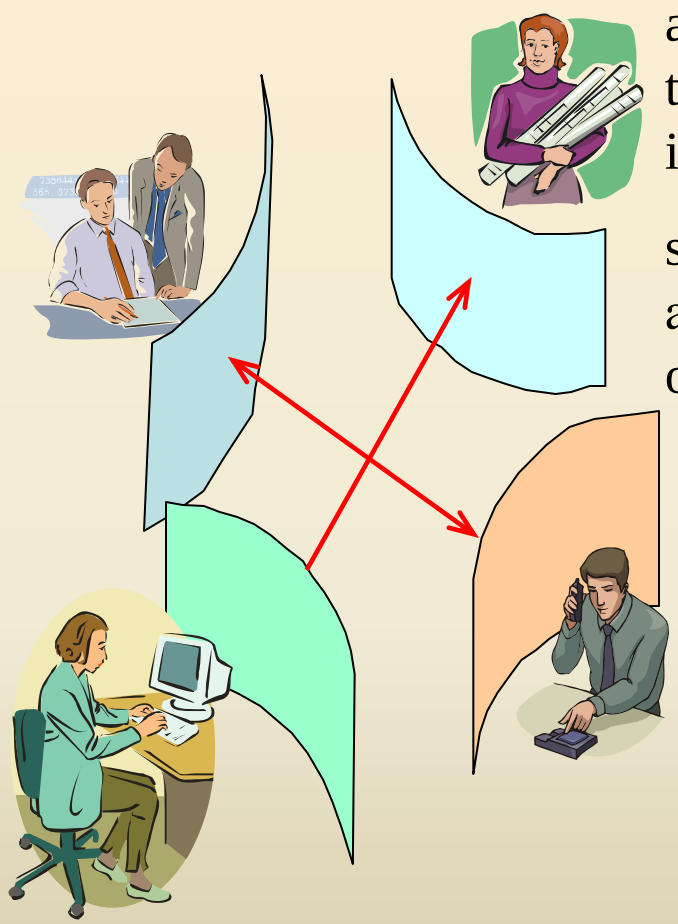
Progettazione Multidisciplinare e Carpenterie

Simulazione di attori nel processo progettuale e dei rispettivi Spazi di lavoro Progettuale Personale - Personal Design Workspace, PeDW (detti anche specialistici - SpDW)

Progettazione Architettonica tre approcci:

- Olistico, unicum (indistinguibili gli apporti, fusione culturale) - Partenone
- Multidisciplinare, più soggetti (ben definiti gli apporti, cooperazione) - HKSBC
- Sistemico, funzionale (sistematizzazione di apporti incrociati, transdisciplinarità) – Guggenheim Bilbao

To simulate a CWE model we are building a toy incubator: x-house game



aims to study and simulate knowledge engineering tools, communication protocols and the areas of an ICT implementation

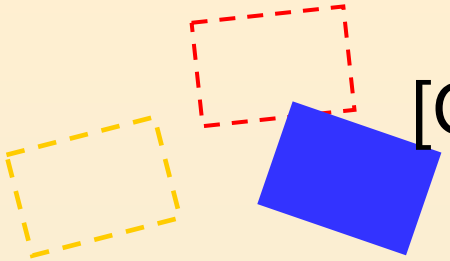
shares immediately conventional assessments of any actor's project proposals to stimulate the development of other proposals.

We conventionally define:

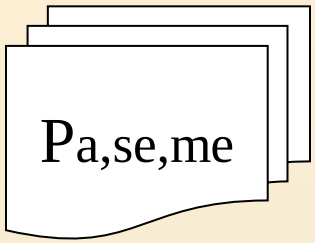
- actors roles: Arch., Structural Eng., Client, Energy Eng.
- game rules: moves, authority, *audience*
- modular spaces, one level, single family house
- modular components: beams, columns, walls, partitions, floors, roofs

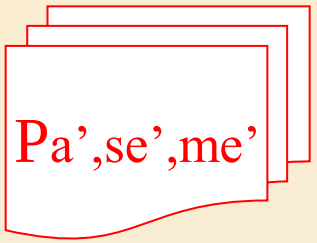
[Communicating Space(s)]

CWE model



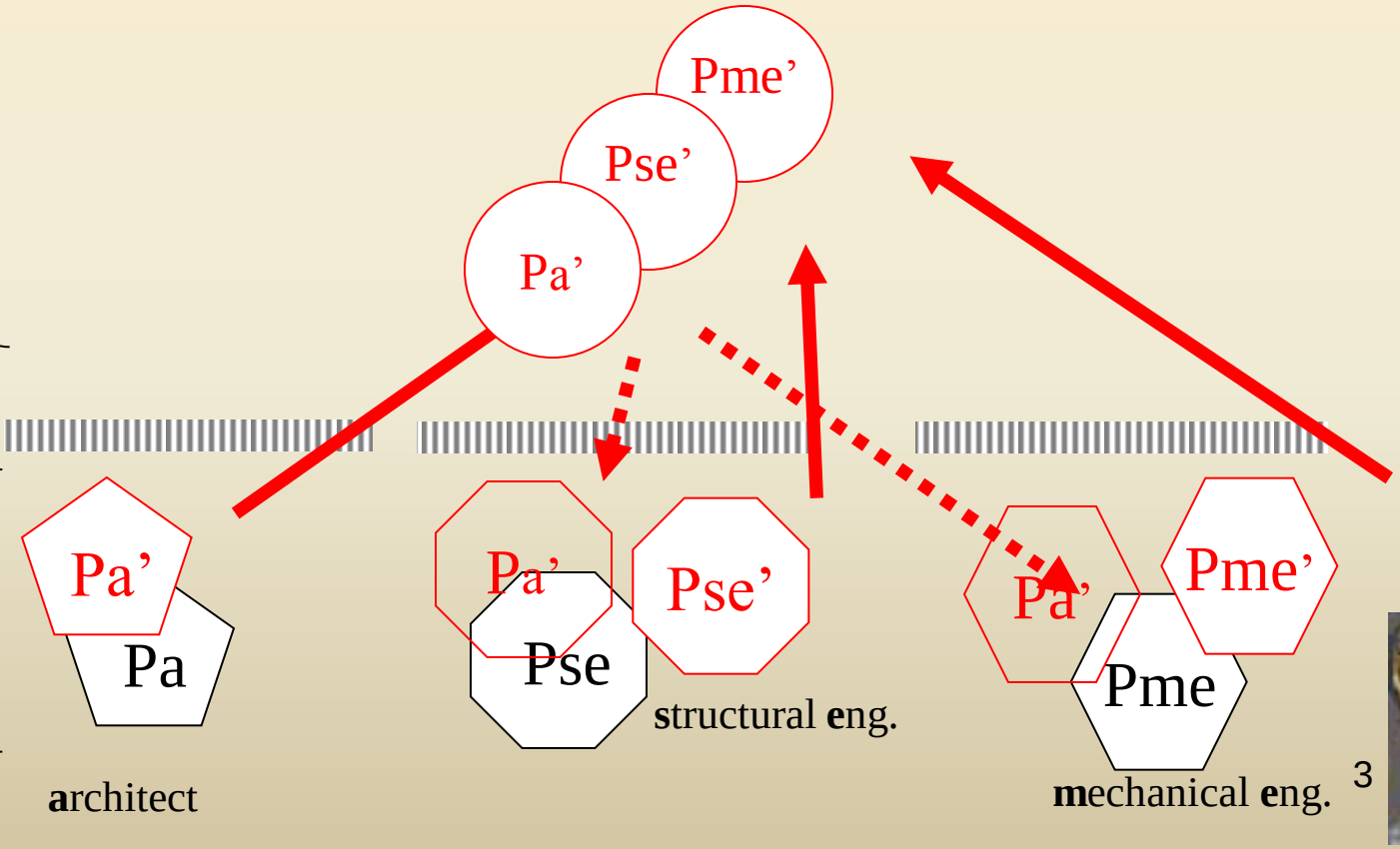
Common Design Workspace
(common operations)





