ITEA4 22003 FireBIM

Deliverable D4.2: User Requirement Document (URD) for custom and industrial applications

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Version history

Version	Date	Coordinator	Change
1.0	2025-12-1212-12	Jenny Delacroix (Buildwise)	First version

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2 Introduction

As fire safety regulations become increasingly complex and critical for building security, the digitalisation of compliance verification processes is now a major challenge for the construction sector.

The FireBIM project addresses this challenge by offering an innovative platform dedicated to the automated analysis and verification of Building Information Models (BIM) against fire safety requirements. This document is intended primarily for architects, engineers, and fire safety experts who must ensure that BIM models contain all the necessary data for reliable and automated compliance checks.

The purpose of this deliverable is to formalise all user needs and functional requirements for the development of the FireBIM platform, covering both custom and industrial applications. It aims to provide a clear and structured foundation for development teams, while ensuring traceability with the use cases and scenarios defined in earlier project phases.

The document is organised as follows:

- Presentation of the main use cases and user journeys
- Detailed description of typical workflows
- Breakdown of functional requirements by major feature, illustrated with user stories
- Mapping of user journeys to use case scenarios and associated solutions
- Specification of technical and methodological requirements for each project phase (initialisation, configuration, checking, and output generation)

The methodology is based on identifying concrete user needs at each stage of the BIM project lifecycle, from data integration to the generation of compliance reports. Requirements are structured to ensure interoperability, traceability, and ease of use, relying on open standards (IFC, API, etc.) and feedback from the consortium's various partners.

3 User Journeys

3.1 User Journey 1 – Early design guidance and compliance checker

3.1.1 Description

Overall idea

This user journey empowers architects and BIM coordinators to efficiently verify that each fire compartment within a building layout complies with the most critical fire safety regulations in the early project stages: maximum permitted floor area, minimum number of exits, and maximum evacuation distances. The process is supported by automated pre-checks for data completeness, rule-based compliance checks, and immediate visual feedback within a 3D environment. The platform enables seamless transfer of compartment data via API, detects missing or inconsistent information, and provides on-screen summaries and model-based visualisation. Results and compliance reports can be exported in multiple formats (PDF, CSV, BCF), ensuring that all stakeholders have access to clear and actionable documentation throughout the project lifecycle.

Involved Stakeholders and their Role

Stakeholder	**Role**
Architect	Initiates data transfer, completes missing info, runs checks, generates reports.
Fire Safety Engineering	Reviews results, validates waivers/justifications, advises on code interpretation.
MEP/Structural Modellers	Provide discipline models, enrich object properties.
Project Owner	Manages project, invites/removes users, controls access.

Building phase

	0	1	2	3	4	5	6	7
Phase	Strategic Definition	Preparation & Planning	Concept Design	Spatial Coordination	Technical Design	Manufacturing & Construction	Handover	Use

Commented [TG1]: Removed phase 1 and 5 from selection for more meaningful positioning.

Objectives

Unlike generic use-case narratives, this journey operationalises a limited but cohesive set of high-value compliance rules across the entire workflow: maximum compartment area, minimum number of exits per compartment, and maximum walking distances in a compartment. The flow connects data readiness, automated checking, and comprehensive reporting, and is closely aligned with the data templates and IDS developed in WP2. The result is a robust, end-to-end process that ensures regulatory compliance is embedded in the design from the outset.

Rationale

The rationale for this journey lies in addressing the pain points of traditional workflows, which often involve manual inspection of multiple IFC files, ad-hoc area and distance calculations, fragmented feedback, and limited traceability. By automating data transfer, validation, and reporting, the platform reduces manual effort, minimises errors, and ensures that all stakeholders are working with consistent and up-to-date information. This approach goes beyond the scenarios and solutions outlined in D4.1 by providing a focused, operational framework for compartment area compliance.

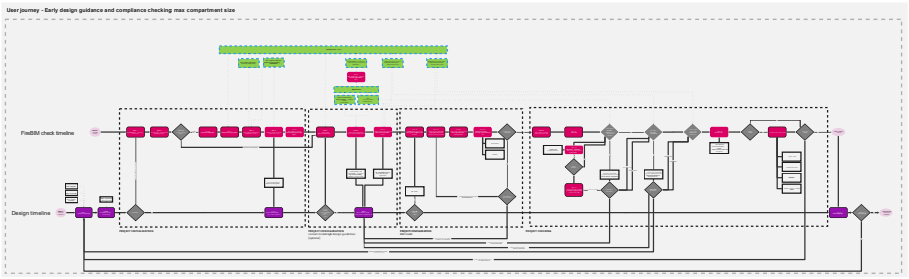
Relation with Use Case Scenarios (D4.1)

This journey is directly related to the use case scenarios in D4.1 that address the need for structured, verifiable fire safety information within BIM models. It builds on the foundational requirements for data completeness and quality, ensuring that compartmentation and evacuation checks are reliably integrated into the overall compliance process.

