

ENVELOPE RETROFIT OF HISTORICAL BUILDINGS

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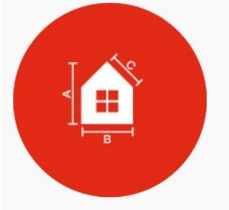
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Swiss global specialist for façade envelopes

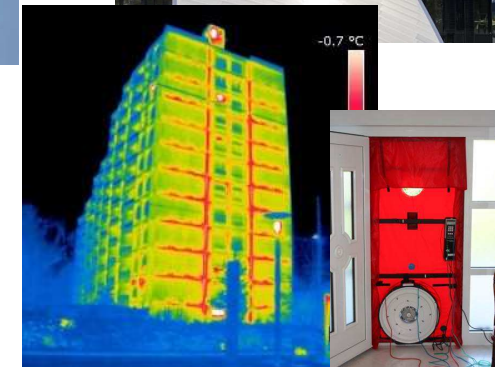
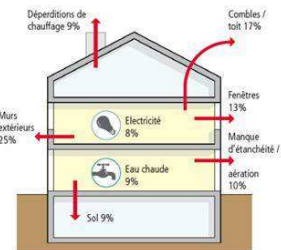
New construction & refurbishment complex projects.



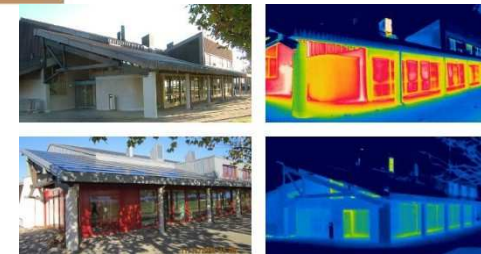
- **TECHNICAL ANALYSIS:**
- Engineering and technical design development for bespoke façade projects.



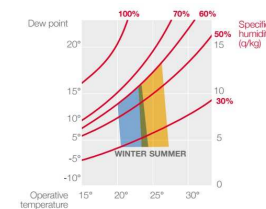
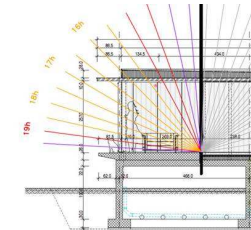
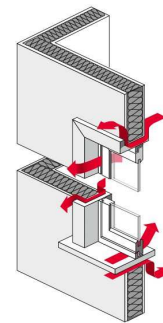
- **BUILDING PHYSICS:**
- Studies and analyses of existing buildings achieving tailored sanitation solutions



