



The Ancram Build

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The Ancram Rural Build

BarlisWedlick partners with Columbia County Habitat for Humanity and Ancram residents to plan affordable, low-energy homes, developed for the rural workforce of Columbia County, NY.¹

Introduction: Saving Farmland, Losing Farmworkers.

Here in Columbia County, in the heart of the Hudson Valley, many of our neighbors are dedicated to promoting and conserving the region's rural economy and character. They recognize the communal benefits of agriculture, sustainable land management, and wildlife stewardship. Together with fellow conservationists throughout the region, these residents have established a remarkable assemblage of easements, designations, and protections to preserve our farmland and agrarian character. As of 2015, there were over 660 easements on approximately 160,000 acres of land within the Hudson River Watershed, which is a remarkable achievement given that this is prime real estate that runs past our state capital and terminates in New York City.² The viability of this monumental effort to preserve our region's bucolic landscape assumes that the rural workforce--those with the special skills required to sustain its agricultural economy and character--will be able to live and thrive here for generations to come. Unfortunately, in Columbia County and elsewhere in the Hudson Valley, agrarian-related occupations no longer provide entry-level compensation sufficient to purchase and maintain a home.³ This is the problem my firm, BarlisWedlick Architects LLC; our client, Columbia County Habitat for Humanity, and partnering landowners in Ancram hope to address with the Ancram Rural Build.

Columbia County needs its farmworkers, and all supporting rural tradespersons, to have affordable homeownership opportunities. Without future generations of farmworkers our agricultural economy, rural character, and farmland conservation is unsustainable. The Ancram Rural Build is a communal development strategy to build affordable, state-of-the-art, low-energy homes in farming communities for the rural workforce.

¹ Submitted to the Office of Didi Barrett, Assemblymember, New York State, Assembly District 106, January 2017.

² National Conservation Easement Database. www.conservationeasement.us/reports/easements?report_state=New%20York&report.

³ See Appendix A, "Average Annual Wages of New York State Rural Entry-Level Workforce, Based on NY Dept. of Labor Statistics."



Farm Landscape, Columbia County

No Farmworkers, No Farms

The Town of Ancram, in the southeast corner of Columbia County, is representative of our farming communities whose residents have succeeded in preserving its irreplaceable agricultural character, but whose farming economy cannot provide our rural workforce with the income sufficient to purchase decent homes. In his ecological and sociological survey of Columbia County entitled The Nature of the Place, Dr. Conrad Vispo points out that over 100,000 acres in our county are open fields and farmland, which is sizeable given our region is just thirty miles north of the New York metropolitan area. With just 97 people per square mile, a mere 31 more people per square mile than in 1850, our county has succeeded in preserving its agrarian character.⁴ Ancram's Farmland Protection Plan spells out the importance farming plays for the township: "It is the major land use, 62% of the acreage, a major employer, and contributes positively to the region's economy, quality of life, open spaces, and wildlife habitats."⁵

Unfortunately, our analysis of data from the New York State Department of Labor reveals that the state's agricultural economy does not provide for jobs with entry-level incomes sufficient to purchase a home in our farming communities. The average annual income of the bottom third of all occupations in New York State needed to sustain a farming community, such as Ancram, is less than \$28,000.⁶ The median price of a home in Ancram is \$289,000--which easily translates to \$2,000 per month of mortgage, taxes, insurance, and utilities, well beyond the means of the entry-level rural workforce. Furthermore, one-third of its residents earn less than 50% of the nation's median income; yet, the cost of housing in Ancram is more than 150% the national average.⁷ How sustainable is farmland protection if farmworkers cannot afford to live in the communities that are preserving farms?

To read the news, it appears farmland protection is economically viable in the Hudson Valley because of the growing demand for farm goods. David Haight of the American Farmland Trust told the New York Times, "The number of farmers markets in New York City has nearly doubled, to 146 in 2015 from 79 in 2006." Richard Ball, the New York State Agricultural and Markets Commissioner, told the Register-Star, "New York City has \$600 million of unmet demand for fresh food each year; 90% of the food that goes through the city's green markets comes from the Hudson Valley."⁸ However, as Vispo has noted, while the proximity of the New York metropolitan area supports the sale of our farm goods, it also drives up our property values.⁹ The fact is the Hudson Valley agriculture economy cannot provide for a sufficient income for the farmworkers to purchase a market rate home in our communities.