Relation with Custom Applications (D4.1)

The workflow leverages and informs the development of custom applications described in D4.1, particularly those focused on automated compliance checking, data enrichment, and reporting. By providing a clear and repeatable process for compartment area validation, it supports the broader adoption of FireBIM tools and methodologies across diverse project types.

3.1.2 Flow Details



Current Flow

In the current workflow for verifying maximum compartment size, project teams rely on a fragmented and largely manual process. Each discipline exports its own IFC model, and architects or BIM coordinators must manually inspect compartment attributes across these separate files. Area and distance calculations are performed in an ad-hoc manner, often using spreadsheets or basic modelling tools, with little automation or standardisation. Stakeholder feedback is collected through emails or annotated documents, resulting in fragmented communication and limited traceability. Version control is minimal, making it difficult to track changes or ensure that all parties are working with the latest information. This approach is not only time-consuming but also increases the risk of errors and inconsistencies, especially when managing multiple models and regulatory requirements.

FireBIM-Enabled Flow

With the FireBIM platform, the workflow becomes streamlined, collaborative, and highly automated. The process begins with the creation or restoration of a project, where the project owner can invite the relevant team members. IFC models are uploaded to a central dashboard, which provides an overview of all models and highlights any gaps or missing data. Users select or confirm the project location, prompting the platform to propose the applicable fire safety regulations, with the option to override if necessary. Compartment data is transferred via API and mapped automatically, with the system detecting missing information and prompting users to fill gaps through structured forms or direct 3D selection. Automated checks for compartmentation and evacuation are run, with results visualised on-screen and in 3D. Issues can be waived with justification if required. All outputs, including BCF, PDF, CSV, and Word reports, are exportable, and enrichments are persistently linked to the model, even as updates occur. This integrated approach ensures traceability, reduces manual effort, and supports real-time collaboration.

High-Level Requirements

To support this advanced workflow, the FireBIM platform must fulfil several high-level requirements. It must enable robust API connections for the seamless transfer of compartment data and properties, including GUIDs, names,

and areas with calculation methods. Automated pre-checks are essential for detecting missing or inconsistent data, with actionable notifications guiding users to resolve gaps efficiently. The platform should facilitate data enrichment through both simple form inputs and advanced 3D selection, ensuring persistent storage and GUID-based re-linking across model updates. Automated compliance checks must provide clear on-screen summaries, 3D visualisation, and flexible export options in multiple formats. Collaboration features should include role-based access control, project and version management, and comprehensive traceability of user actions. Scalability, interoperability with industry standards, and adaptability to evolving regulations are also critical, ensuring the platform remains reliable and valuable for diverse project teams.

3.2 User Journey 2 – Project-Specific IDS & IFC Pre-Check

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3.2.1 Description

Overall idea

The core idea of this user journey is to enable project teams to define and verify project-specific Information Delivery Specifications (IDS) for fire safety compliance, and to perform pre-checks on IFC models against these tailored requirements. By allowing fire safety experts and BIM coordinators to generate custom IDS files that reflect the unique regulatory context and project needs, the process ensures that only the necessary and relevant information is requested from designers. Designers can then upload their IFC models to the platform, where automated pre-checks validate the presence, structure, and quality of the required data before full compliance checks are performed. This approach minimises unnecessary modelling effort, reduces ambiguity, and ensures that all stakeholders are aligned on the information requirements from the outset.

Involved Stakeholders and their Role

Stakeholder	**Role**
Architect	Initiates data transfer, completes missing info, runs checks, generates reports.
Fire Safety Engineering	Reviews results, validates waivers/justifications, advises on code interpretation.
MEP/Structural Modellers	Provide discipline models, enrich object properties.
Project Owner	Manages project, invites/removes users, controls access.

Building phase

Phase	0	**1**	**2**	**3**	**4**	**5**	6	7
	Strategic Definition	Preparation & Planning	Concept Design	Spatial Coordination	Technical Design	Manufacturing & Construction	Handover	Use

Objectives

The main objectives are to:

- Provide a clear and project-specific definition of information requirements for fire safety compliance, tailored to the applicable regulations and project context.
- Enable automated quality checks on IFC models to verify that all required data is present, correctly structured, and consistently applied across disciplines.
- Facilitate early detection and resolution of data gaps or inconsistencies, reducing the risk of costly rework or delays during compliance assessment.

- Support efficient collaboration between fire safety experts, BIM coordinators, designers, and other stakeholders by providing actionable feedback and validation reports.
- Ensure that models are ready for downstream automated compliance checks, both within the FireBIM platform and in external applications

Rationale

A project-specific IDS and pre-check process is essential because fire safety regulations and project requirements can vary significantly between projects, building types, and jurisdictions. Without a clear, machine-readable specification of what information is needed, designers may either under- or over-model, leading to inefficiencies and potential non-compliance. Manual verification of model content is time-consuming and error-prone, especially in multidisciplinary projects. By formalising the IDS and automating the pre-checks, the process ensures that only relevant data is requested, that models are consistently structured, and that compliance checks can be reliably automated. This reduces manual effort, minimises errors, and supports a more robust and transparent compliance workflow.

