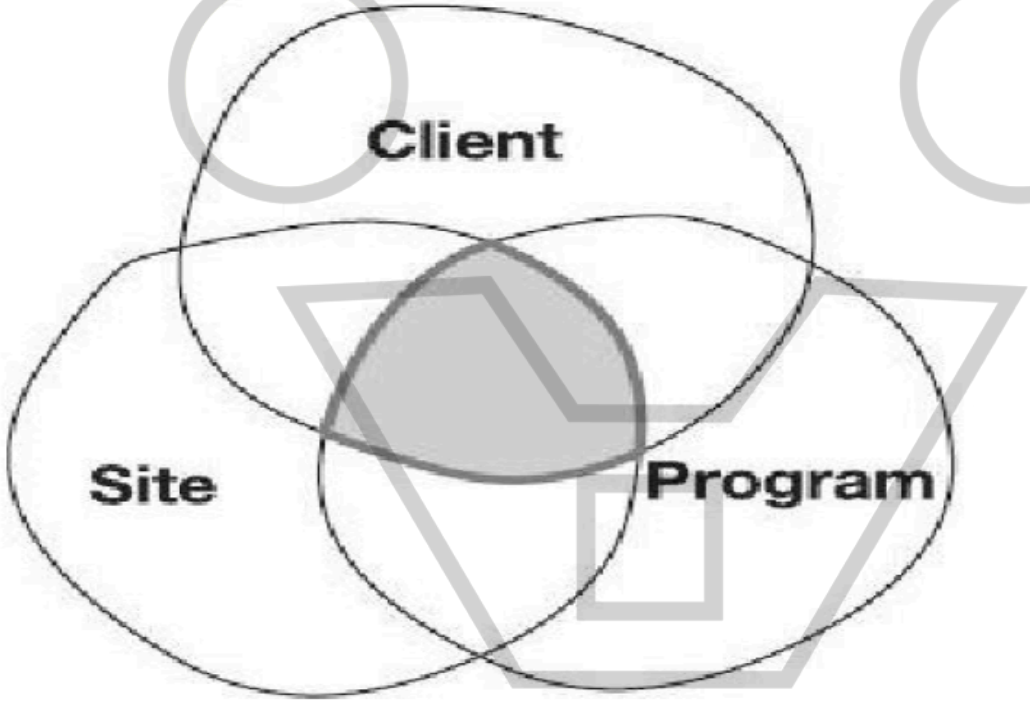
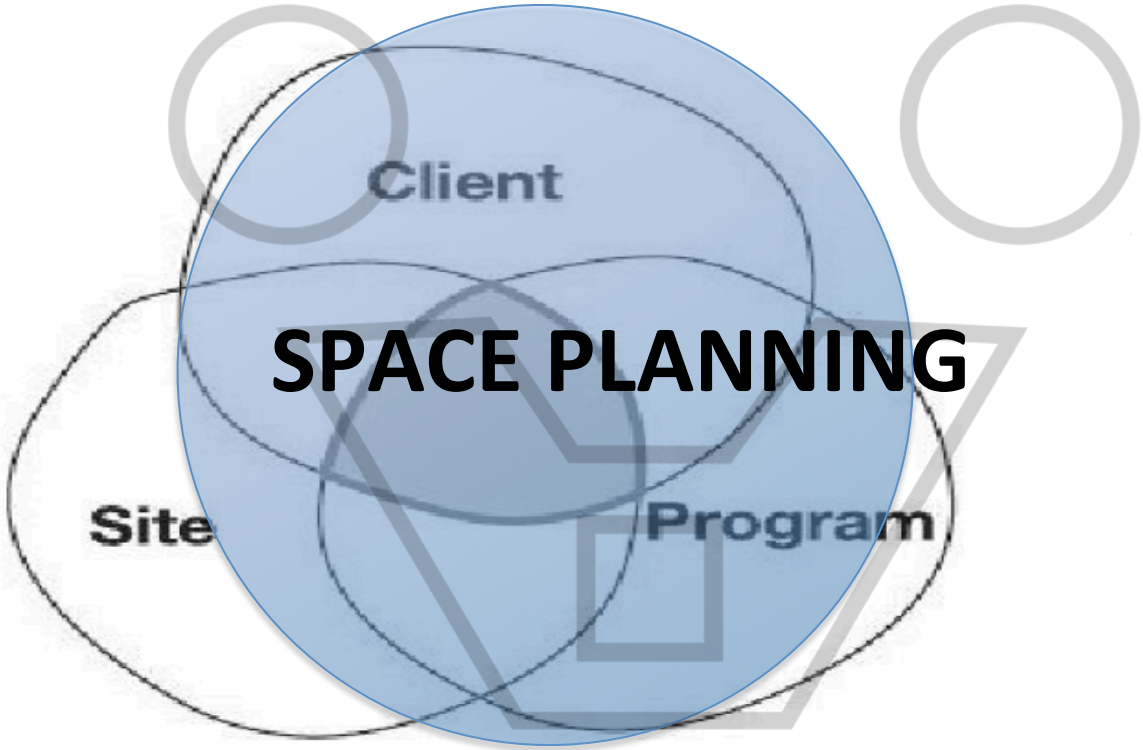
PROJECT MISSION STATEMENT, USERS' REQUIREMENTS MODELING & SPACE PROGRAM

- Architectural Brandscaping. Designing spatial experiences and architectural identity
- Space dimensioning and layout organization using digital tools
- Modeling human behaviours and computing users' comfort

SPACE DIMENSIONING AND LAYOUT ORGANIZATION

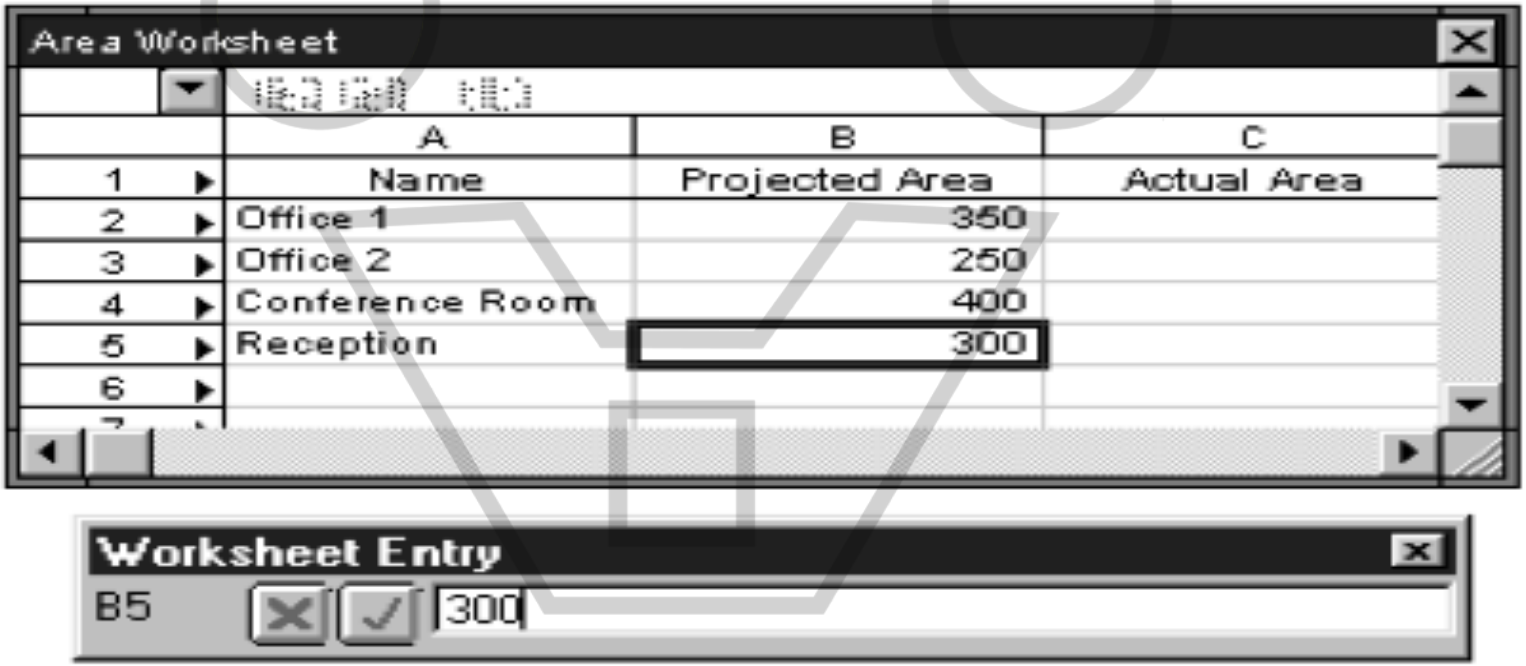
USING DIGITAL TOOLS


Client
Site
Program



SPACE PLANNING

SPACE PROGRAMMING: SPACE SPECIFICATION



SPACE PROGRAMMING: SPACE SPECIFICATION

Area Worksheet

	A	B	C
1	Name	Projected Area	Actual Area
2	Office 1	350	350
3	Office 2	250	250
4	Conference Room	400	517.46
5	Reception	300	300
6	Vestibule		230.48
7			

http://www.mailab.biz/space-planning-concept/

Space planning in early conceptual design: Tools & Tutorials

TOOL> TRELLIGENCE AFFINITY: EXTENDING BIM TO SPACE PROGRAMMING AND PLANNING

Trelligence is a Houston-based software company founded in early 2002 that is focused on enhancing the design process through tools for architectural programming, space planning and early conceptual and schematic design. Affinity is available as a stand-alone application or with plug-ins to the latest versions of Revit Architecture, ArchiCAD, and SketchUp.

TUTORIAL> SPACE PLANNING
Frank Brault

A video part series covering the basic features of the Space Planning suite in Vectorworks 2013.
Part 1 demonstrated creating Spaces with the Space tool, and creating Spaces from polygon objects using the Create Objects from Shapes menu command.
Part 2 demonstrates creating Spaces with Text files using the Import Adjacency Matrix command.
Part 3 demonstrates creating design layers to accommodate a space plan that occupied multiple floors or levels.
Part 5 demonstrates creating walls automatically from the completed Space object layout using the Create Walls from Spaces command.

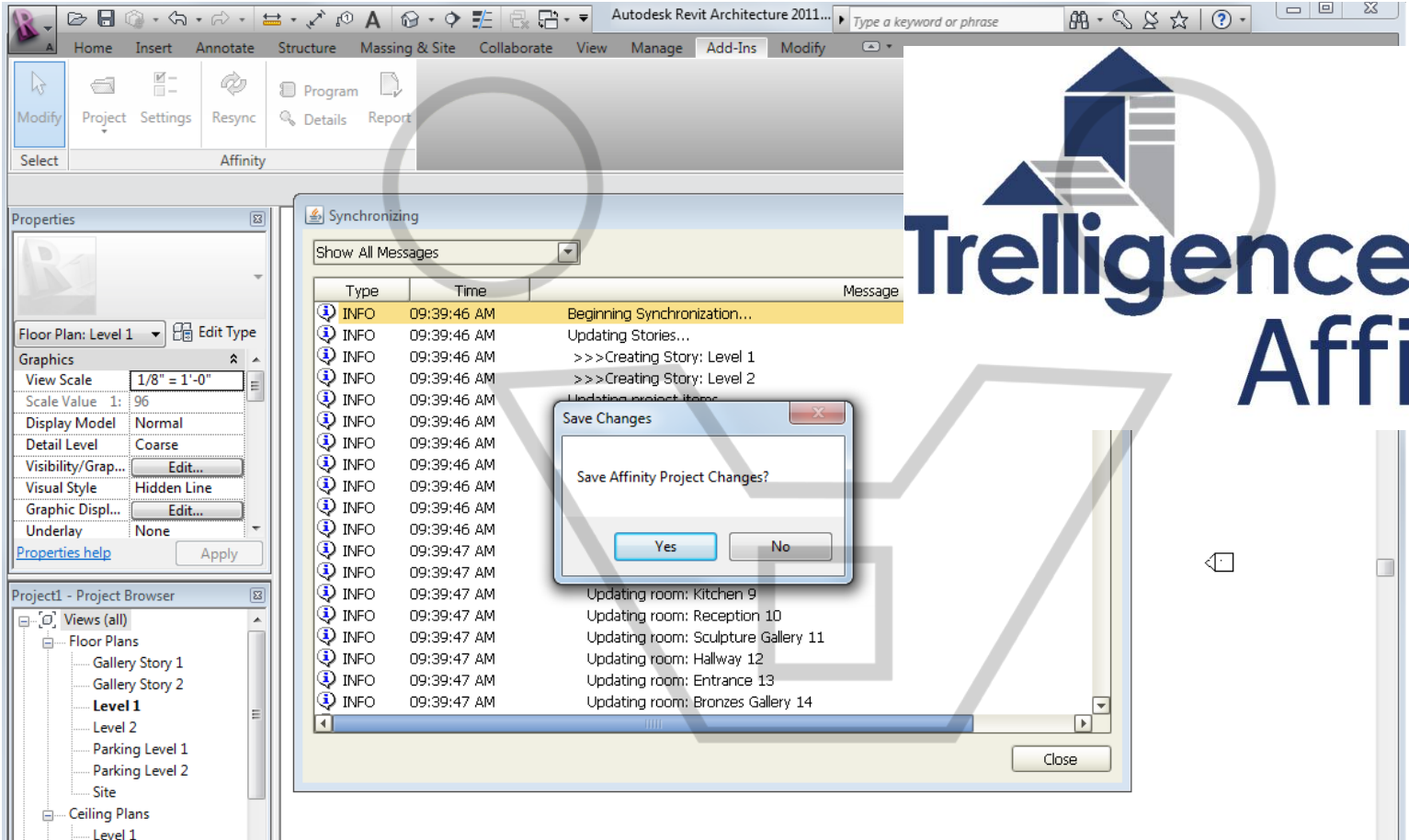
TUTORIAL> SYNTACTIC DESIGN
Pirouz Nourian

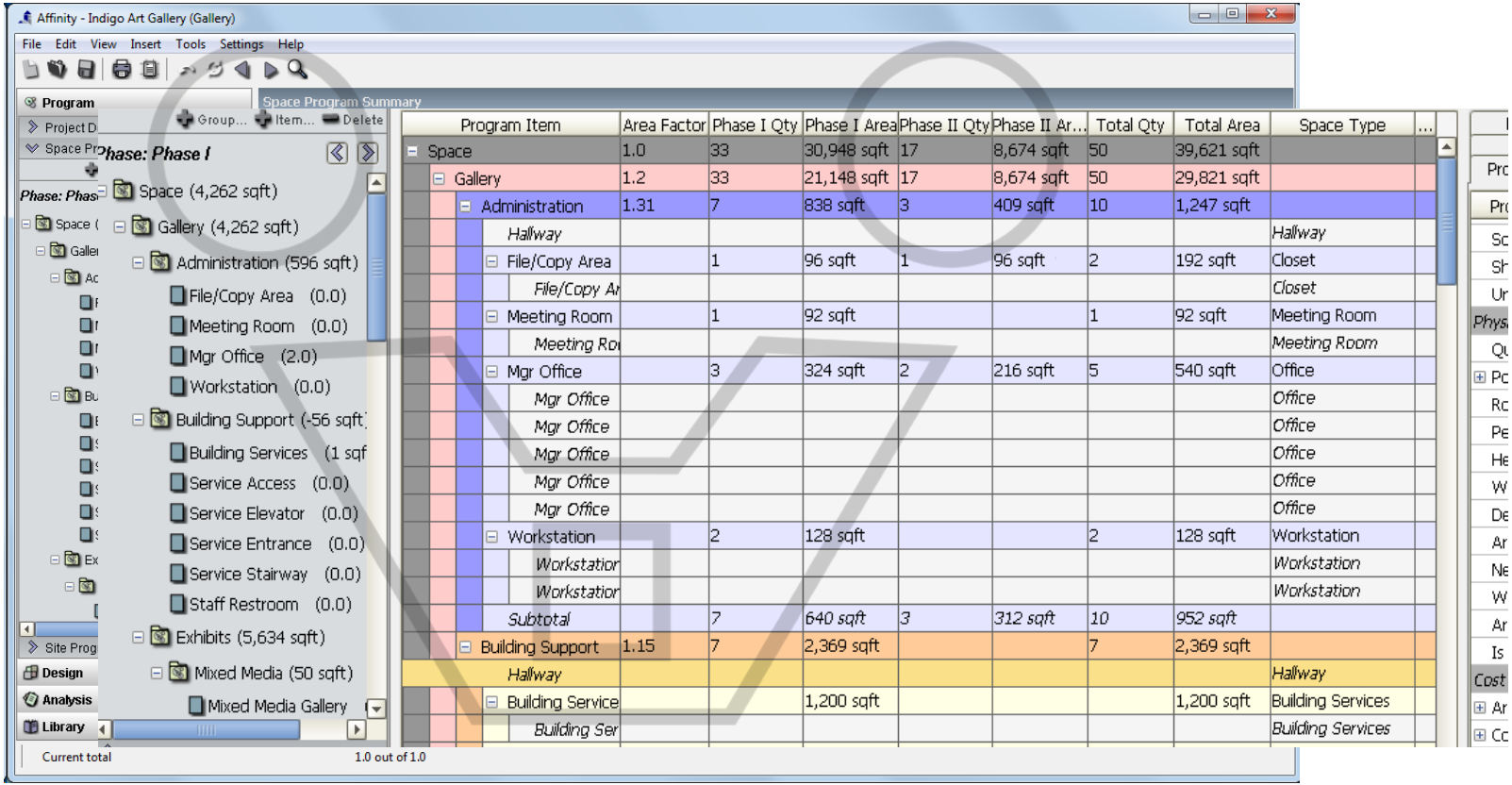
Syntactic Design* (Designing with Space Syntax) for Grasshopper. A plugin for configurative architectural design designed and made by Pirouz Nourian and Samaneh Rezvani.

