

HUDSON RIVER SLOOP
CLEARWATER, INC.



PUBLIC COMMENT

on

AVR Proposal,
The Landing at Kingston and Ulster

**Recommendations for Incorporating
High Performance Building Criteria
Into Project Development**

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INTRODUCTION

Because *The Landing at Kingston and Ulster* is such a massive development when considered as a percentage of the cities total population, it must be planned and executed with the utmost caution and care. Over the course of this document we will present the concepts of High Performance, Green Building and Sustainable Building. We have worked to ensure that what is expressed in this document is fact, backed up with research findings, case studies, and examples of application as much as possible. While some of what is expressed on this portion of Clearwater's comments is opinion, it is based on thorough research. We hope that the Planning Board will agree with, what is in our judgment, the undeniable necessity to incorporate high performance and green building techniques into the design and construction of the buildings to be constructed on the former Tilcon site, by AVR Realty.

SIX KEY PRINCIPLES OF HIGH PERFORMANCE BUILDING

Because the average American spends more than 90% of their time indoors, the buildings we work and live in greatly affect our lives. In the United States, buildings use one-third of our total energy, two-thirds of our electricity, one eighth of our water and consume tens of thousands of acres of ecologically productive land (SABD). In the last thirty years, the building industry has developed new techniques and materials which make it possible to construct much more efficient buildings with very little increase to the upfront construction costs. These practices yield returns as high as 80% on ongoing energy costs, which typically result in very short payback on any initial investment. The concept of high performance or green building incorporates a variety of strategies during the design, construction and operation of building projects. Green building and energy efficient design encompass six key areas as outlined in this section and include economic, social and ecological benefits:

Six Key Principles of High Performance Building:

- **Architecture and Design**
- **Building Materials**
- **Land Use**
- **Energy Use**
- **Water Use**
- **Interiors**

Architecture and Design

Architecture and design are crucial elements in creating a truly sustainable structure. Sustainable architecture utilizes green building materials to their highest efficiency potential. Placement of buildings and application of materials are extremely important to making any structure efficient. Sustainable design is a mixture of sustainable architecture with engineering. Electrical, mechanical and structural engineering are combined to form a truly efficient, ideal (or model) structure. Sustainable design also integrates the aesthetic aspects, such as decoration, light and shade, scale, texture and proportion. The concepts are to use low or non-toxic organic materials that aren't harmful to humans or the environment, as well as construction practices that minimize

negative impacts through energy and resource conservation. When sustainable architecture and design are combined, they create a structure that is equally healthy, aesthetically pleasing and economically efficient.

Sustainable Architecture:

As defined by Sustainable Architecture and Building Design (SABD), Sustainable architecture is “the creation and responsible management of a healthy built environment based on resource efficient and ecological principles.”

Sustainable architecture strives to:

- Minimize non-renewable resource consumption
- Enhance the natural environment and our surroundings
- Eliminate or reduce the use of toxins and harmful chemicals

Five Key Principles of Sustainable Architecture:

1. Healthy Interior Environment. All possible measures should be taken to ensure that materials and building systems do not emit toxic substances and gasses into the interior atmosphere as well as clean and revitalize interior air with filtration and plants.
2. Energy Efficiency. It should be a priority to ensure that the building's use of energy is minimal. HVAC (Heating, Ventilation and Air-Conditioning) and electrical systems should use methods and products that conserve or eliminate energy use. Installation of high-efficiency heating and cooling equipment is key. Well-designed furnaces, boilers, air conditioners and distribution systems not only save residents money, but also reduce pollution during operation.
3. Ecologically Benign Materials. It is extremely important to use building materials and products that minimize destruction of the global environment. Materials and products are to be considered based on a full life cycle analysis of the toxic waste output from production to disposal. The use of reused, recycled and recyclable materials, wherever applicable, is also advisable.
4. Ecological Form. Ecological form is the relationship of the design and structure of the development to the site. It takes into consideration the region and climate, complements the ecology of the site, maximizes recycling and energy efficiency, and assures the building will promote a harmonious relationship between the residents and nature.
5. Good Design. All possible measures should be taken to achieve an efficient, long lasting and elegant relationship of use areas, circulation, building form, mechanical systems and construction technology that reflect the character and charm of the surrounding community.

Sustainable Design:

Sustainable design is a method of design that incorporates nature and works harmoniously to respect the land in use. The structure and building materials that are included in the design are carefully chosen to reflect the manifesto of sustainable design: The idea of pure and wholesome design that is cost effective, efficient, elegant and aesthetically pleasing. Sustainable design is an applicable and crucial part to many large projects, including the planning of buildings, developments and cities.

Sustainable design meets the requirements of today's builders and homeowners without compromising the quality of life for future generations. It sustains economic development while producing a minute amount of pollution, generating less waste, and creating a healthy living environment. It satisfies the inhabitant's needs by upholding a continuous equilibrium between social equality, natural environment and economics. It also requires the consideration of environmental impact, energy use, natural resources and the local economy. Sustainable design can only reach its highest efficiency potential when utilized throughout the entire project, through all aspects of planning, design and construction.

