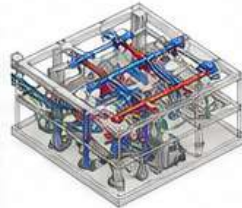
3D MEP MODEL OVERVIEW



MEP WORKFLOW FOR RESIDENTIAL PROJECT

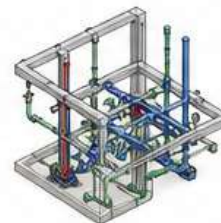
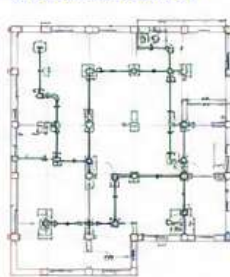


1. HVAC LAYOUT



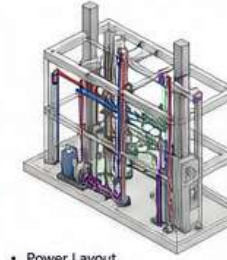
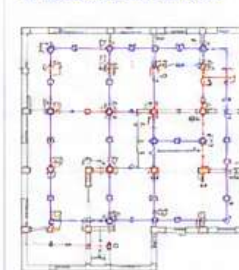
- Duct System
- Air Terminals
- Exhaust & Fresh Air
- Mechanical Equipment
- Duct Sizing
- HVAC Schedules

2. PLUMBING LAYOUT



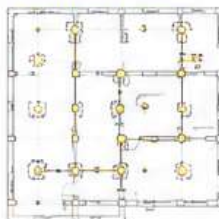
- Water Supply System
- Sanitary System
- Drainage System
- Rainwater System
- Pipe Sizing
- Plumbing Schedules

3. ELECTRICAL LAYOUT



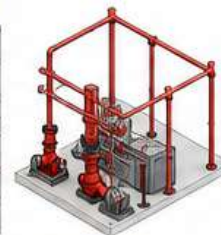
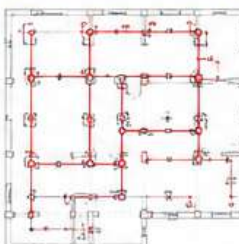
- Power Layout
- Cable Trays & Conduits
- DB & Panel Boards
- Circuiting & Load
- Electrical Schedules
- Load Calculation

4. LIGHTING LAYOUT



- Lighting Fixtures
- Switches & Controls
- Illumination Calculation
- Lighting Circuits
- Lighting Schedules

5. FIRE PROTECTION LAYOUT



- Sprinkler Layout
- Fire Pipe System
- Hydrant & Hose Reel
- Fire Pump
- Fire Schedules

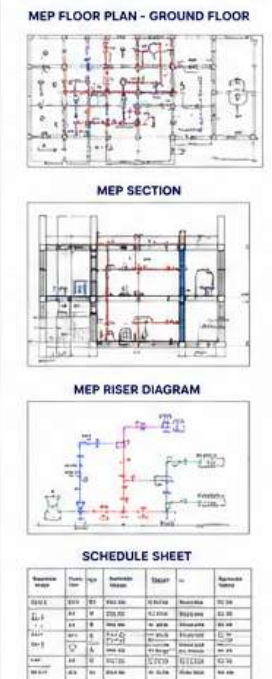
6. SCHEDULES & QUANTITIES

HVAC EQUIPMENT SCHEDULE			PLUMBING FIXTURE SCHEDULE		ELECTRICAL FIXTURE SCHEDULE	
Type Mark	Description	Qty	Fixture Type	Qty	Fixture Type	Qty
AHU-1	Air Handling Unit	1	Wash Basin	6	LED Light	24
FCU-1	Fan Coil Unit	6	Water Closet	6	Celling Fan	6
EF-1	Exhaust Fan	4	Shower	4	Exhaust Fan	4
SA-1	Supply Air Grill	12	Kitchen Sink	2	Switch	20
RA-1	Return Air Grill	8	Floor Drain	6	Socket Outlet	18

PROJECT DELIVERABLES

- ✓ Coordinated 3D MEP Model
- ✓ Floor Plans (HVAC, Plumbing, Electrical, Fire)
- ✓ Sections & Elevations
- ✓ Schedules & Quantities
- ✓ Legends & Annotations
- ✓ Sheet Set (PDF & DWG)

DOCUMENTATION SHEETS



TIPS

- Work with proper levels and views.
- Use system families for easy control.
- Maintain consistent naming.
- Regularly check system warnings.
- Coordinate all services before documentation.



