

Ideas and concepts of architecture; New Haven, Connecticut – the concept of an Ideal city

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Abstract

If based on the concept of an Ideal City as mentioned within the Introduction part, my view is that the New Haven had a chance to be called or considered “Ideal to live in” at the time of its foundation, the beginning of the 17th Century, including the location, original spatial/ urban planning, presence and maintenance of the green area, possibility for trade development and many others.

However, the most important part of the view is the nowadays New Haven, having again a chance to be called the “Ideal City”, just because of a very important initiative of being a Leader in environmental sustainability practices. The Yale University with its impact in this process should not in any case be excluded, being an educational institution located in the urban centre of New Haven and the presence of numerous sustainable buildings within its campus¹.

Keywords

Ideal City, Nine square grid plan, Urban/ spatial planning tradition, the green area, sustainability, energy saving, energy conservation, environmental protection, LEED Certification, environmentally advanced, Yale’s sustainability, urban topography, natural building materials, photovoltaic solar installations, heat exchangers.

Introduction

To get more thoroughly into the meaning of New Haven being an Ideal City it would be important to somehow explain the concept of it, which based on various analysis covers: spiritual and juridical qualities of Residency as well as the urban/ spatial planning design and idea (structures/ buildings, street layouts, green areas, etc).

An ideal city could for someone mean a city very well organized, completed or even geometrical, while for the other longing for Utopia and the perfect circumstance/ condition. However, to be realistic the best or perfect

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¹ <http://sustainability.yale.edu/buildings-and-construction>

result could of course be if all mentioned details are put together in one, function as a whole.

Starting from the earlier times, especially the Renaissance in the 15 Century, tendencies to have well planned and organized cities have been in place. This intention has continued as for the rest of centuries, resulting nowadays as a very important environmental issue, especially after human beings finally being aware of the consequences industrial and technological development have left behind and of course still continues to leave.

Therefore, the idea of an Ideal City in the beginning of the 21st Century is without any doubt, being environmentally friendly. This is at least a very strong opinion, which will be shown while developing and completing the following concept.

New Haven's urban tradition:

This is an example of unique presence for more than 350 years as oldest formally planned community in the United States. The settlement of the Port started back in 1638, by English colonists who came from London through Boston. Originally known as Quinnipiac (based on the tribe of Native Americans in the same area), the New Haven was in 1641 laid on the "nine square grid plan" indicating the ancient Roman military camps (measuring the half mile square)(fig. 1). Eight of the squares were houses, while the ninth in the centre was left for the green.

In relation to the above setup of the city, it would be appropriate to add that the ancient grid plans were expressions of military organization, colonial invasion/ occupation, political and economic power. Grids were in most cases used when there was a large amount of territory to occupy in a short period of time. The same were also used to establish formal order and spatial focus on particular functions of urban life — civic, religious and governmental. In a lot of occasions the orientation of the grid and position of structures had cosmological, religious or other symbolic meanings².

In this particular case, it seemed interesting to address the religious meaning behind the grid setup. One analysis has been found on Torah³ interpretation (within Exodus, one of the five books) 600,000 Israelites migrated from Egypt to the land of Goshen which had to house the above number of people (the desert camp, Plate 26) (Fig. 2)

² <http://pedshed.net/?p=12>

³ The term "Torah" is used in the general sense to include both Judaism's written and oral law, including the entire spectrum of respected Jewish religious teachings throughout history. The Torah is the first of three parts of the Tanakh (the Hebrew Bible as the founding religious document of Judaism) and is divided into five books, known as Genesis, Exodus, Leviticus, Numbers, and Deuteronomy.
http://www.jewishvirtuallibrary.org/jsource/Judaism/The_Written_Law.html



Fig. 1

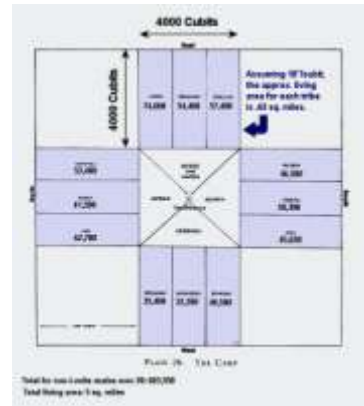


Fig. 2

Going back from ancient times to the beginning of the 17th Century again, the city of New Haven was foreseen as the commercial port. Therefore, the green area was as well known as the trade center called “the market place”. As an addition to the green area, the grass was planted by the residents by 1654 and the trees, of which mainly Elms by 1750s, all through the very well known Hillhouse Avenue (or Temple Avenue as initially called), which according to Charles Dickens and Mark Twain was described as the most beautiful street in America⁴. The Avenue was named by James Hillhouse and his son Abraham, who began the program of tree planting in New Haven (Elm trees, as mentioned above) resulting a very well known nick name, the “Elm City” (Fig. 3; Fig. 4).

