Bridging the Gap: From Current Practice to Meeting the Stretch Code

Phius Pro Forum 2024

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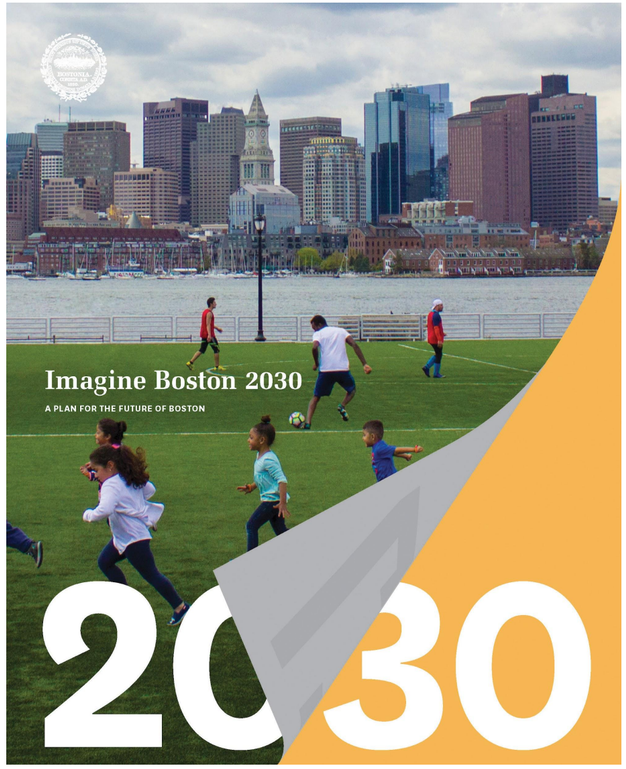
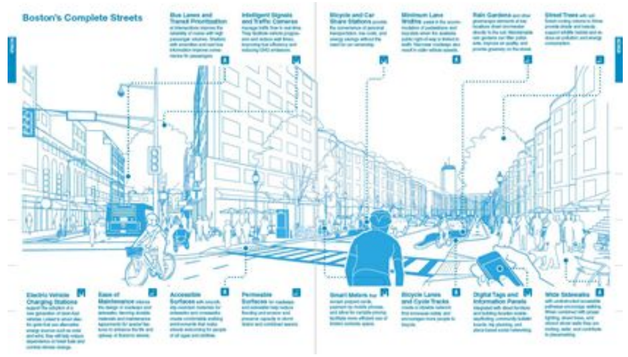

Imagine Boston 2030
A PLAN FOR THE FUTURE OF BOSTON
2030


Teen
Children


MEMORIAL BUILDING


Boston's Complete Streets


THE BOSTON CONSERVATORY
THE BOSTON CONSERVATORY

A Passive Building can be any size/type

Front St.
Portland, ME | 100 Units
Phius Certified (Building 2), Design Certified (Building 5)

3371 Washington St.
Boston, MA | 39 Units
Phius Design Certified, In Construction

152-158 Broadway
Somerville, MA | 45 Units
Phius Design Certified, In Construction

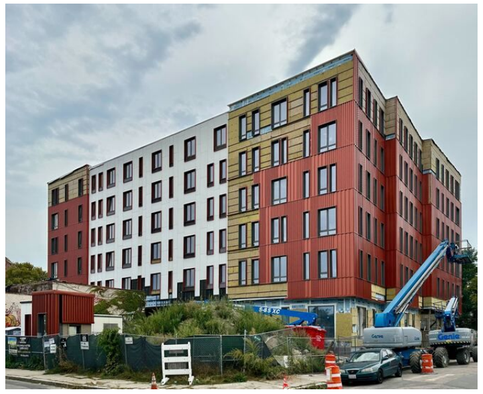
1200 Montello
Brockton, MA | 94 Units
Phius Design Certified, In Construction