Relation with Use Case Scenarios (D4.1)

This user journey is directly related to several use case scenarios in D4.1:

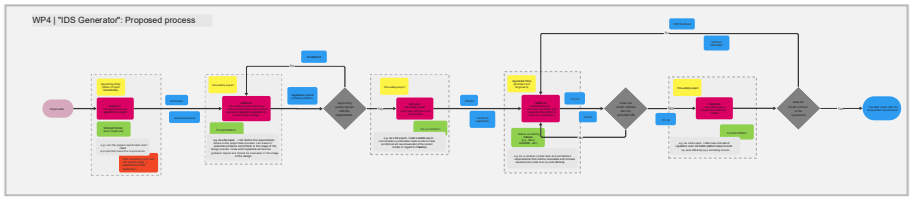
- It builds on Use Case 1 (Ensuring that the required information for checking the compliance on Fire Safety Regulations is in the BIM model), specifically Scenario 1 (Fire-code requirement generation, EIR) and Scenario 2 (Quality checking for fire-code exchange information requirements), by operationalising the definition and verification of information requirements through IDS and pre-checks.
- It supports Use Case 2 (Compliance checking and additional guidance for prescriptive fire safety regulations in building design), by ensuring that models are prepared with the necessary data for automated rule-based checks.
- The process also underpins Use Case 4 (Fire safety compliance checks at the material, component and system level), as robust data quality and structure are prerequisites for reliable compliance checking at all levels

Relation with Custom Applications (D4.1)

The project-specific IDS and IFC pre-check process is closely linked to several custom applications described in D4.1, particularly:

- The Web Application: IDS generator / IFC-checker (Section 3.7), which enables the creation of custom IDS files and the validation of IFC models against them.
- The Smartview fire safety design assistance plug-in (Section 3.3), which relies on structured and validated model data to provide live feedback and visualisation.
- The Early design guidance and compliance checker (Section 3.4), which uses the IDS and pre-check outputs to guide designers through step-by-step compliance validation.
- The development of modelling guidelines and process maps (Section 3.8), which are informed by the IDS and pre-check process to ensure consistent and compliant modelling practices across projects.

3.2.2 Flow Details



Current Flow

In the current workflow for project-specific IDS and IFC pre-checks, the process is sequential and highly dependent on manual coordination between stakeholders. It typically begins with the identification of applicable fire safety regulations and the extraction of information requirements, which are often communicated through static documents or spreadsheets. Designers and BIM coordinators must interpret these requirements and manually enrich their discipline-specific models, frequently resulting in inconsistent data structures and varying levels of detail. The models are then exported in IFC format and shared with fire safety experts or compliance officers, who perform manual or semi-automated checks to verify the presence and quality of the required information. Feedback is provided through annotated reports or emails, leading to iterative cycles of correction and re-submission. This fragmented approach is time-consuming, prone to miscommunication, and increases the risk of missing critical data. The process concludes with a validation step—often outside the main workflow—where the model is finally approved for compliance checks, but only after significant manual effort and potential delays.

FireBIM-Enabled Flow

With the FireBIM platform, the workflow for project-specific IDS and IFC pre-checks becomes streamlined, transparent, and highly automated. The process begins with the creation of a project within the platform, where fire safety experts or BIM coordinators can define a tailored Information Delivery Specification (IDS) that reflects the unique regulatory requirements and project context. This IDS is formalised and shared directly with designers, ensuring clarity and alignment from the outset. Designers upload their discipline-specific IFC models to the centralised platform, where automated pre-checks are immediately performed against the project-specific IDS. The system provides instant, actionable feedback, highlighting missing or inconsistent data and guiding users to resolve issues efficiently—either through structured forms or direct model editing. All validation steps, comments, and corrections are tracked within the platform, fostering real-time collaboration and traceability. Once the model passes the pre-check, it is seamlessly advanced to the compliance validation stage, ensuring that only complete and correctly structured models proceed to regulatory checks. This integrated approach reduces manual effort, minimises errors, and accelerates the overall compliance process.

High-Level Requirements

To enable this advanced workflow, the FireBIM platform must support several high-level requirements. It must provide robust tools for defining and managing project-specific IDS files, ensuring that information requirements are both machine-readable and easily customisable for different regulatory contexts. The platform should facilitate the secure upload and management of multiple IFC models, supporting automated, rule-based pre-checks that validate data presence, structure, and consistency across disciplines. Clear, actionable feedback mechanisms are essential, enabling users to quickly identify and resolve data gaps or inconsistencies. Comprehensive audit trails and version management must be in place to ensure traceability of all actions and decisions. The system should foster collaboration through role-based access control, comment tracking, and integrated communication tools. Finally, the platform must be scalable, interoperable with industry standards, and adaptable to evolving regulations and project needs, ensuring long-term value and reliability for all stakeholders involved in fire safety compliance.