⁴ Conrad Vispo, *The Nature of the Place, A History of Living with the Land*, (Hillsdale: Adonis Press 2016) 127-133.

⁵ Ancram, *Agricultural and Farmland Protection Plan*, <http://www.townofancram.org/images/uploads/maps/4-Farmland.pdf>

⁶ See Appendix A.

⁷ US Town Charts, 2015 <http://www.towncharts.com/New-York/Economy/Ancram-town-NY-Economy-data.html>

⁸ Paul Post, *Real Estate Boom Pinches a Produce Supply in the Hudson Valley* (New York Times: June 1, 2016) & John Mason, *Columbia Green Media, 4.6 million in Grants Go to Five Farms* (Register Star: May 5, 2016).

⁹ Conrad Vispo, *The Nature of the Place*, 297.



The Hudson Passive Project

CCH4H + Passive House = Affordable Homeownership

Columbia County Habitat for Humanity provides low-income families with affordable homeownership opportunities when their income isn't sufficient to purchase a market rate home; they have been doing so since 1993. CCH4H partners with our community members and qualified first-time homebuyers to build low-cost housing. It is this communal effort, and specifically the donation of services and labor, which allows them to offer homes at a price that is significantly less than market rate homes. Recently, CCH4H recognized that rising costs of property values, taxes and utilities were challenging their ability to sustain their mission.¹⁰ That is how we were introduced to CCH4H. In 2009, Executive Director Brenda Adams invited our firm to meet her board and give a talk on our Hudson Passive Project, a case study in Passive House, the most advanced method for reducing building energy use. Adams explained reducing property values and taxes was clearly outside of their reach, whereas they could tackle rising energy costs by pursuing low-energy residential designs.

Passive House achieves low-energy designs by specifying superior building construction details, such as air-tight, super-insulated construction, minimized thermal bridging, high-performing windows, and energy-recovery ventilation systems. With HPP, we compared a home designed using Passive House specifications to a version that used New York code-minimum specifications and a version that used Energy Star specifications, a construction standard commonly used to maximize energy efficiency. In a published report by the New York State Energy Research and Development Authority, HPP proved that Passive House specifications could reduce energy used for heating by 99% and total energy use by 70% when compared to code-minimum construction. Furthermore, the Passive House design far outperformed Energy Star design at a construction cost that was no higher.¹¹ According to Adams, a 99% reduction in energy would be a game changer for the low-income homebuyer who would normally spend as much as nine percent of their income on heating and cooling their homes. Even a temporary spike in energy costs during one cold winter can imperil the family's household budget. For example, local news reported a 2014 rate surge of 66% for heating fuel cost and 88% for electric cost, which was on top of a 25% usage surge.¹² For a small house in the area, this translated to a utility bill of \$700 for the month, instead of the usual bill of \$200.

Impressed with the people of CCH4H and their understanding of low-energy design, we volunteered to design a Passive House that could be built by volunteers within the confines of their limited budget. By 2016, CCH4H had sold their sixth home for a Habitat Partner Family using our Passive House design. The monthly utility bill for these homes is less than \$40 and is only marginally higher during energy-use spikes. Building a Passive House design allowed CCH4H to offer state-of-the-art three-bedroom homes to low-income, first-time homebuyers at a total monthly cost below \$800, including mortgage, taxes, insurance and utilities.

¹⁰ Jennifer Goodman, Habitat takes Passive Approach to Affordable Housing, (Builder Magazine: July 2014).

¹¹ See Appendices B and C ("NYSERDA High Performance Development Challenge, BarlisWedlick Hudson Passive Project").

¹² William Dendis, Electric and Gas Bill Surge in Hudson Valley, (hv1, February, 2014),

<http://hudsonvalleyone.com/2014/02/21/electric-gas-bills-surge-hudson-valley/>



The Ancram Rural Build Duplex Prototype

Farmland Protection vs. Developing Affordable Homes

The success of our Passive House designs for CCH4H attracted the attention of Ancram. The Ancram Preservation Group (a group of residents who advocate for the preservation of the town's historic architecture and character), Planning Board and Supervisor invited our firm to explore the feasibility of a CCH4H development of Passive House designs within one of their hamlets. Ancram is facing a shrinking population, and the town points to the lack of affordable homeownership opportunities as the cause. Supervisor Art Bassin explained to us that the continual decline in population poses a risk to the agrarian economy, emergency services, and municipal agencies of Ancram. The homes within this farming community are simply getting too expensive to buy for the next generation of working-class families. Without younger generations of homebuyers, not only were the farmers aging, so were their civil servants, such as their firefighters. These residents of Ancram hoped that a development of affordable homes by CCH4H in one of the hamlets would spur growth.

