# KING'S BLOCK HISTORIC RETROFIT

LEVERAGING PASSIVE HOUSE ON A 200-YEAR-OLD BUILDING: RESILIENT AND NET-ZERO READY

10.15.2021





# **INTRODUCTION: PROJECT GOALS**

# CHALLENGES OF HISTORIC STRUCTURES: REGULATORY PERSPECTIVE

**MAKING HISTORIC BUILDINGS RESILIENT: FLOOD ZONES & OTHER CHALLENGES** 

**STRATEGIES FOR ZERO ENERGY READY: ENVELOPE, BUILDING SYSTEMS & ON-SITE ENERGY GENERATION** 





PROJECT GOALS



PASSIVE HOUSE PRINCIPALS

THERMAL ENVELOPE

CONTINUOUS AIR BARRIER

RESTRICT TOTAL ENERGY USE

RESILIENCY

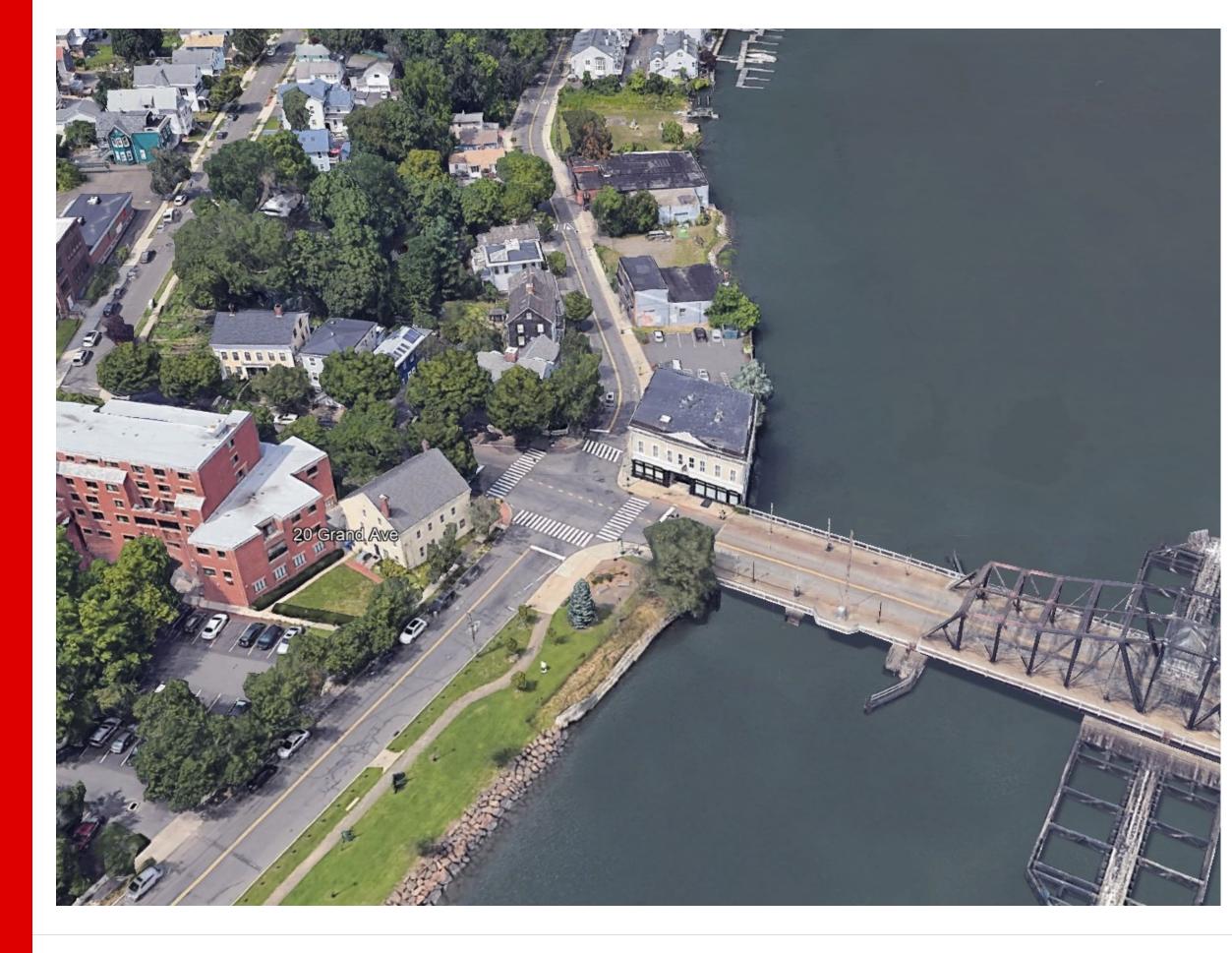
DISCONNECTING A HUMID BASEMENT FROM THE ENVELOPE (FLOOD PLAIN)

NET-ZERO OR NET-ZERO READY?

