

## LEED® Workshop and Design Charrette Report



### **Progetto Nuovo Centro Direzionale Ferrero** Alba

04 e 08 Settembre 2008



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**Project Summary**

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Ferrero Office Building

Ferrero is engaged in the process of developing a new office building on their corporate campus in Alba, Italy. They have hired studioa.s. to provide project design services. Currently, the project is in the Conceptual Design phase. Manens and 7group were contracted to provide an initial LEED Goal-Setting Workshop and Design Charrette for the project team. On 04 September 2008, members of the project team gathered to discuss and evaluate sustainable design practices and the LEED-NC v2.2 Green Building rating system. On 08 September, the project team reconvened and participated in a design charrette led by 7group. This report records key points from the initial LEED review meeting and an overview of the design charrette.

## Summary of the Charrette Process

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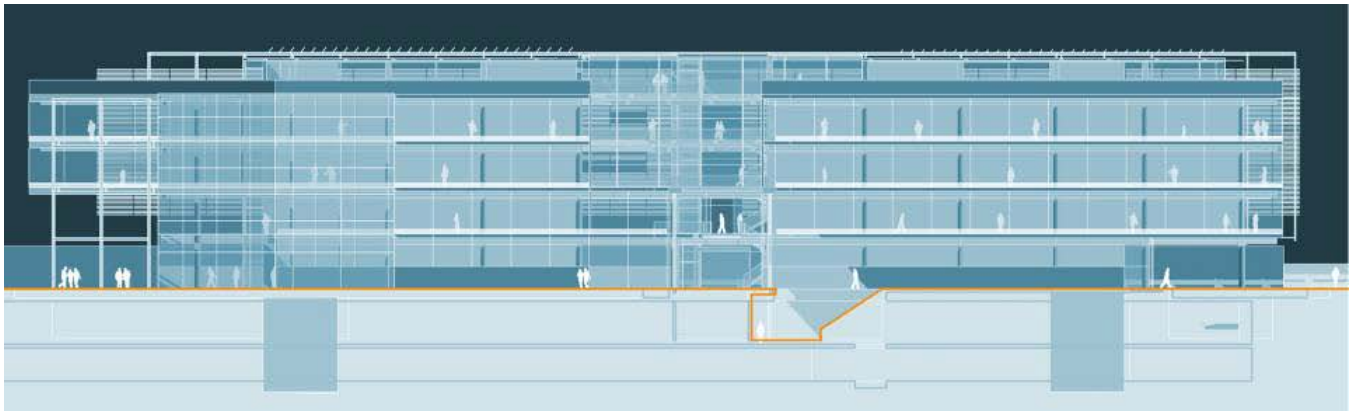
A successful high performance building is a solution that is greater than the sum of its parts. It is a system of integrated processes and products that increases the efficiency of the building systems and helps to reduce overall costs. A building that conserves energy alone does not constitute a high performance building. In the same respect, adding or overlaying environmental systems will not truly help the building benefit from the connections and interdependencies of an integrated, or "whole systems", design approach. This is the fundamental challenge of high performance building design and LEED Certification.

High performance buildings are most effectively developed through a design process that invites the client, building designers and consultants, a consulting general contractor/cost estimator, and other appropriate stakeholders to participate from the very beginning of the project. This is done in a focused and collaborative design effort, or brainstorming session(s), known collectively as a design "charrette" process. The purpose of this composite design team and design process is to encourage the exchange of ideas and information, thereby allowing truly integrated solutions to take form. A forum and methodology is provided where every team member is encouraged to cross fertilize with all others in order to identify solutions to problems that may relate to, but are not typically addressed by any one team member's specialty. The objective is to have every member of this composite design team understand the issues that the other members need to address. Thus more thorough and integrated solutions can result.

The charrette method is very important when the Owner is not one person but consists of a number of interested people. This is a successful way to educate all the participants: architects, engineers, community stakeholders, and the client team. There are many advantages to this approach: The client's staff members are invited to participate throughout the process. Participants are educated about the issues and participate in the team's investigations in order to "buy in" to the solutions. The educational process is accelerated, decisions are verified, adversity is diminished, the nuances of organizational issues are learned, and the design process is expedited. Final resolutions are not necessarily produced in the charrette, but most of the issues are explored with all the involved parties present.