BEST PRACTICES

- Follow BIM Execution Plan (BEP).
- Use templates and view filters.
- Keep model organized & clean.
- Check clashes before final output.
- Extract accurate quantities from model.



LEARNING OUTCOMES

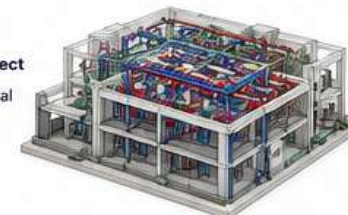
- ✓ Create complete MEP model for a residential building.
- ✓ Design and coordinate HVAC, Plumbing, Electrical, Lighting and Fire Protection systems.
- ✓ Generate accurate schedules, quantities and documentation.
- ✓ Prepare construction-ready drawings and sheets.

NEXT UNIT



Unit 10: Commercial Building MEP Project

Apply your skills to a complete commercial building project including coordination, analysis and advanced documentation.



UNIT 10

REVIEW, OPTIMIZATION & ADVANCED WORKFLOWS

Review and optimize MEP models for performance, accuracy and coordination.
Explore advanced Revit MEP workflows, automation and best practices.

UNIT OVERVIEW

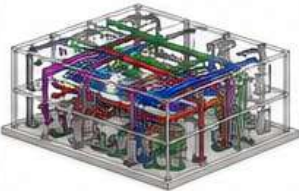
In this unit, you will learn how to review, analyze and optimize MEP models for quality and performance. You will explore advanced workflows, automation tools, Revit add-ins and best practices to deliver accurate, coordinated and efficient MEP projects.

YOU WILL LEARN

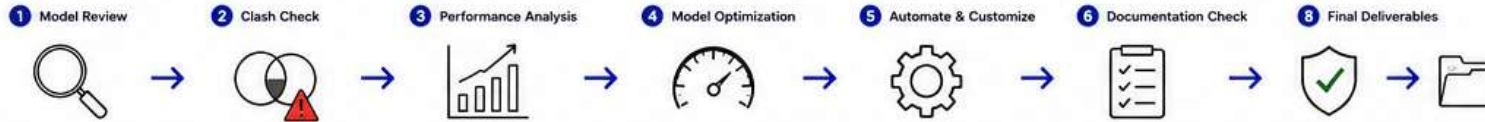
- Model Review Techniques
- Clash Resolution & Coordination
- Energy & System Analysis
- Model Optimization
- Automation & Add-ins
- Advanced Workflows
- Documentation Check
- Quality Assurance
- Final Project Delivery

WHY OPTIMIZATION IS IMPORTANT?

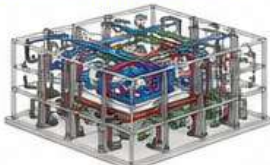
Optimized MEP models ensure better performance, reduced construction issues, cost savings and efficient facility operation. A well-coordinated and optimized model improves project quality and client satisfaction.



MEP OPTIMIZATION & ADVANCED WORKFLOW



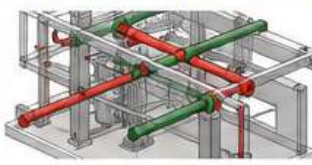
1. MODEL REVIEW TECHNIQUES



- Model Health Check
- View Filters & Visibility
- Standards & Compliance Check
- Model Audit Tools



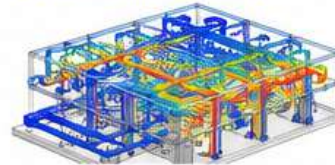
2. CLASH RESOLUTION & COORDINATION



- Clash Check (Hard & Soft)
- Clash Report Analysis
- Assign & Resolve Clashes
- Re-run & Verify



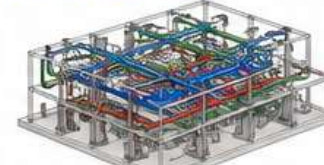
3. PERFORMANCE ANALYSIS



- Duct & Pipe Pressure Loss
- System Balancing
- Flow & Load Analysis
- Energy Analysis & Insights