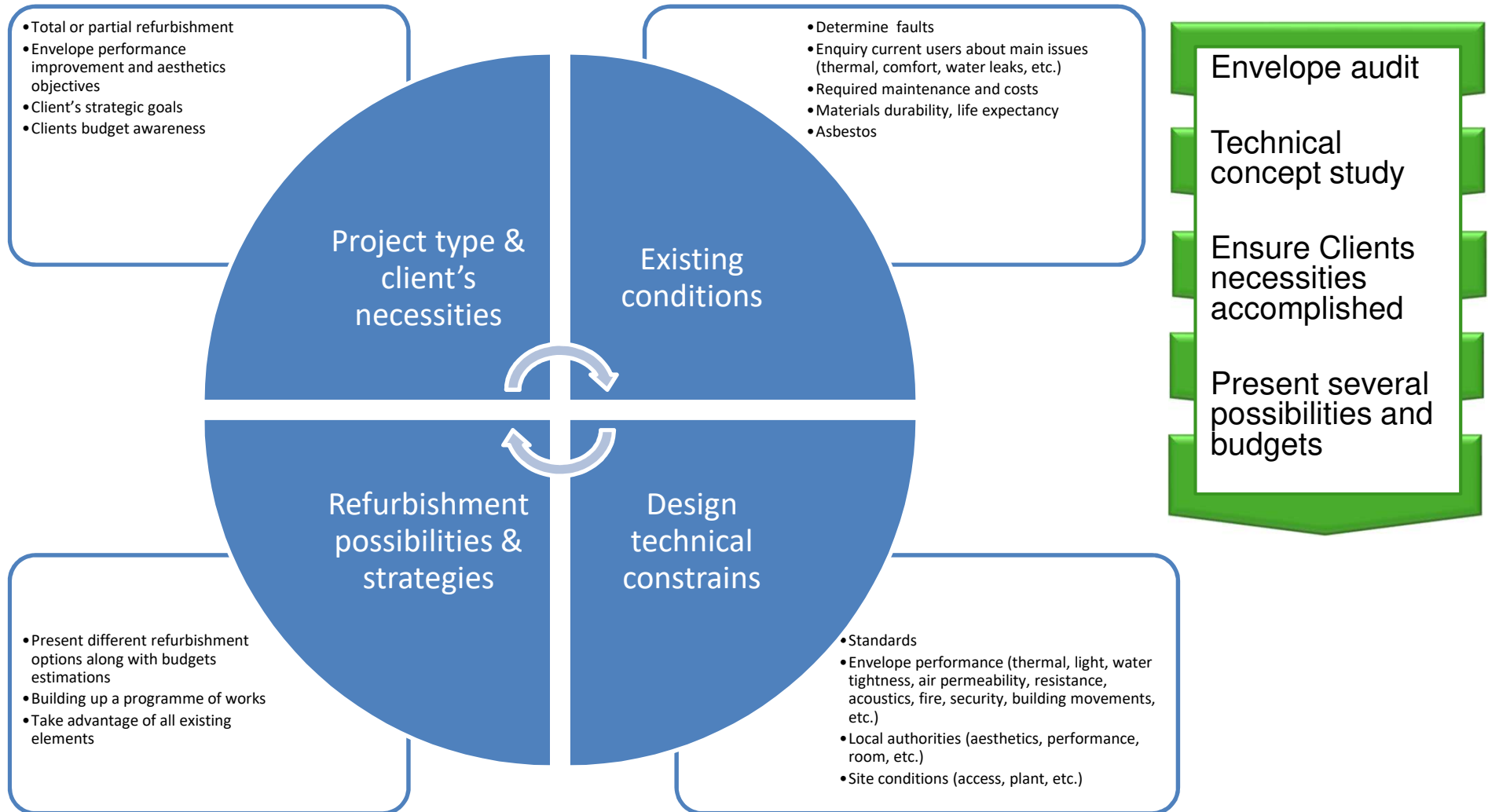
- **WORKS SUPERVISION:**
- Project management and prototype supervision with special attention to programme and cost



- **EXPERTISE**
- Determinate faults, seek out their cause, suggest remedies and budgeting cost repair. Address responsibility.



Analyze refurbishment possibilities & possible Energy-efficient solutions

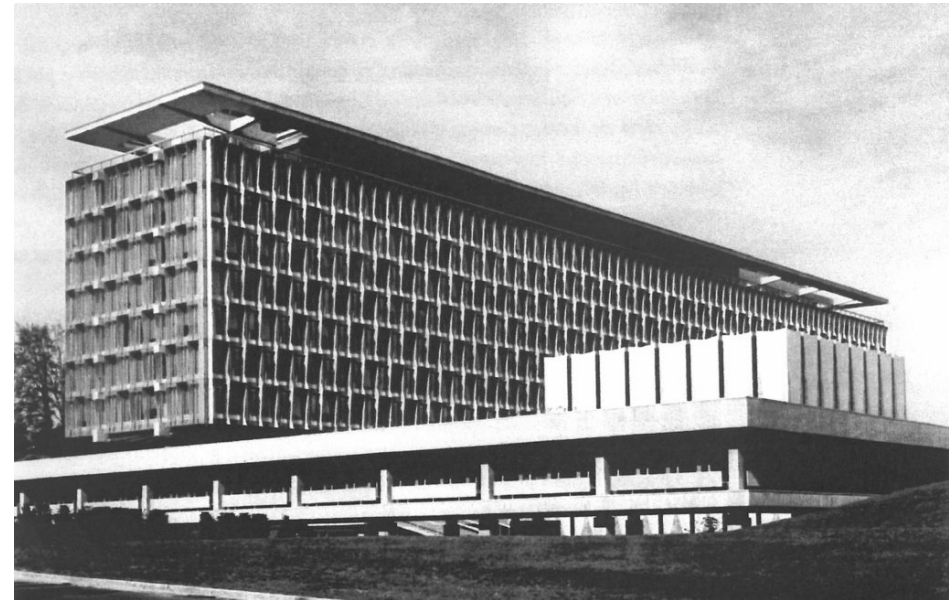


Dealing with special projects

Historic Building OMS - Geneva

Construction 1960

- **Technical issues**
 - Thermal insulation, general façade performance
 - Watertightness and airtightness
 - Obsolete vertical awnings
 - Static limits, adaptations to new standards
 - Expected service life