Scape Charlesgate
Boston, MA | 400 Units
In Design

Walnut St. Housing
Foxborough, MA | 200 Units
Phius Design Certified, In Design

1005 Broadway
Chelsea, MA | 38 Units
Phius Certified

25 Sixth St.
Chelsea, MA | 62 Units
Phius Design Certified, In Construction

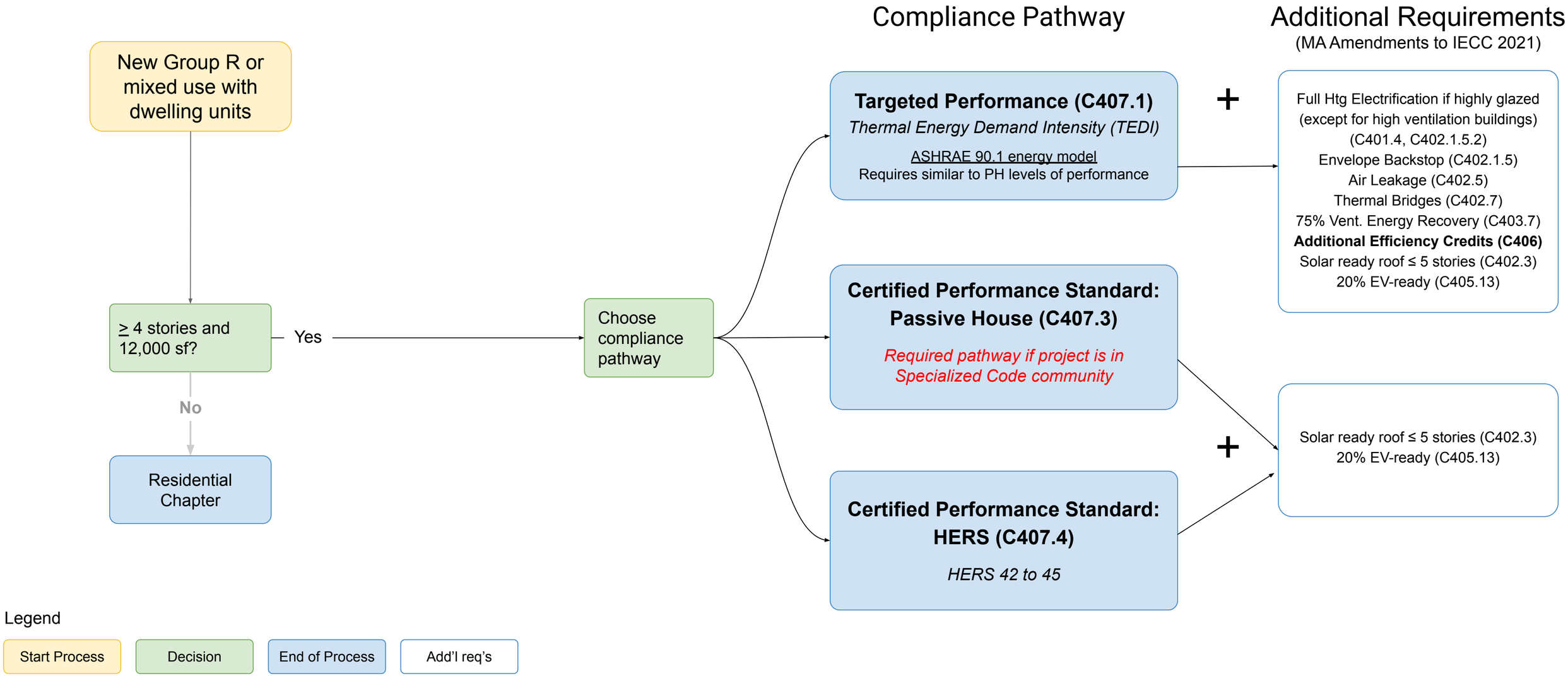


1599 Columbus Ave.
Boston, MA | 65 Units
Phius Design Certified, In Construction

495 On the Dot
Boston, MA | 331 Units
In Design

Stretch Code

Commercial Energy Efficiency, **Group R occupancy**



Legend

Start Process | Decision | End of Process | Add'l req's

C407.3.1 Compliance. Buildings shall be pre-certified as meeting the Phius CORE 2021 or Phius ZERO 2021 Passive Building Standard – North America, or newer, demonstrated using Phius approved software, where Phius Design-Certification is demonstrated by Phius and a Certified Passive House Consultant (CPHC); or, Projects pre-certified as meeting the Certified Passive House standard using the current software and program criteria by the Passive House Institute (PHI), where PHI certification is demonstrated by a Certified Passive House Designer and a Certified Passive House Certifier.

C407.3.2 Documentation. Compliance with Phius or PHI shall be in accordance with C407.3.3.1 or C407.3.3.2

C407.3.2.1 Phius Documentation. When using WUFI Passive or other Phius-approved software:

1. Prior to the issuance of a building permit, the following item(s) must be provided to the Building Official:
    a. A Phius 2021 (or newer) Verification Report which demonstrates project compliance with Phius 2021 (or newer) performance requirements.
    b. A statement from the CPHC that the verification report results accurately reflect the plans submitted.
    c. Evidence of project registration from Phius.

    OR

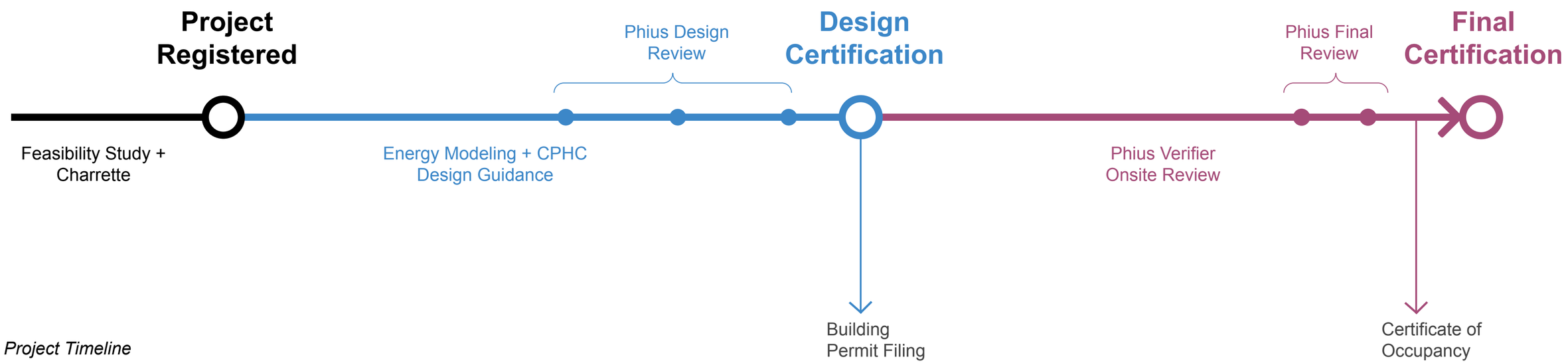
    a. A Design Certification Letter from Phius.

