



# CONSOLIDATION ON CIVIL ENGINEERING AND TECHNICAL INFRASTRUCTURE

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6<sup>th</sup> ST Workshop – March 2003



# General Points

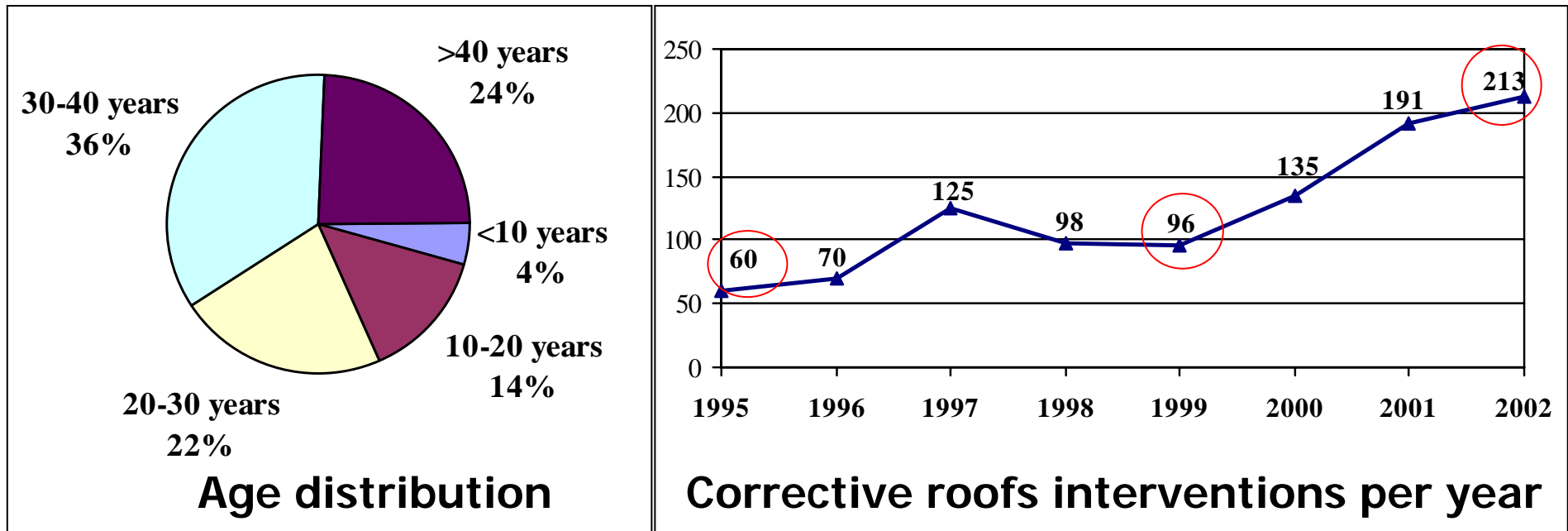
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- Sources
- Something has already been done
- Criteria

# Introduction

## CAUSES:

- ✓ Age
- ✓ Obsolescence, spare parts availability
- ✓ Change of laws



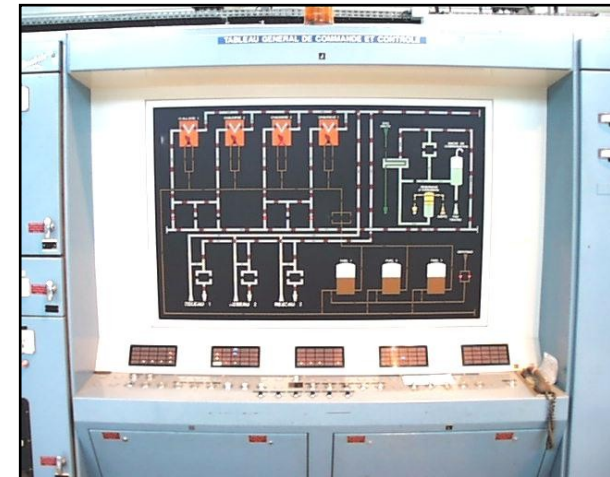


# HVAC, Electricity

Equipment	Budget needed per year [kCHF]	Duration	Total [kCHF]
HVAC - replacement of obsolete equipment	300	5 years	1500
HVAC - control systems renovation	300	5 years	1500
HVAC - eradication of asbestos	200	2 years	400
HVAC - piping networks renovation	100	5 years	500
Electricity –L.V. Switchboards renovation	150	4 years	600
Electricity – Replacement of Lighting equipment	150	4 years	600

# Building 860 Preveessin

Heating Plant Preveessin  
Compressed air plant SPS, NEA  
Estimated cost: 1 MCHF



# Façades

Building	Area to renovate	Estimate
	[m2]	[kCHF]
893	1570	282.6
255	900	162
269	150	27
132	50	9
149	83	14.9
203	700	126
206	155	27.9
168	700	126
60	100	18
30	2153	387
36	936	170
191-192	350	63
376	360	65
31	200	36
102	300	54
<b>Total</b>	<b>8707</b>	<b>1568.4</b>







# Roofs



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# Roofs

<b>SITE</b>	<b>BUILDINGS</b>	<b>AREA TO RENOVATE [m2]</b>	<b>ESTIMATED COST [kCHF]</b>
<b>SPS</b>	<b>BA2,BA3,BA4,...</b>	<b>11395</b>	<b>1'824</b>
<b>Meyrin</b>	<b>13,112,113, 181,...</b>	<b>13613</b>	<b>2'139</b>
<b>Prevessin</b>	<b>865,867,882</b>	<b>5267</b>	<b>848</b>
<b>Total</b>		<b>30275</b>	<b>4'811</b>





# Roofs

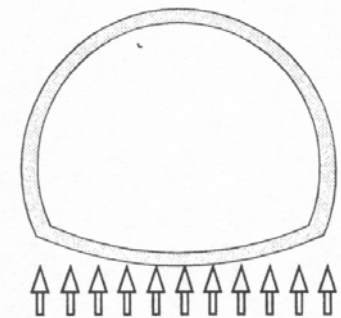
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- Consolidation - cost increasing factors:
  - Respect of today's technical standards
  - Upgrade of thermal conductivity (depending on use)
  - Safety measures during works
  - Safety measures for future interventions (access ladders, handrails, lifelines, walkways)
- Points of discussion:
  - Necessity of gravel protection
  - Use of PVC instead of bitumen

# Underground structures

- Water problem
  - LEP Jura – RE38 > finally watertight (?)
  - Maintenance program of drainage system needed
- Ground pressure on headwalls
  - UX45, UX85: OK - UX65 still to come? (800 kCHF)
- Tunnel heave in swelling rock
  - During LHC construction (TI2, UD68)
  - In existing tunnels (TT20, ...)





# Cleansing

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- A general analysis on all equipment and network is underway.
- Environmental constraints
- Cost



# Conclusions

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- Several interventions needed for the whole infrastructure.
- Delaying interventions shall lead to higher problems and bigger repair costs.
- Intervention needs to be planned at short-medium term.