- **Consequences**
 - Thermal and acoustic comfort complaints
 - High maintenance costs
 - Aesthetics
 - Life expectancy
 - Excessive deformations

Dealing with special projects

Historic Building OMS - Geneva

- **Constrains**
 - **Historic building:** Identical aesthetics and geometry
 - Large project with several phases
 - High raise building and scaffoldings
 - Presence of hazardous materials
 - Structural façade elements
 - External brise-soleils in specific alloys
- **Challenges**
 - Defining required properties within a Swiss changeable environment.
 - Performance improvement.
 - Removing dangerous materials and their contribution to the fire performance.
 - Keeping all architectural design intent. No geometry changes.
 - Structural façade performance and current standards.



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Multi criteria analysis of ground floor façade



DECISION MATRIX		BASE Maintenance		OPTION 1 Static enhancement		OPTION 2 Glass replacement		OPTION 3 Façade replacement	
Criteria	Points	Grade	Comments	Grade	Comments	Grade	Comments	Grade	Comments
1	Installation	0,5	5	5	5	3	4		
2	Planning	0,5	5	5	5	5	4		
3	Cost wise	3	4	4	3	2	5		
4	Quality	3	2	3	4	5	4		
5	Life expectancy	2	2	2	2	5	4		
6	Cleaning	0,5	3	3	3	4	4		
7	Maintenance	0,5	3	3	3	4	4		
8	Warranty	0,75	1	1	1	4	4		
9	Energy production	1	0	0	0	4	0		
10	Fire performance	0,25	4	4	4	4	4		
11	Water proof	1	3	3	3	5	5		
12	Air proof	0,75	3	3	3	3	5		
13	Eco impact	0,5	5	5	4	3	3		
14	Architecture	2	5	5	4	3	4		
15	Energy performance	1	1	1	3	4	4		
16	Insulation	1,5	2	2	3	4	4		
17	Thermal inertia	0,5	3	3	4	4	4		
18	Solar protection	1	3	3	4	4	4		
19	Natural light quality	1	4	4	4	4	4		
20	External light protection	0,5	2	2	3	3	3		
21	Annoying works	0,5	4	4	3	3	3		
TOTAL GRADES		65,00	68,00	69,50	82,25				