Principles of Sustainable Design

- Minimizing energy consumption and promoting human health should be the organizing principles of sustainable design. The other elements of design should include: energy saving architectural features, well-sealed, energy conserving building envelope, and energy-efficient and health-promoting mechanical, electrical, and plumbing systems.
- Sustainable buildings don't have to cost more, nor are they more complicated than traditional construction.
- Sustainable design is more of a philosophy of building than a standard building style. Sustainable buildings don't have any particular look or style. Sustainable designers are finding it is important to listen to every voice. Choosing a co-creative design process requires collaboration with systems consultants, engineers and other experts to happen early on in the design process, instead of as an afterthought. Designers also welcome input from the local community.
- Sustainable design begins with an intimate understanding of place. If we are sensitive to the nuances of place, we can inhabit it without destroying it. Understanding the terrain and surroundings of a site helps determine design practices such as solar orientation of a building, preservation of the natural environment, and access to public transportation.
- Mixed-use development, in which residential and commercial uses are intermingled can reduce automobile use and help to create healthier, more economically-viable and livable community.
- Minimize waste by designing for standard ceiling heights and building dimensions. Avoid waste from structural over-design (use optimum-value engineering/advanced framing).
- Design water-efficient, low-maintenance landscaping with drought resistant native plants and perennial groundcovers. Conventional lawns have a high impact because of water use, pesticide use, and pollution generated from mowing.

- Make it easy for occupants to recycle waste, create a recycling system that is simple and efficient for residents.

Building Materials

The advancement in the last thirty years in building materials has been substantial. Green building materials offer specific benefits to the building's owner and occupants by providing:

- Energy conservation
- Improved occupant health and productivity
- Reduced maintenance costs over the life of the building
- Greater design flexibility.

When architects and builders design green buildings, they are placing their priorities on health, resource conservation and over all building performance. The biggest benefit of choosing to build with green materials is the vast enhancement to the building's efficiency. With an increase to the cost of construction of 0-5%, a building's efficiency can be boosted by 30%-60% (Susanka). This means lower operating costs and less pollution created from the burning of fossil fuel to produce heat and electricity. Increasing a building's efficiency also ensures long term affordability for the owners, who will be less affected by the unstable energy markets.

The other benefit of using green building materials is they take fewer natural resources to produce. When designers are striving to create buildings, which have the lowest possible ecological impact, they look at the building material's "embodied energy." This is a measurement of all of the energy imputes that were required to produce the product. Most green building materials have drastically less embodied energy.

Example of Benefits

Most of today's new buildings are insulated with fiberglass insulation. To reduce this materials flammability, it is saturated with formaldehyde, a known human carcinogen. Fiberglass is made by melting sand and takes an enormous amount of fossil fuel to produce. One of the green building insulating material alternatives is cellulose, which has 300 times less embodied energy than fiberglass (Chiras, 62). Cellulose is made from paper, up to 100% of which can come from recycled newspapers and phonebooks. It is treated with boric acid, which serves as a flame retardant and as a repellent to insects and rodents. Boric acid, a mild antiseptic, is one of the ingredients in eye drops and has no adverse affect on humans. Cellulose is also a much better insulating material, so buildings insulated with cellulose are much less costly to heat and cool.

Land Use

"Between 1982 and 1997 the amount of land consumed for urban development increased by 47% while the nation's population grew by 17%. Inefficient land development practices have increased infrastructure costs as well as the amount of energy needed for transportation, community service, and buildings." (Energy and Smart Growth)

- Site resources: Early in the land evaluation process it is imperative to perform a careful site assessment: solar access, soils, vegetation, water resources, important natural areas, etc. Let the information discovered guide the design.
- Locate buildings to minimize environmental impact: Look for areas that have been previously damaged to build on. Cluster buildings to preserve open space and wildlife habitats, avoid especially sensitive areas like wetlands, and leave the most pristine parts untouched.
- Layout: In a [temperate climate](#), the wind direction usually changes with the season. Choose a street layout that will block the winter wind, yet allow cooling summer breezes through the city. Trees on the east and west sides of a building can also dramatically reduce cooling loads during the summer.

Energy Use

According to the U.S. Department of Energy, buildings consume approximately 37% of the energy and 68% of the electricity produced in the United States annually. As energy prices continue to rise and fossil fuel reserves become increasingly scarce, energy efficiency is quickly becoming one of the most important aspects to consider when building a new home or development. By building energy efficient homes and commercial buildings, it ensures more stability for future building owners by reducing dependency on the fluctuating energy markets. Vast increases in energy efficiency can easily be achieved by making simple changes to the design, building materials used and techniques of insulating and sealing during the initial construction. While taking such measures can increase the cost of construction, this initial investment can be recouped within a few years of the building's operation through energy savings. Over the building's life-cycle, the increased investment can be realized many times over in the energy savings rendered. If potential buyers or tenants understand that the increased up front costs are associated with long-term savings this investment becomes an asset, rather than a liability to the developer.

It is the opinion of many of the US's leading urban development experts that it is irresponsible for cities to allow new residential and commercial buildings to continue to be built without making them highly energy efficient. "By continuing to allow new developments to be built with outdated technologies and techniques, city officials are doing the current and future residents a great disservice by making them vulnerable to sharp rises in energy prices." (Daniel Smith, USGBC)

In order to achieve the desired increase in energy efficiency, designers and builders have to work together from the beginning, to include all the key elements of an energy efficient structure:

- Overall building performance, by increased insulation and weather sealing of a building during construction. Minor increases in insulation can reduce a building's energy use by 30% or more. (Energy and Smart Growth)
- High performance heating, ventilation, and air conditioning (HVAC) systems, including geothermal heat pumps and radiant floors

- High performance lighting
- High performance appliances, such as dish and clothes washers, dryers and refrigerators.
- Install clean, renewable energy technologies, such as solar, wind or geothermal, to offset some or all of the energy consumed by the building's heating, cooling, lighting and physical appliances.
- Reducing a building's energy use also decreases greenhouse gas emissions, which are causing widespread adverse environmental impacts worldwide.