CCH4H had little trouble finding support for building affordable infill housing in Hudson and Valatie, New York, where it has used Passive Home designs to date. These are thickly-settled communities in Columbia County, unlike the farming hamlets of Ancram, which is sparsely populated and far more rural in character. The catch in developing Passive House designs in the hamlets of Ancram is the CCH4H development would need to comply with the town's comprehensive plan, including their farmland protection mandate, and win the support of its residents. Two-thirds of all the land in Ancram is used for agriculture,¹³ and nine out of ten residents desire to preserve open space to protect the community's agricultural economy and character.¹⁴ How would a low-income housing development serve that mandate?

Last summer, our firm completed a marketplace feasibility study and developed a prototype Passive House design for a development of CCH4H Passive Houses in the Ancram. The result is the Ancram Rural Build, a planned CCH4H development of low-energy homes for Ancram that would specifically target first-time homebuyers whose household income is derived from the local agricultural economy. Based on our research, it was clear to us that farmworkers, as well all the other workers in the rural workforce, would need special assistance in the purchase a home in Ancram; without it, the entry-level wages of these occupations simply would not allow these families to set enduring roots here. A CCH4H development specifically targeting first-time homebuyers with the special skills needed to maintain the agriculture economy and character would spur growth and fulfill the goals of the town's farmland protection mandates.

¹³ See Appendix D.

¹⁴ Ancram, Agricultural and Farmland Protection Plan, 4-7.



The Ancram Rural Build Duplex Prototype

Affordable Rural Workforce Housing is Good Growth

Columbia County Habitat for Humanity is uniquely qualified to bring low-energy, green technologies into the affordable housing market of the Hudson Valley. It was not until we were asked to volunteer our services to create a Passive House design for Habitat for Humanity Partner Families that we were able to achieve a single-family Passive House that would be affordable for a low-income family to purchase. As architects who have worked with for-profit developers for over thirty years in the Hudson Valley, we know that a charitable organization, such as CCH4H, can develop low-energy, high-quality homes at a price that marketplace ventures simply cannot by tapping into volunteerism and the communal spirit.

As business owners in Columbia County, we know how valuable the rural workforce is. The people who have the special skills required for these agrarian occupations are the same people that support our economy at large. We work with them directly: The young carpenter that frames the luxury weekend home is the person who builds the neighboring farmer's barn, the junior contractor who excavates the hole for a new swimming pool on a second-home property also plows the nearby farm field, and the young landscaper who sells us locally grown plants is the woman who sells locally grown vegetables at the farmstand. Our goal is to help place the young men and women of the rural workforce into high-quality homes so they can be rewarded for the vocations they have chosen. We believe that by helping our young households today we will encourage future generations to find collective ways to support their farmworkers, trades people, and artisans.

Our firm considers the rural workforce to be part of the environmental sector because it sustains farmland, and its skills are essential for implementing environmentally conscious ideas, policies, and technologies that protect our natural resources, open space, and habitats of the countryside. Dr. Vispo teaches us that the farms and their surrounding woodlands and wetlands in Columbia County are remarkably biodiverse landscapes sustaining a distinct set of rare plants and animals. The American Farmland Trust spells out that about half of protected species use farmland for 80 percent or more of their habitat, and well-managed farms protect wetlands and absorb and filter rainwater and snowfall, helping to control flooding and recharge groundwater.¹⁵ Our hope is to demonstrate that developing affordable, low-energy homes for the rural workforce is good growth beyond its benefits to the agricultural economy. These vocations are not only vital to sustaining our farmlands, they sustain the health of our environment here in Columbia County.

¹⁵ American Farmland Trust, Water, <https://www.farmland.org/our-work/areas-of-focus/water>



Raising a Passive House in Columbia County

Helping Farming Communities House Rural Workers

Columbia County Habitat for Humanity and BarlisWedlick are in the early stages of planning the Ancram Rural Build, a development of affordable, low-energy, low-impact homes for the rural workforce in the farming community of Ancram, New York.