Recommendations from a CPHC

- Set a **road map** for the Phius certification process
- Work backwards from expected **permit date**, set goal to achieve Design Cert letter
- Conduct a **feasibility study** and **design charrette** as early as possible in the process
- Use the feasibility **energy model for design guidance** and refine for Design Certification
- Utilize **checklists to track program requirements** by phase for design team, consultants
- Integrate **Revit outputs** to facilitate the Design Cert process
- **Coordinate with Verifier** and track changes **proactively during construction**

Phius Submission Timeline

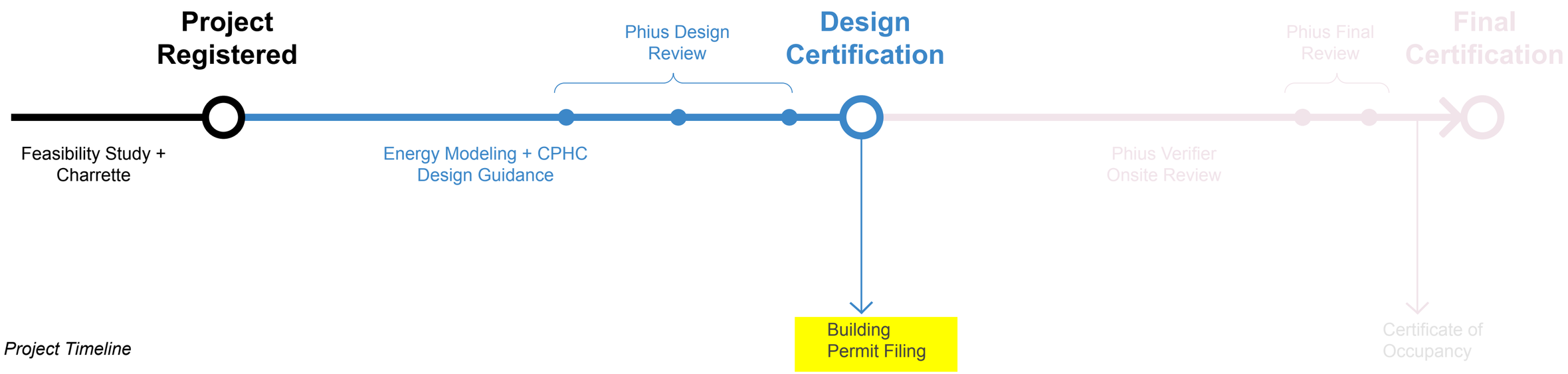
Phius Project Certification Steps



Project Timeline

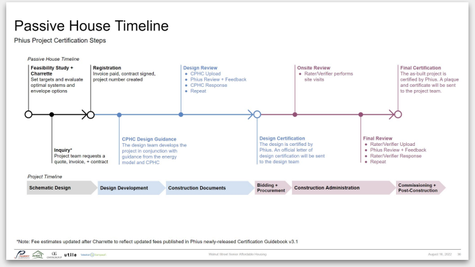
Phius Submission Timeline

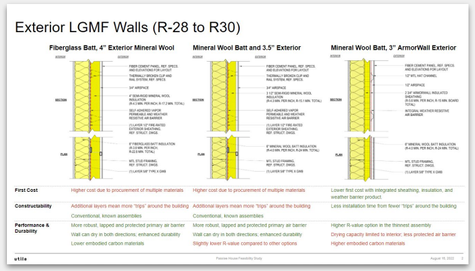
Phius Project Certification Steps

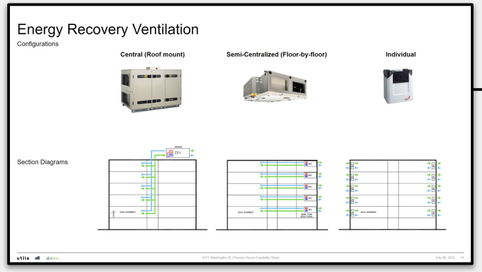


Project Timeline

Feasibility Study







Energy Recovery Ventilation

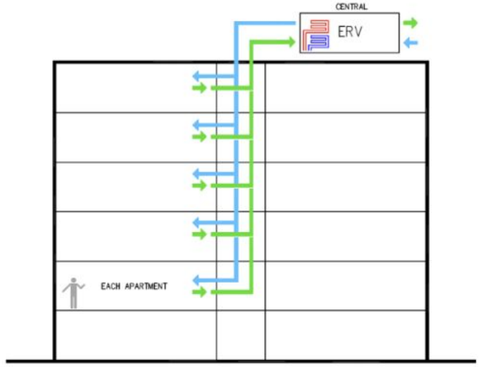
Configurations

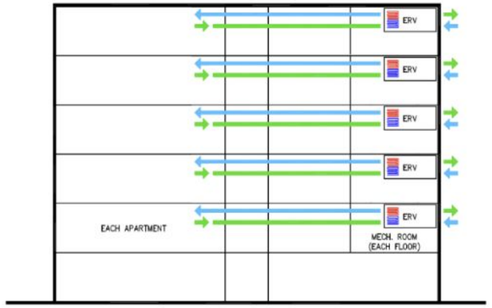
Central (Roof mount)

Semi-Centralized (Floor-by-floor)

Individual

Section Diagrams





utile | JPNDC | 3371 Washington St | Passive House Feasibility Study | July 06, 2022 | 15