Most buildings have great potential for incorporating the most advanced green building design techniques and systems. Part of the team's job is to find an acceptable balance between the economic, cultural, ecological components of sustainability that will meet the Client's objectives and yet allow for future adaptation of new technologies and interactions with the community.

7group's approach targets common sense applications of thoughtful and integrated solutions. Market transformation in this area will occur only if environmentally responsible buildings can be built at conventional construction cost. The integrative design process is the key to producing high performance green buildings within budget.



## **Workshop Descriptions and Agenda**

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### **1° Workshop - Giovedì, 04 Settembre 2008 – Workshop di impostazione obiettivi LEED**

09:30 – 17:30

#### ***Descrizione del workshop***

E' prevista una giornata di workshop con l'intero Gruppo di progettazione ed il Committente e l'Utente finale per definire l'impostazione del progetto. Il workshop sarà coordinato dagli specialisti ambientali di Manens Intertecnica.

Il workshop comprenderà una breve presentazione da parte del moderatore con discussioni e analisi del progetto e stabilirà gli obiettivi iniziali di performance e identificherà opportunità di progettazione integrate.

Verrà fatto un ampio esame del progetto in relazione alla certificazione LEED-NC Version 2.2 Green Building Rating System. Ciò costituirà il cuore del workshop, per indentificare su quali criteri di sostenibilità puntare e quale punteggio è ragionevole ottenere.

I risultati di questa fase comprendono una esaustiva check-list preliminare LEED, un sommario dei risultati del workshop e una lista di punti/commenti per future discussioni con il gruppo di lavoro.

#### ***Obiettivi del workshop***

1. Illustrare cos'è il LEED
2. Familiarizzare i progettisti con i crediti del LEED
3. Stabilire degli obiettivi LEED per il progetto
4. Ipotizzare un primo punteggio obiettivo

**Ordine del giorno del workshop: 04 Settembre 2008**

Ora	Oggetto	Chi
9:30 – 9:45	Presentazione partecipanti	Ing. Loredini - Ferrero
9:45 – 10:15	Introduzione al LEED	Manens Intertecnica
10:15 – 11:15	Analisi dei crediti LEED: - Sustainable Site Credits - Water Efficiency Credits	Manens Intertecnica
11:15 – 11:30	<i>Coffee Break</i>	
11:30 - 13:00	Analisi dei crediti LEED: - Energy & Atmosphere Credits	Manens Intertecnica
13:00 – 14:00	<i>Pranzo</i>	
14:00 – 15:15	Analisi dei crediti LEED: - Energy & Atmosphere Credits (continued) - Materials & Resources Credits	Manens Intertecnica
15:15 – 15:30	<i>Coffee Break</i>	
15:30 – 17:15	Analisi dei crediti LEED: - Indoor Environmental Credits - Innovation & Design Credits	Manens Intertecnica
17:15 – 17:30	Conclusioni	Manens - tutti

**2° Workshop - Lunedì, 08 Settembre 2008 – Workshop di progetto LEED**

09:30 – 17:30

***Descrizione del workshop***

E' prevista una giornata di meeting con l'intero gruppo di lavoro, per analizzare le soluzioni concettuali del progetto, in relazione ai principi di sostenibilità e gli obiettivi definiti durante il workshop di impostazione obiettivi della fase precedente. Il lavoro sarà coordinato dal partner di 7group Mr John Boecker assistito da Fabio Viero di Manens Intertecnica.

Il meeting comprenderà un libero scambio di idee aventi l'obiettivo di implementare i valori e gli obiettivi del progetto stabiliti durante il LEED workshop nella fase precedente. Dopo una revisione degli obiettivi LEED, si analizzeranno le questioni legate alla progettazione generale dell'edificio che saranno indirizzati verso soluzioni di progettazione integrate, basandosi sui documenti progettuali disponibili in quel momento.

Specifici sotto-gruppi di lavoro approfondiranno aspetti quali acqua, energia, materiali e qualità dell'ambiente interno e faranno poi un resoconto all'intero gruppo di lavoro.