MEET HISTORIC DISTRICT REQUIREMENTS

ALL EXTERIOR ELEMENTS ARE SUBJECT TO REVIEW





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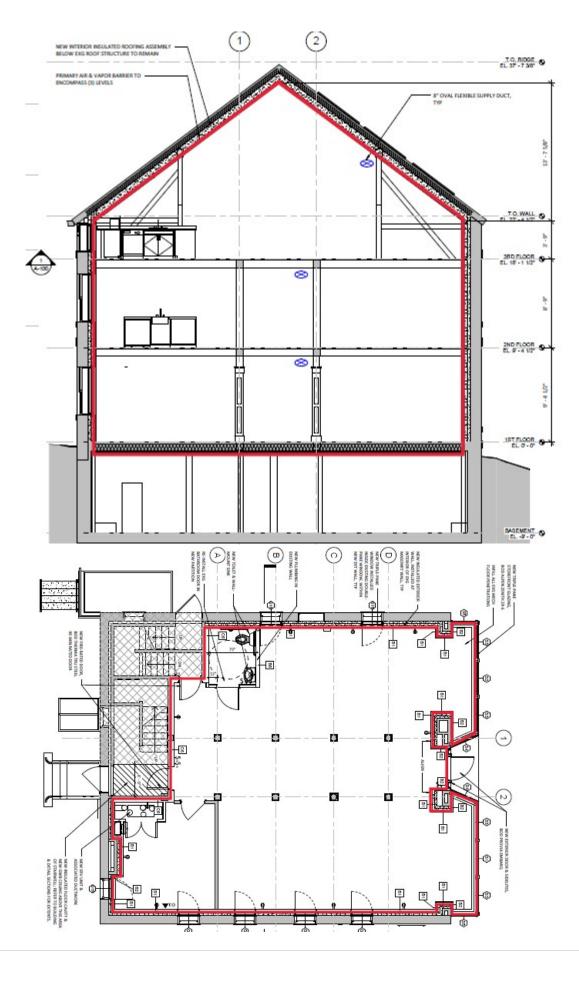
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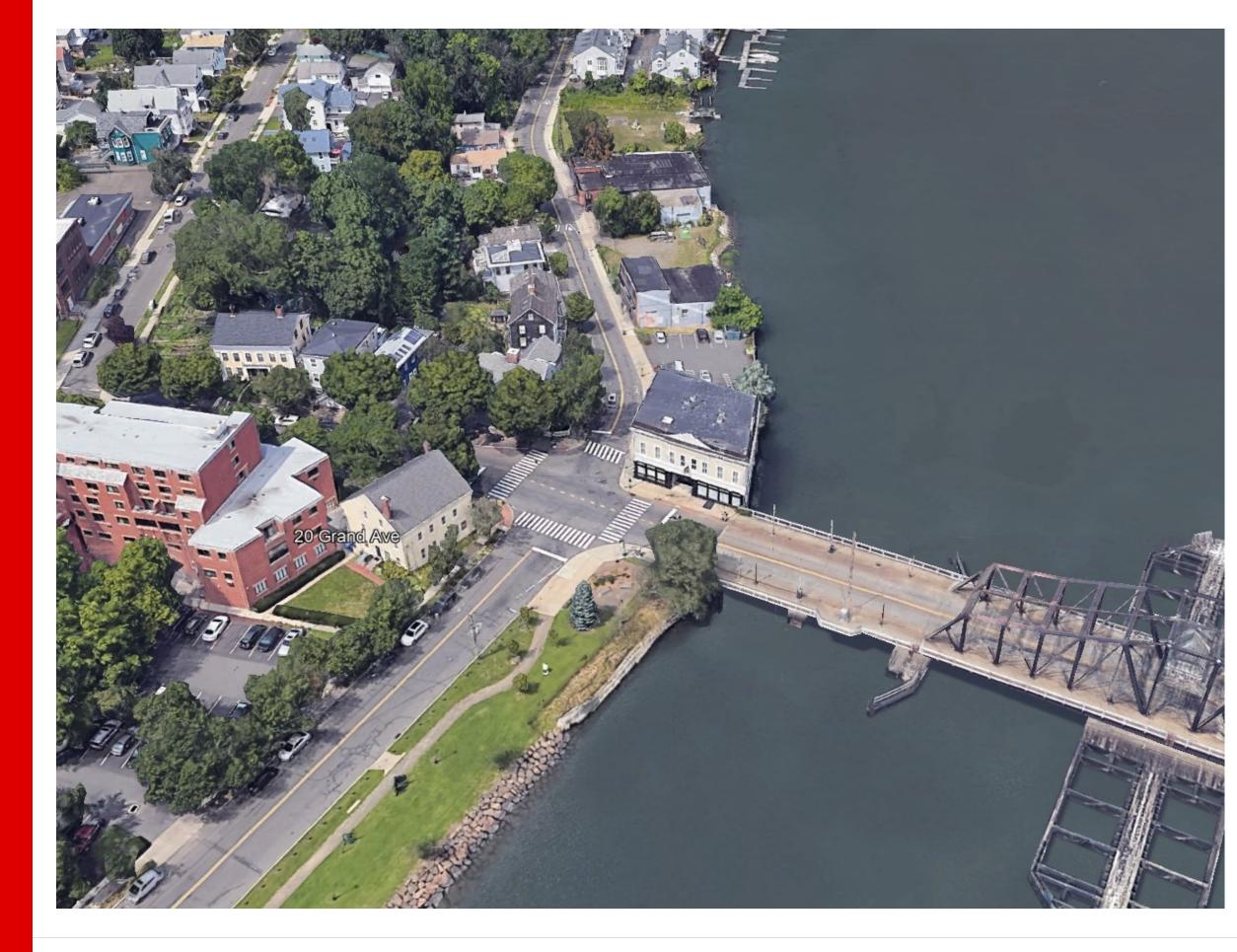
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CHALLENGES OF HISTORIC STRUCTURES: REGULATORY PERSPECTIVE

#### HISTORIC DISTRICT COMMISSION

#### MISSION

"the commission works to promote the educational, cultural, economic and general welfare of the public through the preservation and protection of the distinctive characteristics of buildings and places associated with the history of or indicative of a period or style of architecture of the municipality, of the state or of the nation"

#### SCOPE

"such portion of the exterior of a structure or building as is open to view from a public street, way or place"

#### OUR BUILDING

"oldest free-standing commercial building in New Haven"

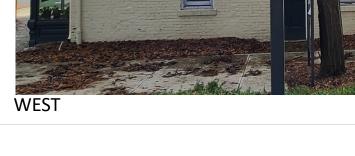






NORTH





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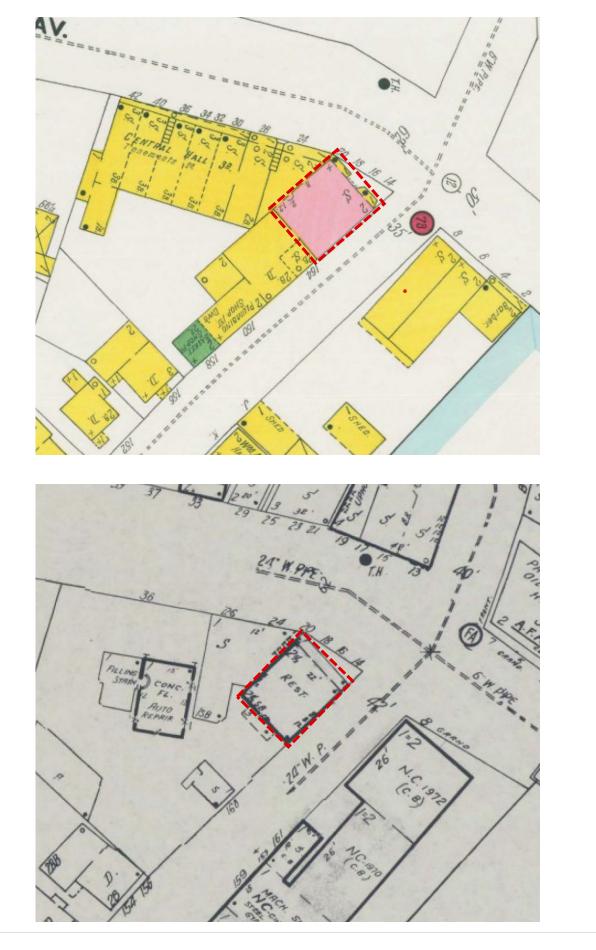
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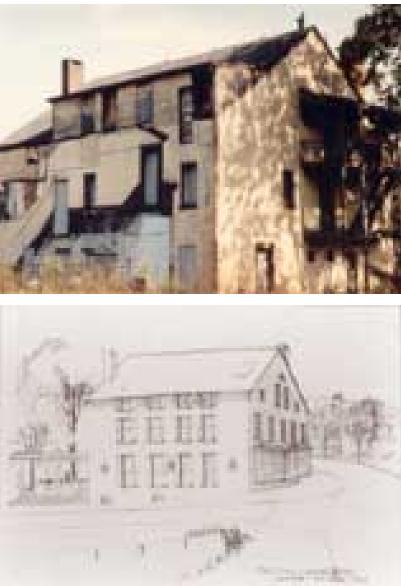




HISTORICAL SANBORN MAPS











## **KING'S BLOCK PASSIVE HOUSE RETROFIT**

Patriquin Architects is pursuing a Passive House retrofit of our historic masonry office building.

