U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

BUILDING TECHNOLOGIES PROGRAM

Whole-House Design and Commissioning in the Project Home Again Hot-Humid New Construction Community

Philip Kerrigan
Building Science Corporation

September 2012

Building America U.S. Department of Energy

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Prepared for:

Building America

Building Technologies Program

Office of Energy Efficiency and Renewable Energy

U.S. Department of Energy

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September 2012

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Unless otherwise indicated, all figures were created by BSC.

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Definitions

ACCA	Air Conditioning Contractors of America
BA	Building America Program
BEopt	Building Energy Optimization Program
BSC	Building Science Corporation
ccSPF	Closed-cell spray polyurethane foam
CFIS	Central fan integrated supply
CFL	Compact fluorescent lamp
CFM	Cubic feet per minute
DOE	U.S. Department of Energy
EF	Energy factor
EPS	Expanded polystyrene
gpm	Gallons per minute
HSP	House Simulation Protocol
HSPF	Heating season performance factor
IECC	International Energy Conservation Code
LEED	Leadership in Energy and Environmental Design
NREL	National Renewable Energy Laboratory
o.c.	On center
ocSPF	Open-cell spray polyurethane foam
OSB	Oriented strand board
SEER	Seasonal Energy Efficiency Ratio
SIP	Structurally insulated panel
SIR	Savings to investment ratio
UV	Ultraviolet
WFCM	Wood Frame Construction Manual

Executive Summary

This report describes work conducted by the Building Science Corporation (BSC) Building America Research Team's "Energy Efficient Housing Research Partnerships" project for Task Order No. KNDJ-1-40337-02 under Task Ordering Agreement No. KNDJ-1-40337-00. The period of performance was May 15, 2011 through January 15, 2012. This technical report is for 10 single-family new construction homes in New Orleans, Louisiana.

BSC seeks to further the energy efficiency market for New Orleans area new construction by supporting projects that are based on solid building science fundamentals and verified implementation. BSC is working with Green Coast Enterprises on 10 new construction homes in New Orleans. All these homes are being managed by Green Coast Enterprises.

BSC seeks to address the following research goals and questions on the 10 test houses:

- Is there a difference in infiltration rates between the two enclosure systems used at Project Home Again Phases V and VI?
- What are the measured ventilation rates in the homes? How do the ventilation rates compare between different project teams?
- What are the measured individual register flows? How do they compare to the Manual J8 design CFM flows?
- What is the cost benefit analysis of the technology package using confirmed cost data and the source energy consumption simulation predictions?

1 Introduction

Building Science Corporation (BSC) seeks to establish and maintain an energy efficiency market penetration in a hot-humid climate for new residential construction. Green Coast Enterprises is a local real estate development firm that has been working on new construction projects in New Orleans with BSC under the Building America (BA) program. Two communities were constructed to BA standards through this partnership: Project Home Again (PHA)[1] Phase V and Phase VI. The report is for 10 new construction homes that were finished in 2011 (see Appendix A and D).

Table 1. Team Members

Company Name	Team Member	Email	Phone
Green Coast Enterprises	Reuben Teague	reuben@greencoastenterprises.com	(504) 281-4372
TKTMJ Inc.	Thomas Tubre	thomas.tubre@tktmj.com	(504) 373-5107
Sustainable Architecture	John Shackai	johnschackai@mac.com	(504) 342-4925
C&G Construction	C.J. Minor	cngconstruction@bellsouth.net	(504) 464-1800
John C Williams	Sarah Howell	showell@williamsarchitects.com	(504) 566-0888
E3 HERS Rater	Ben Millar	ben.millar@e3buildingsciences.com	(239) 949-2405

PHA (www.projecthomeagain.net/) is a not-for-profit development that was started by the Riggio Foundation to provide homes to those whose homes were destroyed or badly damaged by Hurricane Katrina. From the website: "To qualify for a Project Home Again House, an applicant must have owned a home in Gentilly prior to Hurricane Katrina and be unable to amass the resources needed to repair and reoccupy that home."

The potential homeowners must be willing to "swap" their current properties for PHA homes and must live in the new PHA homes for at least five years. Potential homeowners are responsible for paying property taxes, insurance, fuel and general maintenance, and must be employed in the New Orleans area. PHA is in the process of selecting potential homeowners who meet these criteria. Approximately 100 homes were completed by the end of 2011, including four previous phases.

Two separate Phases of PHA were constructed in 2011. Phase VI consisted of 15 new construction single-family homes in New Orleans that were constructed under BA by the builder and architect team of TKTMJ and Sustainable Architecture, which constructed all previous PHA

[1]Nonprofit housing development organization, learn more at http://www.projecthomeagain.net/.

homes. A new builder and architect team, C&G Construction and John C. Williams, was hired to build Phase V, which has 10 new construction homes.

1.1 Background

BSC has been collaborating with Green Coast Enterprises on a nonprofit new construction venture called Project Home Again. PHA has been constructing BA homes with BSC since 2008 (Hahn 2010). About 70 homes were constructed between 2008 and 2010 with PHA; 25 more houses were constructed in 2011. All PHA homes are developed with Green Coast Enterprises.

BSC is under contract to provide BA support to 10 new homes with Green Coast Enterprises. The lessons learned and technology transfer that result from this cooperation will lead to the wider deployment of energy-efficient design in the region.

1.2 Relevance to Building America Goals

Overall, the goal of the U.S. Department of Energy's (DOE) BA is to "demonstrate how cost-effective strategies can reduce home energy use by up to 50%, for both new and existing homes, in all climate regions by 2017" (DOE).

The collaboration between BSC and PHA has the potential to influence decisions on hundreds of new homes over the next three years. The experience and lessons learned that will be communicated through BA have the potential to educationally serve the entire residential construction community in the region. The hot-humid technology packages will significantly affect aspects of residential housing other than energy efficiency. The enclosure and mechanical upgrades will allow for superior thermal control compared to standard homes, and will result in more comfortable living environments. Proper filtering combined with mechanical ventilation will maintain a high level of indoor air quality. A flood-recoverable enclosure design will increase the durability of the structure, as the insulation will be able to remain after a significant wetting event.

All the PHA homes fully comply with the 2009 International Residential Code and International Energy Conservation Code (IECC). The mechanical ventilation systems comply with American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.2 (ASHRAE 2010) and the structures comply with the 130 mph Exposure B Wood Frame Construction Manual (AFPA). Wooden piles were installed according to a geotechnical engineer's recommendation and all homes were elevated 1 ft above the Base Flood Elevation as determined by Federal Emergency Management Agency flood maps.

2 New Construction Measures

2.1 Energy Efficiency Packages

The primary goal of this project was to develop and implement an energy efficiency package that will improve whole-house source energy savings by at least 20% over the B10 Benchmark. Other goals were to improve the durability and sustainability of the homes and to achieve these objectives with the most positive possible cost/benefit ratio. This research project will endeavor to serve as a technology pathway model for the new construction market in New Orleans.

2.1.1 Phase V Specifications

The Phase V enclosure design is summarized in Table 2. An example floor plan, called the 2A, can be found in Appendix G. The dimensions and areas of each plan and the building specifications can be found in Appendix B.

Table 2. Phase V Enclosure Specifications

Enclosure	Specifications
Ceiling	
Description	Light color asphalt shingles on rafter roof—unvented cathedralized attic
Insulation	R-30 low density 0.5 lb/ft^3 open cell spray foam (ocSPF) (8.5 in.) on underside of roof FlameSeal intumescent coating installed on foam for ignition barrier
Walls	
Description	Steel structurally insulated panels (SIPs) with 4-in. expanded polystyrene (EPS) core (Oceansafe)
Insulation	R-16 (4 in. EPS core)
Foundation	
Description	Wood pile foundation—vented crawlspace with borate-treated 14-in. TJIs
Insulation	R-13 high-density 2.0 lb/ft^3 ocSPF (2 in.) in floor joist bay
Windows	
Description	Double-pane vinyl-framed with LoE^3 spectrally selective glazing
Manufacturer	Showcase windows
U-Value	U = 0.38
SHGC	SHGC = 0.23
Infiltration	
Specification	2.5 in.^{2} leakage area per 100 ft^2 enclosure @ 50 Pa
Performance Test	Average test result = 1.4 in.^{2} leakage area per 100 ft^2 enclosure @ 50 Pa

Each PHA Phase V house is elevated about 6 ft above grade on wooden piles. The crawlspace is vented and the perimeter fenced with low-cost wood latticework that will allow floodwater to pass through and is inexpensive to fix. A metal flashing piece is installed over each pier as a capillary break, with a borate-treated sill plate.

Floor framing is pressure-treated borate 14-in. TJIs at 24 in. o.c. spacing and the subfloor is ¾-in. CDX plywood. The joist bays were insulated with 2 in. of high-density 2.0 lb/ft^3 spray foam (R-13) to the underside of the tongue-and-groove CDX subfloor.

Exterior walls are steel SIPs from a local company called Oceansafe. They consist of 4-in. EPS (R-16) between layers of 25-gauge galvalume steel. The SIP joints were taped. Preprimed fiber cement board was installed directly onto the steel SIPs.

The roof has R-30 low-density 0.5 lb/ft^3 ocSPF (8.5 in.) installed under the roof deck to create an unvented cathedralized attic. Light-color hurricane-rated asphalt shingles were installed over #15 felt roofing underlayment over ⅝-in. CDX roof sheathing. The roof sheathing has the joints taped with butyl-based adhesive-backed flashing strips. The building code requires that intermittently occupied spaces with exposed spray foam must have an ignition barrier. Therefore, PHA sprayed an intumescent coating called FlameSeal over the entire open cell low-density 0.5 lb/ft^3 insulation in the unvented cathedralized attic.

The windows installed at PHA Phase V have vinyl frames and LoE^3 spectrally selective glazing. The low SHGC of 0.23 reduces solar gain, resulting in a smaller rightsized heat pump and lowered annual space conditioning energy consumption. This glazing technology has some secondary benefits as well, such as reducing ultraviolet (UV) damage on interior floors or fading on furniture. The glass is impact resistant, so no additional window protection is needed during severe weather.

The air infiltration goal at PHA is commensurate with the BA infiltration goal of 2.5 in^2 of free area per 100 ft^2 of enclosure. The steel SIP walls plus the spray foam on the roof and floor assemblies contribute much to this. The low expanding spray foam that is installed between the window frame and the rough opening is also critical. The high-density 2.0 lb/ft^3 ccSPF is critical in the floor assembly because the low permeability rate of the foam will resist any upward vapor drive. It will also keep the subfloor warm and minimize condensation. PHA was careful to avoid impermeable floor coverings and to prevent moisture from being trapped and condensing. This will have a positive effect on the durability and the indoor air quality of the house (Lstiburek 2008, Glass 2010).

The architectural floor plans for Plan 2A are included in Appendix J.

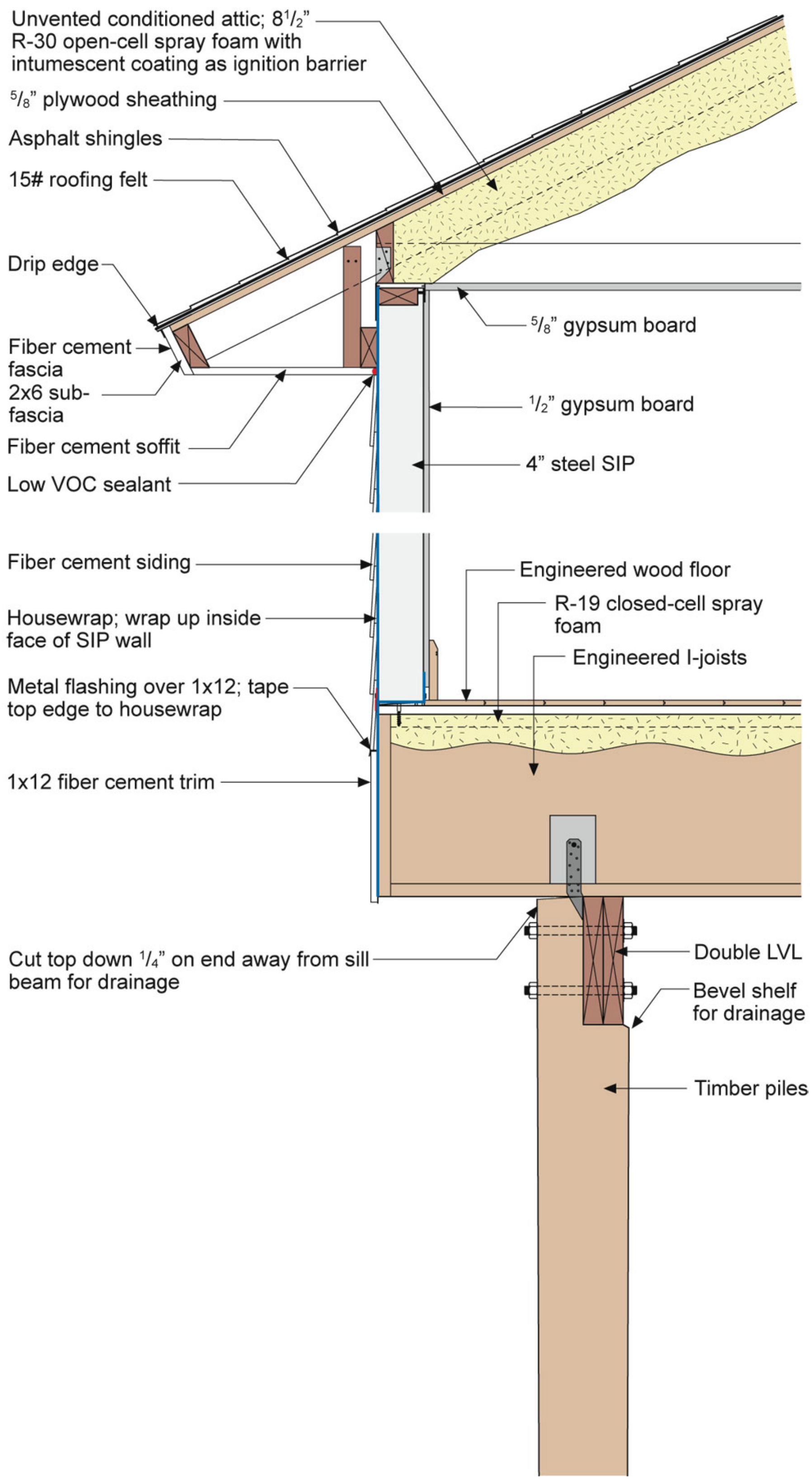


Figure 1. Phase V PHA enclosure section

Table 3 summarizes the mechanical systems used in Phase V.

Table 3. PHA Phase V Mechanical System Specifications

Mechanical Systems	Specifications
Heating	
Description	8.6 heating season performance factor (HSPF) air source heat pump
Manufacturer and Model	Bryant Legacy
Cooling (Outdoor Unit)	
Description	16 seasonal energy efficiency ratio (SEER)—two stage, all homes have 2-ton systems
Manufacturer and Model	Bryant Legacy
Cooling (Indoor Unit)	
Description	ECM air handler with heat pump coil
Manufacturer and Model	Bryant Legacy
Domestic Hot Water	
Description	Instantaneous electric water heater (E = 0.98)
Manufacturer and Model	Rheem
Distribution	
Description	R-6 flex ducts in conditioned unvented cathedralized attic
Leakage	5% duct leakage to outside
Ventilation	
Description	Supply-only system with Aprilaire 8126 VCS, 33% duty cycle: 10 min on; 20 min off, 50 CFM average flow
Manufacturer and Model	Aprilaire 8126 VCS fan cycler
Return Pathways	
Description	Central return on first floor, jump ducts in bedrooms

BSC performed full room-by-room Manual J8 system sizing and duct layout calculations on each plan. The very efficient enclosure and heating, ventilation, and air-conditioning (HVAC) system resulted in smaller heat pumps when rightsized (BSC 2001). PHA installed a 16 SEER/8.6 HSPF air source heat pump in all the community homes. The entire ductwork is located in the conditioned unvented attic as this contributes substantially to the overall efficiency of the HVAC system (BSC 2008).

BSC recommended that PHA use a central fan integrated supply (CFIS) ventilation system. This system draws outside air via a 6-in. flex duct to the return plenum of the HVAC system (see Figure 2). This allows outside air to be introduced into the living space whenever space conditioning is already operating. Fan cycling will turn on the fan at a 33% duty cycle (10 min on, 20 min off) to provide outside air during periods of no space conditioning. A 6-in. mechanical damper is also installed on the 6-in. outside air duct. This is controlled by the fan cycler and will close off the outside air duct during periods of consistent space conditioning to prevent overventilation (Rudd 2008, 2009).

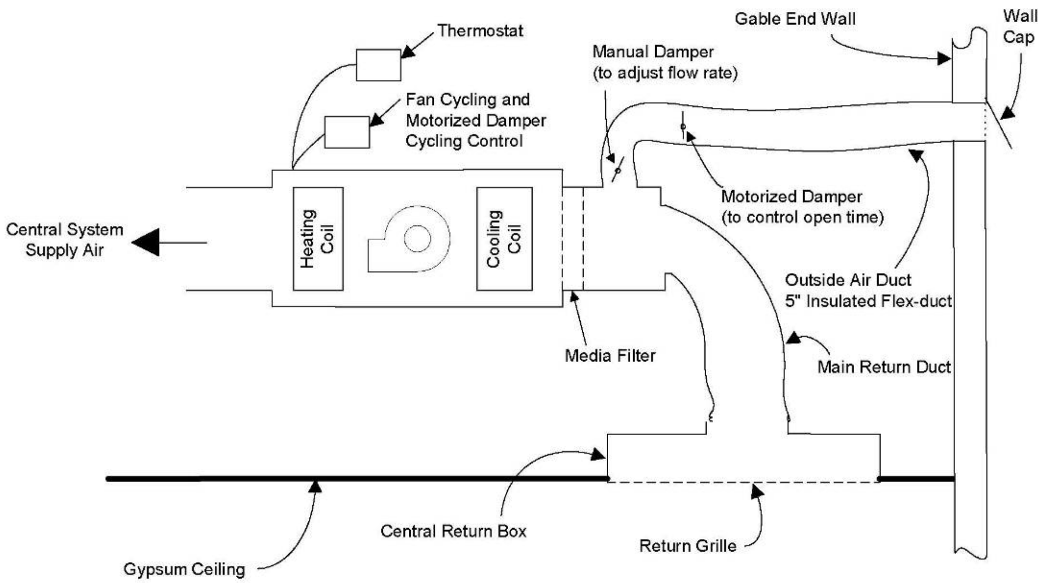


Figure 2. CFIS ventilation schematic

In addition to the building enclosure and mechanical system specifications described, ENERGY STAR® appliances and compact fluorescent lamps (CFLs) were installed in all homes to further reduce internal loads and electricity use. Water-conserving fixtures were installed with the following specifications:

- Toilets 1.28 gpm
- Showerheads 2.0 gpm
- Kitchen faucets 2.0 gpm
- Bathroom faucets 1.5 gpm.

Figure 3. Phase V house under construction

2.1.2 Phase VI Specifications

The Phase VI enclosure design is summarized in Table 4. An example floor plan, called the Alexander, can be found in the Appendix H. Details about building plan specifications are included in Appendix E.

Table 4. Phase VI Enclosure Specifications

Enclosure	Specifications
Ceiling	
Description	Light-color asphalt shingles on rafter roof— unvented cathedralized attic
Insulation	R-23 hybrid 80/20 spray foam (4.5 in.) on underside of roof FlameSeal intumescent coating installed on foam for ignition barrier
Walls	
Description	Pressure-treated borate 2 × 6 wood studs 24 in. o.c., nonadvanced framed
Insulation	R-23 hybrid 80/20 spray foam (4.5 in.) in stud bay
Foundation	
Description	Wood pile foundation—vented crawlspace with borate-treated 2 × 10 floor joists
Insulation	R-13 high-density 2.0 lb/ft^3 ccSPF (2 in.) in floor joist bay
Windows	
Description	Double-pane vinyl-framed with LoE^3 spectrally selective glazing
Manufacturer	Showcase windows
U-value	U = 0.38
SHGC	SHGC = 0.23
Infiltration	
Specification	2.5 in.^{2} leakage area per 100 ft^2 enclosure @ 50 Pa
Performance Test	Average test result = 1.6 in.^{2} leakage area per 100 ft^2 enclosure @ 50 Pa

Each PHA Phase VI house is elevated ~6 ft above grade on wooden piles. The crawlspace is vented and the perimeter fenced with low-cost wood latticework that will allow floodwater to pass through and is inexpensive to fix. A metal flashing piece is installed over each pier as a capillary break, with a borate-treated sill plate.

Floor framing is pressure-treated borate 2 × 10 studs at the traditional 19.2 in. o.c. spacing and the subfloor is ¾ in. CDX plywood. The architect did not upgrade to 24 in. o.c. because of the increased cost and low availability of ⅞-in. subflooring that would be needed to ensure floor stiffness at that joist spacing. The joist bays were insulated with 2 in. of high-density 2.0 lb/ft^3spray foam (R-13) to the underside of the tongue-and-groove CDX subfloor.

Exterior walls are 2 × 6 pressure-treated borate studs at 24 in. o.c. This “advanced framing” design (with wider stud spacing) reduces the amount of wood used in the wall and decreases thermal bridging (Lstiburek, Grin 2010). The stud cavity was insulated with 4.5 in. of a hybrid 80% open/20% ccSPF sprayed up against the ½-in. oriented strand board (OSB) wall sheathing. Additional advanced framing elements such as single top plate and two stud energy corners were not used because of structural requirements. The architect designed the floor plans to conform to the WFCM for a 130-mph wind zone. The WFCM design document does not address many of the upgrades that full optimum value engineering framing or advanced framing call for, such as single top plate or two stud corners, but will allow for 2 × 6 @ 24 in. o.c. wall construction. A house can be structurally designed to comply 100% with all the advanced framing recommendations. However, the architect would have had to hire a licensed structural engineer to analyze the floor plans and calculate a design that includes the full optimum value engineering package. The extra money and time involved was not cost effective for PHA.

The ½-in. OSB served as a structural sheathing on the entire exterior wall. A woven polyurethane housewrap was installed over the OSB in place of the recommended spun high-density polyethylene housewrap. This was due to cost concerns; the spun housewrap was priced three times higher than the woven housewrap. Furring strips made of cut strips of ⅜-in. expandable polystyrene were recommended to provide a drainage space, but the architect deemed it unnecessary. Preprimed fiber cement board was installed directly onto the woven housewrap.

A hybrid 80% ocSPF/20% ccSPF was used as the air and thermal barrier for the entire enclosure. BSC highly recommends a flood-recoverable enclosure design for homes in high-risk flood areas. A spray foam enclosure can dry after a wetting event, so the insulation need not be removed (Lstiburek 2006).

The roof has R-23 80/20 hybrid spray foam (4.5 in.) installed under the roof deck to create an unvented cathedralized attic. Light-color hurricane-rated asphalt shingles were installed over #30 felt roofing underlayment over ⅝-in. CDX roof sheathing. The roof sheathing has the joints taped with butyl-based adhesive-backed flashing strips. The building code requires that intermittently occupied spaces with exposed spray foam have an ignition barrier. Therefore, PHA sprayed an intumescent coating called FlameSeal over the entire hybrid foam installation in the unvented cathedralized attic.

The windows installed at PHA Phase VI have vinyl frames and LoE^3 spectrally selective glazing. The low SHGC of 0.23 reduces solar gain, resulting in a smaller rightsized heat pump and lower annual space conditioning energy consumption. This glazing technology also reduces UV damage on interior floors and fading on furniture. The glass is impact resistant, so no additional window protection is needed during severe weather.

The air infiltration goal at PHA is commensurate with the BA infiltration goal of 2.5 $in.^2$ of free area per 100 ft^2 of enclosure. The spray foam installed on the entire enclosure contributes much to this. The low expanding spray foam that is installed between the window frame and the rough opening is also critical. The high-density 2.0 lb/ft^3 spray foam is critical in the floor assembly because its low permeability rate will resist any upward vapor drive. It will also keep the subfloor warm and will minimize condensation. PHA was careful to avoid impermeable floor coverings and to prevent moisture from being trapped and condensing. This will have a positive effect on the durability and the indoor air quality of the house (Lstiburek 2008, Glass 2010).

Table 5 summarizes the mechanical systems used in Phase VI.

Table 5. PHA Phase VI Mechanical System Specifications

Mechanical Systems	Specifications
Heating	
Description	8.6 HSPF air source heat pump
Manufacturer and Model	Bryant Legacy
Cooling (Outdoor Unit)	
Description	16 SEER—two stage, all homes have 2-ton systems
Manufacturer and Model	Bryant Legacy
Cooling (Indoor Unit)	
Description	ECM air handler with heat pump coil
Manufacturer and Model	Bryant Legacy
Domestic Hot Water	
Description	50-gal 0.92 EF tank water heater in unvented cathedralized attic
Manufacturer and Model	Rheem 82MV52
Distribution	
Description	R-6 flex ducts in conditioned unvented cathedralized attic
Leakage	5% duct leakage to outside
Ventilation	
Description	Supply-only system with Aprilaire 8126 VCS, 33% duty cycle: 10 min on; 20 min off, 50 CFM average flow
Manufacturer and Model	Aprilaire 8126 VCS fan cycler
Return Pathways	
Description	Central return on first floor, jump ducts in bedrooms

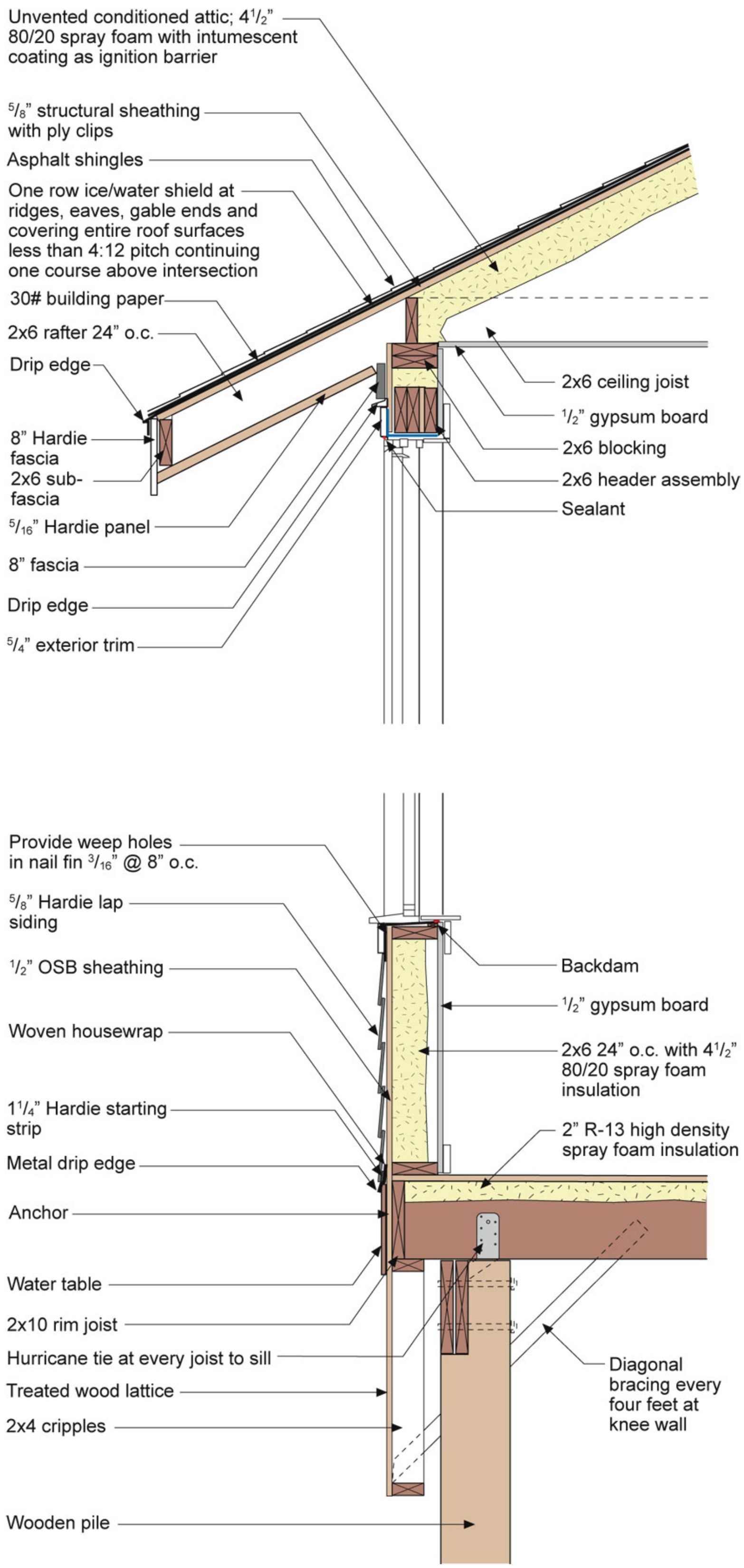


Figure 4. Phase VI PHA enclosure section

BSC performed full room-by-room Manual J8 system sizing and duct layout calculations on each of the three plans. The very efficient enclosure and HVAC system resulted in smaller heat pumps when rightsized (BSC 2001). PHA installed 16 SEER/8.6 HSPF air source heat pumps in all the community homes. The entire ductwork is located in the conditioned unvented attic as this contributes substantially to the overall efficiency of the HVAC system (BSC 2008).

BSC recommended that PHA use a CFIS ventilation system. This system draws outside air via a 6-in. flex duct to the return plenum of the HVAC system (see Figure 5). This allows outside air to be introduced to the living space whenever space conditioning is already operating. Fan cycling will turn on the fan at a 33% duty cycle (10 min on, 20 min off) to provide outside air during periods of no space conditioning. A 6-in. mechanical damper is also installed on the 6-in. outside air duct. This is controlled by the fan cycler and will close off the outside air duct during periods of consistent space conditioning to prevent overventilation (Rudd 2008, 2009).

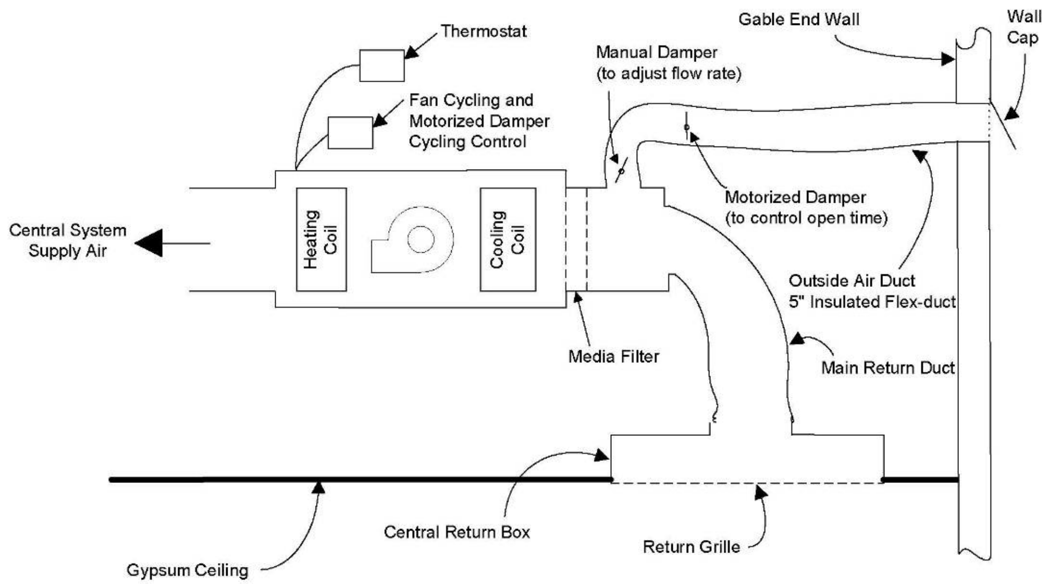


Figure 5. CFIS ventilation schematic

In addition to the building enclosure and mechanical system specifications described, ENERGY STAR appliances and CFLs were installed in all homes to further reduce internal loads and electricity use. Water-conserving fixtures will be installed with the following specifications:

- Toilets 1.28 gpm
- Showerheads 2.0 gpm
- Kitchen faucets 2.0 gpm
- Bathroom faucets 1.5 gpm.

Figure 6. Phase VI house under construction

3 Testing Protocol and Results

All 25 homes at Phases V and VI, including the 10 test houses, were performance tested by a local rater to confirm that the houses meet the energy efficiency specification of the technology package. The full commissioning process was almost finished as of the writing of this report.

BA performance testing typically includes the following measurements:

- Blower door test to measure the house infiltration rate
- Duct blaster test to measure duct leakage (both total duct leakage and duct leakage to outside)
- Outside air ventilation rate measurement
- Register flow measurement (to ensure proper airflow from each supply register).
- Bedroom to hallway pressure difference while door is closed (to ensure that transfer grille or jump ducts were sized properly to prevent room pressurization when the door is closed).

3.1 Phase V Results

Because of budgeting concerns, only 4 of the 10 Phase V homes underwent the full battery of testing. All 10 homes had a blower door test, duct blaster test, and bedroom pressure tests as part of the typical commissioning protocol that was adopted (Table 6).