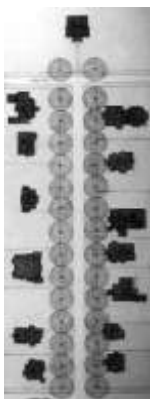


Fig. 3



Fig. 4

The middle square being a common area, during the years has gone through a number of improvements as well by adding Institutional buildings in the neighborhood (especially after it was declared as the co-capital of the Connecticut colony at the time). One very important part, which continues to be nowadays as well, is the Yale University (since 1717); concentrated adjacent to this common area (it will more thoroughly be addressed as a separate part of this work, as it continues to be with its importance). Reference to what was said above; Yale nowadays owns almost all properties

⁴ http://nhpt.org/index.php/site/district/hillhouse_avenue_historic_district

on the Hillhouse Avenue, which were converted into different academic departments.

It is very interesting to mention that on the green area from 1812 to 1815 three churches were built, the three in one line and close to each other: Gothic revival trinity Episcopal Church, Georgian style First Church of Christ and United Congregational Church⁵ (Fig. 5). All of them still continue to be the part of it showing their originality at the present time, as well.

The common area was later on fenced in stone and metal, allowing it and especially its green content, be preserved in a way until today.



Fig. 5

Architectural reflection through years:

Except the spatial planning and the idea behind it, another issue should be addressed such as the architectural, meaning the style, architectural design and construction of buildings/ structures. The decision to have this part included into the work is for the fact that the architectural reflection is a fundamental part of urban planning, completing its full meaning.

Therefore, the most important period which in some cases was called as “the golden age” during the New Haven’s history and development, is the Federal period (1750 – 1835). Considered as the rich period through which the city went, very interesting vernacular architectural elements appeared being defined as; still conservative but graceful and ornamental⁶ and most of these works were anonymous.

The architectural design continues to develop, following the character of Greek revival architecture, trying to create urban scenery with white porticoes. However, during the period before the civil war (almost twenty years before it took place) buildings designed in the style of Roman Villas (Fig. 6) became very much common, trying this way to represent one successful, aggressive but yet traditionally oriented community. This is as well the period, during which the local architectural profession starts in New

⁵ www.towngreens.com/exhibits/index.cgi/2/page2.htm

⁶ Elizabeth Mills Brown, *New Haven - A guide to architecture and urban design*, Yale University Press, 1976, page.4.

Haven, led by Henry Austin (Steinbach Hall, 1849/ Fig. 6) and Sidney Mason Stone.



Fig. 6

However, architectural development in New Haven continues with appearance of Mansard roofs, representing this way the French empire style⁷ (Fig. 7). It should be mentioned that the end of the 19th Century could be considered as the time when the intensity of construction of individual houses was slowed down allowing apartment buildings to “grow up”.



Fig. 7

All mentioned styles above, entered the 20th century, creating a mixture of various types of buildings through years without leaving behind one common style such as Arts and Crafts. However, after all the most obvious architectural style, which could be considered as dominant, is Colonial Revival, with the intention to look back into greater days and create the Preservation movement (red brick Georgian houses, white frame Colonial houses)⁸.

