AI–BOB

PILOT REPORT

The Innovation Idea

Automated regulatory compliance checking in Revit

Programme Smart Built Environment Date 3 February 2026

Partners White Arkitekter · AI–BOB · TillgänglighetSverige

TRANSLATOR'S NOTE

This document is an AI-generated English translation of the original Swedish report (Innovationsidén — 24/25, Slutrapport, 3 February 2026). The Swedish original is the authoritative version. Minor wording may differ. The translation has not been reviewed by a human translator.

SUMMARY

A pilot in real projects

The AI–BOB project has evaluated whether automated regulatory compliance checking in Revit can contribute to higher quality, reduced risk, and more efficient design work in residential projects. Within the framework of Smart Built Environment, final testing of AI–BOB was carried out in two real projects together with White Arkitekter and TillgänglighetSverige.

The results show that automated checking of accessibility requirements is technically feasible and practically useful during the design phase. AI–BOB identified deviations that would otherwise risk being detected late in the process, while the review work could be completed in minutes rather than hours.

The project confirms the potential of AI-based compliance checking as a tool for quality assurance, risk reduction, and more sustainable construction processes in the early stages.

KEY RESULTS

- 2 residential projects together with White Arkitekter
- 10 typical apartments reviewed
- 12 deviations identified
- Review time: approx. 5 minutes instead of 6–8 hours per typical apartment

1. Background

Construction defects and late design changes are a significant cost driver in the built-environment sector. Architects and certified specialists often work under time pressure with complex regulations, where many checks are repetitive and manual. Earlier studies, including from Boverket[1], point to shortcomings in current control systems and a need for more systematic quality assurance in the early stages.

Boverket has also highlighted that construction defects and deficiencies in newly built housing are a long-standing and recurring problem, and that the sector has struggled to achieve a lasting reduction in defect rates since the 1990s.[2] This underscores the need for new ways of working and more effective methods for quality assurance in the early stages.

[1]Boverket. (2018). Kartläggning av fel, brister och skador inom byggsektorn.
[2]Boverket. (2024). Varför minskar inte slöseriet? En studie av kunskapskulturen i den svenska byggbranschen.

AI–BOB has been developed as a Revit-integrated tool for automated regulatory checking, with an initial focus on accessibility requirements in housing. White Arkitekter participated as a needs owner and end user to evaluate the tool's precision, usability, and impact on workflows. TillgänglighetSverige participated as an expert partner and contributed certified expertise in accessibility, both to verify identified deviations and to ensure that the review aligned with established practice and regulatory interpretation.

2. Implementation

The project comprised final testing of AI–BOB in two residential projects. The reviews were carried out directly in Revit and in parallel with the established manual control processes.

The testing focused on:

— accuracy of identified deviations
— time required per reviewed typical apartment
— user experience and workflow
— the ability to identify deviations that are difficult to detect in 2D

A total of 10 typical apartments were reviewed across two projects. In these projects, 12 deviations relevant to accessibility and residential functionality were identified. All were verified in dialogue with certified accessibility specialists at White Arkitekter and TillgänglighetSverige.

3. Results

3.1 Efficiency of the review process

A clear effect of AI–BOB was the reduced time required for accessibility review. With the tool, one typical apartment could be reviewed in around five minutes, compared with the established manual process, which normally requires around six to eight hours.

The review is based on the information in the Revit model, which means that the model must contain a sufficient level of detail for relevant functional dimensions and free areas to be assessed — for example, through correct representation of fixed installations and typical furnishings.

In typical residential projects, a selection of typical apartments is usually reviewed. The difference in time required means that the overall saving per project can amount to several working days, while the review also becomes more consistent, traceable, and easier to follow up.

3.2 Identified deviations

In the projects, AI–BOB identified a total of 12 deviations across three main areas.

Accessibility and functional dimensions. AI–BOB detected, among other things, a shower area with insufficient functional dimensions, opened doors that did not meet passage-space requirements, and a bed position that, after re-arrangement of furniture, could not meet the requirements for assistant access.

Residential functionality. The tool also identified deviations linked to the functionality of the dwelling, such as insufficient storage length and the absence of the prescribed coat rack and wardrobe in the entrance area.

Safety. Safety-related deviations were noted, including a staircase without a handrail and a staircase with insufficient clear height below 200 cm.

One particular example emerged where walls at sloped ceilings on the top floor were modelled in a way that caused them to intrude into the room space. This type of deviation was difficult to detect in traditional 2D drawings but became clear in AI–BOB's 3D-based review.