Table 6. Phase V Blower Door and Duct Blaster Results

Plan	CFM $50_{measured}$	CFM 50_{goal}	ACH 50	EqLA	ELA	Leak Ratio	Duct25 Total	Duct Leak	Duct25 Out	Duct Leak
	CFM @ 50 Pa	CFM @ 50 Pa	CFM 50/vol/h	in.^{2} @ 10 Pa	in.^{2} @ 4 Pa	EqLA/ surf/100	CFM @ 25 Pa	Total %	CFM @ 25 Pa	5% Goal
3B	635	1078	2.3	65.4	34.9	1.5	35	4.4%	10	1.3%
3A	628	1021	2.6	64.7	34.5	1.5	187	23.4%	13	1.6%
3A	617	1021	2.5	63.6	33.9	1.5	160	20.0%	12	1.5%
2A	674	891	3.3	69.4	37.1	1.9	126	15.8%	10	1.3%
3B	555	1078	2.0	57.2	30.5	1.3	121	15.1%	11	1.4%
2B	470	971	2.2	48.4	25.9	1.2	81	10.1%	10	1.3%
3B	611	1078	2.2	62.9	33.6	1.4	51	6.4%	10	1.3%
3A	690	1021	2.8	71.1	38.0	1.7	165	20.6%	12	1.5%
3B	525	1078	1.9	54.1	28.9	1.2	80	10.0%	10	1.3%
3A	450	1021	1.8	46.4	24.8	1.1	138	17.3%	15	1.9%

The tested infiltration rate in all homes exceeded the BA infiltration goal of 2.5 in.^{2} of free area per 100 ft^2 of enclosure area (leak ratio). The Phase V homes tested at an average of a 1.4 leak ratio, a 43% reduction versus the goal.

Duct blaster tests were performed on all 10 homes at Phase V. The duct leak to outside at Phase V exceeded the BA goal of 5% of air handler flow by an average of 1.4%.

BSC recommends no less than 15% total duct leakage in these homes. This is only a recommendation, because the ducts are in conditioned space. However, it is a strong recommendation because a low percent of total duct leakage will ensure that the registers supply the specified CFM to the space. Phase V had an average total duct leakage of 14.3%.

Outside air ventilation was measured at Phase V only, as measuring the outside air pressure was not in the testing protocol for Phase VI. The negative pressures generated at the outside air duct were 13.5–26.2 Pa at Phase V, with an average of 20.1 Pa.

Only four Phase V homes had individual supply register flows measured. This was part of Leadership in Energy and Environmental Design (LEED) certification testing, which was pursued on these four houses only. One of each floor plan type was chosen to be LEED certified. Figure 7 through Figure 10 show scatter plots of the specified versus measured CFM flow rates. Points above the red line indicate the flow was higher than the Manual J8 calculation. The 300+ CFM flow is a summation of the kitchen-living-dining room flows. These were not broken down into individual flows on the rater's field notes. BSC recommended to the rater that he list every register flow rather than summing a group of measured register flows in his notes.

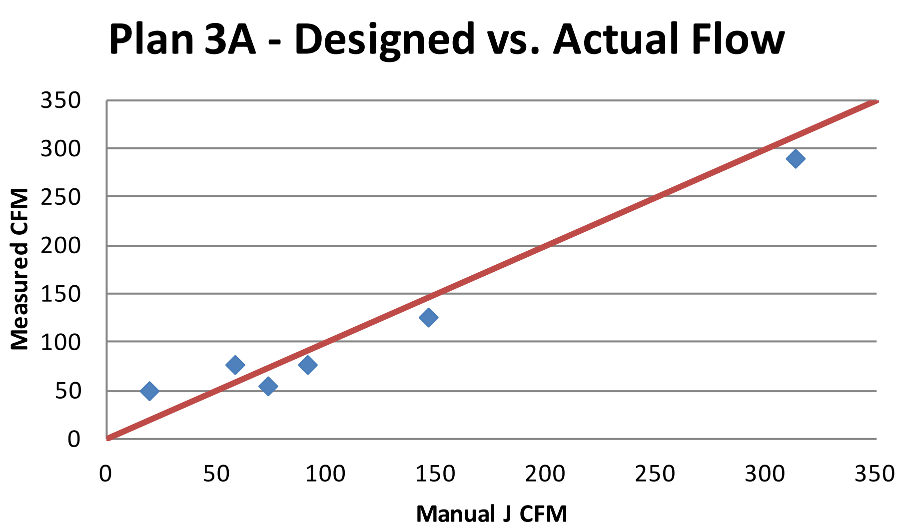


Figure 7. Plan 3A designed versus actual flow plot

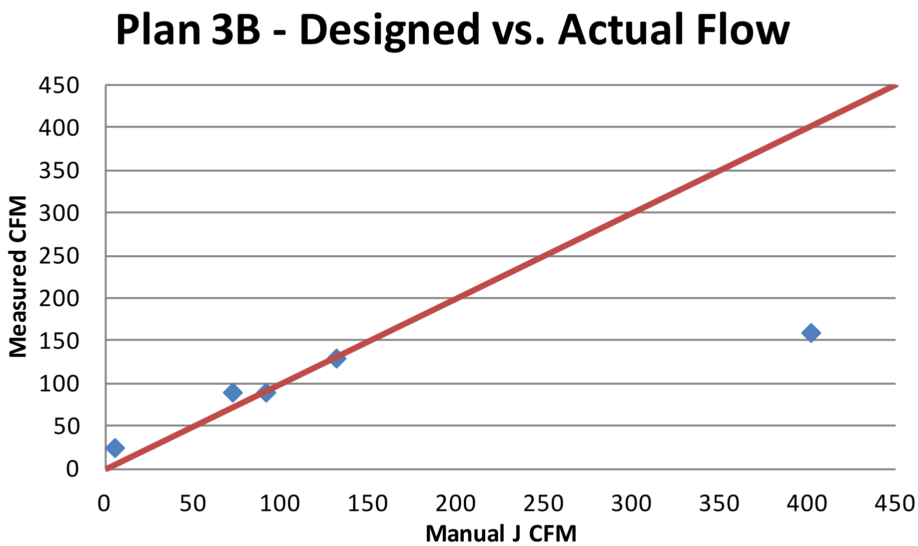


Figure 8. Plan 3B designed versus actual flow plot

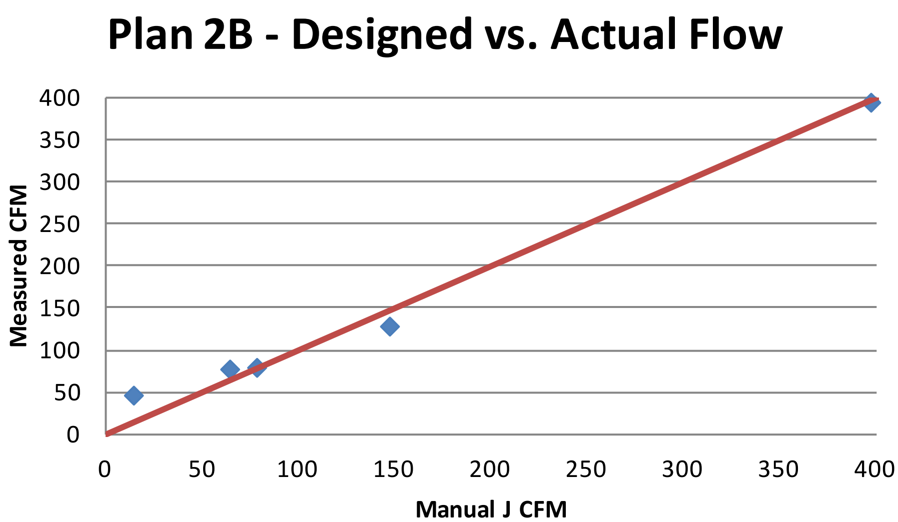


Figure 9. Plan 2B designed versus actual flow plot

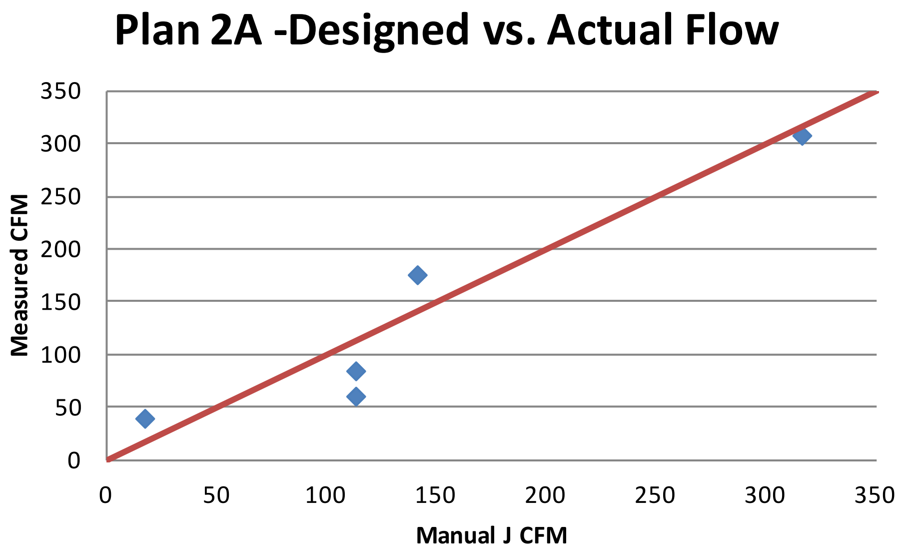


Figure 10. Plan 2A designed versus actual flow plot

Figure 8 shows that the kitchen-dining-living airflow is well below the Manual J8-specified rate. The builder will investigate the low flow and will remediate.

The bedroom to hallway pressure difference was measured while the cooling system was at high speed. All pressures were within the ± 3 Pa difference between the bedrooms and hallway.

3.2 Phase VI Results

Because of budgeting concerns, only 4 of the 15 homes at Phase VI underwent the full battery of testing. All 15 homes had a blower door test, duct blaster test, and bedroom pressure tests as part of the typical commissioning protocol that was adopted.

The tested infiltration rate in all homes exceeded the BA infiltration goal of 2.5 in.^{2} of free area per 100 ft^2 of enclosure area (leak ratio). The Phase VI homes tested at an average of a 1.6 leak ratio, a 35% reduction.

Duct blaster tests were performed on all 15 homes in Phase VI. The duct leak to outside at Phase VI exceeded the BA goal of 5% of air handler flow with an average of 1.7%. Phase VI had an average total duct leakage of 16.1%.

Table 7 lists the blower door and duct blaster results for each house at Phase VI. Phase VI homes tested on average 7% less airtight compared to Phase V. This may be due to the increased airtightness of the steel SIPs versus spray foam in a traditionally framed wall assembly. The SIP walls, with properly sealed joints, form a more continuous air barrier than do framed member-foam connections every 24 in. o.c. as is the case with the Phase VI homes.

Table 7. Phase VI Blower Door and Duct Blaster Results

Plan	CFM $50_{measured}$	CFM 50_{goal}	ACH 50	EqLA	ELA	Leak Ratio	Duct25 Total	Duct Leak	Duct25 Out	Duct Leak
	CFM @ 50 Pa	CFM @ 50 Pa	CFM 50/vol/h	in.^{2} @ 10 Pa	in.^{2} @ 4 Pa	EqLA/ surf/100	CFM @ 25 Pa	Total %	CFM @ 25 Pa	5% Goal
Alexander	660	1107	2.4	68.0	36.3	1.5	43	5.4%	10	1.3%
Alexander	748	1107	2.7	77.0	41.1	1.7	55	6.9%	10	1.3%
Alexander	677	1107	2.5	69.7	37.2	1.5	40	5.0%	10	1.3%
Alexander	701	1107	2.6	72.2	38.6	1.6	161	20.1%	10	1.3%
Alexander	650	1107	2.4	67.0	35.8	1.5	103	12.9%	29	3.6%
Cynthia	799	1089	3.1	82.3	43.9	1.8	178	22.3%	15	1.9%
Cynthia	668	1089	2.6	68.8	36.7	1.5	173	21.6%	12	1.5%
Cynthia	703	1089	2.7	72.4	38.7	1.6	171	21.4%	35	4.4%
Cynthia	776	1089	3.0	79.9	42.7	1.8	132	16.5%	11	1.4%
Helen	594	961	2.8	61.2	32.7	1.5	197	24.6%	11	1.4%
Helen	716	961	3.4	73.7	39.4	1.9	142	17.8%	11	1.4%
Rose	619	1024	2.4	63.8	34.0	1.5	101	12.6%	10	1.3%
Rose	752	1024	3.0	77.5	41.4	1.8	122	15.3%	10	1.3%
Rose	550	1024	2.2	56.7	30.3	1.3	121	15.1%	10	1.3%
Rose	683	1024	2.7	70.3	37.6	1.7	189	23.6%	15	1.9%

Only four of the Phase VI homes had individual supply register flows measured. This was part of LEED certification testing, which was pursued on these four houses only. One of each floor plan type was chosen to be LEED certified. Figures 11–14 show the specified versus measured flow rates. Points above the red line indicate that the flow was higher than the Manual J8 calculation. The measured flows are in a much wider range of the specified flows versus the Phase V measurements. The HVAC contractor had not yet balanced the system. The flows will be rechecked once the flows have been balanced.

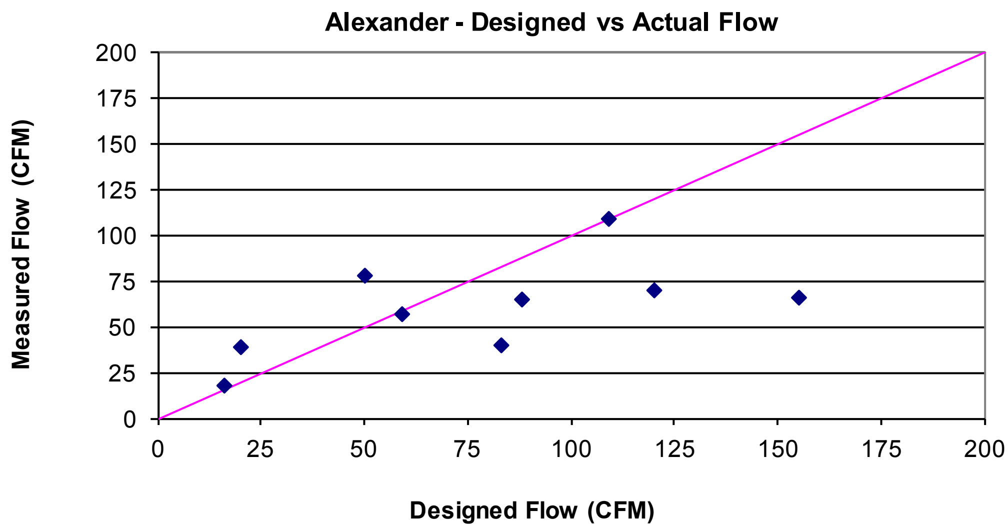


Figure 11. Alexander plan designed versus actual flow plot

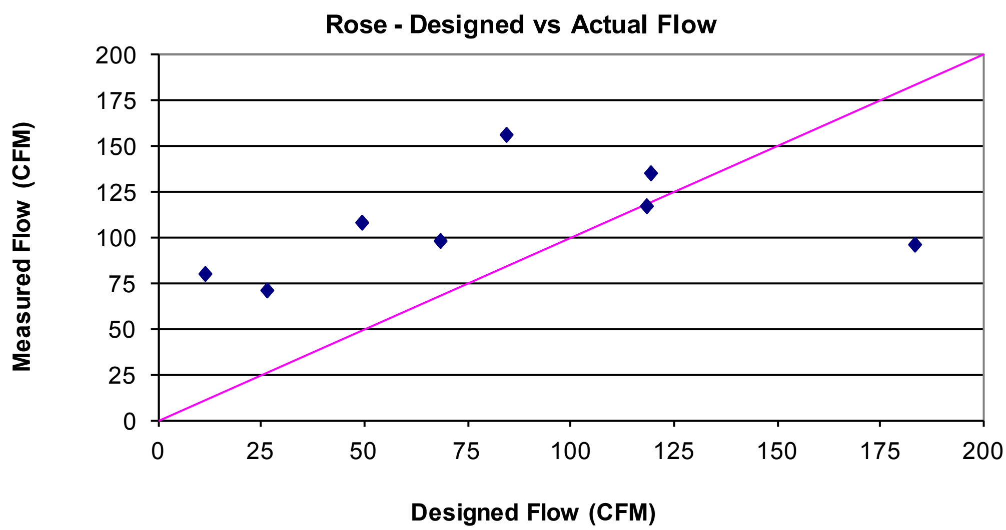


Figure 12. Rose plan designed versus actual flow plot

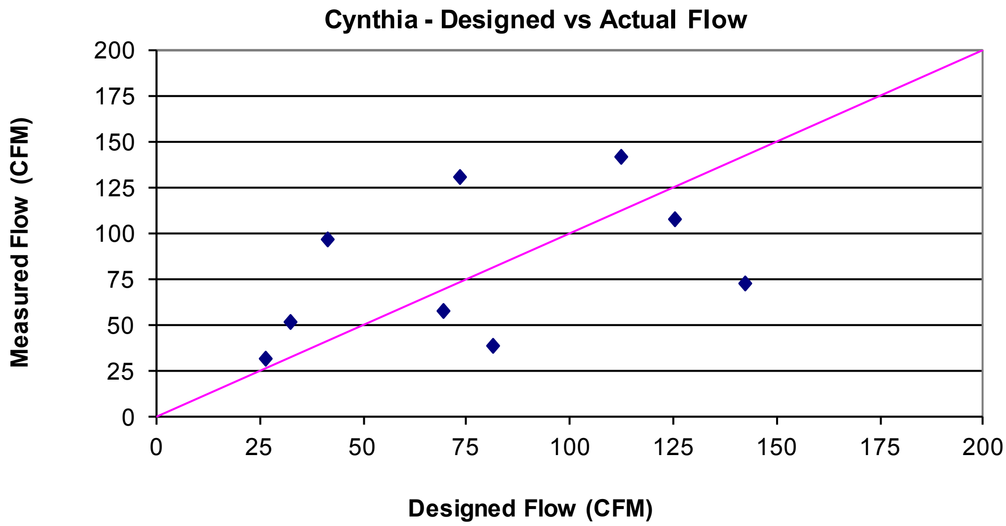


Figure 13. Cynthia plan designed versus actual flow plot

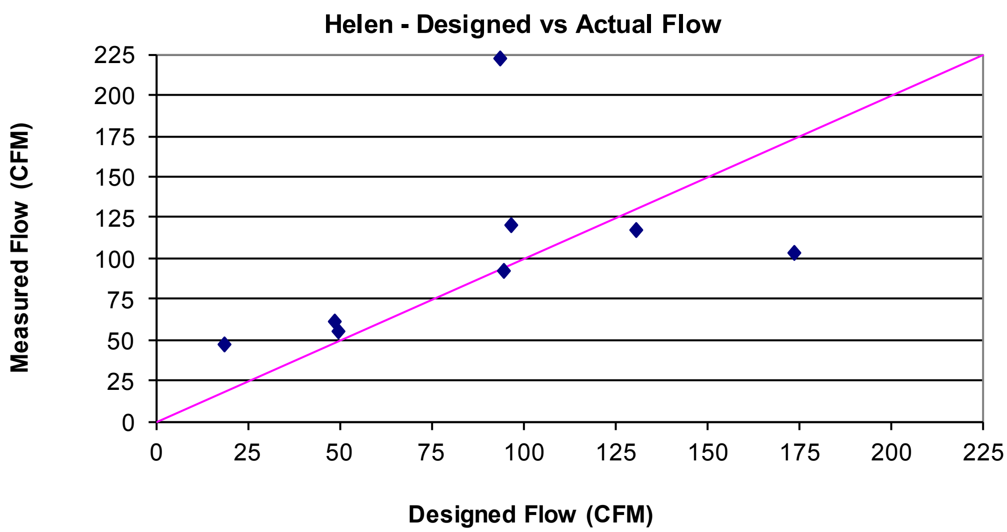


Figure 14. Helen plan designed versus actual flow plot

The bedroom to hallway pressure difference was measured while the cooling system was at high speed. All pressures were within the ± 3 Pa difference between the bedrooms and hallway.

3.3 Discussion

The blower door test results indicate a slight difference between the two Phases at PHA. The Phase V homes tested at an average 1.4 leak ratio, a 43% reduction. The Phase VI homes tested at an average 1.6 leak ratio, a 38% reduction. The tighter enclosure at Phase V may be attributed to the SIP wall construction, as the rest of the enclosure construction was equivalent from an air sealing standpoint.

Duct blaster tests were performed on all 25 homes in Phases V and VI. The duct leak to outside at Phase V exceeded the BA goal of 5% of air handler flow with an average of 1.4%, and Phase VI tested at an average of 1.7%. The slightly lower percent leak at Phase V may be attributed to the marginally tighter enclosure.

Outside airflow measurements are available for Phase V only, as the rater did not measure the outside airflow at Phase VI, so no comparison is available. However, the homes at Phase V are being supplied at least 50 CFM of outside air during ventilation operation.

4 Modeling of Upgrade Options

4.1 Cost Effectiveness of the Retrofit Measures (BEopt)

The cost effectiveness analysis of the new construction measures considered for these projects was performed with BEopt, the BA performance analysis tool that features options for retrofit projects. This tool includes an optimization capability that uses user-supplied cost data and energy use information for a specified set of energy-saving measures to determine combinations of measures that are optimally (or near optimally) cost effective. On a graph that plots the average source energy savings per year against the annualized energy related costs, the optimal packages form the lower bound of the plotted data points. BEopt uses a sequential searching technique so option combinations are limited. The proposed design upgrades are compared in BEopt to the BA B10 Benchmark using the NREL Building America House Simulation Protocols (NREL 2010).

4.1.1 Phase V

Figure 15 illustrates the comparison between the existing conditions and the post-retrofit upgrades based on the average source energy use. The modeled energy savings are predicted to reach 35% and the energy-efficient upgrades to this floor plan will result in 50 MBtu/yr less. Figure 15 through Figure 17 show the outputs from BEopt. More details on the energy analysis for Phase V can be found in Appendix C.

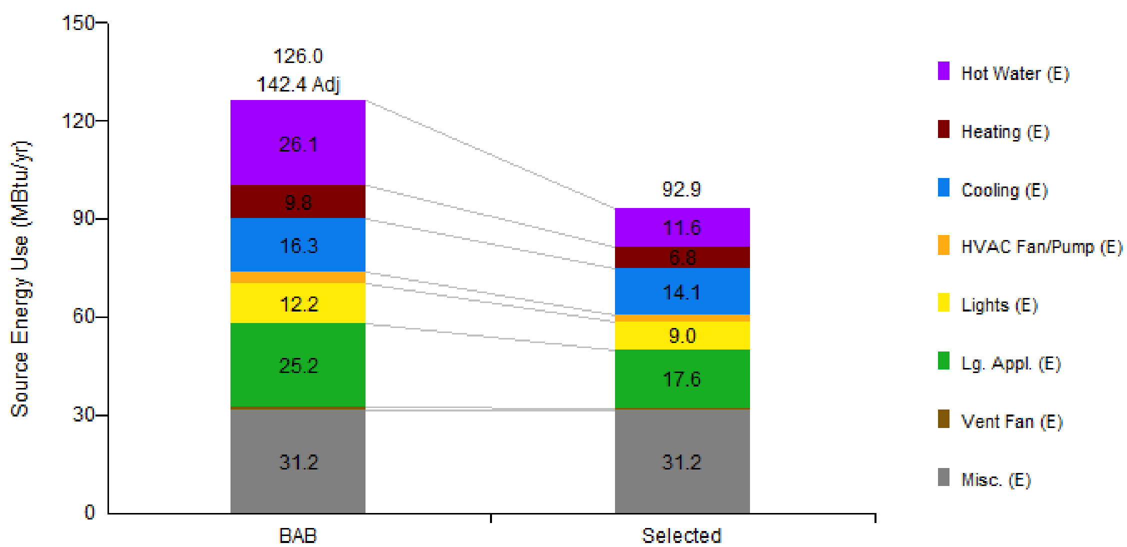


Figure 15. BEopt output graph for Phase V

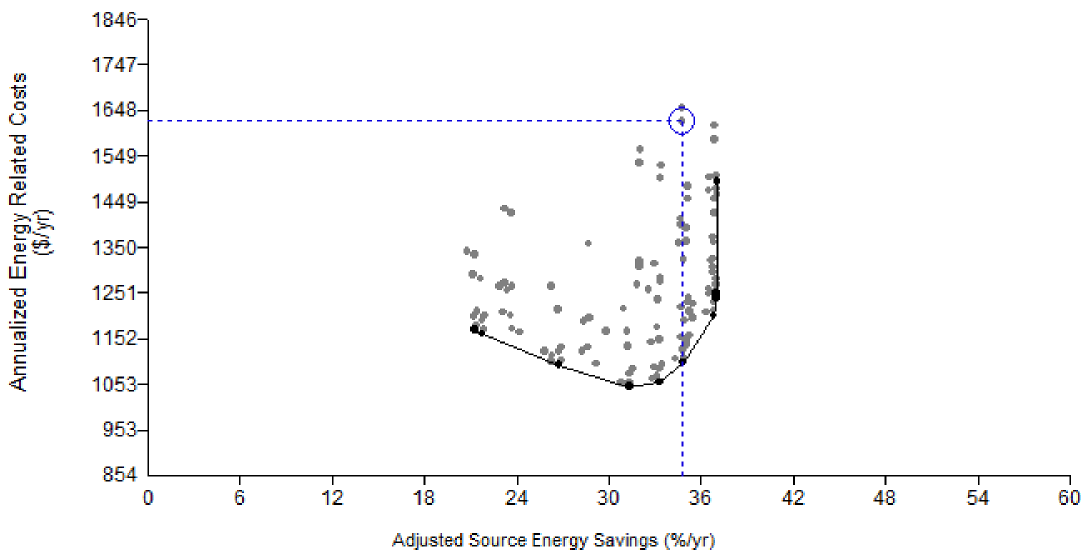


Figure 16. Cost optimization output for Phase V

Figure 17 shows the optimization results from BEopt. The selected point is closest to the prototype specifications.

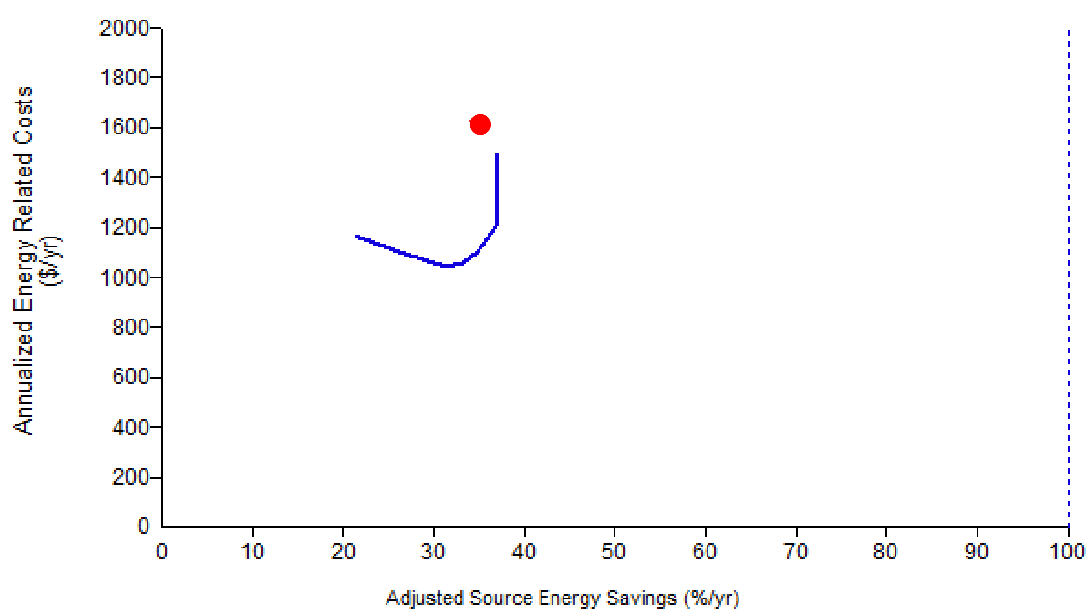


Figure 17. Cost optimization output with selected specifications indicated

The chosen design does not reflect the most cost-effective set of specifications according to BEopt. This is due to the selection of the steel SIP walls and spray foam at the roof and floor, compared to traditional cavity insulation products (e.g., cellulose or fiberglass). Although the selected enclosure assemblies are more expensive, these elements result in homes that will not require insulation to be removed should a flood wet the building.

4.1.1.1 Cost Analysis

The most expensive energy efficiency improvement at Phase V was the upgrade to steel SIPs, which cost $5,725 per house. The SIP walls and spray foam roof and floor will have a beneficial impact on energy use and will improve the overall durability of the structure. The enclosure system will be flood recoverable, such that the cavity insulation will need to dry only in case of a flood. This will save significant repair costs in the event of a storm. Table 8 shows a breakdown of the major upgrade cost figures.

Table 8. Phase V Cost Breakdown

	BA Community Design	Additional Cost Over the B10 Benchmark
Building Enclosure		
Roof	R-30 low-density ocSPF at roof deck to create conditioned attic	$2,983
Walls	R-16 Oceansafe 4-in. steel SIPs	$5,725
Frame Floors	R-13 2-in. high-density spray foam to underside of subfloor	$3,078
Foundation	Vented crawlspace	Included above
Windows	Vinyl double-glazed with LoE^3 (U = 0.38, SHGC = 0.23)	$511
Infiltration	1.4 in.^{2} leakage area per 100 ft^2 of enclosure (600 CFM 50)	Included in spray foam
Mechanical Systems		
Heat	8.6 HSPF air source heat pump	$600
Cooling	16 SEER air source heat pump	$600
DHW	Instant electric water heater (0.98 EF assumed)	$1,430
Ducts	R-6 flex runouts in unvented attic; no leakage to outside (≤ 5%)	–
Dehumidification	No supplemental dehumidification	–
Ventilation	Supply-only system with Aprilaire 8126 VCS, 33% duty cycle: 10 min on; 20 min off, 50 CFM average flow	$500
Return Pathways	Jump ducts at bedrooms	$250
Appliances, Lighting, MELs		
Lighting	ENERGY STAR lighting	$250
Appliances	ENERGY STAR appliances	$500

The average total cost per home for the BA hot-humid technology package at Phase V is $16,427. The HVAC system was downsized by 2 tons, resulting in a $1000 cost savings and a net total of $15,427 per house. The average annual utility bill savings are about $318/year (assuming $0.11/kWh). This results in a payback period of about 51 years.

Phase V will have select homes outfitted with a 3.36-kW photovoltaic (PV) system. The net cost is $5,200, including materials and labor. This includes federal and state rebates.

The approximate total cost of conditioned floor area was $164/ft^2.

4.1.2 Phase VI

Figure 18 illustrates the comparison between the existing conditions and the post-retrofit upgrades based on the average source energy use. The modeled energy savings are predicted to reach 31% and the energy efficient upgrades to this floor plan will result in 49 MBtu less per year. Figure 18 shows BEopt outputs and a comparison between the B10 benchmark and the prototype broken down into components. More details on the energy analysis for Phase V can be found in Appendix F.

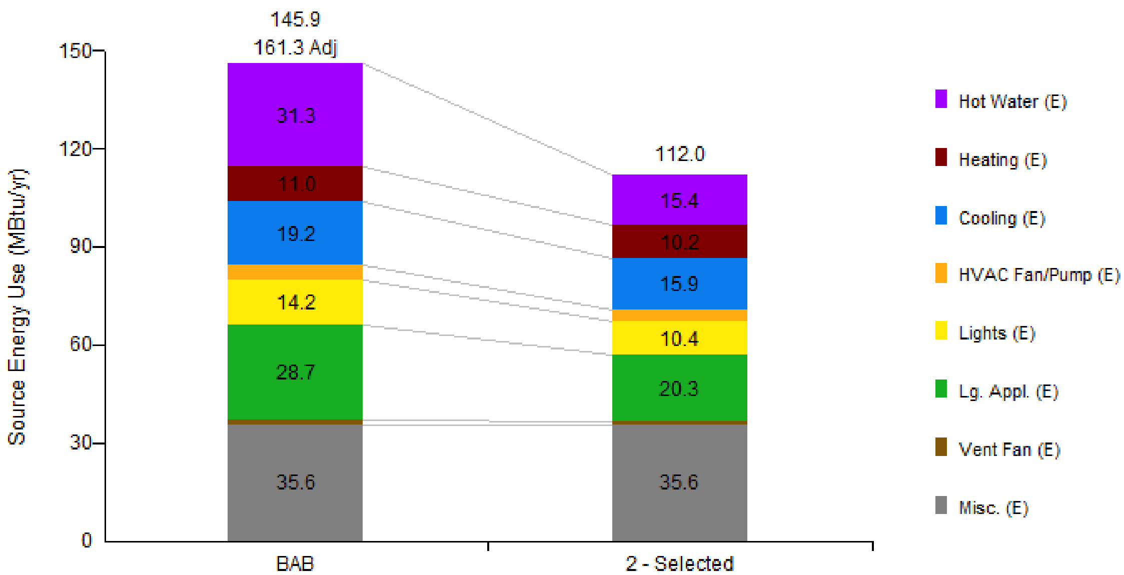


Figure 18. BEopt output graph for Phase VI

Figure 19 shows the optimization results from BEopt. The selected point is closest to the prototype specifications.

