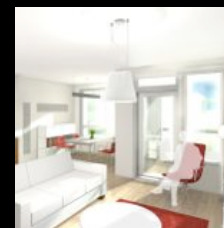


 LARKAS & LAINE

ARCHITECTS LTD



Creating architecture
with Building Information Model (BIM)

LARKAS & LAINE ARCHITECTS LTD.

Personnel 55
Founded 1993
Turnover 5.0 M€
Location Helsinki Lauttasaari

Group executive management



Robert Trapp
CEO, partner



Niklas Sucksdorff
Chairman of the board, partner



Harri Koskinen
Executive director, partner



Pekka Piha,
Senior adviser, partner



Harri Salminen
partner



AREAS OF EXPERTISE

COMMERCIAL

Offices / Shopping Centers/ Retail Park Concepts

RESIDENTIAL

HOTELS

New Construction and Adaptive Re-Use

URBAN PLANNING, LAND USE PLANNING

Master Planning for Office, Retail and Residential Areas

FACILITIES DEVELOPMENT

Renovations and Adaptive Re-Use

INTERIOR DESIGN

Optimization of efficiency in space use and design of interior layouts.

VISUALIZATION & DATA MODELING, BIM

3D images and animations available in all design phases

SPECIAL KNOW-HOW:

BUILDING INFORMATION MODELS

BIM model used and developed throughout all design phases

ENVIRONMENTAL AND ENERGY CONSULTANCY

LEED, BREEAM certifications, energy and life-cycle calculations



ENVIRONMENTAL AND ENERGY CONSULTATION

SERVICES OFFERED BY OUR ENERGY AND ENVIRONMENT TEAM:

- Environmental certifications for buildings (LEED and BREEAM)
- Building energy efficiency consultation
- Building life cycle consultation

Environmental certificates bring energy efficient and environmentally friendly way of working to each phase of our projects.

Energy consultation includes design of efficient energy use, energy simulations and analysis, energy certificates and reports

We conduct building life cycle cost analysis (LCC, Life Cycle Cost) and carbon footprint studies in evaluating different design options.

Memberships:

Green Office Network
FiGBC (Finnish Green Building Council)
USGBC (U.S. Green Building Council)



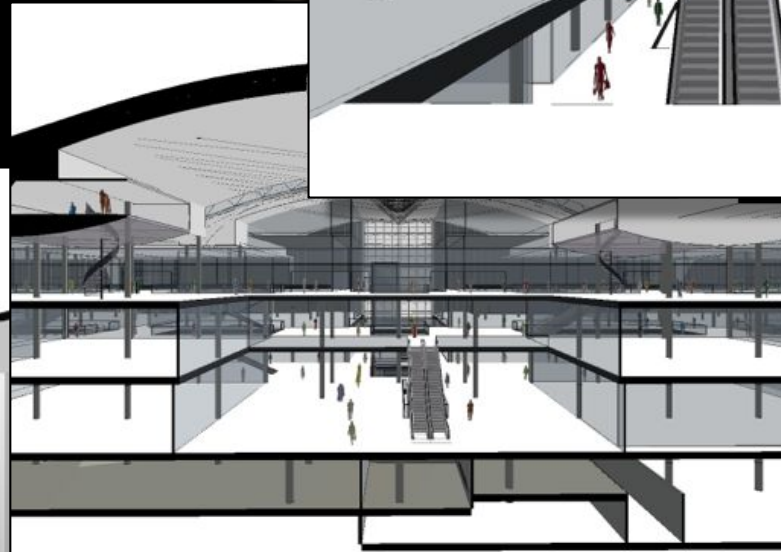
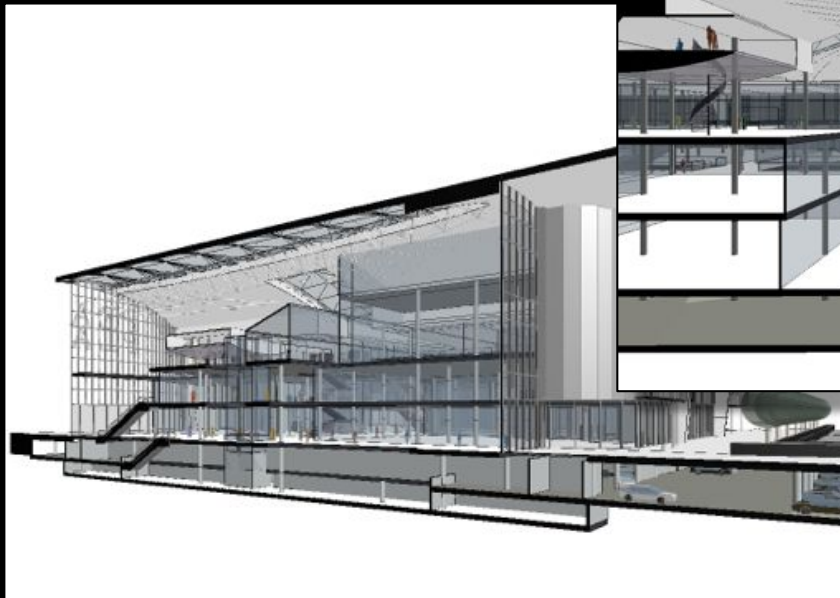
HISTORY OF 3D MODELING IN OUR OFFICE

- Our office has been using Computer Aided 3D Modeling since the early '90s
- We create BIM models with ArchiCAD software



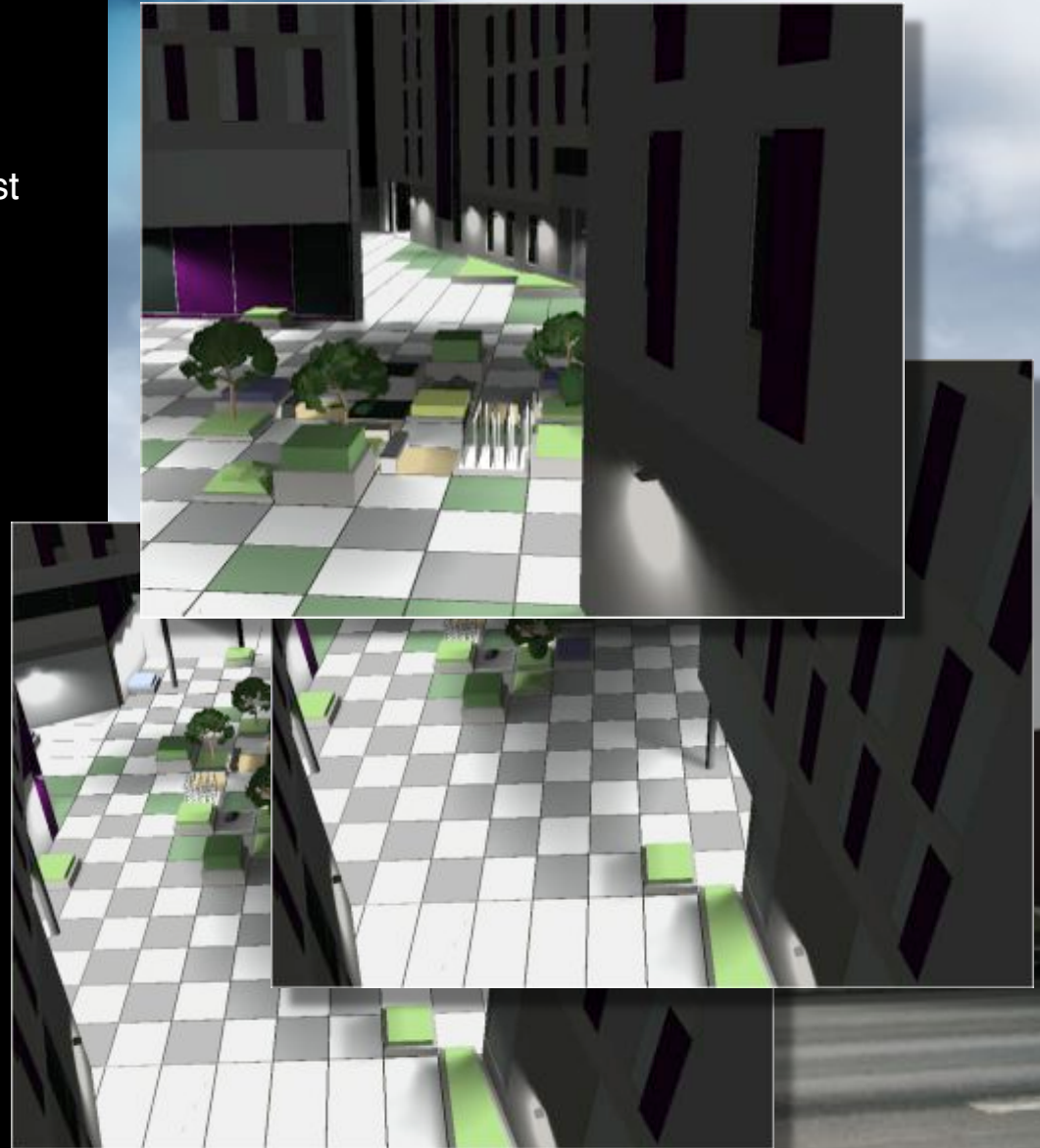
WE USE BIM BECAUSE

- Our designing tool
- Assuring the quality and accuracy of design
- Inhouse project management
- More efficient design process
- Creating all drawings with BIM
- Ease of visualizing design solutions