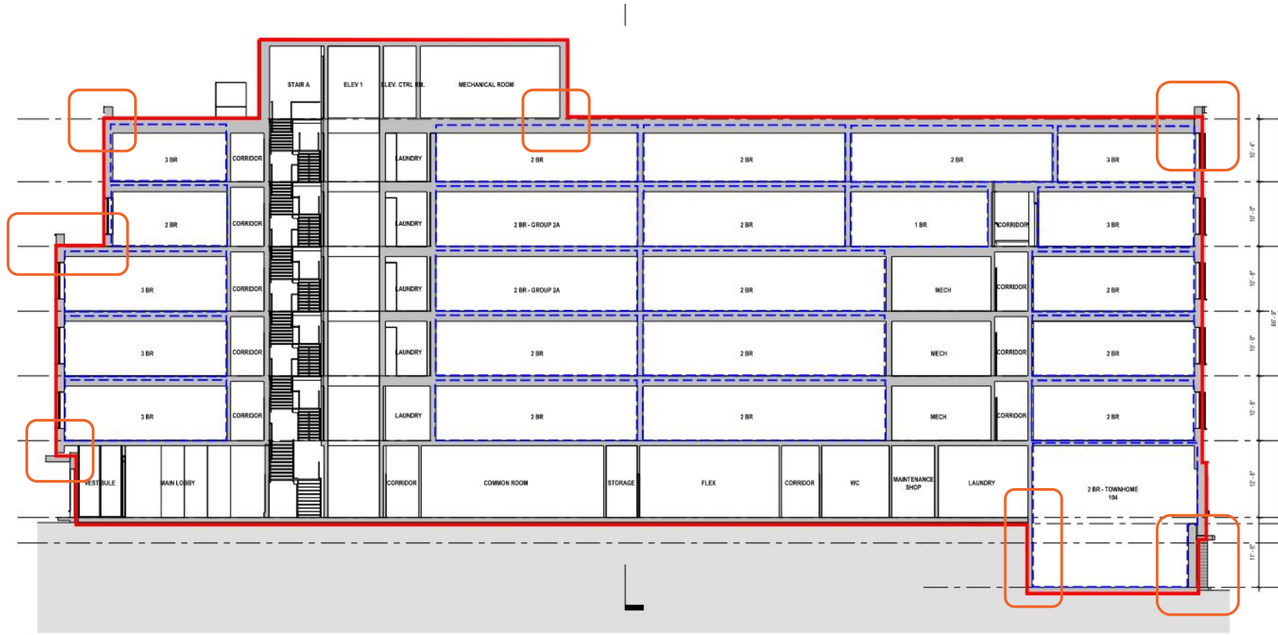
Feasibility Study - Charrette

Goal: Reach consensus around Phius criteria, assemblies, and systems configurations to achieve Phius criteria with the integrated team:

- Owner
- CPHC
- Designer/ architect
- MEP Engineer (systems selection, requirements)
- Structural Engineer (scope of thermal breaks)
- CM or Pre-construction Advisor (cost and constructability)

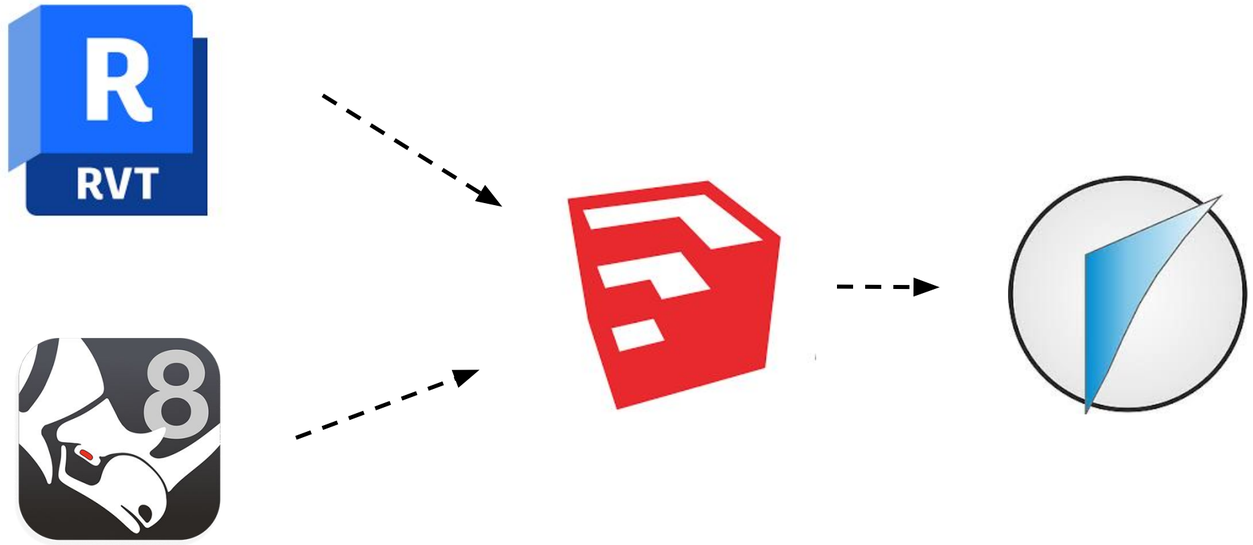
Feasibility Study - Early Identification of Challenges