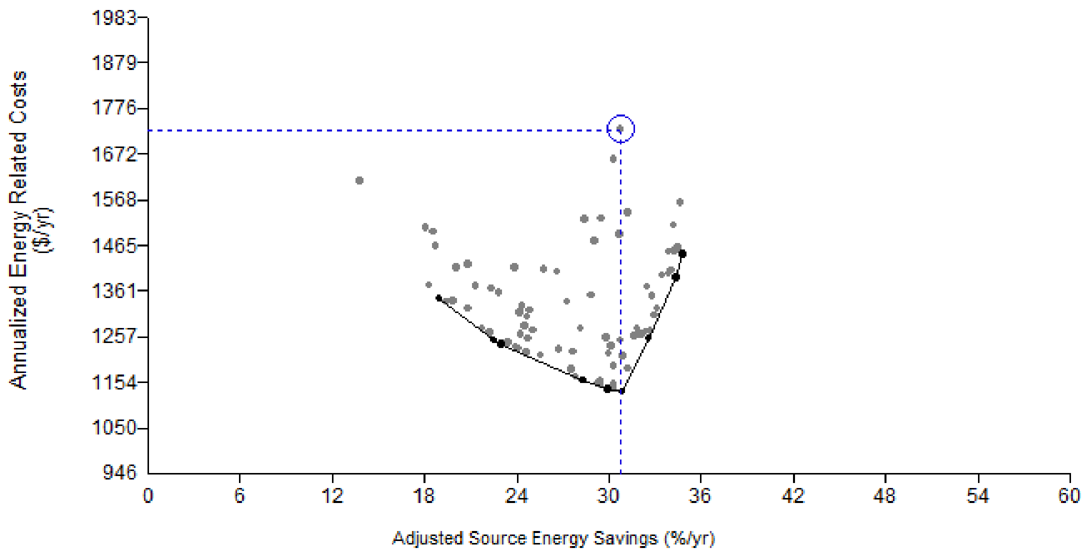


Figure 19. Cost optimization output for Phase VI

Figure 20 shows the annualized energy graph with the actual prototype specifications graphed with the cost optimization curve.

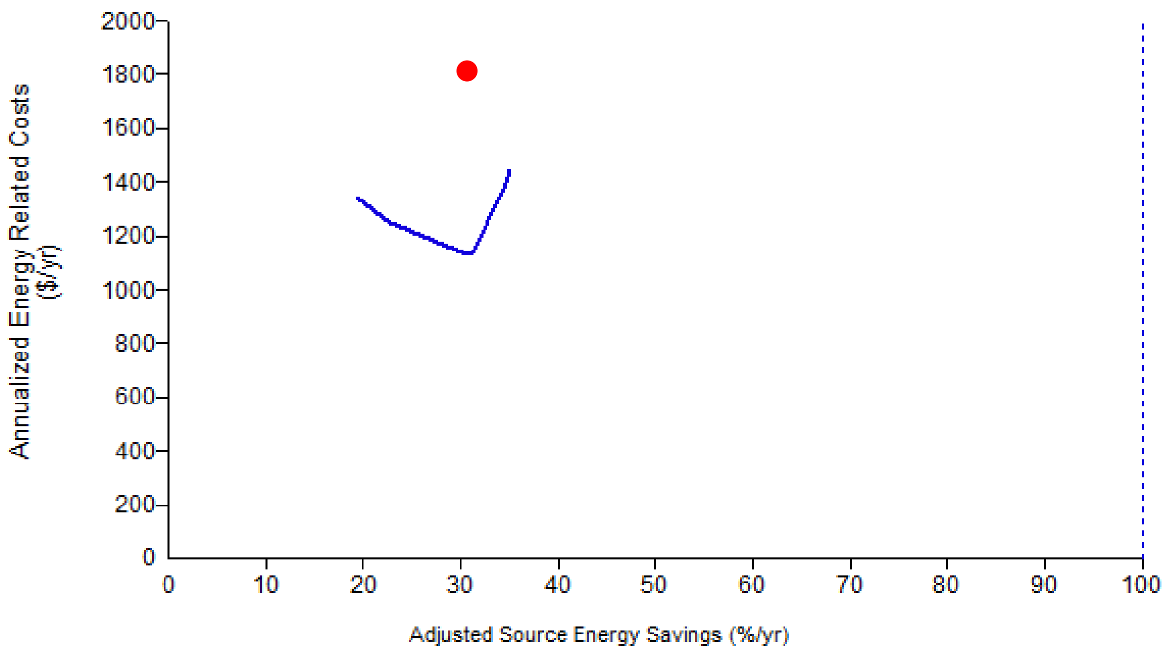


Figure 20. Cost optimization output with selected specifications indicated

The chosen design does not reflect the most cost-effective set of specifications according to BEopt. This is due to the selection of spray foam at the roof, walls, and floor, compared to traditional cavity insulation products that were considered in the BEopt analysis (e.g., cellulose or fiberglass). Although the selected enclosure assemblies are more expensive, these elements result in homes that will not require insulation to be removed should a flood wet the building.

4.1.2.1 Cost Analysis

The most expensive energy efficiency improvement at Phase VI is the upgrade to spray foam insulation. The total costs of spray foam upgrades at the floor, walls, and roof is about $7500. The spray foam will have a beneficial impact on energy use and will improve the overall durability of the structure. The enclosure system will be flood recoverable, such that the cavity insulation will need to dry only in case of a flood. This will save significant repair costs. Table 9 shows a breakdown of the major upgrade cost figures.

Table 9. Phase VI Cost Breakdown

	BA Community Design	Additional Cost Over the B10 Benchmark
Building Enclosure		
Roof	Light-colored asphalt shingles on 30# felt on ⅝-in. CDX with joints taped R-23 4.5-in. 80/20 spray foam at roof deck to create conditioned attic	$2,500
Wall Framing	2 × 6, 24-in. o.c. framing	Included above
Wall Insulation	R-23 4.5-in. 80/20 spray foam stacked framing	$2,500
Frame Floors	R-13 2-in. high-density spray foam to underside of subfloor	$2,500
Foundation	Vented crawlspace with wooden piles	Included above
Windows	Showcase impact double glazed with LoE^3 (U = 0.38, SHGC = 0.23)	$2,500
Infiltration	2.5 $in.^2$ leakage area per 100 ft^2 of envelope	Included in spray foam
Mechanical Systems		
Heat	Bryant Legacy 8.6 HSPF air source heat pump	$500
Cooling	Bryant Legacy 16 SEER air source heat pump	$500
DHW	Rheem 82MV52 electric tank 50 gal EF = 0.92	–
Ducts	R-6 flex runouts in unvented attic or in floor joists; no leakage to outside (≤ 5%)	–
Dehumidification	No supplemental dehumidification	–
Ventilation	Supply-only system with Aprilaire 8126 VCS, 33% duty cycle: 10 min on; 20 min off, 50 CFM average flow	$500
Return Pathways	Transfer grilles at bedrooms	$250

The average total cost per home for the BA hot-humid technology package at Phase VI is $12,500. The HVAC system was downsized by 2 tons, which saved $1000 and a net total of $11,500 per house. The average annual utility bill is reduced by about $300/year (assuming $0.11/kWh). This results in a payback period of about 38 years.

Phase VI will have select homes outfitted with a 3.36-kW PV system. The net cost is $5200, including materials and labor. This includes federal and state rebates.

The approximate total cost of conditioned floor area was $145/ft^2.

5 Conclusions

The new construction projects discussed in this report serve as examples of successful, affordable, high performance homes that could be built in a hot-humid climate similar to New Orleans, Louisiana. The specifications that were recommended clearly improved energy efficiency, durability, and indoor air quality in these homes. These strategies are BSC recommendations but have also been influenced by cost and developer input.

These homes are predicted to save more than 30% in annual source energy versus the B10 Benchmark, as analyzed by BEopt.

BSC has the following answers to the project research questions:

- **Is there a difference in infiltration rates between the two enclosure systems used at PHA Phase V and VI?** The blower door test results indicate a slight difference between the two phases at PHA. The Phase V homes tested at an average of a 1.4 leak ratio, a 43% reduction. The Phase VI homes tested at an average of a 1.6 leak ratio, a 38% reduction. The tighter enclosure at Phase V may be attributed to the SIP wall construction, as the rest of the enclosure construction was equivalent from an air sealing standpoint.

- **What are the measured ventilation rates in the homes? How do the ventilation rates compare between different project teams?** Outside airflow measurements are only available for Phase V, as the rater did not measure the outside airflow at Phase VI, so no comparison is available. However, the homes at Phase V are being supplied at least 50 CFM of outside air during ventilation operation.

- **What are the measured individual register flows? How do they compare to the Manual J8 design CFM flows?** The measured airflow at the supply registers of the Phase V homes are closer to the Manual J8 specification than the Phase VI. However, the Phase VI HVAC systems had not been balanced at the time of testing. The rater may be able to retest after the systems are balanced.

- **What is the cost benefit analysis of the technology package using confirmed cost data and the source energy consumption simulation predictions?** Construction costs were provided by the builder. The spray foam and SIP enclosure assemblies result in higher than normal payback periods for these homes (38–51 years). However, the investment in a "flood-recoverable" climate-specific enclosure design provides the greatest opportunity for the homes to survive a storm without a significant remediation investment.

Many issues could change the specifications in these homes going forward. They include cost and budget concerns, requirements of other rating and certification programs, material availability, and labor experience. BSC will work with the developer to make necessary changes to the improvements while maintaining the high standard of construction that is required by the Building America Program.

6 References

AFPA. Wood Frame Construction Manual, 130 MPH Exposure B. American Forest and Paper Association.

ASHRAE (2010). 2010 ASHRAE Standard 62.2—Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

BSC (June 2008). "Research Reports # 305: Why it's So Important to Keep Ducts and Equipment in Conditioned Space." Building Science Corporation, www.buildingscience.com/documents/reports/rr-0305-why-it-s-so-important-and-troubling-to-keep-ducts-and-equipment-in-conditioned-space/view?searchterm=ducts. Accessed May 15, 2011.

BSC (October 2001). "Research Reports # 110: HVAC Equipment Sizing Strategies: Taking Advantage of High Performance Buildings." Building Science Corporation, www.buildingscience.com/documents/reports/rr-0110-hvac-equipment-sizing-strategies-taking-advantage-of-high-performance-buildings/view?searchterm=right%20sizing. Accessed May 15, 2011.

DOE. "Building America Research for the American Home", http://www1.eere.energy.gov/buildings/residential/ba_research.html. Accessed May 15, 2011.

Glass, S.V.; Curole, J.P.; Carll, C.G.; Voitier, M.D. (2010). "Moisture Performance of Insulated, Raised, Wood-Frame Floors: A Study of Twelve Houses in Southern Louisiana." Madison, WI: United States Forest Products Laboratory, 19 pp.

Hahn, R (September/October 2010). "Moving Back to New Orleans" Home Energy Magazine pp. 32-38. www.buildingscience.com/documents/dtw-related-articles/cs-hem-moving-back-home-to-new-orleans-project-home-again/view?searchterm=project%20home%20again

Lstiburek, Joseph and Grin, Aaron. (November 2010). "Building America Special Research Project—Advanced Framing Deployment." Building Science Corporation, http://www.buildingscience.com/documents/reports/rr-1004-ba-special-research-advanced-framing-deployment/view. Accessed May 15, 2011.

Lstiburek, J (October, 2006)."Building Science Digest #111: Flood and Hurricane Resistant Buildings, www.buildingscience.com/documents/digests/bsd-111-flood-and-hurricane-resistant-buildings/?searchterm=flood Accessed May 15, 2011.

Lstiburek, Joseph (October 2008). "BSI-009: New Light in Crawlspaces". Building Science Corporation, www.buildingscience.com/documents/insights/bsi-009-new-light-in-crawlspaces. Accessed May 15, 2011.

NREL (2010). Building America House Simulation Protocols DOE/GO-102010-3141. Golden, CO: National Renewable Energy Laboratory.

Rudd, Armin (June 2008). "RR-0304: Central Fan Integrated Supply Ventilation—The Basics." Building Science Corporation, www.buildingscience.com/documents/reports/rr-0304-central-fan-integrated-supply-ventilation-the-basics/ Accessed May 15, 2011.

Rudd, A (May 2009)."Information Sheets #610: Central Fan Integrated Supply Ventilation Systems." Building Science Corporation, www.buildingscience.com/documents/information-sheets/hvac-plumbing-and-electrical/information-sheet-ventilation-system/?searchterm=cfis Accessed May 15, 2011.

Appendix A Project Home Again Phase VI Initial Energy Analysis

March 17, 2011

Green Coast Enterprises
4164 Canal Street
New Orleans, LA 70119
(504) 281-4372
Attn: Zachary Lamb

Project Home Again Phase VI Energy Analysis

Mr. Lamb,

Building Science Corporation has completed analysis Project Home Again Phase VI.

The following two qualifications need to be met for a house to be certified Building America.

- 20% or more savings vs. the B10 Benchmark (similar to 50% vs. IECC 2009 code construction)
- HERS rating of 70 or less (per the DOE Builder's Challenge certification)

The table below indicates that these qualifications are met for all four floor plans with the current specifications. The homes were modeled with and without a proposed PV system.

Floor Plan	Source Energy Savings vs. the B10 Benchmark with no PV	Source Energy Savings vs. the B10 Benchmark with 3.36 kW PV	HERS Index without PV	HERS Index with 3.36 kW PV
Alexander	31.7%	60.2%	67	35
Rose	31.5%	60.1%	67	36
Helen	35.3%	63.8%	67	32
Cynthia	32.2%	60.4%	68	36

BSC is excited about the opportunity to work with you under the Building America program. More information on the Building America program can be found here:

http://www1.eere.energy.gov/buildings/building_america/about.html

Please read the report for more information. If you have any questions you can email me at phil@buildingscience.com or call (617) 863-5271.

Sincerely,

Philip Kerrigan Jr., PE

Cc: Betsy Pettit, FAIA (Building Science Corporation)
Will Bradshaw (Green Coast Enterprises)

Appendix B Building Plan Specifications

Each of the four plans submitted are single story structures with a vented crawlspace. Table 10 shows some of the basic dimensions and areas that were calculated in a plan takeoff. Some dimensions (such as floor area) may be different than what is listed in the drawing set. This is because BSC measures the areas from the outside of the exterior framed walls.

Table 10. Basic Dimensions and Areas for the Phase VI Plans

Floor Plan	Floor Area (ft^2)	Surface Area (ft^2)	Volume (ft^3)	Bedrooms (Number)	Baths (Number)	Glazing Ratio
Alexander	1316	4429	16,492	3	2.0	14.3%
Rose	1316	4097	15,168	3	2.0	16.1%
Helen	1051	3845	12,687	3	2.0	15.8%
Cynthia	1305	4357	15,509	3	2.0	14.7%

Table 11 outlines the specifications for PHA Phase VI.

Table 11. Building Energy Specifications

	BA Community Design
Building Enclosure	
Roof	Light-colored asphalt shingles on 30# felt on ⅝ CDX with joints taped R-23 4.5-in. 80/20 spray foam at roof deck to create conditioned attic
Walls	Fibercement siding on woven house wrap on ½-in. OSB 2 × 6, 24-in. o.c. Framing R-23 4.5-in. 80/20 spray foam stacked framing Borate salt pressure-treated wood
Frame Floors	R-13 2-in. high-density spray foam to underside of subfloor
Foundation	Vented crawlspace with wooden piles
Windows	Showcase impact double glazed with LoE^3 (U = 0.38, SHGC = 0.23)
Infiltration	2.5 in.^{2} leakage area per 100 ft^2 of envelope
Mechanical Systems	
Heat	Bryant Legacy 8.6 HSPF air source heat pump
Cooling	Bryant Legacy 16 SEER air source heat pump
DHW	Rheem 82MV52 electric tank 50 gal EF = 0.92
Ducts	R-6 flex runouts in unvented attic or in floor joists; no leakage to outside (≤5%)
Dehumidification	No supplemental dehumidification
Ventilation	Supply-only system with Aprilaire 8126 VCS, 33% duty cycle: 10 min on; 20 min off, 50 CFM average flow
Return Pathways	Transfer grilles at bedrooms
Appliances, Lighting, MELs	
Lighting	CFL lighting package all screw base
Appliances	ENERGY STAR refrigerator, dishwasher, clothes washer
Renewables	
Photovoltaics	3.3-kW array (Canadian Solar CS5P-240)
Inverter	PV-powered PVP3500 (95.5% efficiency)

Appendix C Energy Analysis

Two criteria need to be met for a house to receive BA support:

B10 Benchmark compliance. Whole-house hourly energy consumption simulations were completed comparing the proposed energy efficiency strategies compared to the BA B10 Benchmark created by DOE. The BA Benchmark is a protocol for creating a reference house to which the prototype house compared to in order to calculate a % savings. The BA Benchmark specifies a home with similar dimensions versus the prototype but with IECC 2009 code specifications. It is similar to the HERS Reference Home but does have some slight differences. The BA compliance simulations were run using BEopt developed by NREL.

Hot-humid homes constructed in 2011 need to achieve whole-house source energy savings of 20% or higher compared to the B10 Benchmark.

Builder's Challenge compliance: The Builders Challenge program is intended to gain recognition for those buildings that exceed ENERGY STAR standards. More information can be found at http://www1.eere.energy.gov/buildings/challenge/. Builder's Challenge compliance simulations were run using Energy Gauge USA, developed by NREL.

A home requires a HERS Index of ≤ 70 to qualify for Builder's Challenge certification.

Table 12 shows the calculated whole-house source energy savings and HERS Index for each floor plan at its worst case orientation. Each floor plan is also modeled with a 3.36-kW PV system.

Table 12. Energy Analysis Results

Floor Plan	Source Energy Savings Versus the B10 Benchmark With No PV	Source Energy Savings Versus the B10 Benchmark With 3.36 kW PV	HERS Index Without PV	HERS Index With 3.36 kW PV
Alexander	31.7%	60.2%	67	35
Rose	31.5%	60.1%	67	36
Helen	35.3%	63.8%	67	32
Cynthia	32.2%	60.4%	68	36

Figure 21 shows the whole-house source energy use broken down into components for the Alexander plan. The other plans calculated with a very similar result.

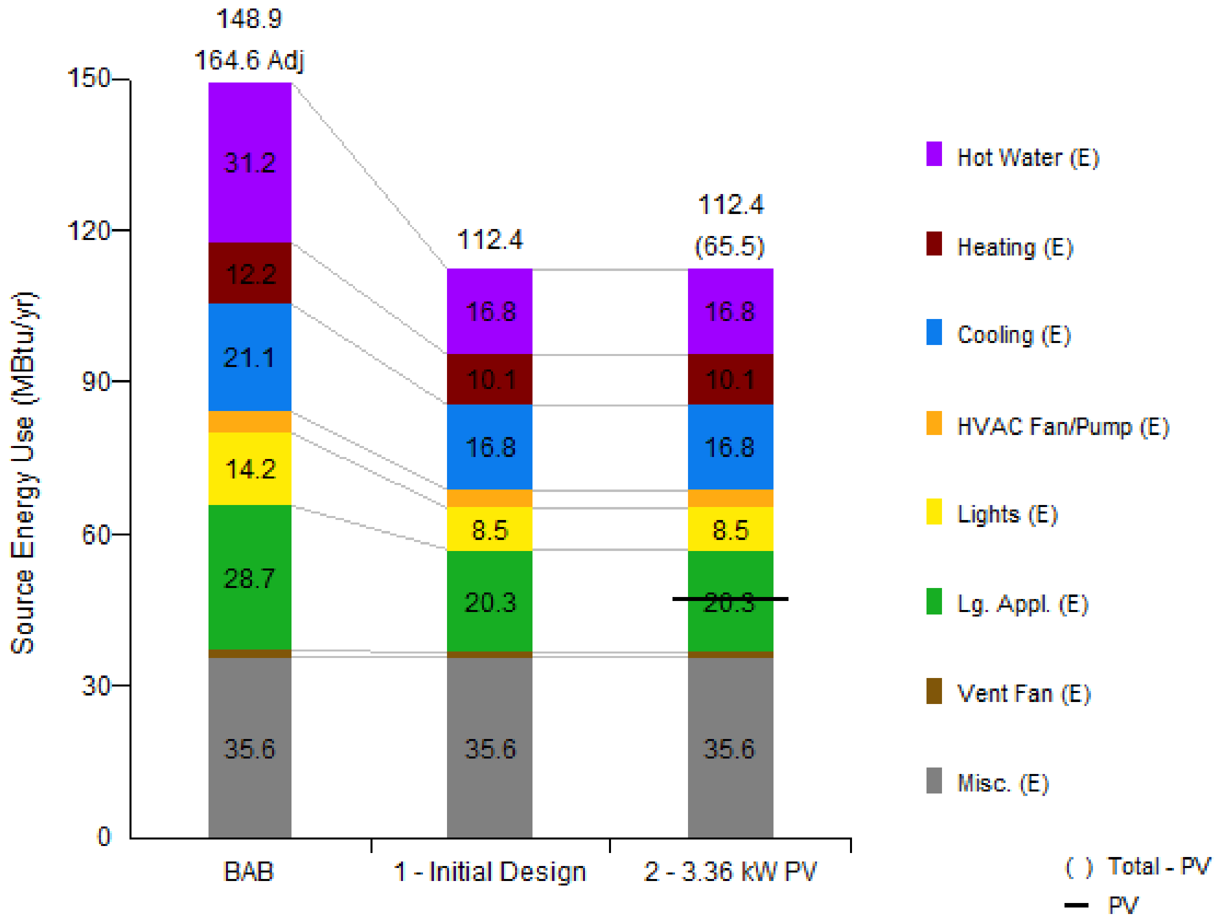


Figure 21. Predicted component source energy use for the Alexander plan

Appendix D Project Home Again Phase V Initial Energy Analysis

September 29th, 2010

Green Coast Enterprises
3517 Canal Street
New Orleans, LA 70119
(504) 281-4372
Attn: Reuben Teague

Initial Energy Design Review of Project Home Again Phase V- Plan 3B2BB

Mr. Teague,

Building Science Corporation has completed analysis on the Project Home Again Phase V Plan 3B2BB. The simulations show how this floor plan can qualify for Building America support.

The following two qualifications need to be met for a house to be certified Building America.

- HERS rating of 70 or less (per the DOE Builder's Challenge certification)
- 50% or more savings vs. the Building America Benchmark (similar to 50% vs. code construction)

The memo includes a recommended pathway for meeting both requirements through a parametric analysis of the 3B2BB floor plan.

Also included in this report is a discussion of related buildings science technologies that are recommended in low energy homes. BSC is able to provide architectural and mechanical details for any recommended upgrades if needed.

BSC is excited about the opportunity to work with you under the Building America program. More information on the Building America program can be found here:

http://www1.eere.energy.gov/buildings/building_america/about.html

Please read the report for more information. If you have any questions you can email me at phil@buildingscience.com or call (617) 863-5271.

Sincerely,

Philip Kerrigan Jr., PE

Cc: Betsy Pettit, FAIA (Building Science Corporation)
Will Bradshaw (Green Coast Enterprises)

Appendix E Building Plan Specifications

The PHA Phase V 3 Bedroom, 2 Bath, Option B Plan (or 3B2BB) is a single-story structure that is built on a wooden pile foundation. Table 13 shows some of the basic dimensions and areas that were calculated in a plan takeoff. Some dimensions (such as floor area) may be different than what is listed in the drawing set. This is because BSC measures the areas from the outside of the exterior framed walls.

Table 13. Basic Dimensions and Areas for Plan 3B2BB

Floor Area (ft^2)	Surface Area (ft^2)	Volume (ft^3)	Bedrooms (Number)	Baths (Number)	Glazing Ratio
1344	4259	15,456	3	2.0	8.9%

Table 14 outlines the specifications as noted on the drawing set.

Table 14. Building Energy Specifications

	As Designed
Building Enclosure	
Roof	R-30 low-density ocSPF at roof deck to create conditioned attic
Walls	R-16 Oceansafe 4-in. steel SIPs
Frame Floors	R-13 2-in. high-density spray foam to underside of subfloor
Foundation	Vented crawlspace
Windows	Vinyl double-glazed with LoE^3 (U = 0.35, SHGC = 0.27)
Infiltration	1.4 in.^{2} leakage area per 100 ft^2 of enclosure (600 CFM 50)
Mechanical Systems	
Heat	8.6 HSPF air source heat pump
Cooling	16 SEER air source heat pump
DHW	Instant electric water heater (0.98 EF assumed)
Ducts	R-6 flex runouts in unvented attic; no leakage to outside (≤ 5%)
Dehumidification	No supplemental dehumidification
Ventilation	Supply-only system with Aprilaire 8126 VCS, 33% duty cycle: 10 min on, 20 min off, 50 CFM average flow
Return Pathways	Jump ducts at bedrooms
Lighting	ENERGY STAR lighting
Appliances	ENERGY STAR appliances
Renewables	
PV	2.7-kW array

Some assumptions in the above specifications were not on the drawings. The infiltration rate is assumed to be around 1.4 $in.^2$ of leakage area per 100 ft^2 of enclosure. This is from actual blower door results on previous homes of similar size and construction. Also, an outside air duct with fan cycler was called out on the plans; this analysis assumed it to be an Aprilaire fan cycler. This assumption has no impact on the energy analysis.

Also, BSC does have the capacity to model solar hot water systems. If there is a specific solar DHW technology that is of interest to PHA, it can be added to the model.

Appendix F Energy Analysis

Baseline energy efficiency package. Whole-house hourly energy consumption parametric simulations were completed comparing the incremental energy consumption reduction for various energy efficiency strategies compared to the BA Benchmark Protocol created by DOE. The BA Benchmark is a protocol for creating a reference house to which the prototype house (the 3B2BB plan, in this case) compared to in order to calculate a % savings. The BA Benchmark specifies a home with similar dimensions versus the prototype but with standard code specifications. It is very similar to the HERS Reference Home but does have some slight differences.

The simulations were run using EnergyGauge USA USRCBB v2.8.04 software developed by the Florida Solar Energy Center (FSEC).

The energy analysis for this plan consists of a parametric simulation of the upgrades vs. the Building America benchmark. The benchmark house is then upgraded step by step to the design that is on the drawing set, along with some assumed specifications.

Parametric simulations. The incremental parametric changes done in the simulation (EnergyGauge USA USRRPB v 2.804) are described in Table 15. The abbreviation IOSEU is used to replace "incremental overall source energy use." A negative value reflects an increase in energy use, and a positive value a decrease.

Table 15. Plan 3B2BB Parametric Steps

Parametric Run ID	Parametric Step	Description	Plan 3B2BB Total %	Plan 3B2BB IOSEU
1	0 + window configuration changes and shading	In this step, the house plan was oriented in the worst-case scenario orientation and the window sizes were changed to match the layout of the prototype house. Overhangs were added per the floor plans.	17.3%	17.3%
2	1 + air sealing	The building infiltration rate is reduced to a leak ratio of 2.5 (equal to 1065 CFM 50)	21.3%	4.0%
3	2 + ducts inside and 5% leakage	The overall duct leakage is reduced to 5.0% and all ductwork and mechanical equipment is moved to inside conditioned space (unvented cathedralized attic).	25.4%	4.1%
4	3 + steel SIPS	The walls are upgraded to 4-in. Oceansafe steel SIPs	27.0%	1.6%
5	4 + R-30 unvented cathedralized attic	The roof is converted to an unvented attic with ~8.5-in. low-density 0.5 lb/ft^3 ocSPF (R-30) installed to the underside of the roof deck.	33.0%	6.0%

Parametric Run ID	Parametric Step	Description	Plan 3B2BB Total %	Plan 3B2BB IOSEU
6	5 + R-13 floor over crawlspace	2 in. high-density 2.0 lb/ft^3 ccSPF is installed under the subfloor in the joist space	33.4%	0.4%
7	6 + U = 0.35, SHGC = 0.27 windows	Windows are upgraded to vinyl or fiberglass framed units with LoE^3 spectrally selective glass coating	36.0%	2.6%
8	7 + 16 SEER heat pump	Upgraded to 16 SEER air source heat pump	41.9%	5.9%
9	8 + 8.6 HSPF heat pump	Upgraded to 8.6 HSPF air source heat pump	42.7%	0.8%
10	9 + CFIS ventilation	CFIS ventilation will incur a slight efficiency drop, but it is necessary to maintain proper indoor air quality	42.0%	-0.7%
11	10 + 0.92 EF electric water heater	Upgraded to an efficient electric water heater (EF = 0.92)	43.9%	1.8%
12	11+ 100% CFLs	The lighting scheme was changed from a 14% CFL package to a complete 100% CFL package for all hardwired lights	48.4%	4.6%
13	12+ ENERGY STAR appliances	The refrigerator, clothes washer and dishwasher all have been upgraded to ENERGY STAR status. This saves both electricity and water.	53.3%	4.9%
14	13 + 2.0 EF water heater	Water heater is retrofitted with an air source heat pump water heater (2.0 EF)	57.2%	8.8%
15	14 + 2.7 kW PV	2.7-kW PV system	72.4%	19.1%

Figure 22 shows the parametric analysis results.

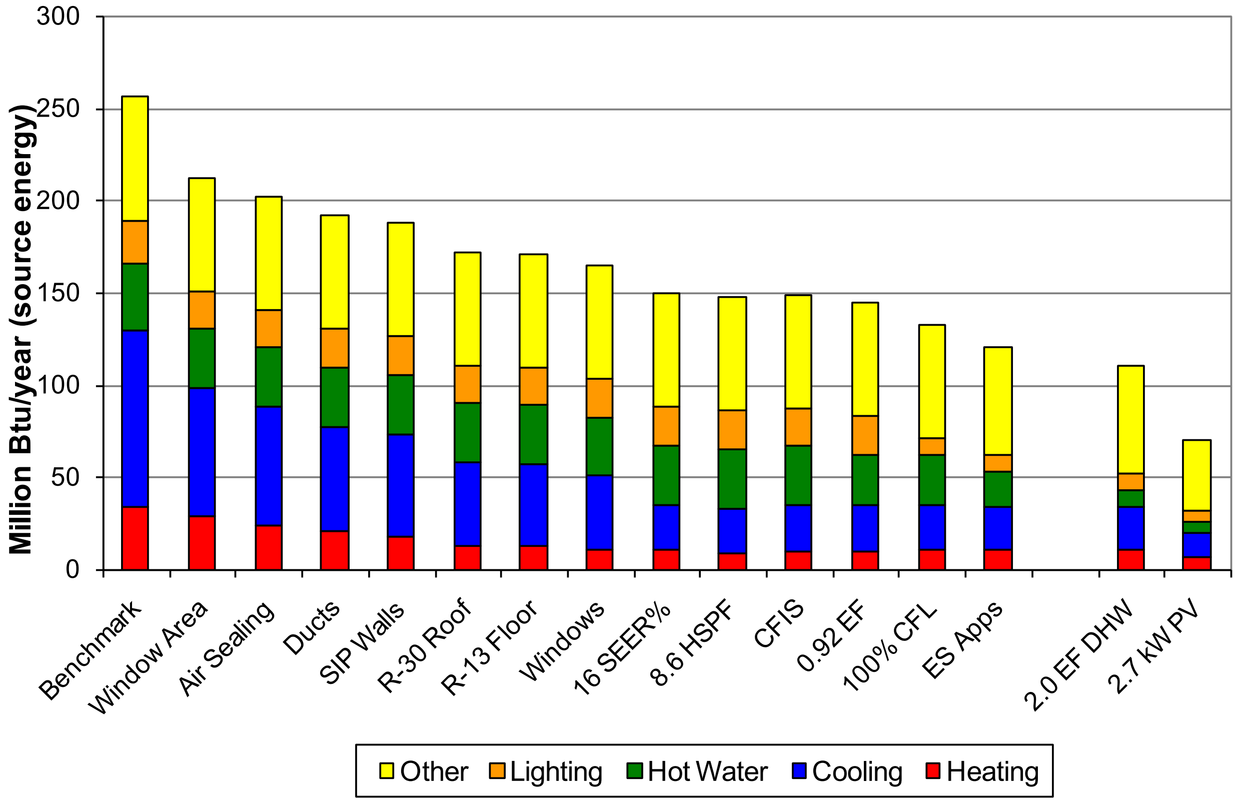


Figure 22. Plan 3B2BB parametric results graph

Table 16 outlines the incremental savings for this plan. In addition to energy savings, the cooling and heating peak loads are listed to show the impacts of individual upgrades.

Table 16. Plan 3B2BB Parametric Results Breakdown

Parametric Run ID	Description of Change	% Over Benchmark	Incremental Over Benchmark	Annual Energy Cost	Savings	HERS Index
0	Benchmark	N/A	N/A	$2,209	N/A	139.0
1	0 + window areas and shading	17.3%	17.3%	$2,033	$176	
2	1 + air sealing (1.4 leak ratio)	21.3%	4.0%	$1,935	$99	
3	2 + duct airtightness	25.4%	4.1%	$1,833	$102	
4	3 + R-16 SIP walls	27.0%	1.6%	$1,794	$39	
5	4 + R-30 ocSPF unvented attic	33.0%	6.0%	$1,646	$148	
6	5 + /R-13 ccSPF floor	33.4%	0.4%	$1,637	$9	
7	6 + low-e windows (U = 35, SHGC = 0.27)	36.0%	2.6%	$1,574	$63	
8	7 + 16 SEER windows	41.9%	5.9%	$1,428	$146	
9	8 + 8.6 HSPF HP	42.7%	0.8%	$1,408	$19	
10	9 + CFIS	42.0%	–0.7%	$1,425	$(17)	
11	10 + 0.98 EF DHW	43.9%	1.8%	$1,380	$45	72.0
12	11 + 100% CFLs	48.4%	4.6%	$1,268	$112	67.0
13	12 + ENERGY STAR appliances	53.3%	4.9%	$1,148	$120	67.0
Recommended Option						
14	12 + 2.0 EF DHW HP	57.2%	8.8%	$1,051	$217	60.0
15	13 + 2.7-kW PV array	72.4%	19.1%	$667	$481	35.0

Although the specifications on the plan meet both thresholds, in case one of the upgrades is not implemented, BSC has suggested an option (the air source heat pump water heater) and has shown its impact on energy use.

The total annual energy costs were predicted using local utility rates:

Entergy New Orleans *~$0.11/kWh—total*

The BSC-recommended house design saves around $1,061 annually compared to standard practice.

A HERS calculation from Energy Gauge predicts that this plan can receive a HERS rating of 67, or even as low as 35, if all improvements are specified.