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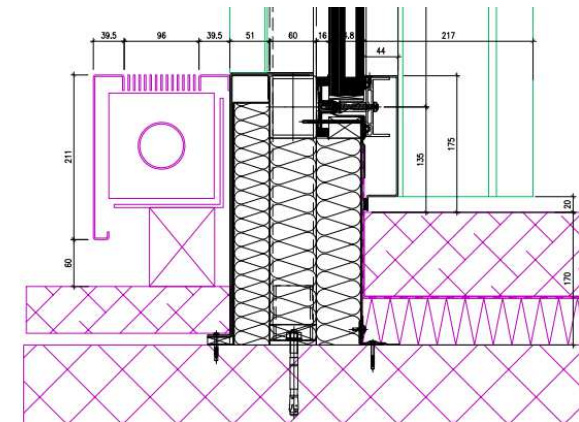
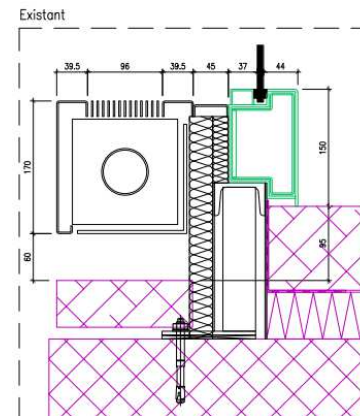
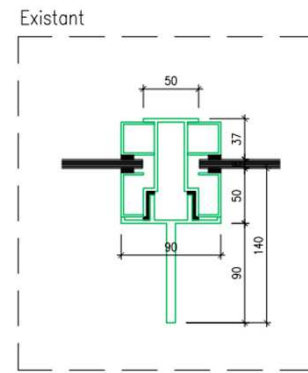
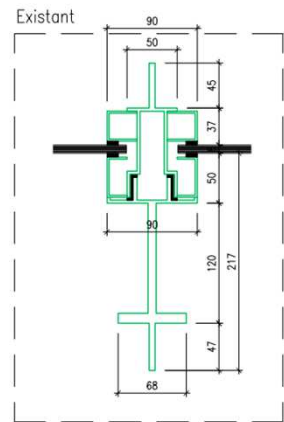
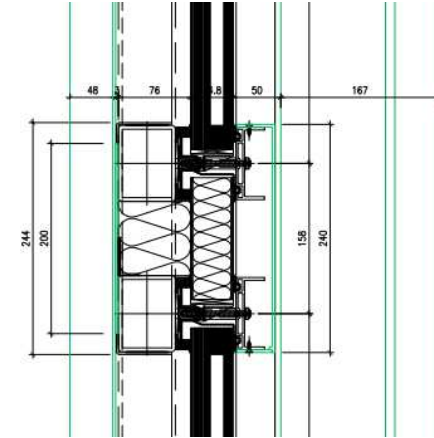
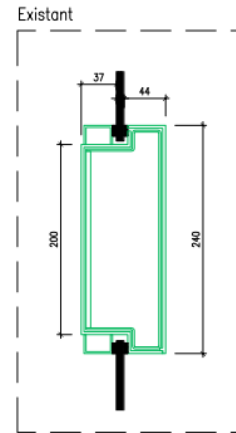
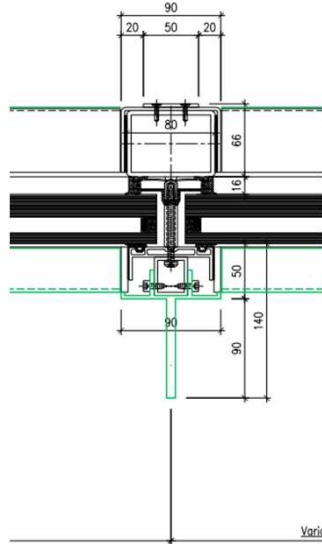
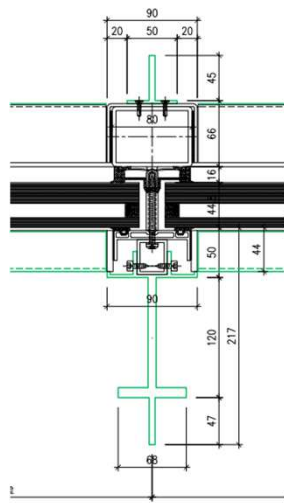
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- **Proposed solutions**
 - Various possible solutions to be discussed with client and authorities
 - Technical preference for façade replacement
 - Development of new systems with improved performances but same esthetics.
 - System developments
 - New aluminum casts
 - New materials
 - Doubled insulated glass units.
 - Static performance according to current standards
 - Improving performance against possible blast loads
 - Several rapports to be discussed with authorities, development of possible intermediate solutions