** a Grasshopper plugin* ***(download)***

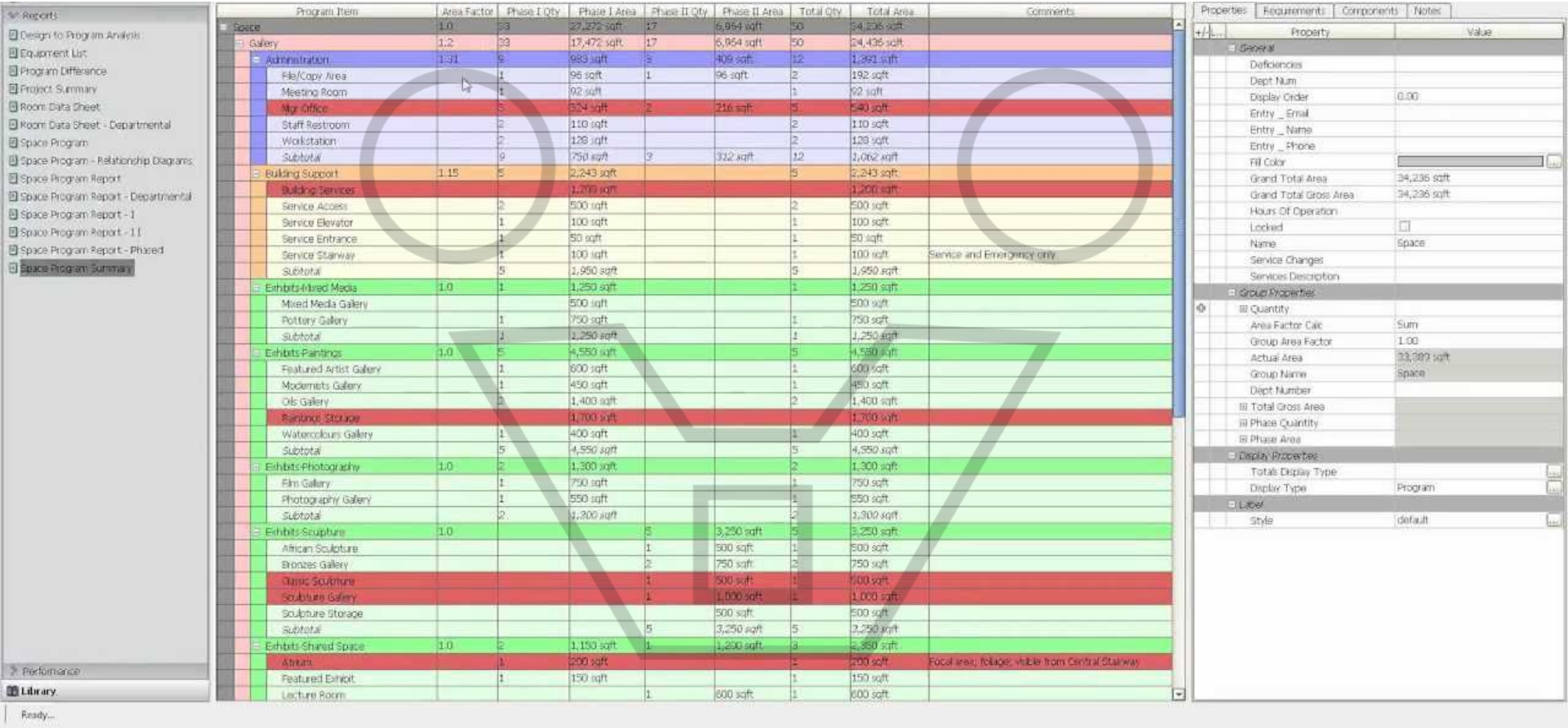
Guide>EGAN SPACE PLANNING
Peter Egan

The app is intended to help the user work in an intuitive and graphic way during early design. It allows for multiple rapid, lightweight iterations and reduces repetition and tedium in plan development. Helps keep track of program spaces during the design process and provides constant, graphic display of program reconciliation. The app also provides a rudimentary bubble diagram at each step along the way. The app will import a user defined space program in CSV format. Changes to the program can easily be made and re-imported.
** a Revit add-on* ***(download)***

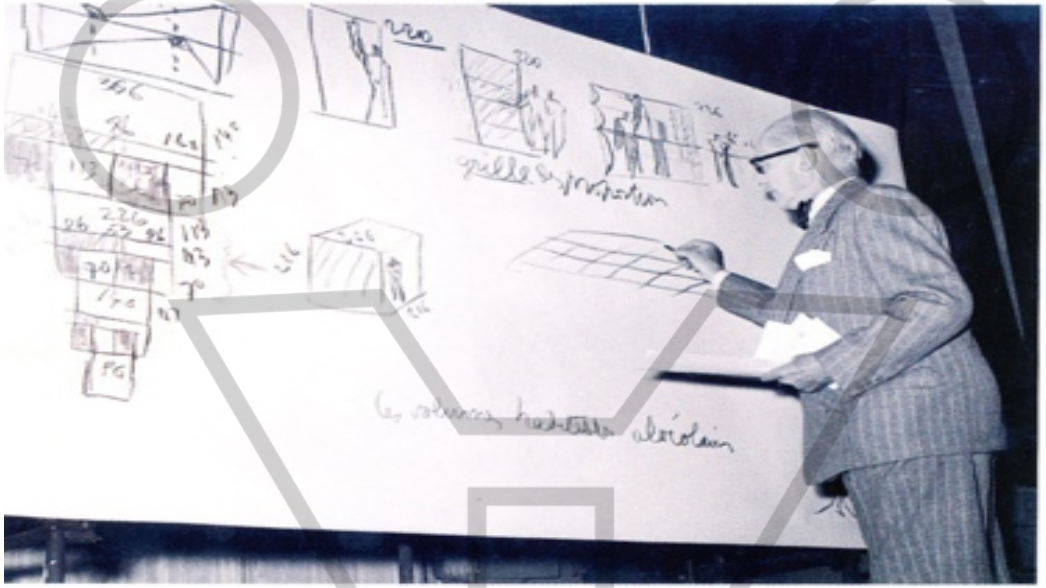

Autodesk Revit Architecture 2011...
Type a keyword or phrase
Home Insert Annotate Structure Massing & Site Collaborate View Manage Add-Ins Modify
Modify Project Settings Resync Program Details Report
Select Affinity
Properties
Floor Plan: Level 1 Edit Type
Graphics
View Scale 1/8" = 1'-0"
Scale Value 1: 96
Display Model Normal
Detail Level Coarse
Visibility/Grap... Edit...
Visual Style Hidden Line
Graphic Displ... Edit...
Underlay None
Properties help Apply
Project1 - Project Browser
Views (all)
Floor Plans
Gallery Story 1
Gallery Story 2
Level 1
Level 2
Parking Level 1
Parking Level 2
Site
Ceiling Plans
Level 1
Synchronizing
Show All Messages
Type Time Message
INFO 09:39:46 AM Beginning Synchronization...
INFO 09:39:46 AM Updating Stories...
INFO 09:39:46 AM >>>Creating Story: Level 1
INFO 09:39:46 AM >>>Creating Story: Level 2
INFO 09:39:46 AM Updating project items...
INFO 09:39:46 AM Updating room: Kitchen 9
INFO 09:39:47 AM Updating room: Reception 10
INFO 09:39:47 AM Updating room: Sculpture Gallery 11
INFO 09:39:47 AM Updating room: Hallway 12
INFO 09:39:47 AM Updating room: Entrance 13
INFO 09:39:47 AM Updating room: Bronzes Gallery 14
Close
Save Changes
Save Affinity Project Changes?
Yes
No
Trelligence™
Affinity



Program Item	Area Factor	Phase I Qty	Phase I Area	Phase II Qty	Phase II Ar...	Total Qty	Total Area	Space Type
Space	1.0	33	30,948 sqft	17	8,674 sqft	50	39,621 sqft	
Gallery	1.2	33	21,148 sqft	17	8,674 sqft	50	29,821 sqft	
Administration	1.31	7	838 sqft	3	409 sqft	10	1,247 sqft	
Hallway								*Hallway*
File/Copy Area		1	96 sqft	1	96 sqft	2	192 sqft	Closet
File/Copy Ar								*Closet*
Meeting Room		1	92 sqft			1	92 sqft	Meeting Room
Meeting Ro								*Meeting Room*
Mgr Office		3	324 sqft	2	216 sqft	5	540 sqft	Office
Mgr Office								*Office*
Mgr Office								*Office*
Mgr Office								*Office*
Mgr Office								*Office*
Mgr Office								*Office*
Workstation		2	128 sqft			2	128 sqft	Workstation
Workstatior								*Workstation*
Workstatior								*Workstation*
Subtotal		7	*640 sqft*	3	*312 sqft*	10	*952 sqft*	
Building Support	1.15	7	2,369 sqft			7	2,369 sqft	
Hallway								*Hallway*
Building Service			1,200 sqft				1,200 sqft	Building Services
Building Ser								*Building Services*


Reports
Design to Program Analysis
Equipment List
Program Difference
Project Summary
Room Data Sheet
Room Data Sheet - Departmental
Space Program
Space Program - Relationship Diagrams
Space Program Report
Space Program Report - Departmental
Space Program Report - I
Space Program Report - II
Space Program Report - Phased
Space Program Summary
Performance
Library
Ready...
Program Item
Area Factor
Phase I Qty
Phase I Area
Phase II Qty
Phase II Area
Total Qty
Total Area
Comments
Space 1.0 53 27,272 sqft 17 6,964 sqft 50 34,236 sqft
Gallery 1.2 33 17,472 sqft 17 6,964 sqft 50 24,436 sqft
Administration 1.31 9 983 sqft 3 409 sqft 12 1,392 sqft
File/Copy Area 1 96 sqft 1 96 sqft 2 192 sqft
Meeting Room 1 92 sqft 1 92 sqft
Mgr Office 5 524 sqft 2 216 sqft 5 540 sqft
Staff Restroom 2 110 sqft 2 110 sqft
Workstation 2 128 sqft 2 128 sqft
Subtotal 9 750 sqft 3 312 sqft 12 1,062 sqft
Building Support 1.15 5 2,243 sqft 5 2,243 sqft
Building Services 1,200 sqft 1,200 sqft
Service Access 2 500 sqft 2 500 sqft
Service Elevator 1 100 sqft 1 100 sqft
Service Entrance 1 50 sqft 1 50 sqft
Service Stairway 1 100 sqft 1 100 sqft Service and Emergency only
Subtotal 5 1,950 sqft 5 1,950 sqft
Exhibits-Mixed Media 1.0 1 1,250 sqft 1 1,250 sqft
Mixed Media Gallery 500 sqft 500 sqft
Pottery Gallery 1 750 sqft 1 750 sqft
Subtotal 1 1,250 sqft 1 1,250 sqft
Exhibits-Paintings 1.0 5 4,550 sqft 5 4,550 sqft
Featured Artist Gallery 1 600 sqft 1 600 sqft
Modernists Gallery 1 450 sqft 1 450 sqft
Oils Gallery 2 1,400 sqft 2 1,400 sqft
Paintings Storage 1,700 sqft 1,700 sqft
Watercolours Gallery 1 400 sqft 1 400 sqft
Subtotal 5 4,550 sqft 5 4,550 sqft
Exhibits-Photography 1.0 2 1,300 sqft 2 1,300 sqft
Film Gallery 1 750 sqft 1 750 sqft
Photography Gallery 1 550 sqft 1 550 sqft
Subtotal 2 1,300 sqft 2 1,300 sqft
Exhibits-Sculpture 1.0 5 3,250 sqft 5 3,250 sqft
African Sculpture 1 500 sqft 1 500 sqft
Bronzes Gallery 2 750 sqft 2 750 sqft
Classic Sculpture 1 500 sqft 1 500 sqft
Sculpture Gallery 1 1,000 sqft 1 1,000 sqft
Sculpture Storage 500 sqft 500 sqft
Subtotal 5 3,250 sqft 5 3,250 sqft
Exhibits-Shared Space 1.0 2 1,150 sqft 1 1,250 sqft 3 2,350 sqft
Atrium 1 200 sqft 1 200 sqft Focal area; foliage; visible from Central Stairway
Featured Exhibit 1 150 sqft 1 150 sqft
Lecture Room 1 600 sqft 1 600 sqft
Properties
Requirements
Components
Notes
Property
Value
General
Deficiencies
Dept Num
Display Order 0.00
Entry _ Email
Entry _ Name
Entry _ Phone
Fill Color
Grand Total Area 34,236 sqft
Grand Total Gross Area 34,236 sqft
Hours Of Operation
Locked
Name Space
Service Changes
Services Description
Group Properties
Quantity
Area Factor Calc Sum
Group Area Factor 1.00
Actual Area 33,397 sqft
Group Name Space
Dept Number
Total Gross Area
Phase Quantity
Phase Area
Display Properties
Totals Display Type
Display Type Program
Label
Style default

SPACE PROGRAMMING: LAY OUT ORGANIZATION



Le Corbusier making a presentation at the Triennale, Milan, 1951. He often lectured on architecture, using and making diagrams on the spot. © FLC/ADAGP, Paris and DACS, London 2008.