Ground Floor Plan

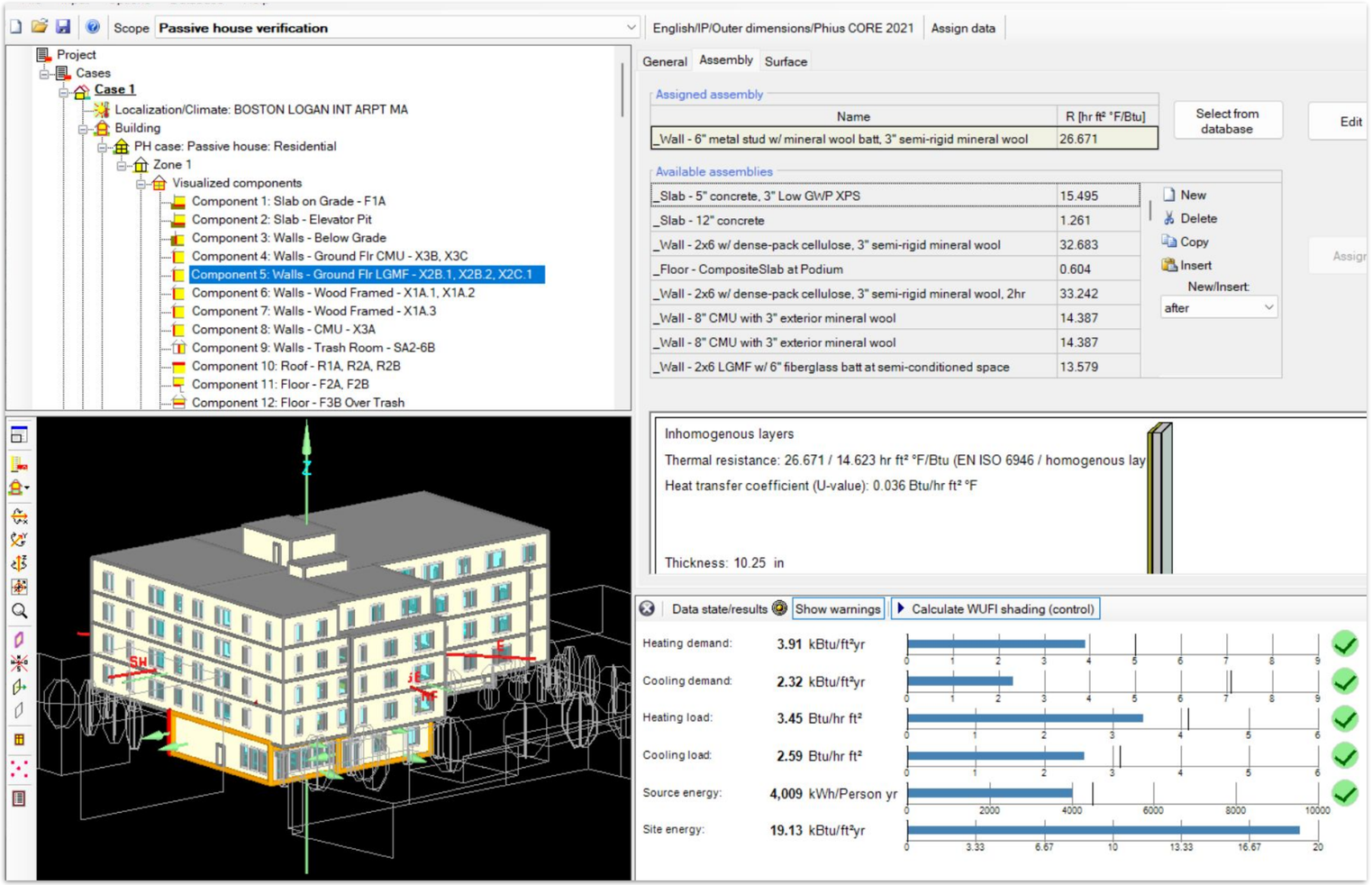


1 OVERALL BUILDING SECTION - E-W
1/8" = 1'-0"

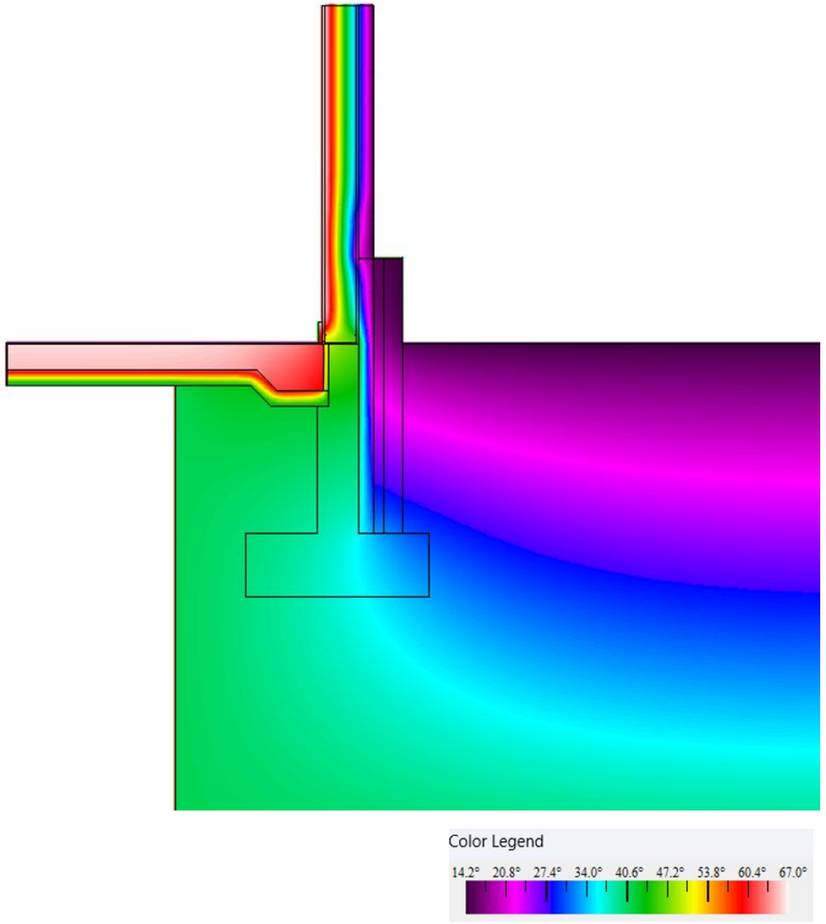
Feasibility Study - Set up initial WUFI Passive Model