3.3 User Journey 3 – Detect, Select, Comply: Penetrations at Compartment Boundaries

3.3.1 Description

Overall idea

Enable designers / (MEP) contractors to select compliant solutions for service penetrations, in order to restore the fire resistance of the compartment boundaries. Automating this process will speed up the workflows, provide users with valuable insights, allow for compliance checks in an earlier stage (RIBA 4 – technical design), and identify potential issues before the construction phase begins. The application includes:

- automated pre-checks to ensure data completeness and gather information from various models
- automated clash detections and creation of a database of identified clashes
- selection of compliant solutions from predefined databases
- 3D visualization for better understanding and analysis
- exportable reports in PDF, CSV, and BCF formats

Involved Stakeholders and their Role

Stakeholder	Role
MEP designer / (HVAC) subcontractor	Designs all required services in the building, and compliant solutions to restore the fire compartmentation according to the local rules sets and European legislation. Combines all information from different models. Performs the pre-checks and clash detections. Selects the compliant solutions and generates reports.
(FB) Project owner	Manages the project, invites/remove users and manages user rights
Architect	Provides the architectural model, and possibly the (overall) fire resistance requirements
Structural engineer	Provides the structural model. Validates structural openings for service penetrations
Fire safety engineer	Provides the fire safety model. Can be involved in the validation of the selected solutions for restoring the fire compartmentation according to the (legal) requirements
Controlling bodies, fire brigade	Validates the selected solutions for compartmentation, based on reports provided by the designer
Manufacturers	Help populate and document certified solutions for the database of solutions

Building phase

Phase	0	**1**	**2**	**3**	**4**	**5**	6	7
	Strategic Definition	Preparation & Planning	Concept Design	Spatial Co-ordination	Technical Design	Manufacturing & Construction	Handover	Use

Objectives

The aim is to create an application linked to the FireBIM platform for overall project management, including the creation of new projects, the management of participants and their rights, and tools to check data completeness and quality in BIM models. The application will create a database of clashes, based on tools for clash detection. The database of clashes is a dashboard where the user can visualise the individual clashes and add comments. The application allows the user to select a sealing solution from a database of solutions, based on the properties of the clash (size, location, required fire resistance, type of compartment boundary...) and the type of service involved. The user can generate reports based on the database of clashes and the choices made.

Rationale

See 2.4 E in D4.1 document.

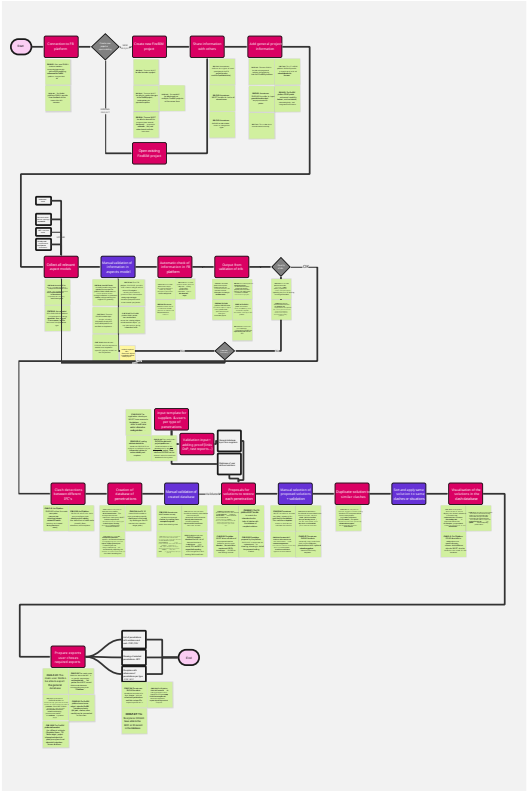
Relation with Use Case Scenarios (D4.1)

Linked to use case 4 scenario 1 (compliance checking for ventilation penetrations (into compartment boundaries) and scenario 2 (compliance checking for other penetrations (into compartment boundaries). Also linked to use case 1 (ensuring that the required information for checking the compliance on fire safety regulation is in the BIM model), scenario 1 (fire-code requirement generation (EIR) and scenario 2 (quality checking for fire-code exchange information requirements).

Relation with Custom Applications (D4.1)

Linked to custom applications 3.9: automated detection of ventilation duct and other service penetrations intersecting with compartment boundaries; and 3.10: product selection and compliance checking tool for ventilation penetrations and other service penetrations into compartment boundaries

3.3.2 Flow Details



Current Flow

In the current workflow for managing service penetrations at compartment boundaries, the process is largely manual and fragmented. MEP designers, architects, and fire safety engineers must coordinate across multiple discipline-specific BIM models, exporting and inspecting IFC files to identify penetrations that intersect with fire compartment boundaries. Clash detection, if performed, is typically handled in separate tools, and the results are compiled into static lists or spreadsheets. The selection of compliant sealing solutions is based on individual expertise and reference documents, with limited traceability or cing overall fire safety.