Passive House is a rigorous design standard for energy efficient new or retrofitted buildings.

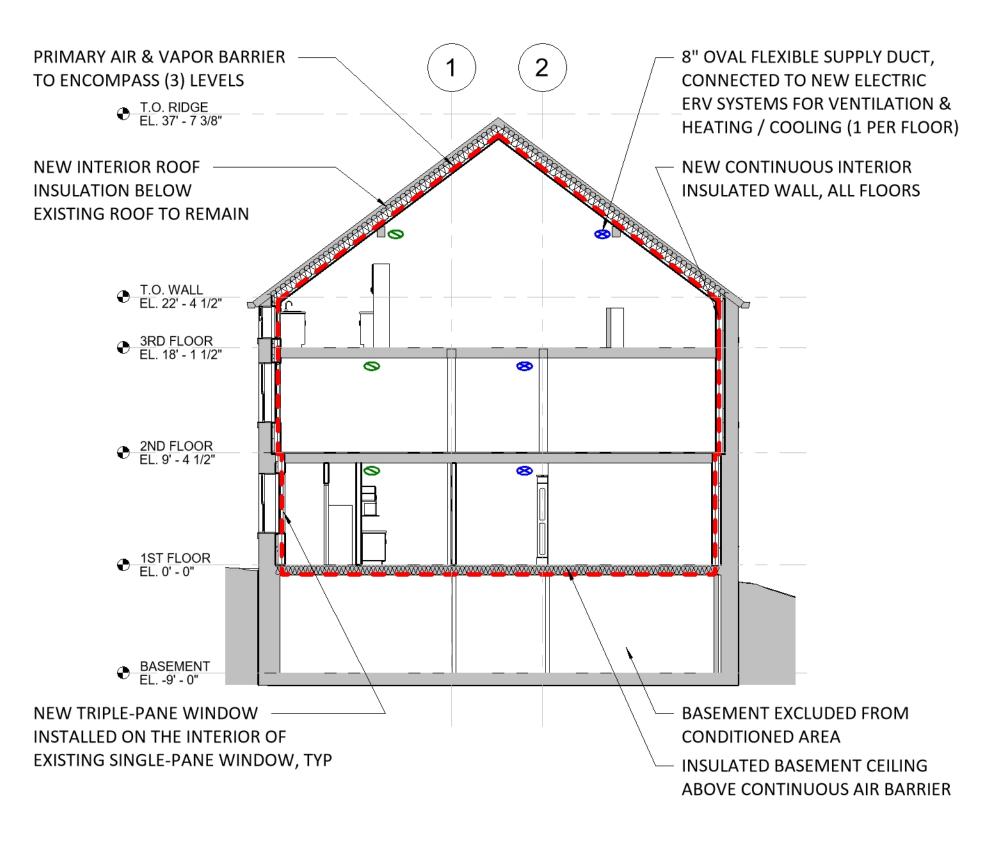
## Our retrofit primarily includes the following:

- 1. Improved envelope
- 2. Improved interior windows
- 3. New mechanical systems, separate for each floor

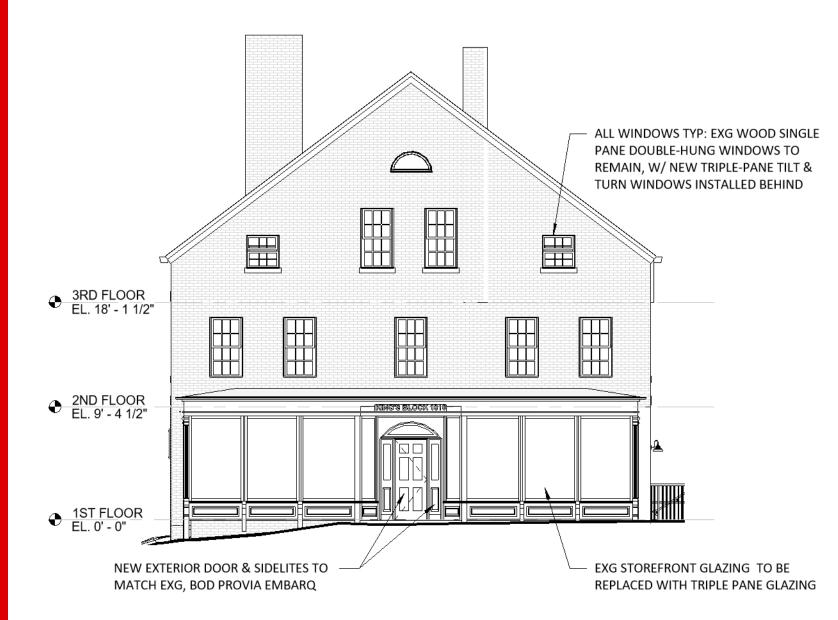
## It is our hope that this retrofit will result in the following:

- 1. Respond to climate change through greatly improved energy efficiency
- 2. Improved interior conditions and occupant health
- 3. Resiliency: Extend the building's lifespan and preserve a key part of New Haven architectural history

We have designed our retrofit to minimally impact the exterior of the building & maintain its historic character.