A HERS Index of ≤ 70 qualifies this home for DOEy's Builder's Challenge Program (see Figure 23). The Builders Challenge program is intended to gain recognition for those buildings that exceed ENERGY STAR efficiency. More information can be found at www1.eere.energy.gov/buildings/challenge/.

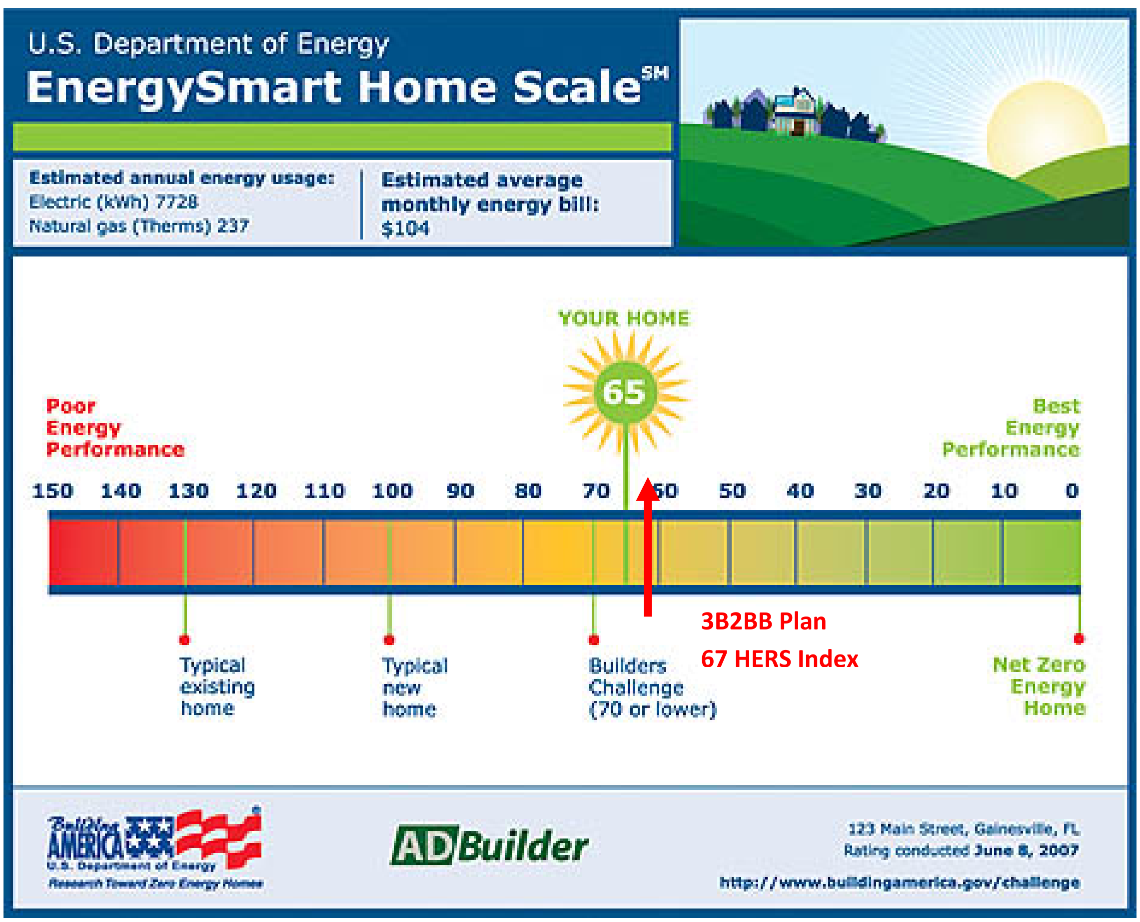


Figure 23. Builders Challenge example label with predicted HERS index indicated

A brief discussion of the various upgrades that were addressed in the Energy Analysis follows. These recommendations impact more than energy use. They are intended to improve the sustainability and the durability of the house as well the indoor living environment.

Insulation. The recommended building design is a very high efficiency enclosure. This includes a fully insulated raised floor on piers with R-13 2 in. high-density 2.0 lb/ft^3 ccSPF. The walls are constructed with steel R-16 SIPs. The SIPs are 4 in. wide and are constructed with EPS foam (R-4/inch). The roof is designed as an unvented attic with R-30 ~8.6 in. low density 0.5 lb/ft^3 open cell spray foam insulation.

Spectrally selective windows. The specified windows are either fiberglass or vinyl framed double glazed spectrally selective units with the next generation of low emissivity glass coatings. One example of this next generation of Low-E coatings is the Lo-E^3 from Cardinal Glass (http://www.cardinalcorp.com/products_coated_366/366.htm) This glass coating allows transmission of most of the visible light (unlike tinted windows), while cutting ultraviolet light transmittance by approximately 90%. Therefore, they reduce cooling load from solar gain, increase comfort, and reduce UV damage to furnishings. Furthermore, the coated glazing has superior insulating properties compared to clear glass (U=0.24, SHGC=0.19).

Infiltration/air flow retarder (a.k.a. air barrier). The air barrier in this design is provided by the high density 2.0 lb/ft^3 closed cell spray foam insulation installed in the framed wall, roof, and floor. In addition, spray foam should be applied in areas of known air infiltration (rim/band joists, around windows, at any mechanical/electrical penetrations). The Building America infiltration target is 2.5 square inches of equivalent leakage area per 100 square feet of envelope area.

Drainage plane. Drainage planes are water repellent materials (building paper, house wrap, sheet membranes, etc) that are located behind the cladding and are designed and constructed to drain water that passes through the cladding. They are interconnected with flashings, window and door openings, and other penetrations of the building enclosure to provide drainage of water to the exterior of the building. The materials that form the drainage plane overlap each other shingle fashion or are sealed so that water drains down and out of the wall. The drainage plane is also referred to as the "water resistant barrier" or WRB.

A more complete discussion of the topic of water management can be found in the Building Science Press book, *The Water Management Guide* (http://www.buildingsciencepress.com/books.asp?CatID=21), or in Building Science Digest 105: "Understanding Drainage Planes" (http://www.buildingscience.com/documents/digests/bsd-105-understanding-drainage-planes). In the proposed BSC enclosure design the drainage plane can be a housewrap, such as Tyvek. A full set of details should be created and included in the plans to minimize risks of water damage to the building. Examples of some of these details are below for window flashing (drainage pan at window rough openings) are shown in Figure 24 and Figure 25). The wood frame wall with sheathing is a steel SIPs panel in this case.

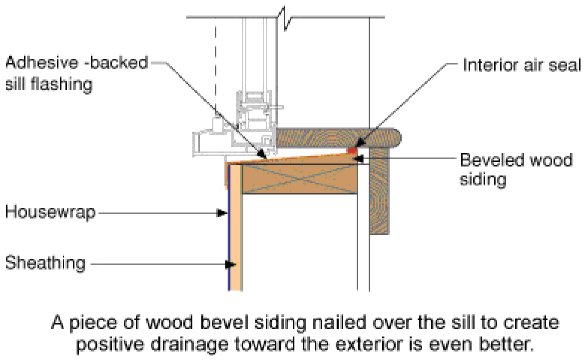


Figure 24. Use of beveled siding at a window flashing

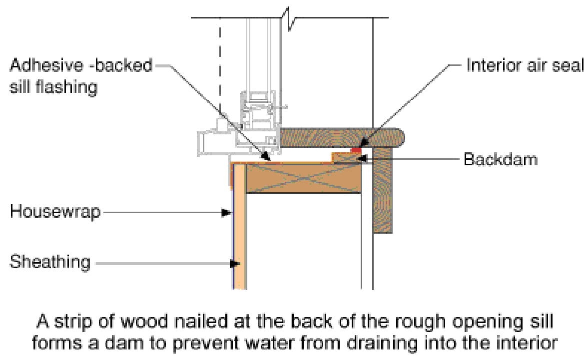


Figure 25. Use of a backdam at a window flashing

Air source heat pump. The use of a high efficiency air source heat pump is an important aspect of this design. The climate is Hot-Humid, so the demand for cooing and dehumidification will be high.

Dehumidification. Dehumidification control is important in low energy homes in this climate. This is because the sensible load has been reduced through the building design however the latent load is only marginally reduced (because much of the load is generated from occupant behavior). Therefore, dehumidification control separate from cooling operation is needed to control humidity levels year round. This can be achieved through the installation of a whole house dehumidifier (such as an Ultra-Aire 65H). This will allow the house to be dehumidified when there is no need for cooling.

Heat pump rightsizing. The leak-free nature of the building envelope, the high-performance window system, and the increased levels of thermal insulation allow a considerable simplification and reduction in size of the duct distribution system for heating and cooling. High efficiency units do cost more than standard efficiency, but right sizing of the equipment often helps offset some of the additional cost. After the building enclosure design is committed to, BSC can assist in a complete HVAC system sizing and duct design following the procedures of ACCA Manuals J, S, and D.

Duct system air sealing. Mastic or foil tape is recommended to seal all ductwork joints. The ductwork system should be tested for tightness in the completed house with a duct blaster test, as part of the commissioning process. The goal is a CFM 25 (cubic feet per minute at 25 Pascals test pressure) equal to 5% of the high-speed air handler nominal flow, at 400 CFM per ton. For instance, a 2-ton unit has a nominal 800 CFM flow, with a 40 CFM 25 goal. The requirement is for duct leakage to the outside, not total duct leakage.

The HVAC equipment is recommended to always be located in the conditioned space. This is done because the air handler and associated ductwork connections can be leaky parts of the HVAC system; this move eliminates much of the leakage to the outside. In these homes, the HVAC is recommended to be installed in the conditioned unvented cathedralized attic.

The recommended whole-house ventilation system will be primarily a supply system with an intermittent exhaust boost as needed (see Figure 26). For local (or spot ventilation), the kitchen, laundry and each bathroom should have an exhaust fan that will be energized whenever the room is in use and moisture or pollutants are being generated.

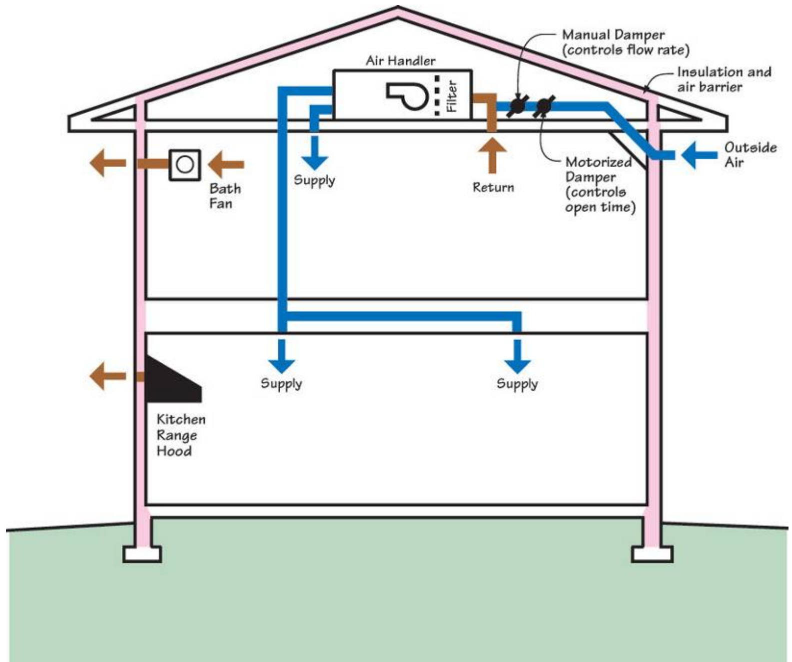


Figure 26. Recommended HVAC design schematic

Supply Ventilation system: The recommended ventilation system is a central fan integrated supply ventilation system; the basics are covered in the document "Central Fan Integrated Supply Ventilation—The Basics" (www.buildingscienceconsulting.com/resources/mechanical/fancycling/CFIS_Basics.pdf) and at http://www.fancycler.com

The system is shown in Figure 27 and Figure 28. It consists of an outside air duct connected to the return side of the air handler; when the system runs, it draws in outside air and distributes it throughout the house. The HVAC air distribution system provides circulation and tempering of outside air. A low-voltage electrically operated damper should be installed to prevent excess ventilation during peak load usage. This damper will automatically close the fresh air duct when enough ventilation time has already occurred, even if the fan continues to run. Because continuous running of the air handler is not recommended, a fan cycler (such as an Aprilaire Model 8126 Ventilation Control System) is recommended to run the air handler periodically. This fan controller will assure that the air handler will operate a minimum amount, and will close the electrically operated damper to prevent over ventilation during long periods of space conditioning. In addition to providing whole-house ventilation, this system also provides intermittent thermal comfort mixing, reducing temperature and humidity variations in the house. More information about the Aprilaire 8126 VCS fan controller and mechanical damper is available at http://fancycler.com/products/default.htm.

Figure 27 Aprilaire Model 8126 VCS fan cycler controller

Figure 28. 6 in. Normally Closed 24V motorized damper installed

The outside air duct should be set up to draw about 50 CFM at a fan cycling run time of 10 min on/20 min off (33% duty cycle). A 6 in. outside air duct tapped at the return box should provide enough negative pressures to reach this flow rate. See Figure 29 for a representation of the entire HVAC system setup.

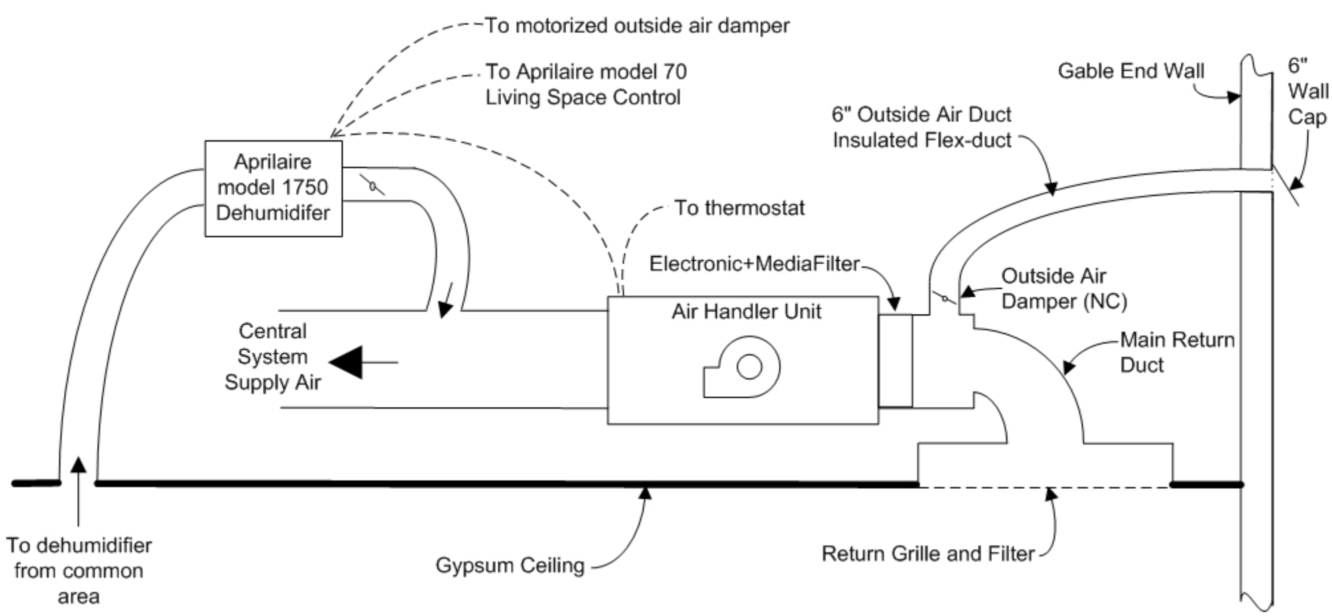
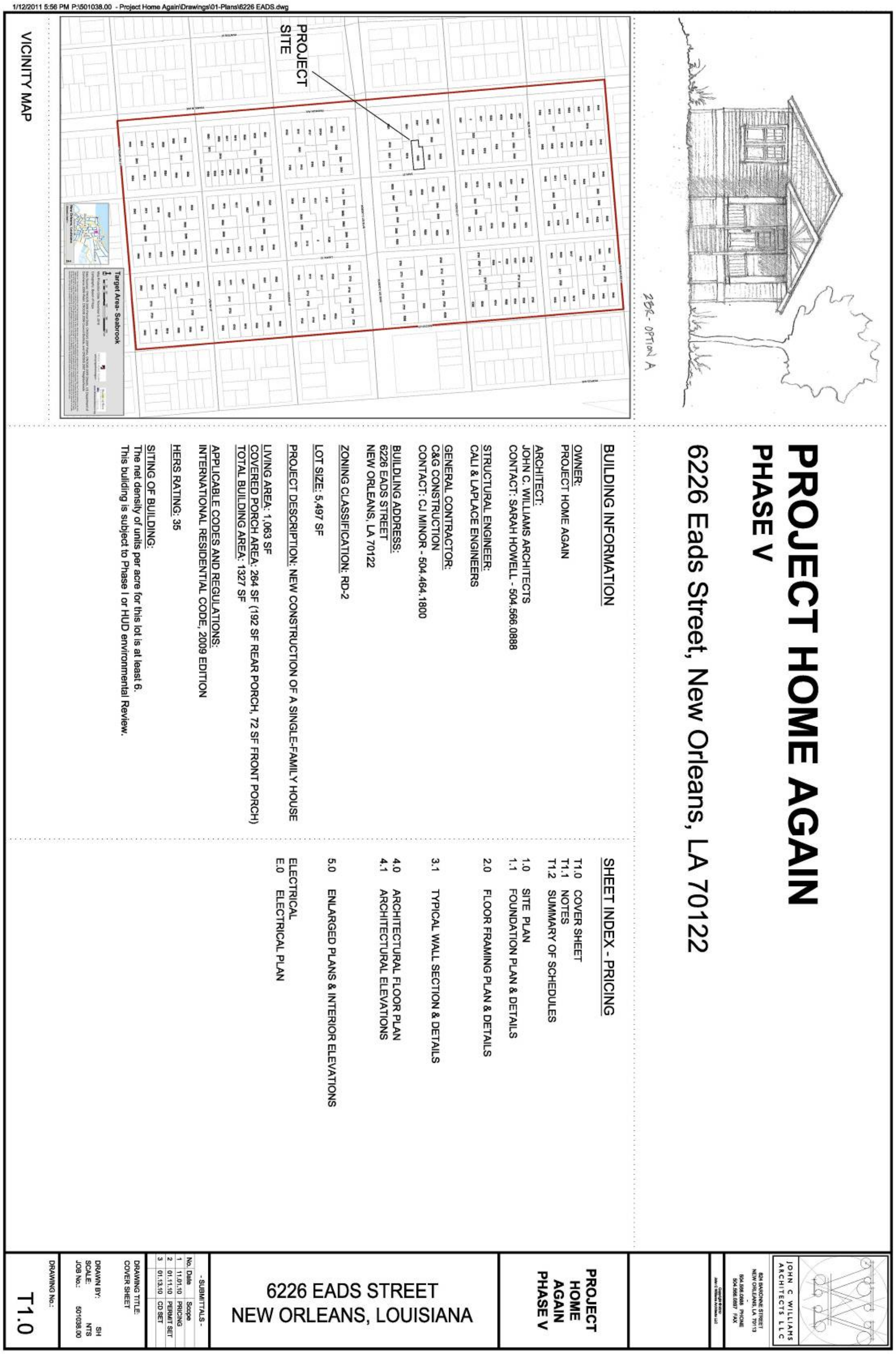


Figure 29. Schematic of HVAC system setup

Bedroom passive returns: All bedrooms should have a transfer grill or jump duct that will allow for return air to passively move to the hallway or main living area when the door is closed, keeping the pressure differential between the room and common area less than 3 Pascal. Airflow to the bedrooms can be severely restricted if the doors are shut at night with no passive returns installed.

Laundry Room Pressure Relief: The laundry room should also have a 10 in.x12 in. transfer grille installed to provide pressure relief during dryer operation. Typical dryers exhaust 150-200 CFM: although a supply duct is making up for some of that air, when the door is closed during dryer operation a return pathway must be present to keep the pressure within the +/- 3 Pa range.

Appendix G Architectural Drawings for Plan 2A



ARCHITECTURAL:

SITE/LANDSCAPING
1. Erosion control to be installed in accordance with EPA's best methods and practices and contractor must label all storm drains.
2. Environmental resources, such as trees, must be protected.
3. Lot to be crowned for drainage.
4. The General Contractor is responsible only for seeding the lot, but additional landscaping will be a design/bulid process by the owner and plantings will be pulled from a list of non-invasive species, including, but not limited to:
- Southern & Sweet Bay Magnolia
- Bald Cypress
- Walters Vibernium
- Saw & Dwarf Palmetto
- Savannah Holly
- Mondo Grass
- Crepe Myrtle
- Satsuma

5. The following climate-appropriate turf may be installed:
- Saint Augustine Grass
- Centipede Grass
- Buffalo Grass

BUILDING ENVELOPE / PEST MANAGEMENT
1. Owner to provide testing by a certified Energy Rater prior to occupancy. Leakage must test to less than 0.25 CFM/sf of building enclosure area at a pressure differential of 50 Pascals between the house interior and outdoors.
2. For pest management, all wall, floor, and joint penetrations to be sealed with low VOC caulk. Rodent- and corrosion-proof screens to be installed at large openings. Termite treatment to be provided at ground level.

SCREENING BELOW FLOOR LEVEL
1. Treated wood lattice over treated wood frame. Lockable access panel to be provided at rear of house. Paint color to be selected by architect.
2. Alternate: masonry screen wall on primary facade only.

FRONT STAIRS AND PORCHES
1. Front porch to be painted T&G 5/4 x 3 1/2" pressure-treated deck boards. Porch to slope 1/8" per foot.
2. Side and rear porches to be painted 5/4 x 6" pressure-treated deck boards with radius edges and 1/8" gap for drainage.
3. Stair to be painted, pressure-treated wood with closed risers.
4. Handrail to be painted, pressure-treated wood.
5. Front porch columns to be 8" square structural fiberglass with square capital and base.

EXTERIOR SIDING & TRIM
1. Typical siding to be fiber-cement smooth finish, integral color lap-siding, 5" exposure. Color to be selected by architect.
2. Siding on gable ends to be either fiber cement shingle or fiber cement panel with batten "starburst" overlay (per plans).
3. Fiber-cement trim (including soffit and fascia), smooth finish, integral color, size per plans. Color to be selected by architect.
4. Fiber-cement ceiling at porches.
5. Exposed beams to be wrapped in fiber-cement.

INSULATION
Closed-cell spray foam insulation at floor, R13.
Open-cell spray foam insulation at roof, R30.
Oceansafe 4" Steel SIP walls, insulation value R16 (R4 per inch).

WINDOWS
1. Windows to be vinyl, single hung windows with low E glass (SHGC 0.29); ENERGY STAR rated for Region 1.
2. Windows to be impact-resistant to meet either the Miami Dade County PA 201, 202, and 203 requirements or the ASTM E 1886 and ASTM E 1996 (Missile Level C-91b) requirements.
3. Windows to match window types shown in elevations as closely as possible within the budget.
4. Applied interior and exterior mullions and spacer to be included as an alternate.
5. Verify that sill height of windows on tub wall is 3" above shower surround.
6. Window flashing to be installed at head of windows. Steel track at window sill rough opening to be sloped per plans.
7. Window blinds to be purchased and installed by contractor.
8. All sleeping areas to have at least one window that meets egress requirements of IRC 2009 - 5.7 sf open area.

DOORS
1. Exterior front door to be insulated fiberglass or solid wood door with transom. Match door type indicated in plans as closely as possible within the budget.
2. Exterior rear or side doors to be single-lite doors with transoms.
3. Interior passage and privacy doors to be hollow-core, masonite, four-panel doors.
4. Double closet doors to be swing with ball catch or sliding (per schedule).
5. Attic pull-down stair will be located in master bedroom and accessed by hook and pole, not string.

ARCHITECTURAL (continued):

FLOORING
1. Wet area flooring: 12x12 tile over fiber cement backer board with sealed grout.
2. All other areas: engineered wood flooring (5 1/4" board width, 1/2" depth) over plywood subfloor.
3. Wood flooring must contain no added Urea-Formaldehyde.

INTERIOR WALLS
1. 1/2" gypsum board on walls; Level 3 finish. 5/8" gypsum board on ceiling.
2. Contractor to verify that gypsum board is not contaminated.
3. Cultured marble over moisture-resistant gypsum board in master bathroom, fiberglass (or sim.) tub/shower enclosure over moisture-resistant gypsum board in bathroom 2.

INTERIOR TRIM
1. 5 1/4" finger-joint, painted wood base board at wood floors; profile to be selected by architect.
2. 3 1/4" square-edge painted wood base board at tile floors.
3. Gypsum board return at head and jambs of windows with painted wood stool and apron.
4. 3 1/4" painted wood casing at interior doors.
5. Attic access stair opening to be cased with 2 1/4" painted wood casing.

CABINETRY
1. Cabinetry to be solid wood construction.
2. Cabinetry plywood to contain no added Urea-Formaldehyde.
3. Cabinets to be Shaker Style standard overlay; finish to be selected by architect.
4. Vanity cabinets to be standard 31" height.
5. Drawers should be dovetail jointed, not stapled.
6. Kitchen countertops to be 2 cm granite.
7. Lavatory counters to be cultured marble one-piece counter/lav bowl.

HARDWARE/ACCESSORIES
1. Hardware to be selected by architect. Contractor to include allowance of $500.
2. The following plumbing accessories to be installed in each bathroom per plans: 18" or 24" towel bars, towel ring, robe hook, toilet paper holder, cabinet over toilet.

PAINTS, ADHESIVES & SEALANTS
1. All interior paints and primers will meet Green Seal limits for VOCs.
2. All adhesives and sealants used in the construction of the house to be low VOC, meeting the standards specified in South Coast Air Quality Management District Rule 1168.
3. All painted surfaces to receive one coat primer, two top-coats paint.

STRUCTURAL:

GENERAL
1. All connectors exposed to exterior to be galvanized in accordance with ASTM A123 or A153. Simpson Connectors to be hot dip galvanized or "ZMAX"; Electro-galvanized fasteners are not acceptable.
2. All connectors to be rated clips or fasteners. No toe-nailing of structural members.

FOUNDATION
1. Foundation designed in accordance with ASCE 7 for 130 MPH winds, exposure category B.
2. Piles to be 25' Class 5 treated timber piles ASTM D25, spacing per plans.
3. Pile layout based on data obtained from the City of New Orleans (stating a pile-load capacity of 8 tons per pile) and assuming a 40 psf live load and 10 psf dead load.
4. Top of subfloor to be 12" above Base Flood Elevation.

FLOOR SYSTEM
1. 3/4" T&G OSB subfloor, glued and nailed to Bluwood engineered I-joists, size and spacing per plan.
2. Pipes passing through beams to pass within the middle third of the beam span and the depth of the beam.

WALLS
1. Exterior Walls: 4" Oceansafe Steel Structural Insulated Panels (where exterior wall is a plumbing wall, furr out with 2x6 studs).
2. Interior Walls: All interior walls are non-load bearing. Interior walls to be constructed of 2x4 Bluwood studs @ 24" o.c., 2x6s at plumbing walls (per plan).

ROOF
1. Roof framing: Building wrap over 5/8" CDX Bluwood plywood over Bluwood truss system, size and spacing per plans.
2. Truss manufacturer to provide shop drawings.
3. Roof trusses to be fastened to SIP walls with Simpson H2.5a hurricane clips at each truss-to-top plate connection.
4. Roof decking to be fastened with 8d - 2.5" min., 3" preferred ring shank full-head nails at 6" o.c. on the edge and 12" o.c. in the field. Within 4' of ridge beam, gable end or hips, nail spacing should be 3" o.c. at the edge and 6" o.c. in the field.
5. Roof shingles to be dimensional shingles (Owens Corning - Duration Series or similar). Shingles must conform to ASTM D 7158G (130 mph). Fasten shingles with 6 nails per shingle.
6. Install galvanized metal roof flashing.

MECHANICAL:
Central-fan, integrated supply, whole-house mechanical ventilation system to be provided with the following specifications:
1. Equipment to be sized in accordance with ACCA Manual J and S to ensure adequate dehumidification.
2. AHU: Carrier indoor variable-speed air handler, 16 SEER, minimum 8.6 HSPF; Carrier 2-stage outdoor condensing unit; Carrier toptech 3H/2C HC/HP Thermostat.
3. Fresh Air Intake: HVAC contractor must install a 6" fresh air duct tied into return air plenum with electronic damper and fan cycling controller. Fresh air will, therefore, be provided per ASHRAE 62.2-2007.
4. Ductwork: Ductwork shall be located within the thermal enclosure of the house. All taps and connections shall be Mastic sealed to reduce leakage to 3 CFM per 100 SF conditioned floor area (less than 10% of conditioned floor area when measured at 25 Pascals using duct pressurization methods). Duct leakage will be tested by a certified Energy Rater prior to payment of mechanical contractor.
5. Filters: Filter at return air grill to be pleated filter, MERV 8 minimum.
6. Balancing: Room airflows must balance within 10% of Manual J designations. Manual balancing dampers must be installed at each takeoff.
7. Pressure balancing: Install jump ducts or transfer grills at each bedroom so that pressure difference between rooms does not exceed +/- 3 Pascals during cooling operation.
8. Location of unit: Air Handling Unit to be in attic or on living level (per plans), raised at least 18" above floor. Condensing Unit to be installed at the BFE on a platform constructed with 2x6 treated wood joists at 16 inches on center. Platform to be fastened with structural beam with metal joist hangers or ledger strip.

PLUMBING/APPLIANCES:
1. Hot water to be provided by electric on-demand tankless water heater.
2. Clothes washer, dishwasher, and refrigerator to be ENERGY STAR rated. 18 cu.ft. refrigerator with icemaker for 2-bedroom house, 21 cu.ft. refrigerator with icemaker for 3 bedroom house.
3. Install pipe to exterior with bug screen in floor behind refrigerator in case of icemaker leak.
4. Dual flush toilets to be installed in each bathroom. Average flow rate 1.3 gpf (gallons per flush).
5. Low-flow aerators to be installed at bathroom and kitchen faucets to reduce flow to 2.0 gpm max.
6. Low-flow shower heads to be installed to reduce flow to 2.0 gpm max.
7. Hot and cold water lines to be PEX piping.
8. Install washing machine controls at 4'-4" AFF with single-throw valve for accessibility.

ELECTRICAL:
1. All interior and exterior light fixtures to be ENERGY STAR.
2. Smoke detectors to be installed in and directly outside of all sleeping areas. Smoke detector in hallway outside of bedrooms to be combination smoke and carbon monoxide detector.
3. Daylight sensors or timers to be installed on all outside lighting including porch lighting.

VENTING:
1. All bathroom exhaust fans must be ASHRAE 62.2 compliant, ENERGY STAR labeled, vented directly to the outdoors, connected to the light switch, and equipped with a humidistat sensor or timer.
2. Kitchen will be equipped with power vented range hood that exhausts to the exterior.
3. Clothes dryer must vent directly to the outdoors.
4. No combustion equipment to be installed in the house.

SOLAR:
1. Photovaultaic panels to be provided by owner.
2. General Contractor's electrician to provide 3/4" EMT conduit from underside of joists with 12" stub out in attic.
3. General Contractor to assist in coordination and supervision of panel installation.

TERMITE/PEST MANAGEMENT:
1. All wall, floor, and joint penetrations to be sealed with low VOC caulk or spray foam insulation.
2. Provide termite treatment at ground level.
3. Install termite shields between sill beams and piling.
4. Utilize Bluwood treated wood for floor system in order to resist termites.
5. Install rodent- and corrosion-proof screens at large openings.

SECURITY:
1. Hard-wired security systems to be installed with sensors on all doors and windows, motion detector, key pad, AC condenser wire, and optional monitoring.