BENEFITS OF BIM FOR OUR CUSTOMERS

- Better opportunity to compare design solutions
- Possibility to get information for building cost calculations
- BIM available for other designers in the project
- Possibility to have better presentation / marketing materials (including animations)
- BIM available for eg. energy and efficiency simulations
- BIM available for construction site use



THESE DOCUMENTS WE CREATE WITH BIM

Visualization material of the design at all phases of a project

- Marketing

Drawings (2D):

- Plans, sections, elevations, floor and ceiling drawings

Quantities of building components:

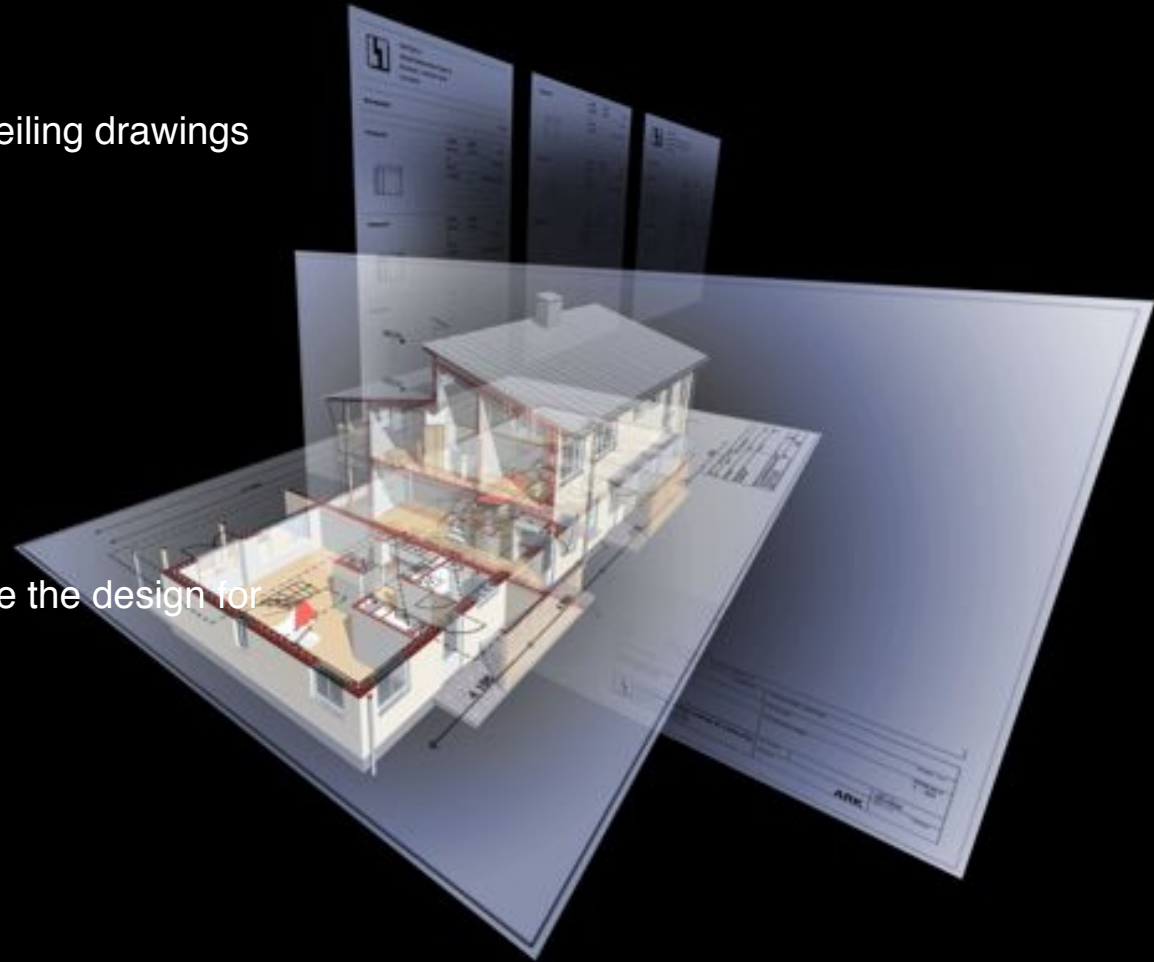
- Windows, doors, furniture etc

Building in numbers:

- Area information
- Volumes
- number of eg. parkingplaces

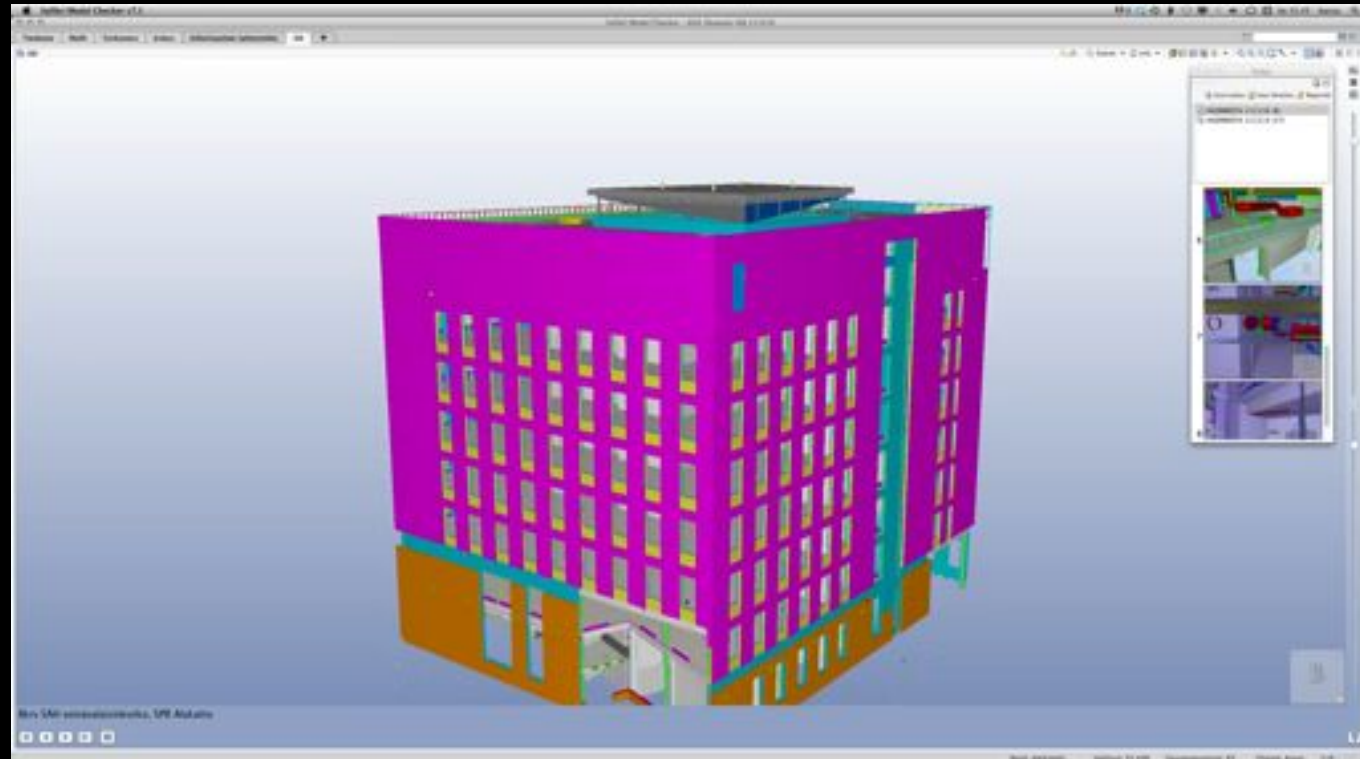
3D views from the model to demonstrate the design for those involved:

- Users
- Clients
- Authorities
- Building site



HOW WE CHECK THE MODEL

- Importance of an accurate model
- Tools to check the accuracy of the model
 - Our experience, highly trained staff
 - Checking software : Solibri Model Checker 7.1
 - Our own desing guidelines METHOD
 - Combination models
 - Clients check lists



CONTINUOUS DEVELOPMENT OF USING BIM



- Quality control program
- Design guideline "Method"
- Careful inhouse guidance
 - all these continuously updated
- Training / studying
- Research projects (TEKES)
- Inhouse development group
- Participating in pilot projects
- Open mind to try and learn new things

OUR LEADING ROLE IN DEVELOPMENT OF BIM

- Inhouse resources to study and test
- We have been a Beta- ja Alpha tester for Graphisoft
- Inhouse GDL-programming and schooling
- We have been architects in different BIM pilot projects
- We have been partner in research projects(TEKES)



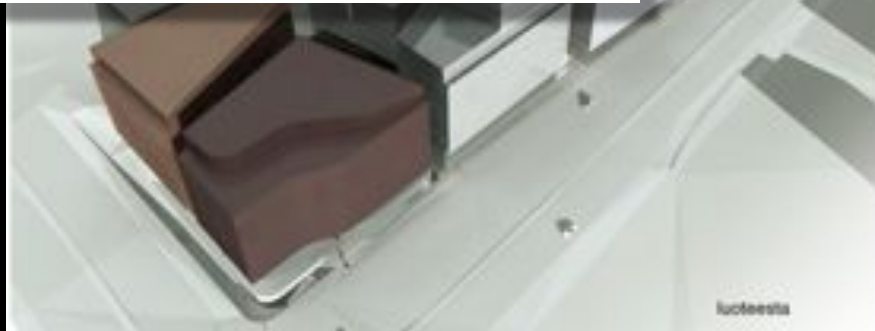
BIM IN THE FIRST SKETCHES OF A BUILDING DESIGN