Semi-Private DW
(shared operations)

Private DWs
(local operations)



Space(s)

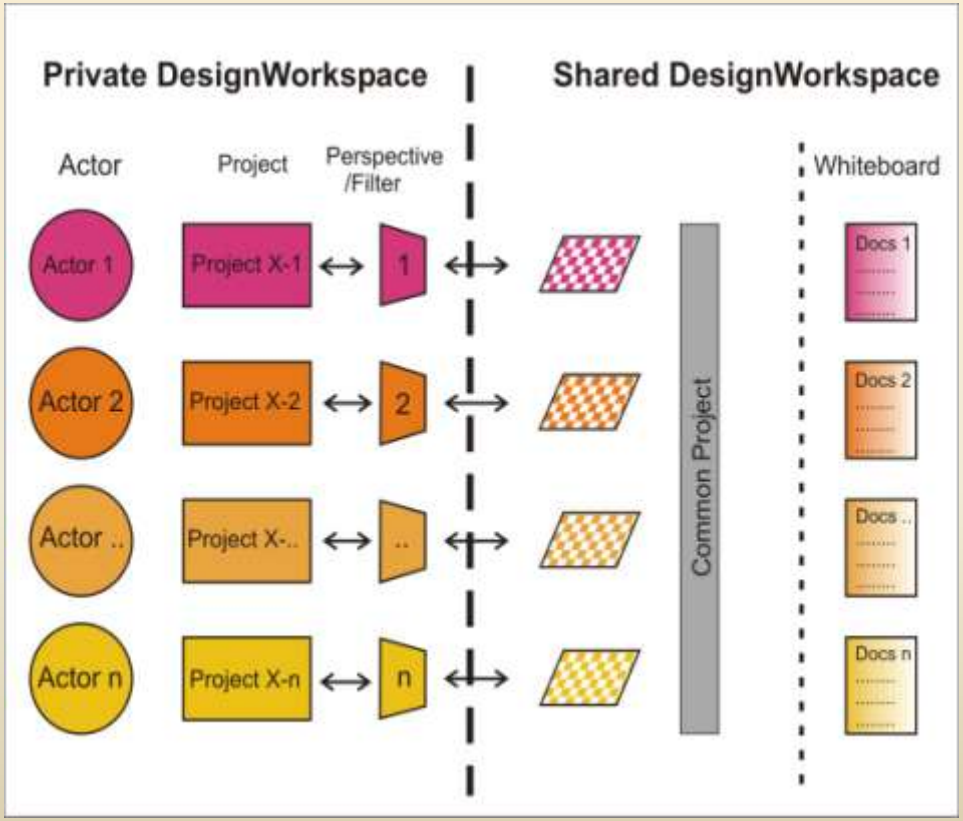
architect

structural **e**ng.

mechanical **e**ng.

actors take part in the process by means of a perspective/filter

the perspective/filter works in two directions: inwards, it enriches the project core with its private knowledge; outwards, it impoverishes the actor's project



The notifications exchanged in the SDW are:

- automatic, which are triggered by the daemons and the procedural attachments;
- manual, which are published by the actors on a whiteboard.

In this way a more exhaustive exchange of knowledge is obtained which includes both the formalized aspects and the no-formalized ones.

The latter can then be formalized by means of conventions among actors using XML.