Considering Energy Efficiency as a Affordable Housing Strategy

One way to address the issue of rising housing costs, is by making homes in the affordable housing market highly energy efficient. This creates homes that people will continue to be able to afford, even as heating oil and gas prices steadily rise. Several cities around the country, like the Bronx in New York City and the town of Greenburgh, NY have created policy and urban development plans that support and/or require low income housing to be energy efficient.

A study done by Fisher, Sheehan and Colton Law and Economic firm in Colorado stresses the importance of energy efficiency for low-income housing. Their brief (5 page) report can be found at the following website:

www.fsconline.com/downloads/news2003/mayjun03.pdf

There is also is also a national coalition called The Green Affordable Housing Coalition, which has hundreds of organizations in it. The coalition website has a lot of information about the concept, complete with case studies from all over the country. Their website is:

www.frontierassoc.net/greenaffordablehousing/index.shtml

Although AVR has stated that this project will include affordable housing, one of the main comments by the Friends of the Kingston Waterfront coalition is that housing diversity is essential to healthy communities, and they have asked the Planning Board to assure 10-15% affordable housing, as consistent with the Ulster County Housing Consortium's recommendations.

Water Use

Reducing water usage in an important element of creating a building or development that has the lowest possible impact on the natural environment. Water use can be reduced by at least 35% (Ecology Action) cost effectively with existing proven technologies. Significant water conservation can be easily accomplished by installing highly efficient sink and shower fixtures, toilets and landscape irrigation equipment. It is also important to provide responsible on-site water management, particularly in landscape design. By designing landscapes to absorb rainwater runoff (storm water) rather than having to carry it off-site in storm sewers, it would reduce the development's impact on the area's water treatment plant.

Better Site Design Principles:

The Center for Watershed Protection developed 22 Better Site Design (BSD) Principles. The NYS Department of Environmental Conservation is now promoting the implementation of these principles in order to lower the impact of development on water resources (see: http://www.cwp.org/22_principles.htm). Using a collaborative process funded by the DEC, many of the BSD Principles have been adopted by Towns of Clinton and Wappingers in Dutchess County. Although not every principle will apply to every site, many will and their implementation will greatly improve the project. See the Appendix for more details.

Grey Water:

Grey water is all wastewater except that which comes from toilets. Grey water from dish, shower, sink, and laundry accounts for 50-80% of residential wastewater. With the installation of the proper equipment, this water may be reused for other purposes, especially landscape irrigation. Installing systems that use grey water to irrigate the facility's landscape significantly reduces the building's water consumption. Utilizing grey water onsite would reduce the developments burden on the already troubled water treatment plant, which would be processing all of the waste water from *The Landing*.

Interiors

Americans spend an average of 90% of their time indoors, where levels of pollutants tend to be two to five times, and occasionally more than 100 times, higher than outdoor levels, according to the U.S. Environmental Protection Agency. Green building materials emit significantly fewer toxins than conventional building products. This leads to "increased employee productivity, reduce rates of sick leave, increase the rate at which students learn, and improve employee morale." (Robert Hascall). Overall health and comfort of building occupants is increased substantially.

Interiors are a big part of the design of a healthy structure. Materials and products should be chosen for their reduced environmental impacts, from the insulation inside your walls, to your floor material, to the quality of the indoor air you breath, designing a healthy interior environment is vital to living a healthy life:

- Use low and zero VOC paint and finishes
- Use of natural light; placement of windows
- Install high-efficiency lights and appliances. LED and fluorescent lighting have improved dramatically in recent years and are now suitable for homes. High-efficiency appliances offer both economic and environmental advantages over their conventional counterparts.
- Use of wood and other renewable products increases occupant's health and productivity.

LEED[®] CERTIFICATION

LEED (Leadership in Energy and Environmental Design) is a certification for Green Building created by the United States Green Building Council (USGBC) under commission by the United States Government. LEED is a national standard for developing high-performance, sustainable buildings and developments, and provides comprehensive structure for meeting building performance and sustainability goals. LEED emphasizes modern strategies for sustainable site development, water savings, energy efficiency, material selection and indoor environmental quality. The program offers industry recognition in green building through a complete system offering project certification, professional accreditation, training and practical resources. LEED was created to:

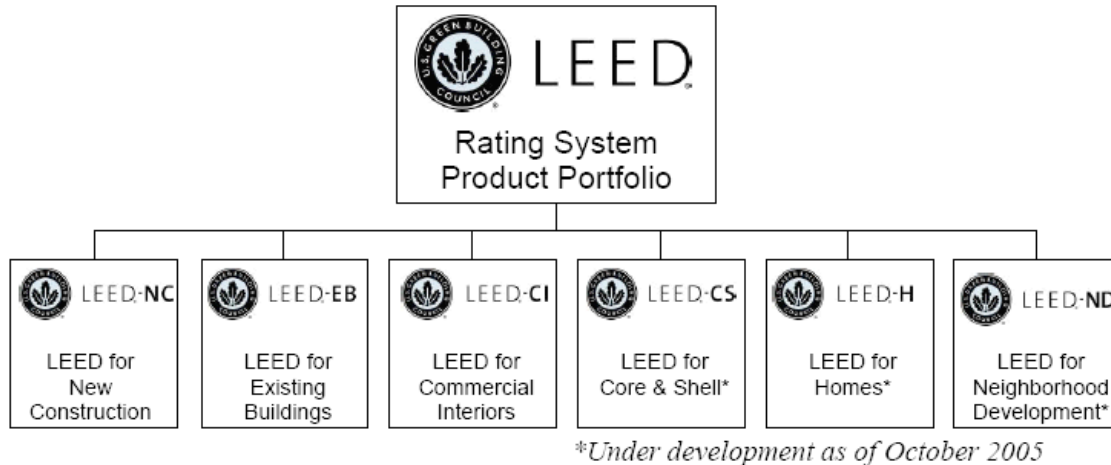
- Define “green building” by establishing a common standard of measurement
- Promote integrated, whole-building design practices where all aspects of the development’s impacts are considered and planned from the beginning of the design process
- Recognize environmental leadership in the building industry
- Stimulate green competition
- Raise consumer awareness of green building benefits
- Transform the building market