The planning of the Ancram Rural Build has inspired Ancram landowners Dan Slott and Frank and Katherine Martucci to pledge a donation of property to CCH4H, so ground may be broken for the first set of homes in the hamlet of Ancramdale in 2017. Thanks to this pledge, the donations of all those who generously support the work of Habitat for Humanity, and the communal spirit of all those who volunteer their time and effort, the Ancram Rural Build will soon demonstrate how affordable low-energy homes can be developed for qualified first-time homebuyers from the rural workforce.

Once the Ancram Rural Build land and funding is fully secured for the first home, a qualified Habitat for Humanity Family Partner will have the opportunity to purchase a newly built, three-bedroom home at a cost that is less than half of the median-price home in Ancram. As envisioned, these low-energy homes will be built on one-half to one-acre lots within a short commute to the surrounding farms. They will be designed to meet the low-impact standards of CCH4H, which include limiting the overall size of the house to slightly more than twelve hundred square feet. The homebuyers' families will join the Ancram Build volunteers to raise high-quality, resilient homes with the most minimal carbon-footprint.

Fair housing and equal opportunity guidelines require that there be a large enough pool of applicants from the rural workforce for a Habitat for Humanity development project that targets this agrarian sector of the Hudson Valley economy. To help accomplish this, we are asking rural workforce organizations, such as farmer coalitions, trade organizations, and local community groups, to encourage all first-time homebuyers who earn their income from agrarian occupations in the Hudson Valley and may be interested in this program to reach out to Columbia County Habitat for Humanity (<http://columbiacountyhabitat.org>).

Appendix A

Table A1
Average Annual Wages of New York State Rural Entry-Level Workforce--
BarlisWedlick Analysis Based on New York Department of Labor Statistics