Progettazione Integrale – Interfaccia dell'Ing. Strutture

Shared DW

Warning Window

Info-counter della versione *Nord/ quote/ scala*

Video-chat

Score Current Proposal

Sketch with some comments

Game χ-House

Private DW

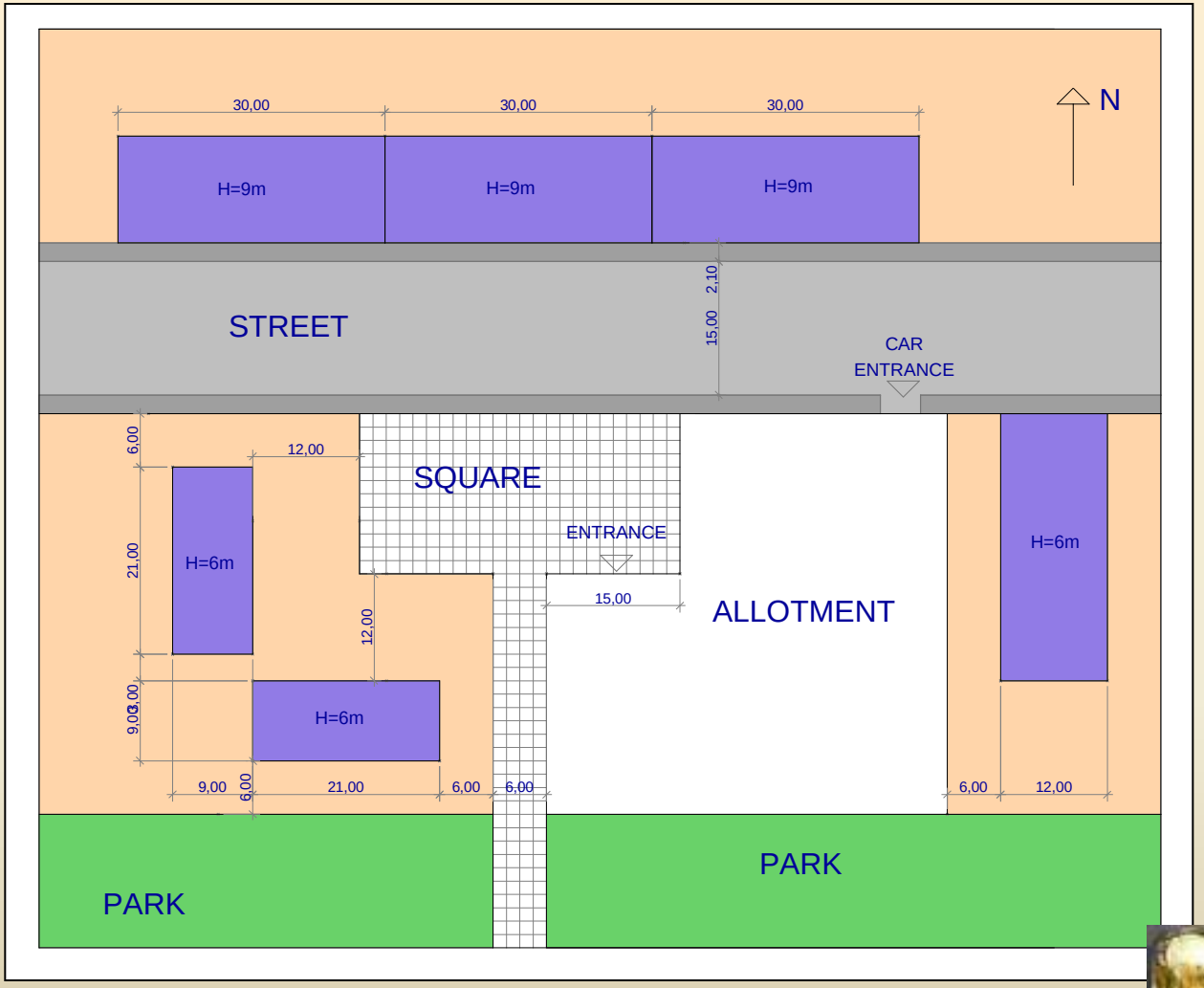
X-House – Summary - Brief

PIANO TERRA

Entrance/Lounge/Dining room:
E/S/P 50-60 m2
Kitchen
K 12-14 m2
Porch 1
P1 6-8 m2
Porch 2
P2 12-14 m2

PIANO PRIMO

Double bedroom with cupboard
LM 15-18 m2
First room with double bed
L2 13-15 m2
Second room with double bed
L2 13-15 m2
Bathroom 1 complete with shower
B1 3-4 m2
Bathroom 2 complete with bath tub
B2 4-5
Terrace 1
T1 9-12 m2
Terrace 2
T2 9-12 m2
Lumber room
D 5-8 m2



X-House: Summary – Dimensions, Positioning, Moving Rules

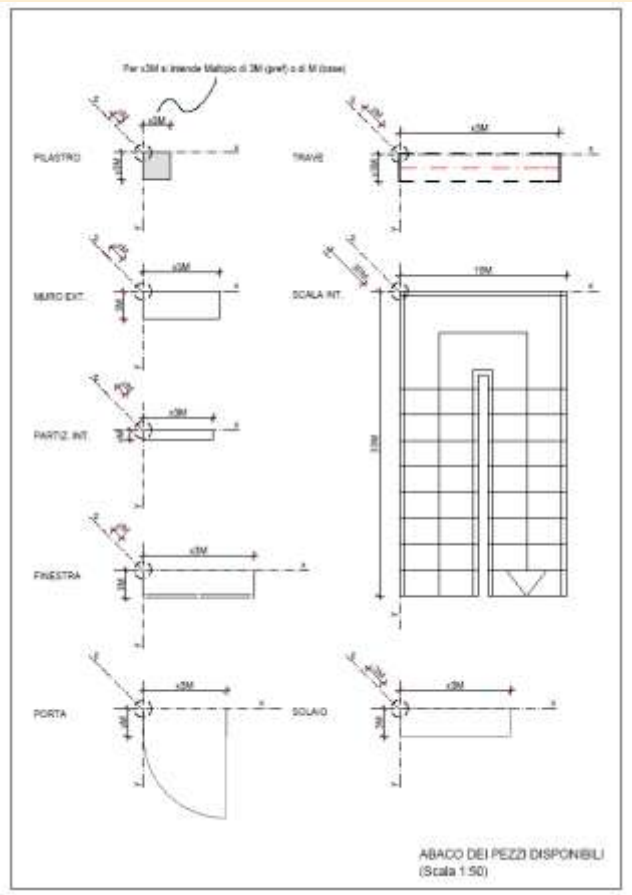
The project will be implemented by positioning conventional objects of a library, parameterized with a step of 1M = 10 cm. These objects are all reducible to a composition of parallelepipeds with a rectangular base.

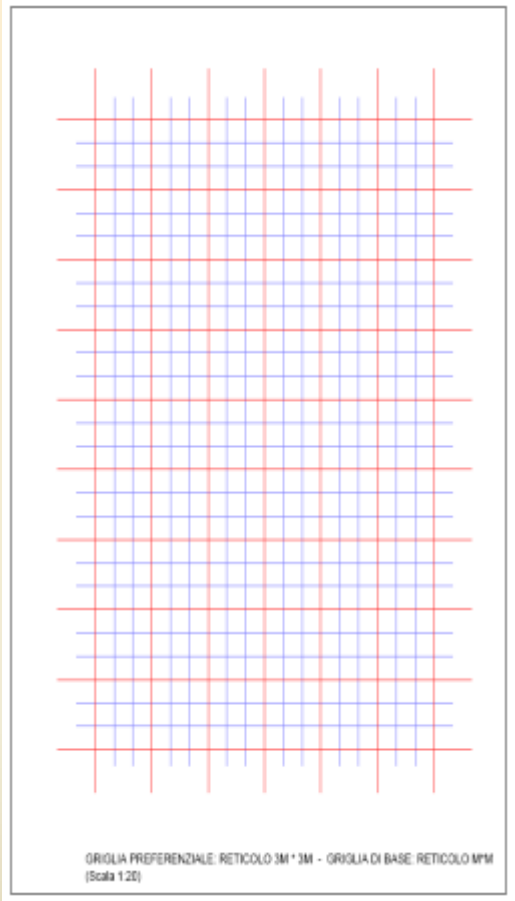
Their positioning will be effected on a modular orthogonal spatial grid, also having a 1M = 10cm module. The axis of each parametric object will be positioned on one of the axes of the grid. The joints and tolerances are considered conventionally to the extent that the objects are all connected together with the constraint of simple adherence by contact.
The staircase is an exception to the extent that it is an object that cannot be reduced to simple straight-line prisms positioned on a spatial grid.