The LEED program emphasizes maximizing building performance at minimal increase in construction costs. The USGBC offers four levels of certification, depending on level of efficiency achieved. Working with LEED provides developers the technical support needed to plan and execute the low cost construction of high performance buildings. Getting a development or building LEED certified allows the owners and city to gain national recognition as a leader in green building.

The USGBC has LEED broken up into six sub-programs, in order to allow certifications to be awarded appropriately. If the Planning Board required AVR to have all, or part of the development build to LEED standards, it would:

- Lower the developments impact of the city’s sewage treatment system
- Give residents of the future development a higher level of financial security by offering them energy efficient homes
- Establish Kingston as a leader in green building and sustainable development in the North East

The USGBC offers six programs within the LEED portfolio, allowing certifications to be as specific as necessary.



Example of Application

Eastern Village Co-housing (EVC), located in downtown Silver Spring Maryland, is a LEED certified silver project. Consisting of 56 residential condominium units, EVC represents a new direction in mixed-income, urban, residential development. LEED provided the primary framework for the design team to explore green-building strategies best suited for the project. Many of the new residents of the now complete development were involved in the design process, ensuring that the development would embody what they wanted. The project has received positive national media coverage from five notable publications. EVC has proven that high quality, energy efficient, sustainable construction does not have to exceed the cost of conventional construction. While incorporating state of the art green technology, more than 50 percent of the units were affordable to tenants whose income is below 80 percent of the area median income. Most units are sold below market value while maintaining standards of comfortable living. “LEED makes good business sense. The initial cost of greener building is recovered through lower operating cost” (Robert Hascall)

The LEED program web site is: www.usgbc.org/LEED/

NEW YORK GREEN BUILDING GUIDELINES

The Green Building Guidelines were created by the NAHB Research Center, Inc. with support from the New York State Research and Development Authority (NYSERDA) and assistance from the Builders association of the Hudson Valley and The Capital Region Builders & Remodelers Association. They were created to help residential building professionals and homeowners move toward a more environmentally responsible construction process and finished product.

Values and priorities:

- Efficiency
- Create the fewest possible social and environmental problems for future generations
- Durability of buildings
- CO₂ reduction

- To analyze the true costs and savings of each building method and material over the life of the building with the understanding that sometimes materials that cost a little more upfront can lead to thousands of dollars in energy savings over the life of the building

Areas Addressed By Program

- 1) Land Development and Quality Communities
- 2) Site Planning
- 3) Resource Efficiency
- 4) Energy Efficiency
- 5) Water Efficiency
- 6) Occupant Health and Indoor Air Quality
- 7) Keeping it Green – Occupant Education

The entire New York Green Building Guidelines can be found at the following website:

www.sustainhv.org/about/NY_GB_GUIDE.pdf

ENERGY STAR

ENERGY STAR is a U.S. government backed program aiding businesses, residents and individuals in protecting the environment through superior energy efficiency. “Results are already adding up. In 2004 alone, Americans, with the help of ENERGY STAR, saved enough energy to power 24 million homes and avoid greenhouse gas emissions equivalent to those from 20 million cars - all while saving \$10 billion.” (ENERGY STAR)

ENERGY STAR Certified Homes

Homes that are ENERGY STAR qualified are independently rated to be at least 30% more energy efficient than homes built to the 1993 national Model Energy Code and 15% more efficient than state energy code. These statistics are based on heating, cooling, and hot water energy use and are achieved through an equal combination of:

- Building envelope upgrades
- High performance windows
- Tight Construction (controlled air infiltration)
- Upgraded heating and air conditioning systems
- Tight duct systems
- Upgraded water-heating equipment.

Implementing these suggestions lowers the energy demand of a home, reduces air pollution and also creates improved home quality, comfort and market value. Overall ENERGY STAR qualified new homes won’t cost more because the owner will spend less on their new home's utility bill each month in comparison to a standard home. “These energy savings can more than offset any increase in mortgage payments needed for the improved energy features and can result in a positive monthly cash flow.” (ENERGY STAR)

Homebuyer Incentives:

Because ENERGY STAR qualified new homes offer significant utility bill savings each and every month, ownership gives access to special financing opportunities such as Energy Efficient

Mortgages. These special mortgages make it easier for borrowers to qualify to purchase homes with specific energy-efficiency improvements.

ENERGY STAR's "New Homes Partner Locator provides contact information for local home builders that build ENERGY STAR qualified new homes, lenders that offer energy efficient mortgages, utilities and other sponsoring programs that offer incentives for buying and building ENERGY STAR qualified new homes..." (ENERGY STAR)

The New Homes Partner Locator can be found at:

http://energystar.gov/index.cfm?fuseaction=new_homes_partners.showHomesSearch

Appliances:

One of the most important energy saving choices that a new homeowner can make is choosing energy efficient household appliances. It is imperative to choose appliances that have earned the ENERGY STAR label. These products have been certified as energy efficient over the generic leading appliances and meet strict energy efficiency guidelines and standards set by the EPA and U.S. Department of Energy.