I risultati di questa fase comprendono: la definizione del programma di lavoro e l'identificazione delle responsabilità. Sarà prodotta una relazione che riporta gli esiti del workshop.

***Obiettivi del workshop***

1. Rivedere gli obiettivi LEED stabiliti nel workshop precedente
2. Illustrare metodologie di progettazione integrata avanzata
3. Sviluppare concept e strategie di progetto
4. Stabilire programma e responsabilità



**Ordine del giorno del workshop: 08 Settembre 2008**

Ora	Oggetto	Chi
9:30 – 9:45	Presentazione partecipanti	Ing. Loredini
9:45 – 10:00	Revisione obiettivi LEED dal workshop precedente	Manens Intertecnica
10:00 – 10:30	Presentazione sulla progettazione integrata, lo strumento chiave per produrre edifici ad con alte prestazioni secondo il LEED con il budget disponibile: <ul style="list-style-type: none"> <li>- Che cos'è ed alcuni esempi dei benefici</li> <li>- Come applicarla: cambiamenti rispetto al processo tradizionale di progettazione</li> </ul>	John Boecker
10:30 – 10:45	Presentazione stato attuale del progetto (15 min)	Progettisti
10:45 – 11:15	<i>Touchstone Exercise: Valori e Aspirazioni</i>	Tutti
11:15 – 11:30	<i>Coffee Break</i>	
11:30 - 12:00	<i>Site Forces Exercise –</i> Aspetti climatici e sostenibilità del sito: opportunità, limiti e flussi	Tutti
12:00 – 3:00	<i>Progettazione Sostenibile</i> Esplorazione di soluzioni/affinamenti progettuali: <ul style="list-style-type: none"> <li>- Componenti primari del sito (acqua piovana, servizi, circolazione, parcheggio, etc.)</li> <li>- Orientamento e Massa termica</li> <li>- Relazioni funzionali</li> <li>- Progettazione Luce Naturale</li> </ul>	Tutti
13:00 – 14:00	<i>Pranzo</i>	
14:00 – 14:45	<i>Progettazione Sostenibile (continua)</i>	Tutti
14:45 – 15:30	<i>Sessione in gruppi</i> Sessioni in piccoli gruppi per esplorare ed identificare parametri di prestazioni e specifiche soluzioni progettuali: <ul style="list-style-type: none"> <li>- Energia</li> <li>- Building &amp; Site Design</li> </ul>	Tutti
15:30 – 15:45	<i>Coffee Break</i>	
15:45 – 16:00	Presentazioni dalle sessioni in gruppi: <ul style="list-style-type: none"> <li>- Cosa tenere</li> <li>- Cosa evitare</li> </ul>	Tutti
16:00 – 16:45	<i>Sessione in gruppi</i> Integrazione dei vari metri di prestazione e idee progettuali dalle sessioni in gruppi precedenti mirando a soluzioni di tipo olistico, considerando budget, efficacia ambientale, fattibilità, valori e scopo del progetto.	Tutti
16:45 – 17:00	Presentazioni dalle sessioni in gruppi: <ul style="list-style-type: none"> <li>- Cosa tenere</li> <li>- Cosa evitare</li> </ul>	Tutti
17:00 – 17:30	Passi successivi: <ul style="list-style-type: none"> <li>- Implementazione del processo di progettazione integrata olistica</li> <li>- Servizi specialistici richiesti</li> <li>- Programma di lavoro</li> </ul>	John Boecker/Tutti

**Agenda Note:**

It should be noted that the above agenda was provided as an overall approach to the workshops on both days. During the charrette on the second day (08 September), the extent of discussion did not allow enough time for two break-out group work sessions; hence, following a morning discussion about integrative design and the project’s values and aspirations, it was decided that a single break-out session would be the most efficient use of the project team’s time, given the advanced stage of the design.

**LEED Review**

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During the September 4<sup>th</sup> Goal-Setting workshop, the project team reviewed the LEED-NC v2.2 Green Building Rating System on a credit-by-credit basis in the context of the project. Each credit was determined to be a “Yes” - it will be implemented on this project; a “Maybe” - these credits will require further investigation and/or consideration; and a “No” – these credits are not feasible for this project. In this comprehensive review of the LEED Rating System, each credit was discussed to determine how it fit (or not) within the scope of the project.