High-Level Requirements

To support this advanced workflow, the FireBIM platform must fulfil several high-level requirements. It must enable the import and synchronisation of multiple IFC models, supporting automated clash detection between services and compartment boundaries. The platform should maintain a structured database of clashes, enriched with metadata such as location, type, and severity, and provide intuitive 3D visualisation tools for issue review. Integration with a validated database of sealing solutions is essential, allowing users to select, assign, and document compliant options for each penetration. The system must facilitate collaboration through role-based access control, comment tracking, and version management, ensuring that all decisions and modifications are auditable. Export capabilities for reports and data, as well as persistent links between model elements, clashes, and solutions, are critical for traceability and regulatory compliance. Finally, the platform should be scalable, secure, and adaptable to evolving standards, supporting the needs of diverse project teams and complex building environments.

3.4 User Journey 4 – From Site Scan to FireBIM: Unified Point Cloud, BIM Model, Compliance

3.4.1 Description

Overall idea

The retrofit of existing buildings, supported by reality-capture technologies, enables architects and fire safety engineers to efficiently verify compliance with fire safety regulations. In this project, the proposed framework uses LiDAR to perform a digital survey, acquire point cloud data, and generate early-design BIM models derived from the building's geometric characteristics. These BIM models can then be enriched and refined by the user as needed. The application workflow includes:

i) automated point cloud processing

ii) building-level segmentation, and

iii) automated generation of IFC models to allow feature extraction within the FireBIM platform.

Involved Stakeholders and their Role

Stakeholder	**Role**
Architect	Initiates data transfer, completes missing info, review first results (3D object model)
Fire Safety Engineering	Reviews results, validates IFC characterization in the model generated
MEP/Structural Modellers	-
Project Owner	Point cloud acquisition

Building phase

	0	**1**	**2**	**3**	**4**	**5**	6	7

Phase	Strategic Definition	Preparation & Planning	Concept Design	Spatial Coordination	Technical Design	Manufacturing & Construction	Handover	Use

Objectives

The aim is to create an add-on linked to the FireBIM platform for retrofit projects. The main objective is to upload a point cloud and generate an early BIM model. This process streamlines the transition from physical site conditions to a digital environment, ensuring that all relevant geometric and spatial information is captured accurately. By facilitating the rapid creation of BIM models from point clouds, the platform supports the subsequent enrichment, validation, and compliance checking of retrofit projects, ultimately improving the quality and reliability of fire safety assessments for existing buildings.

Rationale

The rationale for this user journey differs from previous use case scenarios and solutions by addressing the unique challenges associated with retrofit projects and existing buildings. Unlike new construction, where digital models are typically available from the outset, many existing buildings lack up-to-date or accurate digital representations. Traditional methods for capturing as-built conditions are labour-intensive, error-prone, and often incomplete. By leveraging advanced reality capture and automated BIM generation, this approach ensures that all necessary geometric and contextual data is available for fire safety compliance checks. It bridges the gap between physical and digital workflows, reduces manual effort, and minimises the risk of missing critical information—thereby enabling more robust and scalable compliance processes for the growing market of building renovations and retrofits.

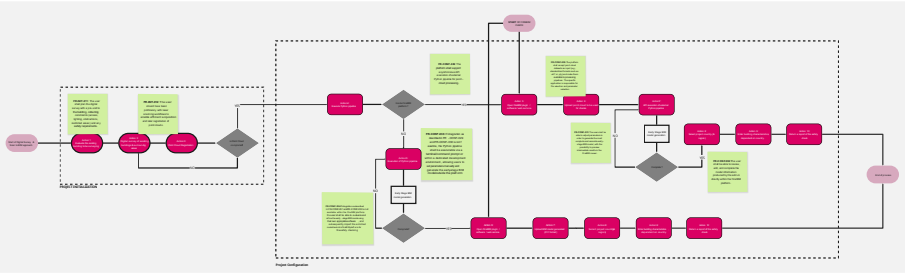
Relation with Use Case Scenarios (D4.1)

This user journey is directly linked to Use Case 2, Scenario 3 from D4.1: “capturing existing buildings for retrofit design projects”. The workflow supports the systematic acquisition and processing of geometric data from existing structures, enabling the creation of BIM models that are suitable for fire safety analysis and compliance verification. By integrating reality capture and BIM generation into the FireBIM platform, the solution addresses the specific needs of retrofit projects, where accurate as-built information is essential for effective fire safety planning and regulatory approval.

Relation with Custom Applications (D4.1)

The described workflow is closely related to Custom Application 3.11 in D4.1: “Techniques for Digital surveys of existing buildings”. The add-on leverages and operationalises these techniques, providing users with practical tools for conducting digital surveys, processing point clouds, and generating BIM models that are compatible with the FireBIM platform. This integration ensures that the benefits of advanced survey methods are fully realised within the context of fire safety compliance, supporting both the technical and regulatory requirements of retrofit projects.