PROPOSED NORTH ELEVATION 1/8" = 1'-0" EXISTING NORTH ELEVATION Not to Scale

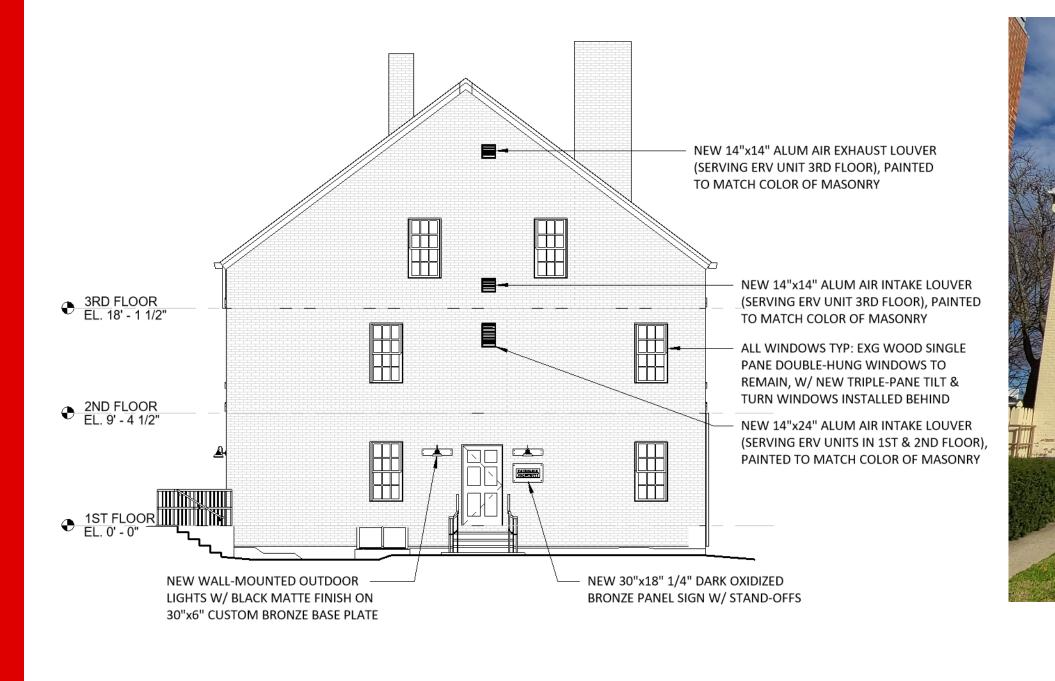
PROPOSED & EXISTING BUILDING ELEVATIONS











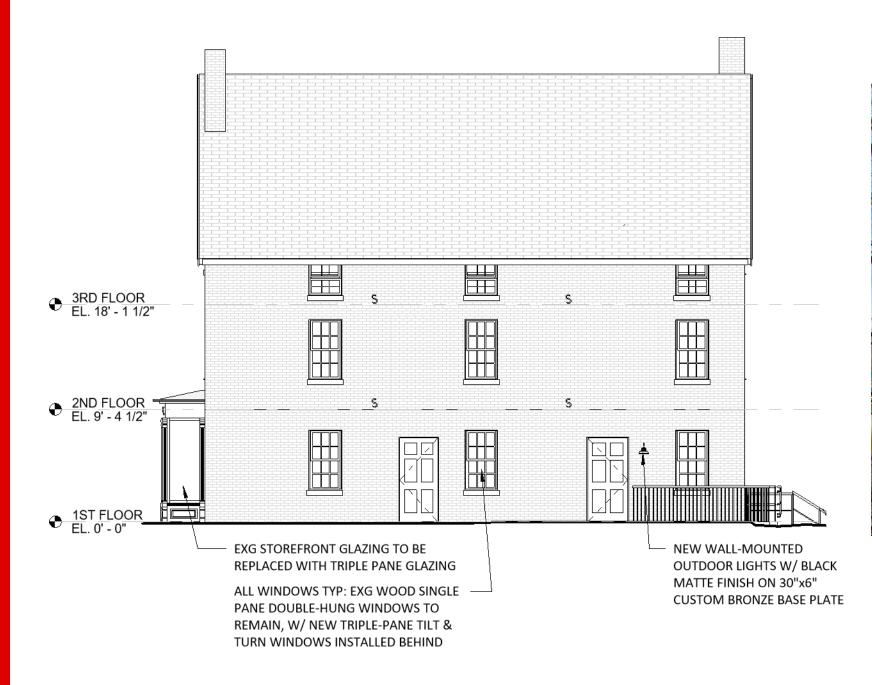
#### PROPOSED SOUTH ELEVATION 1/8" = 1'-0"

**EXISTING SOUTH ELEVATION** Not to Scale

**PROPOSED & EXISTING BUILDING ELEVATIONS** 







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PROPOSED EAST ELEVATION 1/8" = 1'-0" EXISTING EAST ELEVATION Not to Scale

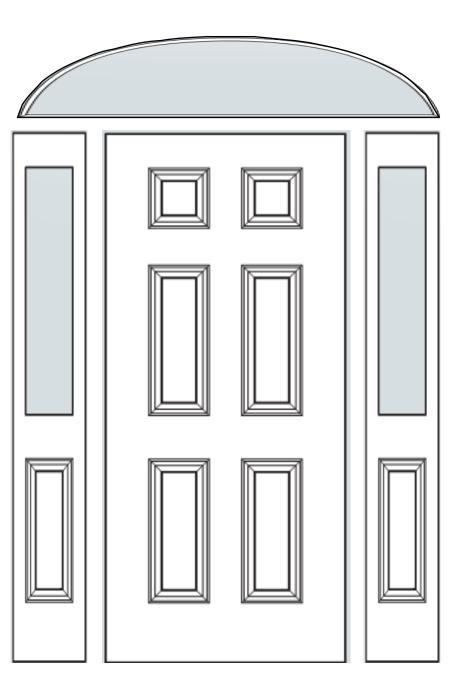
PROPOSED & EXISTING BUILDING ELEVATIONS





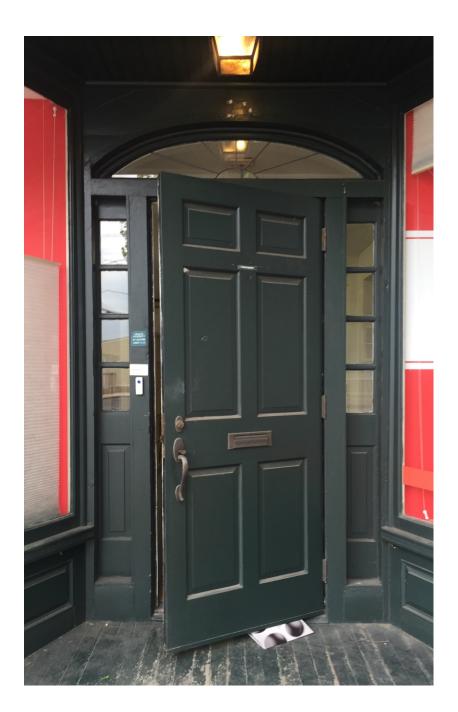
PROPOSED FRONT DOOR

PAINTED FIBERGLASS, OIL-RUBBED BRONZE HANDLE



#### EXISTING FRONT DOOR

PAINTED WOOD, GLAZED SIDELIGHTS & TRANSOM











#### EXISTING FRONT STOREFRONT GLAZING

#### DOUBLE-PANE GLAZING, PAINTED WOOD MULLIONS

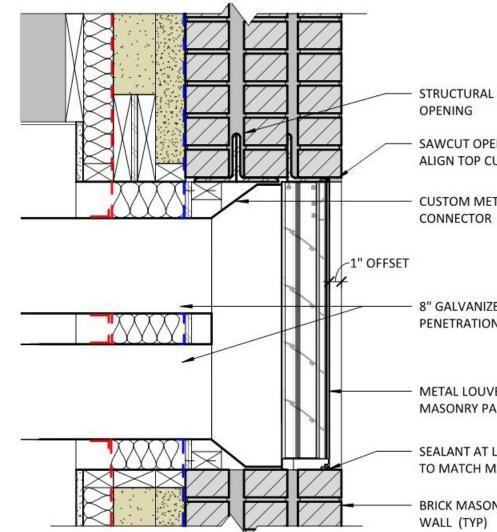
PROPOSED STOREFRONT MATERIALS & DETAILS

#### PROPOSED FRONT STOREFRONT GLAZING

#### TRIPLE-PANE, PAINTED WOOD WINDOWS

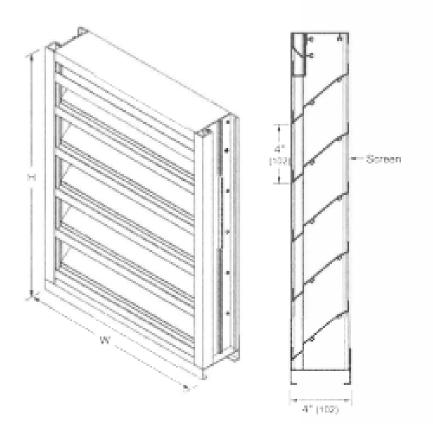


#### TYPICAL LOUVER SECTION



PROPOSED LOUVER

#### PAINTED MATTE TO MATCH EXISTING FACADE



NOTE: DIMENSIONS VARY. SEE ELEVATIONS

PROPOSED LOUVER SECTION 1-1/2" = 1'-0"

