

BIM Boot Camp

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BOSTON
NEW YORK
CHICAGO
LOS ANGELES
SAN FRANCISCO

COPENHAGEN
DUBLIN
WARSAW
MOSCOW
MUNICH
MILAN

MUMBAI
HONG KONG
BEIJING

Fire and Life Safety
Engineering

Structural Engineering

MEP Engineering

Computational
Simulation & Analysis

BUROHAPPOLD ENGINEERING

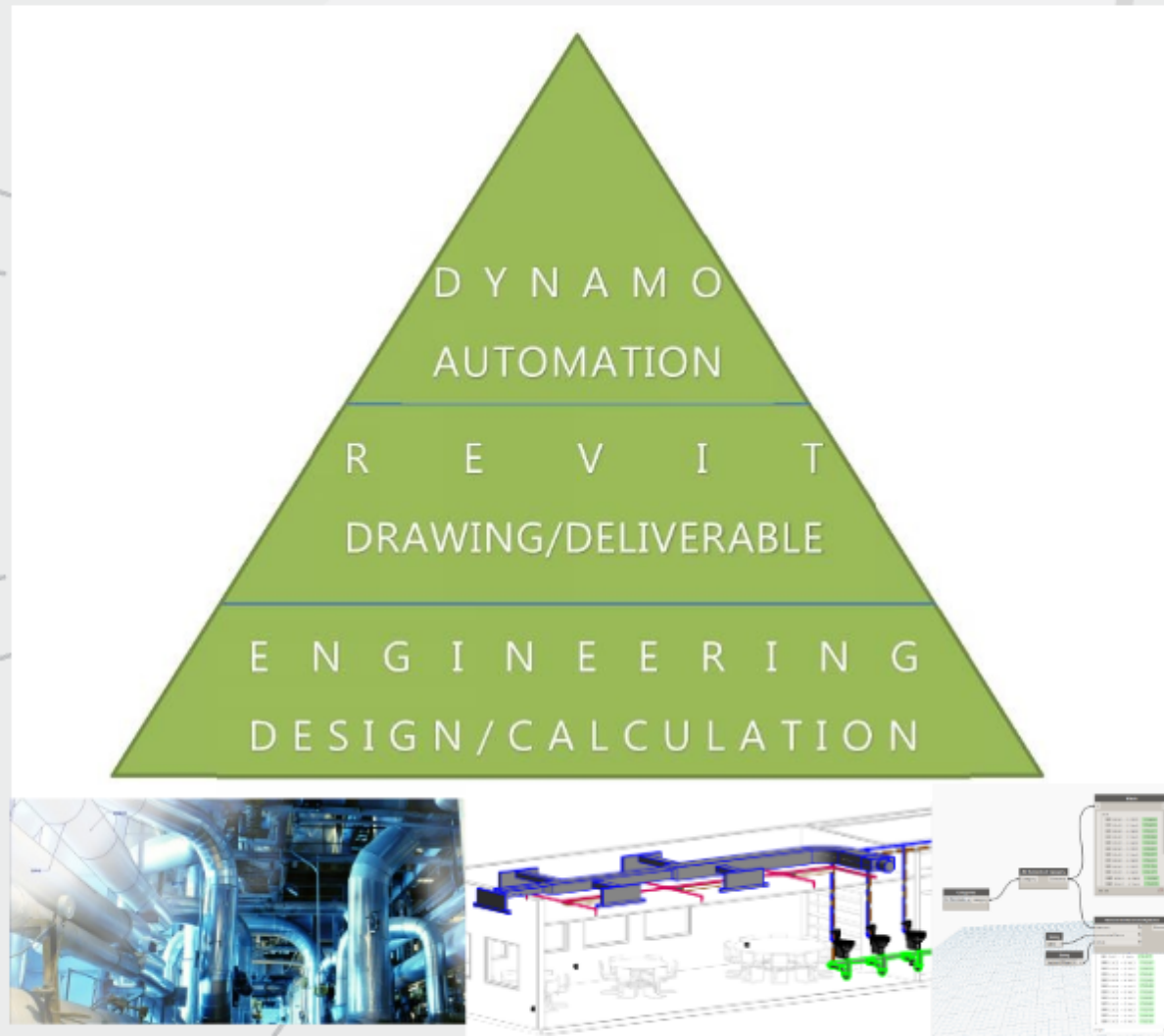
Sustainability and
Building Performance
Design