SPACE PROGRAMMING: LAY OUT ORGANIZATION

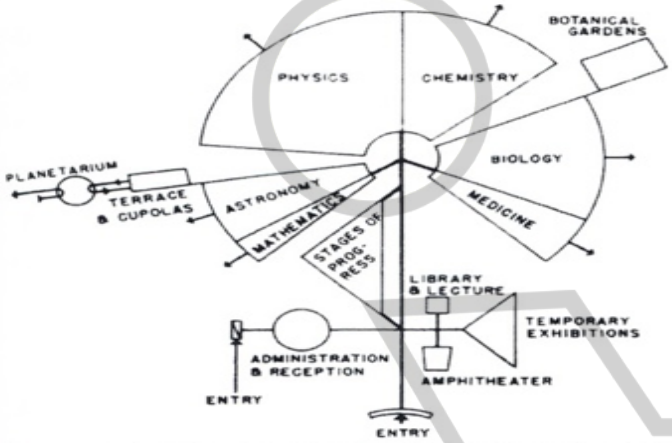
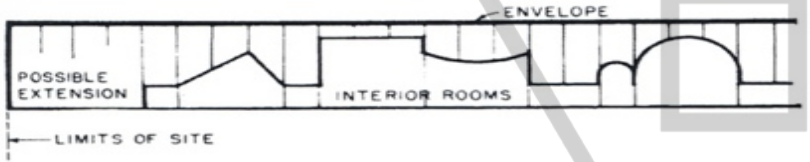
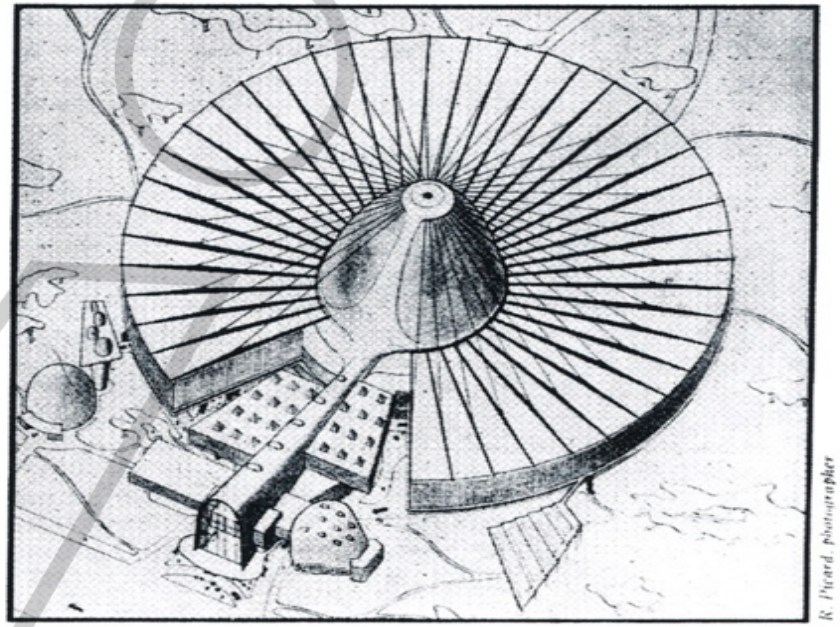


Diagram showing functional relationships of areas

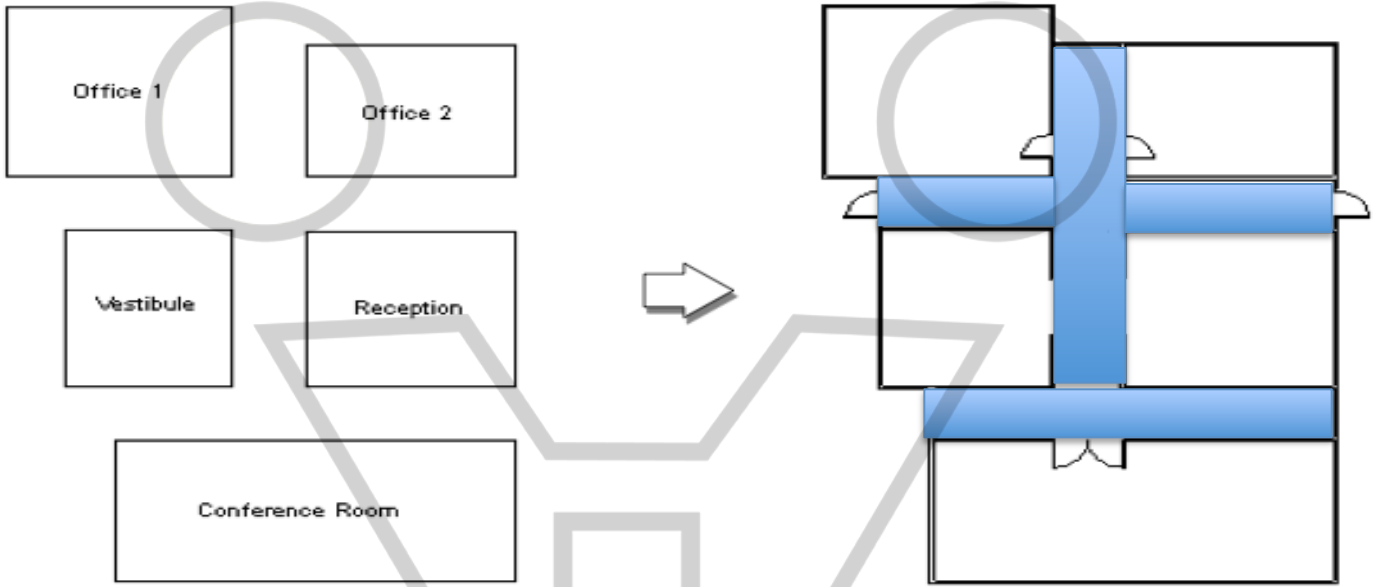


Envelope



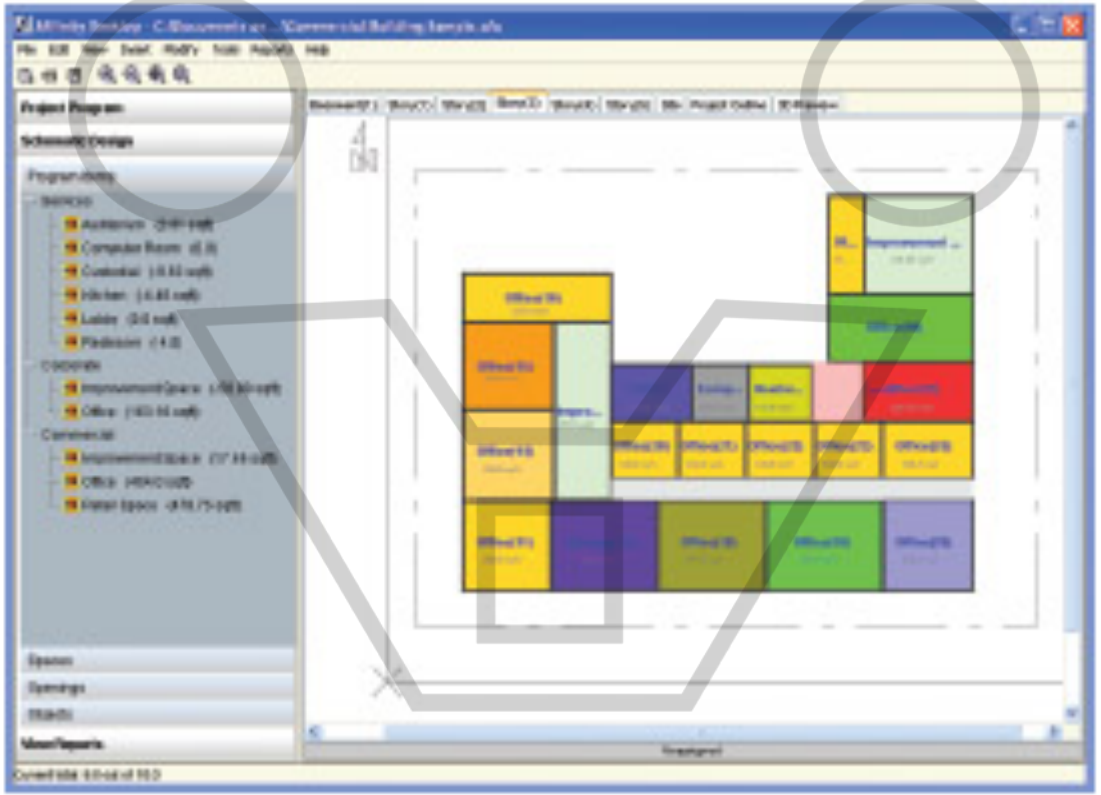
Perspective view from entrance side

Figure 8 Paul Nelson, 'Museum of Science' (or Palace of Discovery). From *Architectural Record*, February 1939. Proposed for the 1937 Exposition Internationale, Paris.

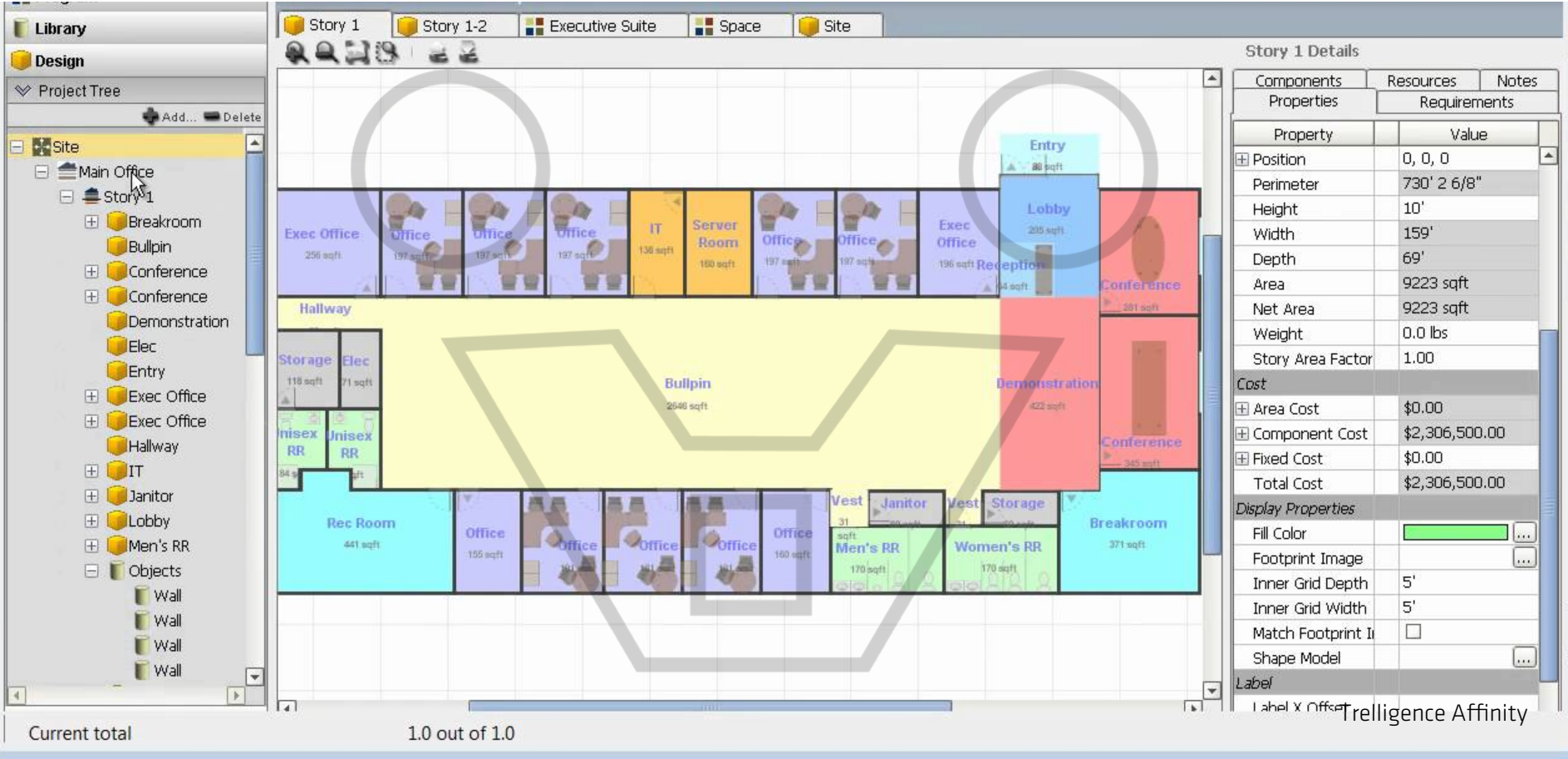


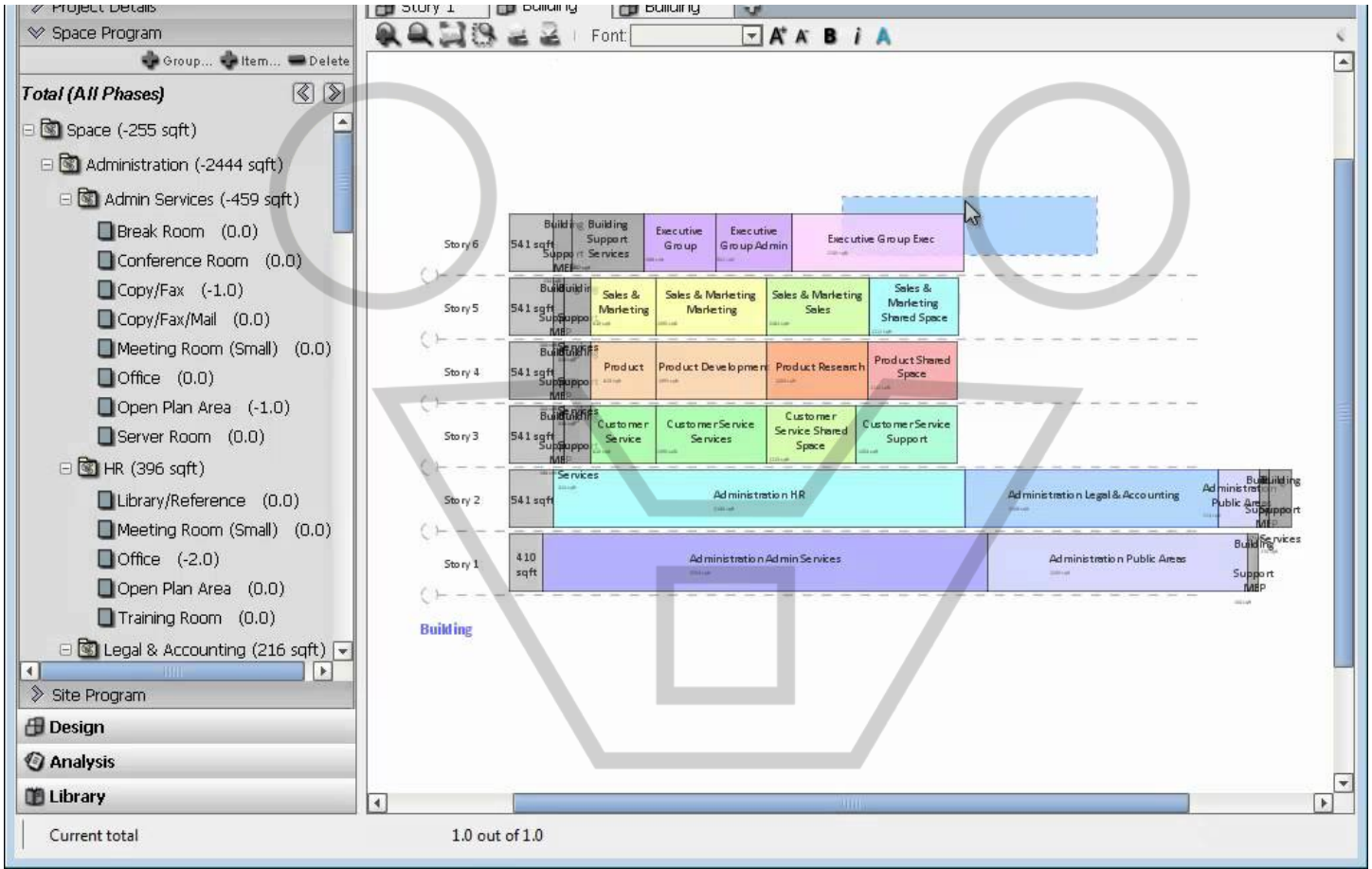
T4R___http://www.aecbytes.com/review/2016/Archetris.html