Even the intention mentioned above, New Haven could not escape and cross over the industrialization process at the beginning of the 20th Century, as a result of which some kind of chaos went over it, destroying even a great number of Elm trees, always considered as its identity. “At the beginning of the 20th century and during the period of dramatic growth and

⁷ John M. Davis House, designed by Henry Austin, 1868. <http://historicbuildingsct.com/?tag=mansard&paged=4;>

⁸ Elizabeth Mills Brown, *New Haven - A guide to architecture and urban design*, Yale University Press, 1976, page. 9.

industrialization, the city of New Haven began to formalize and codify its land use regulations. A Board of Health and a Building Inspector's Office were established early in the century. As the City Beautiful movement swept the nation, the New Haven Civic Improvement Committee was formed in 1907. Cass Gilbert and Frederick Law Olmsted prepared the first modern city plan and presented it to the committee in 1910. The plan was the city's first documented attempt to accommodate dramatic population growth and improve the quality of life in the city by advancing transportation, aesthetic and environmental improvements. These are considered foundation for land use planning and the roles and responsibilities of the City Plan Commission to the present day"⁹. (Fig. 8)



Fig. 8

On the other side, the Modern Architecture came very late (1950s) (Fig. 9), but when it did it was very much revolutionary, turning it into the perfect example of North American urban renewal on a high level, with all components, including superhighways as a strong characteristic. "In 1942, consultant Maurice E.H. Rotival prepared a comprehensive plan for the City Plan Commission. The plan, coming at the start of World War II and additional industrial expansion in the City, advocated economic development east toward the Harbor and attractive residential development to the west of downtown. In addition, Rotival recommended extensive expansion of the transportation system, including an enhanced cross-town road system and port access up the Quinnipiac River"¹⁰. (Fig. 10)

⁹ <http://www.cityofnewhaven.com/cityplan/pdfs/PlanningPrograms/ComprehensivePlan/SectionIIntroduction.pdf> page.3.

¹⁰ <http://www.cityofnewhaven.com/cityplan/pdfs/PlanningPrograms/ComprehensivePlan/SectionIIntroduction.pdf> , page. 4.



Fig. 9

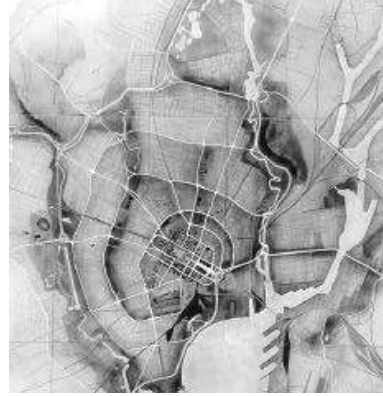


Fig. 10

Even a number of well - known outside architects were hired to create their designs, such Louis Kahn with the Yale New Art Gallery (Fig. 11) and Eero Saarinen with Yale Hockey Rink (Fig. 12; Fig. 13), in which case it should be mentioned that the architect had a chance to completely express freely (open location, absolutely independent).



Fig. 11

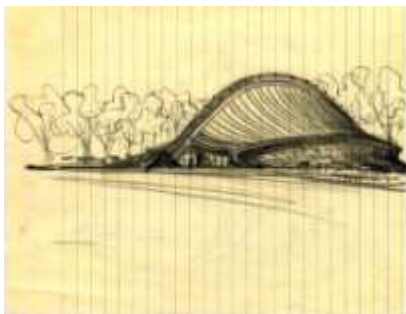


Fig. 12



Fig.

13

Eyes on the Central area of New Haven:

What makes New Haven known for except the fact it is the first urban area in the US (for 350 years), it proudly represents one of the most famous Universities, such as Yale with its architecture which can be focused on (Fig. 14; Fig. 15). What should as well not be left behind is “the Green” right in the

centre of the nine square setup, which now days remains and is being kept in its original shape, as mentioned at the very beginning.



Fig. 14



Fig. 15

Before we continue further more with the analysis of the architectural part, or better say the part of the interest in this particular case, will focus on the impact Yale has on the city. Being the largest employer, the University is without any doubt an integral part of the city's economy, health care (hospitals & biotechnology), professional services (legal, marketing, architectural & engineering), financial services, helping this way the creation of the economic base for the city.

Another aspect of Yale being a strong part of New Haven is the fact of gathering students from around the world. And the intention to widen this can be shown within the statement of Richard C. Levin, the President of Yale University: "The globalization of the University is in part an evolutionary development. Yale has drawn students from outside the United States for nearly two centuries, and international issues have been represented in its curriculum for the past hundred years and more. But creating the global university is also a revolutionary development—signaling distinct changes in the substance of teaching and research, the demographic characteristics of students, the scope and breadth of external collaborations, and the engagement of the University with new audiences."¹¹

Therefore, it should be added that these two aspects mentioned above, the economic impact and being internationally recognized are as important as the fact that New Haven would not be the same without Yale being an integral part of it, as it is.