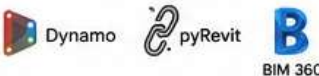
4. MODEL OPTIMIZATION



- Reduce Over-sized Elements
- Optimize Routing & Layout
- Improve System Efficiency
- Model Performance Tips



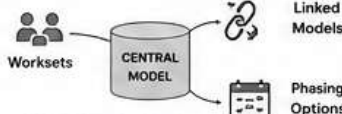
5. AUTOMATION & CUSTOMIZATION



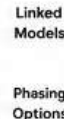
- Dynamo for Automation
- pyRevit Scripts & Tools
- Revit API Basics
- Batch Editing & Automation



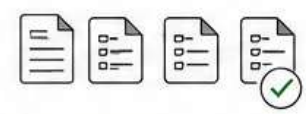
6. ADVANCED WORKFLOWS



- Worksharing Best Practices
- Linked Models Management
- Phasing & Design Options
- Efficient Collaboration Workflow



7. DOCUMENTATION CHECK



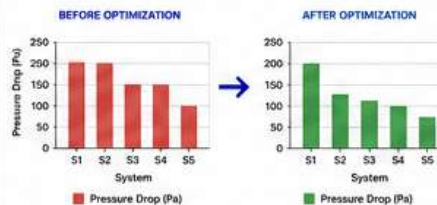
- Sheet Standards Check
- Annotation & Tag Check
- Legends & Schedules Check
- Print & Export Check

8. QUALITY ASSURANCE



- Model QA/QC Checklist
- Accuracy & Completeness Check
- Data & Parameter Validation
- Final Model Review

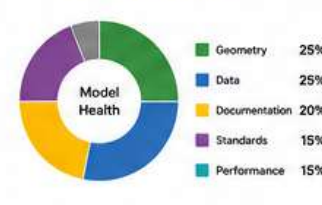
PERFORMANCE IMPROVEMENT EXAMPLE



CLASH REPORT SUMMARY

Clash Type	Status	No. of Clashes (Before)	No. of Clashes (After)
Hard Clash	Open	126	0
Soft Clash	Open	248	14
Clearance	Open	76	0
Total		450	14

MODEL HEALTH CHECK

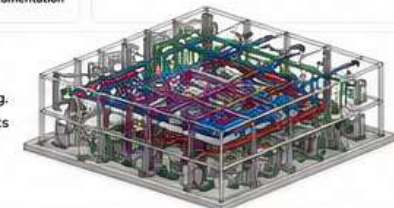


FINAL DELIVERABLES



KEY TOPICS COVERED

- 1. MODEL REVIEW**
 - Model Audit
 - Visibility & Filters
 - Compliance Check
- 2. CLASH RESOLUTION**
 - Clash Detection
 - Clash Reports
 - Resolve & Verify
- 3. PERFORMANCE ANALYSIS**
 - Pressure Loss
 - System Balancing
 - Energy Analysis
- 4. MODEL OPTIMIZATION**
 - Route Optimization
 - Size Optimization
 - Performance Tips
- 5. AUTOMATION & ADD-INS**
 - Dynamo
 - pyRevit
 - API & Add-ins
- 6. ADVANCED WORKFLOWS**
 - Worksharing
 - Linked Models
 - Phasing & Options
- 7. DOCUMENTATION CHECK**
 - Sheet & Annotation Check
 - Legends & Schedules
 - Export & Print Check
- 8. QUALITY ASSURANCE**
 - QA/QC Checklist
 - Data Validation
 - Final Review
- 9. FINAL DELIVERABLES**
 - Coordinated Model
 - Documentation Set
 - Handover Files



TIPS

- Run clash checks regularly.
- Use filters to isolate and review systems.
- Keep model organized with standards.
- Automate repetitive tasks.
- Collaborate and communicate effectively.



BEST PRACTICES

- Follow BIM Execution Plan (BEP).
- Maintain model accuracy and consistency.
- Use templates and standard families.
- Validate data before final delivery.
- Document every important step.



LEARNING OUTCOMES

- Review and analyze MEP models effectively.
- Detect, resolve and prevent clashes.
- Optimize systems for better performance.
- Use automation tools to improve productivity.
- Deliver coordinated, accurate and high-quality MEP projects.



COURSE COMPLETION!

