

Environmentally Focussed



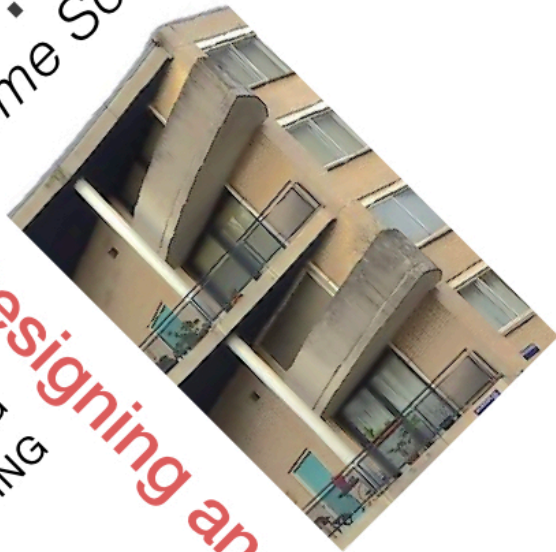
Weather and Wind : the Spoilers

How Beautiful Designs Become Soiled in Practice

ARCHITECTURE
BUILDING
ENGINEERING
CIVIL ENGINEERING

Designing and Detailing

AUTEUR
ALFRED MEIJERS



DESIGNING
FAÇADES
AND
VIADUCT

'RAIN AND WIND: THE DESIGN SPOILERS'

DE ESSENTIE VAN GOED ONTWERP

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FOREWORD: *DESIGN CHOICES UNDER SCRUTINY*

The core idea behind this book is best summarised in the words of architect Frei Otto:

*"Building sandcastles on the beach, we may ignore the waves,
but we must always keep an eye on the tide."*

For a long time, the author has wondered why so many facades and civil-engineering structures display avoidable or minimisable soiling, and why so little is said about it.

Do designers, then, simply have no eye for this?

These questions gave rise to this book. It not only demonstrates the seriousness of the phenomenon but also offers — through clear text and striking imagery — insight into the causes, possible solutions, and the dilemmas architects face.

The examples show how easily the harmful influence of rain, rainwater flow, and wind — much like the tide in Otto's metaphor — is overlooked during the design process.

His message is clear: those who ignore these factors design blindly. Those who understand them gain an advantage: a challenge that leads to surprising design solutions and strengthens the quality and durability of the design. The book is therefore a valuable resource for:

Students of architecture, building engineering, and civil engineering.

Gaining early insight into what takes place around objects.

Professionals in the construction sector.

Refreshing knowledge and understanding that may have faded.

Architecture enthusiasts.

A glimpse into the ups and downs of the design process.



SECTIONS AND CHAPTERS

The overview below points to the different aspects that play a role in developing surface soiling. The common thread is the dominant interplay of rain, rainwater flow, and the wind that directs it.

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ANOTHER PERSPECTIVE
ON *FAÇADES*

AN UNNOTICED PHENOMENON?

During my travels, in the Netherlands and beyond, I noticed that facade soiling shows the same characteristics everywhere — on buildings, civil-engineering structures, and all those anonymous objects found in public spaces. Much of this soiling could have been prevented, which made me curious about its underlying causes.

A first clue emerged when I asked around: I mostly received puzzled looks and the remark that people simply never gave it a thought. That inspired me to devote a lecture series to the subject. My students were sceptical at first, but that quickly changed once they started looking around more consciously. Some even said: "Once you've noticed it, you can't unsee it."

WHAT MAKES SOILING A PROBLEM?

You might say: "Buildings and civil structures get dirty — so what?" But that mainly holds true in dry conditions, where dirt settles gradually and evenly. In wet regions, rain and wind play an entirely different role — they are the real disruptors. The more erratic and forceful their influence, the more disfiguring the soiling.

And that is precisely where the core of the problem lies: there is too little awareness of how wind and rain affect facades and other visible surfaces. For some facade finishes, that combination can even prove disastrous. This is not a truism, because as this book shows, the consequences are often far more serious than one might think.

Without the will to change this, all that remains is the bitter irony of Frank Lloyd Wright's words:

"A doctor can bury his mistakes, but an architect can only advise his clients to plant vines."



An unnoticed phenomenon?



ACCEPTANCE OF SURFACE SOILING

Why does the often glaring soiling of objects receive so little attention? There are several reasons for this. After all, buildings do not stand in museums, but in the wet, windy outside world. Moreover, people grow accustomed to their everyday surroundings, causing facade soiling to be seen as normal.

This also applies to the famous Art Nouveau facades of Victor Horta. Their soiling is not straightforward: wind, rain, and the refined ornamentation together influence how dirt settles or is washed away. Yet this does nothing to diminish the admiration, and the soiling itself is rarely mentioned. Perhaps we look at his facades the way we look at an older person: marked by time, but retaining lasting dignity. Horta's facades bear witness to craftsmanship and unique value — qualities that continue to shine through the soiling.