Lighting and
Daylighting Design

Façade Engineering

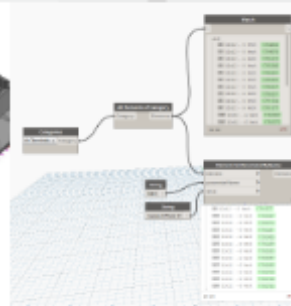
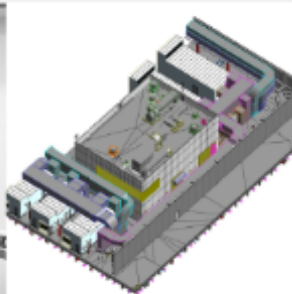
Urban Development
and Design

CAIRO
BRAZIL
DOHA
ABU DHABI
DURBAN



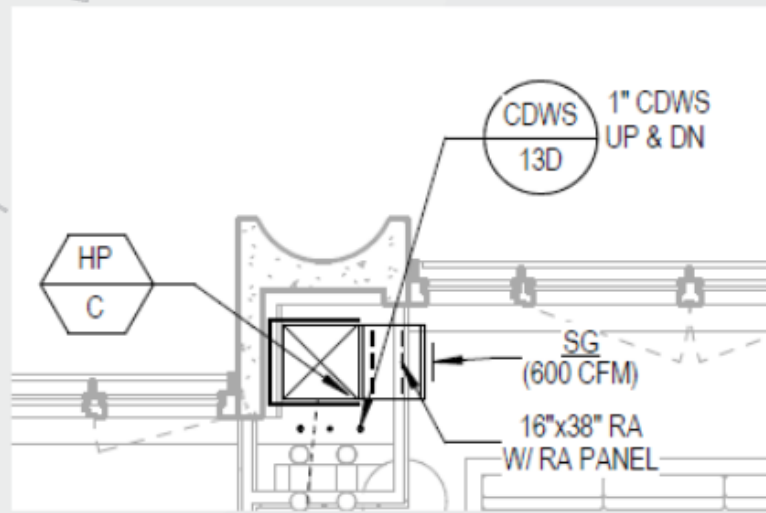
Objectives:

- Analyzing your Abilities
- Laying the Foundation
- Creating Training Content
- Implementing Training
 - Post-Training Plan



Step II: Lay the Foundation

- Project Template
 - Libraries | Families & Parameters
 - Established Graphical Standards
- Best Practice Manual / Training Guide



Step III: Outline the Training Program

- Number of Sessions
- Length of Sessions
 - Size of Group
- Material to be Covered

REVIT TRAINING		BUREAU HAPPOLO ENGINEERING	
TRAINING	GROUP TRAINING	TRAINING	GROUP TRAINING
COURSE			
I. FUNDAMENTALS			
II. ADVANCED			
III. PLUMBING & FIRE PROTECTION			
IV. MECHANICAL			
V. ELECTRICAL			
VI. DOCUMENTATION			
VII. CALCULATIONS			



Step III: Outline the Training Program

REVIT TRAINING

TIMEFRAME

2 Hour Training Session

FOR WHOM

Graduate +

BUROHAPPOLD
ENGINEERING

OVERVIEW

I FUNDAMENTALS

II MECHANICAL

III ELECTRICAL

IV LIGHTING

V PLUMBING & FIRE PROTECTION

VI FAMILIES & SCHEDULES

VII DOCUMENTATION STANDARDS

VIII CALCULATIONS

FUNDAMENTALS

INTRODUCTION

Introduction to the Principles of Revit
Revit 2015 Interface and Navigation
Ribbon
Options Menu | Keyboard Shortcuts