Rural Sector Typology	SOC Code ¹	New York State Rural Workforce Occupations	Entry-level Annual Wages	Most common education attained by workers in the occupation ⁶
Ag/Farm Equip	45-2091	Agricultural Equipment Operators	\$27,950	Less than high school diploma
Ag/Farm Labor	45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	\$19,470	Less than high school diploma
Ag/Farm Labor	45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	\$19,870	Less than high school diploma
Ag/Farm Management	11-9013	Farmers, Ranchers, and Other Agricultural Managers	\$39,690	High school diploma or equivalent
Ag/Farm Products	13-1021	Buyers and Purchasing Agents, Farm Products	\$38,580	Bachelor's degree
Ag/Farm Tech	19-4011	Agricultural and Food Science Technicians	\$34,790	Associate's degree
Ag/Farm Tech	19-4021	Biological Technicians	\$30,140	Bachelor's degree
Ag/Farm Tech	19-4093	Forest and Conservation Technicians	\$38,160	Bachelor's degree
Ag/Farm Tech	29-2056	Veterinary Technologists and Technicians	\$30,010	Associate's degree
Ag/Farm Tech	31-9096	Veterinary Assistants and Laboratory Animal Caretakers	\$21,460	Some college, no degree
Ag/Farm Tech	45-2011	Agricultural Inspectors	\$42,290	Bachelor's degree
Ag/Forest	19-1032	Foresters	\$53,000	Bachelor's degree
Ag/Forest	37-3013	Tree Trimmers and Pruners	\$31,400	High school diploma or equivalent
Ag/Forest	45-4021	Fallers	\$24,730	High school diploma or equivalent
Ag/Forest	45-4022	Logging Equipment Operators	\$24,190	High school diploma or equivalent
Related Ag Admin	43-3031	Bookkeeping, Accounting, and Auditing Clerks	\$27,930	Some college, no degree
Related Ag Admin	43-9061	Office Clerks, General	\$20,860	Some college, no degree
Related Ag Admin	43-9199	Office and Administrative Support Workers, All Other	\$32,510	Some college, no degree
Related Ag Admin	45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$37,630	Less than high school diploma
Related Ag Art/Craft	27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	\$38,310	Bachelor's degree
Related Ag Art/Craft	27-1019	Artists and Related Workers, All Other	\$29,410	Bachelor's degree
Related Ag Art/Craft	27-1023	Floral Designers	\$20,620	Bachelor's degree
Related Ag Art/Craft	51-6062	Textile Cutting Machine Setters, Operators, and Tenders	\$22,050	High school diploma or equivalent
Related Ag Art/Craft	51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	\$19,150	High school diploma or equivalent
Related Ag Art/Craft	51-6099	Textile, Apparel, and Furnishings Workers, All Other	\$21,550	High school diploma or equivalent
Related Ag Art/Craft	51-7011	Cabinetmakers and Bench Carpenters	\$25,650	High school diploma or equivalent
Related Ag Art/Craft	51-7021	Furniture Finishers	\$25,450	High school diploma or equivalent
Related Ag Art/Craft	51-7099	Woodworkers, All Other	\$25,590	High school diploma or equivalent
Related Ag Art/Craft	51-9022	Grinding and Polishing Workers, Hand	\$21,130	High school diploma or equivalent
Related Ag Art/Craft	35-1011	Chefs and Head Cooks	\$23,310	High school diploma or equivalent
Related Ag Art/Craft	35-2021	Food Preparation Workers	\$19,250	High school diploma or equivalent
Related Ag Art/Craft	35-9099	Food Preparation and Serving Related Workers, All Other	\$19,200	High school diploma or equivalent
Related Ag Art/Craft	37-1012	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	\$34,970	High school diploma or equivalent
Related Ag Art/Craft	45-2041	Graders and Sorters, Agricultural Products	\$19,360	Less than high school diploma
Related Ag Art/Craft	51-3011	Bakers	\$19,940	High school diploma or equivalent
Related Ag Art/Craft	51-3021	Butchers and Meat Cutters	\$23,640	High school diploma or equivalent
Related Ag Art/Craft	51-3022	Meat, Poultry, and Fish Cutters and Trimmers	\$19,490	High school diploma or equivalent
Related Ag Art/Craft	51-3023	Slaughterers and Meat Packers	\$19,270	High school diploma or equivalent
Related Ag Art/Craft	51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	\$21,920	High school diploma or equivalent
Related Ag Art/Craft	51-3092	Food Batchmakers	\$19,750	High school diploma or equivalent
Related Ag Art/Craft	51-3093	Food Cooking Machine Operators and Tenders	\$19,800	Less than high school diploma
Related Ag Art/Craft	51-3099	Food Processing Workers, All Other	\$19,500	High school diploma or equivalent
Related Ag Art/Craft	53-3033	Light Truck or Delivery Services Drivers	\$21,010	High school diploma or equivalent
Related Ag Retail	53-7064	Packers and Packagers, Hand	\$19,400	Less than high school diploma
Related Ag Retail	41-2011	Cashiers	\$19,110	High school diploma or equivalent
Related Ag Retail	41-2021	Counter and Rental Clerks	\$19,360	High school diploma or equivalent
Related Ag Retail	41-2031	Retail Salespersons	\$19,140	Some college, no degree
Related Environment	17-3025	Environmental Engineering Technicians	\$30,390	Associate's degree
Related Environment	19-4091	Environmental Science and Protection Technicians, Including Health	\$32,740	Bachelor's degree
Related Landscape	37-3011	Landscaping and Groundskeeping Workers	\$21,370	Less than high school diploma
Related Landscape	17-1022	Surveyors	\$48,180	Bachelor's degree
Related Landscape	17-3031	Surveying and Mapping Technicians	\$31,450	Associate's degree
Rural Infrastructure	37-3019	Grounds Maintenance Workers, All Other	\$22,160	Less than high school diploma
Rural Infrastructure	47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	\$55,120	High school diploma or equivalent
Rural Infrastructure	47-2022	Stonemasons	\$33,050	High school diploma or equivalent
Rural Infrastructure	47-2031	Carpenters	\$35,370	High school diploma or equivalent
Rural Infrastructure	47-2061	Construction Laborers	\$25,880	High school diploma or equivalent
Rural Infrastructure	47-2071	Paving, Surfacing, and Tamping Equipment Operators	\$34,810	High school diploma or equivalent
Rural Infrastructure	47-2111	Electricians	\$41,350	High school diploma or equivalent
Rural Infrastructure	47-2121	Glaziers	\$29,120	High school diploma or equivalent
Rural Infrastructure	47-2131	Insulation Workers, Floor, Ceiling, and Wall	\$29,840	High school diploma or equivalent
Rural Infrastructure	47-2132	Insulation Workers, Mechanical	\$31,320	High school diploma or equivalent
Rural Infrastructure	47-2141	Painters, Construction and Maintenance	\$28,780	High school diploma or equivalent
Rural Infrastructure	47-2151	Pipelayers	\$32,840	High school diploma or equivalent
Rural Infrastructure	47-2152	Plumbers, Pipefitters, and Steamfitters	\$40,870	High school diploma or equivalent
Rural Infrastructure	47-2181	Roofers	\$31,390	Less than high school diploma
Rural Infrastructure	47-2211	Sheet Metal Workers	\$36,980	High school diploma or equivalent