- Mass models of a building project
- Building volumes and area information
- Presentation material of the preliminary design to the customer and the City

Mannerheimintie päin

BPM T3 PINTA-ALALASKELMA 25.07.07

Torri 3	Bruttoala	Kem	Isola	Vuokratilaa	Isola määrä	Käytös, Isola kokoo
1. krs	1 090,0	1 090,0		824,0	4 kpl tulo	206,120
2. krs	1 202,5	1 202,5		1 040,0	4 kpl tulo	260,0
3. krs	1 203,0	1 203,0		1 040,0	4 kpl tulo	260,0
4. krs	1 202,5	1 202,5		1 040,0	4 kpl tulo	260,0
5. krs	1 202,5	1 202,5		1 040,0	4 kpl tulo	260,0
6. krs	1 203,0	1 203,0		1 040,0	4 kpl tulo	260,0
7. krs	747,4	681,4	146,0	460,0	2 kpl tulo + IVKH	220,0
8. krs	399,0	399,0		460,0	2 kpl tulo	230,0
9. krs	399,0	399,0		460,0	2 kpl tulo	230,0
10. krs	212,5	0,0	212,5	0,0	IVKH	0,0
	9 266,9	8 907,4	399,0	7 419,0	30	247,3
k1	1 090,0					
k2	1 090,0				50 AP	
	3 700,0				40 AP + VSS	
Bruttoala	12 046,9					



VISUALIZATION FOR DESIGN AND MARKETING

- Still images -Artlantis Studio and Cinema 4D
- Animations
- QuickTime models
- BimX – Virtual Building Explorer models



VISUALIZATION FOR CITY PLANNING

- Simplify building permit process with authorities
- Some cities in Finland are developing IFC-format to their building permit standard