¹¹ http://www.yale.edu/chinatrip/documents/International_Aspects_Yale.pdf

Continuing with the architectural aspect of it, a lot of historical buildings compile the University Complex (as mentioned above), but the actual Yale Art and Architecture building should be mentioned, which represents one of the first and very well known examples of Brutalist architecture in the United States¹². Designed by Paul Rudolph (who was as well the Dean for a certain period of time) and completed in 1963.

One of the ways to keep this structure architecturally alive nowadays, since it really belongs to one of shorter phases 20th Century had, was the decision to somehow complete the Yale Arts Complex with one new structure adjacent to it (Fig. 14). Charles Gwathmey had in this case an opportunity to reshape the Institution that gave him a professional vision, which is, must admit very much rear. This building followed the steps of sustainability, new air-conditioning technology, energy saving materials, gaining this way the LEED¹³ silver certificate. He managed to preserve a very important structure on one side and create sustainable architecture on the other¹⁴ (Fig. 16; Fig. 17).



Fig. 16



Fig. 17

Eco systems, energy saving design, green building, being environmentally friendly, is the direction towards the World these days tries to lead on. These are without any doubt the steps New Haven started to take and will continue to do.

There is one excerpt to be included: “Yale's Office of Sustainability develops and implements sustainability practices at Yale. Yale is committed to reduce its greenhouse gas emissions 10% below 1990 levels by the year 2020. As part of this commitment, the university allocates renewable energy credits to offset some of the energy used by residential colleges. Eleven campus buildings are candidates for LEED design and certification. The Yale Sustainable Food Project initiated the introduction of local, organic vegetables, fruits, and beef to all residential college dining halls. Yale was

¹² Yale Art and Architecture building http://www.greatbuildings.com/buildings/Art_and_Arch_Building.html

¹³ Leadership in Energy and Environmental Design, and is a designation provided by the USGBC (US Green Building Council) to recognize buildings that have been designed to reduce energy and that incorporate natural resources in design and construction.

¹⁴ www.interiordesign.net

listed as a Campus Sustainability Leader on the Sustainable Endowments Institute’s College Sustainability Report Card 2008, and received a “B+” grade overall.”¹⁵

Since, the issues to be addressed bellow are as well closely related with the LEED certification it will be of an importance to widen the explanation about it. Being a voluntary certification program and internationally recognized, it can be applied to any type of buildings, by promoting the whole building sustainability in the areas such as: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, locations and linkages, awareness and education, innovation in design, etc.

Architects, Real estate professionals, Facility managers, Engineers, Interior designers, Landscape architects, Construction managers, Government officials, use LEED to help transform the built environment to sustainability.

In general the Certification provides independent, third-party verification that a building or neighborhood development project meets the highest green building and neighborhood performance measures.

As an example the LEED 2009 for Existing Buildings, Operations & Maintenance uses the 100 base points of which; 26 possible for sustainable sites, 14 for water efficiency, 35 for energy and atmosphere, 10 for materials and resources, 15 for Indoor environmental quality, as well as the additional 6 possible Innovation in operations and 4 regional priority points, resulting the following types: Certified (40–49 points), Silver (50–59 points), Gold (60–79 points), and Platinum (80 points and above) (Fig. 18).



Fig. 18

Sustainable City on the move:

In February 2010, the US Department of Energy, in particular the EECBG¹⁶, provided funds to the city of New Haven for establishing the Office

¹⁵ Statistics taken from: <http://sustainability.yale.edu/office-sustainability/mission-history>

of Sustainability. However, before that the awareness in this particular field has started and this might be one of the main reasons why the decision to allocate the above mentioned funds has been made. It became clear that this city's main intention is to create sustainable, energy saving and above all healthy living conditions for its residents.