In addition, following the two workshops, 7group reviewed the results recorded in the LEED checklist at the Goal-Setting workshop revised the status of a few credits, given the knowledge gained at the 08 September charrette. Additional comments also were added into the “comments” column of the LEED checklist. A complete version of this revised checklist with comments is contained in the Appendix.

The results of the LEED review indicate a total of 49 points targeted as feasible with 6 additional points listed as maybe. The project team has determined that LEED Platinum level certification could be a realistic target. In the comprehensive review of the LEED Rating System, each credit was discussed to determine how they fit within the scope of the project.

The results of the LEED review and subsequent revisions indicate a total of 26 points targeted as definitely feasible with 31 additional points listed as maybe. It should be noted that many of these “maybe” credits are highly likely as achievable. As a result, it appears that the project could fairly easilt achieve LEED Gold level certification if only about one-half of the maybe credits are achieved; hence, LEED Gold level certification could be a realistic target, and Platinum could be achievable with additional effort.

<b>LEED® Targeted Credits Summary by Credit Category</b>		Yes	?	Total
	Sustainable Sites (SS)	8	5	13
	Water Efficiency (WE)	3	2	5
	Energy & Atmosphere (EA)	3	10	13
	Materials & resources (MR)	2	5	7
	Indoor Environmental Quality (EQ)	9	5	14
	Innovation & Design Process (ID)	1	4	5
	<b>Total</b>	<b>26</b>	<b>31</b>	<b>57</b>

## **Integrative Design**

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A presentation was made during the 08 September design charrette to illustrate that a successful sustainable, or green, project is a solution that is greater than the sum of its parts. By intentionally building connections and cross-linked support between the engineered, cultural and natural systems present in all building projects, significant efficiencies, as well as natural system regeneration, can be achieved. Project and operating costs can also be reduced. Simply adding or overlaying individual "environmental" systems in isolation will not allow buildings and communities to benefit from the available connections and interdependencies that can be identified in an integrated, or whole system, design approach. This is the fundamental challenge of sustainable design and building cost-effective LEED® projects.

The core concept of integrative design is simple - most everything in a building project affects everything else. Consequently, we will examine how to integrate site parameters, solar orientation, water, stormwater systems, thermal envelope, lighting, window performance, heating and cooling supply systems, ventilation, and air distribution in a way that all of these systems are working together, much like those within an organism.

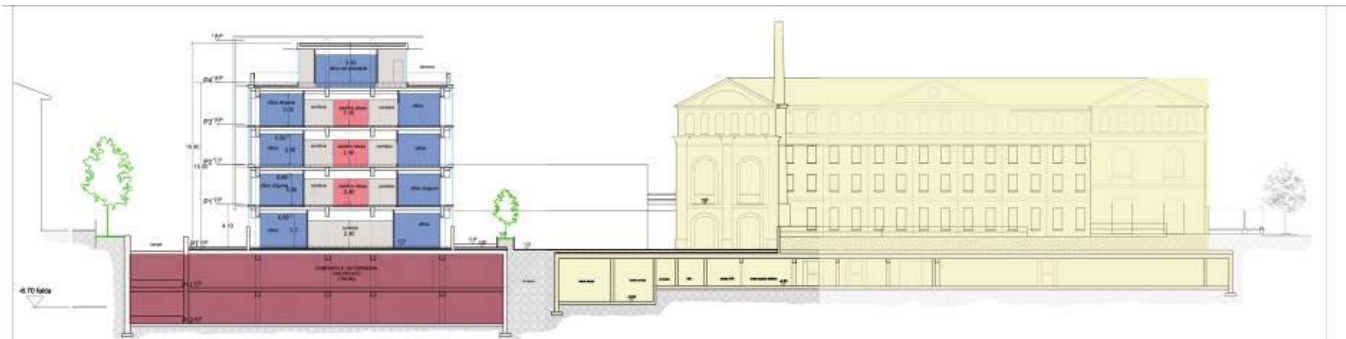
For example: by enhancing insulation levels, improving lighting, increasing air distribution efficiency, and installing high-performance glazing that keeps out the summer heat and the winter cold, we can downsize a building's mechanical systems (equipment such as furnaces, air conditioners, heat pumps, fans, etc.). In many climates, entire perimeter heating systems can be eliminated. The cost savings achieved through such mechanical equipment reductions pay for the provisions that allowed for such downsizing in the first place (the better insulation, lighting, air distribution, and windows listed above). The resulting building will cost the same, but energy consumption and utility bills will be reduced dramatically.