STRUCTURAL SUPPORT FOR NEW

SAWCUT OPENING FOR NEW LOUVERS. ALIGN TOP CUT WITH BOTTOM OF BRICK

CUSTOM METAL LOUVER & DUCT

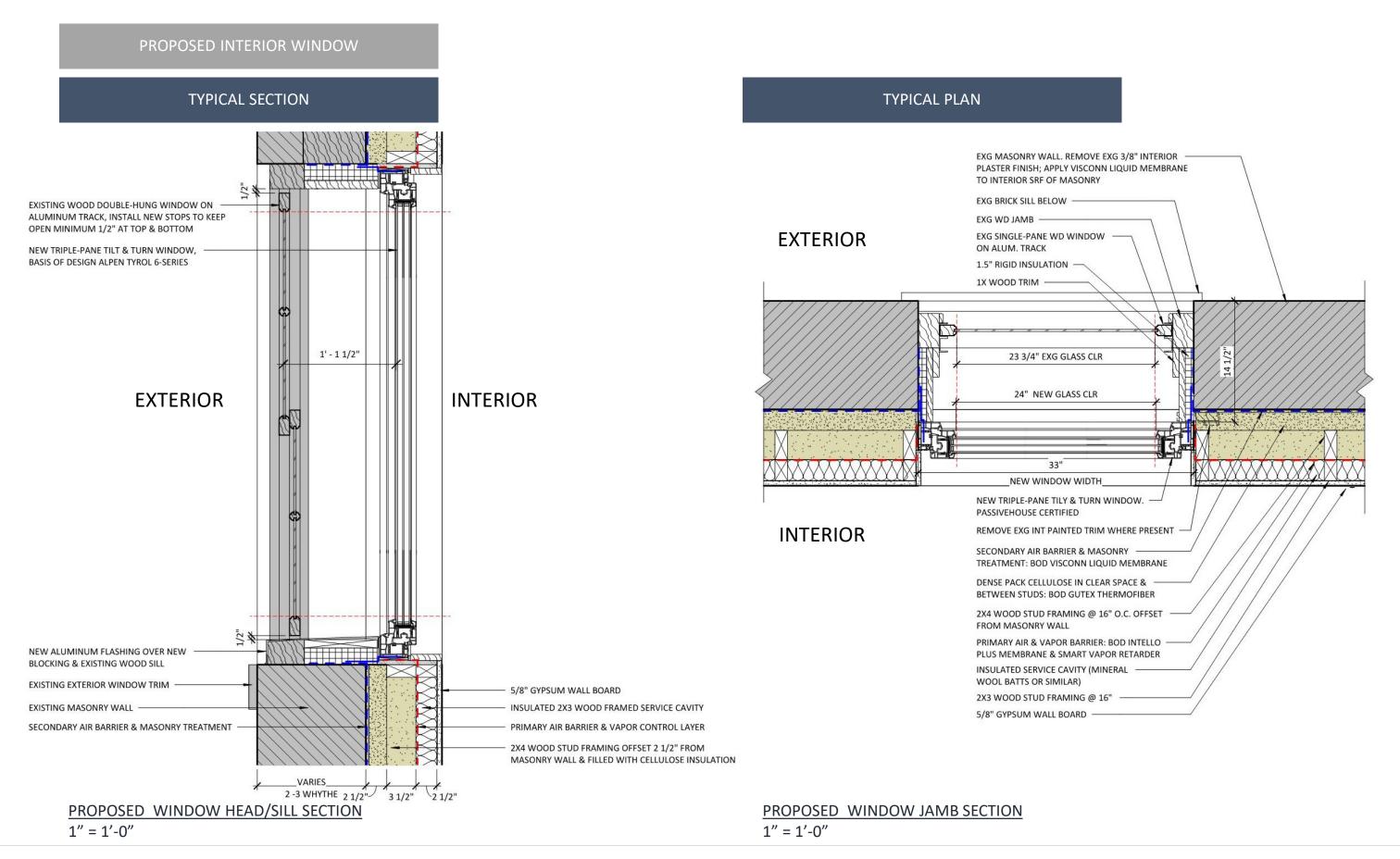
8" GALVANIZED DUCTWORK. TAPE PENETRATION THROUGH AIR BARRIER

METAL LOUVER PAINTED TO MATCH MASONRY PAINT COLOR

SEALANT AT LOUVER PERIMETER PAINTED TO MATCH MASONRY PAINT COLOR

BRICK MASONRY EXTERIOR







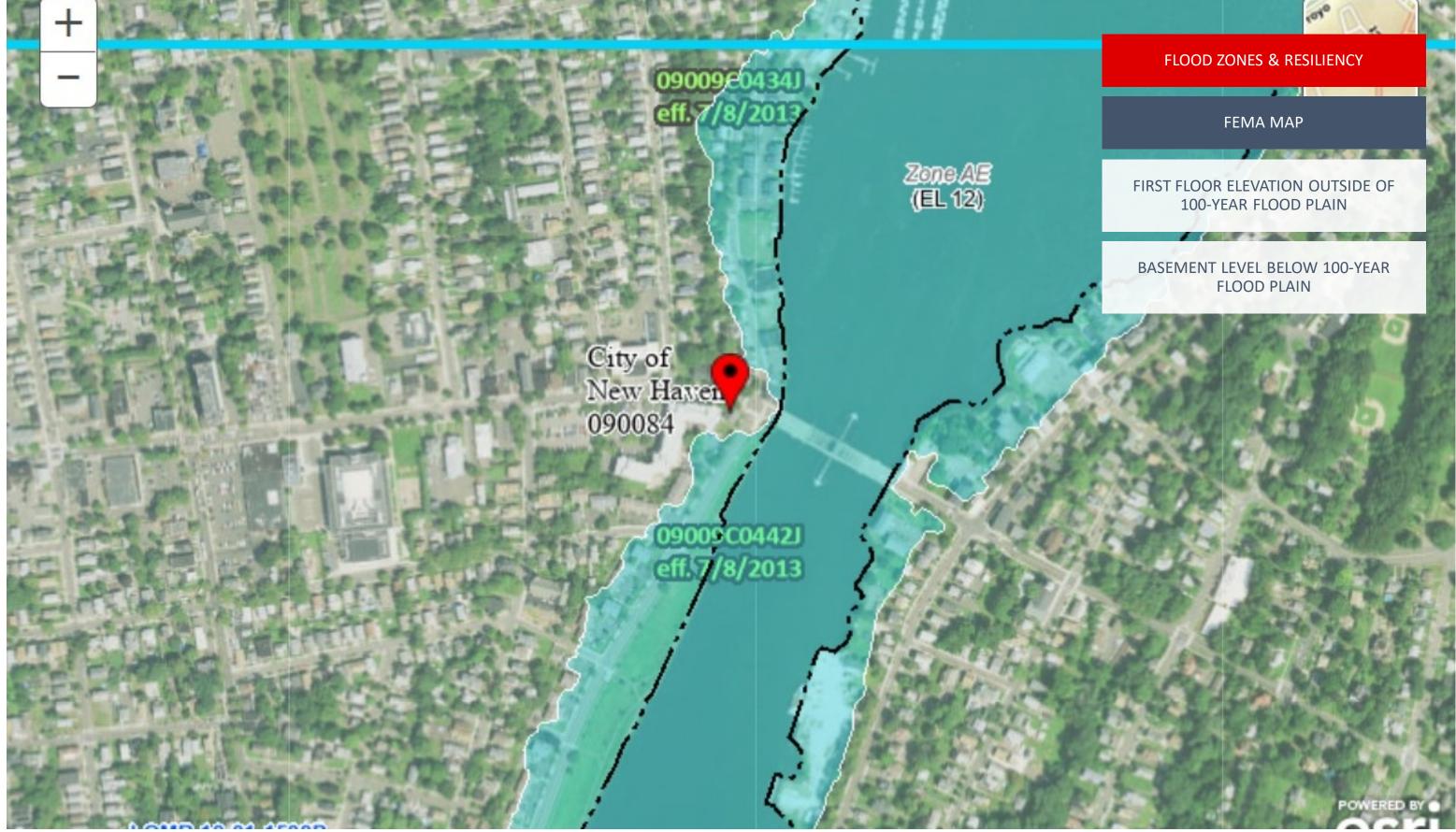