The best explanation of this intention could be made through a number of projects, already completed as well as what could be seen in the horizon or perspective. There are few LEED projects that describe the idea behind;

- Pfizer Clinical Research Unit; LEED - Silver certificate
- Bernard Environmental Magnet School; LEED – Gold certificate
- Yale University School of Forestry and Environmental Studies; LEED – Platinum certificate
- Gateway Community College; targeting LEED – Gold Certificate
- 360 State Apartment Building; targeting LEED - Platinum certificate

Pfizer Clinical Research Unit (CRU)(Fig. 19)

Is the first building in Connecticut to achieve the LEED Silver certificate. The reason stands in the fact that it has 20% energy efficiency more than expected, just because of the use of appropriate eco-friendly materials and techniques during the construction.

Architects and engineers for this facility were the S/L/A/M Collaborative from Glastonbury, CT. Whiting Turner from Baltimore while MD, provided construction management services.

The project team for the CRU has been recognized, both on the state and national level, for including environmentally sound features in the building's construction. The CRU has been registered with the U.S. Green Building Council as a LEED (Leadership in Energy and Environmental Design) certified facility. It is the first Pfizer-constructed LEED certified facility, and New Haven's first biomedical research building with this characteristic.



Fig. 19

¹⁶ Energy Efficiency and Conservation Block Grant, US Department of Energy

Barnard Environmental Magnet School (Fig. 20)

The solar photovoltaic system has been installed in 2006, considered as the first commercial PV solar system in the area. The solar electric system provides almost 11% of the total electricity in the building, while 15% of materials used during construction are of recycled content. All these features helped Barnard be the most environmentally advanced school in New Haven.



Fig. 20

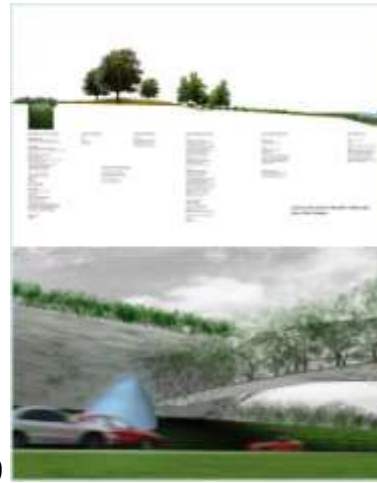


Fig. 21

The landscape concepts include the mapping of the site's hydrological cycle through the building, and a "wildlife corridor" connecting bridge and iconic cisterns¹⁷.

Except the fact of sustainability the building has reached if architecturally addressed, the other very important issue as the outdoor education which is utilized to develop skills that students will have for a lifetime. A bridge over Ella Grasso Boulevard leading to the school's own nature center extends the classrooms to the West River environment where students canoe, conduct field studies, and develop an appreciation for their natural environment (**Fig. 21**). The intention of Barnard Environmental Magnet School is for the students to become environmental wardens for their planet¹⁸.

The entire site is a living outdoor laboratory for lessons in ecology which begin the moment a student arrives through a rich habitat growing in the school's central courtyard.

In this LEED Gold project, every part of the site removes the boundaries between interior and exterior ideas of nature.

¹⁷ <http://www.brookfarmgroup.com/institutional.html>

¹⁸ <http://schools.nhps.net/barnard>

Yale University School of Forestry and Environmental Studies (Fig. 22)

Is one of the buildings really promoting the energy saving and green building, just for the fact that it consumes 81% less water and 58% less energy than other comparable buildings. From solar panels installed on the roof, it fulfills 25% of required energy, while the same panels heat almost 50% of potable water¹⁹.



Fig. 22



Fig. 23

The new home for the School of Forestry & Environmental Studies joins with two adjacent buildings to create a new unified campus, establishing a highly visible center for the study of the environment at Yale.

Sustainable features (as a result of which we have the percentage mentioned above) include solar photovoltaic panels, ground source heat pumps, displacement air systems, high thermal retention, daylight collection, and energy recovering ventilation, a rainwater collection and cleansing pond, a green roof and recycled, local and sustainable building materials.

Executive Architect (Centerbrook) worked together on the project with the Design Architects, Hopkins Architects of London and an all-star team of consultants including ARUP engineers, Atelier 10, Nitsch Engineering, Kalin Associates and Olin Partnership.

The impression this building gives can be shown through the words of James Gustave Speth, Former Dean of the School of Forestry & Environmental Studies at the Yale University²⁰, saying: "We love our new Kroon Hall. It is not only a feast for the eyes but a joy in which to work. Thank you for your inspired vision and execution." (Fig. 23)

The following two buildings are in the process of completion or in fact are being seen in the horizon or perspective of New Haven's sustainable development.