SPACE PROGRAMMING: LAY OUT ORGANIZATION



Trelligence Affinity


Library
Design
Project Tree
Add...
Delete
Site
Main Office
Story 1
Breakroom
Bullpin
Conference
Conference
Demonstration
Elec
Entry
Exec Office
Exec Office
Hallway
IT
Janitor
Lobby
Men's RR
Objects
Wall
Wall
Wall
Wall
Story 1
Story 1-2
Executive Suite
Space
Site
Story 1 Details
Components
Resources
Notes
Properties
Requirements
Property
Value
Position
0, 0, 0
Perimeter
730' 2 6/8"
Height
10'
Width
159'
Depth
69'
Area
9223 sqft
Net Area
9223 sqft
Weight
0.0 lbs
Story Area Factor
1.00
Cost
Area Cost
$0.00
Component Cost
$2,306,500.00
Fixed Cost
$0.00
Total Cost
$2,306,500.00
Display Properties
Fill Color
Footprint Image
Inner Grid Depth
5'
Inner Grid Width
5'
Match Footprint I
Shape Model
Label
Entry
Lobby
Exec Office
Office
Office
Office
IT
Server Room
Office
Office
Exec Office
Reception
Conference
Hallway
Storage
Elec
Bullpin
Demonstration
Conference
Unisex RR
Unisex RR
Rec Room
Office
Office
Office
Office
Office
Vest
Janitor
Vest
Storage
Men's RR
Women's RR
Breakroom
Current total
1.0 out of 1.0
Trelligence Affinity



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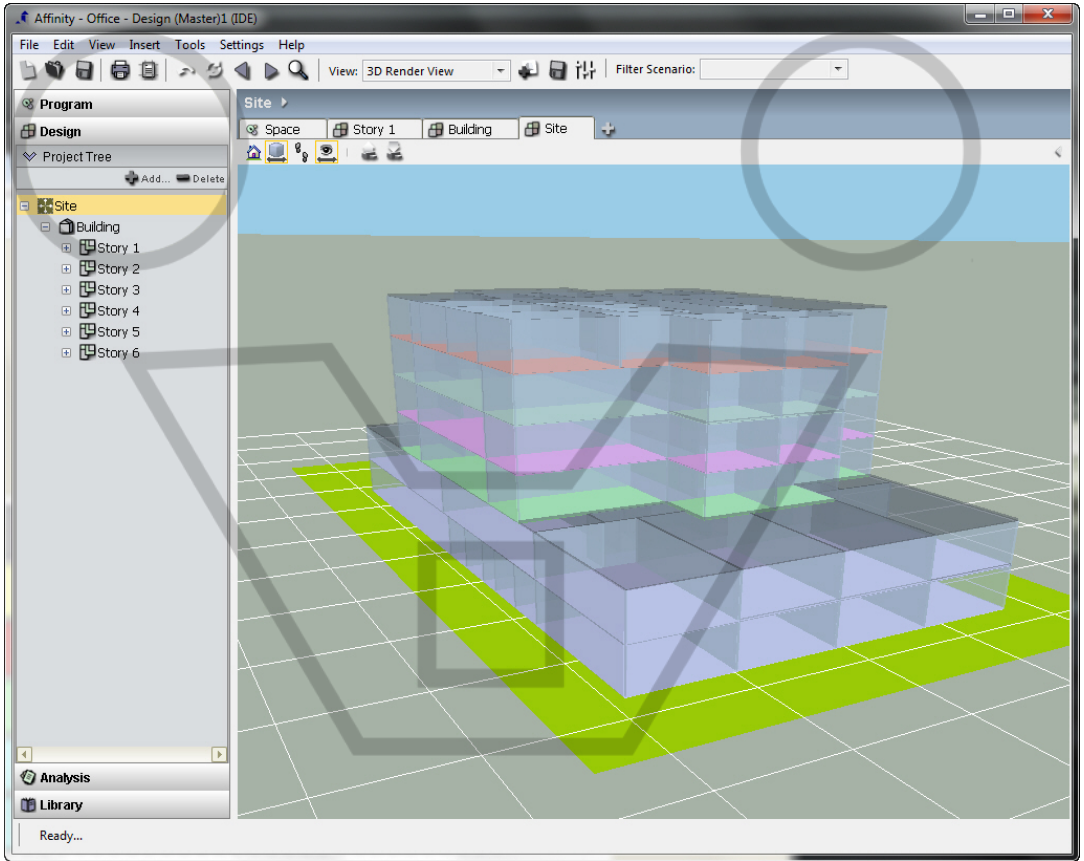

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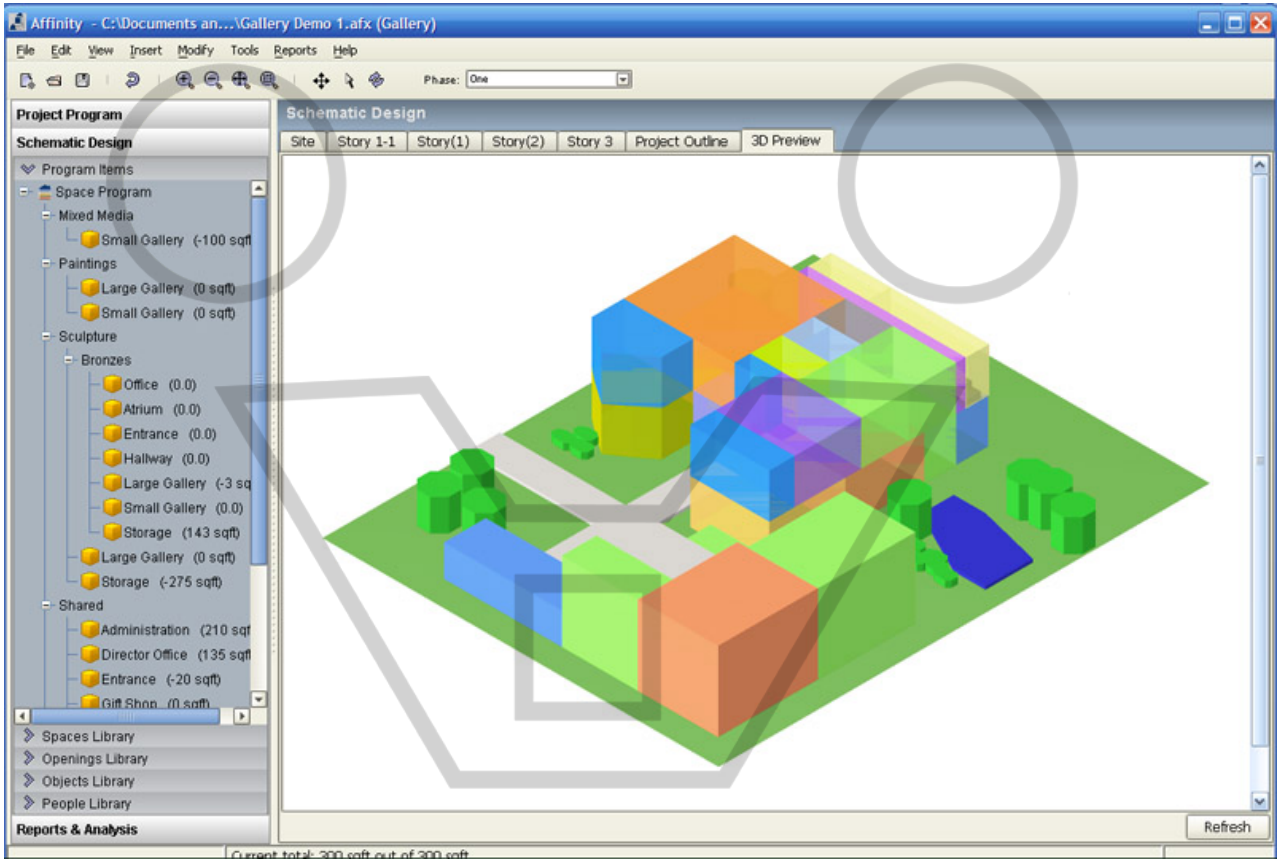

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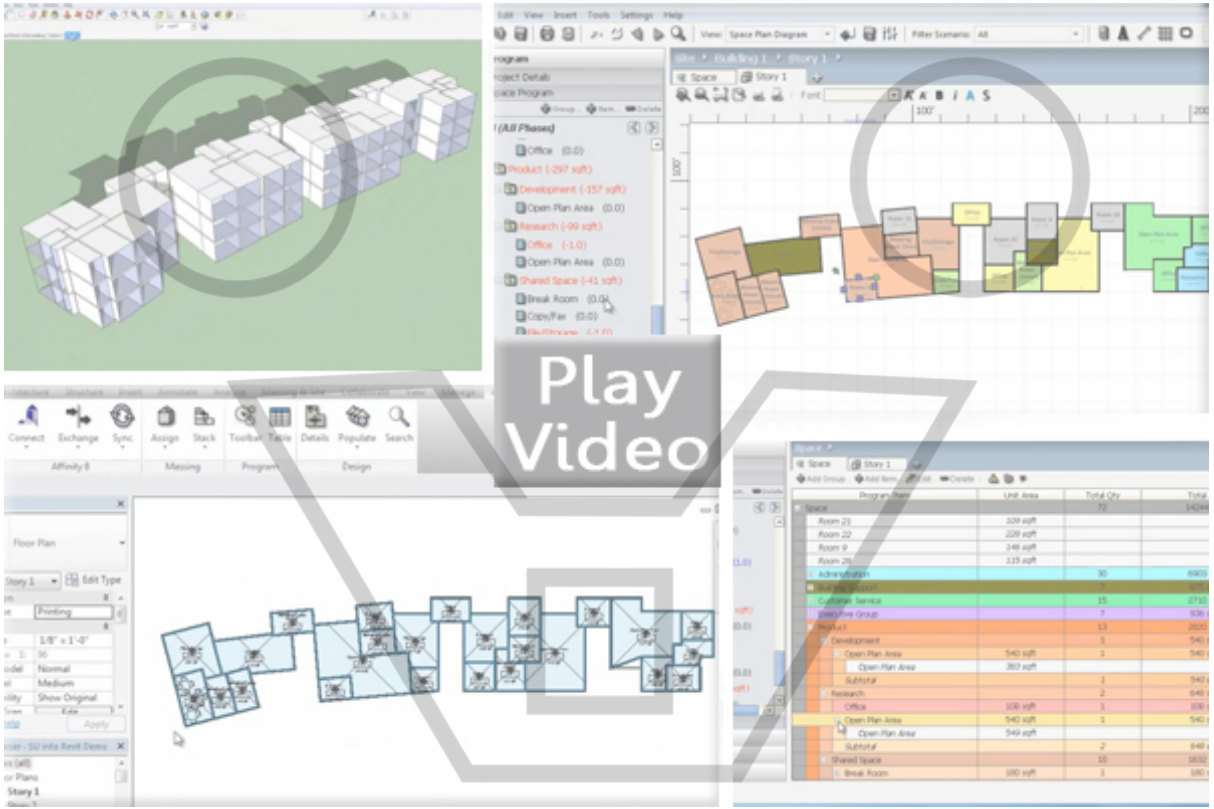
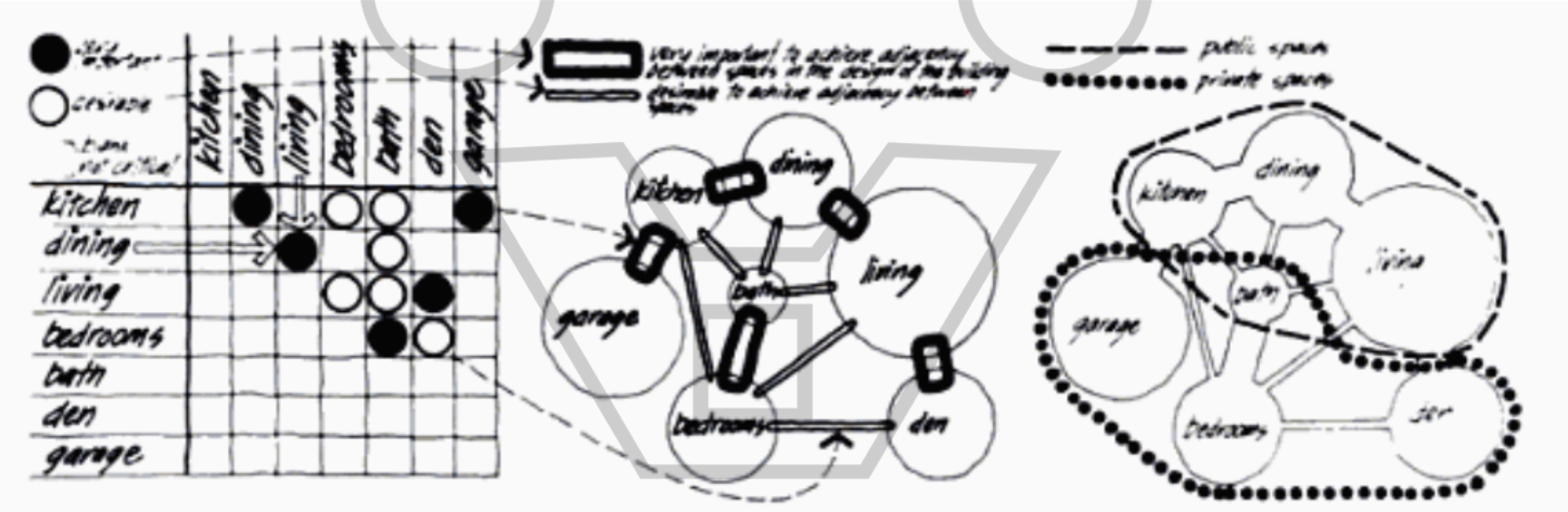