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## FLOOD ZONES & RESILIENCY

#### FEMA MAP

#### FIRST FLOOR ELEVATION OUTSIDE OF (above) 100-YEAR FLOOD PLAIN

#### BASEMENT FLOOR LEVEL BELOW 100-YEAR FLOOD PLAIN



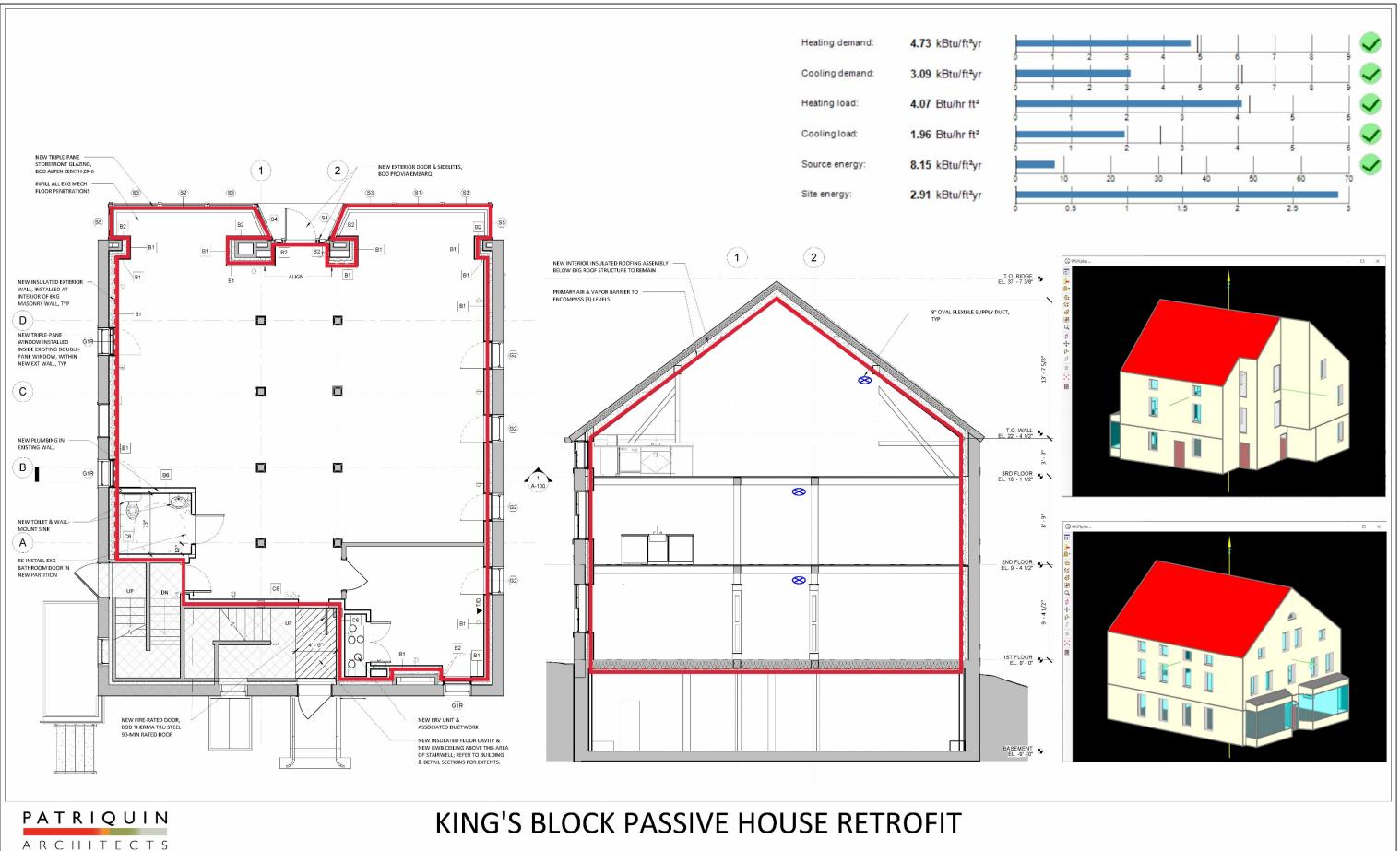
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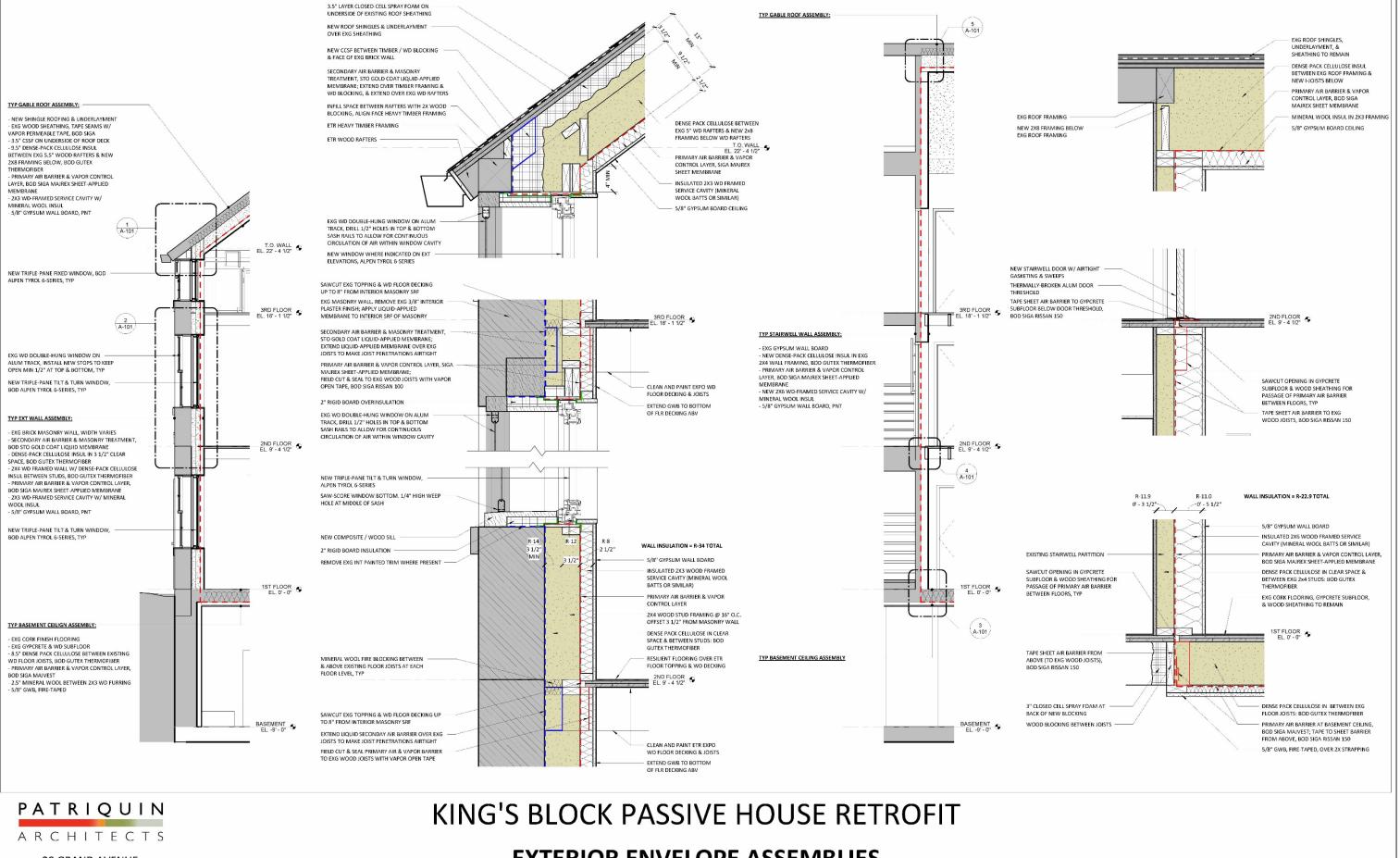
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20 GRAND AVENUE NEW HAVEN, CT 06513 BUILDING CONCEPTS