Looking around, it seems as though many designers in architecture and civil engineering focus mainly on aesthetics, where making concessions feels like a loss. But is that desirable?

Ironically, Horta did not have access to the technical knowledge we now have about wind and rain. Yet his facades have stood the test of time — something that cannot be said of many projects featured in this book. That raises the question: are we making the most of our knowledge? Isn't it time that preventing unwanted forms of soiling was considered from the very first design stage?



A beautiful design on paper says little about how a facade holds up in the outside world. The photographs on the left-hand page show what happens when vulnerable materials are used alongside — unfortunately — failing detailing.

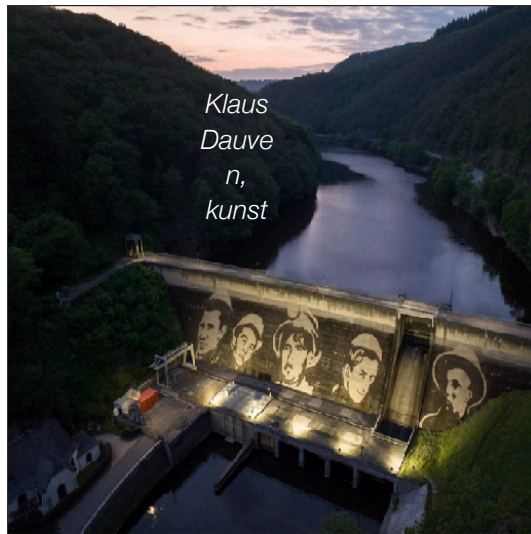
ENVIRONMENTAL VARIABLES AND DETAILING

For instance, the plasterwork of the facade in image [1.5] suffers from persistent dampness and a lack of drying sunlight. This is a more common form of facade soiling on north-facing facades. The soiling here is further intensified by the proximity of trees, a small watercourse, and a busy ring road. Looking further at the image, we see that partial cleaning (far left in the photo) achieved little. The soiling begins again immediately, since the environmental factors remain unchanged. Given the materials and detailing chosen, this is merely a temporary fix, without a structural solution.

The situation was different for the facade in image [1.6], whose unattractive condition is a direct result of poor design choices: the absence of flashings and the use of lower-quality plasterwork. Rainwater flows down over the plasterwork together with dirt from the window frames and roof edge. This roughens the plasterwork's surface, increasing dirt adhesion. Adjusting the details proved difficult, so a pragmatic decision was made to repaint it in a dark blue colour. This masks the problem but does not resolve its cause.

THE IMPORTANCE OF 'DESIGN THAT ACCOUNTS FOR CONTEXT'

These two examples are merely the tip of the iceberg. They do, however, expose a gap in the design approach. They underline the need for greater awareness of weather conditions, environmental influences, and the combined effects of wind and rainwater. Long before the first sketches are put to paper, it is important to consider the orientation of every facade of a building or complex, and to assess this against prevailing weather conditions and the presence of greenery, water, and traffic density in the immediate surroundings.



The Dutch architect Rem Koolhaas described the life cycle of design and building as follows:

"A building has at least two lives: the one conceived by its maker, and the life it leads afterwards, and the two are never the same."

This statement certainly holds true for facades that, unfortunately, disrupt the visual coherence of a building's exterior. Deviations stand out quickly on large, dense, evenly coloured facade surfaces. Think of lime and salt efflorescence and other moisture-related staining. Large surfaces can be painted in a uniform colour, as in image [1.12], but this does not prevent deviations from occurring. Because these gable ends occur at great height, they are more exposed to erosion from wind and rain. Environmental factors such as sunlight also leave their mark, as seen in the fading colour of the red south-facing facade in image [1.13]. This makes regular repainting necessary to maintain the facade's quality.

Vulnerable facades are better finished with glazed tiles. Combined with imagery, this creates a facade truly worth pausing to admire, as with the north-facing facade in image [1.14]. This more expensive solution nonetheless requires less maintenance and remains attractive for years, whereas other north-facing facades often age more quickly. A less costly alternative is glazed facade bricks. That these finishes are merely a few of the many alternative solutions for north-facing facades will become clear later in this book.

Climate change is intensifying the need for smart detailing and deliberate material choices. Heavier rainfall and stronger winds are making joint sealing and protection against abrasive wind currents — particularly on tall facades — increasingly important.

For heavily soiled surfaces, creative but temporary solutions are possible, as demonstrated by the German artist Klaus Dauven. Using a high-pressure sprayer, he created artworks by selectively removing dirt, including on the dam shown in image [1.15]. The effect is spectacular but short-lived, much like facade cleaning itself. The question remains how soon such an intervention needs to be repeated — or do facade-cleaning companies ultimately benefit the most?



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