Dozens more examples could be described here, but the point being made is that when all design decisions are based on similar notions of integrating the building's systems, certain conventional components can be reduced in size or even eliminated altogether. The result can be dramatic in terms of energy efficiency, performance, cost savings, and environmental impacts. Via such integration, the size and cost of HVAC systems typically can be reduced by 40-50% - or even more depending upon project parameters and goals. Consequently, over the life of the building, operational cost savings will easily exceed the building's initial construction cost.

In short, this design methodology constantly examines the tradeoffs between up-front costs for pursuing these goals and the benefits that are derived from achieving them. Design decisions are based upon analyzing, quantifying, and evaluating the synergistic interactions between building systems in a series of research and analysis stages followed by "all hands" team workshops. Unlike conventional design, then, integrative design mandates closer interaction among the owner's representatives, architects, engineers, and operations staff while they work together from the earliest pre-design phase to evaluate measures that can produce overall project savings, higher performance, and environmental benefits.

In conclusion, many projects have great potential for incorporating the most advanced green building design techniques and systems. However, there can be a cost to pay in terms of budget as well as untested techniques; technically feasible solutions may not be right for operational simplicity and budget. The design team's job is to find an optimal balance between the economic, cultural, and ecological areas of sustainability that will meet the objectives of the client.

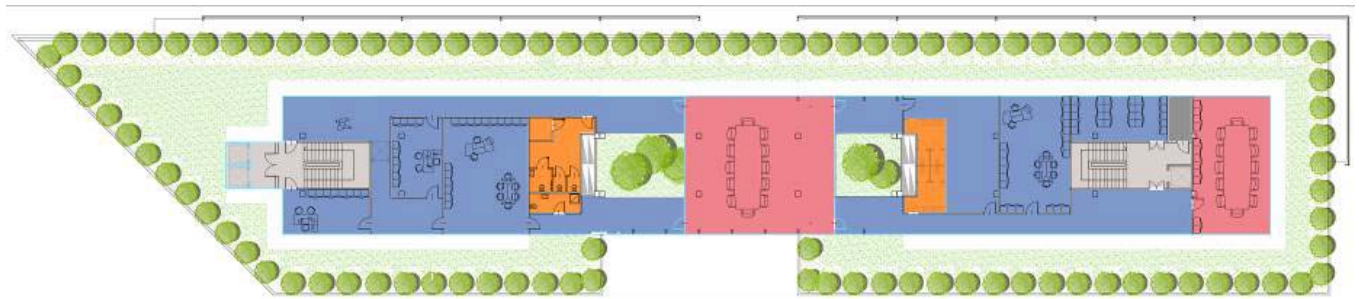




## **Design Team Presentation**

The design team gave a brief overview of the project and issues raised after a recent conceptual design phase presentation to the owner. The project's approach to the four key sub-systems (habitat, water, energy, materials) and issues raised by the owner are listed below.

- Habitat:
  - daylighting
  - operable windows
  - site: connection of indoor/outdoor
  - landscaping strategies to utilize native species potentially
- Water:
  - stormwater: reduce impervious surface area (no net increase in rate/quantity)
  - water efficient plumbing fixtures
  - potential for rainwater harvesting and uses
- Energy:
  - as energy-efficient as possible
  - solar orientation optimized, given site constraints
  - solar shading elements on south façade – need more exploration to east and west
  - reducing internal loads
  - rooftop photovoltaics
- Materials:
  - Targeting regional materials
  - High levels of flexibility and aesthetics
  - recycled materials
- Parameters and status of design comments:
  - Sensitive site: transparency to north views of existing building and site
  - Rather brutal views to the south
  - Programmatic issues: indoor/outdoor connection
  - Façade studies are still in preliminary phase so open to revisions
  - The building will house 350 (appropriate) to 450 people (max.), final number TBD
  - Two underground parking levels are included