When buying an appliance, it is important to remember that it has two price tags: the amount that you pay to take it home and the amount for the energy and water it uses. ENERGY STAR certified appliances utilize advanced technologies that consume up to 50% less energy and water than standard generic models. "Simple actions can make a big difference. If just 1 in 10 homes used ENERGY STAR qualified appliances, the [pollution reducing] equivalent would be like planting 1.7 million new acres of trees." (ENERGY STAR)

NYSERDA

The New York Energy Research and Development Authority (NYSERDA) was established in 1975 as a public benefit corporation. NYSERDA funds research into energy supply and efficiency, as well as energy-related environmental issues, important to the well being of New Yorkers.

Since late 1998, in cooperation with the NYS Public Service Commission, (PSC), NYSERDA has managed the New York Energy Smart program. Funded by a System Benefits Charge (SBC) on electric transmission, this program offers energy efficiency research and development, low-income, environmental disclosure funding and education to assist electric consumers as the regulated electricity market moves to more open competition.

These programs are designed to assist developers and building owners in improving the energy efficiency of their buildings by means of both financial and technical assistance and would have application to *The Landing* project:

New Construction Program – designed to encourage the installation of energy-efficient measures in new or substantially renovated buildings by offsetting costs.

- Combines technical assistance and cash incentives
- **Green Buildings Program** (subset of New Construction Program)
 - Designed for builders interested in taking their efficiency to the next level.

- Provides advanced measures such as computer modeling and analysis of materials to identify products with low emissions, high recycled content, local availability and reduced maintenance.
- Capital cost incentives are calculated using energy performance and technical assistance is provided on a cost-shared basis.

New York Energy Smart Equipment Choices Program – provides pre-determined financial incentives to encourage customers to purchase high-efficiency equipment.

New York Energy Smart Loan Fund – provides an interest rate reduction up to 4.0% (400 basis points) off a participating lender's normal loan interest rate for a term up to 10 years on loans for certain energy-efficiency improvements and/or renewable technologies.

PON 716-02 – Offers cash incentives that cut the cost of installing Photovoltaic Solar Electric Systems by 45-60%. This Program will be discussed in more detail in the alternative energy section.

NYSERDA currently has nearly \$2 billion (NYSERDA) which they are dedicating to financial incentives and assistance for building energy efficient homes and installing alternative energy. There is such a substantial opportunity for new homes built on the former Tilcon property to be energy efficient structures and incorporate alternative energy with much of the additional costs heavily subsidized by NYSERDA.

Mid-Hudson Energy Smart Communities is NYSERDA's representative in this region and has excellent information on NYSERDA incentives and a variety of related programs.

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www.bl-a.com / www.getenergysmart.org / www.nyserda.org

RENEWABLE ENERGY OPTIONS

Throughout the 1980's and 1990's, energy prices rose at reasonable and predictable rates, very closely mirroring inflation. But in the last few years, this trend has shifted. Energy prices are no longer following the predictable increase rate of about 2.5% that it did over the last two and a half decades (DOE).

In order to reduce the emission of carbon dioxide and other pollutants, as well as reduce our dependency on foreign fossil fuels, we need to start obtaining energy from clean and renewable sources. There are many renewable energy sources available on today's market, including solar, wind and hydroelectric power, as well as power from hydrogen, biomass, geothermal, and oceanic sources.

Of these renewable energy sources, solar power and geothermal are readily available for residential or commercial consumers to utilize. Both are abundant, renewable, emission free, and not effected by energy market price fluctuations. Geothermal heat pumps are the best renewable alternative to conventional heating and cooling systems, while solar is the most common technology used to produce electricity on a micro, individual property level.

Geothermal Heat Pumps

Geothermal heat pumps, also known as ground source heat pumps, are a smart alternative to conventional heating and cooling. The principle behind geothermal heat pumps is that they move heat from the earth into the building in the winter, and pull the heat from the building and discharge it into the ground in the summer. The basis upon which the technology operates is that just a few feet below the surface, the earth maintains a relatively constant temperature year round (about 52° F locally). A geothermal heat pump utilizes this constant temperature to heat the building in the winter and remove heat from the building and place it into the ground to cool the building in the summer. The only additional energy used by the systems is the small amount of electricity it employs to run the heat pump itself. Geothermal can be used to run any conventional heating or cooling system, whether it is forced air, base board hot water or any other technology used in modern building.

Heat is transferred through a series of piping below ground or submerged in a pond or lake. This piping can easily be installed during construction when the ground is being excavated for the foundation, minimizing the installation costs. Refrigeration fluid circulates through the loop and carries the heat to the building. An electrically driven compressor and heat exchanger concentrate the earth's energy and releases it inside the building at a higher temperature. This heat pump concentrates the abundant low temperature heat, to provide usable high temperature heat. In the summer the system cools the building using the same founding principals that refrigerators use.

Geothermal is one of the most efficient heating and cooling methods available today. Because most of the energy used by the system is provided by the earth, with a small amount of electricity used in the process, these systems operate with over 300% efficiency.

Geothermal heat pumps are durable and require little maintenance. Compared to other more conventional systems, they have fewer mechanical components and most of the other components used are sheltered from weathering. The underground or submerged piping system is guaranteed to last 35-50 years with life expectancy of 60-120 year. The pumps themselves are guaranteed for 20 years or more. Furthermore, because typical annual energy savings range from 30-60% the average payback time for the increased initial expense of the system is 2-8 years making them a very competitive choice for builders and homeowners alike.