3.4.2 Flow Details



Current Flow

In the current workflow for retrofit of existing buildings, supported by reality-capture technologies, the process remains sequential and only partly automated. Architects and fire-safety engineers must upload the point-cloud data and review the contour-extraction outputs to detect missing or mischaracterized geometry. If the building floor plans are incomplete, they must manually adjust the parameters to obtain the most accurate results, relying on individual expertise and parameter sensitivity. Once the data passes this initial stage, a 3D object model is automatically generated to represent the various compartments within the building. As a result, the process becomes more user-friendly, faster, and can be completed by mapping the 3D model to the appropriate IFC entities.

FireBIM-Enabled Flow

The FireBIM-enabled workflow introduces a semi-automated process for generating early-design BIM models from point-cloud data to evaluate compartmentation code check. This workflow runs through the FireBIM platform via API. It begins with the reality capture of the existing building by laser scanner, after which the point-cloud data is processed using the Open3D library. All building data is classified according to element orientation, allowing the building to be divided into levels. Users must select parameters suited to each building to achieve the most complete geometric characterization possible. A 3D model is then automatically generated, with results visualized in 3D. An early-design IFC model is also created automatically, enabling users to review, adjust, and enrich the resulting IFC entities. This integrated approach improves traceability and reduces manual effort in fire-safety code checking during the retrofit of existing buildings.

High-Level Requirements

To support this advanced workflow, the FireBIM platform must meet some requirements, including API connectivity for transferring point-cloud data. A pre-check feature is needed to detect missing data in a 3D point-cloud viewer by allowing parameter adjustments; this step is essential for ensuring that the point cloud has well-defined geometry. The ability to execute a Python script via API is needed to automatic generation and download of the early-design IFC model. Moreover, the possibility to enrich the IFC model with additional information or modify the generated entities is an important requirement. Finally, it must be scalable, secure, and adaptable to evolving IFC-model enrichment tasks, performing fire-compartmentation code checks directly from point-cloud data.

4 Mapping of user journeys to use case scenarios and solutions

Use Case	Use Case 1 – Ensuring that the required information for checking the compliance on Fire Safety Regulations is in the BIM model		Use Case 2 – Compliance checking and additional guidance for prescriptive fire safety regulations in building design			Use Case 3 - Facilitate the management of fire code exceptions for a building permit		Use Case 4 - Fire safety compliance checks at the material, component and system level		
Use Case Scenario Solution	1.1: Fire-code requirement generation (EIR)	1.2: Quality checking for fire-code exchange information requirements	2.1: Understanding a building in terms of fire safety	2.2: Automated compliance checks for prescriptive fire requirements	2.3: capturing existing buildings for retrofit design projects	3.1: Designing with an equivalent level of fire safety	3.2: Identify required values & insights for fire brigade	4.1: Compliance checking tool for ventilation penetrations (into compartment boundaries)	4.2: Compliance checking for other penetrations (into compartment boundaries)	4.3: Identify required values for manufacturers & subcontractors (installers)
1. Template : 2D/3D visualisation of fire safety data in BIM			X							
2. Application: Visualizing fire safety design for emergencies			X							
3. Plug-in : Smartview fire safety design assistance		X	X							
4. Plug-in/application: Early design guidance and compliance checker		**X**	**X**	**X**						

Use Case	Use Case 1 – Ensuring that the required information for checking the compliance on Fire Safety Regulations is in the BIM model		Use Case 2 – Compliance checking and additional guidance for prescriptive fire safety regulations in building design			Use Case 3 - Facilitate the management of fire code exceptions for a building permit		Use Case 4 - Fire safety compliance checks at the material, component and system level		
Use Case Scenario Solution	1.1: Fire-code requirement generation (EIR)	1.2: Quality checking for fire-code exchange information requirements	2.1: Understanding a building in terms of fire safety	2.2: Automated compliance checks for prescriptive fire requirements	2.3: capturing existing buildings for retrofit design projects	3.1: Designing with an equivalent level of fire safety	3.2: Identify required values & insights for fire brigade	4.1: Compliance checking tool for ventilation penetrations (into compartment boundaries)	4.2: Compliance checking for other penetrations (into compartment boundaries)	4.3: Identify required values for manufacturers & subcontractors (installers)
5. Plug-in: Early design: from compliant spaces to building elements		X	X	X						
6. Application/Plug-in: technical design compliance checker		X	X	X						
7. Web - Application : IDS generator / IFC-checker	**X**	**X**						**X**	**X**	
8. Developing Modelling Guidelines, Process Maps, and Sample BIM Models for Fire Safety Compliance	X	X			X					

Use Case	Use Case 1 – Ensuring that the required information for checking the compliance on Fire Safety Regulations is in the BIM model		Use Case 2 – Compliance checking and additional guidance for prescriptive fire safety regulations in building design			Use Case 3 - Facilitate the management of fire code exceptions for a building permit		Use Case 4 - Fire safety compliance checks at the material, component and system level		
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9. Application: automated detection of ventilation duct and other service penetrations intersecting with compartment boundaries								**X**	**X**	
10. Application/plug-in: Product selection and compliance checking tool for ventilation penetrations and other service penetrations into compartment boundaries								**X**	**X**	
11. Techniques for Digital surveys of existing buildings					**X**					