¹⁹ www.cityofnewhaven.com

²⁰ http://www.centerbrook.com/project/yale_university_kroon_hall_school_of_forestry_and_environmental_studies

Gateway Community College (Fig. 24)

This building's intention is the green roof area on the top floor as well as the solar photovoltaic panels on a very special frame system. It is targeting the LEED Gold certificate, which remains to be seen after its completion.

This project designed by Thornton Tomasetti²¹, has been completed in 2012. Two four-story Academic buildings consist of composite steel framing and rest upon spread-footing and mat foundations. The buildings are linked by a full-height connector bridge. The site was such that presents a number of design challenges, including the presence of old foundations from demolished buildings, an existing tunnel that runs across the site as well as the adjacent Hotel's loading dock that has to remain in service throughout the entire construction process. (Fig. 25)

Since designed for sustainability, it includes a multi-level student gathering area that steps up from the ground floor to a roof-top garden (as already mentioned).



Fig. 24



Fig. 25

360 State Apartment Building (Fig. 26)

Is the first residential building in the area targeting the LEED Platinum Certificate with features such as: The 400 kW fuel cell on site to produce clean energy, elevators that recapture their own energy, recycled and local construction materials, recycling room on every floor, high efficiency lighting with occupancy sensors and a lot others, which remains to be seen and luckily be used²².

²¹ www.thorntontomasetti.com/projects/gateway-community-college-central-campus

²² www.360statestreet.com



Fig. 26

Through this project, a long time underutilized site will be reused again. The site is considered as one of the prime downtown locations, being only a block away from the New Haven's Green. It is believed to be the largest private new construction project ever built in New Haven as well as the greenest large-scale residential building in Connecticut.

Designed by Becker+Becker and finished by the end of 2010. In addition to the 400kW fuel cell, the project designer likes to point out: "the building uses 34 energy saving technologies. For example, the Climate Master TS-series heat pumps used in the building are the highest efficiency pumps on the market today. The result speaks for itself. When benchmarked against a comparable, code-compliant building of similar proportions, 360 State will have half the carbon footprint"²³.



Fig. 27

One more issue to be mentioned, except all features mentioned above, which fully support the idea of the sustainability and energy saving is as well the initiative to include the urban agriculture in all this mix, through the green rooftop (Fig. 27).

Conclusion

Except the intention to have sustainable and energy saving buildings, the city of New Haven gives major importance on environmental protection through identifying the most sustainable use of land in a fully developed urban topography (Fig. 28). These as well include housing and neighborhood preservation or better formulate in general the Inter-connections between

²³ <http://greenlandlady.com/site/business/living-the-platinum-dream-360-state-street/>

society, nature and the built environment²⁴. The Office for Sustainability even promotes bicycles as a very important transport mean in both cases: keeping the environment clean/ sustainable and of course the healthy aspect of it.

It is to be strongly believed that at the beginning of the 21st Century and onwards, the only remaining Ideal City idea will be the one that manages to encourage the energy conservation and the sustainable economic activity, and always having in mind that sustainable buildings are designed and executed with a particular sensitivity toward their surroundings and purpose. In addition to this: “the wide range of natural building materials, energy saving techniques, reduced environmental pollution, photovoltaic solar installations, and heat exchangers are just some examples of the new technologies being applied to construction”²⁵.



Fig. 28

Bibliography

David Pearson, *The New natural House Book - Creating a healthy, harmonious and ecologically sound home*, New York, A Fireside Book Simon & Schuster, 1998

Elizabeth Mills Brown, *New Haven - A guide to architecture and urban design*, Yale University Press, 1976.

James Wines, *Green Architecture*, Taschen, 2000.

Joseph F. Kennedy, Michael G. Smith, Catherine Wanek, *The Art of Natural Building, Design, Construction, Resources*, New Society Publishers, 2001.

Alex Sanchez Vidiella, *Green living, sustainable houses*, BooQs publishers bvba, 2009.

Internet Sources

www.interiordesign.net (visited on 10/03/2014)

www.towngreens.com (visited on 12/03/2014)

www.cityofnewhaven.com (visited on 07/04/2014)

²⁴ www.yale.edu

²⁵ Alex Sanchez Vidiella, *Green living, sustainable houses*, BooQs publishers bvba, 2009, page.7.