Table A1 (continued)

Rural Sector Typology	SOC Code ¹	New York State Rural Workforce Occupations	Entry-level Annual Wages	Most common education attained by workers in the occupation ⁶
Rural Infrastructure	47-3011	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	\$21,970	Less than high school diploma
Rural Infrastructure	47-3012	Helpers--Carpenters	\$20,640	Less than high school diploma
Rural Infrastructure	47-3013	Helpers--Electricians	\$22,610	High school diploma or equivalent
Rural Infrastructure	47-3014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	\$22,900	Less than high school diploma
Rural Infrastructure	47-3015	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	\$22,310	High school diploma or equivalent
Rural Infrastructure	47-3016	Helpers--Roofers	\$21,680	Less than high school diploma
Rural Infrastructure	47-3019	Helpers, Construction Trades, All Other	\$20,810	Less than high school diploma
Rural Infrastructure	47-4031	Fence Erectors	\$30,750	High school diploma or equivalent
Rural Infrastructure	47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	\$26,680	High school diploma or equivalent
Rural Infrastructure	47-5021	Earth Drillers, Except Oil and Gas	\$37,860	High school diploma or equivalent
Rural Infrastructure	49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	\$50,050	High school diploma or equivalent
Rural Infrastructure	49-3041	Farm Equipment Mechanics and Service Technicians	\$28,190	High school diploma or equivalent
Rural Infrastructure	49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	\$25,060	High school diploma or equivalent
Rural Infrastructure	49-3093	Tire Repairers and Changers	\$21,820	High school diploma or equivalent
Rural Infrastructure	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$35,440	High school diploma or equivalent
Rural Infrastructure	49-9043	Maintenance Workers, Machinery	\$31,970	High school diploma or equivalent
Rural Infrastructure	49-9044	Millwrights	\$40,720	High school diploma or equivalent
Rural Infrastructure	49-9071	Maintenance and Repair Workers, General	\$27,380	High school diploma or equivalent
Rural Infrastructure	49-9098	Helpers--Installation, Maintenance, and Repair Workers	\$20,590	High school diploma or equivalent
Rural Infrastructure	49-9099	Installation, Maintenance, and Repair Workers, All Other	\$25,570	High school diploma or equivalent
Rural Infrastructure	51-1011	First-Line Supervisors of Production and Operating Workers	\$38,960	High school diploma or equivalent
Rural Infrastructure	51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	\$26,270	High school diploma or equivalent
Rural Infrastructure	51-4041	Machinists	\$29,630	High school diploma or equivalent
Rural Infrastructure	51-4121	Welders, Cutters, Solderers, and Brazers	\$29,800	High school diploma or equivalent
Rural Infrastructure	51-4194	Tool Grinders, Filers, and Sharpeners	\$25,070	High school diploma or equivalent
Rural Infrastructure	51-6051	Sewers, Hand	\$20,040	High school diploma or equivalent
Rural Infrastructure	51-9031	Cutters and Trimmers, Hand	\$20,060	High school diploma or equivalent
Rural Infrastructure	51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	\$22,480	High school diploma or equivalent
Rural Infrastructure	51-9198	Helpers--Production Workers	\$19,820	Less than high school diploma
Rural Infrastructure	53-7032	Excavating and Loading Machine and Dragline Operators	\$36,320	High school diploma or equivalent
Rural Infrastructure	53-7062	Laborers and Freight, Stock, and Material Movers, Hand	\$20,200	High school diploma or equivalent
Average Wages of All New York State Rural Entry-Level Workforce			\$27,945	

Appendix B

NYSERDA High Performance Development Challenge

BarlisWedlick Hudson Passive Project

First Year Performance Report, Levy Partnership, Inc.