Trelligence Affinity

SPACE PLANNING: SPACE ADJACENCY & CLUSTERING



CLUSTER ANALYSIS

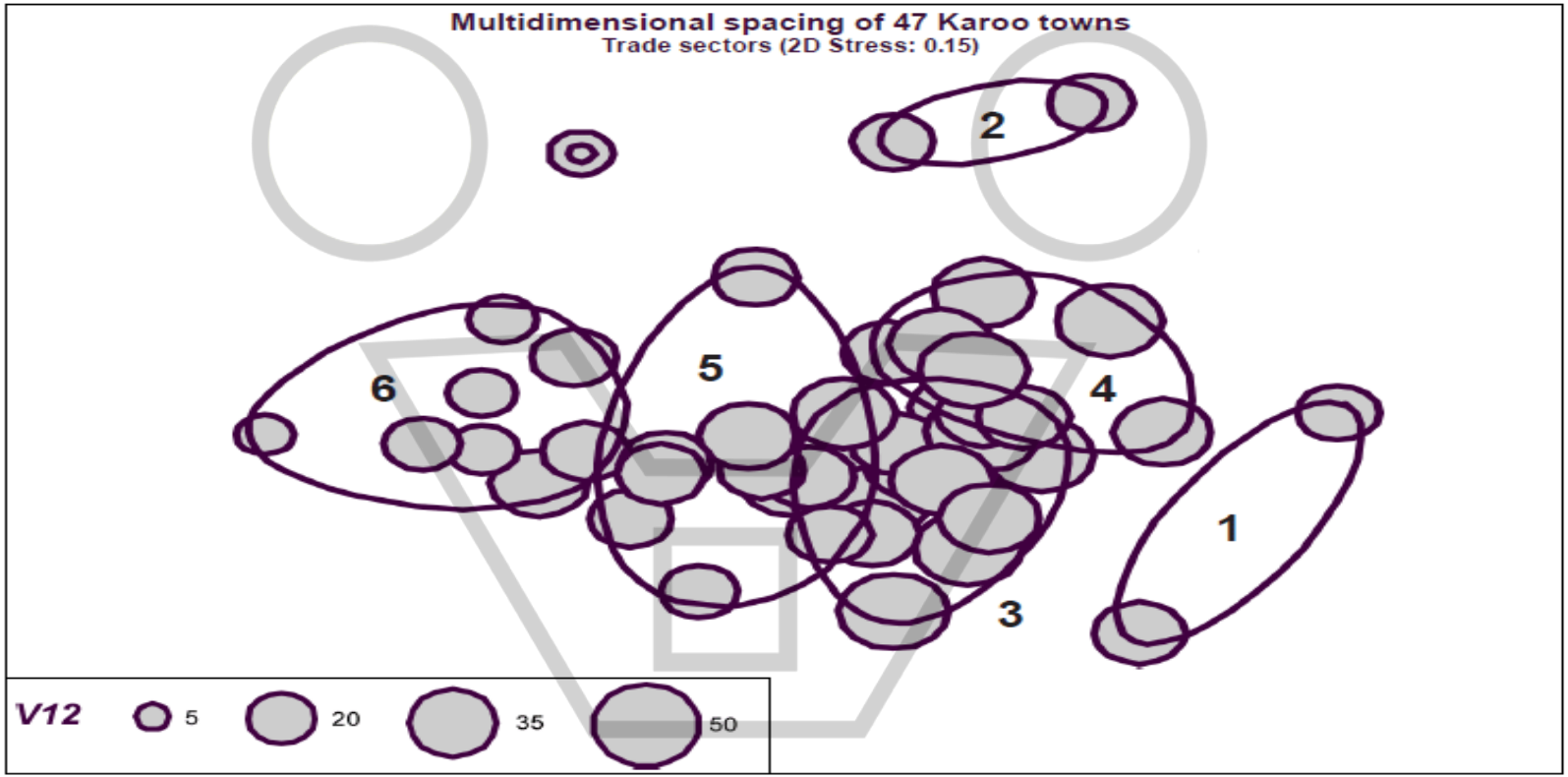
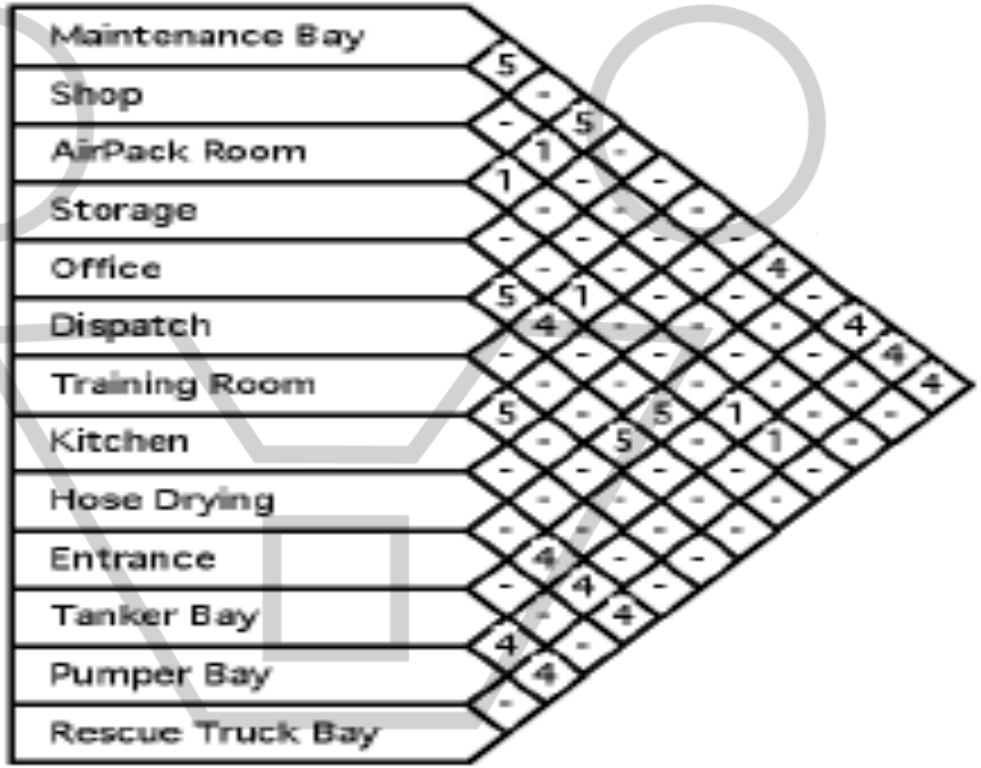
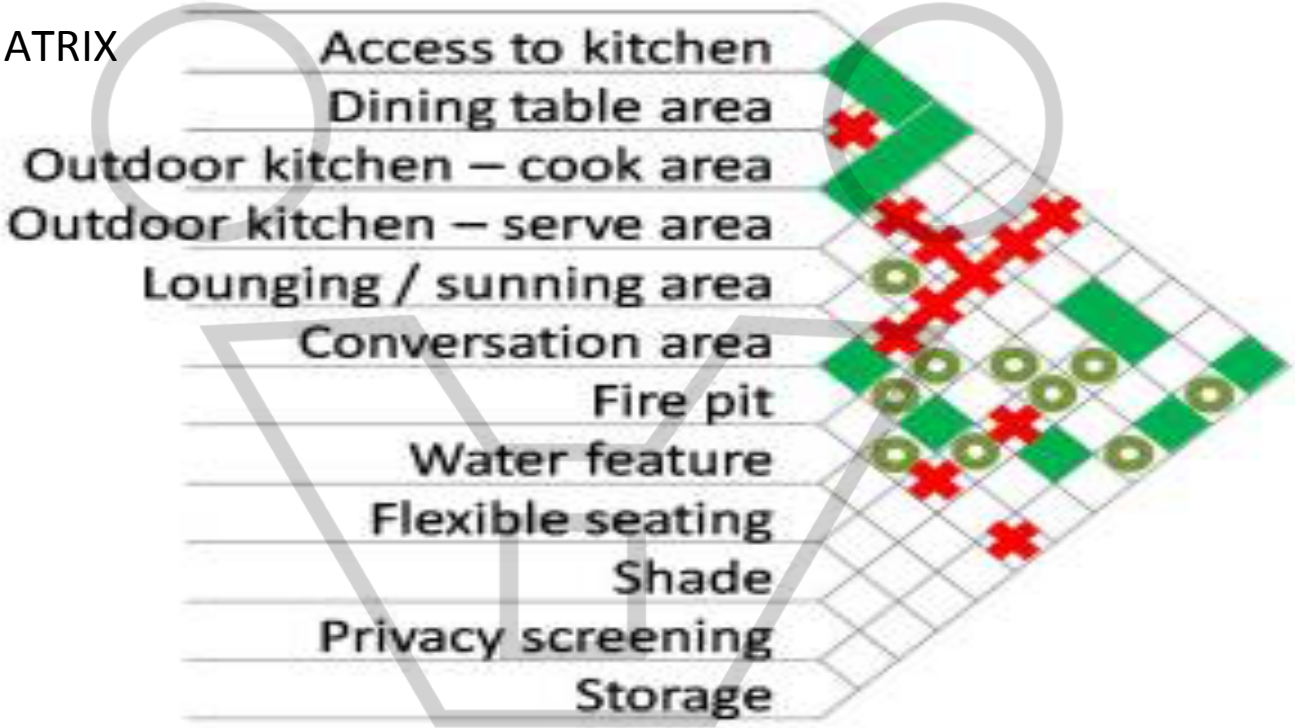


FIGURE 6
Multidimensional spacing plot of the trade sectors of the different clusters

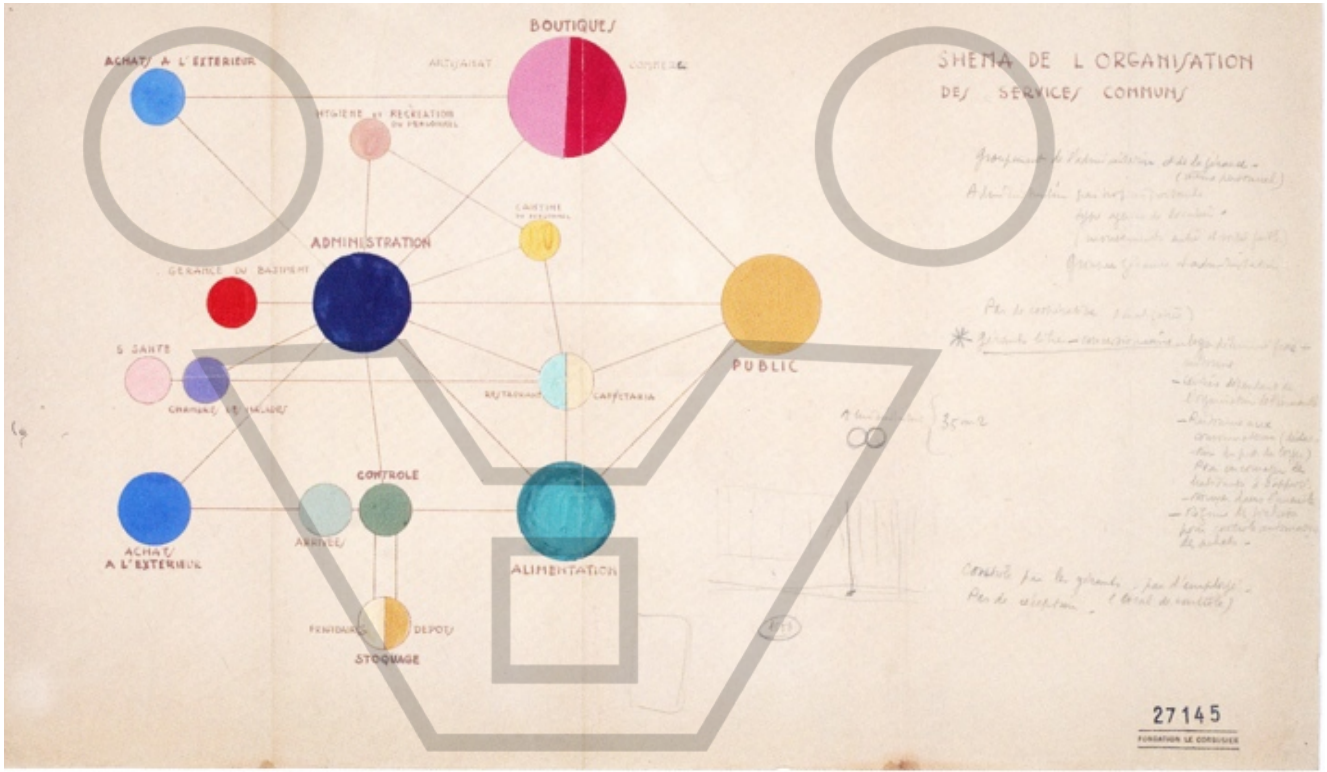
ADJACENCY MATRIX



ADJACENCY MATRIX

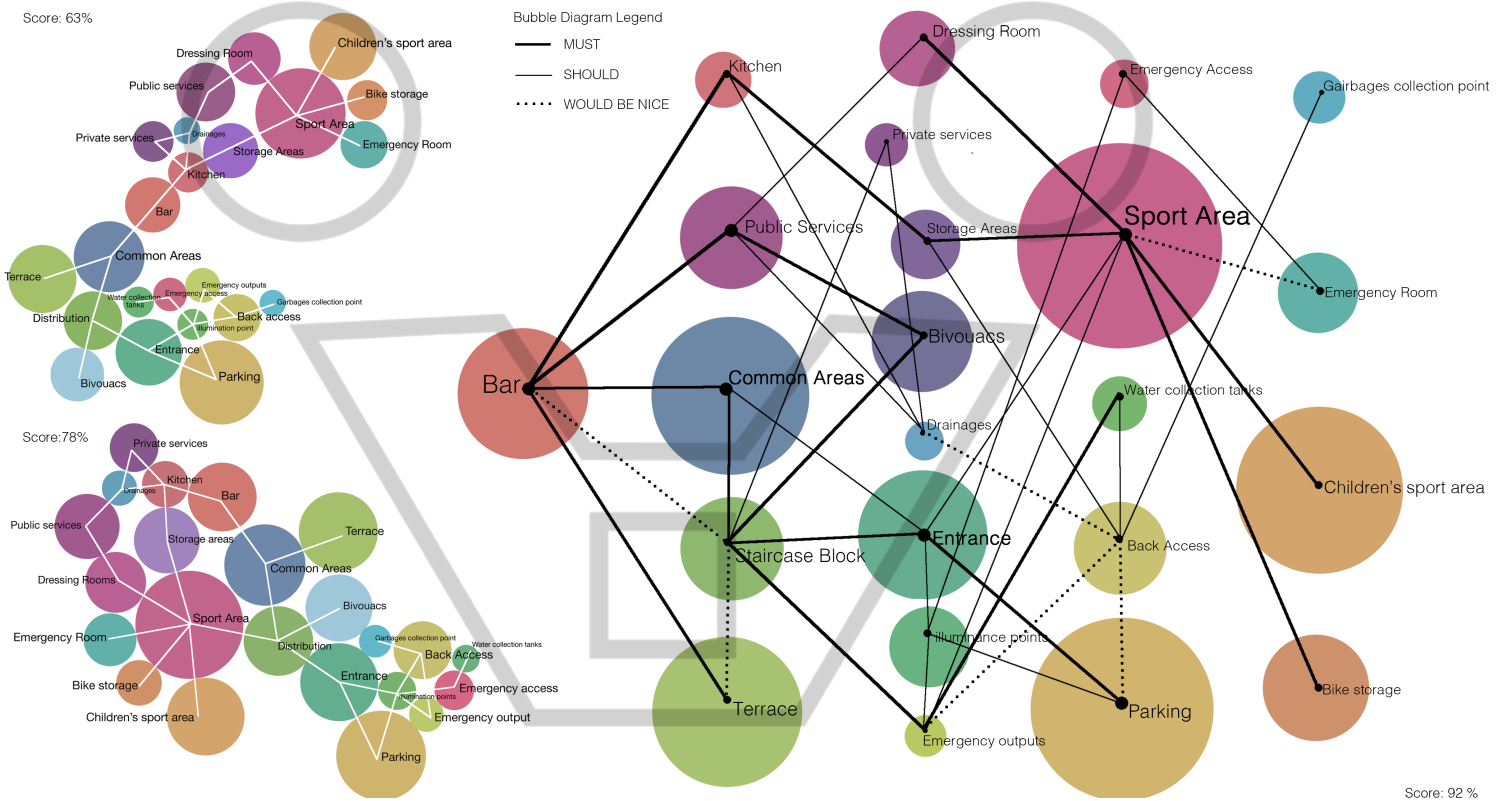


BUBBLE GRAPH VISUALIZATION

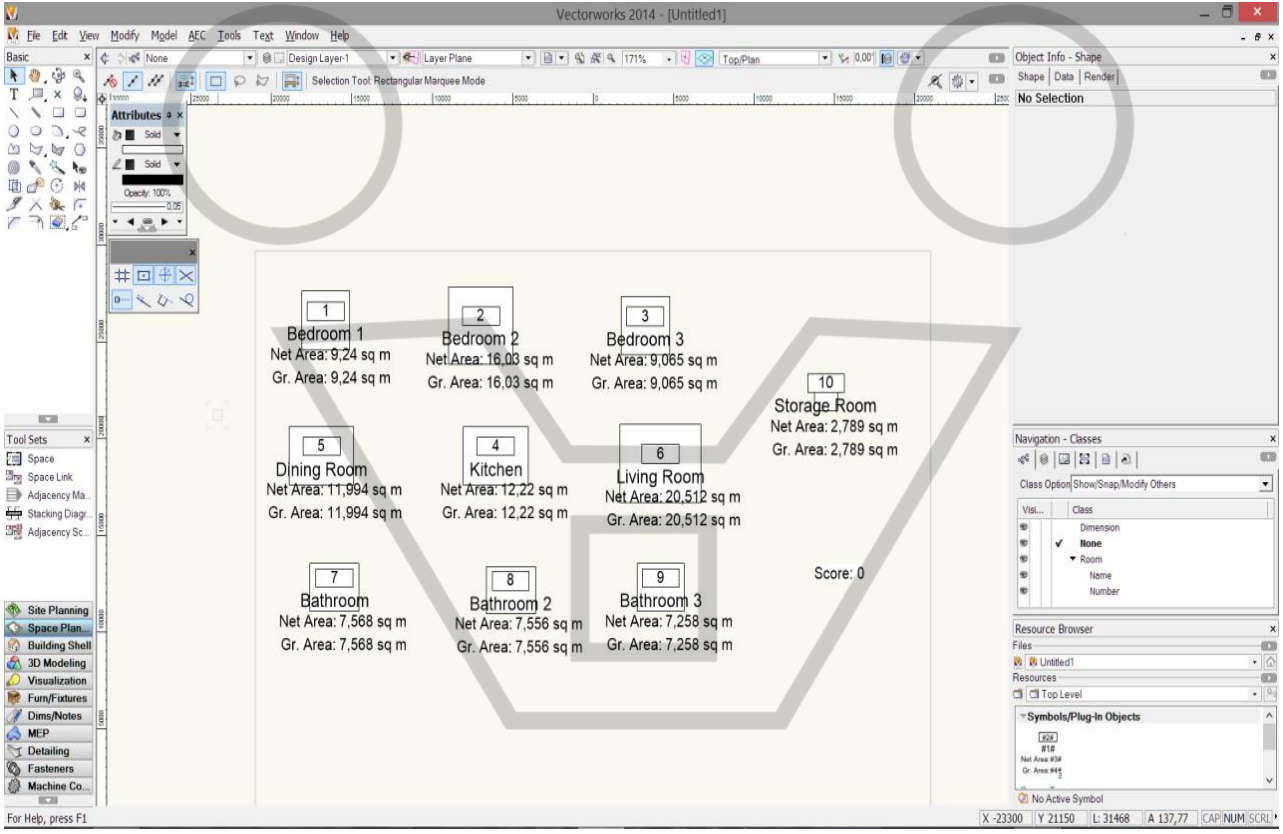


Le Corbusier, Marseille: Unité d'habitation, 1945. Bubble diagram of communal services for the building complex. © FLC/ADAGP, Paris and DACS, London 2008