<http://sustainability.yale.edu/office-sustainability/mission-history> (visited on 07/04/2014)

www.biospace.com/news_story.aspx?NewsEntityId=19685920 (visited on 10/04/2014)

www.usgbc.org/DisplayPage.aspx?CMSPageID=1989 (visited on 10/04/2014)

www.yaleinsight.library.yale.edu/nhimageviewer/newhaven.asp?groupno=8775 (visited on 10/04/2014)

www.frumheretic.blogspot.com/2008/05/very-crowded-campsite (visited on 15/04/2014)

www.brookfarmgroup.com/institutional.html (visited on 15/04/2014)

www.centerbrook.com/project/yale_university_kroon_hall_school_of_forestry_and_environmental_studies (visited on 22/04/2014)

http://www.yale.edu/chinatrip/documents/International_Aspects_Yale.pdf (visited on 05/05/2014)

www.thorntontomasetti.com/projects/gateway_community_college_central_campus (visited on 05/05/2014)

www.jewishvirtuallibrary.org/jsource/Judaism/The_Written_Law.html (visited on 05/05/2014)

Figures/ Photos courtesy

(Fig.1) - Thomas Kensett, 1806, New Haven Colony Historical Society.

(Fig. 2) - www.frumheretic.blogspot.com/2008/05/very-crowded-campsite

(Fig. 3) - Original plan, 1870

(Fig. 4) – Hillhouse Avenue, 1890

(Fig. 5) - Illman and Pilbrow, New York, 1831, New Haven Colony Historical Society.

(Fig. 6) - Checkmate24

(Fig. 7) - www.historicbuildingsct.com/?tag=mansard&paged=4

(Fig. 8) - www.cityofnewhaven.org/cityplans/pdfs/ Olmsted original plan, 1910

(Fig. 9) - Aerial view of Yale campus, New Haven Green, and harbor-1946

(Fig. 10) - www.cityofnewhaven.org/cityplans/pdfs/ ,Maurice E.H. Rotival original plan, 1942

(Fig. 11) - Jeffrey Keffer, www.architectureweek.com.

(Fig. 12) - Eero Saarinen, www.design.walkerart.org.

(Fig. 13) - www.arthistory.rutgers.edu, New Jersey University.

(Fig. 14) - 1911 Birdseye view postcard.

(Fig. 15) - JD Brandt, 2009

(Fig. 16) - www.interiordesign.net , Richard Barnes.

(Fig. 17) - www.interiordesign.net , Richard Barnes.

(Fig. 18) - www.usgbc.org/DisplayPage.aspx?CMSPageID=1989

(Fig. 19)

www.cityofnewhaven.com/Sustainability/Energy_and_Climate/readmore.asp?ID={607FD32A-0F82-4F6E-8BDF-CCBD0048B038}

(Fig. 20) -

www.cityofnewhaven.com/Sustainability/Energy_and_Climate/readmore.asp?ID={C648BC67-F61E-4109-B116-40106B872B94}

(Fig. 21) - www.brookfarmgroup.com/institutional.html#

(Fig. 22)

www.cityofnewhaven.com/Sustainability/Energy_and_Climate/readmore.asp?ID={D8608AAD-903B-41FB-81BD-C6778A5FA439}

(Fig. 23)

www.centerbrook.com/project/yale_university_kroon_hall_school_of_forestry_and_environmental_studies

(Fig. 24)

www.cityofnewhaven.com/Sustainability/Energy_and_Climate/readmore.asp?ID={D7A3DC42-D109-4E7C-9228-6F189A20624E}

(Fig. 25) - Perkins + Will

www.thorntontomasetti.com/projects/gateway_community_college_central_campus

(Fig. 26)

www.cityofnewhaven.com/Sustainability/Energy_and_Climate/readmore.asp?ID={0B58C836-6458-4490-AE40-B4E85D68560C}

(Fig. 27) - Bozzutto <http://greenlandlady.com/site/business/living-the-platinum-dream-360-state-street/>

(Fig. 28)

www.cityofnewhaven.com/CityPlan/pdfs/EnvironmentalInitiatives/Greenways/GreenMapFront.pdf