OPENING PROJECTS

Opening a file – Central vs. Local
Best Practices – Local File Management
BH Standard MEP Template
BH Project Browser Organization
BH Revit Standards

VIEWS

View Creation- Plans & RCPs
View Creation- Sections
View Creation- 3D Views
View Creation- Duplication
View Creation- Part Plans (Call Outs)
Plan Regions
Scope Boxes vs. Crop Regions
Arranging View Windows
Visibility Control & Categorization

SELECT

Selection Methods
Element Manipulation- Type Selector

MANAGEMENT

Linking Revit Models
Linking vs. Importing CAD
Managing Links
Coordination Review

SAVE

Saving & Synchronizing to Central
Relinquishing Ownership

WORKSETS & COLLABORATION

Using Worksets
Creating Worksets
Visibility Control via Worksets
Moving Objects to/from Worksets
Opening Files by Workset
Worksharing Monitor

SERVER

Opening & Saving Files on Revit Server
Revit Server Maintenance

PRINT

Printing to PDF | Bluebeam Add-In
Exporting to DWG

Step IV: Create Revit Training

- I FUNDAMENTALS
- II MECHANICAL
- II ELECTRICAL
- II LIGHTING
- II PLUMBING & FIRE PROTECTION
- III FAMILIES & SCHEDULES
- IV DOCUMENTATION STANDARDS
- V CALCULATIONS

Session I: **Fundamentals**

- Interface Tour
- Central vs. Local
 - Printing
 - BH Workflow
- Project Browser
 - Properties

Session II:

Discipline Specific Modeling

- Duct/Pipe/Conduit
 - Family Libraries
 - View Templates
- Discipline Worksets
 - Views/Sheets
- Parameter Libraries

Session III: **Families & Schedules**

- Family Library
- Building Families
- Parameter Library
- Adding Parameters
- Creating Schedules
 - Creating Tags



Session IV:

Documentation Standards

- MEP-001 | Symbols Sheet Comparison (Dynamo)
- MEP-100 | Family Management (Kinship)
- MEP-500 | Detail Sheet Creation Tool (Dynamo)
- MEP-600 | Schedule Reviews (RushForth)
- MEP-700 | Riser Creation Tools 3D to 2D (Adroit)



Kinship



Dynamo



Session V:

Calculations & Automation

- Duct/Pipe Sizing
- Static Pressure Calc
- Automated Tools via Dynamo



Dynamo

BIM Forums

Abstract

1. *Stomoxys calcitrans* (L.) (House Fly)

1. Components slide technique sheet



Figure 2.1: A simplified illustration of the model.



Source: U.S. Bureau of Economic Analysis.

2. Measuring the Strategy's Results

- Identify the Extended Family (Nursing Assistant does?)
- Under the name is listed, assign the names of the client, partners, etc., avoiding the contact for 48h.
- It may be necessary for you to describe the history of the Extended Family to suit the nature of clients in your practice.
- Avoid the family, non-acute contact.

5. Reducing the cost of transportation.

- Update the Project and/or Member
- The **Owner** field reflects a user's status, as it is a First Parameter item. If you modify the user, the related field is automatically reset to the parent user.
- No additional or parent-level attributes are available when you select a Project Parameter for an administrative data. For example, 0000-00-12-12-12-12 for the subject is replaced by:
 - Child Name: **Plange** tab
 - Child or Project Parameter
 - Child ID
 - Select Project Parameter
- The **Item Name** of the ItemID: 0000-00-12-12-12-12
- Display is Common, "Typed Parameter is Text, and Second Parameter Under Text
- Click the **Category** button
- Click OK

