A Successful Approach to Achieving Passive House at Scale

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A Successful Approach to Achieving Passive House at Scale

TEAM

MICHAEL INGUI, WILL CONNER, MARY GILMARTIN, ASHLEY GRIFFITH, Baxt Ingui Architects
ANDREW FISHMAN, SMR CRAFTWORKS, General Contractor
CRAMER SILWORTH, BAUKRAFT ENGINEERING, Mechanical
JOHN MITCHELL, BLDYP, Passive House Consultants
A SYSTEMATIC APPROACH TO COST-EFFECTIVE CARBON NEUTRAL BUILDINGS

BAXT INGUI’S SYSTEMATIC APPROACH INCLUDES THESE CRITICAL STEPS:

1. Educating the client on passive house in an effective way.
2. Involving the passive house consultant before or during schematic design.
3. Start the certification process with your certification body early and harness their feedback as early as possible.
4. Select and involve a contractor as early as possible, and get them and their team certified/trained.
5. Hold weekly meetings.
6. Use the blower door as a tool.
7. Openly share knowledge & receive feedback with the community.

SCHEMATIC DESIGN PHASE ENERGY MODEL OF SUMMER PERIOD WINDOW NET ENERGY BALANCE. COURTESY OF BLDGTYP, LLC.
When we renovate 100-year-old buildings, we design them to last another 100 years.
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THE PROJECT: HEALTHY HOME FOR A FAMILY
THE PROJECT: REAR GARAGE
THE PROJECT
CREATING AN OPEN, LIGHT-FILLED HOME

[Image of a modern, open-plan home with lots of natural light and a clean, light-filled interior.]
BEFORE & AFTER: ENTRYWAY
AIR SEALING STRATEGY BOTTOM TO TOP: CELLAR

1. CELLAR BEFORE
2. CELLAR HVAC INTAKE AND ORIGINAL BOILER
3. CELLAR DURING CONSTRUCTION
4. CELLAR WITH STEGO WRAPS
Air Sealing Strategy Bottom to Top: Corner Windows

1. Cellar Plan
2. First Floor Plan
3. Cellar Community Center Area = 1113 SF
4. First Floor Community Center Area = 1400 SF
AIR SEALING STRATEGY BOTTOM TO TOP: CROWN MOLDING

1. EXISTING CROWN
2. CROWN SUPPORTED AND WALL SPOT POINTED
3. LIQUID-APPLIED AIRTIGHT MEMBRANE
4. SMART MEMBRANE ADHERED TO CROWN
5. FINISHED PARLOR CROWN
AIR SEALING STRATEGY BOTTOM TO TOP: STAIRCASE

1. LIQUID APPLIED AIRTIGHT MEMBRANE UNDER STAIRCASE
2. ENTRY STAIR BEFORE
3. ENTRY STAIR AFTER
AIR SEALING STRATEGY BOTTOM TO TOP: ATTIC

1. ATTIC BEFORE
2. FRAMING OUT NEW ROOF DECK
3. WINDOWS INSTALLED
4. FINISHED ATTIC
SCALING RETROFITS...

DERISKS
PASSIVE HOUSE
FOR
ARCHITECTS,

ENSURING SUCCESS FOR PASSIVE HOUSE PROJECTS!

AND FOR
BUILDERS,
LEARNING FROM YOUR PEERS

CONTRACTOR COLLECTIVE

STUDENT WALKTHROUGHS
MECHANICAL AND VENTILATION STRATEGY
THE TEAM

Michael Ingui
Partner
Baxt Ingui Architects

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Mary Gilmartin
Technician
Baxt Ingui Architects

John Mitchell
Passive House Consultant
bldgtyp

Andrew Fishman
General Contractor
SMR Craftworks

Cramer Silkworth
Mechanical Engineer
Baukraft Engineering
IDENTIFY CHALLENGES EARLY AND STRATEGIZE WITH WHOLE TEAM
STANDARDIZED APPROACH

Boundary Condition: $q[W/m^2K] \leq [C] R[m^2K/W]$

- Walls: $0.020$ $0.140$
- Windows: $0.060$ $0.170$
- Doors: $0.020$ $0.020$

Material:
- Concrete (Lightly Reinforced) [R-0.064k]: $3.050$ $0.060$
- 20% [R-0.064k] $0.060$ $0.060$

$U_w = 0.350$ $W/[m^2K]$
STANDARDIZED APPROACH
STANDARDIZED APPROACH

Boundary Condition: $q(W/m^2)$, $T(C)$, $R(m^2.K/W)$, $\varepsilon$

Material: $\lambda(W/m.K)$

Example Materials:
- Air (unmixed, ungrounded, thickness 50 mm): 0.025, 0.000, 0.000, 0.000
- Gypsum Board (R-2.5 in): 0.070, 0.000, 0.000, 0.000
- Steel (Type A): 3.0 mm: 0.000, 0.000, 0.000, 0.000
- Glass (Type B): 1.25 mm: 0.000, 0.000, 0.000, 0.000
- Wool (Kauffman's Wool): 0.100, 0.000, 0.000, 0.000
- Asbestos (Kauffman's Insulation): 1.000, 0.000, 0.000, 0.000
- Wood (Douglas Fir): 0.015, 0.000, 0.000, 0.000
- Plastic, coated (aluminum): 0.700, 0.000, 0.000, 0.000
STANDARDIZED APPROACH TO TRICKY DETAILS
STANDARDIZED APPROACH TO TRICKY DETAILS
STILL SOME CUSTOM DETAILS... BUT NOT MANY!
SEQUENCING YOUR PROJECT
EDUCATING YOUR TEAM, CONTRACTOR CERTIFICATION, KICKOFF
SEQUENCING YOUR PROJECT: PARLOR CROWN

CLOCKWISE FROM TOP LEFT
1. CROWN SUPPORTED AND WALL SPOT POINTED
2. LIQUID-APPLIED AIRTIGHT MEMBRANE
3. SMART MEMBRANE ADHERED TO CROWN
4. FINISHED PARLOR CROWN
5. PARLOR CROWN BEFORE
6. PART OF PARLOR CROWN TAKEN DOWN
SEQUENCING YOUR PROJECT: STAIRCASE

1. ORIGINAL STAIRCASE
2. AIR SEALING AND ERV DUCTS BELOW STAIRCASE
3. FINISHED ENTRYWAY
4. FINISHED NEWEL POST
5. NEWEL POST RESTORATION
SEQUENCING YOUR PROJECT: WOOD FLOORING
SEQUENCING YOUR PROJECT: STRUCTURE
RE-EDUCATING CONSTRUCTION WORKERS: TRAINING

TRAINING NEW CONTRACTORS IS IMPORTANT, BUT EQUALLY, IF NOT MORESO, IS RE-TRAINING CONTRACTORS WHO HAVE BEEN IN THE BUSINESS FOR YEARS.
CODE REQUIREMENTS: LOCAL LAW 97 AND BEYOND

NYC Climate Mobilization Act

Decarbonizing NYC's Buildings
New York City, NY

CODE IMPROVMENTS WILL HELP LEVEL THE PLAYING FIELD.
LARGE SCALE CLIMATE ACTION IS BEST ACHIEVED THROUGH MUNICIPAL ACTION.
PRODUCT AVAILABILITY AND EVOLUTION
THANK YOU!