Use Case	Use Case 1 – Ensuring that the required information for checking the compliance on Fire Safety Regulations is in the BIM model		Use Case 2 – Compliance checking and additional guidance for prescriptive fire safety regulations in building design			Use Case 3 - Facilitate the management of fire code exceptions for a building permit		Use Case 4 - Fire safety compliance checks at the material, component and system level		
Use Case Scenario Solution	1.1: Fire-code requirement generation (EIR)	1.2: Quality checking for fire-code exchange information requirements	2.1: Understanding a building in terms of fire safety	2.2: Automated compliance checks for prescriptive fire requirements	2.3: capturing existing buildings for retrofit design projects	3.1: Designing with an equivalent level of fire safety	3.2: Identify required values & insights for fire brigade	4.1: Compliance checking tool for ventilation penetrations (into compartment boundaries)	4.2: Compliance checking for other penetrations (into compartment boundaries)	4.3: Identify required values for manufacturers & subcontractors (installers)
12. Application: Comparing fire safety compliance between countries		X	X	X		X				

5 General Flow

The FireBIM workflow begins with the initialisation phase, where users establish a secure connection between their BIM authoring tool and the FireBIM platform via the provided API. At this stage, a new project is created or duplicated, general project and building information—such as location, type, and intended use—is entered, and access rights are assigned to different roles (reader, contributor, administrator). The platform then suggests applicable fire safety regulations based on the project data, which users can confirm or override as needed. This ensures that every project starts with a structured, versioned foundation, ready for further configuration.

The configuration phase focuses on importing and managing IFC models. Users can enrich the data without altering the underlying geometry and transfer fire compartment information into the platform. Any missing or incomplete data can be completed or corrected through intuitive forms or directly within a 3D viewer, with all changes and ignored elements clearly tracked. The platform guarantees persistence of all user inputs, even as models are updated, and provides tools for mapping data to regulatory classifications and requirements. This phase establishes a clean, consistent dataset, forming the basis for reliable compliance checks.

During the checking phase, the platform first performs a pre-check to verify the completeness and validity of the information model. Automated compliance checks then follow, with results displayed in an interactive dashboard that allows users to filter, sort, and visualise non-compliances directly within the model. Users can accept or reject detected issues, perform clash detection if necessary, and select corrective solutions from a validated database. Additional features include grouping similar issues, applying duplicate solutions where appropriate, and visualising resolutions in a central repository. The process concludes with the generation of comprehensive reports (BCF, PDF, Excel) and the export of enriched data for seamless integration into BIM workflows.

Finally, the output phase enables users to prepare customised exports—such as penetration lists, drawings, and compliance summaries—ensuring that all validated information is ready for project delivery and regulatory approval. This structured, end-to-end workflow not only streamlines fire safety compliance but also enhances traceability, collaboration, and overall project quality.

6 Requirements

6.1 Initialization Phase

6.1.1 Connection & software integration

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-A-01	The user SHALL be able to establish a connection between their active BIM modelling software and the FireBIM platform via a provided API. ***User Story:*** *As a user, I want to seamlessly connect my BIM software to FireBIM so that I can initiate a fire safety check without manual file transfers.*	**M**	**M**	W	S	*C*
INI-A-02	The FireBIM platform SHALL provide clear feedback on the status of the API connection. ***User Story:*** *As an Architect, I want to see a clear indication of whether the connection to FireBIM is successful or if there are any issues.*	**M**	S	W	S	S

6.1.2 FireBIM Project Management

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-B-01	A user with the right privileges must be able to duplicate a FireBIM project. ***User Story:*** *As an architect, I might make a duplicate version as a back-up or to compare the impact of design decisions.*	S	S	W	W	
INI-B-02	A user with the right privileges (MEP designer, BIM modeller, ...) MUST be able to create a FireBIM project ***User Story:*** *The main user can create new projects. Other users can be invited to access and share information in a created project, but should not be able to create or delete projects.*	**M**	**M**	W	**M**	
INI-B-03	A FireBIM project is owned by the user who created it.					
INI-B-04	à user with the right privileges CAN change ownership of a FireBIM project.					
INI-B-05	A user MUST see an overview of the FireBIM projects they own and the projects they have access to. The type of access MUST be visible.					
INI-B-06	The main user MUST be able to make changes to the FireBIM project, including deleting the FireBIM project from the FireBIM platform ***User Story:*** *As a user, I want to be able to add information to the project, perhaps changing the name of the project, and possibly delete the project. The platform will ask for confirmation before deleting a project*	**M**	**M**	W	**M**	
INI-B-07	The user must be able to store all his progress (data entered, data uploaded, processes and results from the platform, etc.) and return to work on it at a later date. ***User Story:*** *As a user, it could take me multiple sessions over the course of days, weeks or months to perfect a project's fire safety design. At each time, I want to continue where I left off.*	**M**	**M**	**M**	**M**	