You have completed the Revit MEP Training. Apply your knowledge to real-world projects and continue to learn and grow in your BIM journey!

UNIT 11

FAMILIES, FAMILY CREATION & CONTENT MANAGEMENT

Learn to work with families in Revit MEP, create custom families, manage content, and build a library for efficient MEP modeling.

UNIT OVERVIEW

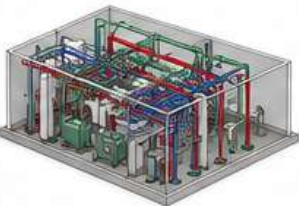
In this unit, you will learn about Revit families, family categories, types and parameters. You will create custom MEP families, manage and organize content libraries for efficient and consistent modeling.

YOU WILL LEARN

- Family Concepts
- Load & Place Families
- Edit Family
- Create New Family
- Parameters & Types
- Family Categories
- Family Templates
- Content Management
- Shared Parameters
- Family QA & Standards

WHY FAMILIES ARE IMPORTANT?

Well-structured and standardized families ensure accurate modeling, consistent documentation, easier coordination and better project performance across all MEP disciplines.



FAMILY WORKFLOW

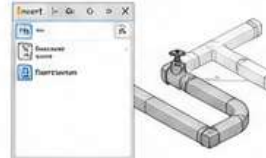


1. FAMILY CONCEPTS



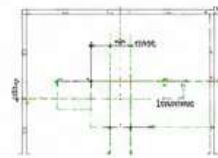
- System Families vs Loadable Families
- Family Categories
- Family Types & Instances
- Nested Families
- Family Origins & Reference Planes

2. LOAD & PLACE FAMILIES



- Load from Libraries
- Place in Model
- Type Selector
- Replace Family
- Visibility Control

3. EDIT EXISTING FAMILY



- Open Family Editor
- Modify Geometry
- Constraints & Alignments
- Family Types
- Save & Reload

4. CREATE NEW FAMILY



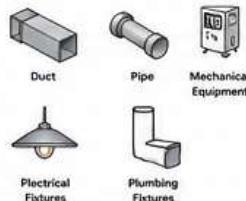
- Choose Template
- Set Reference Planes
- Create Geometry
- Add Connectors
- Load into Project

5. PARAMETERS & TYPES

Family Types		
Type name	Supply Diffuser - 600x800	
Parameter	Value	Formula
Width	600 mm	=
Length	600 mm	=
Height	250 mm	=
Neck Diameter	200 mm	=
Air Flow	300 L/s	=
Material	Galvanized Steel	=

- Instance vs Type Parameters
- Add Parameters
- Parameter Groups
- Formulas
- Type Catalogue

6. FAMILY CATEGORIES



- Model Categories
- Annotation Categories
- MEP System Categories
- Category Properties

7. FAMILY TEMPLATES

Template Name	Discipline
Mechanical Equipment.rft	Mechanical
Duct.rft	Mechanical
Pipe.rft	Mechanical
Electrical Fixture.rft	Electrical
Plumbing Fixture.rft	Plumbing
Generic Model.rft	Generic

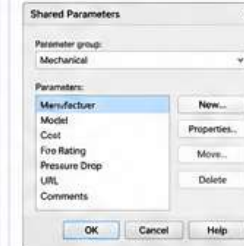
- Use Correct Template
- Template Setup
- Units & Scale
- Starting Points

8. CONTENT MANAGEMENT



- Organize Content Library
- Naming Conventions
- Folder Structure
- Standardization

9. SHARED PARAMETERS



- Create Shared Parameters
- Add to Families
- Use in Schedules
- Project Consistency

10. FAMILY QA & STANDARDS



- Naming Standards
- Connector Orientation
- Geometry Check
- Parameter Check
- Performance Optimization

EXAMPLE: CUSTOM MEP FAMILIES



TIPS

- Always use correct family templates.
- Keep families simple and parametric.
- Use shared parameters for consistency.
- Test families before using in projects.
- Maintain a well-organized content library.



BEST PRACTICES

- Follow company standards.
- Use meaningful names.
- Avoid over-constraint in families.
- Check connectors & reference planes.
- Keep families up to date.