### Touchstones Exercise

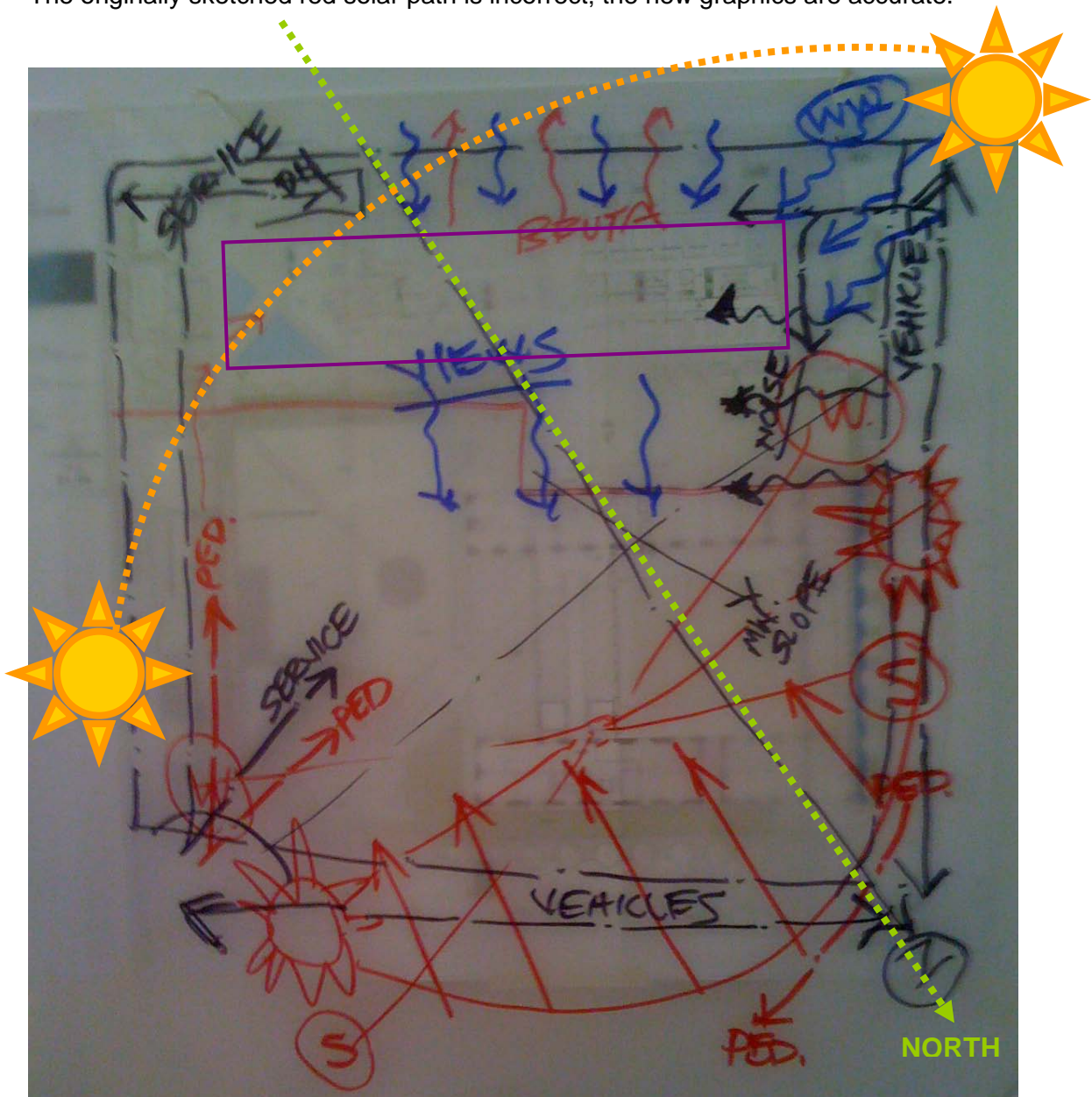
A brain-storming session was initiated during the September 8<sup>th</sup> session to list the core values and aspirations of the group and to prioritize important issues. The “Touchstones” listed below were determined to be important design considerations. Once this list was generated, each project team member was given 10 votes (20 votes for the owners’ representatives) and asked to distribute them among the values listed. The results of the exercise are listed in the table below.