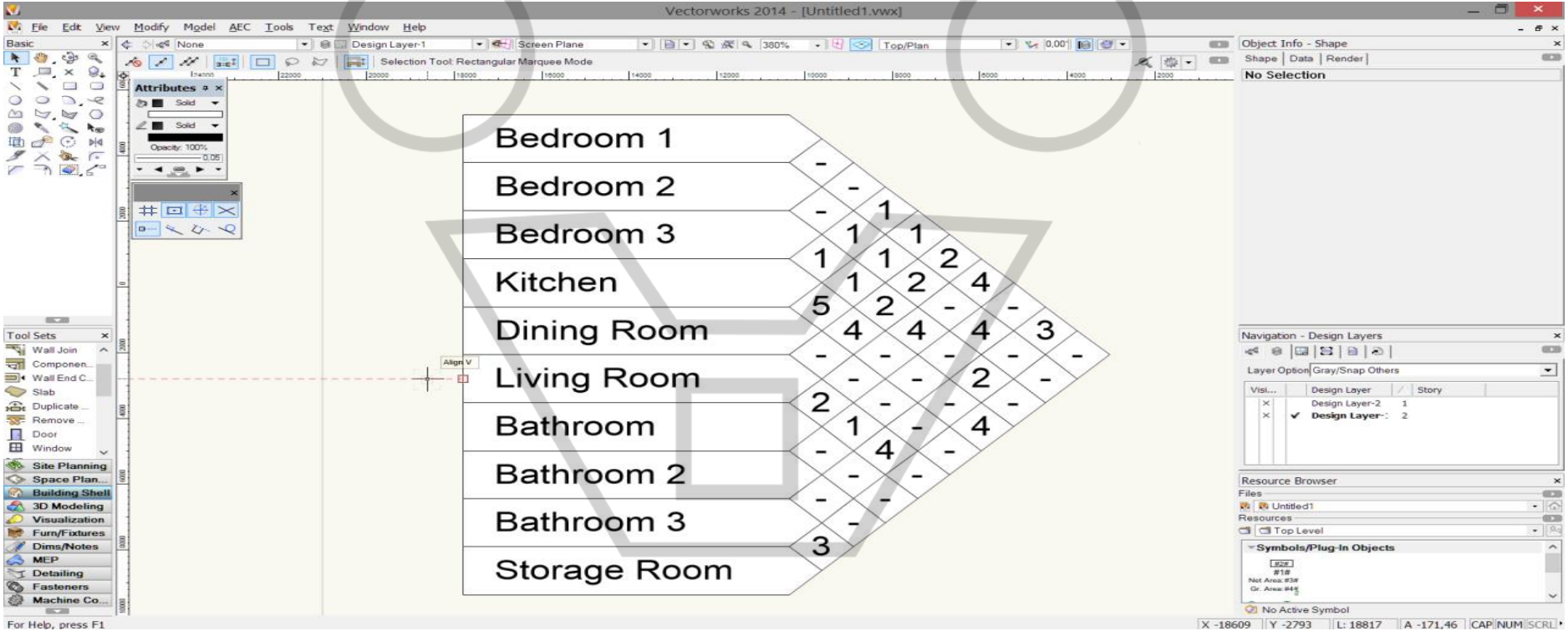
BUBBLE GRAPH VISUALIZATION



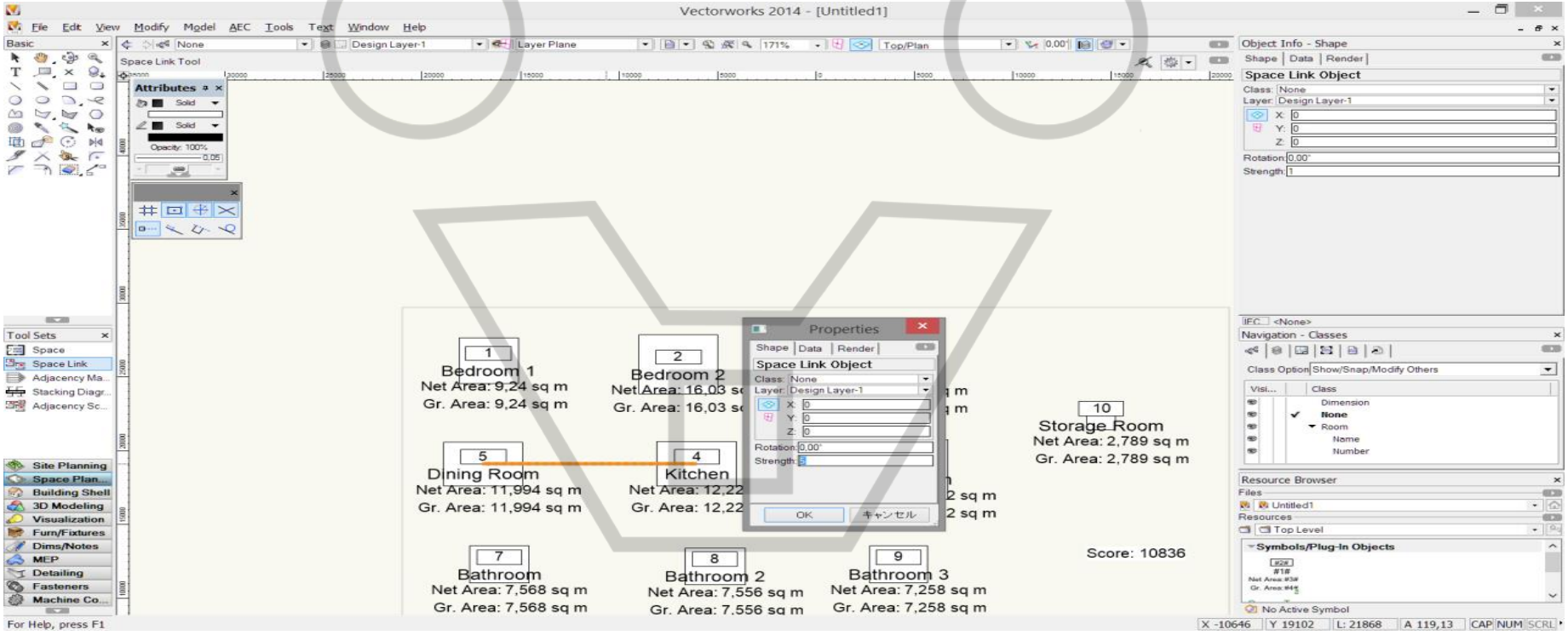
SPACE SYNTAX ON VECTORWORKS: defining spaces



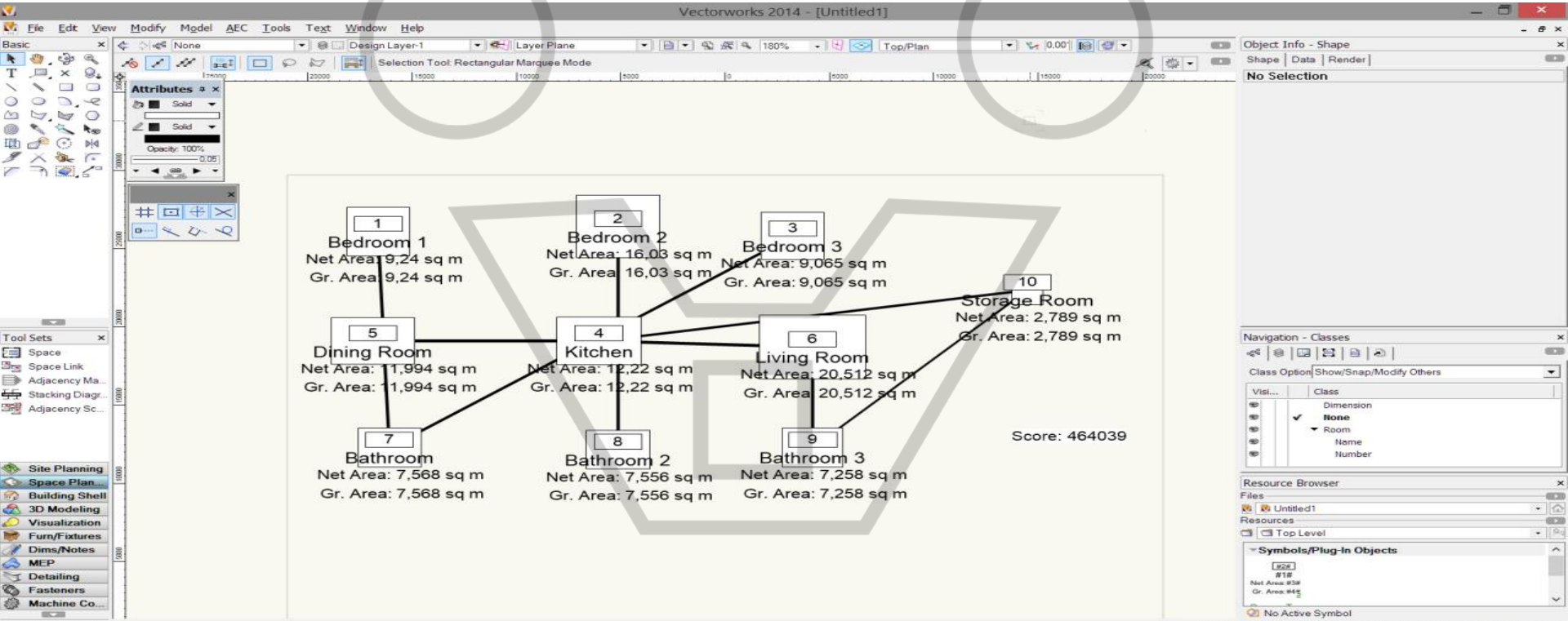
SPACE SYNTAX ON VECTORWORKS: defining Adjacency Matrix



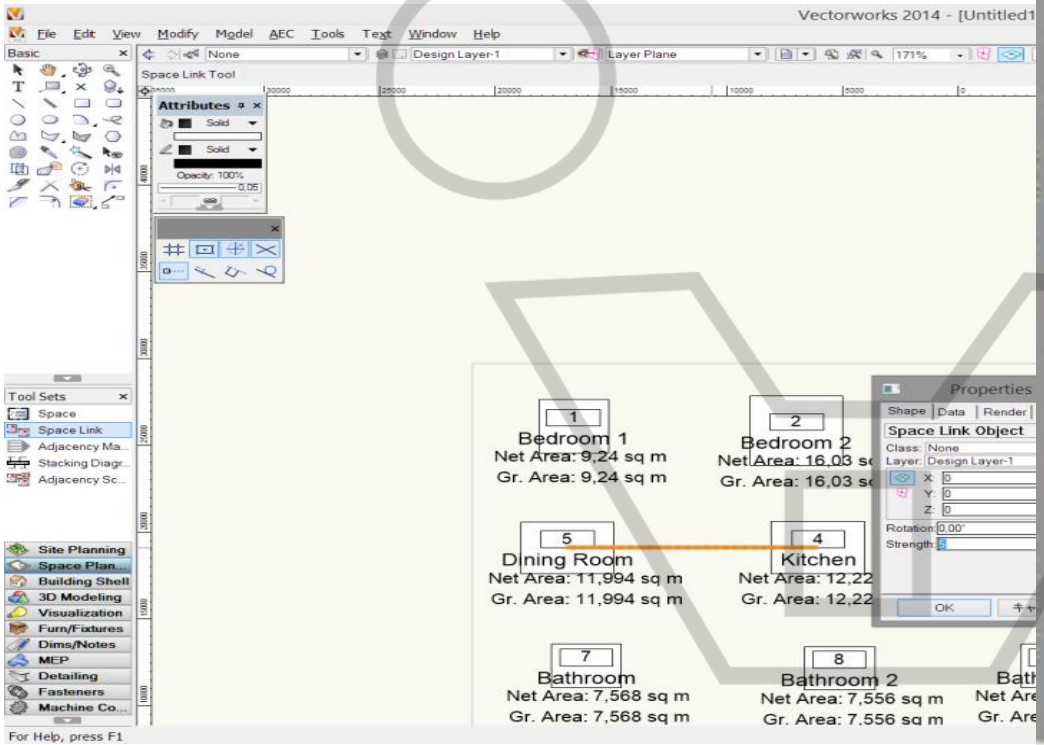
SPACE SYNTAX ON VECTORWORKS: defining space links