If Geothermal is installed during the initial construction of a project, when the grounds around the building are already being excavated to build the foundation and heating/cooling systems are being installed anyway, they are an almost undeniably cost effective choice. Considering how volatile the heating oil market has become, it would significantly increase a building owner's economic stability to have their heating and cooling expenses be affected by the unpredictable energy market.

Solar (Photovoltaic)

New York has laws and regulations which make it much easier to have a PV system of all sizes. The most common type of PV system installed in NY is connected to the utility grid, so that when the system can't produce the amount of electricity needed, the facility can still receive the necessary electricity directly from the grid (like at night). Grid tied systems are more affordable and require very little maintenance because they don't need storage batteries. When the system produces over 100% of the energy necessary to fulfill the facilities needs, all of the extra energy absorbed flows back into the grid. As a result, your meter spins backwards, which is called "net-metering." In New York State, utility companies are required to buy the electricity that is net-metered back into the grid at market value. Grid tied systems can be set up so that the solar system only supplies part of the facilities power, since any extra needed power will be supplied by the utilities company.

Alternatively, some facilities may use battery storage to assure electricity in the event of an outage. If a building is heated and cooled with geothermal, powered by photovoltaics with battery back up, it can provide a fully functional building in the event of an emergency or disaster 24 hours a day, year round.

NYSERDA (New York State Energy Research and Development Authority) offers generous grants, which pay for up to 60% of the total systems cost rebated up-front, with an additional 10% tax reduction for commercial application. PV systems pay for themselves in 7-20 years in electrical savings with the state average payback time currently at 9 years (NYSERDA). For every 1¢ per kWh that electricity goes up, a year is cut off the payback time on the installed system, so if energy prices continue to rise at rates they are now (13% in 2004 [Jordan]) installed PV systems will pay for themselves very quickly. Solar electric systems are an excellent decision from an economic standpoint, having an average lifetime of 30-40 years. Once the payback time is complete, the system generates free electricity for the next 20 plus years.

Because solar power comes from the sun, it is emission-free. The amount of pollution that is offset for a 100 kilowatt system (about 25 homes or a large business) operating over an average lifetime of thirty years is 25 tons of Nitrogen Oxide, 40 tons of Sulfur Dioxide, and 6,000 tons of Carbon Dioxide (NYSERDA). Photovoltaic technology is a clean, renewable, alternative source of electricity. With the financial incentives available from NYSERDA, PV is now an economically viable addition to any residential or commercial building. While it is our recommendation to incorporate PV systems into the initial construction of *The Landing* development, steps should at least be taken to make it so that future home owners could easily add solar systems to their property if they want. At minimum, wherever possible, building's roof orientation should allow a south-facing slope to maximize solar exposure for possible future solar panel placement.

CITIES WITH SUSTAINABLE DEVELOPMENT PLANS

Introduction to the Concept

One of the problems we continually came up against when searching for examples of cities that integrated large developments in a way that had a positive impact on the community, is that

development projects that will change the size of a city as drastically as *The Landing* will, require a comprehensive city development plan to be created. It has been recognized by many cities across America, that in order to achieve economic and environmental sustainability with continuous social stability, a comprehensive, citywide sustainable development plan is required. These plans strive to address the many aspects that need to be considered when fostering trends and achieving goals to help the city reach its sustainability objectives. While these plans differ considerably from city to city, an important part of almost every one is the “greening” of residential and commercial development. These cities have realized that in order to create economic stability for its residents and business owners, it must implement policy which promotes or requires new development be built with environmental impact and energy efficiency as leading considerations.

Clearwater would encourage the City of Kingston Planning Board to seriously consider that the negative and positive impacts that AVR’s development might have, cannot be accurately assessed if proposed developments are considered separately. In order to make a truly informed decision about what is best for Kingston, the Planning Board must consider both proposed developments together (*Sailor’s Cove* and *The Landing*), as well as any others on the drawing board or already in the pipeline.

The creation of a sustainable city development plan, with the help of local residents, business owners, urban development experts and other parties of interest would help Kingston become a better city. It would also make new development decisions easier to make, because they would be proposed with an understanding of what is needed and wanted by Kingston. This section will describe the plans some cities across the county have created in hope that it might show the Planning Board the growing importance to create such a program for Kingston.

Santa Monica, CA

Santa Monica’s Sustainable City Plan is designed to help the city as a community, begin to think, plan and act in a more sustainable manner. The plan is designed to help address the root causes of problems rather than the symptoms of those problems, and to provide criteria for evaluating the long-term impacts of planning decisions. The purpose of the program is to foster thinking among city official and residents about the future when they are making decisions about the present (Santa Monica Sustainable City Plan).

In 1994 Santa Monica’s City Council adopted the original Sustainable City Program to begin addressing issues related to sustainability in the community. A comprehensive update process was begun in 2001 to improve and expand the program and set new goals for the future. The updated Sustainable City Plan adopted by the City Council in February 2003 is the result of this update process and includes goals for the City government and all sectors of the community, to conserve and enhance the local resources, safeguard human health and the environment, maintain a healthy and diverse economy, and improve the livability and quality of life for all community members in Santa Monica.