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PROJECT HOME AGAIN PHASE V

6226 EADS STREET
NEW ORLEANS, LOUISIANA

- SUBMITTALS -

No.	Date	Scope
1	11.01.10	PRICING
2	01.11.10	PERMIT SET
3	01.13.10	CD SET

DRAWING TITLE: SPECIFICATIONS

DRAWN BY: SH
SCALE: NTS
JOB No.: 501038.00

DRAWING No.: T1.1

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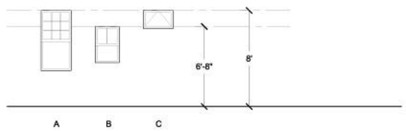
WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	HEAD HEIGHT (AFF)	QTY.	NOTES
A	30"	60"	8'-0"	7	SINGLE-HUNG; ENERGY STAR; APPLIED INT. & EXT. MUNTINS; EGRESS
B	24"	36"	6'-8"	2	SINGLE-HUNG; ENERGY STAR; APPLIED INT. & EXT. MUNTINS
C	30"	18"	8'-0"	2	AWNING; ENERGY STAR



WINDOW TYPES

FINISH SCHEDULE

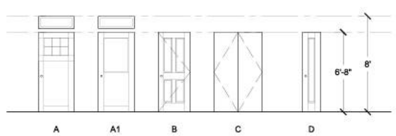
ROOM NAME	FLOOR MATERIAL	AREA (SF)	NOTES
LIVING/DINING/KITCHEN (INCL. CLOSET)	WOOD FLOORING	428	SF INCLUDES UNDER CABINETS
MASTER BEDROOM (INCL.CLOSET)	WOOD FLOORING	228	
BEDROOM 2 (INCL. CLOSET)	WOOD FLOORING	162	
MASTER BATHROOM	TILE	41	SEALED GROUT; SF INCLUDES UNDER CAB., EXCLUDES TUB
BATHROOM 2	TILE	36	SEALED GROUT; SF INCLUDES UNDER CAB., EXCLUDES TUB
LAUNDRY/MUDROOM	TILE	54	SEALED GROUT;

PLUMBING/APPLIANCE SCHEDULE

FIXTURE/FITTING	DESCRIPTION (DETAILED SPECIFICATIONS PROVIDED BY DISTRIBUTOR)
TOILET	DUAL-FLUSH TOILET - AVG. FLOW RATE 1.3 GPF
BATHROOM SINK	MAN-MADE COMBINATION COUNTER/LAVATORY
VANITY FAUCET	LOW-FLOW TWO-HANDLE FAUCET - 2.0 GPM
BATH 2 TUB/SHOWER	ONE-PIECE T/S ENCLOSURE
MASTER BATH TUB/SHOWER	STEEL TUB WITH CULTURED MARBLE SURROUND
TUB/SHOWER CONTROLS	LOW FLOW SHOWER HEAD - 2.0 GPM
KITCHEN SINK	DOUBLE-BASIN SELF-RIMMING SINK
KITCHEN FAUCET	LOW-FLOW SINGLE-CONTROL FAUCET - 2.0 GPM
DISHWASHER	ENERGY STAR
REFRIGERATOR	ENERGY STAR - 18 CU.FT. 2 BR, 21 CU.FT. 3BR
RANGE	ELECTRIC RANGE WITH HOOD VENTED DIRECTLY TO EXTERIOR
CLOTHES WASHER	ENERGY STAR FRONT-LOADING
CLOTHES DRYER	STACKABLE
WATER HEATER	ELECTRIC ON-DEMAND TANKLESS WATER HEATER

DOOR SCHEDULE

DOOR No.	DOOR TYPE	ACTUAL DOOR	ROUGH OPENING	NOTES
1	A	3'-0" x 6'-8"	3'-2½" x 6'-10"	EXTERIOR - 6 LITE; TRANSOM ABOVE
2	A1	3'-0" x 6'-8"	3'-2½" x 6'-10"	EXTERIOR - SINGLE LITE
3	A1	3'-0" x 6'-8"	3'-2½" x 6'-10"	EXTERIOR - SINGLE LITE
4	B	2'-6" x 6'-8"	2'-8" x 6'-9"	CLOSET
5	B	2'-8" x 6'-8"	2'-10" x 6'-9"	BEDROOM
6	C	4'-0" x 6'-8"	4'-2" x 6'-9"	CLOSET - DOUBLE SWING W/ BALL CATCH
7	B	2'-6" x 6'-8"	2'-8" x 6'-9"	BATHROOM
8	B	3'-0" x 6'-8"	3'-2" x 6'-9"	BEDROOM - HANDI-CAP ACCESSIBLE
9	C	4'-0" x 6'-8"	4'-2" x 6'-9"	CLOSET - DOUBLE SWING W/ BALL CATCH
10	B	3'-0" x 6'-8"	3'-2" x 6'-9"	BATHROOM - HANDI-CAP ACCESSIBLE



DOOR TYPES

LIGHTING SCHEDULE

TAG	SYMBOL	LOCATION	DESCRIPTION
F1	WP	REAR PORCH/ENTRANCE	EXTERIOR SCONCE
F2		LIVING/DINING ROOM; BEDROOMS	CEILING FAN WITH LIGHT KIT
F3	WP	COVERED REAR OR SIDE PORCH	EXTERIOR CEILING FAN (NO LIGHT KIT)
F4		KITCHEN; HALLWAY	RECESSED CAN
F5		KITCHEN	SURFACE-MOUNTED FLOURSECENT
F6		ENTRANCE / HALLWAY	DOOR BELL / CHIME
F7	VL	BATHROOMS	VENT/LIGHT COMBINATION
F8		LAUNDRY/UTILITY ROOM; CLOSET(S)	SURFACE-MOUNTED FLOURSECENT
F9	WP	EXT. FRONT ENTRY	EXTERIOR ENTRY PENDANT
F10a		BATHROOMS	2-LIGHT VANITY SCONCE
F10b		BATHROOMS	3-LIGHT VANITY SCONCE
F11		BEDROOMS; HALLWAY	SMOKE DETECTOR
F12		ATTIC	PORCELAIN KEYLESS
F13		EXT. FRONT & REAR	MOTION-SENSORED FLOOD LIGHT

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	STANDARD SWITCH		JUNCTION BOX
	3-WAY SWITCH		CABLE / DATA JACK
	DUPLEX RECEPTACLE		PHONE JACK
	QUAD RECEPTACLE		ELECTRICAL SUB-PANEL
GFI	GFCI DUPLEX RECEPTACLE		ELECTRICAL DISCONNECT
GFI WP	EXTERIOR DUPLEX RECEPTACLE		SOLAR PV INVERTER
	DUPLEX DEDICATED CIRCUIT		

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PROJECT HOME AGAIN PHASE V

6226 EADS STREET
NEW ORLEANS, LOUISIANA

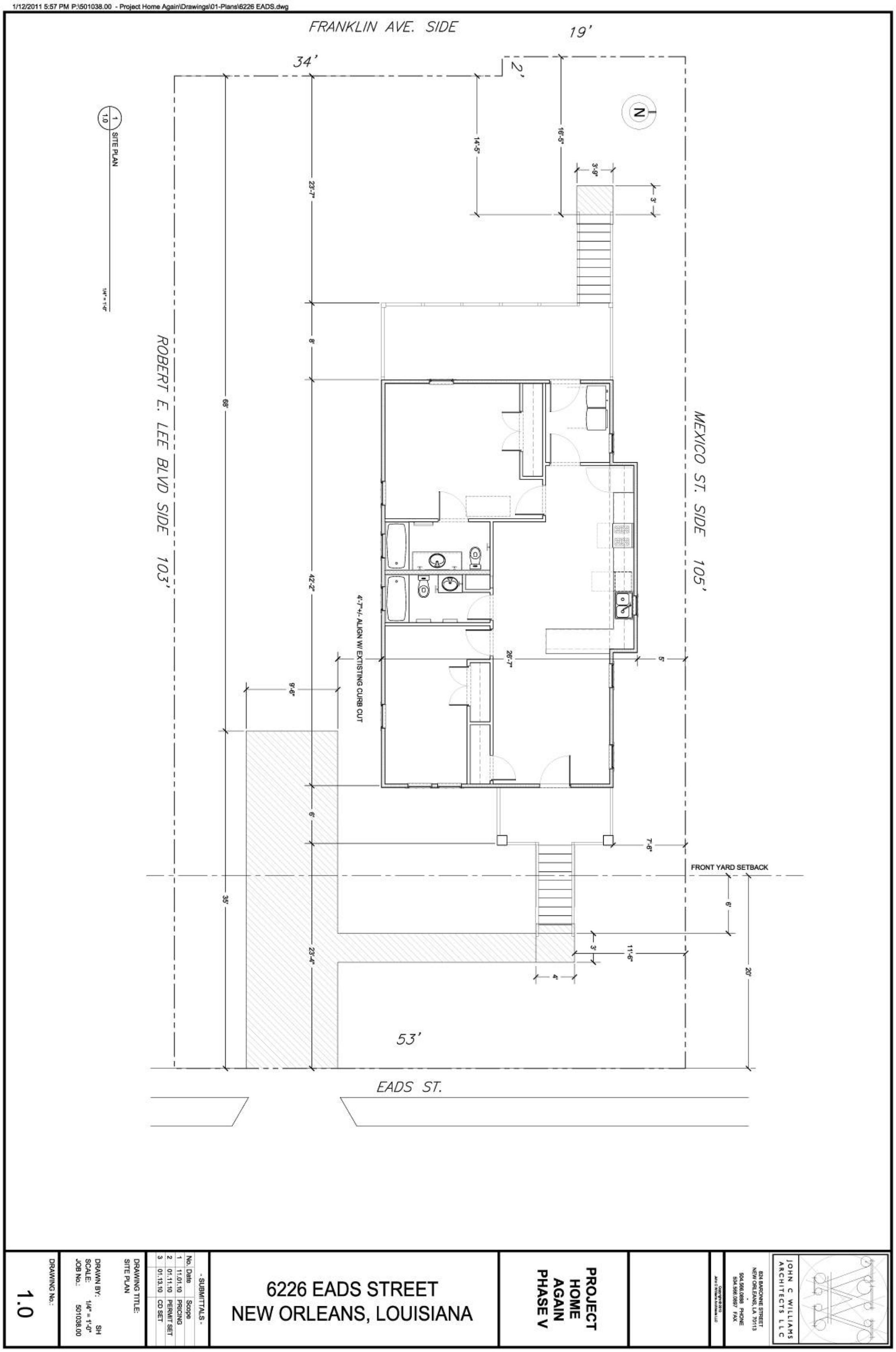
- SUBMITTALS -

No.	Date	Scope
1	11.01.10	PRICING
2	01.11.10	PERMIT SET
3	01.13.10	CD SET

DRAWING TITLE: SCHEDULES

DRAWN BY: SH
SCALE: NTS
JOB No.: 501038.00

DRAWING No.: T1.2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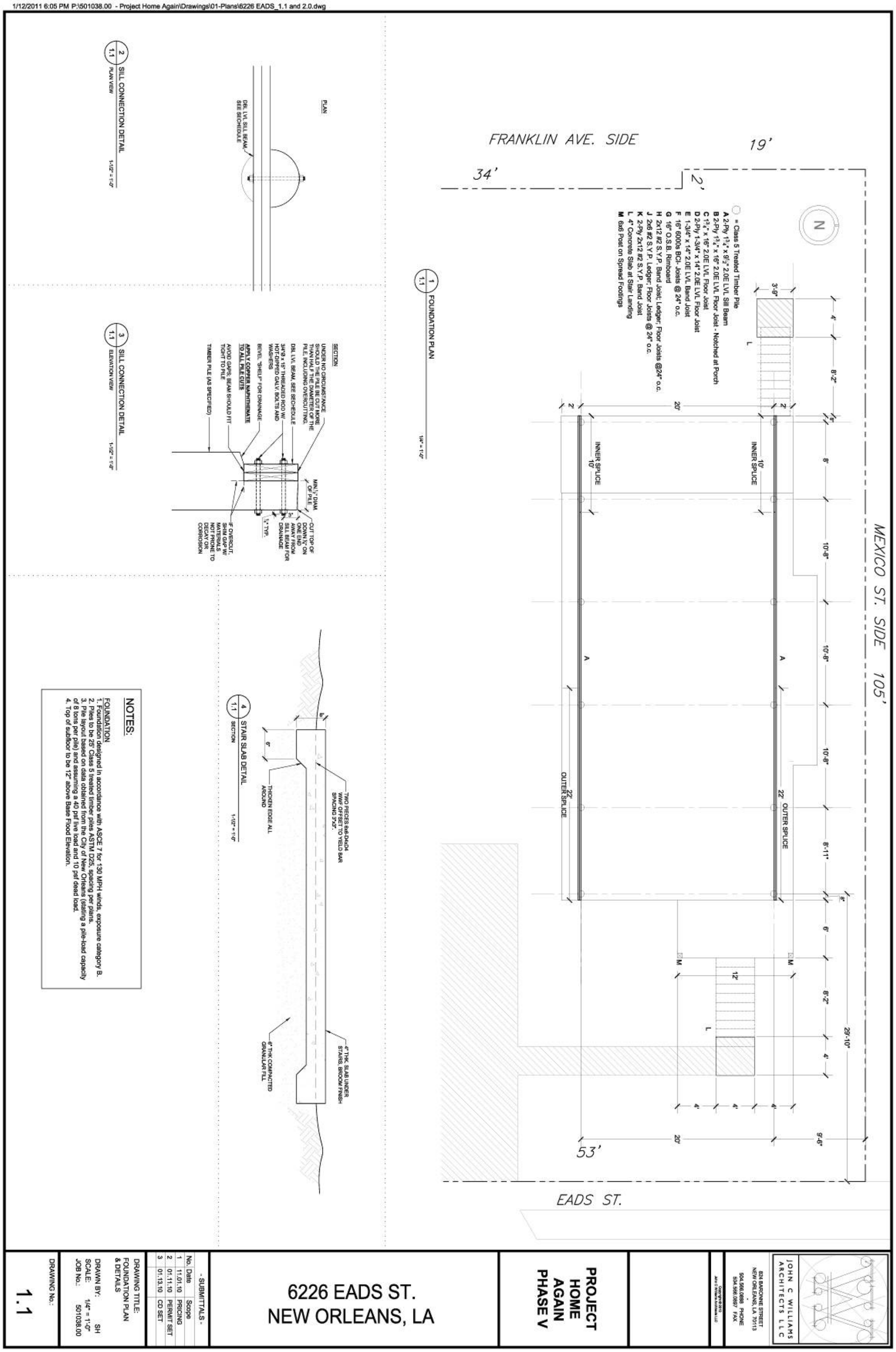
FRANKLIN AVE. SIDE
19'
34'
2'
ROBERT E. LEE BLVD SIDE 103'
MEXICO ST. SIDE 105'
53'
EADS ST.
FRONT YARD SETBACK
4'-7"+/- ALIGN W/ EXISTING CURB CUT
SITE PLAN
1/4" = 1'-0"
6226 EADS STREET
NEW ORLEANS, LOUISIANA
PROJECT HOME AGAIN PHASE V
- SUBMITTALS -
No. Date Scope
1 11.01.10 PRICING
2 01.11.10 PERMIT SET
3 01.13.10 CD SET
DRAWING TITLE: SITE PLAN
DRAWN BY: SH
SCALE: 1/4" = 1'-0"
JOB No.: 501038.00
DRAWING No.: 1.0
JOHN C WILLIAMS ARCHITECTS LLC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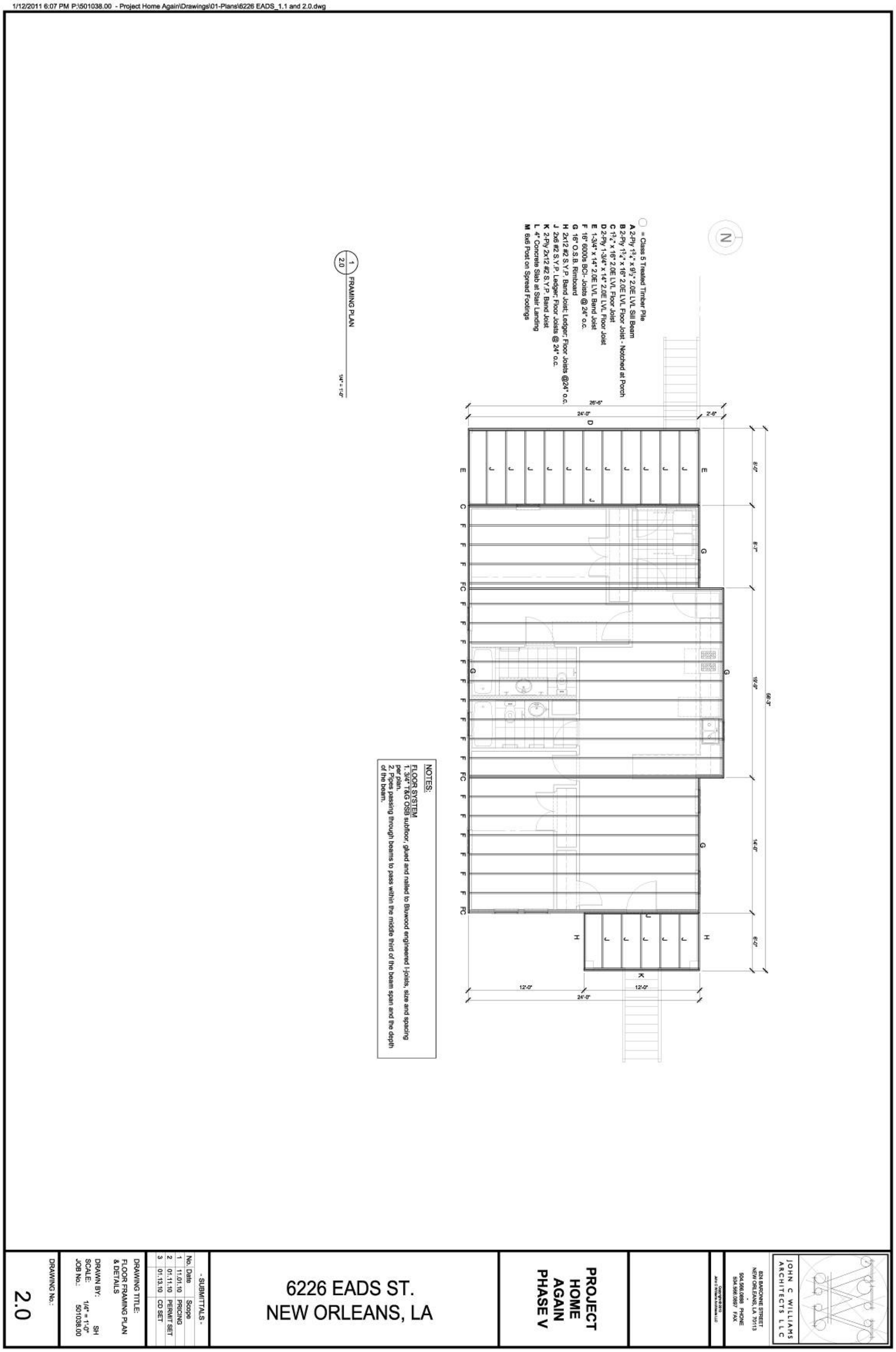
FRANKLIN AVE. SIDE
MEXICO ST. SIDE 105'
EADS ST.
34'
19'
2'
53'
= Class 5 Treated Timber Pile
A 2-Ply 1¾" x 9½" 2.0E LVL Sill Beam
B 2-Ply 1¾" x 16" 2.0E LVL Floor Joist - Notched at Porch
C 1¾" x 16" 2.0E LVL Floor Joist
D 2-Ply 1-3/4" x 14" 2.0E LVL Floor Joist
E 1-3/4" x 14" 2.0E LVL Band Joist
F 16" 6000s BCI- Joists @ 24" o.c.
G 16" O.S.B. Rimboard
H 2x12 #2 S.Y.P. Band Joist; Ledger; Floor Joists @24" o.c.
J 2x6 #2 S.Y.P. Ledger; Floor Joists @ 24" o.c.
K 2-Ply 2x12 #2 S.Y.P. Band Joist
L 4" Concrete Slab at Stair Landing
M 6x6 Post on Spread Footings
INNER SPLICE 10'
OUTER SPLICE 22'
1 FOUNDATION PLAN 1/4" = 1'-0"
2 SILL CONNECTION DETAIL PLAN VIEW 1-1/2" = 1'-0"
3 SILL CONNECTION DETAIL ELEVATION VIEW 1-1/2" = 1'-0"
4 STAIR SLAB DETAIL SECTION 1-1/2" = 1'-0"
NOTES:
FOUNDATION
1. Foundation designed in accordance with ASCE 7 for 130 MPH winds, exposure category B.
2. Piles to be 25' Class 5 treated timber piles ASTM D25, spacing per plans.
3. Pile layout based on data obtained from the City of New Orleans (stating a pile-load capacity of 8 tons per pile) and assuming a 40 psf live load and 10 psf dead load.
4. Top of subfloor to be 12" above Base Flood Elevation.
JOHN C WILLIAMS ARCHITECTS LLC
PROJECT HOME AGAIN PHASE V
6226 EADS ST.
NEW ORLEANS, LA
- SUBMITTALS -
No. Date Scope
1 11.01.10 PRICING
2 01.11.10 PERMIT SET
3 01.13.10 CD SET
DRAWING TITLE: FOUNDATION PLAN & DETAILS
DRAWN BY: SH
SCALE: 1/4" = 1'-0"
JOB No.: 501038.00
DRAWING No.: 1.1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N
○ = Class 5 Treated Timber Pile
A 2-Ply 1¾" x 9½" 2.0E LVL Sill Beam
B 2-Ply 1¾" x 16" 2.0E LVL Floor Joist - Notched at Porch
C 1¾" x 16" 2.0E LVL Floor Joist
D 2-Ply 1-3/4" x 14" 2.0E LVL Floor Joist
E 1-3/4" x 14" 2.0E LVL Band Joist
F 16" 6000s BCI- Joists @ 24" o.c.
G 16" O.S.B. Rimboard
H 2x12 #2 S.Y.P. Band Joist; Ledger; Floor Joists @24" o.c.
J 2x6 #2 S.Y.P. Ledger; Floor Joists @ 24" o.c.
K 2-Ply 2x12 #2 S.Y.P. Band Joist
L 4" Concrete Slab at Stair Landing
M 6x6 Post on Spread Footings
NOTES:
FLOOR SYSTEM
1. 3/4" T&G OSB subfloor, glued and nailed to Bluwood engineered I-joists, size and spacing per plan.
2. Pipes passing through beams to pass within the middle third of the beam span and the depth of the beam.
1 2.0 FRAMING PLAN 1/4" = 1'-0"
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PROJECT HOME AGAIN PHASE V
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NEW ORLEANS, LA
- SUBMITTALS -
No. Date Scope
1 11.01.10 PRICING
2 01.11.10 PERMIT SET
3 01.13.10 CD SET
DRAWING TITLE:
FLOOR FRAMING PLAN & DETAILS
DRAWN BY: SH
SCALE: 1/4" = 1'-0"
JOB No.: 501038.00
DRAWING No.:
2.0

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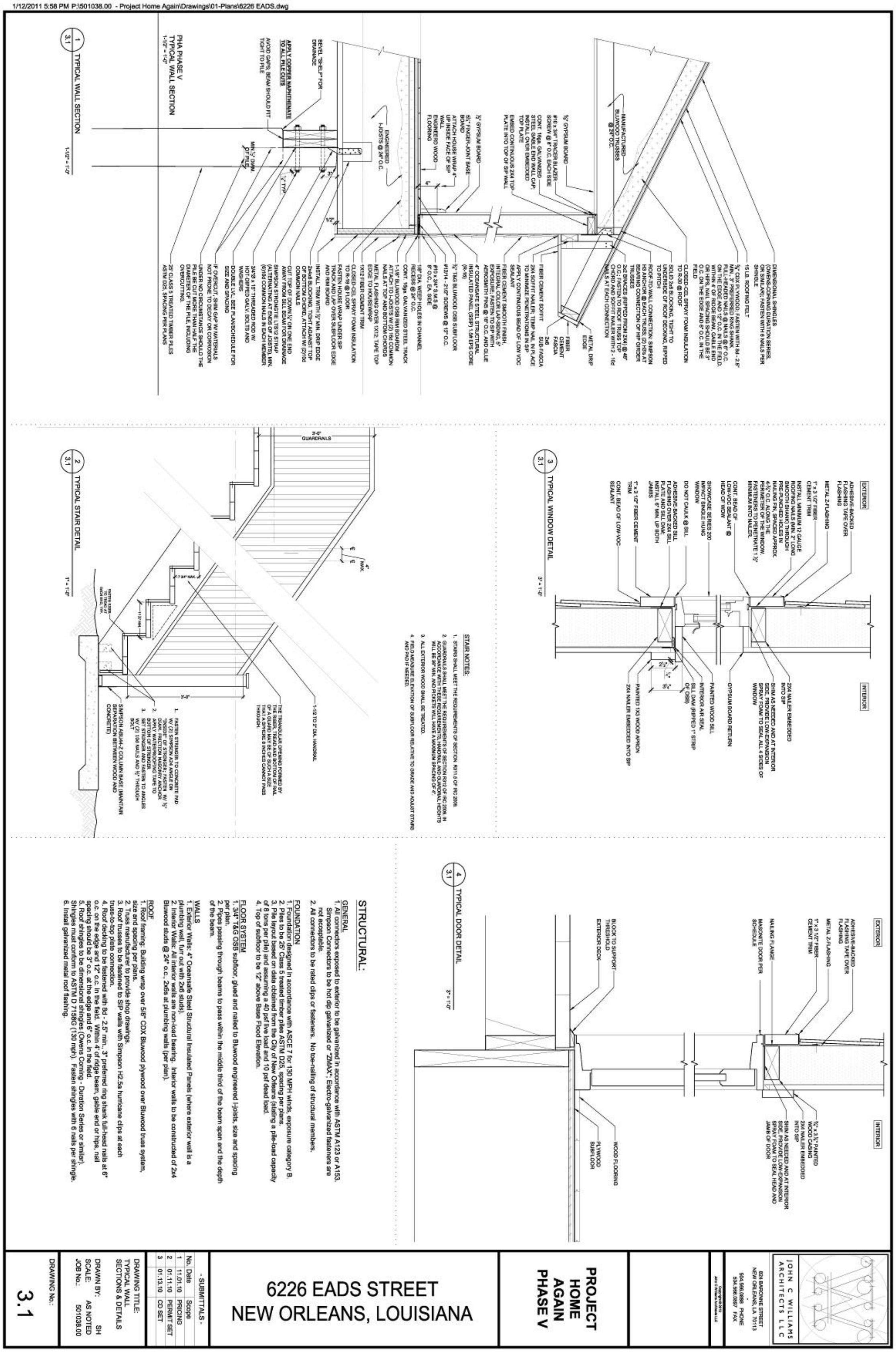

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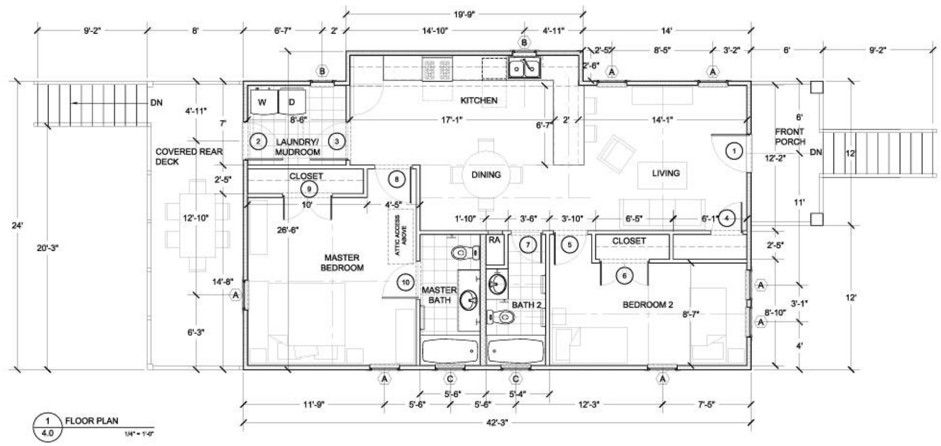


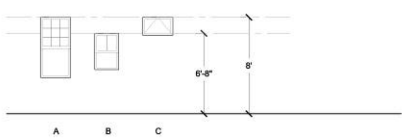
1 FLOOR PLAN 4.0 1/4" = 1'-0"

PLUMBING/APPLIANCE SCHEDULE

FIXTURE/FITTING	DESCRIPTION (DETAILED SPECIFICATIONS PROVIDED BY DISTRIBUTOR)
TOILET	DUAL-FLUSH TOILET - AVG. FLOW RATE 1.3 GPF
BATHROOM SINK	MAN-MADE COMBINATION COUNTER/LAVATORY
VANITY FAUCET	LOW-FLOW TWO-HANDLE FAUCET - 2.0 GPM
BATH 2 TUB/SHOWER	ONE-PIECE T/S ENCLOSURE
MASTER BATH TUB/SHOWER	STEEL TUB WITH CULTURED MARBLE SURROUND
TUB/SHOWER CONTROLS	LOW FLOW SHOWER HEAD - 2.0 GPM
KITCHEN SINK	DOUBLE-BASIN SELF-RIMMING SINK
KITCHEN FAUCET	LOW-FLOW SINGLE-CONTROL FAUCET - 2.0 GPM
DISHWASHER	ENERGY STAR
REFRIGERATOR	ENERGY STAR - 18 CU.FT. 2 BR, 21 CU.FT. 3BR
RANGE	ELECTRIC RANGE WITH HOOD VENTED DIRECTLY TO EXTERIOR
CLOTHES WASHER	ENERGY STAR FRONT-LOADING
CLOTHES DRYER	STACKABLE
WATER HEATER	ELECTRIC ON-DEMAND TANKLESS WATER HEATER

WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	HEAD HEIGHT (AFF)	QTY.	NOTES
A	30"	60"	8'-0"	7	SINGLE-HUNG; ENERGY STAR; APPLIED INT. & EXT. MUNTINS; EGRESS
B	24"	36"	6'-8"	2	SINGLE-HUNG; ENERGY STAR; APPLIED INT. & EXT. MUNTINS
C	30"	18"	8'-0"	2	AWNING; ENERGY STAR

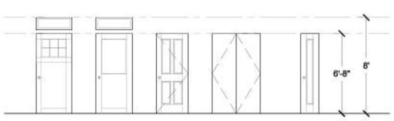


WINDOW TYPES

WINDOWS
1. Windows to be vinyl, single hung windows with low E glass (SHGC 0.29); ENERGY STAR rated for Region 1.
2. Windows to be impact-resistant to meet either the Miami Dade County PA 201, 202, and 203 requirements or the ASTM E 1886 and ASTM E 1996 (Missile Level C-91b) requirements.
3. Windows to match window types shown in elevations as closely as possible within the budget.
4. Applied interior and exterior mullions and spacer to be included as an alternate.
5. Verify that sill height of windows on tub wall is 3" above shower surround.
6. Window flashing to be installed at head of windows. Steel track at window sill rough opening to be sloped per plans.
7. Window blinds to be purchased and installed by contractor.
8. All sleeping areas to have at least one window that meets egress requirements of IRC 2009 - 5.7 sf open area.

DOOR SCHEDULE

DOOR No.	DOOR TYPE	ACTUAL DOOR	ROUGH OPENING	NOTES
1	A	3'-0" x 6'-8"	3'-2½" x 6'-10"	EXTERIOR - 6 LITE; TRANSOM ABOVE
2	A1	3'-0" x 6'-8"	3'-2½" x 6'-10"	EXTERIOR - SINGLE LITE
3	A1	3'-0" x 6'-8"	3'-2½" x 6'-10"	EXTERIOR - SINGLE LITE
4	B	2'-6" x 6'-8"	2'-8" x 6'-9"	CLOSET
5	B	2'-8" x 6'-8"	2'-10" x 6'-9"	BEDROOM
6	C	4'-0" x 6'-8"	4'-2" x 6'-9"	CLOSET - DOUBLE SWING W/ BALL CATCH
7	B	2'-6" x 6'-8"	2'-8" x 6'-9"	BATHROOM
8	B	3'-0" x 6'-8"	3'-2" x 6'-9"	BEDROOM - HANDI-CAP ACCESSIBLE
9	C	4'-0" x 6'-8"	4'-2" x 6'-9"	CLOSET - DOUBLE SWING W/ BALL CATCH
10	B	3'-0" x 6'-8"	3'-2" x 6'-9"	BATHROOM - HANDI-CAP ACCESSIBLE



DOORS
1. Exterior front door to be insulated fiberglass or solid wood door with transom. Match door type indicated in plans as closely as possible within the budget.
2. Exterior rear or side doors to be single-lite doors with transoms.
3. Interior passage and privacy doors to be hollow-core, masonite, four-panel doors.
4. Double closet doors to be swing with ball catch or sliding (per schedule).
5. Attic pull-down stair will be located in master bedroom and accessed by hook and pole, not string.

FINISH SCHEDULE

ROOM NAME	FLOOR MATERIAL	AREA (SF)	NOTES
LIVING/DINING/KITCHEN (INCL. CLOSET)	WOOD FLOORING	428	SF INCLUDES UNDER CABINETS
MASTER BEDROOM (INCL.CLOSET)	WOOD FLOORING	228	
BEDROOM 2 (INCL. CLOSET)	WOOD FLOORING	162	
MASTER BATHROOM	TILE	41	SEALED GROUT; SF INCLUDES UNDER CAB., EXCLUDES TUB
BATHROOM 2	TILE	36	SEALED GROUT; SF INCLUDES UNDER CAB., EXCLUDES TUB
LAUNDRY/MUDROOM	TILE	54	SEALED GROUT;

FLOORING
1. Wet area flooring: 12x12 tile over fiber cement backer board with sealed grout.
2. All other areas: engineered wood flooring (5 1/4" board width, 1/2" depth) over plywood subfloor.
3. Wood flooring must contain no added Urea-Formaldehyde.

INTERIOR WALLS
1. 1/2" gypsum board on walls; Level 3 finish. 5/8" gypsum board on ceiling.
2. Contractor to verify that gypsum board is not contaminated.
3. Cultured marble over moisture-resistant gypsum board in master bathroom, fiberglass (or sim.) tub/shower enclosure over moisture-resistant gypsum board in bathroom 2.

INTERIOR TRIM
1. 5 1/4" finger-joint, painted wood base board at wood floors; profile to be selected by architect.
2. 3 1/4" square-edge painted wood base board at tile floors.
3. Gypsum board return at head and jambs of windows with painted wood stool and apron.
4. 3 1/4" painted wood casing at interior doors.
5. Attic access stair opening to be cased with 2 1/4" painted wood casing.