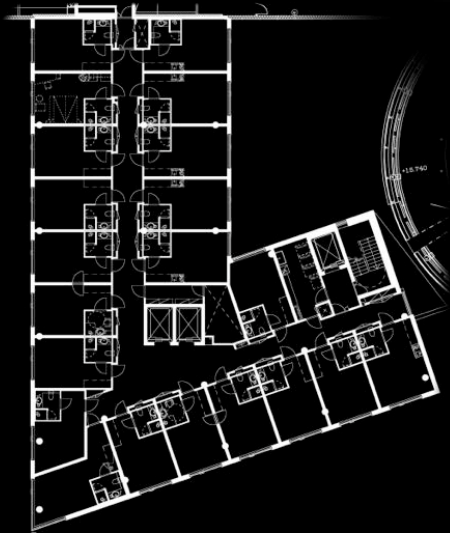
CASE: HOTEL PALACE SELLO

Hotel Sello

Espoo, Finland

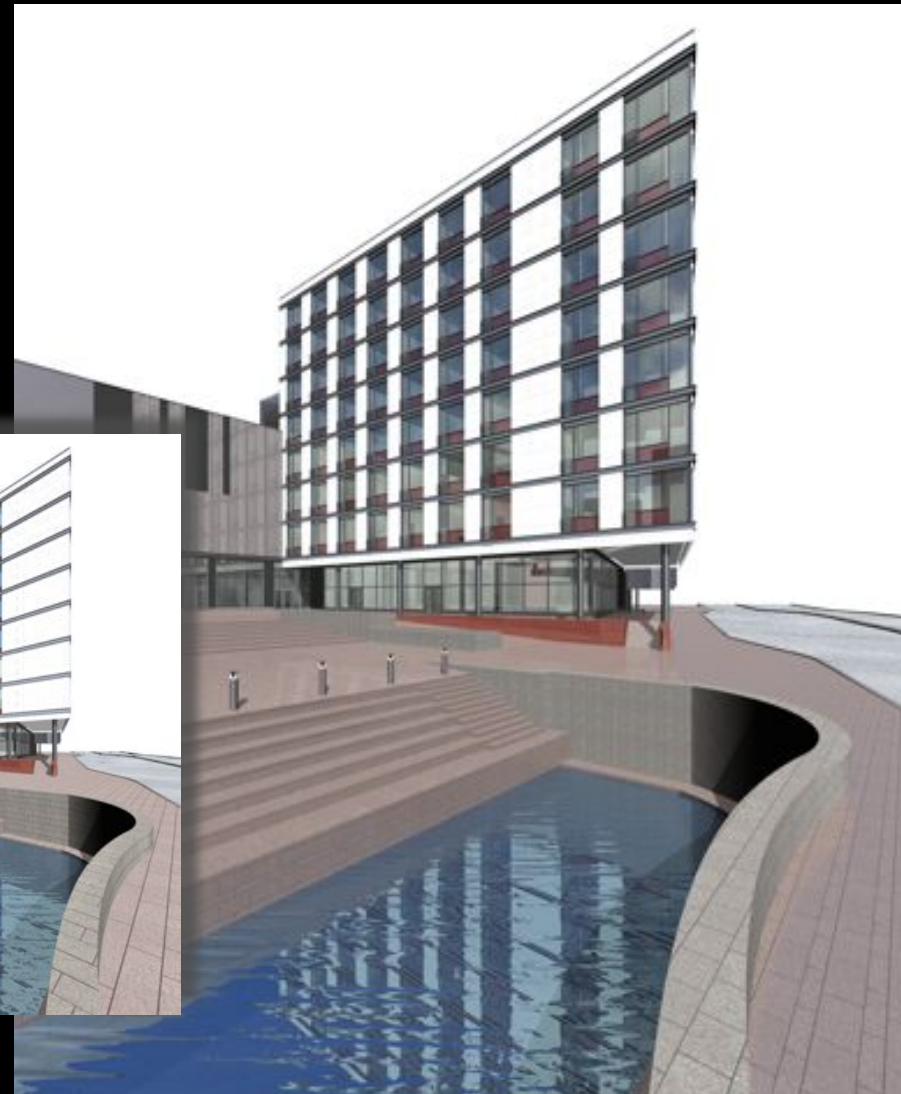
2006

number of rooms 147



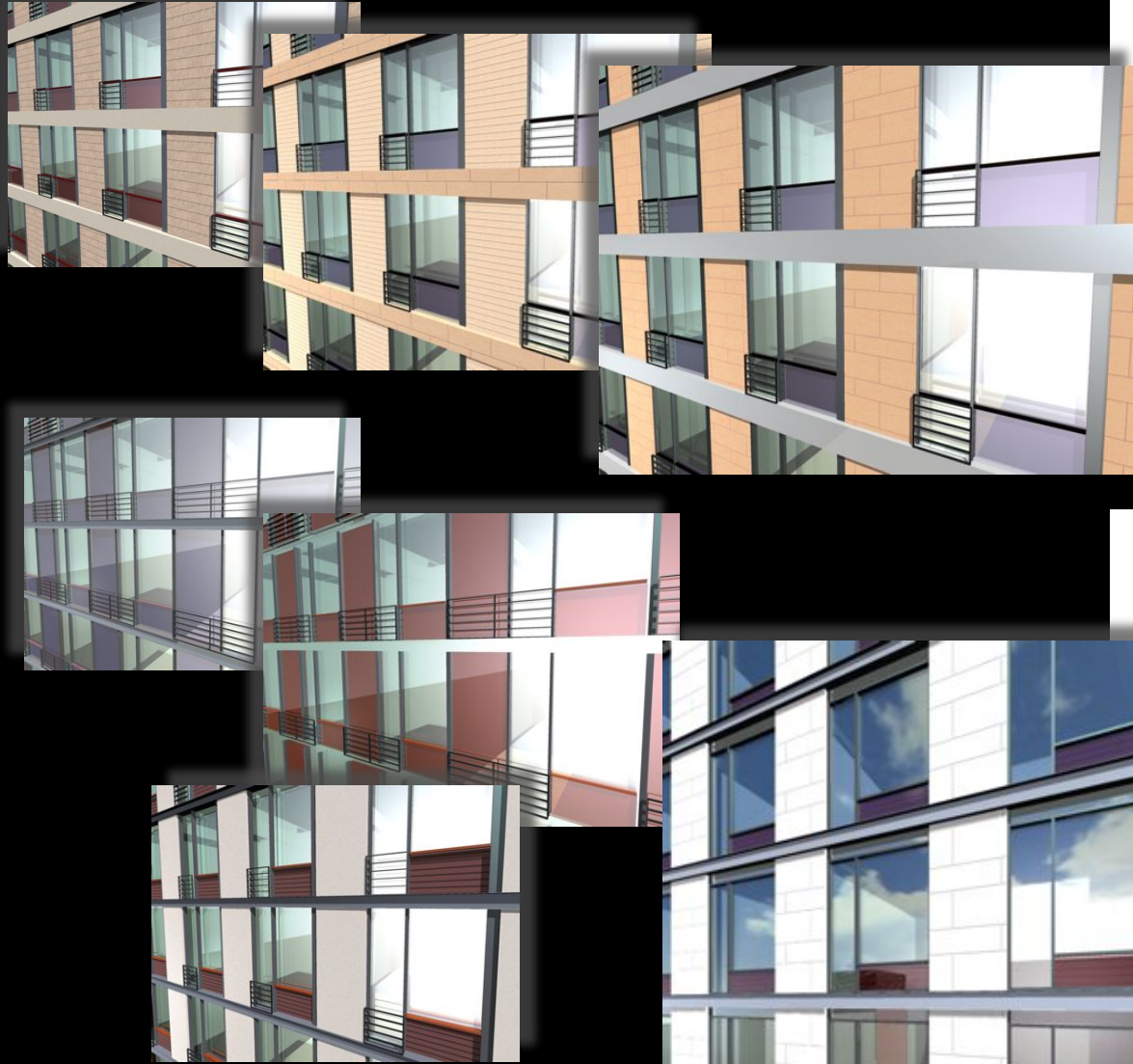
CASE: HOTEL PALACE SELLO

DESIGNING FACADE; OPENINGS AND RYTHM



CASE: HOTEL PALACE SELLO

DESIGNING FACADE ; COLOURS AND ELEMENTS



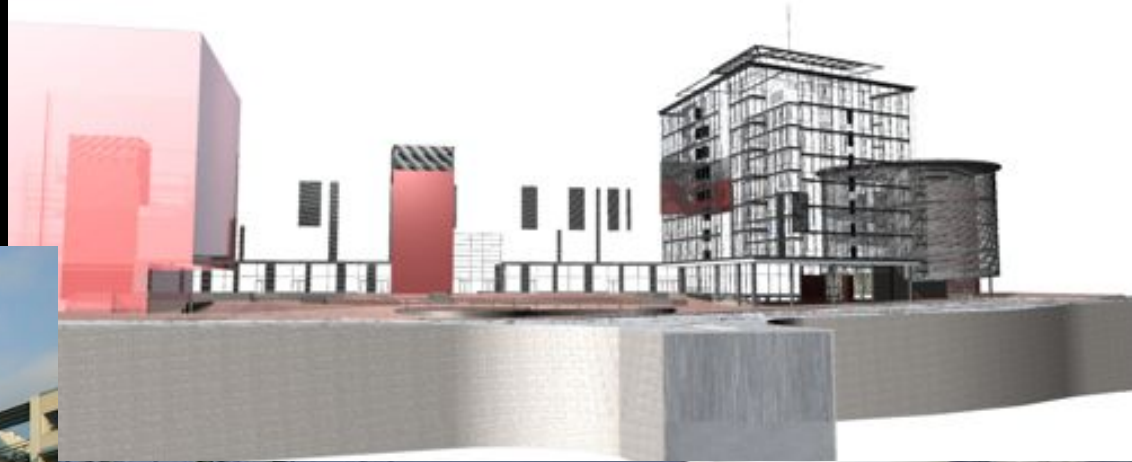
CASE: HOTEL PALACE SELLO

DESIGNING FACADE; DETAILS



CASE: HOTEL PALACE SELLO

PRESENTING THE MODEL WITH EXISTING
SURROUNDINGS TROUGH PHOTOMONTAGE



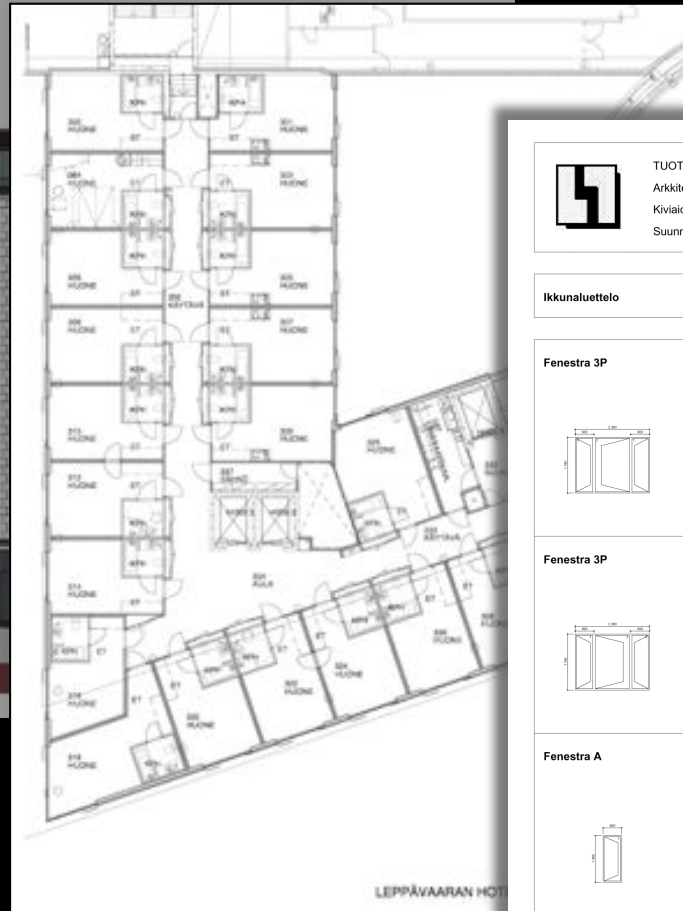
CASE: HOTEL PALACE SELLO

MARKETING VISUALIZATION AND BUILDING AFTER COMPLETION



CASE: HOTEL PALACE SELLO

2D DRAWINGS AND QUANTITIES FROM THE ONE MODEL



TUOTEMALLI
Arkkitehtitoimisto Larkas & Laine Oy
Kivialdantie 2 i, 00210 HELSINKI
Suunnittelija:

Ikkunaluettelo

31.3.2003

Fenestra 3P



Leveys	2,38 m	2 kpl
Korkeus	1,79 m	
ID	i-Fenestra	
Kätisyys	O	
Materiaali	392-JS-LautaVaaka	

Fenestra 3P



Leveys	2,38 m	2 kpl
Korkeus	1,79 m	
ID	i-Fenestra	
Kätisyys	V	
Materiaali	392-JS-LautaVaaka	