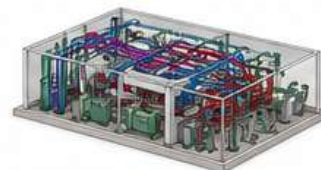
LEARNING OUTCOMES

- Understand Revit family concepts and categories.
- Create, edit and manage MEP families.
- Add parameters, types and shared parameters.
- Organize and manage content libraries effectively.
- Ensure quality, consistency and best practices in families.

NEXT UNIT >>

Unit 12: Advanced Modeling Techniques

Learn advanced MEP modeling techniques including system creation, complex routing, design options, phasing, worksets and model performance.



KEY TOPICS COVERED

- 1. FAMILY CONCEPTS**
 - Family Types
 - Instances vs Types
- 2. LOAD & PLACE FAMILIES**
 - Load Families
 - Place & Replace
- 3. EDIT EXISTING FAMILY**
 - Edit Geometry
 - Modify Types
- 4. CREATE NEW FAMILY**
 - Family Templates
 - Build & Load
- 5. PARAMETERS & TYPES**
 - Add Parameters
 - Type Management
- 6. FAMILY CATEGORIES**
 - Category Selection
 - MEP Systems
- 7. FAMILY TEMPLATES**
 - Template Usage
 - Template Setup
- 8. CONTENT MANAGEMENT**
 - Library Organization
 - File Management
- 9. SHARED PARAMETERS**
 - Create & Manage
 - Use in Families
- 10. FAMILY QA & STANDARDS**
 - QA Checklist
 - Best Practices

UNIT 12

ADVANCED SYSTEMS, ANALYSIS & PROJECT DELIVERY

Master advanced MEP systems, perform analysis, coordinate multidisciplinary models and deliver high-quality, constructible MEP projects.

UNIT OVERVIEW

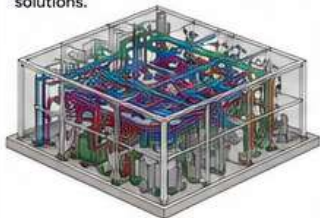
In this unit, you will learn advanced MEP topics including system design principles, load calculations, energy analysis, clash resolution, advanced coordination and complete project delivery from model to construction.

YOU WILL LEARN

- ✓ Advanced HVAC Systems
- ✓ Plumbing & Drainage Design
- ✓ Electrical Power Systems
- ✓ Load Calculations
- ✓ Energy Analysis
- ✓ Clash Management
- ✓ Advanced Coordination
- ✓ Documentation Standards
- ✓ BOQ & Estimation
- ✓ Project Delivery

WHY ADVANCED KNOWLEDGE IS IMPORTANT?

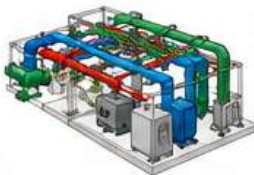
Advanced knowledge ensures efficient system performance, code compliance, cost optimization and smooth project execution. It helps deliver sustainable, coordinated and high-quality MEP solutions.



MEP PROJECT DELIVERY WORKFLOW



1. ADVANCED HVAC SYSTEMS



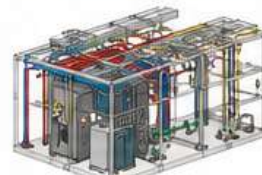
- AHU & Air Distribution Design
- Duct Sizing & Pressure Calculation
- VAV & DCV Systems
- Chilled Water & VRF Systems
- Smoke Control & Pressurization

2. PLUMBING & DRAINAGE DESIGN



- Water Supply Design
- Soil, Waste & Vent Systems
- Stormwater & Rainwater Systems
- Pumping & Booster Systems
- Water Conservation Strategies

3. ELECTRICAL POWER SYSTEMS



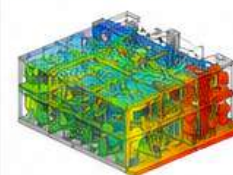
- Power Distribution Design
- Lighting & Illumination Design
- Earthing & Lightning Protection
- Cable Sizing & Load Balancing
- Backup Power & Generators

4. LOAD CALCULATIONS

Electrical Load Summary			
Description	Connected Load (kW)	Demand Factor	Demand Load (kW)
Lighting	85.6	1.00	85.6
Power	120.4	0.80	96.3
HVAC	250.0	0.70	175.0
Pumps	35.0	0.90	31.5
Miscellaneous	18.0	0.80	14.4
Total Demand Load (kW)			402.8