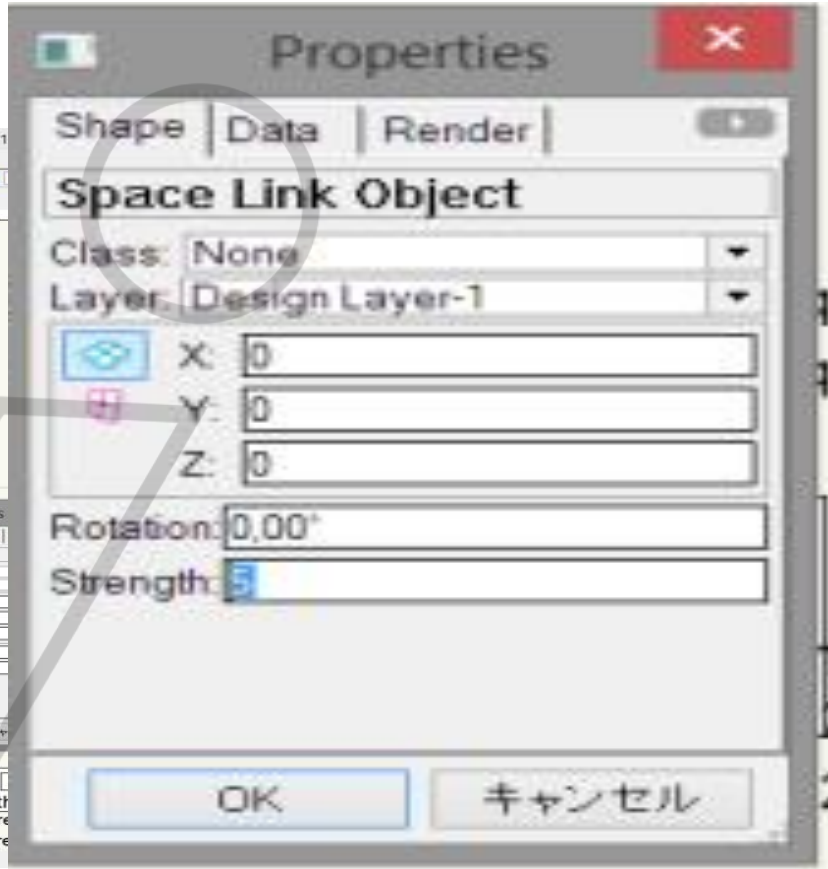


SPACE SYNTAX ON VECTORWORKS: defining space links

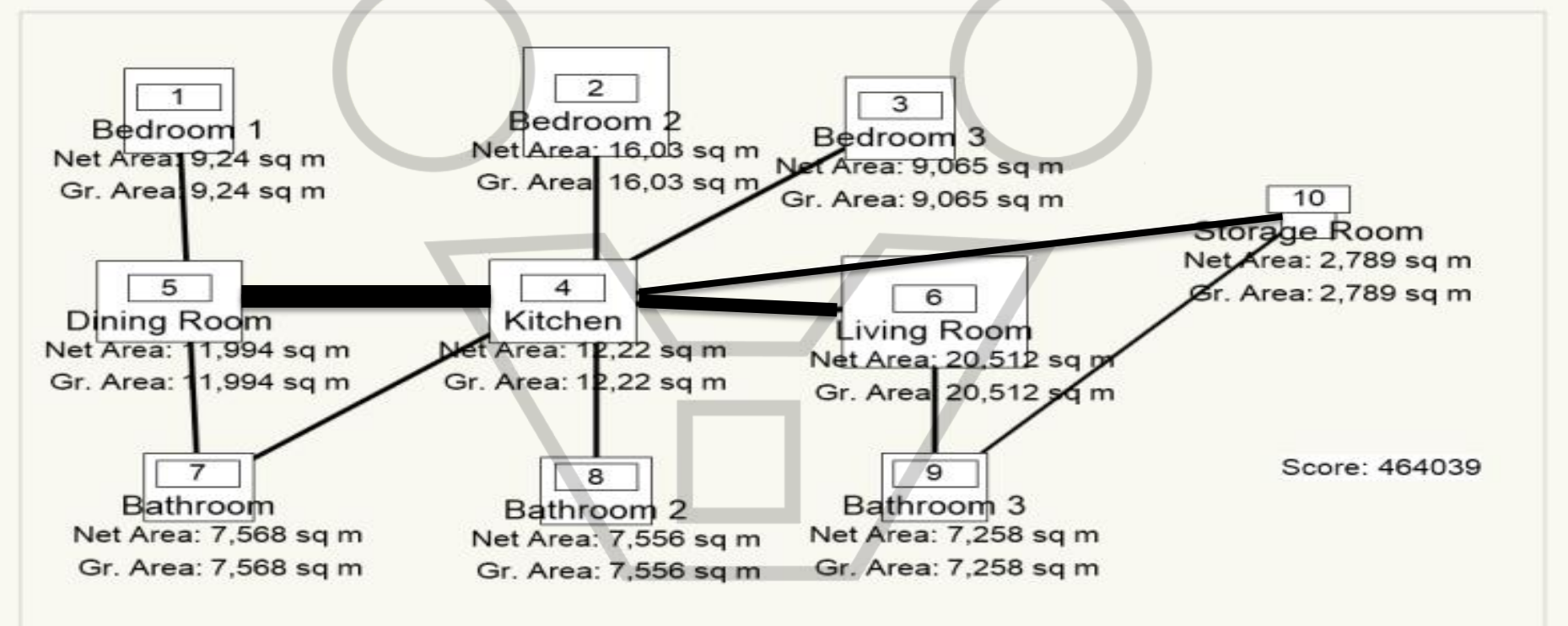


SPACE SYNTAX ON VECTORWORKS: strenght of links

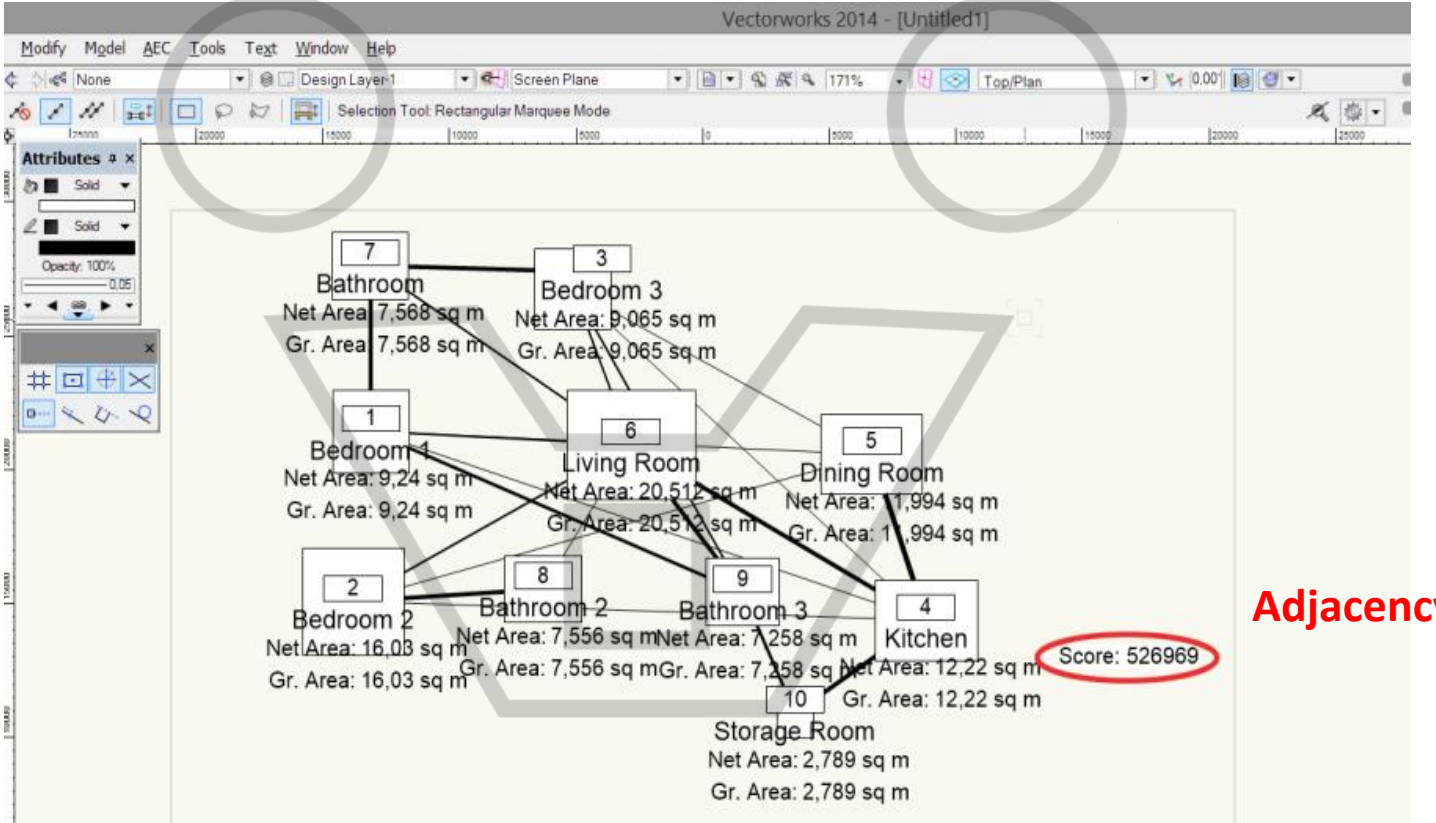




SPACE SYNTAX ON VECTORWORKS: visualizing strenght of links

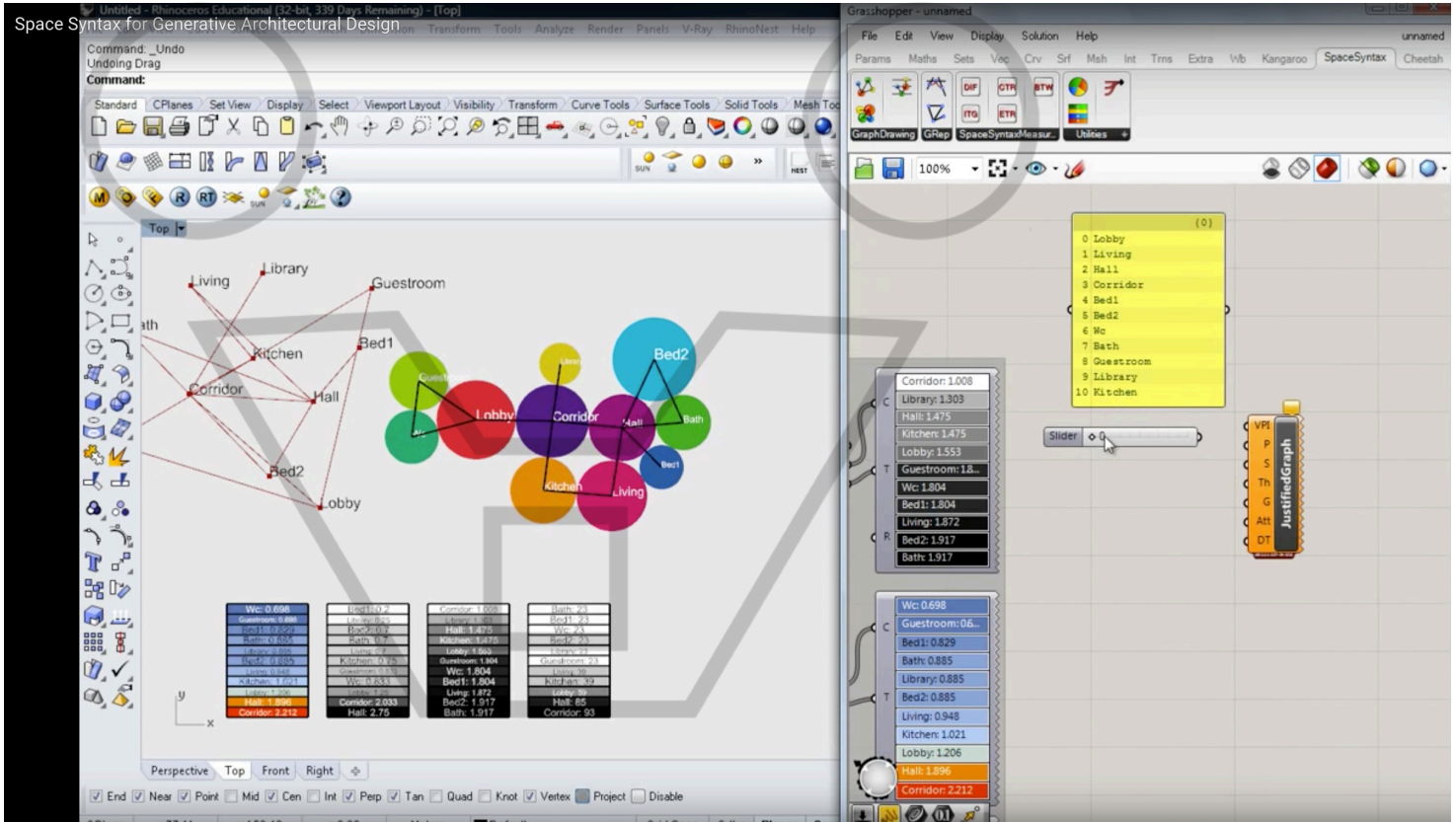


SPACE SYNTAX ON VECTORWORKS: reading the layout efficency

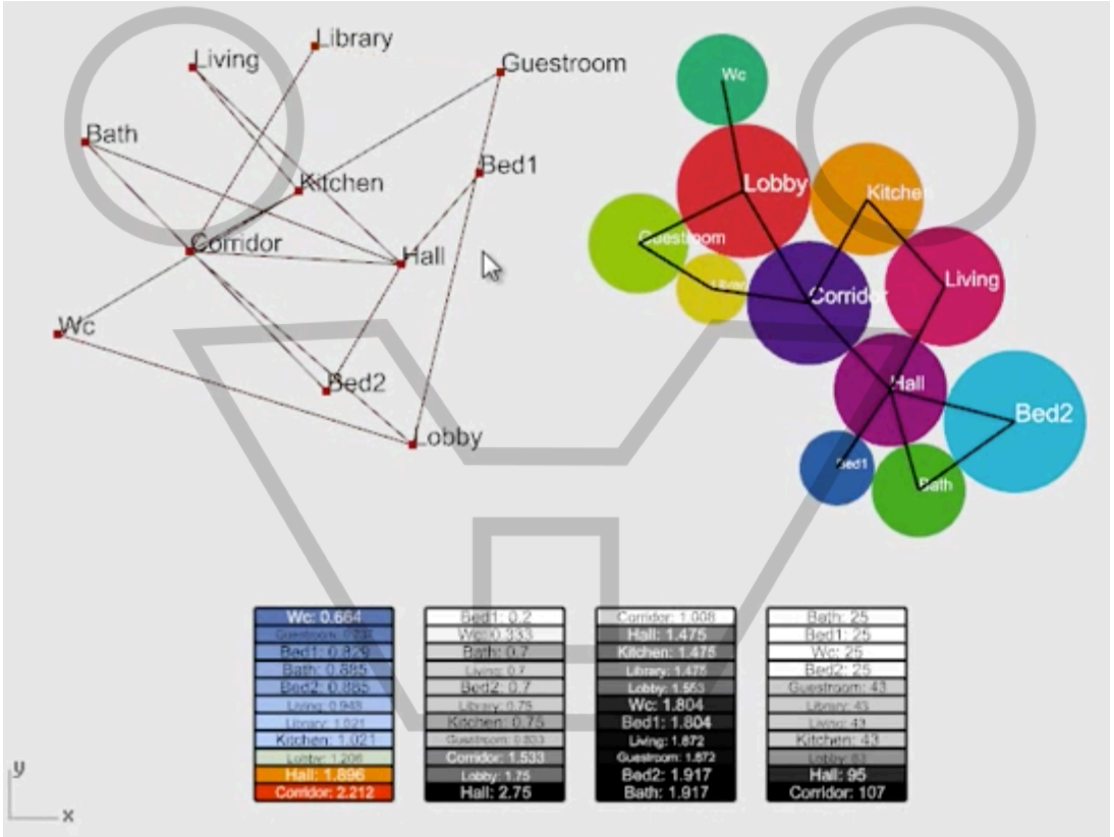


Adjacency Score

SPACE SYNTAX ON GRASSHOPPER



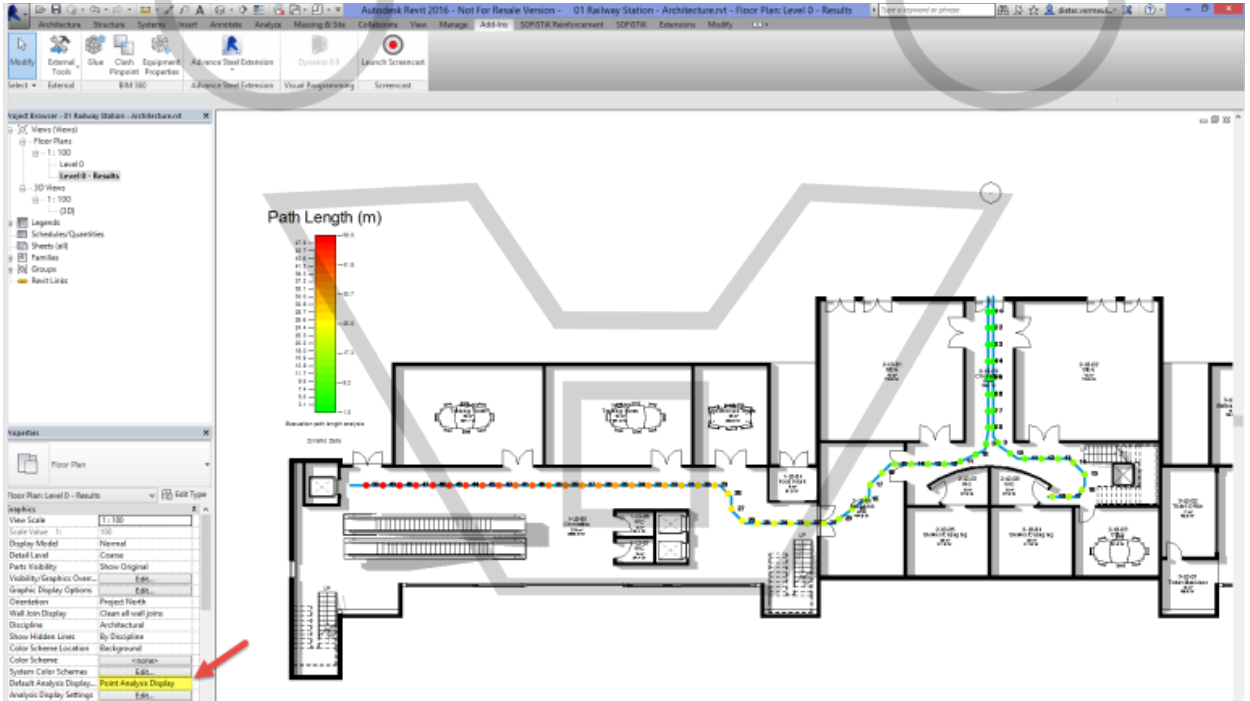
SPACE SYNTAX ON GRASSHOPPER



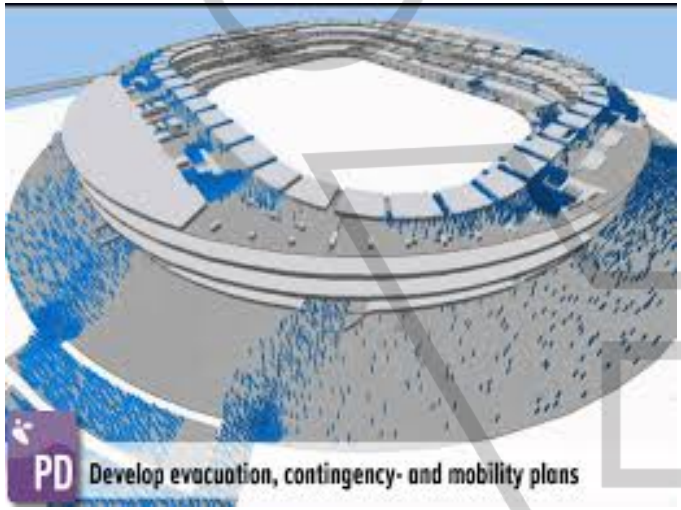
OTHER LAYOUT ASPECT TO CONSIDER: Evacuation Layout

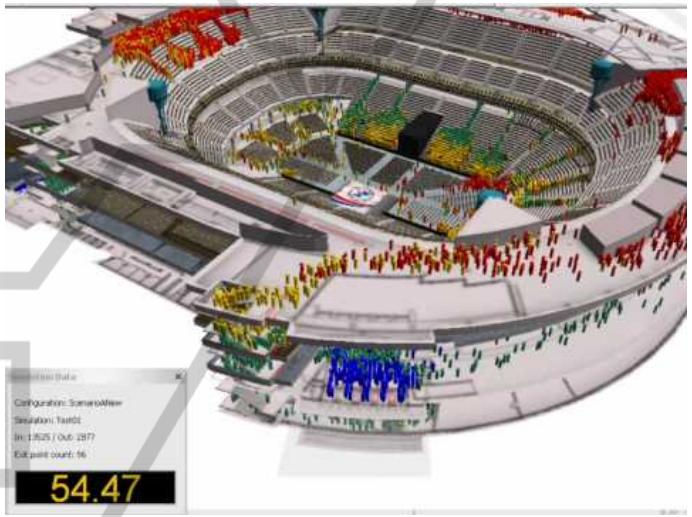
Evacuation Planning Tool (**EPT**) Dynamo Add-on

https://revitbeyondbim.wordpress.com/2016/04/22/evacuation-path-analysis-with-dynamo/

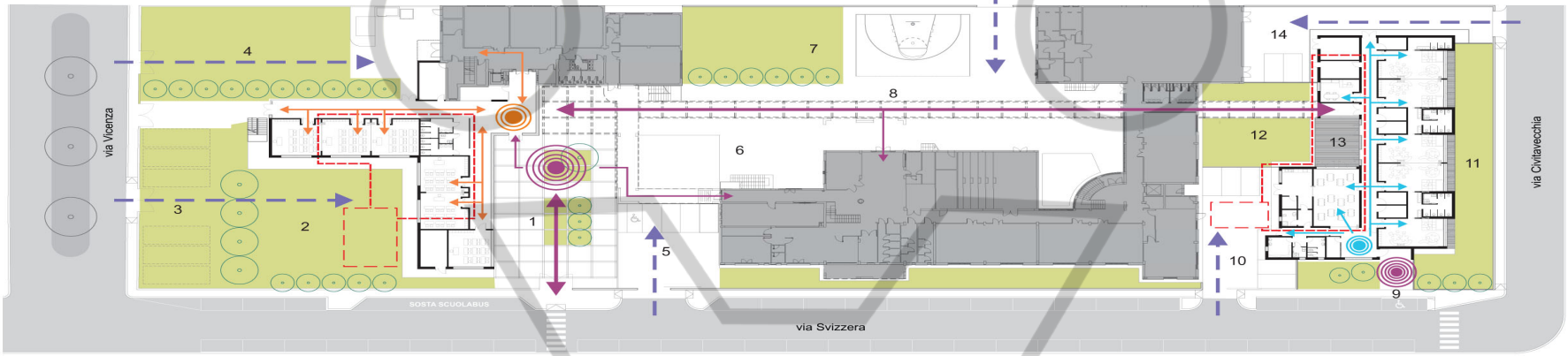


Evacuation Planning Tool





ACCESSIBILITY AND CONNECTIONS



Schemi dei percorsi nelle aree esterne

- direttrici principali tra i plessi scolastici
- punti di aggregazione alunni
- direttrici di accesso per i mezzi di soccorso, di servizio e manutenzione

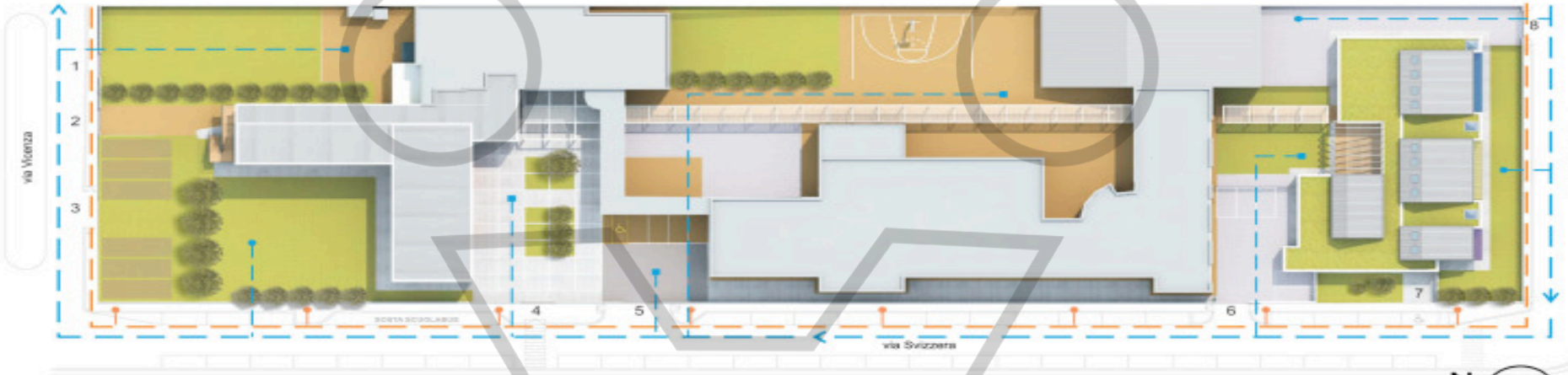
Schemi dei percorsi di distribuzione interna alla scuola primaria

- direttrici connettive
- punti di accoglienza alunni

Schemi dei percorsi di distribuzione interna alla scuola primaria

- direttrici connettive
- punti di accoglienza bambini

ACCESSIBILITY AND UTILITIES LINES



LEGENDA

1) accesso carrabile di servizio (mezzi di soccorso/manutenzione)
2) accesso pedonale secondario
3) accesso carrabile di servizio (mezzi di soccorso/manutenzione)
4) ingresso pedonale principale scuole primaria e media
5) accesso carrabile parcheggio di relazione
6) accesso carrabile di servizio (mezzi di soccorso/manutenzione)
7) ingresso pedonale principale scuola per l'infanzia
8) accesso carrabile di servizio (mezzi di soccorso/manutenzione)

Smaltimento acque meteoriche
- rete fognaria principale
- rete fognaria smaltimento acque meteoriche aree pavimentate
- drenaggi smaltimento acque meteoriche aree permeabili

Illuminazione pubblica
- cavidotto principale
- pali di illuminazione stradale

ENVIRONMENTAL CLUSTERS

Space requirements expressed in a qualitative notation

Source IESNA, 9th Edition Lighting Handbook, Reference and Applications, Chapter 10

I. INTERIOR LOCATIONS AND TASKS — Very Important | Important | Somewhat important | Blank = Not important or not applicable

Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	Light Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	Luminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Reading (16)																								Ch. 11, 12
Copied tasks																								
Microfiche reader																				A		A		
Photograph, moderate detail																				E				
Thermal copy, poor																				F				
Photocopies																				D				
Photocopies, 3rd generation																				E				
Data processing tasks																								
VDT screens																				A		A		
Impact printer																								
good ribbon																				D				
2nd carbon and greater																				E				
ink jet/laser printer																				D				
keyboard reading																				D				
Machine rooms																								
Active operations																				D				
Tape storage																				D		B		
Machine area																				C				
Equipment service																				E		C		
Thermal print																				E				
Handwritten tasks																								
#2 pencil and softer leads																				D				
#3 pencil																				E				
#4 pencil and harder leads																				F				
Ball-point pen																				D				
Felt-tip pen																				D				
Handwritten carbon copy																				E				
White boards																						B		
Chalk boards																						E		
Printed tasks																								
6-point type																				E				
8- and 10-point type																				D				
Glossy magazines																				D				