Energy modeling through the process

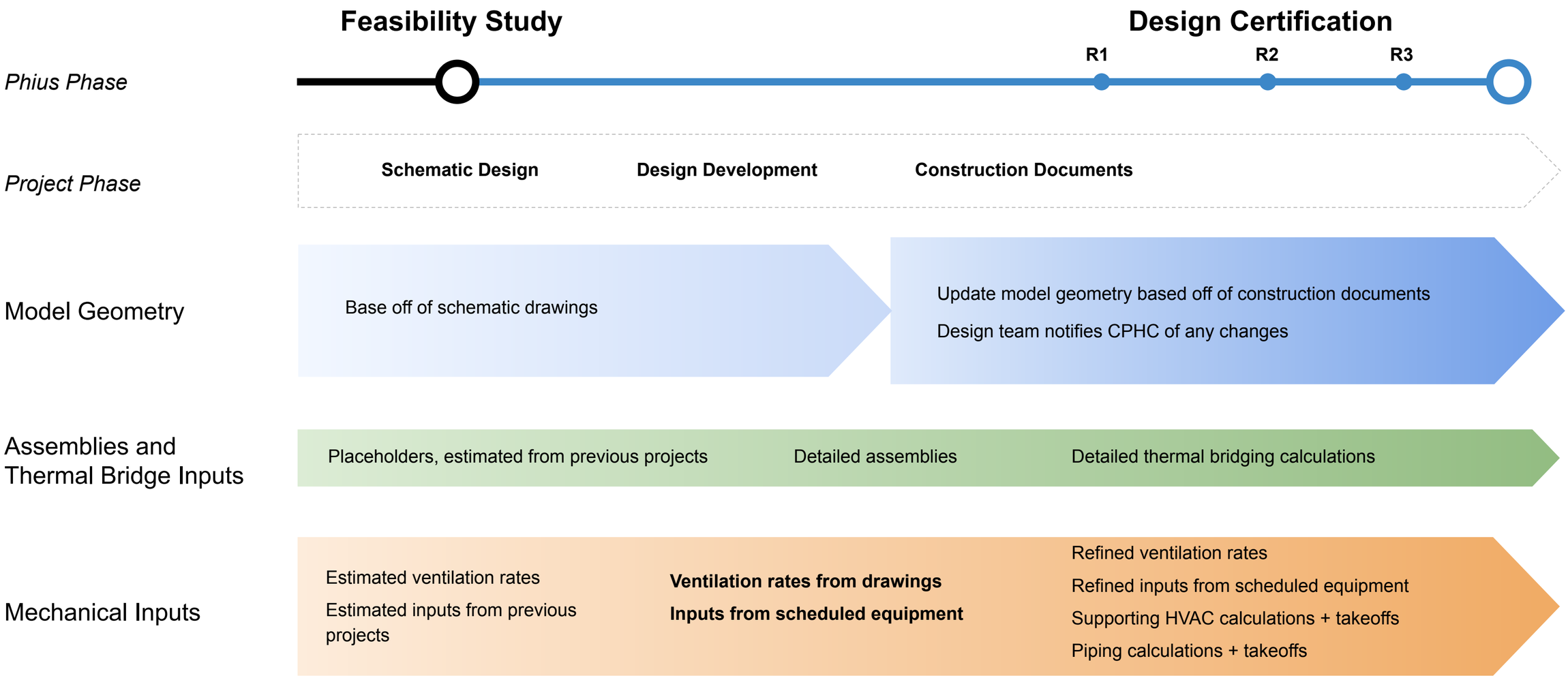


WUFI Passive energy model

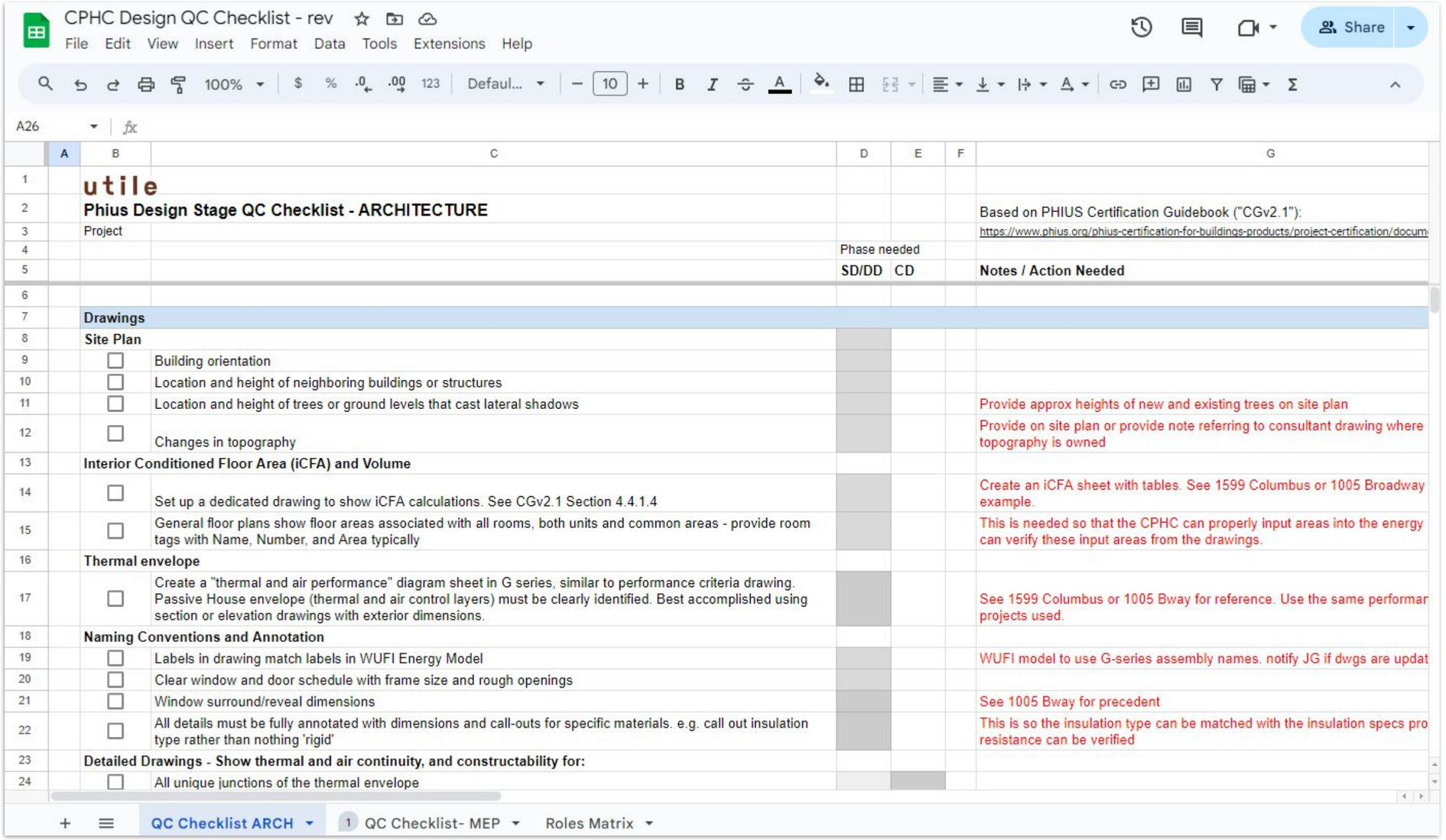


Thermal bridging analysis of a typical foundation detail

Energy modeling through the process



Utilize checklists to track program requirements



CPHC Design QC Checklist - rev

File Edit View Insert Format Data Tools Extensions Help

Share

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Phius Design Stage QC Checklist - ARCHITECTURE