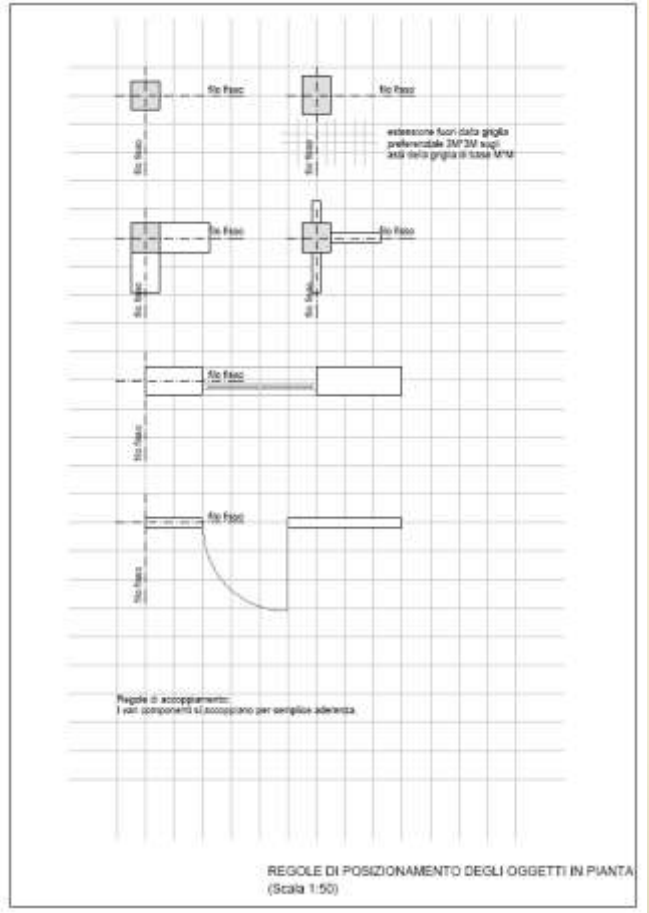
The first move is made by the client who entrusts the task to the architect and acts as go-between with the structural engineer and the plant engineer.
The architect implements the first drawings by positioning the axes of the wireframe objects available to him on the modular grid. Subsequently, the set of drawings will be submitted to the structural engineer and the plant engineer. After an initial revision session, the architect proceeds with his proposals.

The subsequent rules will be attributed to the individual actors, as the simulation project proceeds. No processing using IT tools is required at this stage.