Design and Construction Elements/Issues	# of votes
Energia efficienza	36
Funzionalità	31
In budget	27
Estetica – interna e esterna	21
Edificio modello di sostenibilità e educativo	19
Flessibilità	19
Riduzione costi di operations and maintenance	18
IAQ: qualità aria interna	13
Luce naturale	11
On time	10
Conforto acustico	9
Sicurezza	7
Materiali Regionali	6
Accessibilità disabili	3
Integrazione col contesto urbano/sociale	3
Acqua elemento visibile di progettazione	3
Creazione senso di appartenenza (working pride)	2
Connessione al contesto visuale (view connection to outdoors)	1
Accessibilità alla rete dei trasporti	0

## Site Forces Exercise

This exercise focused on climatic issues and sustainable site opportunities, constraints and flows, including: solar orientation, prevailing winds, vehicular and pedestrian traffic, location of utilities, stormwater drainage, site boundary and other factors impacting the project. The conversations resulting from this exercise brought to light concerns relating to the site.

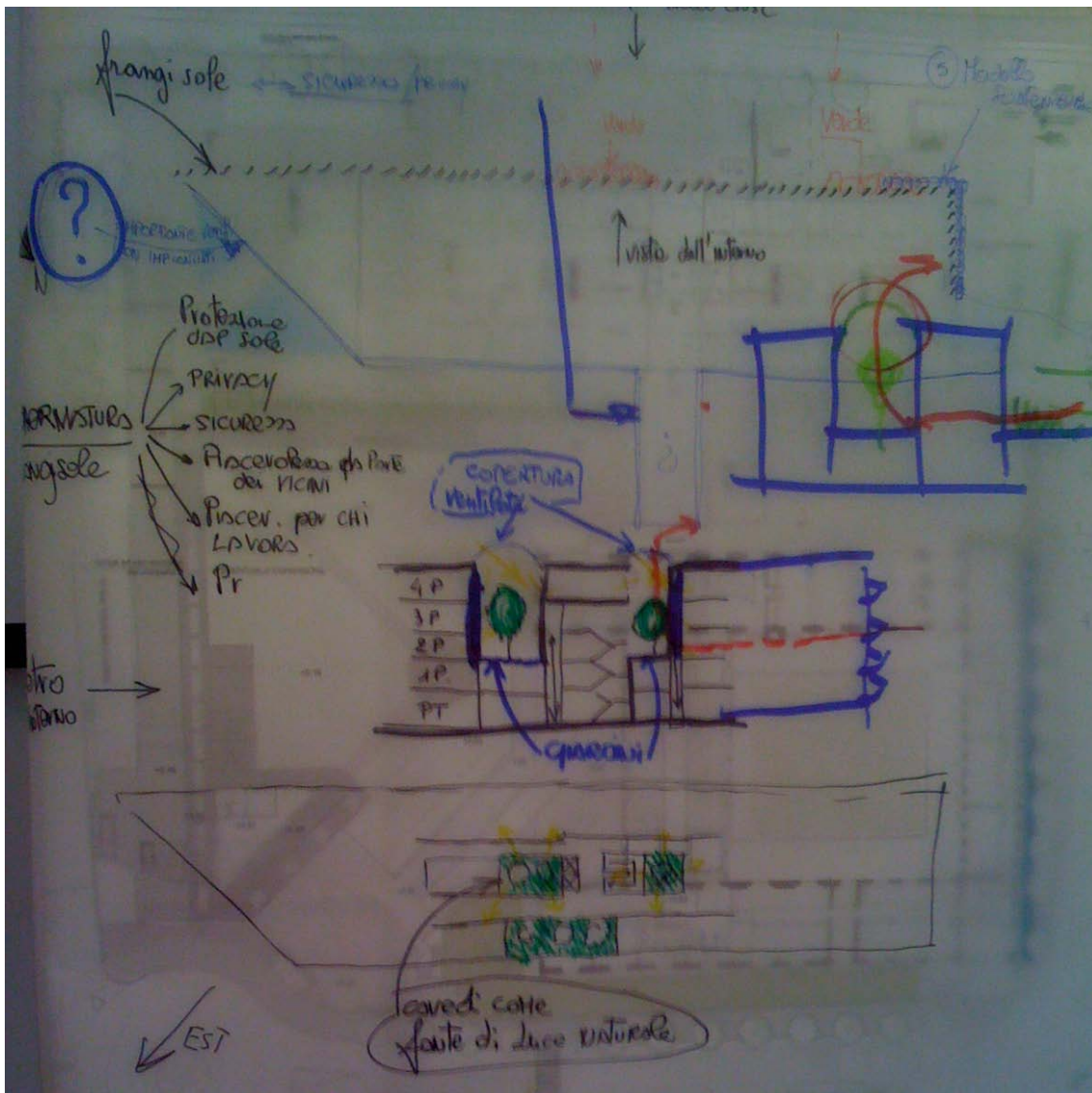
- Solar orientation has been maximized within the constraints of the site.
- Primary pedestrian access from the east corner of the site
- Breezes year round come from the west corner of the site
- The originally sketched red solar path is incorrect; the new graphics are accurate.