Project

Based on PHIUS Certification Guidebook ("CGv2.1"):

https://www.phius.org/phius-certification-for-buildings-products/project-certification/docum

		Phase needed		
		SD/DD	CD	Notes / Action Needed
Drawings				
Site Plan				
☐	Building orientation			
☐	Location and height of neighboring buildings or structures			
☐	Location and height of trees or ground levels that cast lateral shadows			Provide approx heights of new and existing trees on site plan
☐	Changes in topography			Provide on site plan or provide note referring to consultant drawing where topography is owned
Interior Conditioned Floor Area (iCFA) and Volume				
☐	Set up a dedicated drawing to show iCFA calculations. See CGv2.1 Section 4.4.1.4			Create an iCFA sheet with tables. See 1599 Columbus or 1005 Broadway example.
☐	General floor plans show floor areas associated with all rooms, both units and common areas - provide room tags with Name, Number, and Area typically			This is needed so that the CPHC can properly input areas into the energy can verify these input areas from the drawings.
Thermal envelope				
☐	Create a "thermal and air performance" diagram sheet in G series, similar to performance criteria drawing. Passive House envelope (thermal and air control layers) must be clearly identified. Best accomplished using section or elevation drawings with exterior dimensions.			See 1599 Columbus or 1005 Bway for reference. Use the same performar projects used.
Naming Conventions and Annotation				
☐	Labels in drawing match labels in WUFI Energy Model			WUFI model to use G-series assembly names. notify JG if dwgs are updat
☐	Clear window and door schedule with frame size and rough openings			
☐	Window surround/reveal dimensions			See 1005 Bway for precedent
☐	All details must be fully annotated with dimensions and call-outs for specific materials. e.g. call out insulation type rather than nothing 'rigid'			This is so the insulation type can be matched with the insulation specs pro resistance can be verified
Detailed Drawings - Show thermal and air continuity, and constructability for:				
☐	All unique junctions of the thermal envelope			

QC Checklist ARCH | QC Checklist- MEP | Roles Matrix

Conduct drawing review for Phius documentation

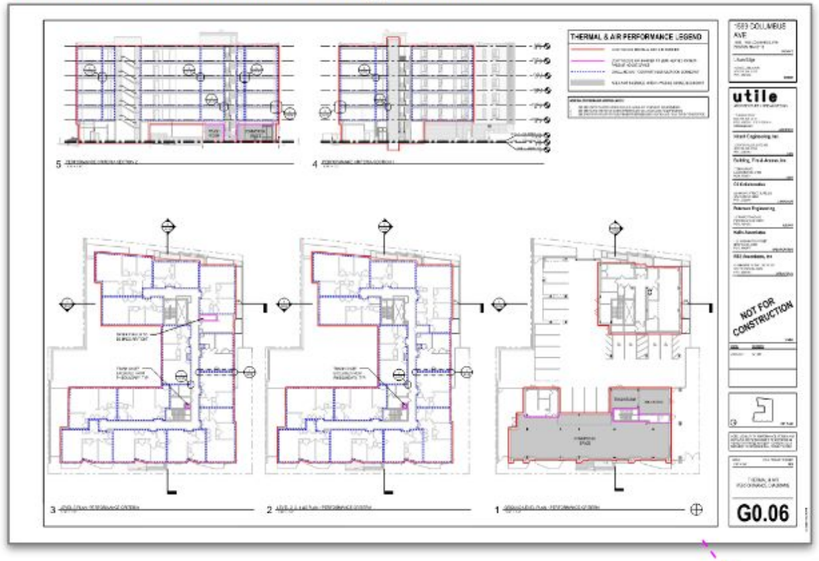
	Feasibility Study	Design Certification	
Contract Document G-Series		*R1 Submission*	*Round 2, 3…*
iCFA	X	**X**	**X**
Thermal Envelope Diagram	X	**X**	**X**
Exterior Assemblies	X	**X**	**X**
Contract Document A-Series			
Room Tags and Schedules for Int. Gain Calcs	X	**X**	**X**
Typical Exterior Details		**X**	**X**
Window Schedule, Surround Dim's		**X**	**X**
Thermal Bridge Mitigation, Details		X	**X**
Unique Conditions Exterior Details		X	**X**
Consultants			
MEP drawings meet Phius requirements		**X**	**X**
Structural includes thermal breaks as required		X	X