Excerpts from Santa Monica’s Sustainable City Plan:

Indicators – System Levels	Targets
<p>Solid waste generation</p> <ul style="list-style-type: none"> ▪ Total citywide generation (also report per capita and by sector) ▪ Amount landfilled ▪ Amount diverted (recycled, composted, etc) from landfill 	<p>Generation: Do not exceed year 2000 levels by 2010</p> <p>Diversion: Increase amount diverted to 70% of total by 2010</p>
<p>Water use</p> <ul style="list-style-type: none"> ▪ Total citywide use (also report per capita and by sector) ▪ Percent local vs. imported ▪ <i>Potable</i> vs. non-potable 	<p>Reduce overall water use by 20% by 2010 (baseline 2000). Of the total water used, non-potable water use should be maximized</p> <p>Increase percentage of locally-obtained potable water to 70% of total by 2010</p>
<p>Renewable Energy use</p> <p>Percent of citywide energy use from <i>renewable</i> and more efficient sources</p> <ul style="list-style-type: none"> ▪ Total renewable energy use (also report by sector) ▪ Total energy use from <i>clean distributed generation</i> sources in SM (also report by sector) 	<p>By 2010 25% of all electricity use in Santa Monica should come from renewable sources</p> <p>By 2010 1% of all electricity use should come from clean distributed generation sources in Santa Monica</p>
<p>“Green” Construction</p> <p>Total number of LEED™ certified buildings in Santa Monica as a percent of new construction</p>	<p>100% of all buildings* greater than 10,000 square feet eligible for LEED™ certification constructed in Santa Monica in the year 2010 shall achieve LEED™ certification or its equivalent. Of these, 20% should attain LEED™ Silver, 10% LEED™ Gold and 2% LEED™ Platinum certification or equivalent. In addition, 50% of all new, eligible buildings* less than 10,000 square feet constructed in 2010 shall achieve LEED™ certification or its equivalent.</p> <p>*including all municipal construction</p>

(Santa Monica Sustainable City Plan)

We encourage you to read the entire Sustainable City Plan, because it is one of the best examples of a city understanding and addressing the need to promote energy efficiency, resource

conservation and increased sustainability. It must be understood that increasing a city's sustainability creates long term benefits for the entire community.

The Entire "Sustainable City Plan" can be found at the following website:

http://santa-monica.org/epd/scp/pdf/SCP_2003_Adopted_Plan.pdf

Austin, TX

The City of Austin Green Building Program is nationally known for expertise in green residential and commercial construction. Over the last ten years, the city officials have made energy efficient and environmentally sound construction one of their biggest policy priorities. They have created one of the most complete programs which are designed to support the cities residents and business owners in making all new construction as ecologically benign as possible, while maximizing energy efficiency. They also have sections of the program which promote people make their existing building very energy efficient, safer to live in and have the lowest possible impact on the natural environment. The city has created a complete, updated Sustainable Building Sourcebook, an in-depth and extremely resourceful website, continually produce and sponsor local sustainable building (and related) events, and created city departments which focus on:

- Watershed Protection (storm-water management, emergency spills, water quality)
- Green Garden Program (native plants, composting, rainwater collection, green garden award)
- Water and Wastewater
- Smart Growth
- Neighborhood Housing (S.M.A.R.T. Housing)
- Solid Waste Services (recycling, hazardous waste)
- Water Conservation (fixtures, rainwater collection)

The city is also a member of the national Green Affordable Housing Coalition, which was referenced earlier in this document.

Austin's Green Building Program has won numerous awards for developing ecological building agendas, and for establishing precedent setting guidelines, ordinances, and market strategies. The Program has been recognized as a top "success story" by the U.S. Department of Energy (Green Building Program).

The program's website, which is first-rate and contains excellent information, is:

www.ci.austin.tx.us/greenbuilder/

Greenburgh, NY

In the last few years, the Town of Greenburgh has begun to take energy efficiency very seriously. In partnership with Energy Star, the city has created the "Greenburgh Energy Conservation Program." Nicola Coddington, Greenburgh Energy Conservation Coordinator, has

overseen the creation of many education tools and resources to help educate and promote energy efficiency in the town.

A website was created to help promote energy conservation in the town. The site includes information and education about the following topics to help city residents get the information they need to reduce their energy use.

- Current seasonal tips: Winter Tips to Save Energy At Home
- How to save energy at home
- How to save energy in your business
- How to reduce pollution and support clean, renewable energy by buying “green” electricity or choosing a new electric utility provider
- How to generate clean, renewable energy such as solar, wind, or geothermal at your home or business
- Green (environmentally friendly) building
- Healthy, high-performance schools
- Energy policy and action
- Saving energy in transportation (including saving gas in your car)

Greenburgh also has a 38 year long program called “The Greening of Greenburgh.” This program is “The Acquisition of Wildlife Habitat and Protection of the Environment.” It was created to “...ensure that future generations will be able to keep Greenburgh Greener.” (The Greening of Greenburgh).

The Greening of Greenburgh can be found at the following website:

www.greenburghny.com/FCpdf/Greening%20of%20Greenburgh.pdf

Atlanta, GA

Atlanta has been a significant leader in the green building movement, consistently ranking among the top ten cities for LEED projects. The city passed an ordinance in 2003 requiring all new commercial construction to be LEED silver-certified or higher. There has also been an explosion in the residential green market in the last five years in the city, helping Atlanta record the most housing starts of any city in the United States for the 13th year in a row.

RECOMMENDATIONS – APPLYING THE PRINCIPLES

We believe that the City of Kingston Planning Board should require AVR Realty to include the following measures in the design and construction of *The Landing at Kingston and Ulster* development project.

- Require that buildings be built to LEED standards
- Require all of the homes be ENERGY STAR certified
- Install Geothermal heating and cooling systems instead of oil, gas or electricity driven systems

- Utilize plans from cities like Santa Monica, CA and Austin, TX in the planning of this and all future projects
- Involve the community in the design process
- Engage with the US Green Building Council, the New York State Energy Research and Development Authority and Mid-Hudson Energy Smart Communities in the design process of the project. The purpose of these organizations is to assist cities, developers, business owners and residents in creating the best developments possible.