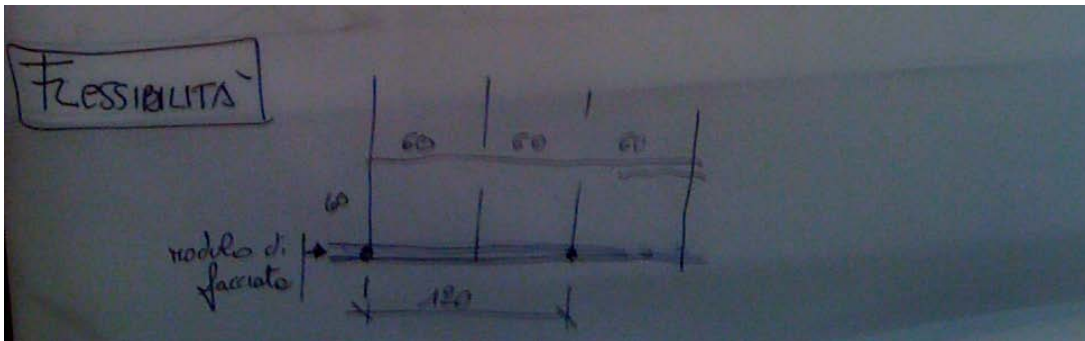
## Results from Small Group Sessions

The project team was split into two groups to participate in focused small group sessions to explore and identify performance parameters and specific design solutions. One group focused on building and site design, while the other group focused primarily on energy issues. The issues and ideas resulting from this breakout session are indicated below.



### Building/Site

- Passive ventilation through “heat chimneys” in atrium space(s) with interior gardens
- Potentially include interior water feature with natural ventilation/cooling
- Design for flexibility with dimensional modules



## Energia

- Tecnologia LED
- Efficienze apparecchi elettronici
- Dimmerazione luce ort / naturale
- Flessibilità occupazione
- Riduzione sup vetrate O-S
- Coperture (colore/tipologia)
- Fotovoltaico
- Prestazione sup vetrate / doppia pella?
- Schermeture
- Ventilazione naturale
- Acqua meteorica
- Acqua di falda (spesi / confi) – sciacquesi irrigazioni

Following the presentation of both groups, the team discussed and identified specific ideas and approaches that were discovered and should be kept in the project as the design proceeds, along with energy issues that should be studied further during the next research and analysis stage, as follows:

### Cosa Tenere e Studiare:

- Facciate
- Giardini Interni
- Materiali Locali
- Coperture (Verdi / fotovoltaico)
- Acqua (irrigazione / “fontane” / WC)
- Energia:
  - modellare le schermature
  - ventilazione naturale e i controlli
  - fotovoltaico quantita