X-House - Libreria di componenti costruttivi e loro posizionamento sulla griglia



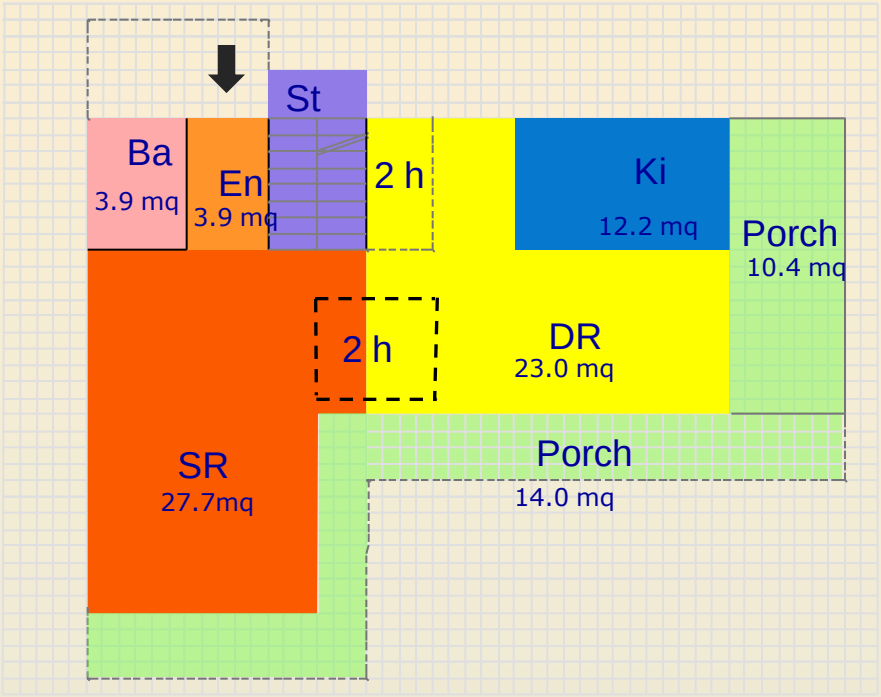




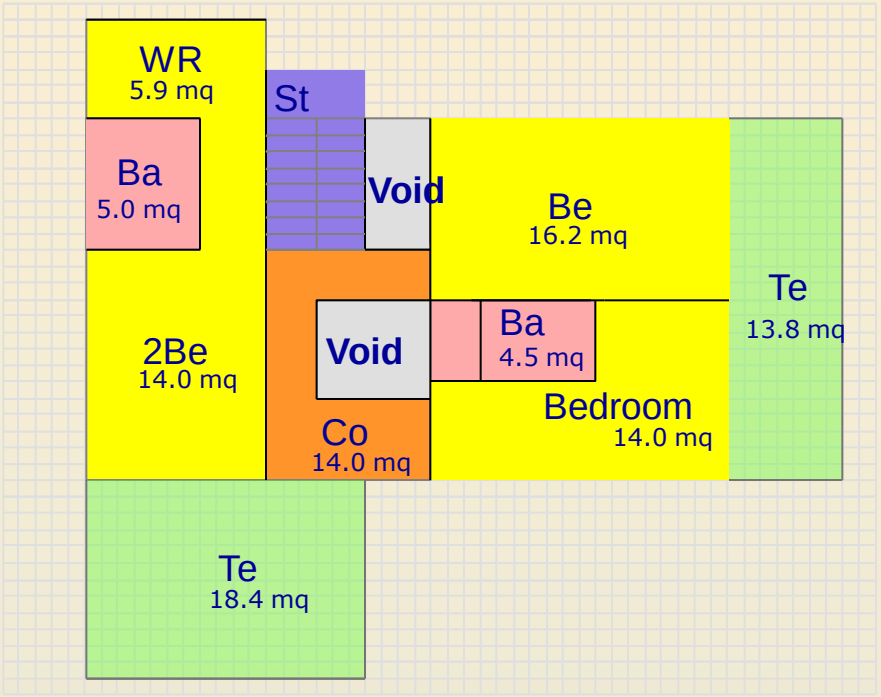
X-House -1st Proposal diagram – SDW

N

Piano Terra



Piano Primo



Ba = Bathroom
Be = Bedroom
2Be = Double Bedroom

Co = Corridor
En = Entrance
DR = Dining Room
Ki = Kitchen

Po = Porch
SR = Sitting Room
St = Stairs

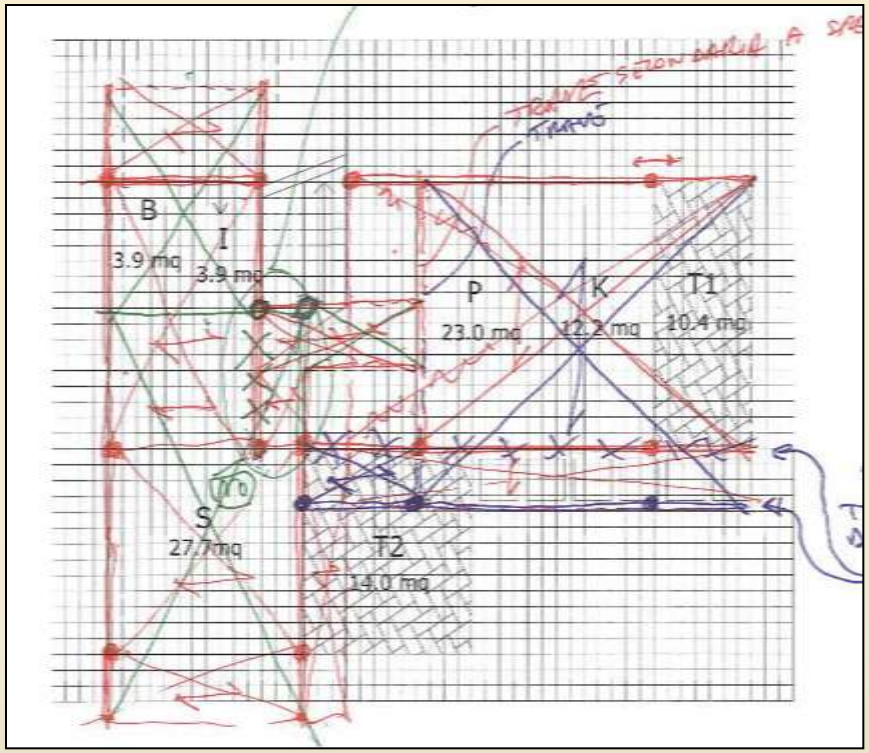
2h: Double height
Te = Terrace
WR = Wardrobe Room

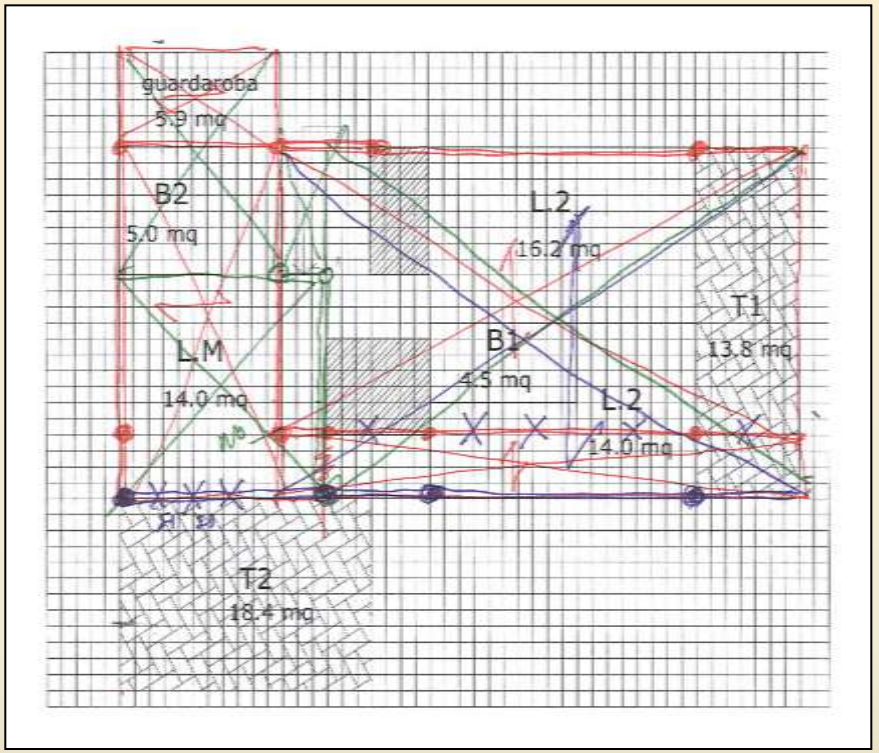
X-House – il punteggio

- Each actor, both during the development and in the final result, gives a mark.
- The score assigned to each individual project aspect is computed as the mean of the scores assigned according to criteria previously defined in a simplified and conventional manner by the individual actors
- assessment criteria and consequent scores achieved can vary in time and place, and are therefore highly contextualized. To satisfy this need different “weights” may be assigned to the scores
- The various assessments are conventional and scores assigned by the various actors are purely indicative although reasonable.
- The score for each actor ranks from 1 to 10
- luce netta del solaio < 5 m voto 8, 5m < slab < 6 m voto 7, 6m < slab voto 5