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PROJECT HOME AGAIN PHASE V

6226 EADS STREET
NEW ORLEANS, LOUISIANA

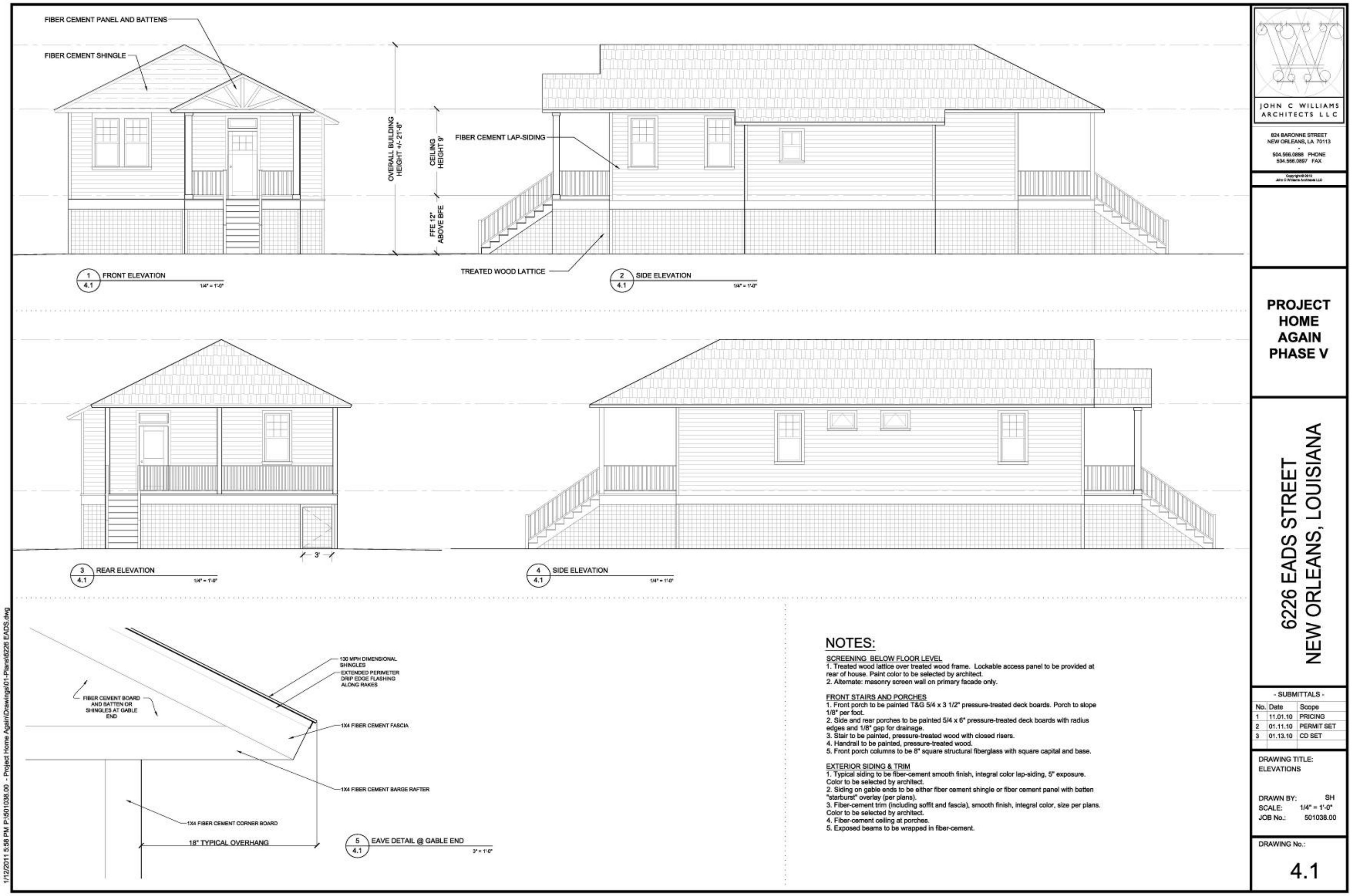
- SUBMITTALS -

No.	Date	Scope
1	11.01.10	PRICING
2	01.11.10	PERMIT SET
3	01.13.10	CD SET

DRAWING TITLE: FLOOR PLAN & SCHEDULES

DRAWN BY: SH
SCALE: 1/4" = 1'-0"
JOB No.: 501038.00

DRAWING No.: 4.0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FIBER CEMENT PANEL AND BATTENS
FIBER CEMENT SHINGLE
OVERALL BUILDING HEIGHT +/- 21'-8"
CEILING HEIGHT 9'
FFE 12" ABOVE BFE
FIBER CEMENT LAP-SIDING
TREATED WOOD LATTICE
1 4.1 FRONT ELEVATION 1/4" = 1'-0"
2 4.1 SIDE ELEVATION 1/4" = 1'-0"
3'
3 4.1 REAR ELEVATION 1/4" = 1'-0"
4 4.1 SIDE ELEVATION 1/4" = 1'-0"
130 MPH DIMENSIONAL SHINGLES
EXTENDED PERIMETER DRIP EDGE FLASHING ALONG RAKES
FIBER CEMENT BOARD AND BATTEN OR SHINGLES AT GABLE END
1X4 FIBER CEMENT FASCIA
1X4 FIBER CEMENT BARGE RAFTER
1X4 FIBER CEMENT CORNER BOARD
18" TYPICAL OVERHANG
5 4.1 EAVE DETAIL @ GABLE END 3" = 1'-0"
NOTES:
SCREENING BELOW FLOOR LEVEL
1. Treated wood lattice over treated wood frame. Lockable access panel to be provided at rear of house. Paint color to be selected by architect.
2. Alternate: masonry screen wall on primary facade only.
FRONT STAIRS AND PORCHES
1. Front porch to be painted T&G 5/4 x 3 1/2" pressure-treated deck boards. Porch to slope 1/8" per foot.
2. Side and rear porches to be painted 5/4 x 6" pressure-treated deck boards with radius edges and 1/8" gap for drainage.
3. Stair to be painted, pressure-treated wood with closed risers.
4. Handrail to be painted, pressure-treated wood.
5. Front porch columns to be 8" square structural fiberglass with square capital and base.
EXTERIOR SIDING & TRIM
1. Typical siding to be fiber-cement smooth finish, integral color lap-siding, 5" exposure. Color to be selected by architect.
2. Siding on gable ends to be either fiber cement shingle or fiber cement panel with batten "starburst" overlay (per plans).
3. Fiber-cement trim (including soffit and fascia), smooth finish, integral color, size per plans. Color to be selected by architect.
4. Fiber-cement ceiling at porches.
5. Exposed beams to be wrapped in fiber-cement.
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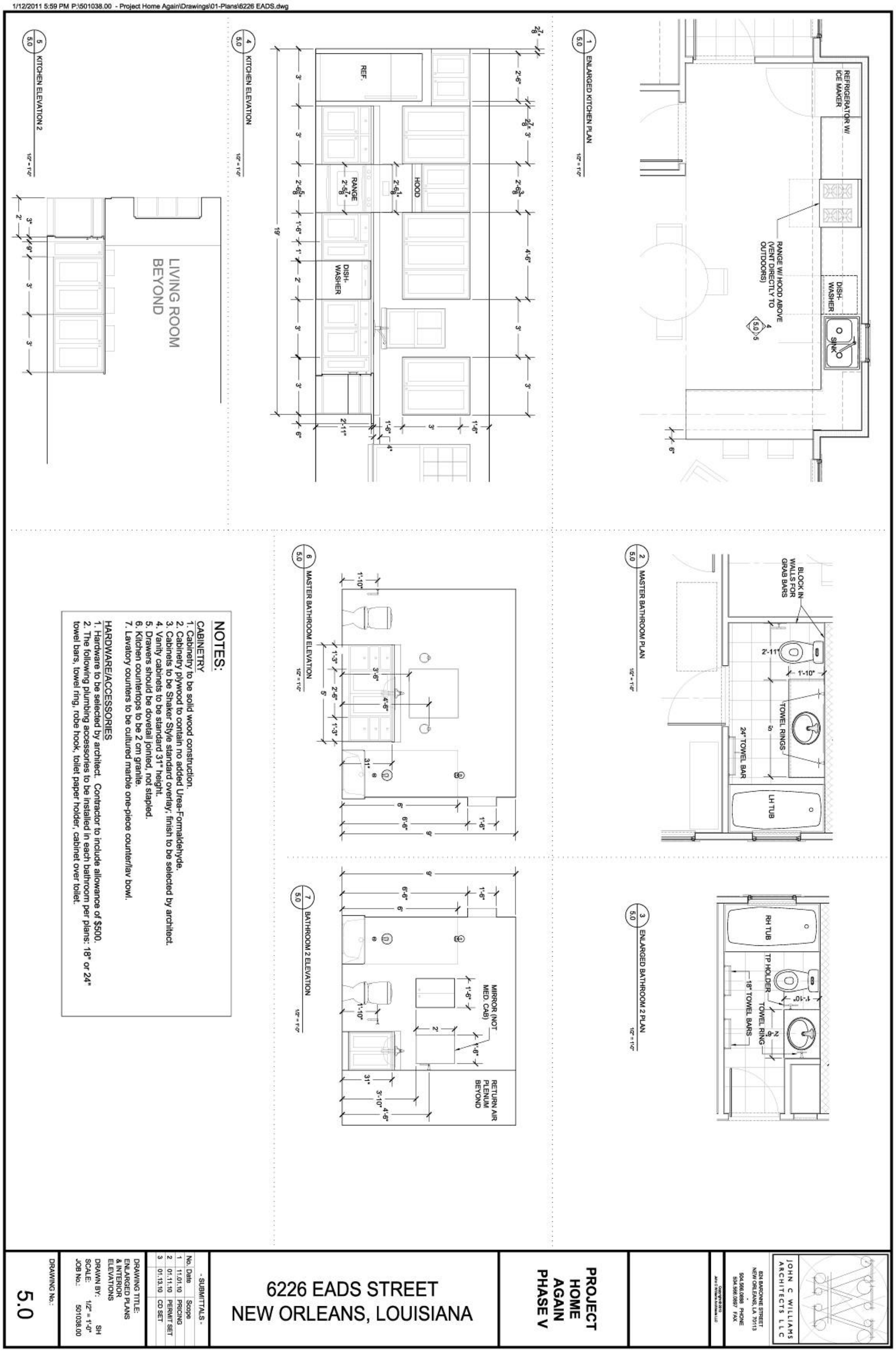
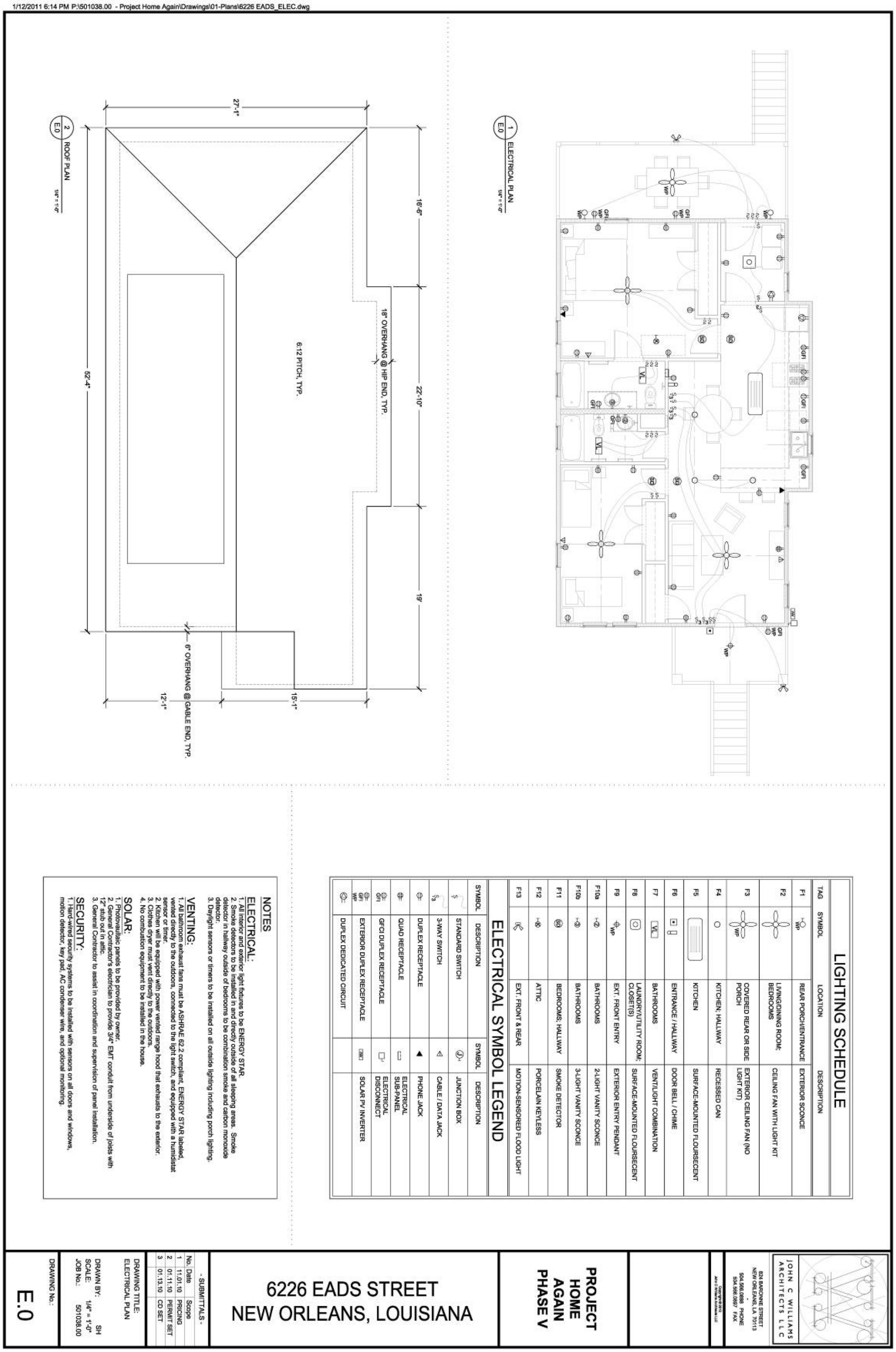
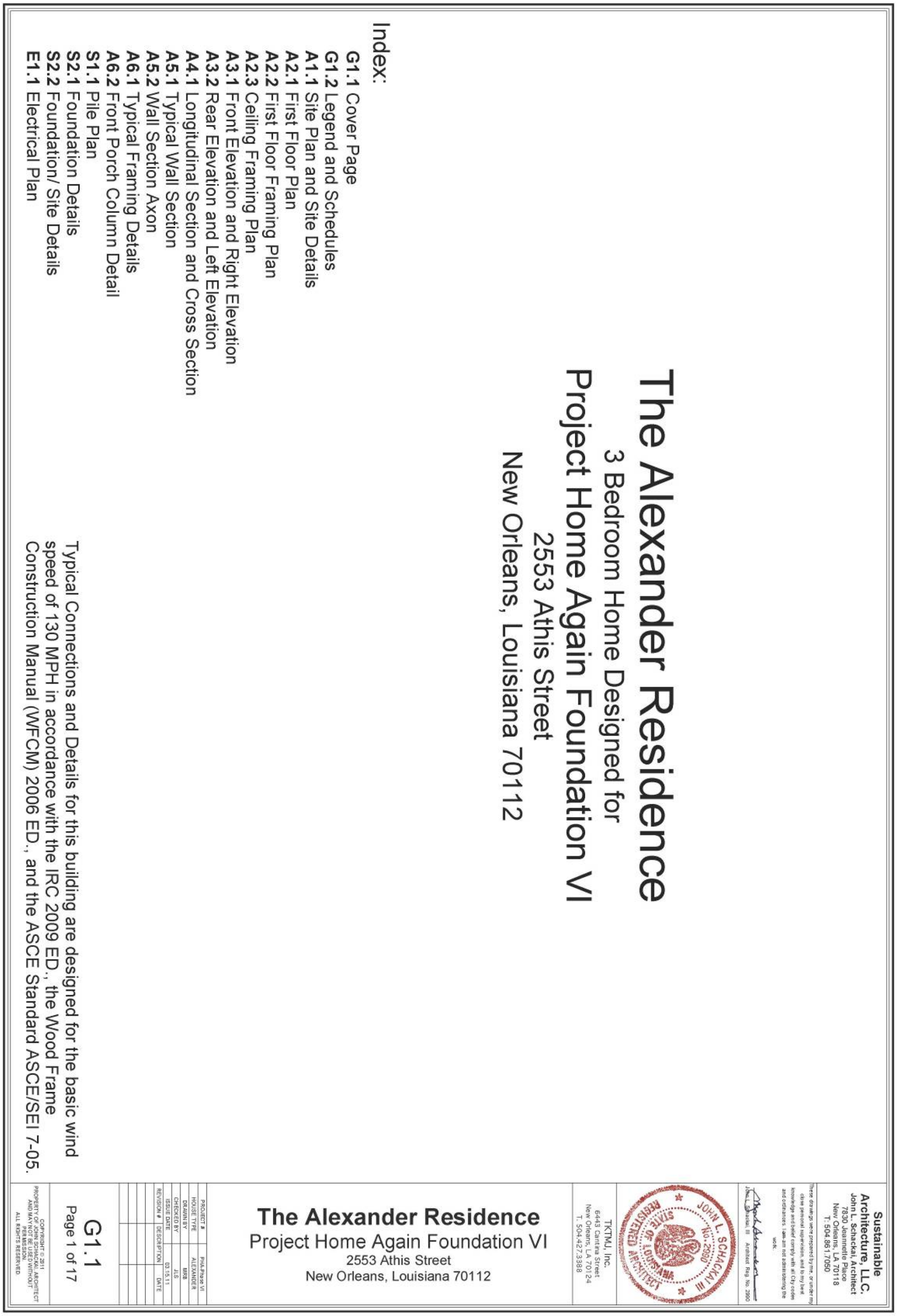
PROJECT HOME AGAIN PHASE V
6226 EADS STREET
NEW ORLEANS, LOUISIANA
- SUBMITTALS -
No. Date Scope
1 11.01.10 PRICING
2 01.11.10 PERMIT SET
3 01.13.10 CD SET
DRAWING TITLE: ELEVATIONS
DRAWN BY: SH
SCALE: 1/4" = 1'-0"
JOB No.: 501038.00
DRAWING No.: 4.1


1/12/2011 5:59 PM P:\501038.00 - Project Home Again\Drawings\01-Plans\6226 EADS.dwg
1 ENLARGED KITCHEN PLAN 5.0 1/2" = 1'-0"
REFRIGERATOR W/ ICE MAKER
DISH-WASHER
SINK
RANGE W/ HOOD ABOVE (VENT DIRECTLY TO OUTDOORS)
2 MASTER BATHROOM PLAN 5.0 1/2" = 1'-0"
BLOCK IN WALLS FOR GRAB BARS
TOWEL RINGS
24" TOWEL BAR
LH TUB
3 ENLARGED BATHROOM 2 PLAN 5.0 1/2" = 1'-0"
RH TUB
TP HOLDER
TOWEL RING
18" TOWEL BARS
4 KITCHEN ELEVATION 5.0 1/2" = 1'-0"
REF.
HOOD
RANGE
DISH-WASHER
5 KITCHEN ELEVATION 2 5.0 1/2" = 1'-0"
LIVING ROOM BEYOND
6 MASTER BATHROOM ELEVATION 5.0 1/2" = 1'-0"
7 BATHROOM 2 ELEVATION 5.0 1/2" = 1'-0"
MIRROR (NOT MED. CAB)
RETURN AIR PLENUM BEYOND
NOTES:
CABINETRY
1. Cabinetry to be solid wood construction.
2. Cabinetry plywood to contain no added Urea-Formaldehyde.
3. Cabinets to be Shaker Style standard overlay; finish to be selected by architect.
4. Vanity cabinets to be standard 31" height.
5. Drawers should be dovetail jointed, not stapled.
6. Kitchen countertops to be 2 cm granite.
7. Lavatory counters to be cultured marble one-piece counter/lav bowl.
HARDWARE/ACCESSORIES
1. Hardware to be selected by architect. Contractor to include allowance of $500.
2. The following plumbing accessories to be installed in each bathroom per plans: 18" or 24" towel bars, towel ring, robe hook, toilet paper holder, cabinet over toilet.
JOHN C WILLIAMS ARCHITECTS LLC
824 BARONNE STREET
NEW ORLEANS, LA 70113
504.566.0888 PHONE
504.566.0897 FAX
PROJECT HOME AGAIN PHASE V
6226 EADS STREET
NEW ORLEANS, LOUISIANA
- SUBMITTALS -
No. Date Scope
1 11.01.10 PRICING
2 01.11.10 PERMIT SET
3 01.13.10 CD SET
DRAWING TITLE: ENLARGED PLANS & INTERIOR ELEVATIONS
DRAWN BY: SH
SCALE: 1/2" = 1'-0"
JOB No.: 501038.00
DRAWING No.: 5.0


1/12/2011 6:14 PM P:\501038.00 - Project Home Again\Drawings\01-Plans\6226 EADS_ELEC.dwg
ELECTRICAL PLAN
ROOF PLAN
6:12 PITCH, TYP.
18" OVERHANG @ HIP END, TYP.
6" OVERHANG @ GABLE END, TYP.
27'-1"
16'-6"
22'-10"
52'-4"
19'
12'-1"
15'-1"
LIGHTING SCHEDULE
ELECTRICAL SYMBOL LEGEND
NOTES
ELECTRICAL:
VENTING:
SOLAR:
SECURITY:
JOHN C WILLIAMS ARCHITECTS LLC
PROJECT HOME AGAIN PHASE V
6226 EADS STREET
NEW ORLEANS, LOUISIANA
DRAWING TITLE: ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"
JOB No.: 501038.00
DRAWING No.: E.0

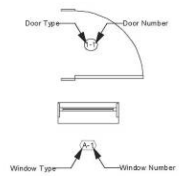
Appendix H Architectural Drawings for Alexander Plan



General Statistics:

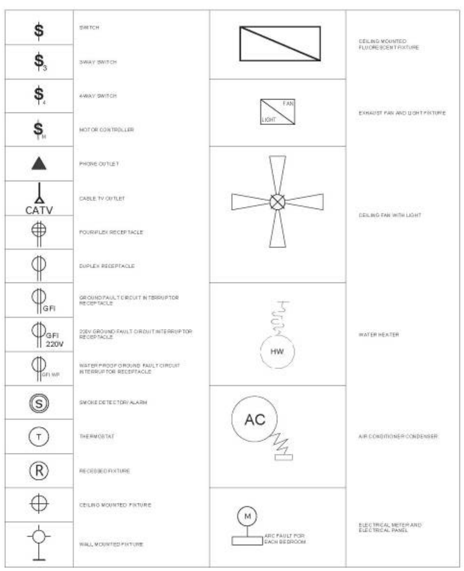
Number of Bedrooms: 3
Number of Bathrooms: 2
Number of Floors: 1
Total Enclosed Area: 1316
Total Exterior Area: 116
Gross Area:1422

Typical Connections and Details are for the design of this building for the basic wind speed of 130 MPH in accordance with IRC 2009 ED., the Wood Frame Construction Manual (WFCM) 2006 ED., and the ASCE Standard ASCE/SEI 7-05.



DOOR SCHEDULE						
TYPE	# OF UNITS	WIDTH	HEIGHT	EXT/INT	DOOR OPERATION	NOTES
1	1	3'0"	6'8"	EXT	Simple Swing	Front
2	1	3'0"	6'8"	EXT	Simple Swing	Rear
3	4	2'6"	6'8"	INT	Simple Swing	
4	4	2'4"	6'8"	INT	Simple Swing	
5	2	5'0"	6'8"	INT	Slider	
6	1	2'4"	6'8"	INT	Pocket	
7	1	1'6"	6'8"	INT	Simple Swing	
TOTAL # OF UNITS	14					

WINDOW SCHEDULE					
TYPE	# OF UNITS	WIDTH	HEIGHT	SASH OPERATION	NOTES
A	10	2'8"	6'0"	Single Hung	
B	1	2'8"	4'0"	Single Hung	
C	2	3'0"	1'0"	Fixed	
E	1	3'0"	1'0"	Fixed	Transom
# OF UNITS	14				



ELECTRICAL FIXTURE SCHEDULE

Fixture No.	Manufacturer	Model #	Description	# Of Units
F-1	Sea Gull	2940616	H/LNTRN O/BRZ CORNERSTONE	1
F-2	Harbor Breeze	SP6376,SP6314	MARQUIS 52" FAN AW/ 1 30W CF LIGHT KIT APLL WHITE	4
F-3	Harbor Breeze	1888791, 2131255	52" 5 BLD FAN OUT DR./ 2 40W M FAN LT KIT OUTDR	0
F-4		3567713	REGULAR FIXTURE 3 LIGHT HANGING	0
F-5	American Flourescent	2013203	CONTEMP CLOUD RED ECON	1
F-6	Cooper Lighting	3040799	ECON NARROW WRAP MTL END WHIT	0
F-7	Utilitech	N/A	RECESSED LIGHT	2
F-8	Good Earth Lighting	3053034	SHAL MUSH STYLE CLOUD	6
F-9	Utilitech	N/A	EXT LIGHT SURFACE MOUNTED	1
F-10	Portfolio	SP2668	NUVO LIGHTING 42" GLAMOUR VANITY BN.	2
F-11	Broan	N/A	Bath Fan Light	2
F-12		1227567	WHIT 1 150 W M KEYLESS	1
F-13		N/A	Exterior Security Light	1

Structural Connectors Schedule

Detail ID	Location	Description	Manufacturer / Supplier	Connector	Remarks
Dwg. 1 A2.1					
	Beam @ Porch to Wall	Lateral Strap Connect Porch to Wall of House	Simpson Strong Tie	LSTA36	Strap Tie
Dwg. 1 A5.1 and A5.2					
	Typical Wall Section	Hurricane Strap @ each Rafter	Simpson Strong Tie	H8	Hurricane Tie
	Typical Wall Section	Joist to Sill	Simpson Strong Tie	H8	Hurricane Tie
Dwg. 1 A6.1					
	Framing @ Openings	Double Top Plate to King Stud	Simpson Strong Tie	LSTA15	Tension Strap
	Framing @ Openings	Jack Stud to King Stud	Simpson Strong Tie	LSTA15	Tension Strap
	Framing @ Openings	Sill to King Stud @ First Floor	Simpson Strong Tie	LSTA15	Tension Strap
Dwg.5 A6.1					
	Lookouts	Rafter to Each Cripple	Simpson Strong Tie	LSTA9	Strap Ties
Dwg. 2 A6.1					
	Ridge Beam @ Rafters		Simpson Strong Tie	LSTA9	Strap Ties
Dwg. 1 A6.2					
	Porch Column Detail	Rafter to Ea. Cripple	Simpson Strong Tie	LSTA9	
	Porch Column Detail	@ Ea. Cripple to Beam	Simpson Strong Tie	LSTA9	
	Porch Column Detail	Beam to Column	Simpson Strong Tie	MSTA15	2 @ Both Ext. Faces of Column
	Porch Column Detail	Column to Sill	Simpson Strong Tie	TS18	2 @ Both Int. Faces of Colmn
	Porch Column Detail	@ Ea. Joist to Sill	Simpson Strong Tie	H8	Hurricane Tie
Dwg. 1 S2.2					
	Sill Joint Connection	Nailing Requirements @ Sill Overlap	NA	5 Rows of 4 16d @ 1 1/2" Each Side of Pile	Nailing Requirements @ Sill Connection
Dwg. 1 S2.1					
	Sill Joint	Plan and Section View	Simpson Strong Tie	5 Rows of 4 16d @ 1 1/2" Each Side of Pile	Nailing Requirements @ Sill Connection
	Sill to Pile	Plan and Section View	Simpson Strong Tie	MST27	Strap
	@ Joists	Joist Hanger	Simpson Strong Tie	U210	Joist Hanger
Dwg. 2 S2.1					
	Sill to Corner Studs @ Corner Piles	Holdown Tie @ Corners	Simpson Strong Tie	HDU8-SDS25	Holdown Ties

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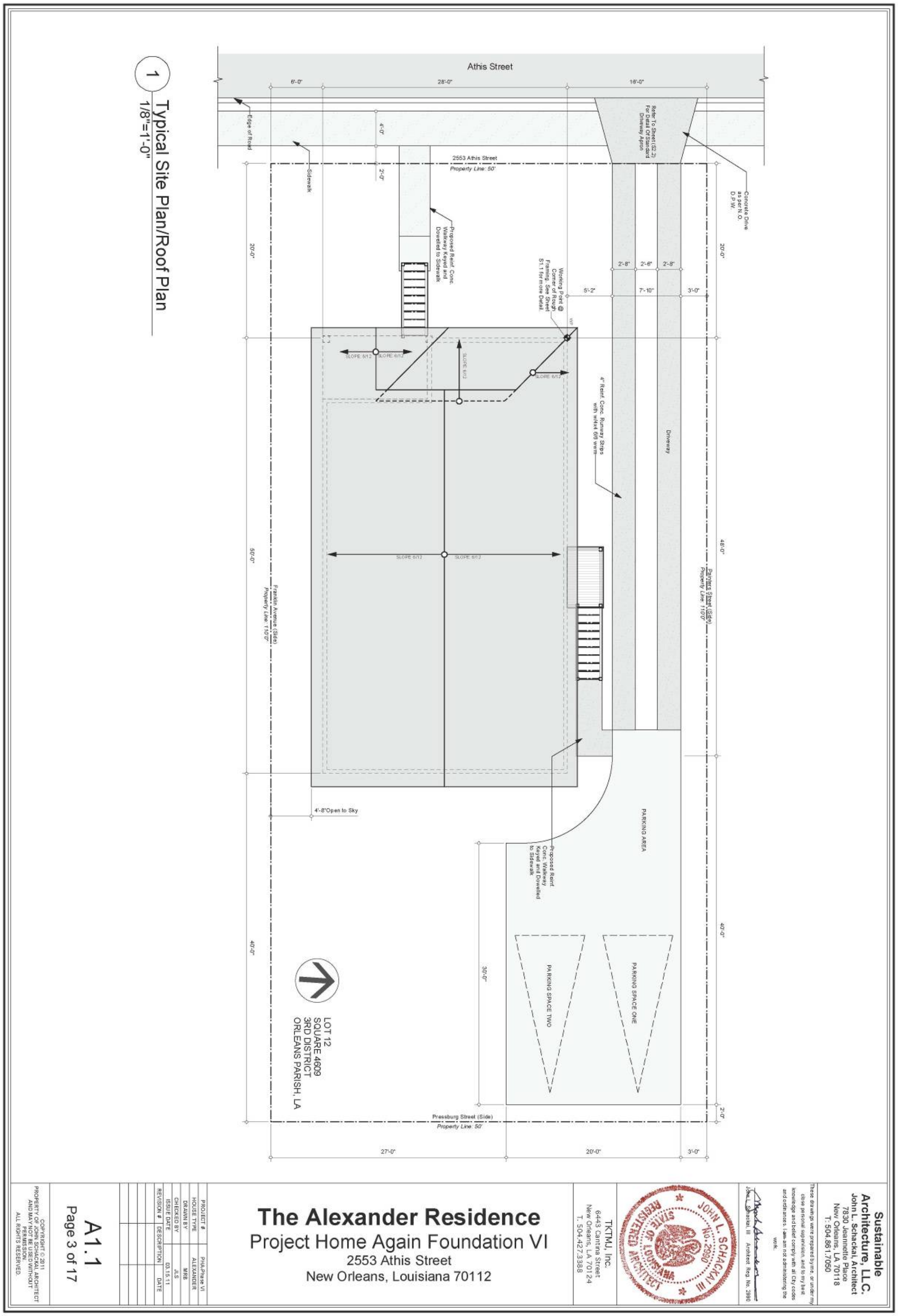
The Alexander Residence