AVR should follow the example of developers who have built LEED certified developments, such as AIG in Atlanta, GA and HOK, who have built dozens of LEED certified projects all over the country.

HOK's website: www.hoksustainabledesign.com

CONCLUSION

It is our hope that the information presented in this document adequately demonstrates the necessity to have all future developments in Kingston be designed and built with high performance, green and sustainable building techniques, materials and design features. In an era where energy prices double in ten months (DOE) and future price trends are very unpredictable, but will undoubtedly continue to rise, it seems to Clearwater and many other industry professionals that cities that continue to allow developments to be built with “outdated technologies and techniques” are doing their current and future residents a great disservice (Daniel Smith). We hope that the Planning Board takes responsible steps to ensure that the City of Kingston's long-term economic and social stability is protected. We hope that the Planning Board does what's right for Kingston, not just what will allow AVR to make the greatest profit.

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APPENDIX

New York Green Building Guidelines

Samples of Program Guidelines

- Maximize insulation: Super insulate walls and ceilings. Build 8" wall, 12" ceiling in order maximize insulation; cellulose preferred as insulator.
- Consider full life cycle of materials used from manufacture to end of life
- Consider installing alternative energy-efficient heating, ventilation and air-conditioning (HVAC) systems
- Radiant Heat (piping in the floor) is considered by most professional to be the most efficient heating system
- Geothermal heating and cooling
- Plan ahead for solar – orient roofline with long southern exposure at ideal angle for Photovoltaic
- Maximize day lighting and operable windows to allow for natural lighting and ventilation
- Give preference to renewable, reusable or recyclable materials.
- Use only non-toxic materials
- Minimize use of toxic chemicals; use least toxic glues, paints, carpeting and other materials in construction and furnishings
- No use of PVC; no vinyl siding
- Energy-efficient lighting fixtures and appliances.

Better Site Design Principles

Site Planning Model Development Principles

These twenty-one model development principles provide design guidance for economically viable, yet environmentally sensitive development. Their objective is to provide planners, developers, and local officials with benchmarks to investigate where existing ordinances may be modified to reduce impervious cover, conserve natural areas, and prevent storm-water pollution. These development principles are not national design standards. Instead, they identify areas where existing codes and standards can be changed to better protect streams, lakes and wetlands at the local level. The development principles are divided into the three following areas:

- Residential Streets and Parking Lots (Habitat for Cars)
- Lot Development (Habitat for People)
- Conservation of Natural Areas (Habitat for Nature)

Each principle is presented as a simplified design objective. Actual techniques for achieving the principle should be based on local conditions.

Residential Streets and Parking Lots (Habitat for Cars)

1. **Reduce Residential Street Width:** Design residential streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance,

and service vehicle access. These widths should be based on traffic volume.

2. **Reduce Residential Street Length:** Reduce the total length of residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length.

3. **Reduce Residential Right-of-Way Widths:** Wherever possible, residential street right-of-way widths should reflect the minimum required to accommodate the travel-way, the sidewalk, and vegetated open channels. Utilities and storm drains should be located within the pavement section of the right-of-way wherever feasible.

4. **Minimize Cul-de-sacs:** Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

5. **Use Vegetated Open Channels:** Where density, topography, soils, and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat stormwater runoff.

6. **Lower Parking Ratios:** The required parking ratio governing a particular land use or activity should be enforced as both a maximum and a minimum in order to curb excess parking space construction. Existing parking ratios should be reviewed for conformance taking into account local and national experience to see if lower ratios are warranted and feasible.

7. **Reduce Parking Ratios for Mass Transit or Shared Parking:** Parking codes should be revised to lower parking requirements where mass transit is available or enforceable shared parking arrangements are made.

8. **Reduce Parking Lot Imperviousness:** Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas where possible.

9. **Structured Parking:** Provide meaningful incentives to encourage structured and shared parking to make it more economically viable.

10. **Stormwater Treatment for Parking Lot Run-off:** Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic islands.

Lot Development (Habitat for People)

11. **Open Space Design Options:** Advocate open space design development incorporating smaller lot sizes to minimize total impervious area, reduce total construction costs, conserve natural areas, provide community recreational space, and promote watershed protection.

12. Relax Setbacks and Frontage Distances: Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front setback requirements to minimize driveway lengths and reduce overall lot imperviousness.

13. More Flexible Sidewalks Standards: Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on only one side of the street and providing common walkways linking pedestrian areas.

14. Alternative and Shared Driveways: Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

15. Specify Management of Open Space: Clearly specify how community open space will be managed and designate a sustainable legal entity responsible for managing both natural and recreational open space.

16. Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Conservation of Natural Areas (Habitat for Nature)

17. Provide Aquatic Buffers: Create a variable width, naturally vegetated buffer system along all perennial streams that also encompasses critical environmental features such as the 100-year floodplain, steep slopes and freshwater wetlands.

18. Maintain Buffers over Time: The riparian stream buffer should be preserved or restored with native vegetation. The buffer system should be maintained through the plan review delineation, construction, and post-development stages.

19. Minimize Clearing Native Vegetation: Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.

20. Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Wherever practical, manage community open space, street rights-of-way, parking lot islands, and other landscaped areas.

21. Conservation incentives and flexibility in the form of density compensation, buffer averaging, property tax reduction, stormwater credits, and by-right open space development should be encouraged to promote conservation of stream buffers, forests, meadows, and other areas of environmental value. In addition, off-site mitigation consistent with locally adopted watershed plans should be encouraged.

22. Improve Stormwater Management: New stormwater outfalls should not discharge unmanaged stormwater into jurisdictional wetlands, sole-source aquifers, or sensitive areas.