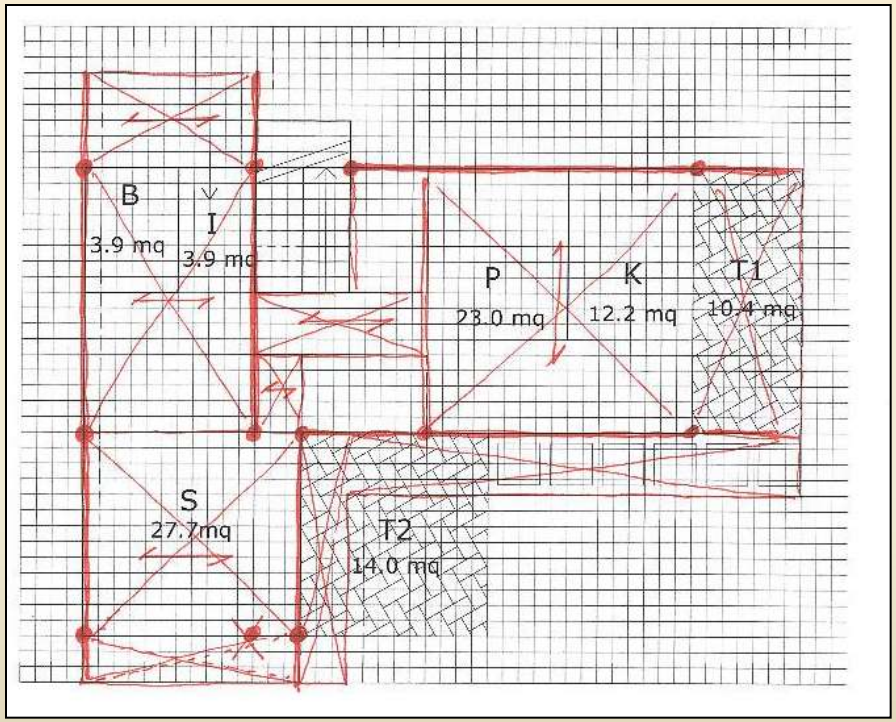
- The group wins when the overall score it reaches is over a minimum threshold related to the degree of difficulty selected; if several groups are present, the one obtaining the highest score wins