Project Home Again Foundation VI
2553 Athis Street
New Orleans, Louisiana 70112

PROJECT #	PHA-Phase VI
HOUSE TYPE	ALEXANDER
DRAWN BY	MRB
CHECKED BY	JLS
ISSUE DATE	03.15.11

REVISION #	DESCRIPTION	DATE

G1.2
Page 2 of 17


1
Typical Site Plan/Roof Plan
1/8"=1'-0"
Athis Street
Concrete Drive as per N.O. D.P.W.
Refer To Sheet (S2.2) For Detail Of Standard Driveway Apron
Driveway
PARKING AREA
PARKING SPACE ONE
PARKING SPACE TWO
4" Reinf. Conc. Runway Strips with w/4x4 6/6 wwm
Working Point @ Corner of Rough Framing. See Sheet S1.1 for more Detail.
Proposed Reinf. Conc. Walkway Keyed and Dowelled to Sidewalk
Painters Street (Side)
Property Line: 110'0"
2553 Athis Street
Property Line: 50'
Pressburg Street (Side)
Property Line: 50'
Franklin Avenue (Side)
Property Line: 110'0"
Sidewalk
Edge of Road
4'-8" Open to Sky
LOT 12
SQUARE 4609
3RD DISTRICT
ORLEANS PARISH, LA
Sustainable Architecture, LLC.
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Project Home Again Foundation VI
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New Orleans, Louisiana 70112
PROJECT # PHA-Phase VI
HOUSE TYPE ALEXANDER
DRAWN BY MRB
CHECKED BY JLS
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REVISION # DESCRIPTION DATE
A1.1
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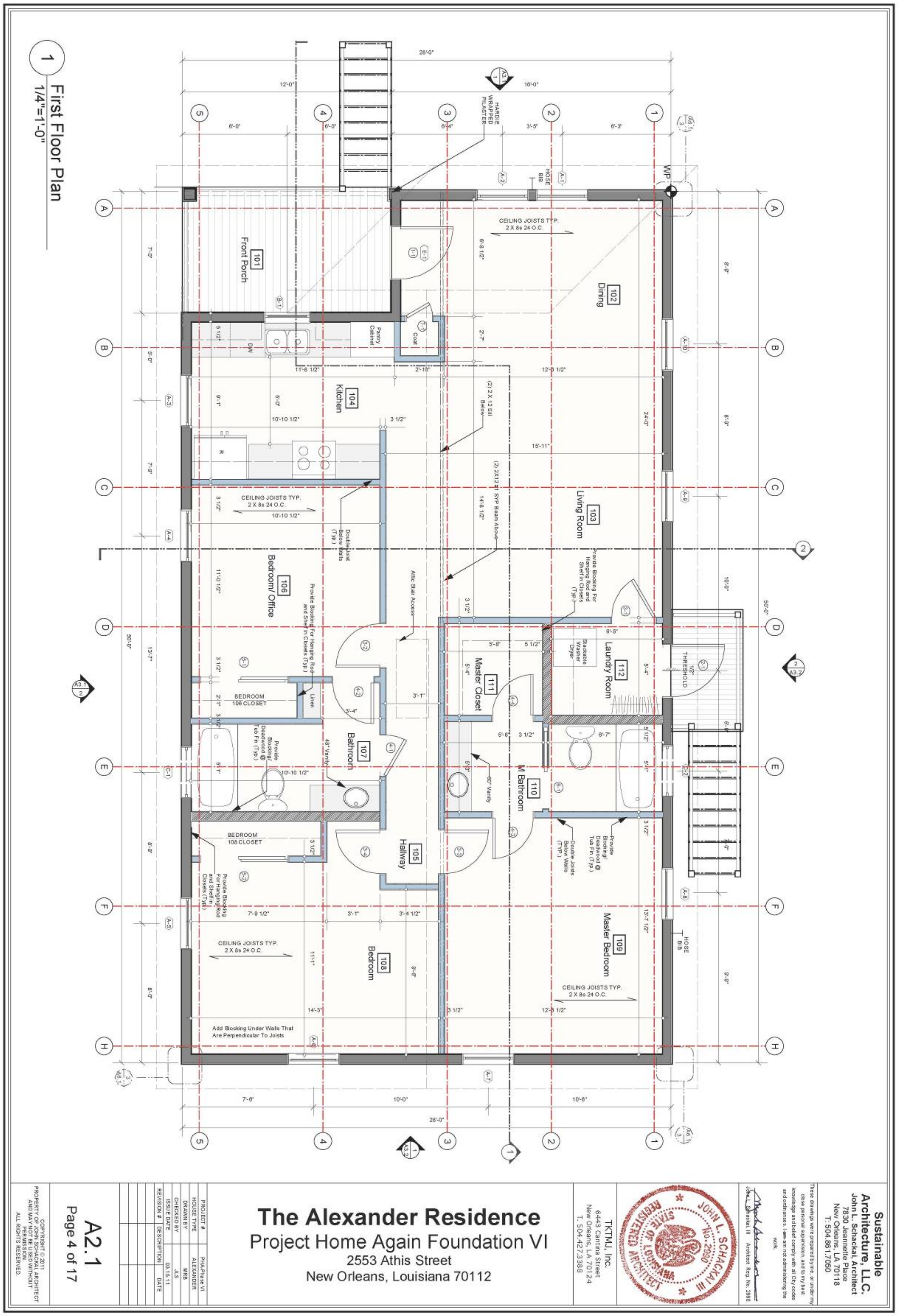
First Floor Plan
1/4"=1'-0"
Front Porch
Dining
Kitchen
Living Room
Bedroom/ Office
Bathroom
Hallway
Master Closet
Laundry Room
M Bathroom
Bedroom
Master Bedroom
The Alexander Residence
Project Home Again Foundation VI
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New Orleans, Louisiana 70112
A2.1
Page 4 of 17
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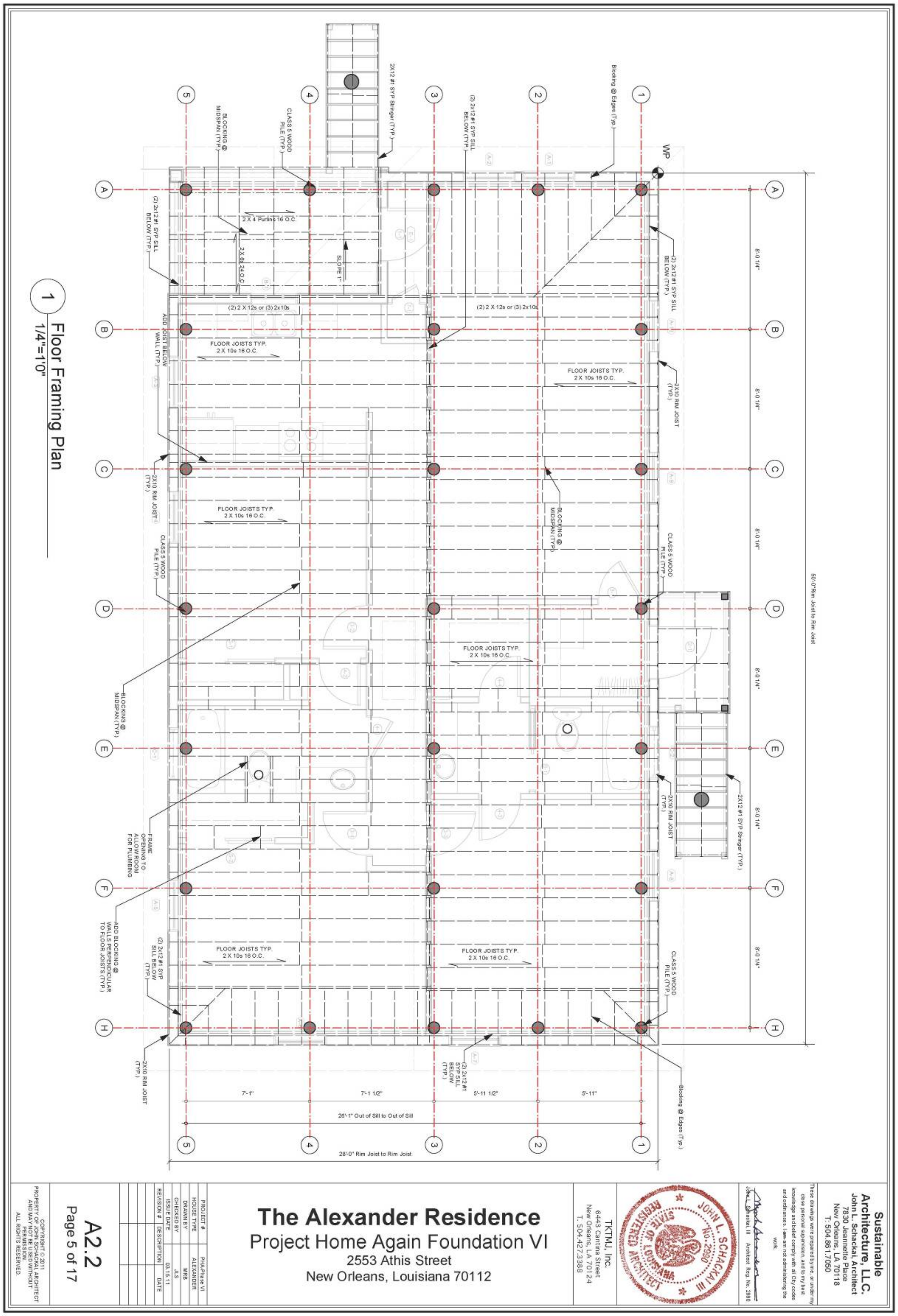
The Alexander Residence
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2553 Athis Street
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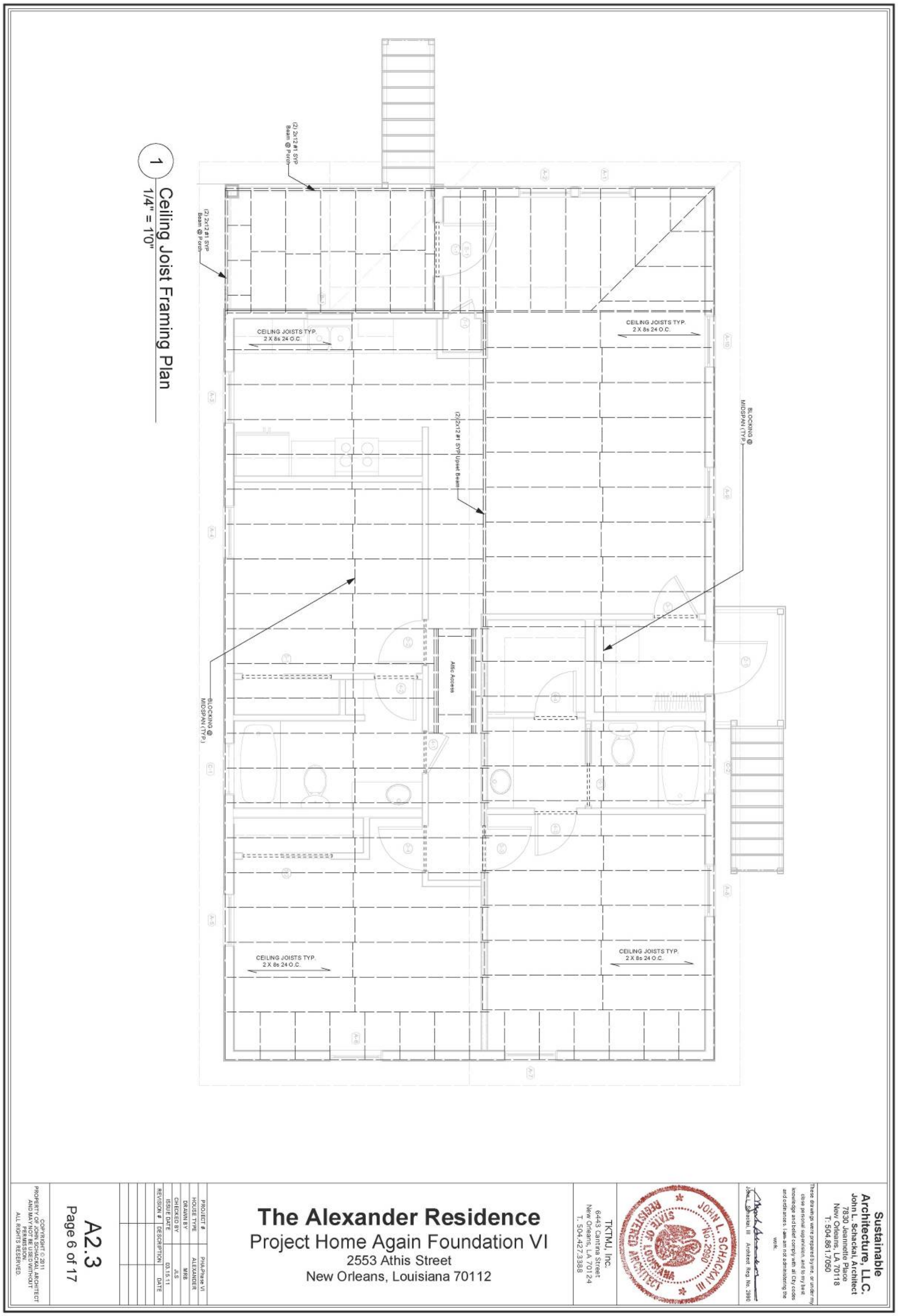
A2.2
Page 5 of 17


1
Ceiling Joist Framing Plan
1/4" = 10"
CEILING JOISTS TYP.
2 X 8s 24 O.C.
BLOCKING @ MIDSPAN (TYP.)
(2) 2x12 #1 SYP Upset Beam
Attic Access
Sustainable Architecture, LLC.
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The Alexander Residence
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PROJECT # PHA-Phase VI
HOUSE TYPE ALEXANDER
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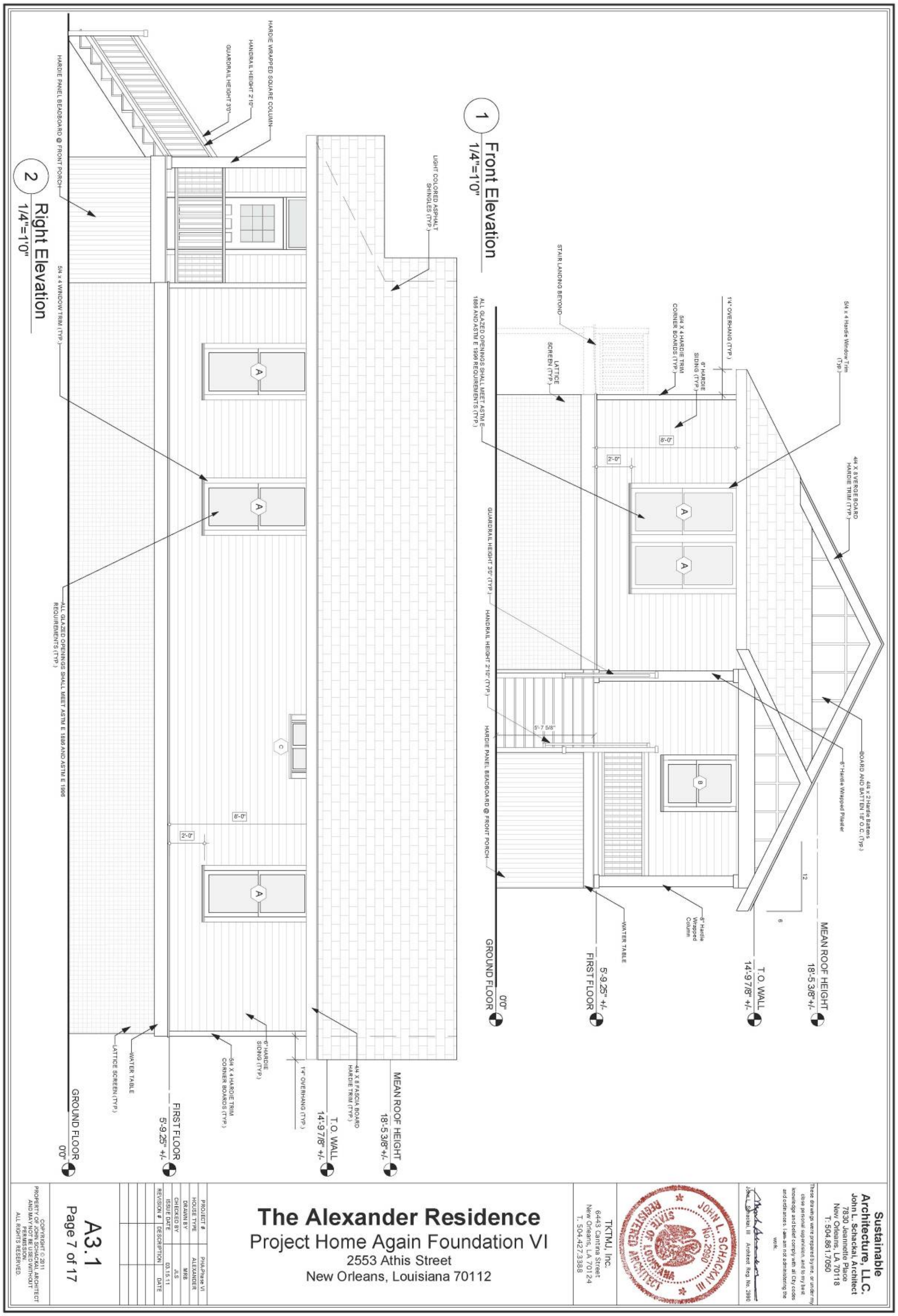
Front Elevation
1/4"=1'0"
Right Elevation
1/4"=1'0"
MEAN ROOF HEIGHT
18'-5 3/8" +/-
T.O. WALL
14'-9 7/8" +/-
FIRST FLOOR
5'-9.25" +/-
GROUND FLOOR
0'0"
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A3.1
Page 7 of 17
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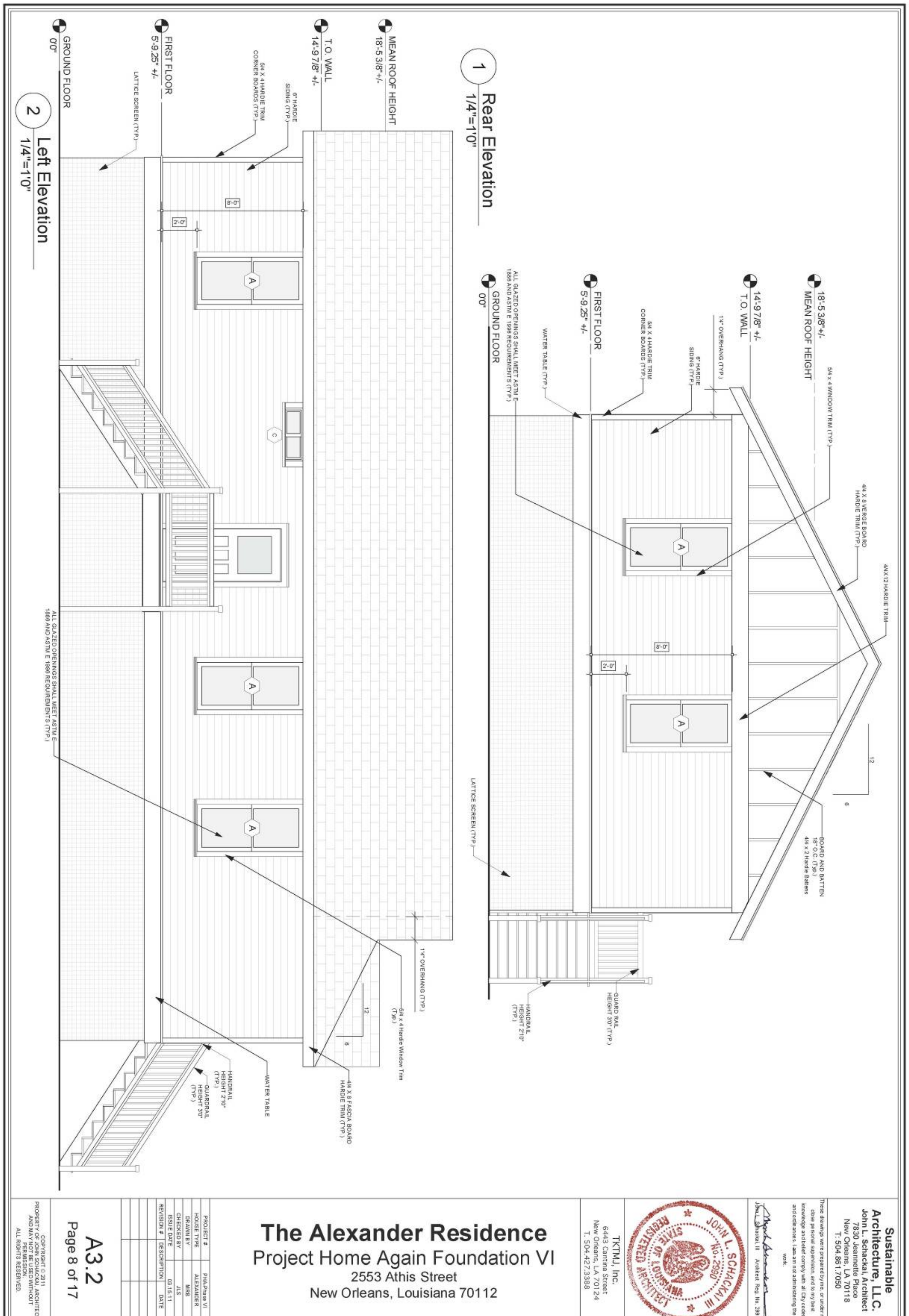
1 Rear Elevation
1/4"=1'0"
2 Left Elevation
1/4"=1'0"
MEAN ROOF HEIGHT
18'-5 3/8" +/-
T.O. WALL
14'-9 7/8" +/-
FIRST FLOOR
5'-9.25" +/-
GROUND FLOOR
0'0"
LATTICE SCREEN (TYP.)
WATER TABLE
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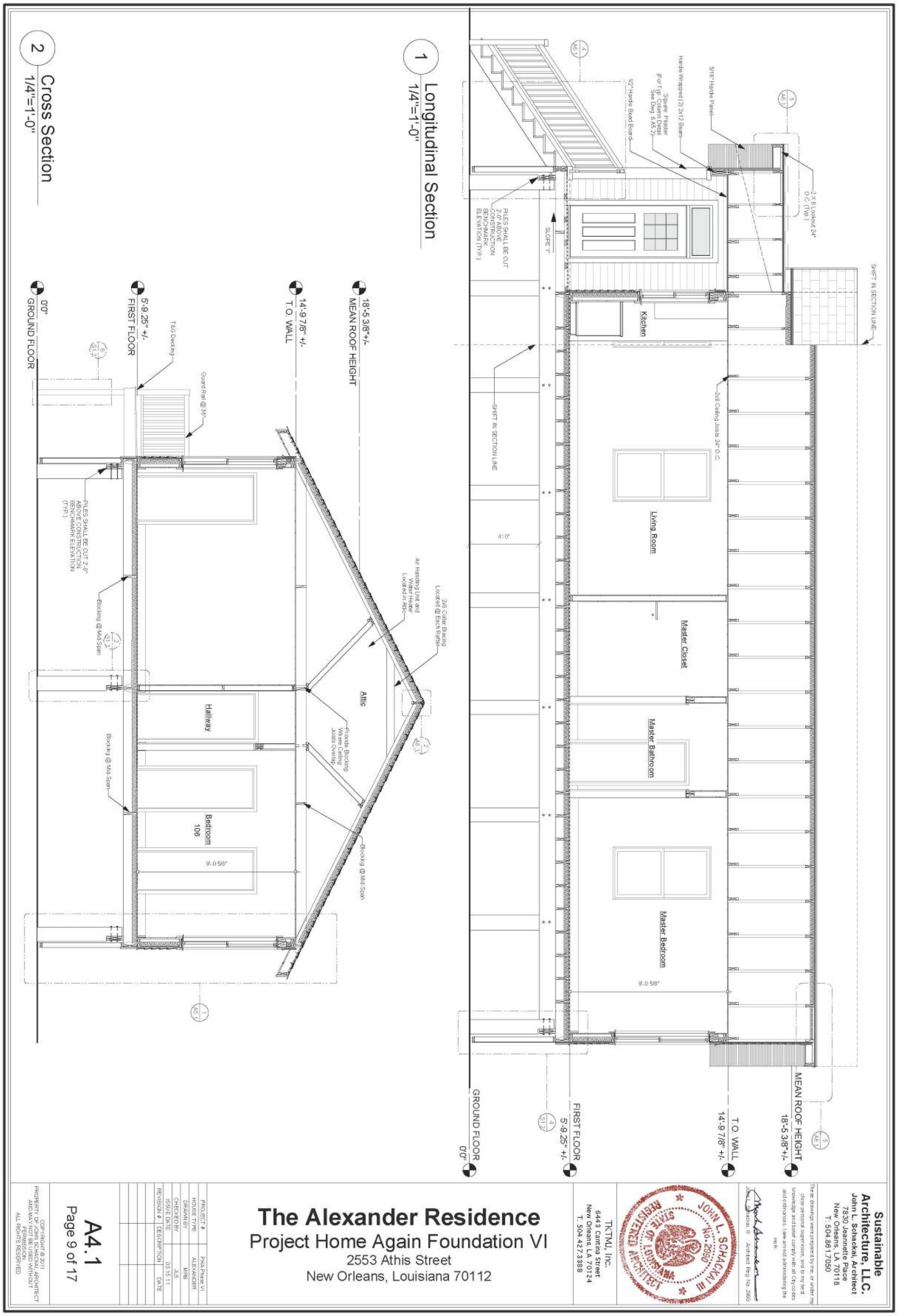
A3.2
Page 8 of 17


1 Longitudinal Section
1/4"=1'-0"
2 Cross Section
1/4"=1'-0"
Kitchen
Living Room
Master Closet
Master Bathroom
Master Bedroom
Hallway
Bedroom 106
Attic
MEAN ROOF HEIGHT
18'-5 3/8" +/-
T.O. WALL
14'-9 7/8" +/-
FIRST FLOOR
5'-9.25" +/-
GROUND FLOOR
0'0"
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A4.1
Page 9 of 17
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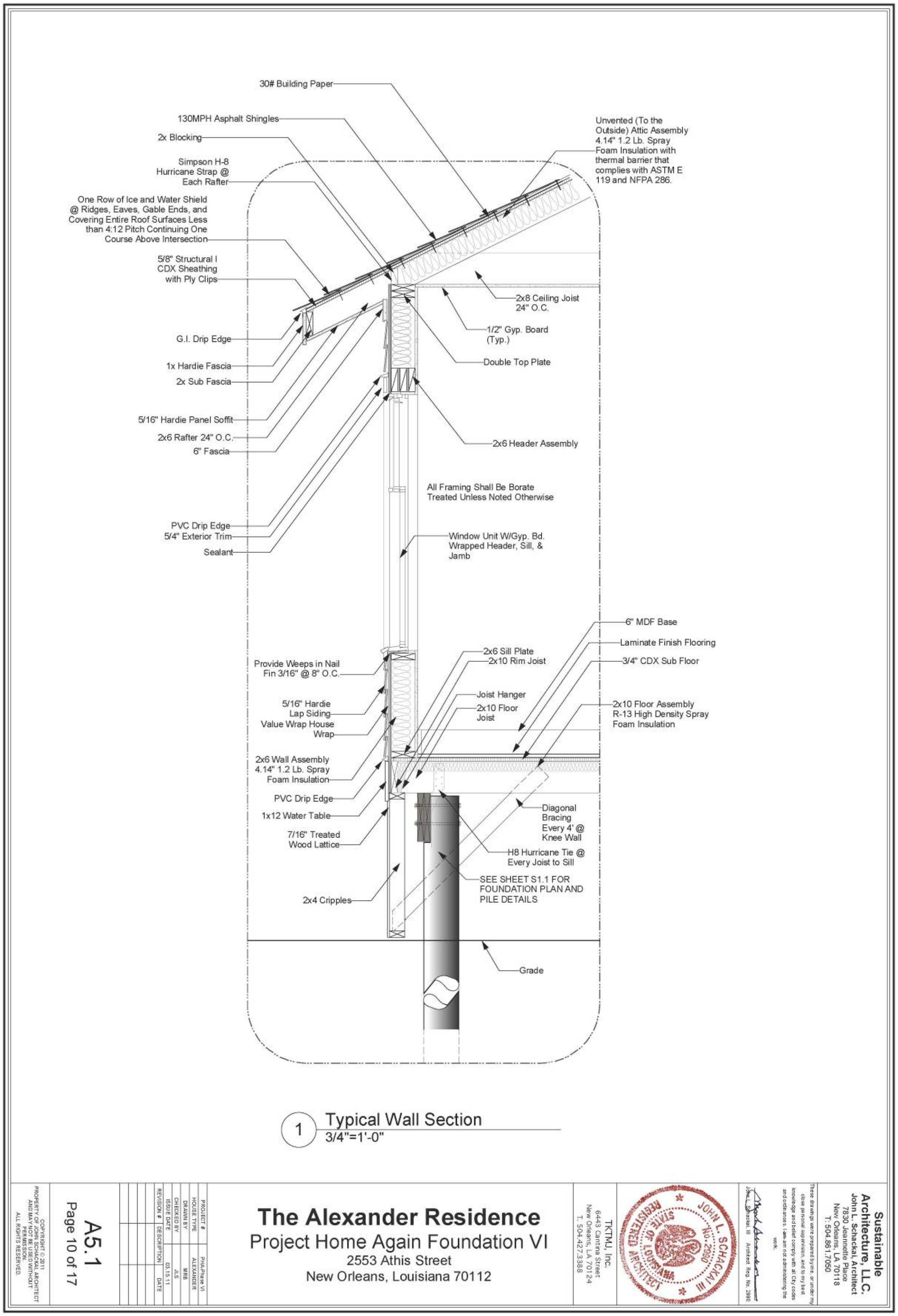
30# Building Paper
130MPH Asphalt Shingles
2x Blocking
Simpson H-8 Hurricane Strap @ Each Rafter
One Row of Ice and Water Shield @ Ridges, Eaves, Gable Ends, and Covering Entire Roof Surfaces Less than 4:12 Pitch Continuing One Course Above Intersection
5/8" Structural I CDX Sheathing with Ply Clips
G.I. Drip Edge
1x Hardie Fascia
2x Sub Fascia
5/16" Hardie Panel Soffit
2x6 Rafter 24" O.C.
6" Fascia
PVC Drip Edge
5/4" Exterior Trim
Sealant
Unvented (To the Outside) Attic Assembly 4.14" 1.2 Lb. Spray Foam Insulation with thermal barrier that complies with ASTM E 119 and NFPA 286.
2x8 Ceiling Joist 24" O.C.
1/2" Gyp. Board (Typ.)
Double Top Plate
2x6 Header Assembly
All Framing Shall Be Borate Treated Unless Noted Otherwise
Window Unit W/Gyp. Bd. Wrapped Header, Sill, & Jamb
6" MDF Base
Laminate Finish Flooring
3/4" CDX Sub Floor
2x6 Sill Plate
2x10 Rim Joist
Provide Weeps in Nail Fin 3/16" @ 8" O.C.
Joist Hanger
2x10 Floor Joist
2x10 Floor Assembly R-13 High Density Spray Foam Insulation
5/16" Hardie Lap Siding
Value Wrap House Wrap
2x6 Wall Assembly 4.14" 1.2 Lb. Spray Foam Insulation
PVC Drip Edge
1x12 Water Table
7/16" Treated Wood Lattice
Diagonal Bracing Every 4' @ Knee Wall
H8 Hurricane Tie @ Every Joist to Sill
SEE SHEET S1.1 FOR FOUNDATION PLAN AND PILE DETAILS
2x4 Cripples
Grade
1 Typical Wall Section
3/4"=1'-0"
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A5.1
Page 10 of 17
PROJECT # PHA Phase VI
HOUSE TYPE ALEXANDER
DRAWN BY MRB
CHECKED BY JLS
ISSUE DATE 03.15.11
REVISION # DESCRIPTION DATE
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Project Home Again Foundation VI
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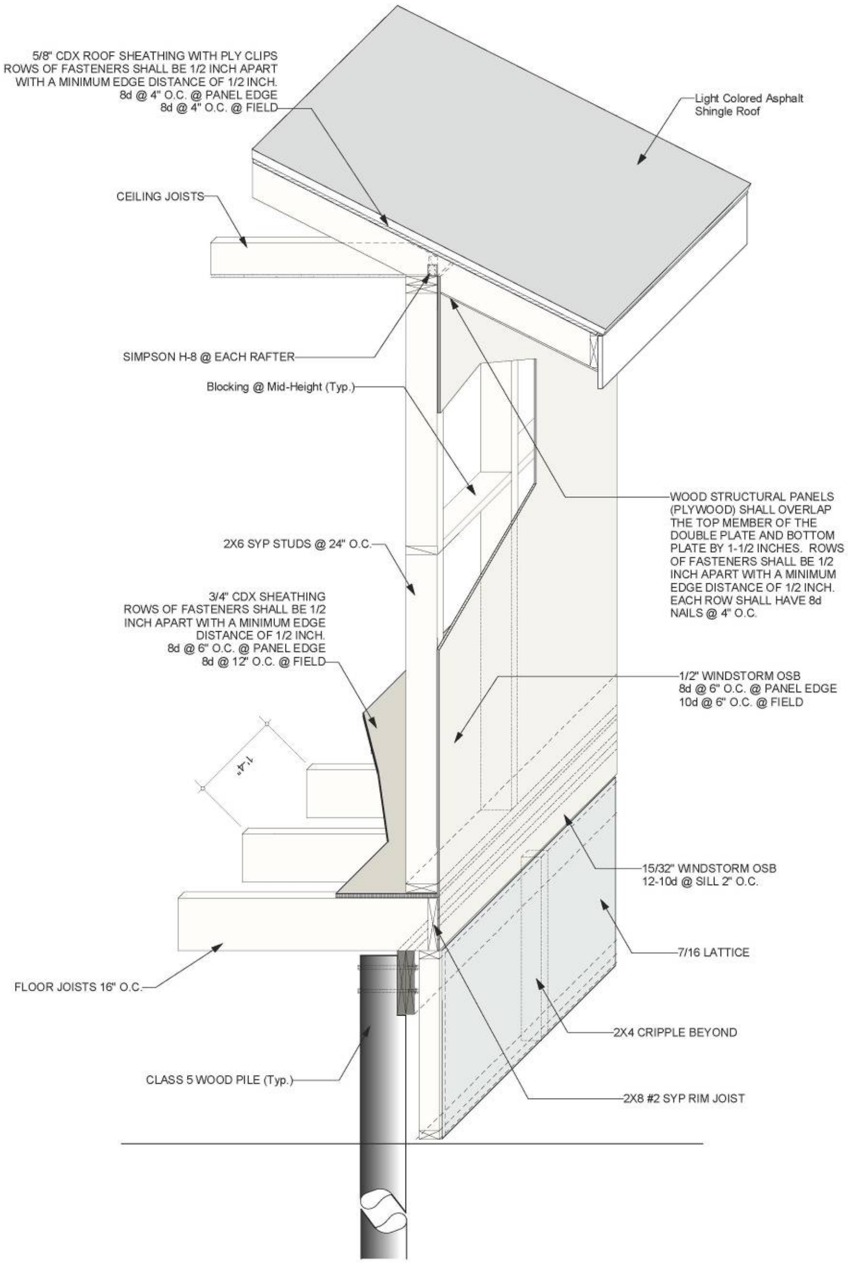

NAILING SCHEDULE

SHEATHING LOCATION	SHEATHING TYPE	NAIL TYPE	NAIL SPACING
ROOF	WOOD STRUCTURAL PANELS	8d	4" EDGE/ 4" FIELD
CEILING	GYPSUM WALLBOARD*	5d COOLER NAIL	7" EDGE/ 10" FIELD
WALL	WOOD STRUCTURAL PANEL	8d	6" EDGE/ 6" FIELD
WALL INTERIOR	GYPSUM WALLBOARD	5d	7" EDGE/ 10" FIELD
FLOOR	WOOD STRUCTURAL PANEL	8d	6" EDGE/ 6" FIELD

2 Typical Wall Section with Nailing Requirements
Not to Scale

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Project Home Again Foundation VI
2553 Athis Street
New Orleans, Louisiana 70112