Fenestra A

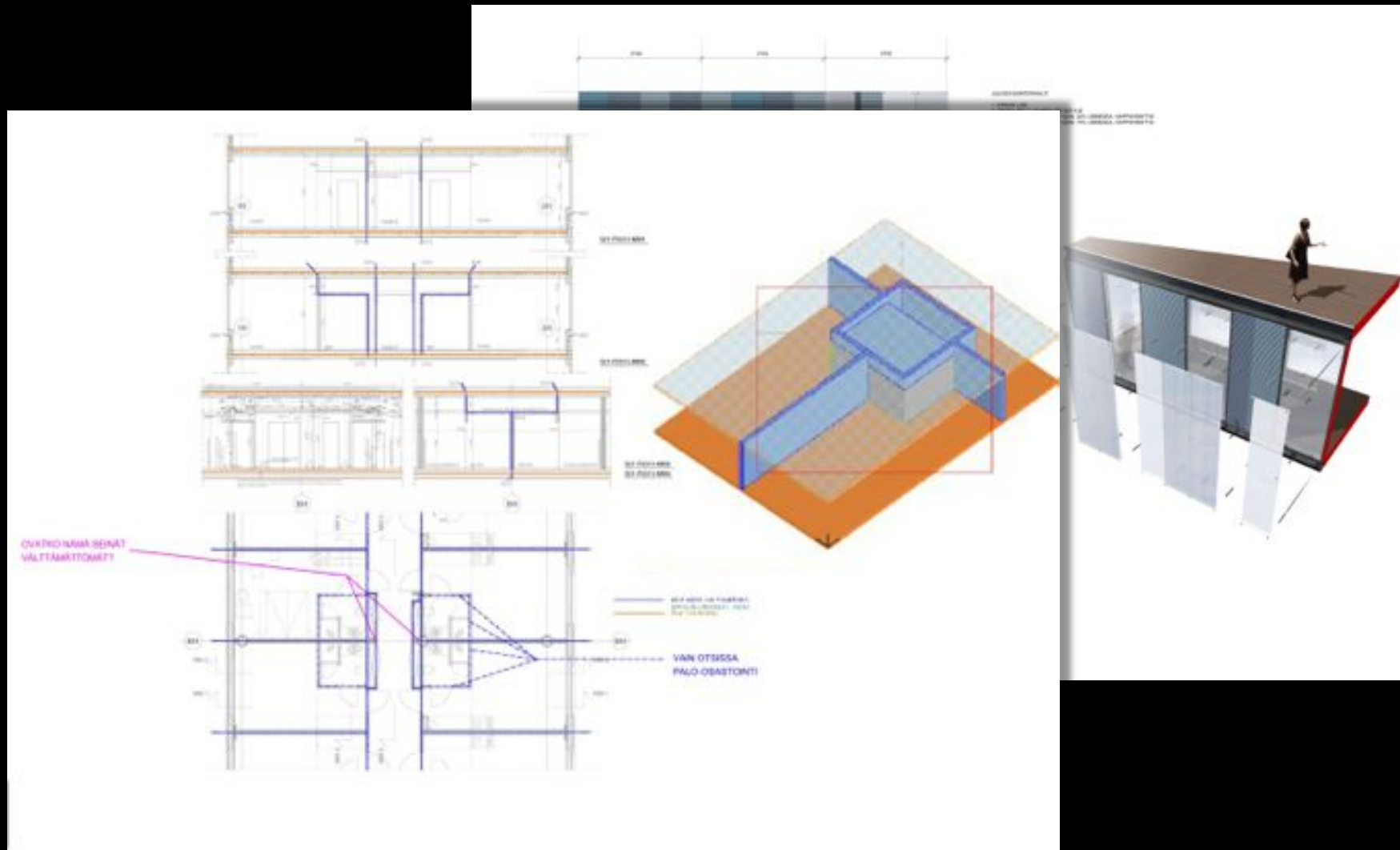


Leveys	0,60 m	2 kpl
Korkeus	1,49 m	
ID	i-Fenestra	
Kätisyys	V	
Materiaali	Mänty	

Sivu 1

CASE: HOTEL PALACE SELLO

PRESENTING CLEAR AND ACCURATE
TECHNICAL INFORMATION FOR
CONSTRUCTION SITE



CASE: Skanska Ruskeasuo



CASE: Skanska Ruskeasuo

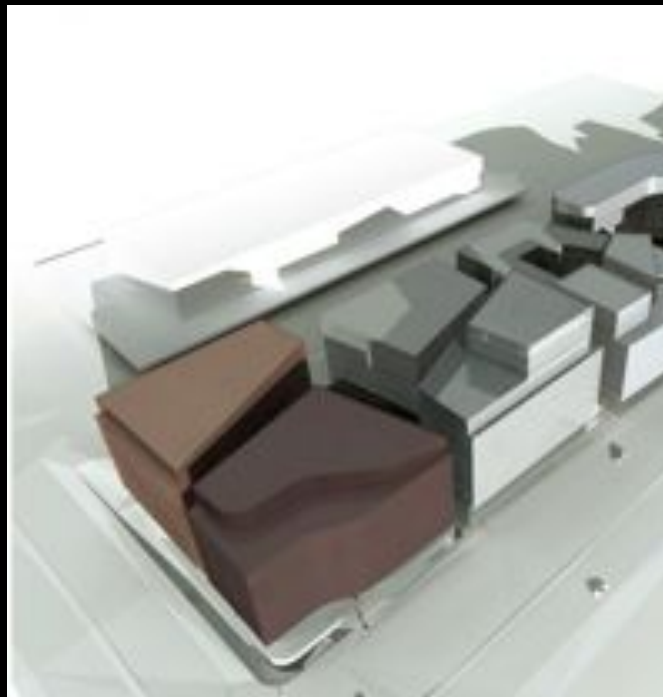
Client Skanska Commercial Development Finland Oy

- Headquarters and office complex
- Helsinki, Ruskeasuo
- 26000 brm²
- Completion phase 1 and 2 2012



CASE: Skanska Ruskeasuo

- BIM Pilot project with Skanska Commercial Development
- BIM has been used since the preliminary sketches of area layout
- BIM model has been utilized in the decision making process during the meetings



BPM T3 PINTA-ALALASKELMA 25.07.-97

Torri 3	Bruttoala	Kem	Isän	Vuokratilaa	Isän määrä	Keskitt. Isän koot
1. krs	1 090,0	1 090,0		824,0	4 kpl Isän	206,125
2. krs	1 203,5	1 203,5		1 043,0	4 kpl Isän	260,0
3. krs	1 203,5	1 203,5		1 043,0	4 kpl Isän	260,0
4. krs	1 203,5	1 203,5		1 043,0	4 kpl Isän	260,0
5. krs	1 203,5	1 203,5		1 043,0	4 kpl Isän	260,0
6. krs	1 203,5	1 203,5		1 043,0	4 kpl Isän	260,0
7. krs	747,4	681,4	146,0	460,0	2 kpl Isän + IVKH	230,0
8. krs	599,0	599,0		460,0	2 kpl Isän	230,0
9. krs	599,0	599,0		460,0	2 kpl Isän	230,0
10. krs	213,5	0,0	213,5	0,0	IVKH	0,0
	9 266,9	8 907,4	359,5	7 419,3	30	247,3
k1	1 090,0				50 AP	
k2	1 090,0				40 AP + VSS	
	3 780,0					
Bruttoala	12 046,9					

CASE: Skanska Ruskeasuo

Building models have been modeled by our office standards



CASE: Skanska Ruskeasuo

Visualisations of important design solutions



CASE: Skanska Ruskeasuo

Visualisations of important design solutions



CASE: Skanska Ruskeasuo



824 Skanska Ruskeasuo
Koy Helsingin Kathy

BIM seloste
mallin tilanne 28.09.2010

Yleistä huomioitavaa:

- malli on monelta osin 3D-kuvia varten tehty. Luottavin pohjapiirustuksien vuoksi mallissa käytetty eritasojen yhteydessä 3D-lisämerkityksiä tasojen, jotka oltava päällä 3D tarkastelussa, mutta eivät ole näkyvissä pohjapiirustuksissa.
- monilta osin mallissa ovat rakenne-elementit paikallaan ja esim. niiden rakennetyypit oikein, mutta puuttettakin vielä on:
 - lähes kaikki portaat mallinnettu. (Kaupungin ulkoportaista ei ole mallinnettu, mutta pihakannetta Mannerheimintien jalkakäytävälle johtavat portaat on mallinnettu). D-porras ja Neptunin aulan avoporras on mallinnettu. Portaissa ei ole rakennetyyppejä, mutta ne on nimetty.
 - palkkeja puuttuu mallista lähinnä Neptun-talosta, Kathyin sisäänvetojen palkit päivittämättä
 - sisäseinät menevät reunoilla ulkoseinien "läpi" ulkoseinien emäilviivaan, jotta malli tekisi vinojen seinien seinäliitokset oikein -> mahdollinen vaikutus määrissä tutkimatta
 - kevyet sisäseinät on mallinnettu ylempään laatan alapintaan asti, kantavat laatan läpi, ulkoseinät kerroskorkeuden mukaan, ulkoseinissä lisäksi ns. helmoja ja yläosia alimmissa ja ylimmissä osissa
 - ulkosivun ulkopuolella ikkunoiden ns. auringonsuojalevyt mallinnettu pelkällä levyillä tässä vaiheessa, kokoon tuosta vielä tarkentunee, kiinnikkeitä ei mallinnettu
 - ulkoseinän perusrakenteena on puu-alumini-ikkuna alkaen kerrosta 700, alla umpiossa, jossa siis sisäkuoribetoni ja eriste, sen päälle tulevaa ja-lasia ei mallinnettu.
 - alakatot pääosin mallinnettu (siitä osin kuin pohjin alakatot merkitty, saattaa tulla tarve lisätä alakatkoja esim. kopiohuoneisiin)
 - Kellarin välipohjaleattojen kallistuksia ei mallinnettu, kallistuksen korkeus on mukana laatan paksuudessa
 - ARK-RAK-IFC yhteensovituskasetelu antoi herjan VSS:n HS-1 luukuista, jotka ovat ark-mallissa suuremmat kuin rak-mallissa. Tämä johtuu siitä, että luukussa on oikeasti avautuva osa selväsi kulkuaukkoa 600x800 suurempi ja se on mallinnettu niin, että työpiirustuksiin tulisi oikeannäköinen luukku. Normaalisti on oltava aukkoa pienempi.
 - pihan istutusarvokkeet ja kasvillisuus päivitetty muutuneen pihasuunnitelman mukaiseksi. Talojen välillä sijottuva istutusallas on mallinnettu tasolle "1173 Aidat ja tukimuurit", muureilla ei toistaiseksi ole rakennetyyppejä. Muurien korkeus tarkentuu myöhemmin. Pihapäällysteet mallinnettu tasolle 1153. (Vaihe 2 pihaluonnos tasolla 11531.)
 - kellarissa tarkennettu seinä rakennesuunnitelmien mukaiseksi
 - kettisuunnitelma tuotu "kuvana" pla-tiedostoon, kylähuoneita ei ole mallinnettu

Savuosastointimuutoksen lisäovet mallinnettu atriumin reunoille ja porrashuoneisiin.

Mallissa oikein:

- asiat pääosin oikeilla tasoilla
- kerroskorkeudet
- seinät pääosin
- ikkunat ja ovet oikein
- laatat aukkoineen (isot aukotukset)
- seinien rakennetyypit, RAK-rakennetyyppejä, täydennetty mallin "alatyyppillä" esim.