X-House – Spazio di Lavoro Progettuale attore: Ingegnere Strutturista

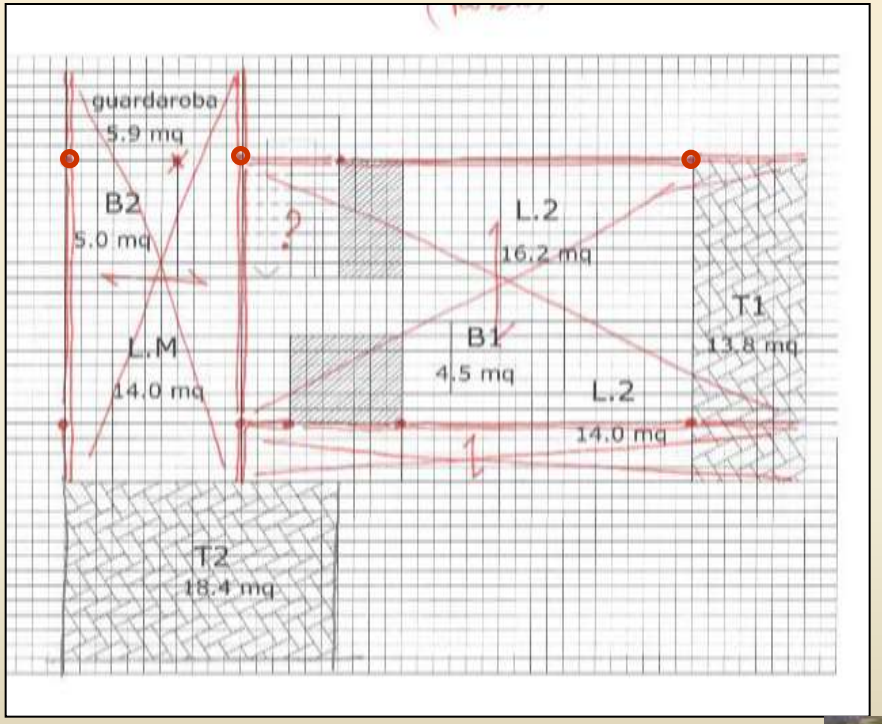




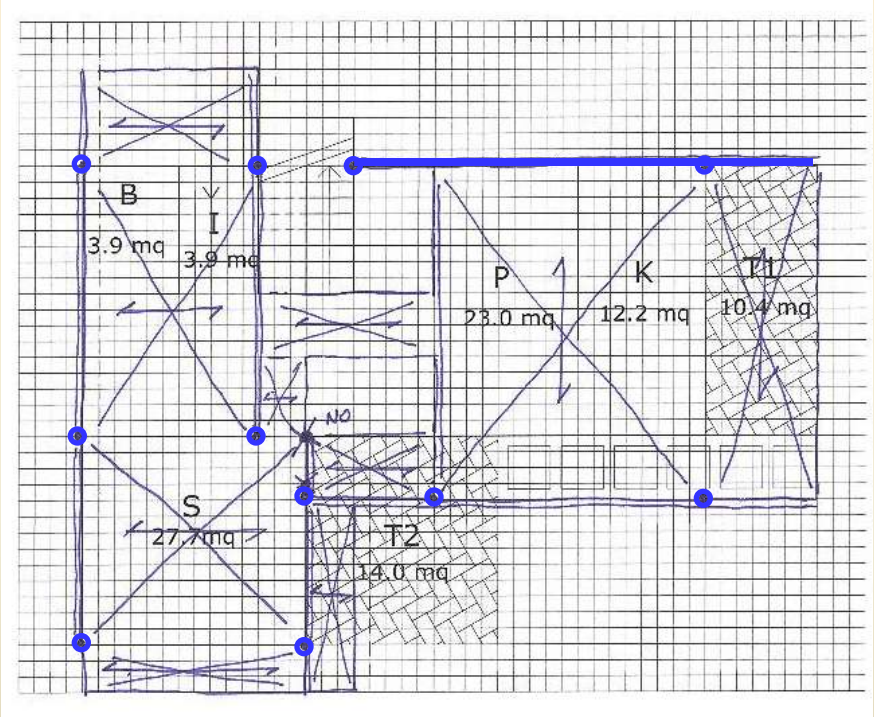
1^ Soluzione – solaio piano primo



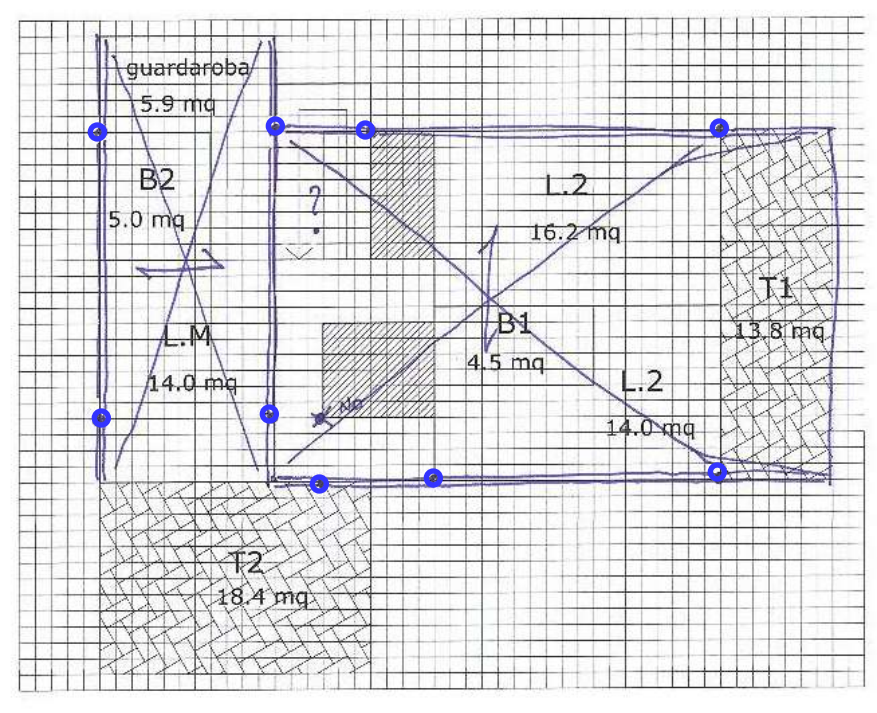
1^ Soluzione – solaio piano copertura



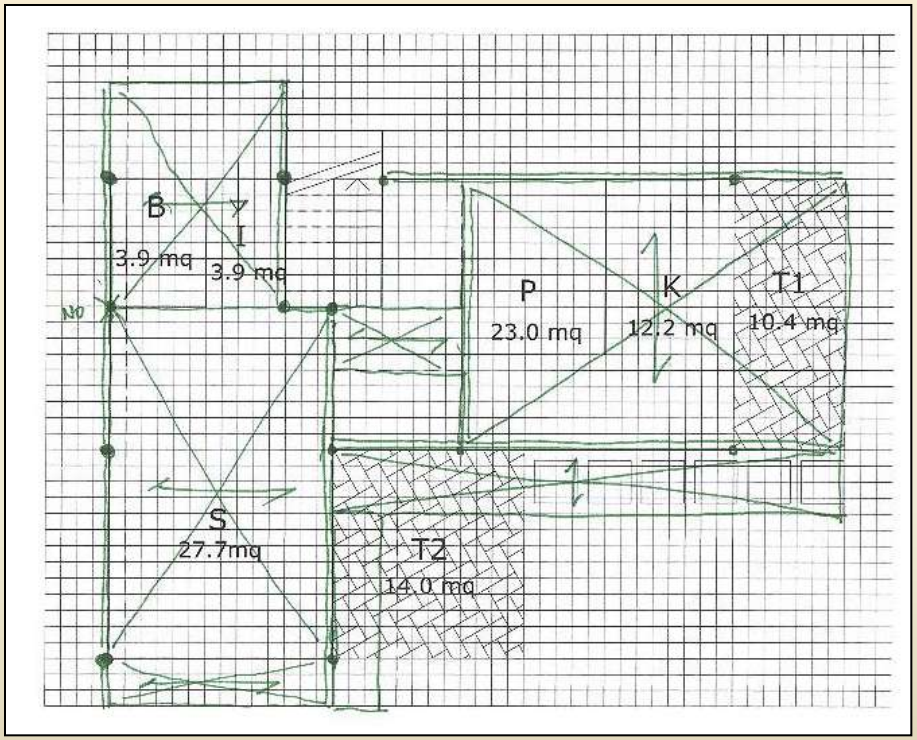
2^ Soluzione – solaio piano primo



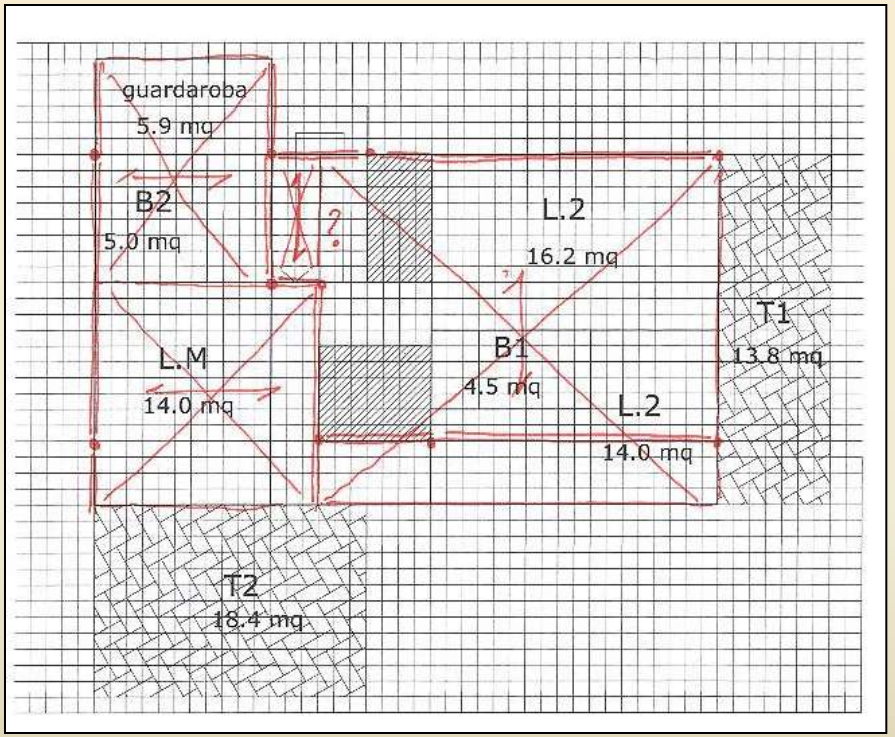
2^ Soluzione – solaio piano copertura



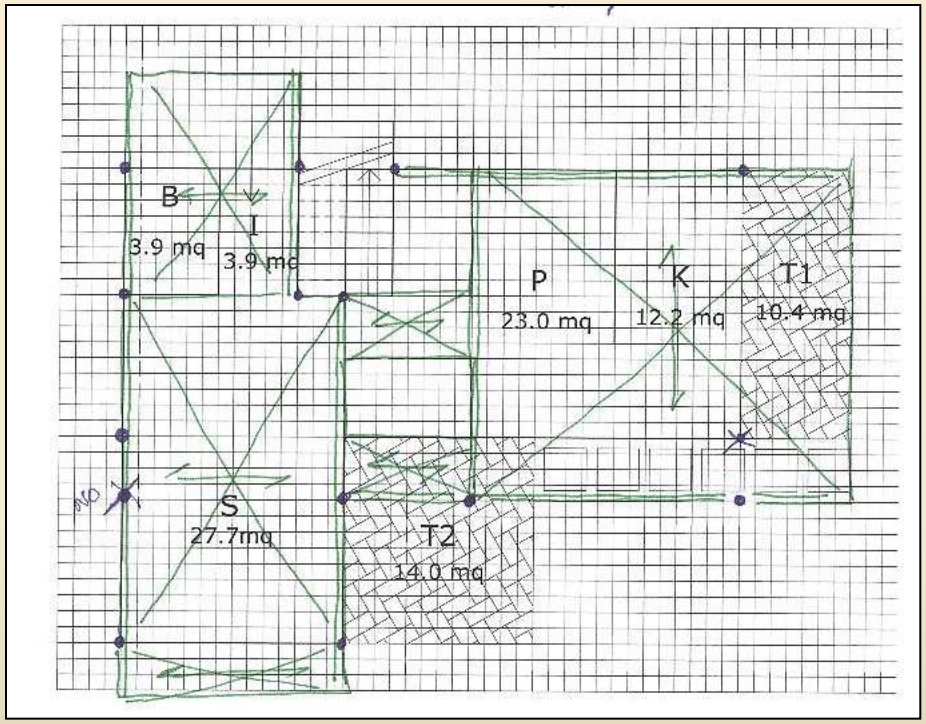
3^ Soluzione – solaio piano primo



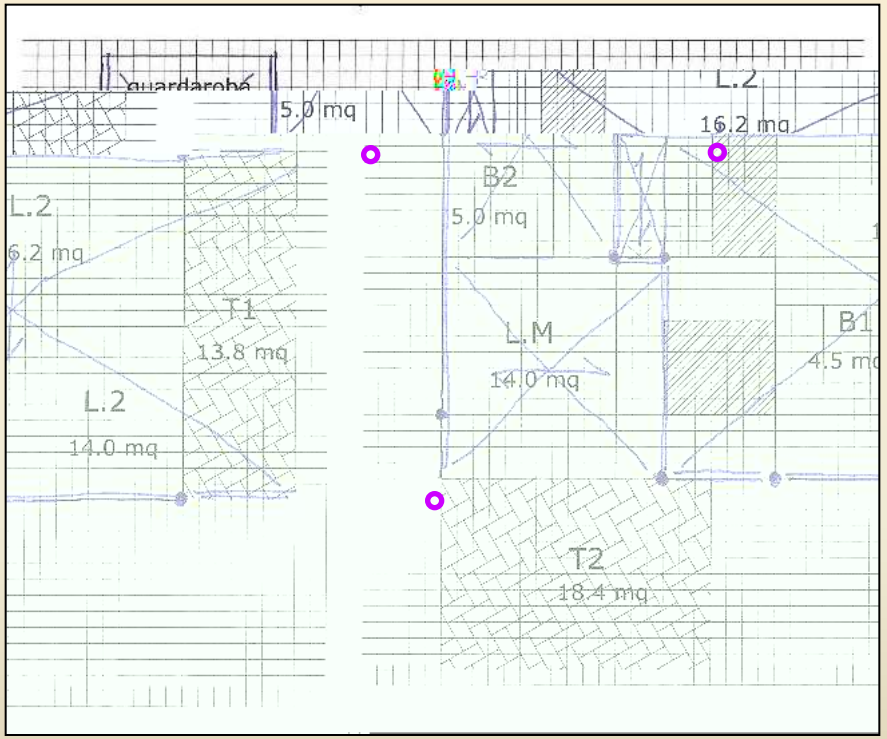
3^ Soluzione – solaio piano copertura



4^ Soluzione – solaio piano primo



4^ Soluzione – solaio piano copertura



Invarianti Metodologiche

1) Impostazione delle Linee di Costruzione

1a) Linee di Costruzione per ciascun “attore di spazi”, “attore di strutture”, “attore di impianti”

1b) Linee di Costruzione di un attore

Differente orientazione

Differente spaziatura

2) Identificazione degli spazi funzionali e vuoti nello schema delle piante

ignorando quelli identificati dagli altri attori

2a) Identificazione degli spazi funzionali e vuoti in elevazione (dalla sezione)

ignorando quelli identificati dagli altri attori

3) Allineamento delle Linee di Costruzione di volumi “pieni” (pareti opache)

3a) Allineamento di Linee di Costruzione di volumi “vuoti” (pareti trasparenti)

L'attore nel suo "Spazio di Lavoro Progettuale Personale" -PeDW,
per semplificare il suo lavoro opera sia su rappresentazioni volumetriche,
sia su superfici piane, attraverso una continua transizione tra queste,
associate o meno a programmi S/W

4) individuazione di "alcune" Linee di Costruzione che chiaramente non aumentino conflitti

   4a) Identificazione di Linee di Costruzione critiche = non allineamento di aree critiche

   4b) proposta di Linee di Costruzione alternative

5) impostazione sulle Linee di Costruzione alcuni punti fissi e altri variabili ove far convergere i carichi verticali

   5a) così definiti gli interasse si predimensionano le varie sezioni

6) Successivamente sistemazione delle travi o…

   6a) rivalutazione delle scelte strategiche

7) Spostamento delle Linee di Costruzione e gli spazi per regolarizzare i campi e "risquadrare" (regolarità geometrica ortogonale)

   7a) Inserimento di altri pilastri per evitare "rappezzi" e regolarizzare i campi strutturali