June 10, 2013

Table B1 HPP Case Study: Passive House Energy Use

	HPP Case Study: Passive House Energy Use	HPP Case Study: Code-Min. Design Energy Use	HPP Case Study: Passive House Energy Savings	NYS Average Household Energy Use	HPP Case Study Passive House Energy Savings (vs. NYS Avg Hse)
Heating	106 kWh	15,210 kWh	-99%	18,375 kWh	-99%
Cooling	289 kWh	909 kWh	-83%	640 kWh	-54%
Other	7285 kWh	9115 kWh		13,225 kWh	
Total	7680 kWh	25,234 kWh	-70%	32,240 kWh	-76%

Table B2 CCH4H Passive House Energy Use

	CCH4H Passive House Energy Use	CCH4H Code-Min. Energy Use	CCH4H Passive House Energy Savings (vs. Code-Min)	NYS Average Household Energy Use	CCH4H Passive House Energy Savings (vs. NYS Avg Hse)
Heating	678 kWh	15,750 kWh	-96%	18,375 kWh	-96%
Cooling	299 kWh	1,378 kWh	-79%	640 kWh	-53%
Other	9557 kWh	11,438 kWh		13,225 kWh	
Total	10,534 kWh	28,566 kWh	-63%	32,240 kWh	-67%

Appendix C

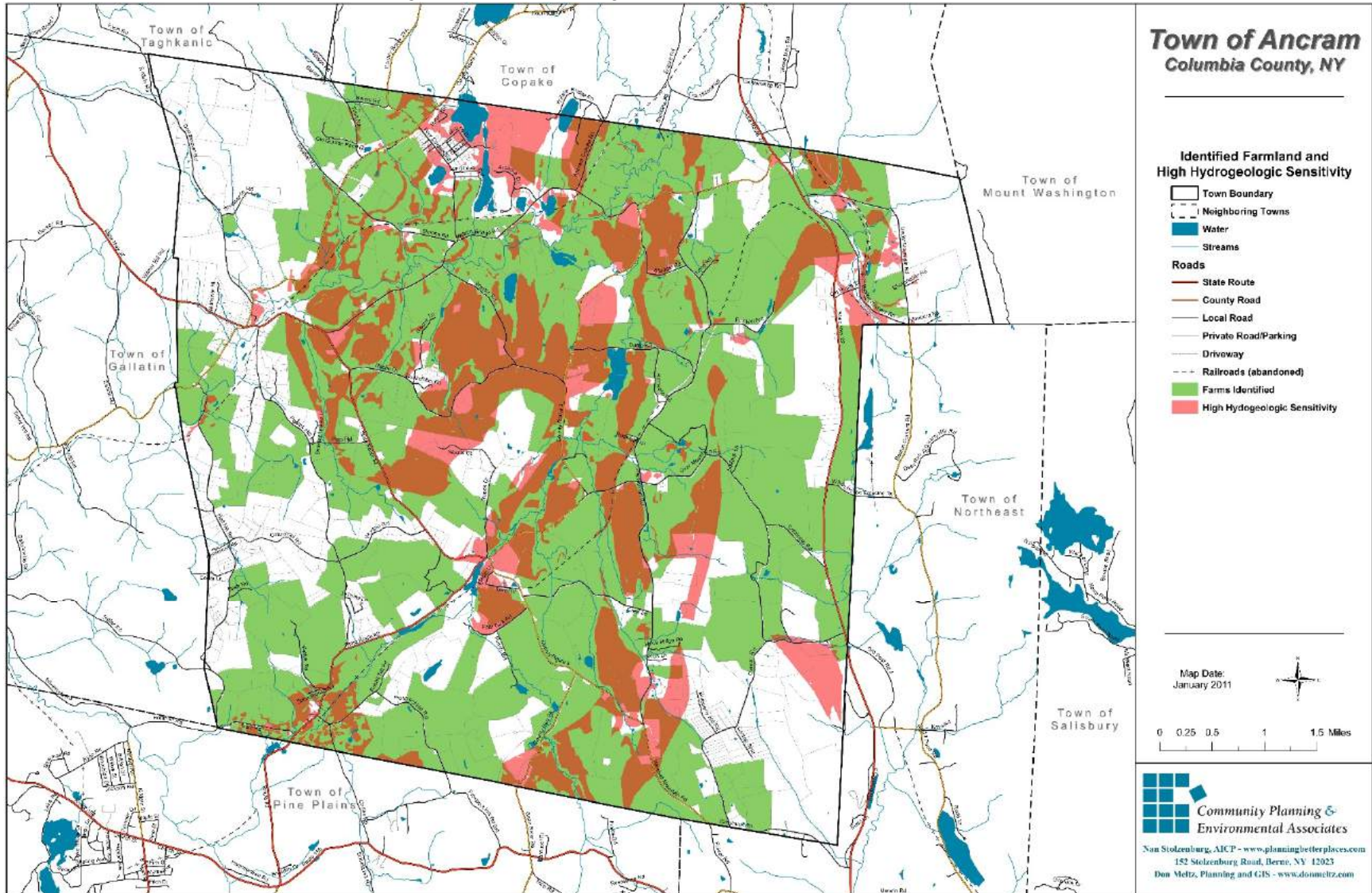
NYSERDA High Performance Development Challenge Construction Report 3 – The Hudson Passive Project The Levy Partnership, Inc. April 25, 2011