WISCONSIN

4. Empirical Results

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10. DEVELOPMENT	Examine how a leader supports his followers
11. CONSEQUENCES	Examine whether the design of a unit's work environment and its tasks affect its effectiveness. How important are these issues in determining a unit's effectiveness?
12. CONCLUSIONS	The design of a unit's work environment and its tasks affects its effectiveness. How important are these issues in determining a unit's effectiveness? Examine the importance of these issues in determining a unit's effectiveness.
13. CONTRAST	Examine the importance of these issues in determining a unit's effectiveness. How important are these issues in determining a unit's effectiveness? Examine the importance of these issues in determining a unit's effectiveness.
14. DEFINITION	Examine the importance of these issues in determining a unit's effectiveness. How important are these issues in determining a unit's effectiveness? Examine the importance of these issues in determining a unit's effectiveness.
15. DEFINITION	Examine the importance of these issues in determining a unit's effectiveness. How important are these issues in determining a unit's effectiveness? Examine the importance of these issues in determining a unit's effectiveness.
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18. DEFINITION	Examine the importance of these issues in determining a unit's effectiveness. How important are these issues in determining a unit's effectiveness? Examine the importance of these issues in determining a unit's effectiveness.
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20. DEFINITION	Examine the importance of these issues in determining a unit's effectiveness. How important are these issues in determining a unit's effectiveness? Examine the importance of these issues in determining a unit's effectiveness.

Source: <http://www.fishbase.org>

1. Set the initial value of θ to 0.
2. Repeat the following steps until the error is small enough:
 - a. Compute the error $J(\theta)$.
 - b. Compute the gradient $\nabla J(\theta)$.
 - c. Update θ using the gradient descent rule: $\theta = \theta - \eta \nabla J(\theta)$.



10. [New, John & Wrenschmeyer, Hilg](#)
11. [Wrenschmeyer, Hilg, Andrew & Hilg, Andrew & Hilg, Andrew & Hilg, Andrew](#)
12. [Wrenschmeyer, Hilg, Andrew & Hilg, Andrew & Hilg, Andrew & Hilg, Andrew](#)
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Step IV: Create Dynamo Training



DYNAMO FUNDAMENTALS



SIMPLE VISUAL PROGRAMMING



SIMPLE+ VISUAL PROGRAMMING



INTERMEDIATE VISUAL PROGRAMMING



ADVANCED VISUAL PROGRAMMING

Training Lab Format:

Part 1 | Present the Problem

DYNAMO TRAINING LAB | PART I

BUROHAPPOLD
ENGINEERING

STEP 1

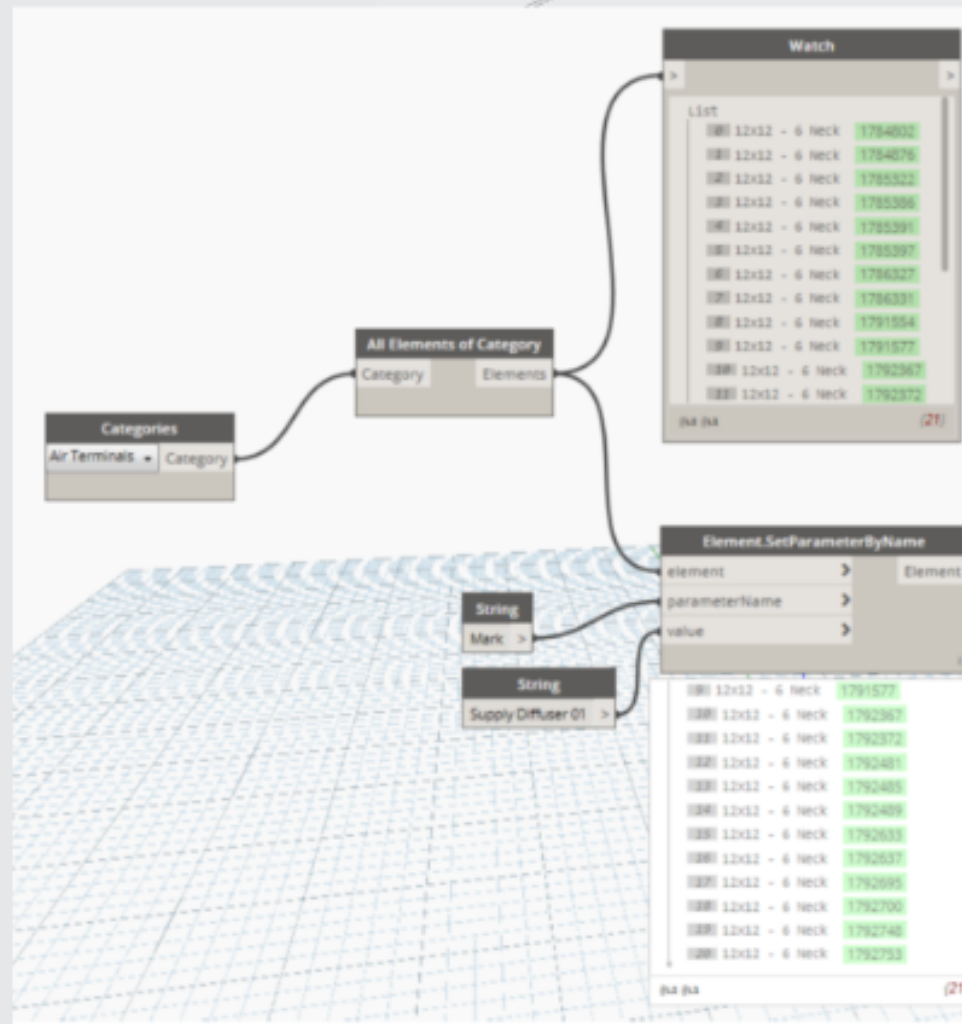
Open Revit 2017 > Go to the Manage Tab > Open Dynamo

STEP 2

Create a Script that takes all of the spaces within your model, and sets their "Specified Supply Airflow" to 500 CFM

Training Lab Format:

Part 2 | Use Dynamo



Training Lab Format:

Part 3 | Node Library

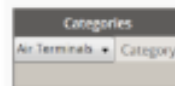
DYNAMO TRAINING LAB | PART I

BURO HAPPOLD
ENGINEERING

TIMEFRAME
1 Hour Training Session

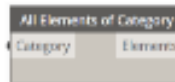
FOR WHOM
Graduate +

NODE

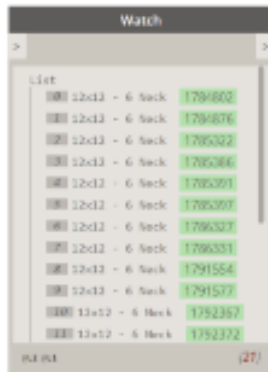


APPLICATION

The "Categories" node allows you to access the categories within Revit, via a drop down menu (eg: Air Terminals, Mechanical Equipment)



The "All Elements of Category" node allows you to pull all of the elements from your Revit model associated with the category specified by the "Categories" node.



The "Watch" node is useful in many applications and allows you to view a list called by the node it is connected to.

Beyond Dynamo Training

Computational Collective Hackathons



Step V: Post-Training ***Follow Up Assessment***

3 Questions about each Training Session

- Name 5 reasons you may not be able to see a duct while drawing it?*
- How can you prevent dragging the architect's model?*

Step V: Post-Training ***BIM Kick Off***

- Review of All BIM Requirements
 - Identify Opportunities for Automation
- Request Additional Revit and Dynamo Training



Benefits of BIM Training



System Connectivity
Data (Parameters)
Calculated Systems
Automation (Dynamo)



Time Spent Drafting
RFIs