During the project we provide BIM for all the other participants once a month in .ifc and .pla (3D dwg) format

BIM Model Report

- Is delivered every time with the model
- Which information is final, what has been changed and data that is still preliminary

BIM desingner meetings

- After updating and checking of combination model
- Between designers

CASE: Skanska Ruskeasuo

Checking the compatibility with Solibri Model Checker

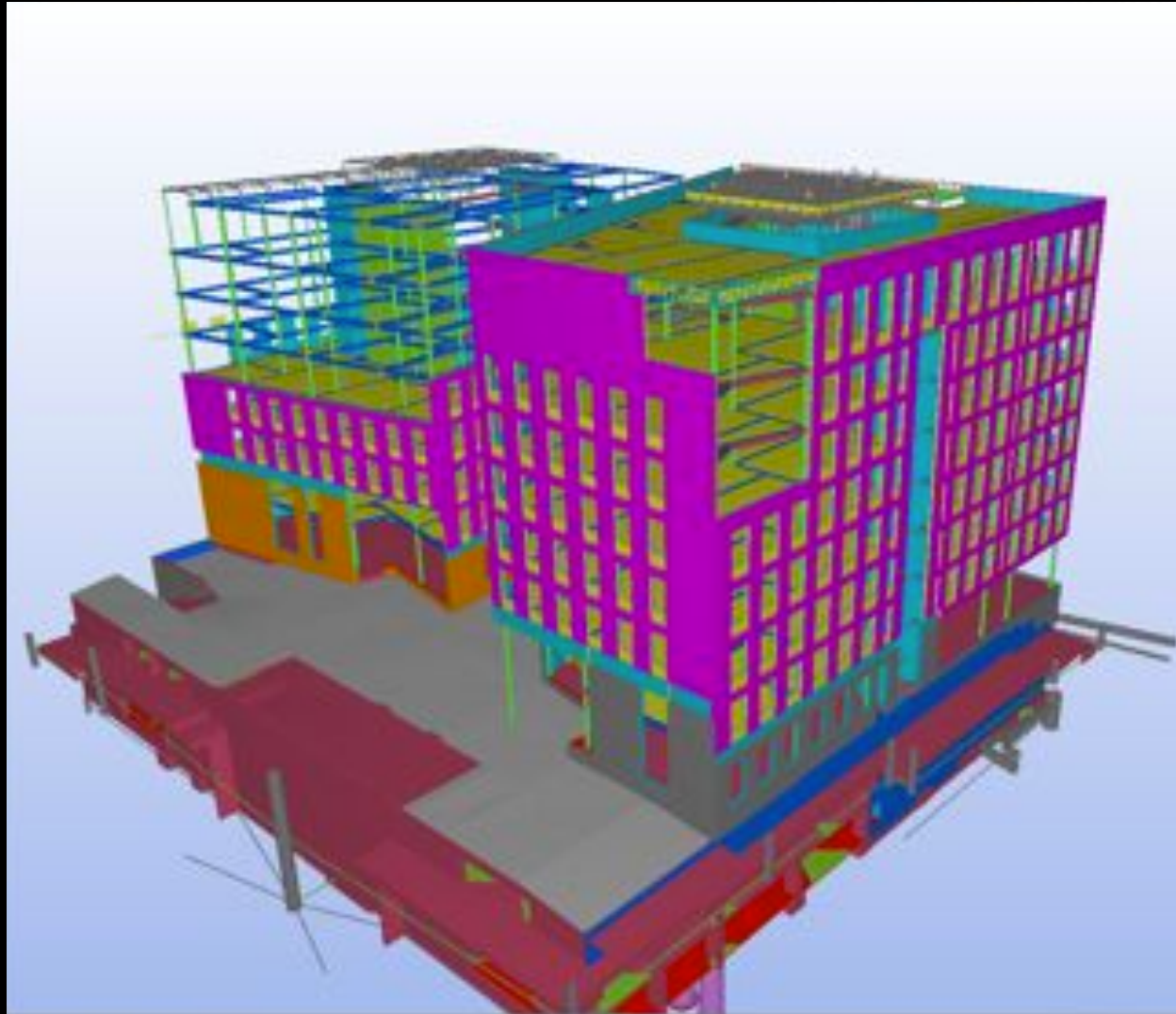
Architect
Structure
HVAC
Electrical
Combination model



CASE: Skanska Ruskeasuo

Checking the compatibility with Solibri Model Checker

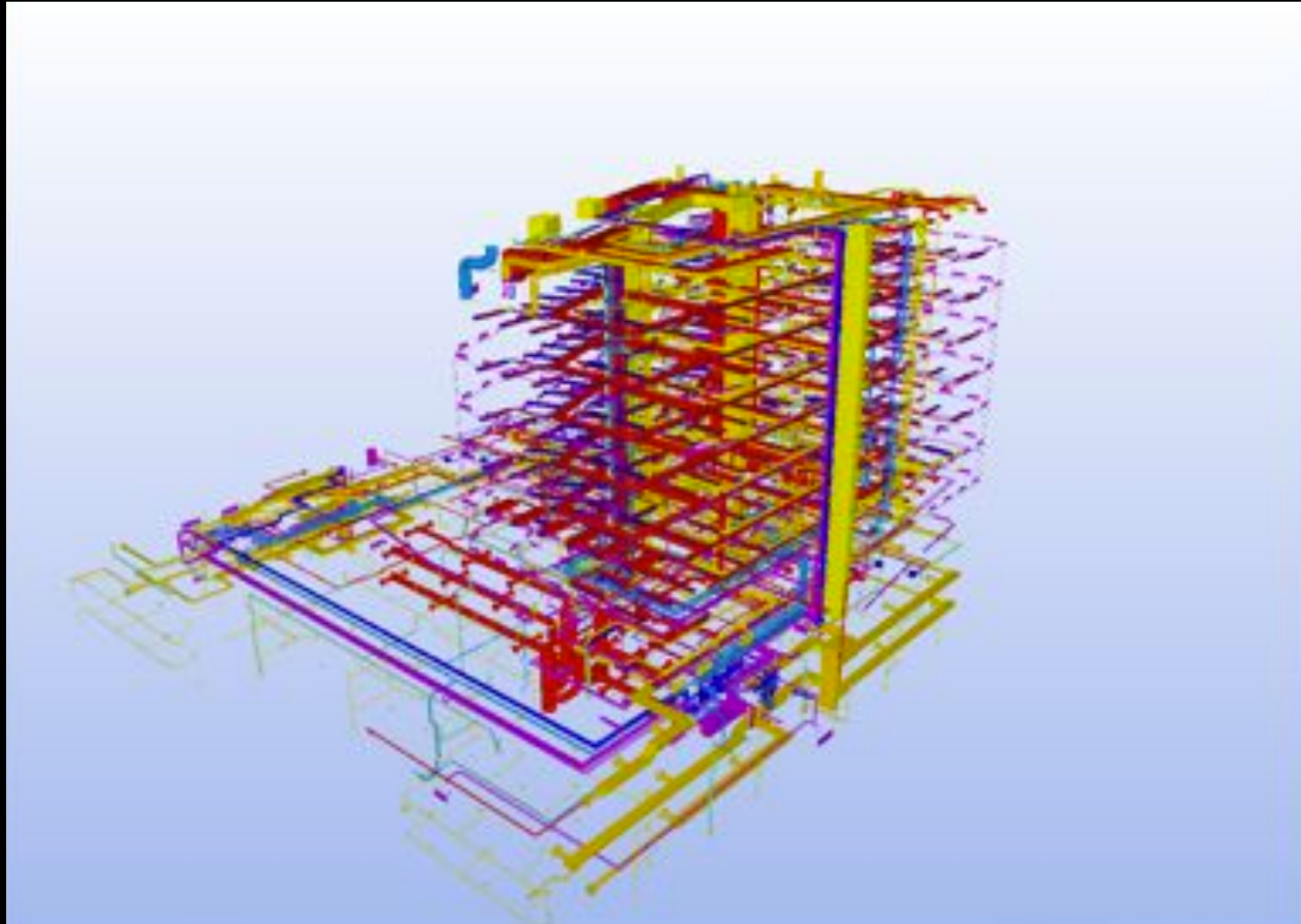
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CASE: Skanska Ruskeasuo

Checking the compatibility with Solibri Model Checker

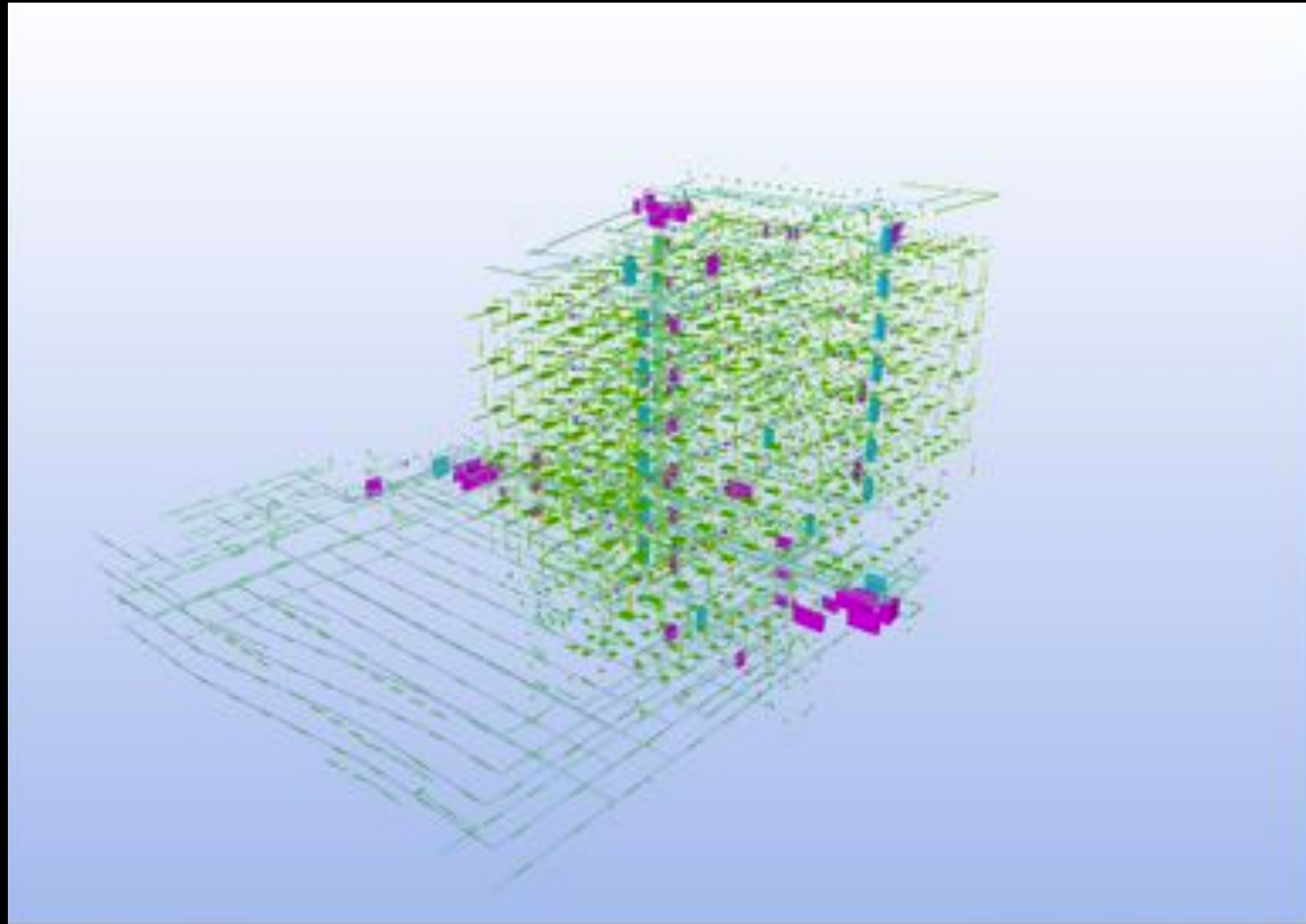
Architect
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CASE: Skanska Ruskeasuo