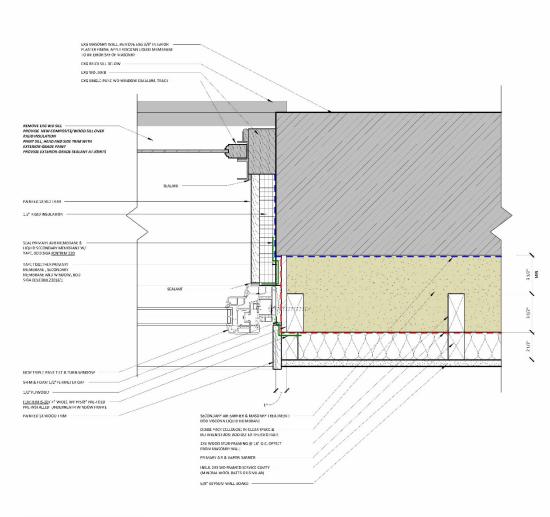


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## **EXTERIOR ENVELOPE ASSEMBLIES**

PRIMARY AIR BARRIER & VAPOR CONTROL LAYER, SIGA MARREX SHEET APPLIED MEMIRRANE; FIELD CUT & SEAL TO EXE WOOD JOISTS WITH VAPOR POTENTIALS BOTTOM OF JOIST, LOCATIO VARIOS PER FLOOR, VIF WALL TOP OF PLATE PROVIDE WOOD HEADER. 2X6 MIN S 2" RIGID INSULATION TO CONNECT PRIMARY & SECONDARY BARRICH AROUND WINDOW PERMETER. PROVIDE FORM SEALANT AT GAPS BETWEEN UNEVEN WALL SURFACE AND BOARD -2" RIGID BOARD C 1X WOOD TRIM. CAULK IN TERSECTIONS 1X PAINTED FRAME AT JAMBS & HEAD SIDES FENTRIM IS 20 (4" WIDEL WITH PRE FOLD PRE INSTALLED UNDERNEATH WINDOW FRAME EKG WO DOUBLE-HUNG WINDOW DN ALUM TRACK, SCORE 1/2' WEEP HOLES IN TOP & BOTTOM SASH RAILS TO ALLOW FOR CONTIN чv UNDERVENTION AND A DESCRIPTION 14 1/2" 1 NEW TRIPLE PANE TILT & TURN WINDOW, ALPEN TYROL 6-SCRIES, FRAME HORZONTALLY CENTERED TO WINDOW OPENING EXG SINGLE-PANE GLAZING -+1 SAW-SECRE WINDOW BOTTOM, 1/4" HIGH WEEP FOLE AT MIDDLE OF SASH GLAZING LEVEL REMOVE EKG WD SILL PROVIDE NEW COMPOSITE/WOOD SILL OVER RIGIO INSUATION PANT SILL, NEAD AND SIDE TRIM WITH EXTERIOR-GRADE PAINT ROVIDE EKTERIOR-GRADE SEALANT AT JOINTS 3 1/2" WD SCREW & CA SHIM & FOAM 1/2" PERIMETER GAP 1/2" 1/2" PLYNODD 2" RIGID BOARD INSULAT I FRAM UTHIM 230 IE FENTRIM IS 20 ( 4" WIDE), WITH 5/8" PRE FOLD PRE INSTALLED ON WINDOW FRAME VEMBRAN DENSE PACK CELLULOSE IN CLEAR SPACE & BETWEEN STUDS: BOD GUTEX THERMORIBER 2X4 WOOD STUD FRAMING @ 24" D.C.

