Quality in Construction

Quality Assessment of Buildings

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Agenda

1. Insight into the technical condition of buildings with focus on Europe

2. TÜV NORD: Challenges in provision of proper technical conditions

3. Case Study: Structural maintenance in contaminated buildings

4. Conclusion

5. Advantages
1. Insight into the technical condition of buildings with focus on Europe

„Quality in Construction“ with regard to:

a) Technology: Consistency, functionality of domestic installations, stability

b) Mental Attitude: Safety for live and health, high-grade, elegance

New buildings:
Quality ensured by building code, design, financial budget, know how, controlling, documentation

Existing buildings:
Every inadequacy could be possible everywhere, especially to “Safety for live and health”. For construction years approx between 1955 and 1995 in East and West.
1.1 Condition of buildings in Europe  
(as based on the findings of the structural tests laboratory)

Our examinations demonstrate:

Almost every larger building (office-buildings, hospitals, schools, etc., even those in high grade performance) built between 1955 and 1995 does not meet the standards required for **Safety for live and health** (Mental Attitude)

Examples

- Application of hazardous materials which has potential to impurify the indoor air with cancerproducing particles like asbestos or polychlorinated biphenyls

- Inadequate standards of preventive fire protection
2. TÜV NORD: Challenges in provision of proper technical conditions

TÜV NORD Group

- One of the world leading German concerns in the field of: conformity assessment, technical safety, construction supervision, testing, inspection, industrial diagnostics and package solutions of safety;
- More than 140 years of history and experience gained since 1869;
- Represented in more than 70 countries;
- Turnover in 2014 is 1.1 billion EUR;

TÜV NORD Baltik

- 100% subsidiary company of TÜV NORD Group;
- 22 years of experience since 1993;
- TOP 3 conformity assessment Company in Latvia:
  - 7 Departments of conformity assessment;
  - 3 Testing and analytical laboratories;
  - Department of construction supervision;
  - Department of industrial energy audit and energy effectiveness;
- European Notification № 1409;
2.1 Challenges to maintain proper technical conditions
(of buildings in the future)

Owners must determine surveys and technical examinations by experts
Challenge: Recognizing and sourcing

Experts must be “state of the art”
Challenge: Education and advanced training, maintenance of quality

Owners must recognise the urgency and react accordingly
Challenge: Recognizing and sourcing

Building site, monitoring and documentation
Challenge for experts: Education and advanced training, maintenance of quality
3. Case Study: Structural maintenance in contaminated buildings

The Object:

Leninskij Prospekt 95a, Moscow

Built in 1984 by the former East German Government according to typical standards of the GDR.

Currently used by the German Consulate and the Goethe-Institute.

Construction method: Steel lattice formwork combined with precast concrete components (cladding panels) and conventional interior fittings
Problem No. 1

The construction method:

Steel lattice formwork covered with asbestos spray

Potential to impurify the indoor air with cancer-producing particles
Problem No. 2

Insufficient fire compartments which do not ensure escape in case of smoke and fire. Strengthening required subject to the regulations DIN 4102

[DIN 4102 “Fire behaviour of building materials and building components”]

Nominal condition of smoke and fire protection
Project Definition

Goal 1:
Attain conditions equal to the effect of an asbestos abatement through interim measures (impossibility for technical/organizational/political reasons of removing the asbestos in a regular way). Average concentration significantly less than 100 F/m³ (equal to outdoor pollution) in accordance with German asbestos regulations

Goal 2:
Strengthening the structural fire protection under physical safeguarding measures in case of constructional intervention

Goal 3:
Monitoring and Documentation in accordance with the quality requirements of German regulations
- DIN/ISO 9001 (Quality Management Systems)
- DIN 17025 (Competence of testing and calibration laboratories)
Realisation: Taking interim measures

Example:

Semi spatial separation of the asbestos products

Asbestos dust removal in inner areas

Intervention strictly under quality monitoring
Realisation:
Strengthening the structural fire protection

Example:
Physical safeguarding measures in the sense of engineering services
Realisation: Monitoring

Example:

Monitoring and supervising in the sense of expert testimony

Method: VDI 3492

Measurement of inorganic fibrous particles
Scanning electron microscope method

Sampling
↓
Scanning Electron Microscop
↓
Quality and Quantity
↓
Calculation and Assessment
Successive documentation of the measured indoor asbestos concentration shows reduced limit of quantification as demonstrated in the accredited quality system of the laboratory.

Realised through the application beyond the standard “Estimation of uncertainty of measurement” including arithmetic mean and 95% confidence level in the sense of Poisson-Statistics.
4. Conclusion

- The quality system of the laboratory allows asbestos monitoring with a quantification below the regular standards of single measurements as described in the regulations (VDI 3492) which is usually not more sensitive than 100 F/m³.

- Demonstrated: 20 F/m³ arithmetic mean and 31 F/m³ in 95% confidence level.

- Demonstrated: The effect of the interim measures is equal to asbestos removal. The concentration of asbestos fibers in the indoor air are on the average approximately equal to expected outdoor pollution.
5. Advantages

- The procedure generates and demonstrates safety for both owner and occupants, even when circumstances avert a performance according to the regular requirements by law.

- This occurs in agreement with the German regulation “Landesbauordnung § 3 BauO Bln”.

- Legal decisions are predictable when the laboratory’s quality system is officially accredited by

- This is also the requirement for physical safeguarding measures in case of intervention like strengthening the structural fire protection.
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