PROJECT #	PHA-Phase VI
HOUSE TYPE	ALEXANDER
DRAWN BY	MRB
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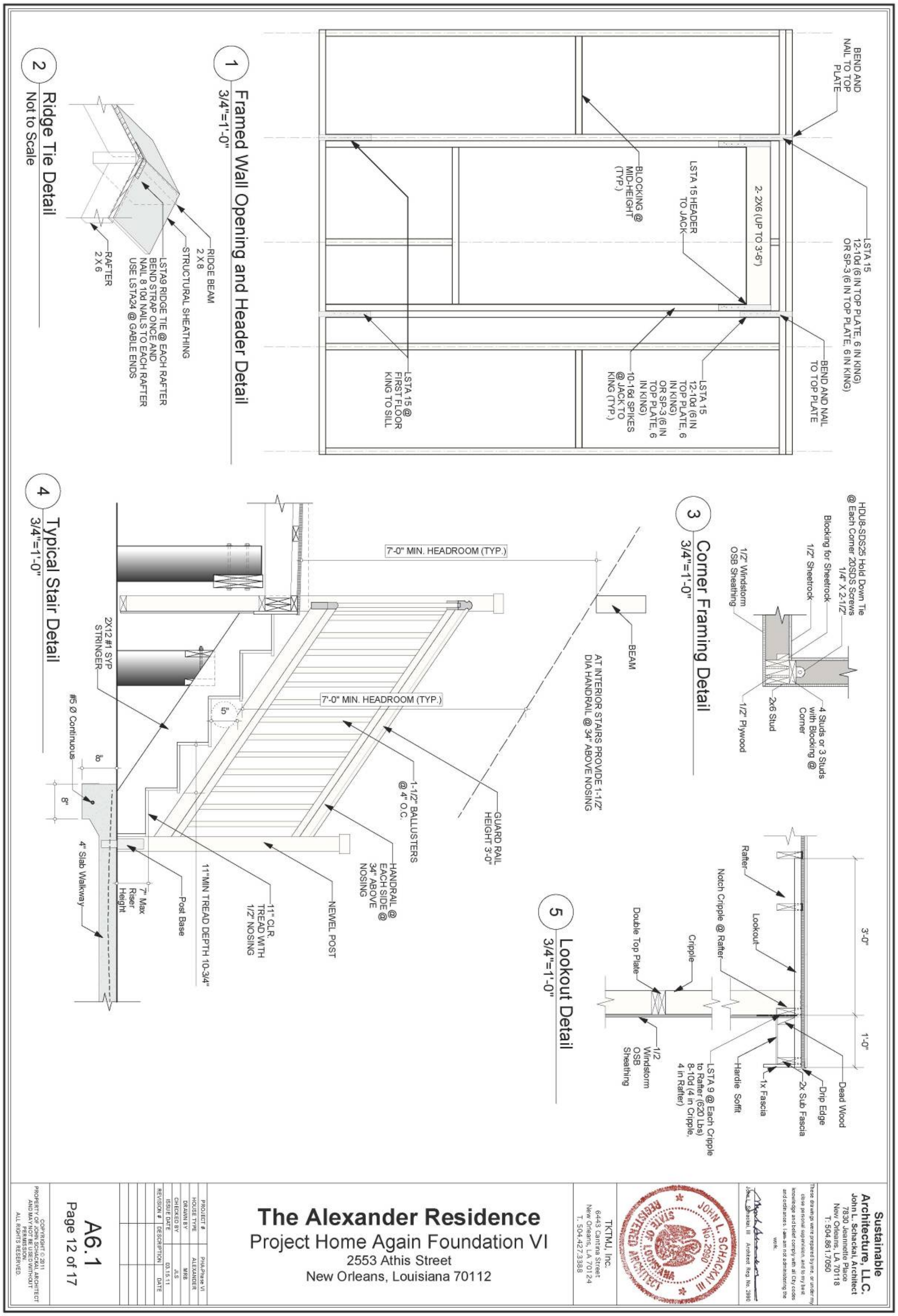
ISSUE DATE	03.15.11

REVISION #	DESCRIPTION	DATE

A5.2
Page 11 of 17



1 Framed Wall Opening and Header Detail
3/4"=1'-0"
BEND AND NAIL TO TOP PLATE
LSTA 15 12-10d (6 IN TOP PLATE, 6 IN KING) OR SP-3 (6 IN TOP PLATE, 6 IN KING)
2- 2X6 (UP TO 3'-6")
LSTA 15 HEADER TO JACK
BLOCKING @ MID-HEIGHT (TYP.)
BEND AND NAIL TO TOP PLATE
LSTA 15 12-10d (6 IN TOP PLATE, 6 IN KING) OR SP-3 (6 IN TOP PLATE, 6 IN KING)
10-16d SPIKES @ JACK TO KING (TYP.)
LSTA 15 @ FIRST FLOOR KING TO SILL
2 Ridge Tie Detail
Not to Scale
RIDGE BEAM 2 X 8
STRUCTURAL SHEATHING
LSTA9 RIDGE TIE @ EACH RAFTER BEND STRAP ONCE AND NAIL 8 10d NAILS TO EACH RAFTER USE LSTA24 @ GABLE ENDS
RAFTER 2 X 6
3 Corner Framing Detail
3/4"=1'-0"
HDU8-SDS25 Hold Down Tie @ Each Corner 20SDS Screws 1/4" X 2-1/2"
Blocking for Sheetrock
1/2" Sheetrock
1/2" Windstorm OSB Sheathing
4 Studs or 3 Studs with Blocking @ Corner
2x6 Stud
1/2" Plywood
4 Typical Stair Detail
3/4"=1'-0"
7'-0" MIN. HEADROOM (TYP.)
BEAM
AT INTERIOR STAIRS PROVIDE 1-1/2" DIA HANDRAIL @ 34" ABOVE NOSING
GUARD RAIL HEIGHT 3'-0"
1-1/2" BALLUSTERS @ 4" O.C.
HANDRAIL @ EACH SIDE @ 34" ABOVE NOSING
NEWEL POST
11" CLR. TREAD WITH 1/2" NOSING
11" MIN TREAD DEPTH 10-3/4"
Post Base
7" Max Riser Height
4" Slab Walkway
#5 Ø Continuous
2X12 #1 SYP STRINGER
8"
5"
5 Lookout Detail
3/4"=1'-0"
3'-0"
1'-0"
Rafter
Notch Cripple @ Rafter
Lookout
Cripple
Double Top Plate
1/2 Windstorm OSB Sheathing
LSTA 9 @ Each Cripple to Rafter (620 Lbs) 8-10d (4 in Cripple, 4 in Rafter)
Hardie Soffit
1x Fascia
2x Sub Fascia
Drip Edge
Dead Wood
Sustainable Architecture, LLC.
John L. Schackai, Architect
New Orleans, LA 70118
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The Alexander Residence
Project Home Again Foundation VI
2553 Athis Street
New Orleans, Louisiana 70112
A6.1
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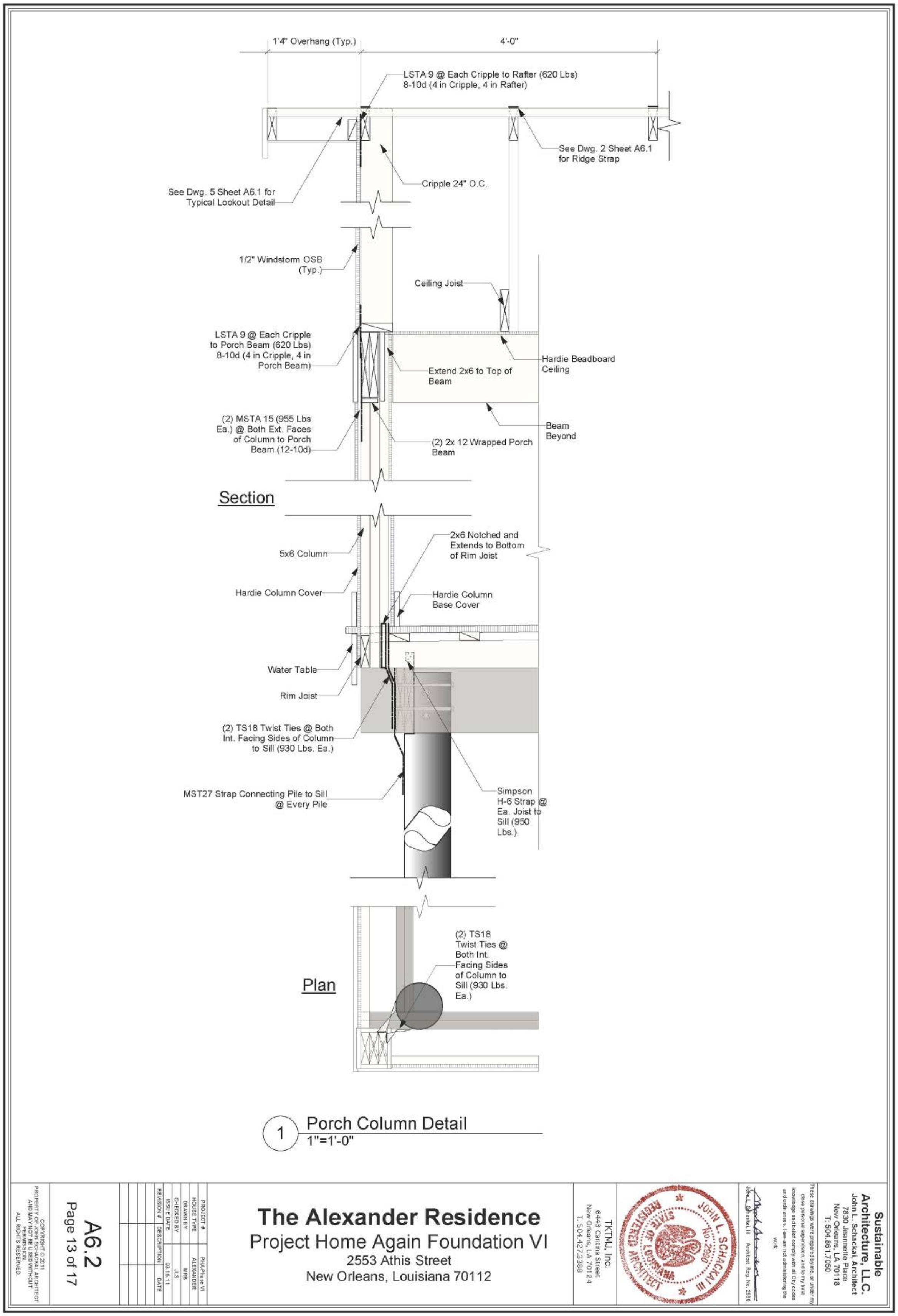

1'4" Overhang (Typ.)
4'-0"
LSTA 9 @ Each Cripple to Rafter (620 Lbs) 8-10d (4 in Cripple, 4 in Rafter)
See Dwg. 2 Sheet A6.1 for Ridge Strap
See Dwg. 5 Sheet A6.1 for Typical Lookout Detail
Cripple 24" O.C.
1/2" Windstorm OSB (Typ.)
Ceiling Joist
LSTA 9 @ Each Cripple to Porch Beam (620 Lbs) 8-10d (4 in Cripple, 4 in Porch Beam)
Hardie Beadboard Ceiling
Extend 2x6 to Top of Beam
(2) MSTA 15 (955 Lbs Ea.) @ Both Ext. Faces of Column to Porch Beam (12-10d)
Beam Beyond
(2) 2x 12 Wrapped Porch Beam
Section
2x6 Notched and Extends to Bottom of Rim Joist
5x6 Column
Hardie Column Cover
Hardie Column Base Cover
Water Table
Rim Joist
(2) TS18 Twist Ties @ Both Int. Facing Sides of Column to Sill (930 Lbs. Ea.)
MST27 Strap Connecting Pile to Sill @ Every Pile
Simpson H-6 Strap @ Ea. Joist to Sill (950 Lbs.)
(2) TS18 Twist Ties @ Both Int. Facing Sides of Column to Sill (930 Lbs. Ea.)
Plan
1 Porch Column Detail
1"=1'-0"
A6.2
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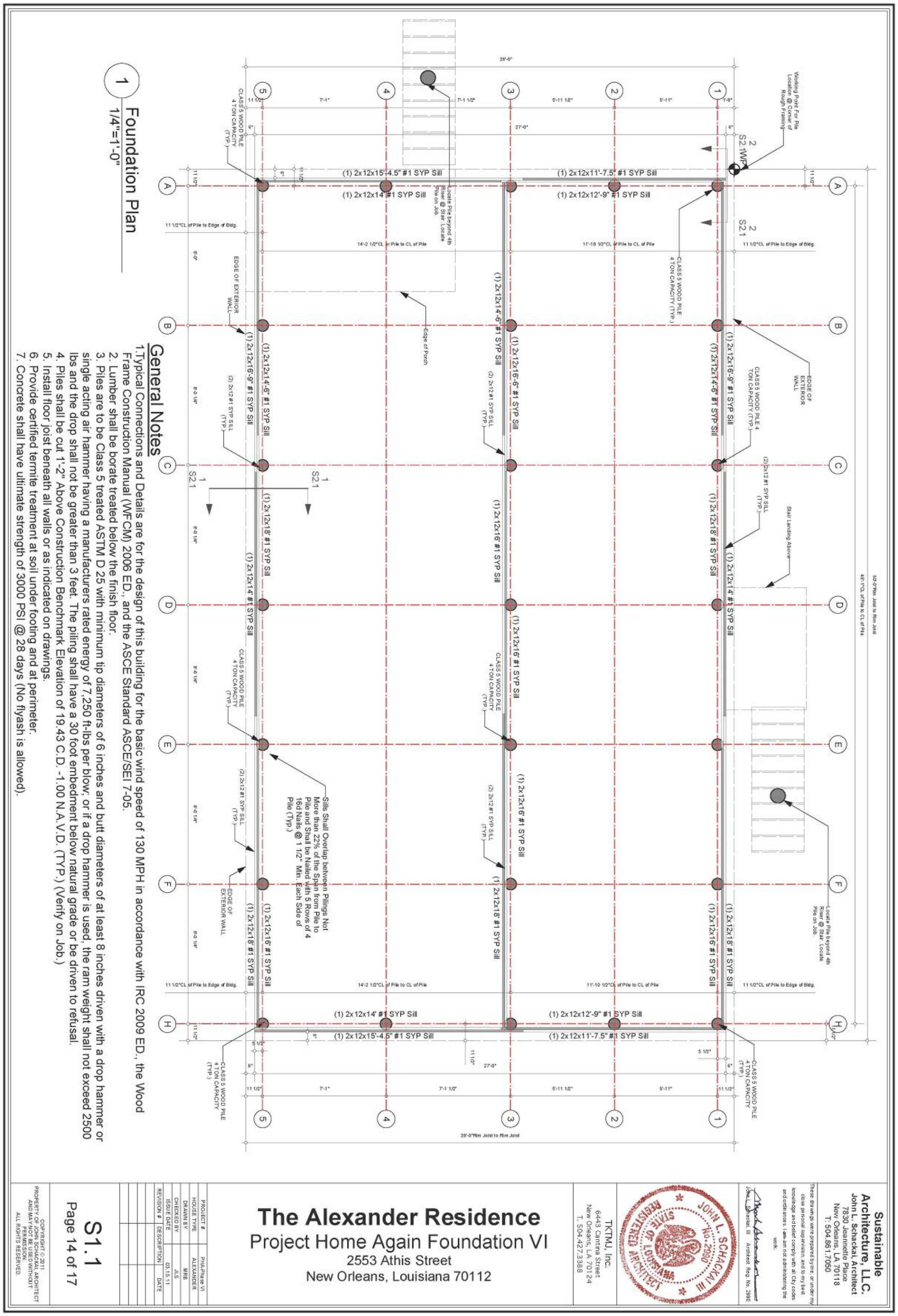
The Alexander Residence
Project Home Again Foundation VI
2553 Athis Street
New Orleans, Louisiana 70112
TKTMJ, Inc.
6443 Canal St.
New Orleans, LA 70124
Sustainable Architecture, LLC.
John L. Schackai, Architect


1 Foundation Plan
1/4"=1'-0"
General Notes
1.Typical Connections and Details are for the design of this building for the basic wind speed of 130 MPH in accordance with IRC 2009 ED., the Wood Frame Construction Manual (WFCM) 2006 ED., and the ASCE Standard ASCE/SEI 7-05.
2. Lumber shall be borate treated below the finish floor.
3. Piles are to be Class 5 treated ASTM D 25 with minimum tip diameters of 6 inches and butt diameters of at least 8 inches driven with a drop hammer or single acting air hammer having a manufacturers rated energy of 7,250 ft-lbs per blow, or if a drop hammer is used, the ram weight shall not exceed 2500 lbs and the drop shall not be greater than 3 feet. The piling shall have a 30 foot embedment below natural grade or be driven to refusal.
4. Piles shall be cut 1'-2" Above Construction Benchmark Elevation of 19.43 C.D. -1.00 N.A.V.D. (TYP.) (Verify on Job.)
5. Install floor joist beneath all walls or as indicated on drawings.
6. Provide certified termite treatment at soil under footing and at perimeter.
7. Concrete shall have ultimate strength of 3000 PSI @ 28 days (No flyash is allowed).
(1) 2x12x15'-4.5" #1 SYP Sill
(1) 2x12x14' #1 SYP Sill
(1) 2x12x11'-7.5" #1 SYP Sill
(1) 2x12x12'-9" #1 SYP Sill
CLASS 5 WOOD PILE 4 TON CAPACITY (TYP.)
EDGE OF EXTERIOR WALL
Edge of Porch
Stair Landing Above
Sills Shall Overlap between Pilings Not More than 22% of the Span from Pile to Pile and Shall be Nailed with 5 Rows of 4 16d Nails @ 1 1/2" Min. Each Side of Pile (Typ.)
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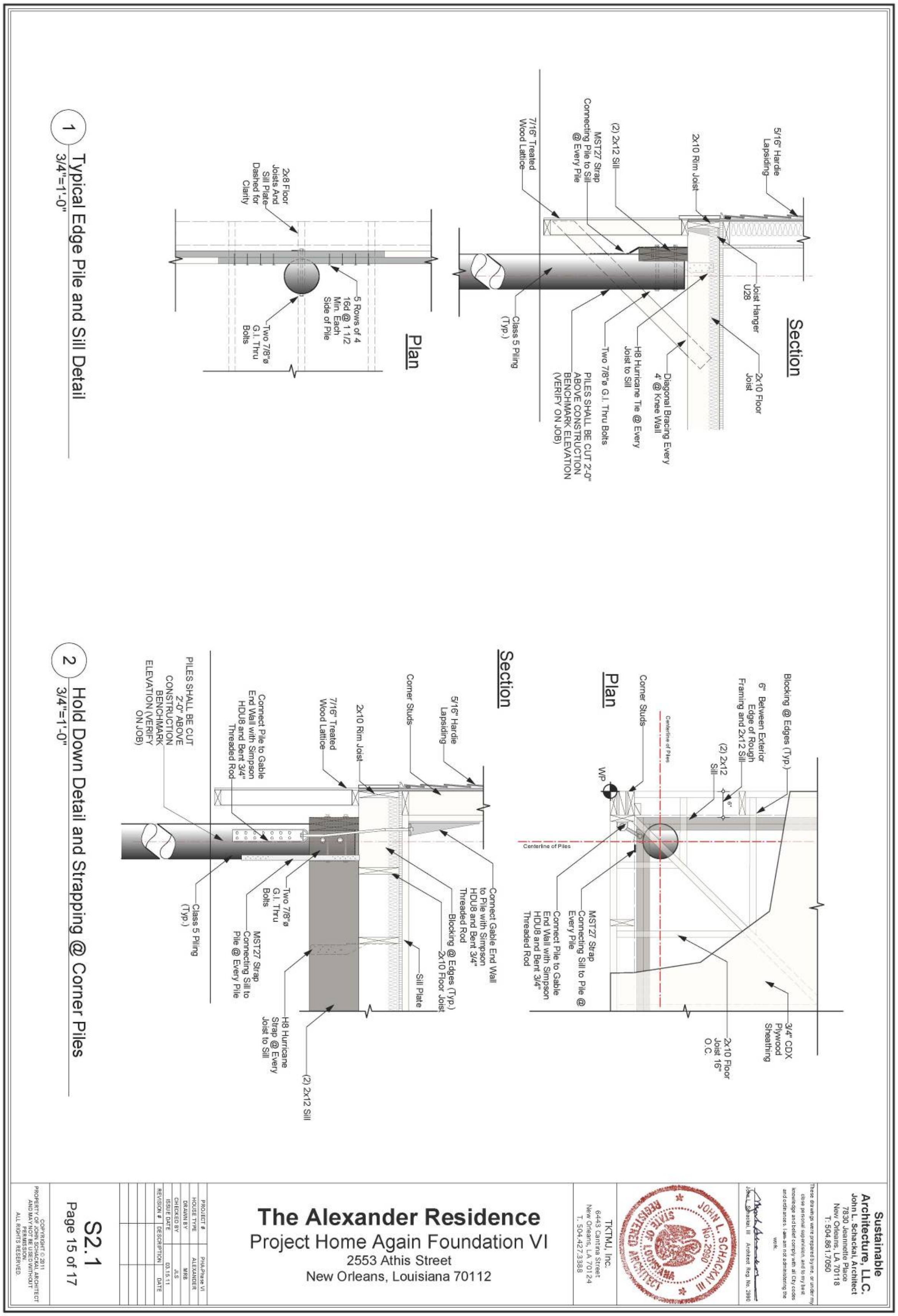
1 Typical Edge Pile and Sill Detail
3/4"=1'-0"
Section
5/16" Hardie Lapsiding
2x10 Rim Joist
(2) 2x12 Sill
MST27 Strap Connecting Pile to Sill @ Every Pile
7/16" Treated Wood Lattice
Joist Hanger U28
2x10 Floor Joist
Diagonal Bracing Every 4' @ Knee Wall
H8 Hurricane Tie @ Every Joist to Sill
Two 7/8"ø G.I. Thru Bolts
PILES SHALL BE CUT 2'-0" ABOVE CONSTRUCTION BENCHMARK ELEVATION (VERIFY ON JOB)
Class 5 Piling (Typ.)
Plan
2x8 Floor Joists And Sill Plate Dashed for Clarity
5 Rows of 4 16d @ 1 1/2 Min. Each Side of Pile
Two 7/8"ø G.I. Thru Bolts
2 Hold Down Detail and Strapping @ Corner Piles
3/4"=1'-0"
Plan
Blocking @ Edges (Typ.)
6" Between Exterior Edge of Rough Framing and 2x12 Sill
(2) 2x12 Sill
Corner Studs
WP
Centerline of Piles
MST27 Strap Connecting Sill to Pile @ Every Pile
Connect Pile to Gable End Wall with Simpson HDU8 and Bent 3/4" Threaded Rod
3/4" CDX Plywood Sheathing
2x10 Floor Joist 16" O.C.
Section
5/16" Hardie Lapsiding
Corner Studs
2x10 Rim Joist
7/16" Treated Wood Lattice
Connect Pile to Gable End Wall with Simpson HDU8 and Bent 3/4" Threaded Rod
PILES SHALL BE CUT 2'-0" ABOVE CONSTRUCTION BENCHMARK ELEVATION (VERIFY ON JOB)
Connect Gable End Wall to Pile with Simpson HDU8 and Bent 3/4" Threaded Rod
Blocking @ Edges (Typ.)
2x10 Floor Joist
Sill Plate
Two 7/8"ø G.I. Thru Bolts
MST27 Strap Connecting Sill to Pile @ Every Pile
H8 Hurricane Strap @ Every Joist to Sill
(2) 2x12 Sill
Class 5 Piling (Typ.)
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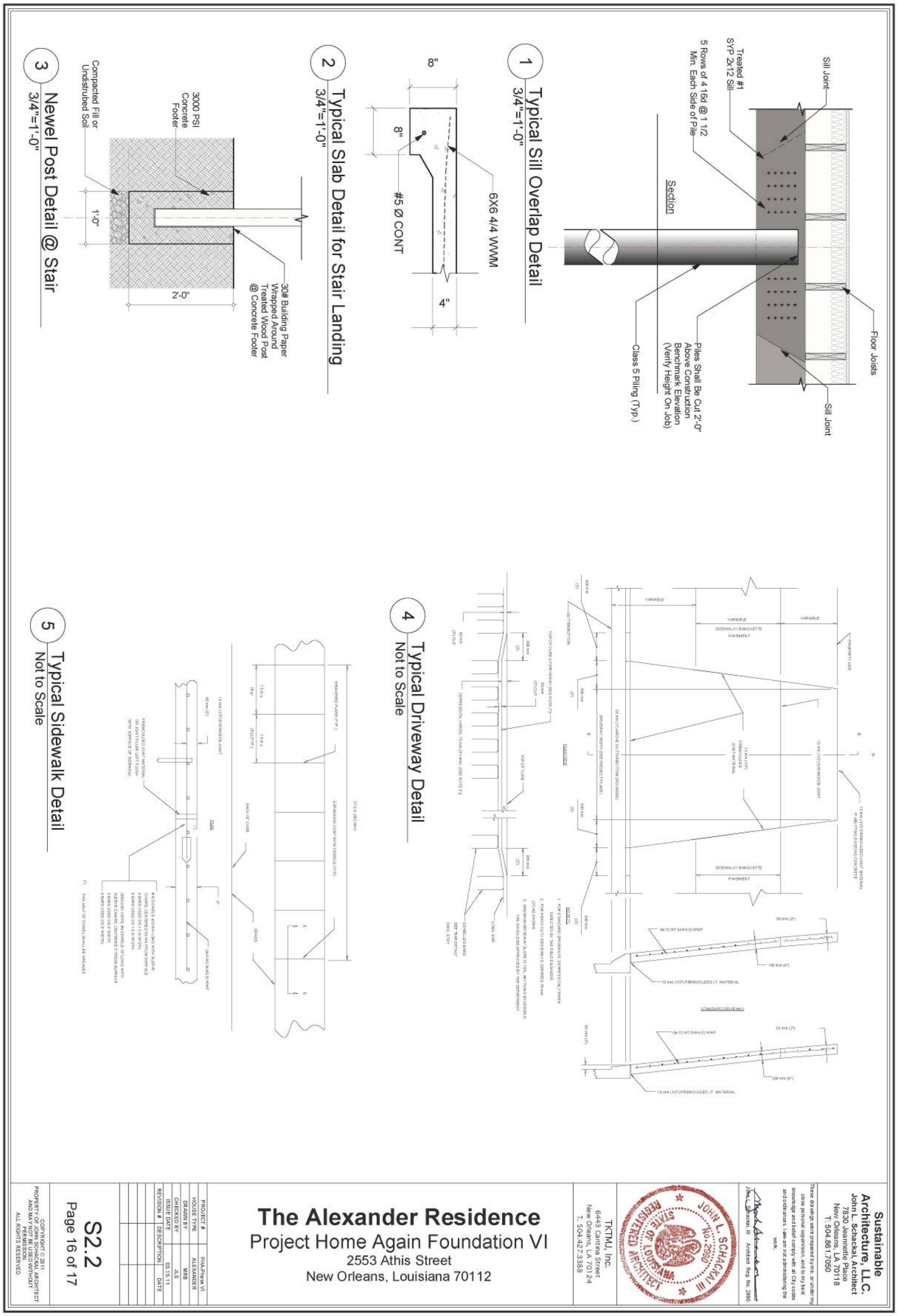
1 Typical Sill Overlap Detail
3/4"=1'-0"
Section
Sill Joint
Treated #1 SYP 2x12 Sill
5 Rows of 4 16d @ 1 1/2 Min. Each Side of Pile
Floor Joists
Sill Joint
Piles Shall Be Cut 2'-0" Above Construction Benchmark Elevation (Verify Height On Job)
Class 5 Piling (Typ.)
2 Typical Slab Detail for Stair Landing
3/4"=1'-0"
8"
8"
4"
6X6 4/4 WWM
#5 Ø CONT
3 Newel Post Detail @ Stair
3/4"=1'-0"
Compacted Fill or Undisturbed Soil
3000 PSI Concrete Footer
30# Building Paper Wrapped Around Treated Wood Post @ Concrete Footer
1'-0"
2'-0"
4 Typical Driveway Detail
Not to Scale
STANDARD DRIVEWAY
5 Typical Sidewalk Detail
Not to Scale
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These drawings were prepared by me, or under my close personal supervision, and to my best knowledge and belief comply with all City codes and ordinances. I am not administering the work.
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Project Home Again Foundation VI
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New Orleans, Louisiana 70112
PROJECT # PHA Phase VI
HOUSE TYPE ALEXANDER
DRAWN BY MRB
CHECKED BY JLS
ISSUE DATE 03.15.11
REVISION # DESCRIPTION DATE
S2.2
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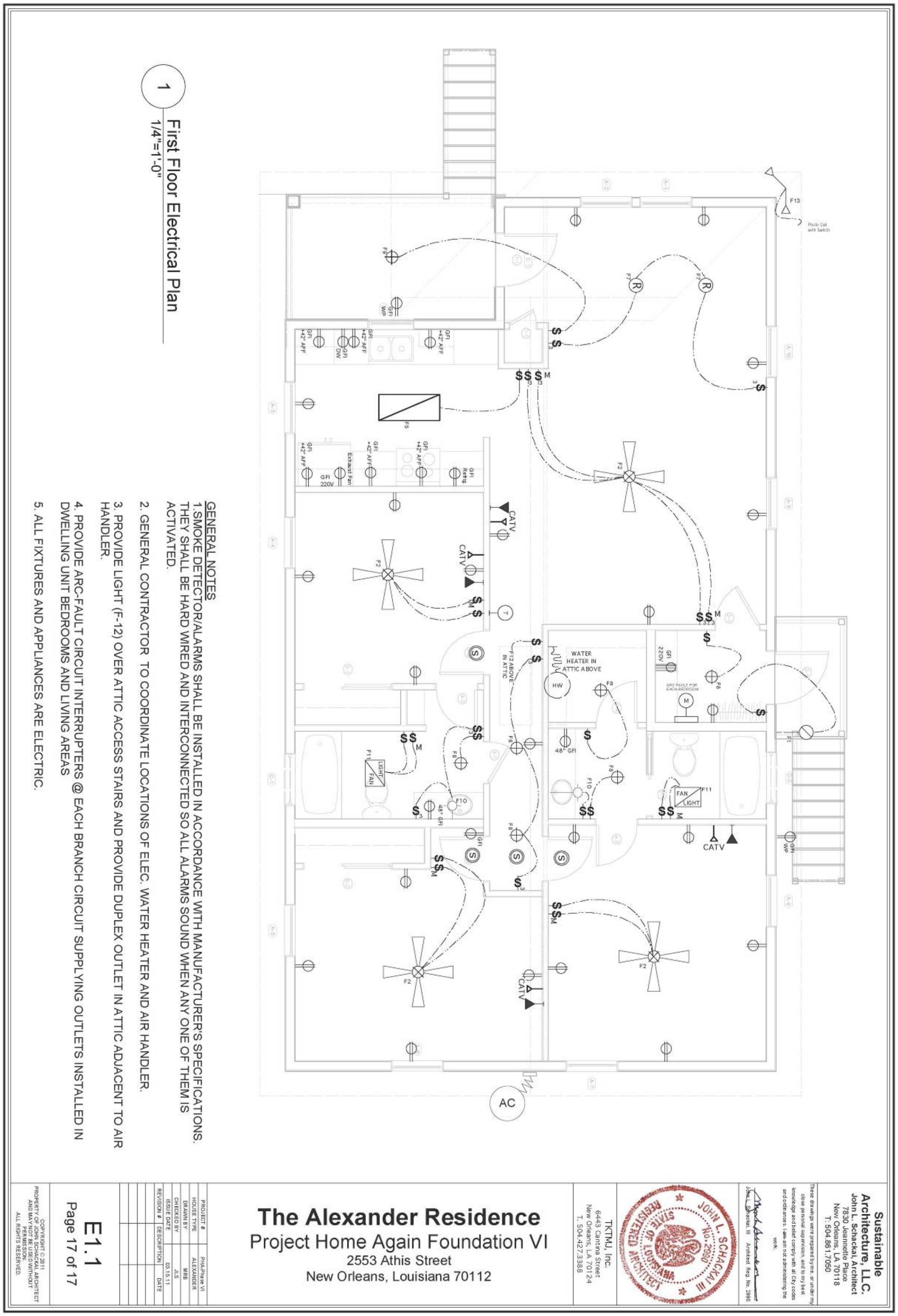
1
First Floor Electrical Plan
1/4"=1'-0"
GENERAL NOTES
1. SMOKE DETECTOR/ALARMS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. THEY SHALL BE HARD WIRED AND INTERCONNECTED SO ALL ALARMS SOUND WHEN ANY ONE OF THEM IS ACTIVATED.
2. GENERAL CONTRACTOR TO COORDINATE LOCATIONS OF ELEC. WATER HEATER AND AIR HANDLER.
3. PROVIDE LIGHT (F-12) OVER ATTIC ACCESS STAIRS AND PROVIDE DUPLEX OUTLET IN ATTIC ADJACENT TO AIR HANDLER.
4. PROVIDE ARC-FAULT CIRCUIT INTERRUPTERS @ EACH BRANCH CIRCUIT SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT BEDROOMS AND LIVING AREAS
5. ALL FIXTURES AND APPLIANCES ARE ELECTRIC.
WATER HEATER IN ATTIC ABOVE
F12 ABOVE IN ATTIC
ARC FAULT FOR EACH BEDROOM
CATV
AC
HW
Photo Cell with Switch
Exhaust Fan
GFI Refrig
GFI 220V
+42" AFF
48" GFI
FAN LIGHT
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REGISTERED ARCHITECT
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