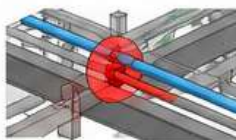
- Electrical Load Calculation
- HVAC Load Calculation
- Lighting Load Calculation
- Equipment Load Schedule
- Diversity & Demand Factors

5. ENERGY ANALYSIS



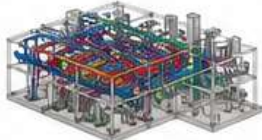
- Energy Modeling
- Energy Performance Analysis
- Optimization Strategies
- Sustainability & Green Building
- LEED / GRIHA Compliance

6. CLASH MANAGEMENT



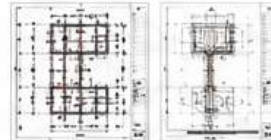
- Clash Detection (Hard & Soft)
- Clash Reports & Grouping
- Clash Resolution Strategies
- Clash Matrix & Tracking
- Clash Free Coordination

7. ADVANCED COORDINATION



- Interdisciplinary Coordination
- Architectural Coordination
- Structural Coordination
- Coordination Meetings & Reports
- Coordination Review Workflow

8. DOCUMENTATION STANDARDS



- Sheet Standards & Templates
- Annotation & Tagging Standards
- Symbols & Legends
- View Naming Conventions
- Documentation Best Practices

9. BOQ & ESTIMATION

BOQ - HVAC Ductwork			
Item	Description	Unit	Qty
1	Rectangular Duct (60)	m³	245.60
2	Circular Duct (100)	m³	156.80
3	Volume Damper	No.	24
4	Fire Damper	No.	18
5	GRD / Diffuser	No.	48
6	Flexible Connector		32
Total			—

- Quantity Take-Off from Model
- Material Take-Off
- BOQ Preparation
- Cost Estimation
- Export to Excel / ERP

10. PROJECT DELIVERY



- Model QA/QC
- Final Coordination Check
- Issuance for Construction (IFC)
- Handover Documents
- As-Built & Close-Out

KEY TOPICS COVERED

- 1. ADVANCED SYSTEMS**
 - HVAC Systems
 - Plumbing Systems
 - Electrical Systems
- 2. ANALYSIS & CALCULATIONS**
 - Load Calculations
 - Energy Analysis
 - System Sizing
- 3. COORDINATION**
 - Clash Management
 - Advanced Coordination
 - Interdisciplinary Review
- 4. DOCUMENTATION**
 - Standards & Templates
 - Annotations & Tags
 - Sheets & Schedules
- 5. ESTIMATION & DELIVERY**
 - BOQ & Estimation
 - Project Delivery
 - Handover & Close-Out

PROJECT DELIVERABLES

- ✓ Coordinated 3D MEP Model
- ✓ Clash Free Model
- ✓ Sheets (PDF / DWG)
- ✓ Schedules & Quantities
- ✓ BOQ & Cost Estimate
- ✓ Handover Documents

EXAMPLES OF ADVANCED MEP SYSTEMS

AHU & DUCT SYSTEM



CHILLED WATER SYSTEM



VRF SYSTEM



WATER SUPPLY SYSTEM



DRAINAGE SYSTEM



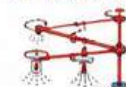
ELECTRICAL DISTRIBUTION



LIGHTING LAYOUT



FIRE SPRINKLER SYSTEM



TIPS

- Plan systems early for better coordination.
- Always follow codes and standards.
- Use analysis tools for efficient design.
- Resolve clashes early to save time and cost.
- Maintain clear documentation for smooth delivery.



BEST PRACTICES

- Follow company standards and templates.
- Keep models clean and well-organized.
- Collaborate and communicate regularly.
- Use automation for repetitive tasks.
- Verify design with calculations and analysis.



LEARNING OUTCOMES

- ✓ Design and model advanced MEP systems.
- ✓ Perform load calculations and analysis.
- ✓ Coordinate multidisciplinary models effectively.
- ✓ Prepare accurate documentation and BOQ.
- ✓ Deliver coordinated, cost-effective MEP projects.



COURSE COMPLETION!

You have completed the Revit MEP Training. You are now ready to handle complex MEP projects with advanced skills and confidence.