1/2" MIN



INSUL 2X3 WO FRAMED SERVICE CAVITY (MINERAL WOOL BALLS OR SIMILAR) 5/8" GY/SUM WALL BOARD

2ND FLOOR EL. 9' - 4 1/2"

WINDOW & TAPE INSTALLATION SEQUENCING: - INSTALL PRIMARY AIR BARRIER AND EXTEND TO WD WINDOW OPENING FRAME AS SHOWN - TAPE CORNER SEAMS OF PRIMARY AIR BARRIER AT WD WINDOW OPENING FRAME. BOD FENTRIM 230 - PROVIDE SEAL CONNECTION BETWEEN PRIMARY MEMBRANE AND SECONDARY MEMBRANE WITH TAPE. BOD FENTRIM 230 - PROVIDE SEAL CONNECTION BETWEEN PRIMARY MEMBRANE AND SECONDARY MEMBRANE WITH TAPE, BOD FENTRIM PRE INSTALL TAPE ONTO WINDOW FRAME, BOD FENTRIN IS20
INSTALL WINDOW AT FRAME OPENING. SHIM AS REQUIRED
INFLL SHIM GAP WITH FOAM
REMOVE TAPE COVER AND TAPE TO INTERIOR SIDE OF WOOD WINDOW OPENING FRAME
TAPE WINDOW AT EXTERIOR SIDE. CONNECT W/ TAPE PRIMARY MEMBRANE, SECONDARY MEMBRANE AND WINDOW
INSTALL SUMMER AND TAPE TO INTERIOR SIDE OF WOOD WINDOW OPENING FRAME
TAPE WINDOW AT EXTERIOR SIDE. CONNECT W/ TAPE PRIMARY MEMBRANE, SECONDARY MEMBRANE AND WINDOW

- INSTALL BLOWN-IN INSULATION - INSTALL BLOWN-IN INSULATION - INSTALL SERVICE CAVITY FRAME , INSULATION AND GWB - INSTALL 1X WOOD TRIM AT SILL, JAMBS AND HEAD SIDES



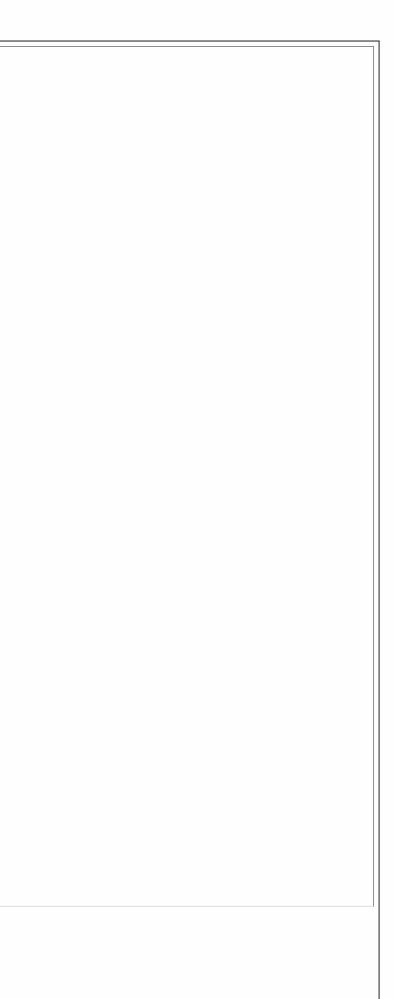
PRIMARY AIR BARRIER & VAPOR CONTRUL LINE. SIGA MAURUS SHIET-APPLIED MEMBRANT; HIED CUT & SEAL TO KRE WOOD JOBIS WITH VAPOR OPEN TAPE, BOD SIGA RISSAN 100

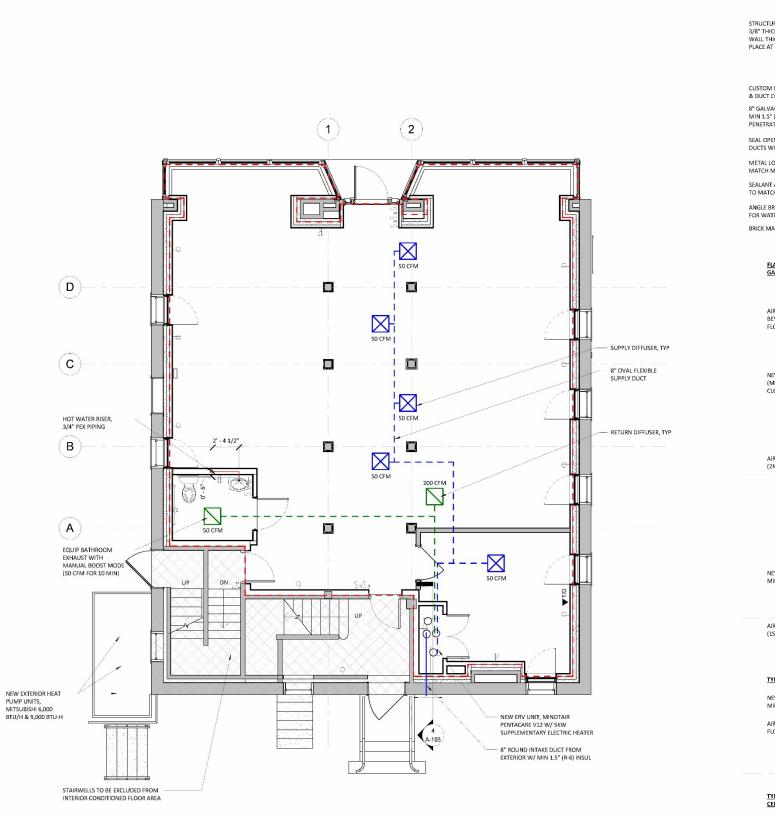
#### ARCHITECTS

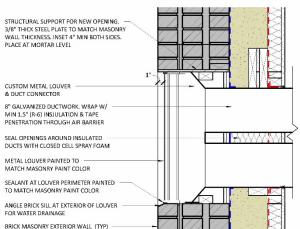
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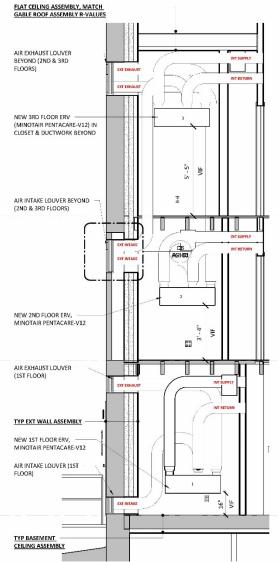
## **KING'S BLOCK PASSIVE HOUSE RETROFIT**

## WINDOW DETAILING









**KING'S BLOCK PASSIVE HOUSE RETROFIT** 

## 20 GRAND AVENUE

PATRIQUIN

ARCHITECTS

## **MECHANICAL STRATEGY**

NEW HAVEN, CT 06513