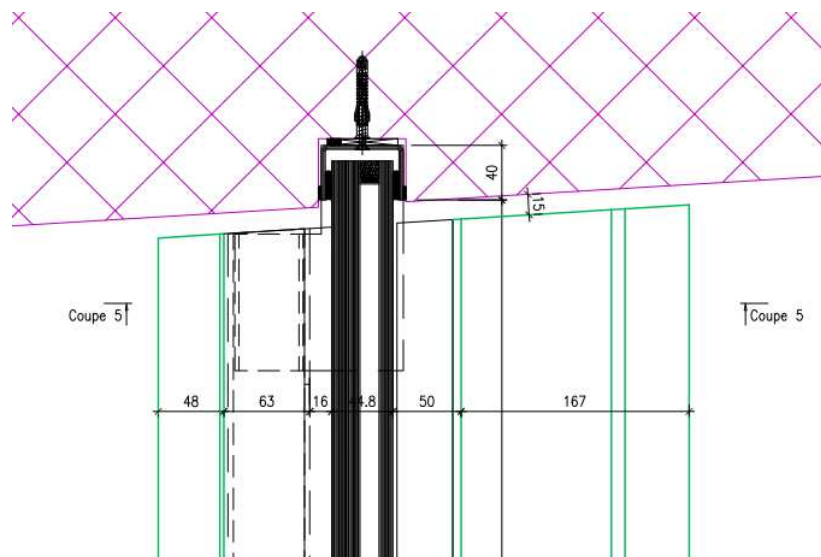
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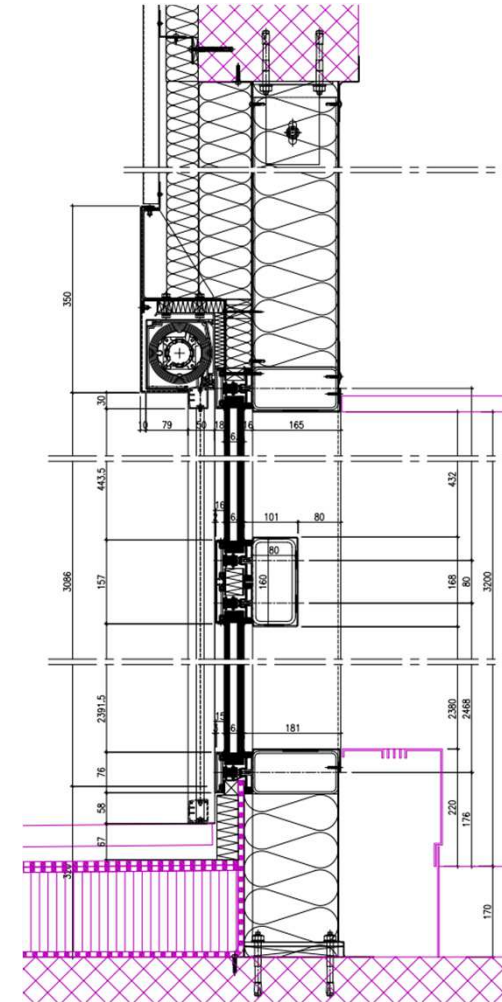
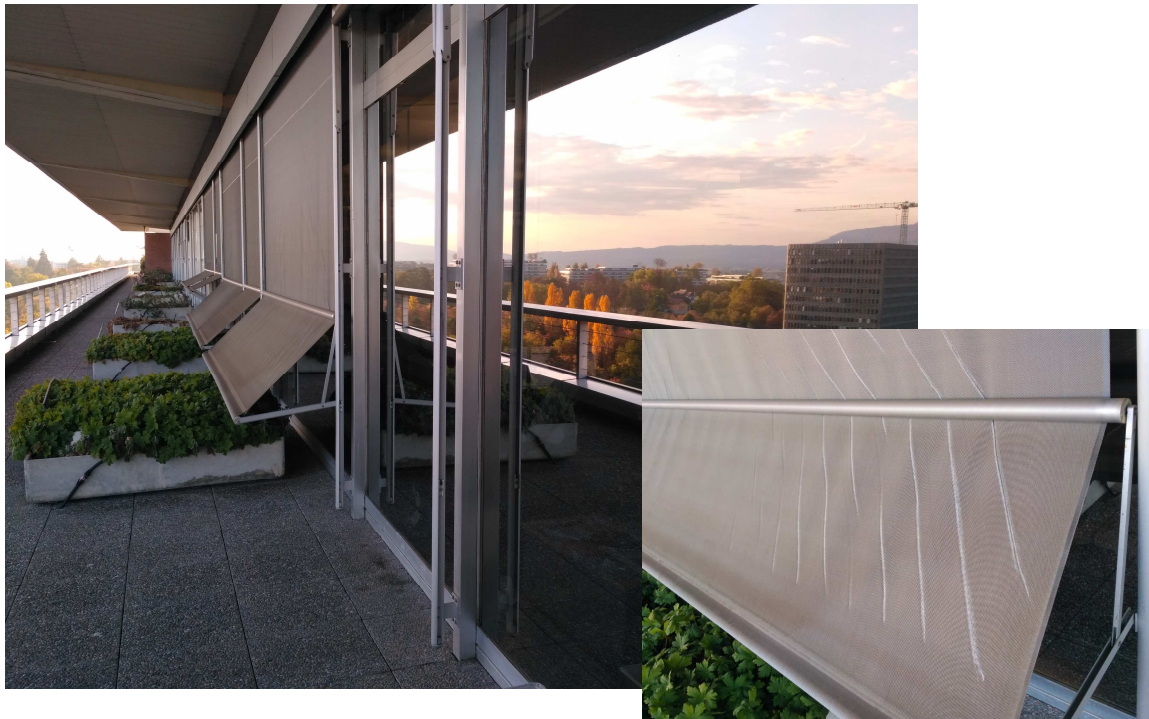
- **Different main areas**
 - Nord façade
 - Nord façade with multi-storey high
 - South, Est and Ouest façade with brise-soleils and vertical awnings



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- **Top floor**
 - Existing different façade solutions
 - Low performance, materials reaching expected life.
 - Development of new façade designs improving performance but maintaining architectural design intent



Building envelope design optimisation for refurbishment projects

THANK YOU - QUESTIONS?