> "It is very valuable that AI–BOB reviews the 3D model, because details like these often aren't visible in 2D."
>
> — Certified specialist, TillgänglighetSverige

3.3 Precision and transparency

The deviations identified by AI–BOB largely matched those from the manual review and helped clarify questions of interpretation and definitions in the projects. The majority of deviations were assessed as relevant and actionable in the design phase, with a low share of false positives. Each deviation was linked to the relevant regulatory reference, which facilitated dialogue between architects and certified specialists.

3.4 User experience in the design phase

The architects particularly highlighted the reassurance of having the review based on the 3D model rather than only on 2D drawings.

> "I feel more confident now knowing that AI–BOB reviews the 3D model and not just the 2D drawings."
>
> — Certified specialist, White Arkitekter

3.5 External assessment from certified specialists

Two certified accessibility experts — one from White Arkitekter and one from TillgänglighetSverige — compared AI–BOB with the traditional method and

particularly emphasised the value of increased confidence and continuous access to review.

> “AI–BOB is a very good tool that creates greater confidence both for the person designing and for the person reviewing.”
>
> — Certified specialist, White Arkitekter

> “AI–BOB is a certified accessibility specialist that is always available to answer your questions.”
>
> — Certified specialist, White Arkitekter

4. Economic significance and risk reduction

Deviations detected late in the design or construction process can have significant consequences in terms of increased time, redesign, and in some cases delays. Accessibility deviations are often relatively simple to correct early on, but become rapidly more resource-intensive as the project progresses. A practical rule of thumb is therefore that the cost of remediation increases sharply in later stages, especially if changes affect production, restoration, or the residential environment.[3]

The figures below are illustrative industry examples and show typical orders of magnitude.

In the early design phase, remedial actions mainly concern redesign and coordination — for example, adjustments to door and WC dimensions, placements, turning areas, and contrast principles.[4] This type of correction can often be carried out directly in the model and drawing and typically involves a limited resource input, in the order of approximately SEK 5,000–25,000 per deviation.

When the building is under construction, materials, installation, and logistics are added. Typical measures may then include the installation of door automation, ramp adjustments, or modifications of WC spaces.[5] Costs at this stage may, according to industry examples, fall in the range of SEK 20,000–80,000, depending on whether the change can be made without demolition or rebuilding.

After completion or during inspection, the same type of deviation often entails the need for demolition and restoration as well as disruption of the contract flow and schedule. At this stage, remedial actions often become disproportionately more expensive, with cost levels potentially reaching SEK 60,000–200,000 or more.

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[3] BuildingSMART International, Patrick MacLeamy. (2022). How to Make a Difference: The MacLeamy Way.

[4] Josephson, P.-E., Chalmers University (1998). Defects and Defect Costs in Construction.

[5] Boverket. (2021). Ansvaret för att åtgärda enkelt avhjälpta hinder.

If deviations are not detected until after move-in, the remedy often shifts into a property-management and disruption project, where follow-on costs and practical consequences can dominate.

The 12 deviations identified in the projects therefore represent a concrete risk reduction by enabling shortcomings to be made visible early in the process. The project illustrates the value of early and systematic deviation identification as a central part of quality assurance and a more robust design process.

5. Limitations and lessons learned

During the project period, a number of limitations were identified in the first version of AI–BOB:

- review could be carried out one apartment at a time
- the result depended on the model containing sufficient structure and level of detail

At the same time, the project showed that the quality and structure of Revit models vary between different project stages and ways of working. Automated regulatory checking therefore needs to be robust against variation in modelling rather than assuming a uniform standard.

As a direct consequence of this insight, AI–BOB has further developed its service towards more flexible and model-adaptive validations, with the goal of reducing setup time and enabling broader use in practical project environments.

6. Conclusion and outlook

The project has demonstrated that AI-driven regulatory checking in Revit is technically feasible and practically useful in residential design. The tests with White Arkitekter show that automated review can identify relevant deviations early and contribute to a more systematic approach to quality work.

The pilot's focus has been to evaluate use in real project environments rather than to statistically quantify accuracy at the sector level. The results nonetheless clearly indicate that automated regulatory checking can serve as a new form of support in the early stages, both for architects' self-checks and for clients' quality assurance.

The results of the project align with Smart Built Environment's impact goals of increased efficiency, quality, and sustainability in the built-environment process.