Checking the compatibility with Solibri Model Checker

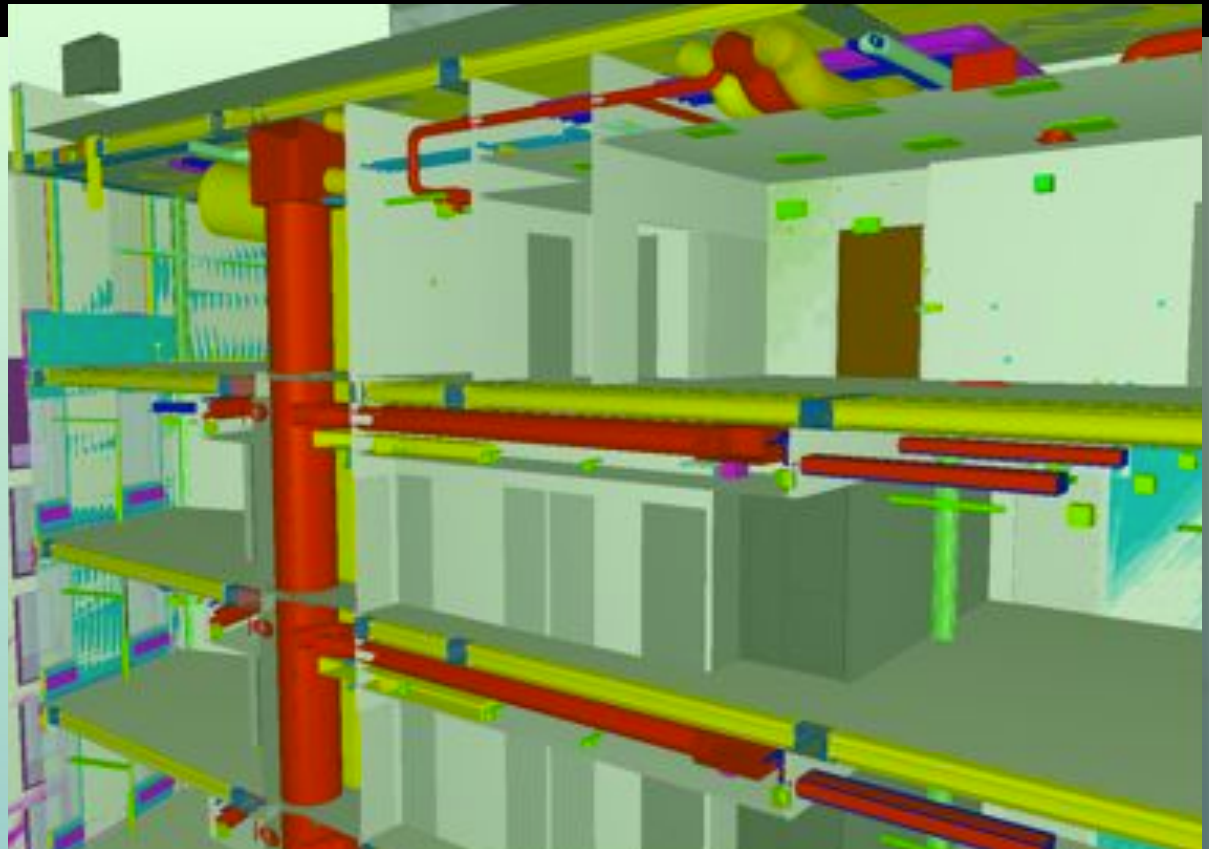
Architect
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Combination model



CASE: Skanska Ruskeasuo

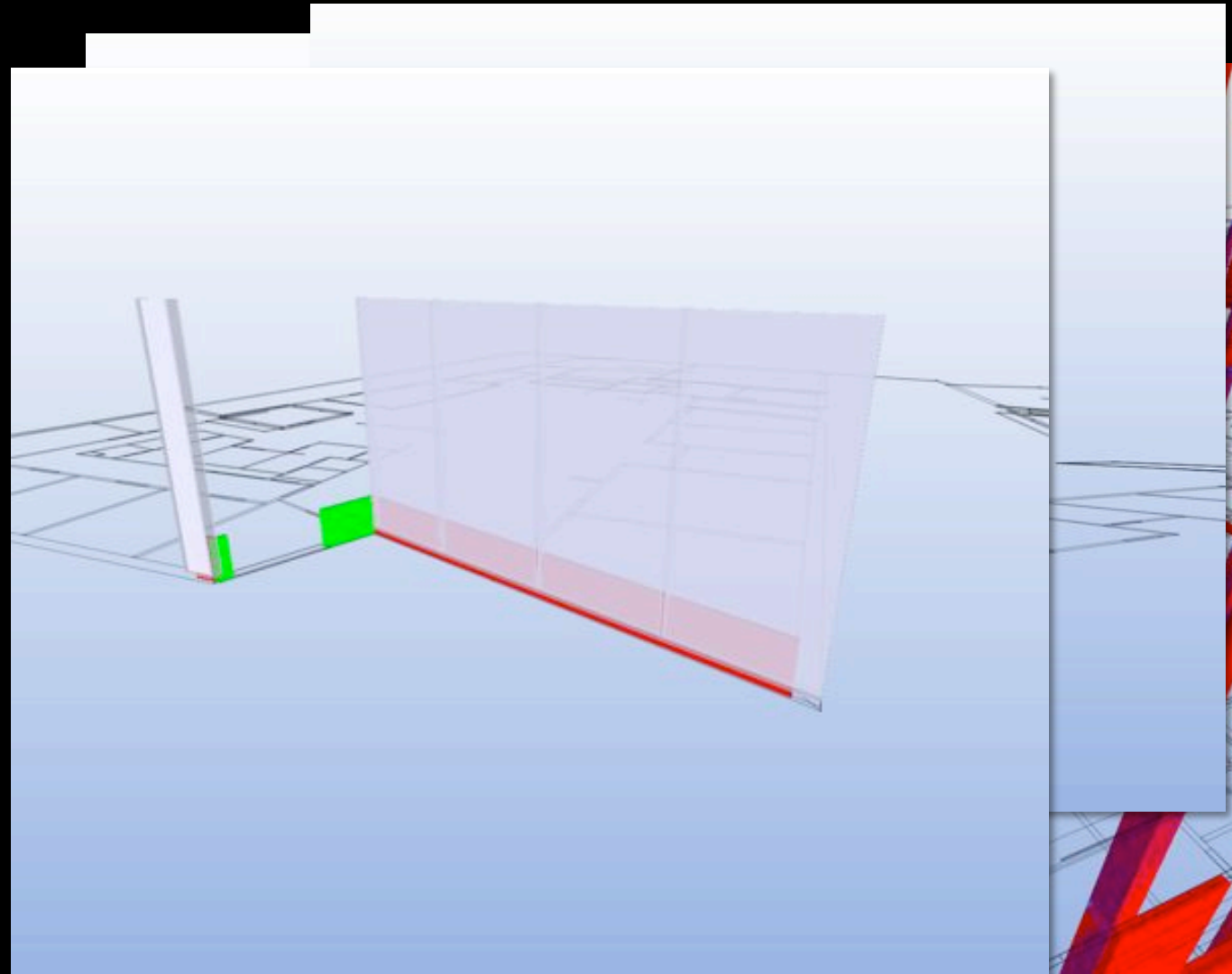
Checking the compatibility with Solibri Model Checker