Maps																				E				
Newsprint																				D				
Typed originals																				D				
Telephone books																				E				

Space requirements expressed in a quantitative notation

ILLUMINANCE

IES ILLUMINANCE CATEGORIES and VALUES - for GENERIC INDOOR ACTIVITIES

ACTIVITY	CATEGORY	LUX	FOOTCANDLES
Public spaces with dark surroundings	A	20-30-50	2-3-5
Simple orientation for short temporary visits	B	50-75-100	5-7.5-10
Working spaces where visual tasks are only occasionally performed	C	100-150-200	10-15-20
Performance of visual tasks of high contrast or large size	D	200-300-500	20-30-50
Performance of visual tasks of medium contrast or small size	E	500-750-1000	50-75-100
Performance of visual tasks of low contrast or very sm size	F	1000-1500-2000	100-150-200
Performance of visual tasks of low contrast or very sm size over a prolonged period	G	2000-3000-5000	200-300-500
Performance of very prolonged and exacting visual tasks	H	5000-7500-10000	500-750-1000
Performance of very special visual tasks of extremely low contrast	I	10000-15000-20000	1000-1500-2000

A-C for illuminances over a large area (ie lobby space)
D-F for localized tasks
G-I for extremely difficult visual tasks

Space requirements expressed in a quantitative notation

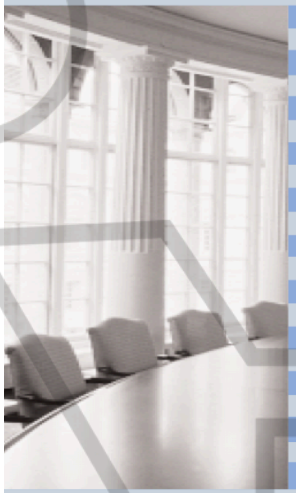
ILLUMINANCE

Activity	Illumination *(lux, lumen/m²)*
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, Homes, Theaters, Archives	150
Easy Office Work, Classes	250
Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories	500
Supermarkets, Mechanical Workshops, Office Landscapes	750
Normal Drawing Work, Detailed Mechanical Workshops, Operation Theatres	1,000
Detailed Drawing Work, Very Detailed Mechanical Works	1500 - 2000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2000 - 5000
Performance of very prolonged and exacting visual tasks	5000 - 10000
Performance of very special visual tasks of extremely low contrast and small size	10000 - 20000

Space requirements expressed in a quantitative notation

ACUSTIC

Indoor Design Conditions[3]



Type of Area	Summer DB[1]	RH[2]	Winter DB[1]	RH[2]
General Office	24 (75)		22 (72)	
ADP Rooms[9]	22 (72)	45[4]	22 (72)	
Corridors	24 (75)		22 (72)	
Building Lobbies[10]	24 (75)		22 (72)	
Toilets	24 (75)		22 (72)	
Locker Rooms	26 (78)		21 (70)	
Electrical Closets	26 (78)		13 (55)	
Mech. Spaces	35 (95)[5]		13 (55)[8]	
Elec. Switchgear	35 (95)[5]		13 (55)	
Elevator Mach. Room[10]	26 (78)[5]		13 (55)	
Emerg. Gen. Room	40 (104)[6]		18 (65)	
Transformer Vaults	40 (104)[5]			
Stairwells	(none)		18 (65)	
Comm./Tel. Frame Room[7]	24 (75)	45	22 (72)	30[12]
Storage Room	30 (85)		18 (65)	
Conference Room[11]	24 (75)		22 (72)	
Auditorium[10]	24 (75)		22 (72)	
Kitchen[10]	24 (75)		22 (72)	
Dining[10]	24 (75)		22 (72)	
Cafeteria[10]	24 (75)		22 (72)	
Courtrooms	24 (75)		22 (72)	454*

*Requires humidification in the winter.

Notes:

1 Temperatures are degrees Celsius (Fahrenheit), to be maintained at +/-1 °C (+/-2 °F).
2 Relative humidity is minimum permissible, stated in percent. Maximum permissible relative humidity is 60 percent in conditioned areas.
3 Dry bulb and relative humidity are to be maintained 150 mm (6 inches) to 1800 mm (6 feet) above the floor.
4 Relative humidity should be maintained at +/-5 percent in ADP spaces.
5 Maximum temperature. Space to be mechanically cooled if necessary.
6 Room must not exceed temperature with generator running.
7 Must comply with EIA/TIA Standard 569.
8 Minimum temperature in the building must be 13 °C (55 °F) even when unoccupied.
9 Confirm equipment manufacturer 's requirements as more stringent. Provide in-room display and monitor device (such as wall mounted temperature and humidity chart recorder),
10 System shall be designed for process cooling. Cooling system shall be a dedicated independent system.
11 Provide independent temperature control.
12 Minimum relative humidity requirements may be omitted in moderate southern climate zones upon approval of local GSA representatives.