Brick, stone, plastered and rendered façades, façade coverings

István Vidovszky PhD

19th century

the structure of the facade getting independent from the load-bearing structure inside the building – change of the approach

facade coverings, claddings
### Typical Structure System

- **traditional**
  - A. load-bearing wall structure (+ rendered surface)
  - B. load-bearing wall structure + surface coverings (ceramic/brick /stone decoration)

- **modern**
  - C. load-bearing wall structure + insulation + rendered surface
  - D. load-bearing wall structure + insulation + surface supporting system + surface structure

### Rendering - Material

- traditional lime-Portland-cement rendering
- frost resistant Portland-cement rendering
- fire proof rendering
- isolating render mortar
- thin surface rendering mortar with polyester mesh reinforcement
- color stone plaster
Types of render finishes

- rendered
- colored rendered
- combed
- scratched
- broomed
- smooth
- rough
- Tyrolean
- polished
- roughcast/wet dashed

Types of architectural render finishes

- brick effect render
- ashlar effect render
- sgraffito
work sequence of rendering

traditional

1. mark out
2. rendering alignment spots
3. rendering alignment stripes
4. surface rendering
5. surface smooth

modern

1. set up
2. set aligning profiles
3. surface rendering
4. surface smoothing
handtools

- plastic float
- sponge float
- finishing trowels
- foam float
- broom
- comb

finishing tools

equipments

temporary structures:
- mortar silo
- scaffolding (above 1,5m)
- mortar mixers
- plastering machines
facade insulation - material

- polystiren
- polyurethane
- fiberglass / glass wool
- mineral wool
- woodwool board
- combinations

facade insulation - fixing

glued + anchored

above the surface
below the surface
facade insulation - fixing

anchoring points

facade insulation + rendering

edge protection  base coat

finish coat  smoothing
facade coverings - material

- brick facades
- stone facades
- metal sheets
- timber panel
- cement panel
- glass panel
- plastic panel
- ceramic facade panel
- polycarbonate

modern facades - requirements

<table>
<thead>
<tr>
<th>Statics</th>
<th>Insulation</th>
<th>Detailing / functionality</th>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>load bearing capacity (self load + impacts)</td>
<td>heat protection (thermal comfort)</td>
<td>maintainability, sustainability and reasonable cost</td>
<td>surface quality</td>
</tr>
<tr>
<td>wind load (+/-) resistance</td>
<td>protection against UV radiation</td>
<td>joints and dilatation</td>
<td>applied colors</td>
</tr>
<tr>
<td>optimal / required distance of the props, proper material quality, etc.</td>
<td>protection against moisture (rainwater, vapour load)</td>
<td>security aspects – property protection</td>
<td>proportions of the surface elements</td>
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<tr>
<td>acoustic protection</td>
<td>fire protection</td>
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<tr>
<td>workability / viability</td>
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</table>
assembled facades systems

Load bearing wall / skeleton structure + exterior wall + insulation + assembled surface

influencing factors (consequences of e.g. material characteristics):

* element size (min.-max.)
* element weight (average /max.)
* element shape

modern brick facades

metal supporting system
modern stone facades

metal supporting system

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2012.10.16

timber panels

timber supporting system

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cement boards

1. load bearing wall
2. thermo insulation
3. supporting battens
4. EPDM joint tape
5. gap
6. facade panel
7. screw

glass facade panels / U-profile glass
ceramic facade panes

ventilated system

metal sheet panels

mounted on a supporting system
**plastic panels**

**Transportation - site logistic**

**equipments required:**
- scaffoldings (fix, mobile)
- platform basket, lifting platform
- lifting equipments (elevator, crane)
- special lifting /rigging tools (e.g. for glass panels)
Office building, London, United Kingdom

Office building, Lisbon, Portugal
U-profile glass facade system, VIA University College, Horsens, Denmark

Brick facade, Apartment building, New York, USA
Fiberglass-concrete facade, „Soccer-City”, Johannesburg, South Africa

Ceramic facade covering, Spanish Expo-Pavilion, Aichi, Japan
Thank you for your attention!

References

[6] Épületszerkezettani segédlet, Kőburkolat Rögzítése, SZIE