Architect
Structure
HVAC
Electrical
Combination model



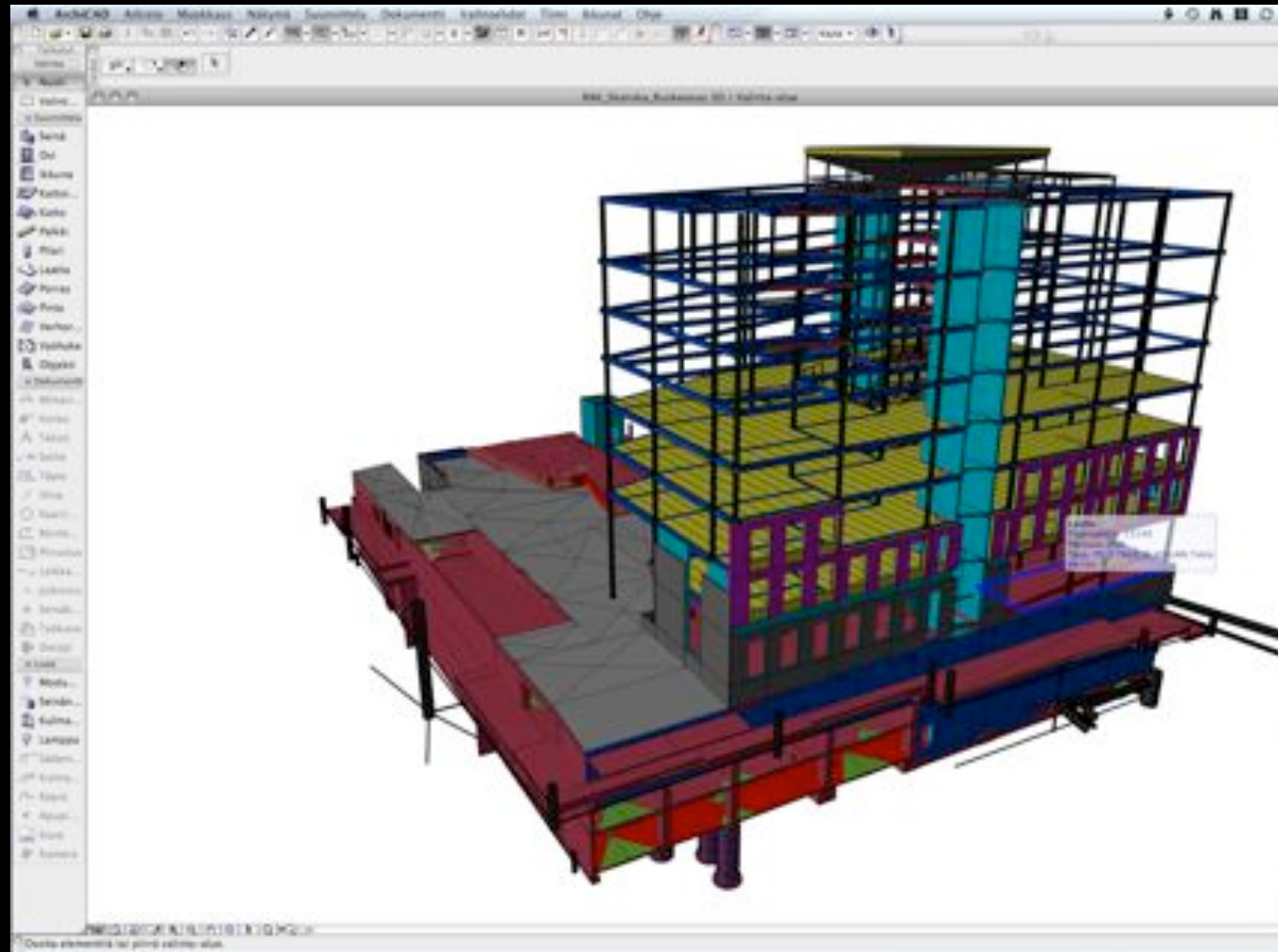
CASE: Skanska Ruskeasuo

Checking the compatibility with Solibri Model Checker



CASE: Skanska Ruskeasu

Structural engineer's Tekla-model IFC-imported in Archicad

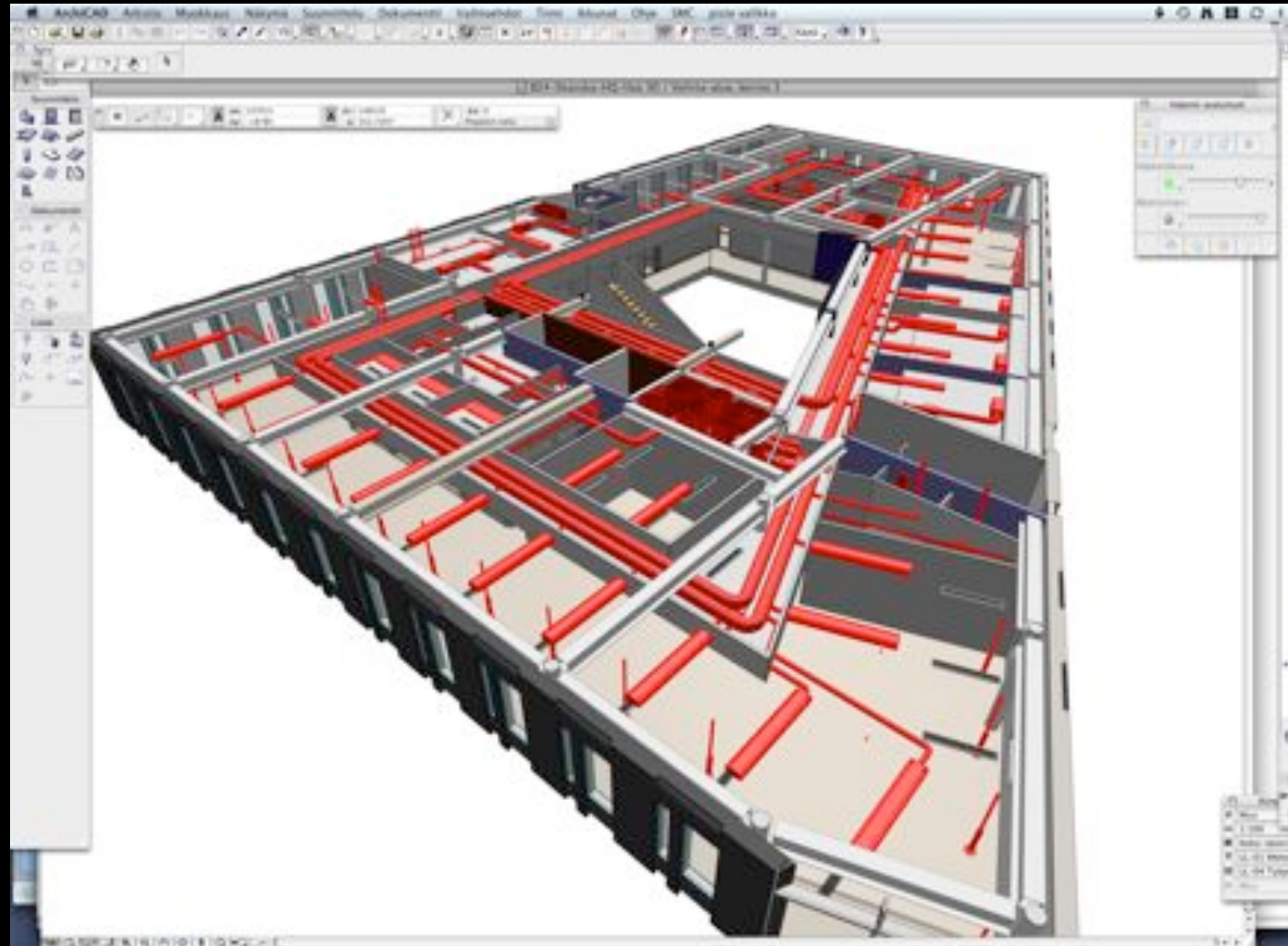


HVAC and electrical designs in Archicad in traditional 2D



CASE: Skanska Ruskeasuo

HVAC and electrical designs IFC-imported in Archicad



CHALLENGES

SITUATION 2009

- Technical limitations of software (IFC dialects)
- Lack of common interest in modeling and use of BIM
- Lack of guidelines
- Variations in personal skills
- One way communication
- Still pilot projects
- Unrealistic expectations



CHALLENGES

SITUATION 2009

- Technical limitations of software (IFC dialects)
- Lack of common interest in modeling and use of BIM
- Lack of guidelines
- Variations in personal skills
- One way communication
- Still pilot projects
- Unrealistic expectations

NOW 2012

- Is being developed all the time, not a big problem anymore
- Some customers still uncertain of benefits vs costs, lack of knowledge
- Common BIM Requirements 2012, published in Finland last spring. When widely in use?
- It just takes time...
- Combination models already in use. Real integration of the designers models are challenge
- If BIM used widely and in every stages
- Still on the scene. Lack of knowledge, customers / end users don't know how and what to order

FUTURE FOR DESIGNING WITH BIM

- From pilot projects to construction industry standard
 - Not only a method to create quality designs but also a tool to ensure the quality of buildings
 - Better opportunity to test various design solutions in the early phase of a project
 - Utilizing the benefits of Building Information Model during the entire lifespan of the building
-
- Development of software to streamline the interaction of information between all project participants ie. Authorities, consumer
 - All design fields contributing 3D information