Table 1C Incremental cost data

Item	Base	Material	Labor	Total	Upgrade	Material	Labor	Total	Increment
Slab Insulation	2" EPS	\$1,184	\$300	\$1,484	12" EPS with high density EPS at perimeter	\$7,106.00	\$2,200.00	\$9,306.00	\$7,822.00
Foundation wall Insulation	2" XPS	\$700	n/a	\$700	4" XPS	\$1,400.00	n/a	\$1,400.00	\$700.00
Exterior walls (materials only)	6.25" thick EPS SIPs	\$14,674	n/a	\$14,674	12.25" thick EPS SIPs	\$17,741.00	n/a	\$17,741.00	\$3,067.00
Roof panels (materials only)	8.25" thick EPS SIPs	\$17,513	n/a	\$17,513	12.25" thick Neopor EPS SIPs	\$23,733.00	n/a	\$23,733.00	\$6,220.00
South wall mullions	No insulation	\$0	\$0	\$0	2" polyiso under trim	\$420.00	\$650.00	\$1,070.00	\$1,070.00
Windows	YKK	\$26,440	n/a	\$26,440	Serious Materials	\$20,116.00	n/a	\$20,116.00	(\$6,324.00)
Doors	Custom with double pane low-e glass	\$800	\$1,200	\$800	Custom with glass from Serious Materials	\$3,900.00	\$1,800.00	\$5,700.00	\$4,900.00
Roof windows	Wasco	\$1,100	n/a	\$1,100	Fakro	\$1,956.00	n/a	\$1,956.00	\$856.00
Air sealing (slab, wall, roof, penetrations)	Standard level of effort	\$400	\$800	\$1,200	As built (0.16 ACH50)	\$2,250.00	\$2,800.00	\$5,050.00	\$3,850.00
Heating system	Viessman boiler	\$7,400	\$14,000	\$21,400	Mitsubishi heat pumps + electric resistance Included with Mitsubishi heat pumps	\$3,800.00	\$950.00	\$4,750.00	(\$16,650.00)
Cooling system	AC system	\$6,000	\$8,000	\$14,000		n/a	n/a	n/a	(\$14,000.00)
Ventilation system	Bath/kitchen exhaust fans	\$1,500	\$0	\$1,500	Zehnder HRV	\$3,300.00	\$1,000.00	\$4,300.00	\$2,800.00
Ventilation system ductwork	Exhaust fan/clothes dryer ducts/fittings			\$0	HRV ductwork and fittings	\$750.00	\$1,800.00	\$2,550.00	\$2,550.00
Water heating	Bosch tankless electric	\$800	n/a	\$800	Steibel Eltron tankless electric	\$800.00	n/a	\$800.00	\$0.00
Clothes dryer	Vented dryer	\$600	\$150	\$750	Condensation dryer (ventless)	\$930.00	n/a	\$930.00	\$180.00
Appliances	Standard Energy Start	\$6,364	n/a	\$6,364	As built	\$6,364.00	n/a	\$6,364.00	\$0.00
Lighting	Standard practice	\$3,700	n/a	\$3,700	As built	\$3,700.00	n/a	\$3,700.00	\$0.00
Total incremental costs	Total incremental costs			\$112,425	Total incremental costs			\$109,466.00	(\$2,959)

Appendix D

Diagram from Ancram Agricultural & Farmland Protection Plan



Acknowledgements

For Ancram Rural Build:

Columbia County Habitat for Humanity
The Office of Assemblymember Didi Barrett
Town of Ancram Planning Board
Ancram Preservation Group
Ancram Supervisor, Art Bassin
Frank & Katherine Martucci
Dan Slott

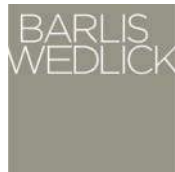
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Hills Construction Management
The Levy Partnership, Inc.
Proper & O'Leary Engineering, PC
475 High Performance Building Supply
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Stratton Building Company

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