X	Required for CPHC inputs
X	Required for CPHC inputs + PHIUS Review

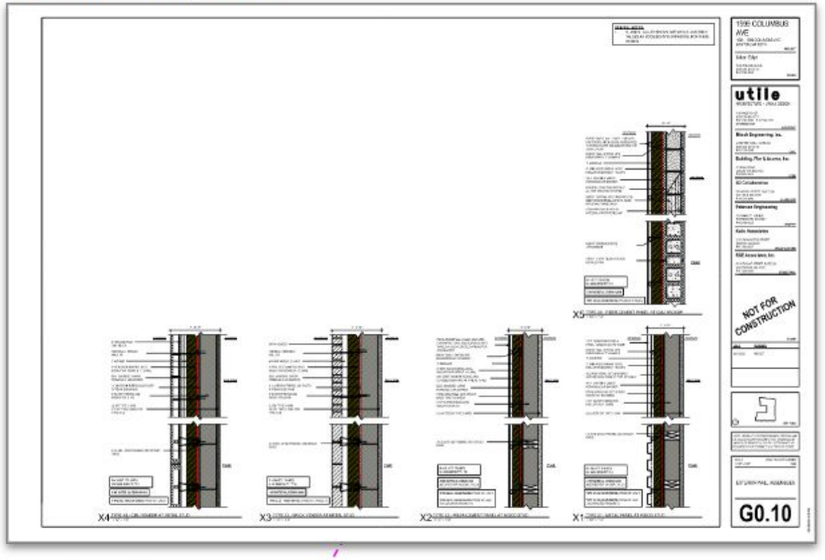
Integrate Revit and Phius Documentation

iCFA and Volume

Thermal and Air Performance Diagram Sheet/



Exterior Assembly Sheets



Inputs in WUFI

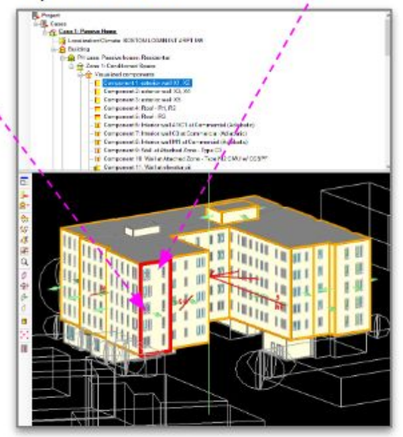
Geometry / Specific heat capacity

Setting	Setting way	Value
Visualized volume [ft³]	From visualized geometry	813185.56
Gross volume [ft³]	From visualized volume and components	813185.56
Net volume [ft³]	User defined	518414
Interior conditioned floor area [ft²]	User defined	66996
Specific heat capacity [Btu/ft²°F]	Lightweight	11

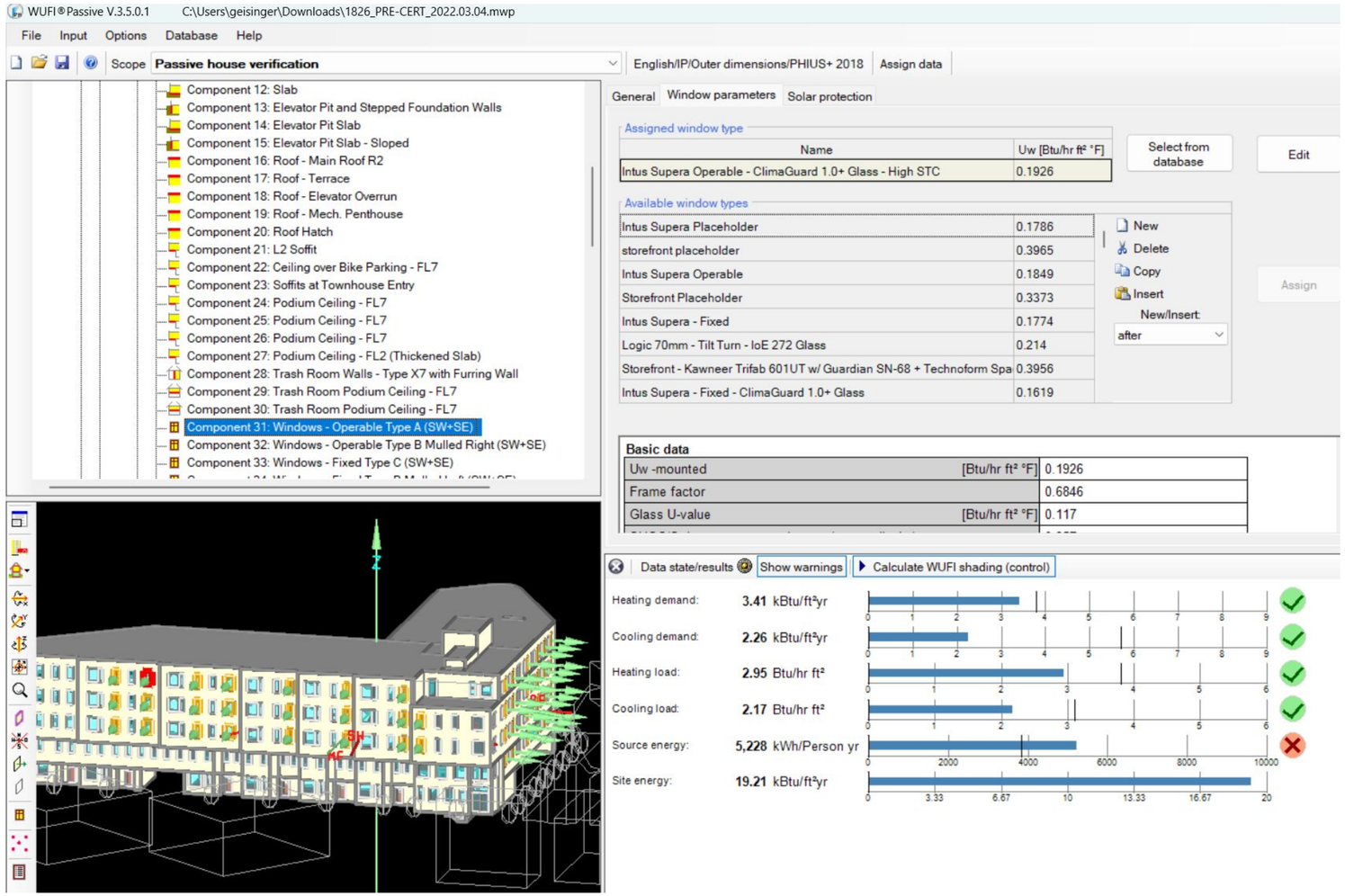
Additional data

Humidity capacity [lb/(lbw/lbda) ft²]	143.3713

Inputs in WUFI



Coordinate with Verifier +
Track changes during construction



Thank you!

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