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-B-08	The user must be able to work on multiple FireBIM projects at the same time. ***User Story:*** *As a user, I often have multiple ongoing projects in parallel.*	**M**	**M**	W	**M**	
INI-B-09	The platform SHOULD provide a versioning system for FireBIM projects and models.	S	S	S	*C*	
INI-B-10	When continuing an existing FireBIM project, the user SHOULD be able to upload a new version of the BIM model and compare the data with the previously stored information.	S	S		*C*	

6.1.3 User management & collaboration

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-C-01	The platform should allow collaboration, and have 3 different level of users: reader – contributor - administrator The reader has view-only rights to everything. The contributor has not only the reader's rights, but can also upload models and enrich those models he has uploaded. He also has the right to delete the models he has uploaded. The administrator has rights from both reader and contributor. He can enrich models he has not uploaded himself. He has overall project and user management rights. ***User Story:*** *The main user would keep the admin rights. The other users would get invited to provide information. The accessible information might be restricted for the other users to what they have provided and the feedback from the main user/platform*	**M**	*C*	W	**M**	
INI-C-02	The main user MUST be able to invite all relevant users. This action should be available both at set-up of the project, but also be possible at a later stage.	**M**	*C*	W	**M**	
INI-C-03	The main user (administrator rights) SHOULD be able to delete users, denying those users any access to that project ***User Story:*** *As a user I want to be able to make changes to the list of persons that have access to the project (adding or removing access)*	**M**	*C*	W	S	
INI-C-04	The user must be able to share a project with collaborators, or join a project created by someone else. ***User Story:*** *As a user, I want to collaborate with colleagues and other stakeholders on a project. (e.g. a fire safety engineer)*	**M**	*C*	W	**M**	
INI-C-05	The platform could send (or save) a notification which who modified what on the model, to ensure a better collaboration.	*C*	*C*			
INI-C-06	The platform SHOULD support role-based access control (RBAC) more granular than the 3 levels, if required.	**M**	*C*			

6.1.4 Project DATA

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-D-01	The user SHALL be able to input general building characteristics into the FireBIM platform. ***User Story:*** *As an Architect, I want to provide general project details to FireBIM so that the platform can apply the correct context for the analysis. NOTE: Please check the fire matrix for details AND For most countries this also includes the building height*	**M**	**M**	S	S	**M**

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-D-02	The main user SHOULD be able to input general information about the project into the FireBIM platform ***User Story:*** *As the main user, I want to be able to add basic information, such as a description of the project, to help clearly define the project and the project boundaries for other users (for example he could provide the address, additional information and description about (parts of the) project...) NOTE: This information is not required for the proper function of the application*	**M**	**M**	S	S	
INI-D-03	The general project information SHALL include but not be limited to: building location (e.g., address, country, region). The building location will determine which other information should be provided by the user. ***User Story:*** *As an Architect, I need to specify the building's location so that FireBIM can reference the relevant local fire safety regulations and request relevant information about the project.*	**M**	**M**	S	*C*	**M**
INI-D-04	The user CAN choose to upload a BIM model, from which the general building characteristics are extracted by the FireBIM platform AND has the ability to overwrite this data. ***User Story:*** *As an architect, I don't won't to reduplicate information if it is already available in the BIM model. However, I want to be able to overwrite anything that might be incorrect or incomplete.*	S	*C*	W	W	
INI-D-05	The user SHALL be able to modify the extracted information, with the changes saved either only within the FireBIM platform or also written back into the IFC file.	S	S	W	W	

6.1.5 Regulatory compliance

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-E-01	Based on the general project information given by the user, the FireBIM platform shall return an overview of all applicable fire safety regulation(s) or standard(s). ***User Story:*** *As an Architect, I want to be able to receive a list with "all" relevant regulations for my project. NOTE: "all" should later be defined by the fire experts*		**M**	W	*C*	**M**
INI-E-02	The user can overwrite the selection of applicable regulations made by the FireBIM platform, if they think the platform made an incorrect choice. ***User Story:*** *As an Architect, I want the ability to overwrite the platforms selection of regulations, in case I am advised to do so by a fire expert or fire officer.*		S	W	W	**M**

6.1.6 Tracability and Security

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-F-01	The user's data must be stored securely. ***User Story:*** *As a user, I want my project data to be securely stored so I don't risk losing it, or accidentally sharing it with unwanted parties.*		**M**	W	**M**	
INI-F-02	The FireBIM platform SHOULD provide a dashboard with all relevant information for the users ***User Story:*** *The main user should have information about the uploaded aspect models (versions and date of the uploads, list of users that have access to different parts of the project, their rights, the status of the project (last time updated for ex.)*			W	S	
INI-F-03	The platform SHOULD provide a traceability mechanism (audit log of modifications, actions, responsibilities).	S		W		

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-F-04	The user SHOULD be able to export data in common formats (PDF, Excel, BCF).	S		S		
INI-F-05	The FireBIM platform SHALL ensure that user-provided information and choices are persistently stored and reusable across sessions, regardless of whether the user logs in through an authentication system or via an alternative mechanism.			W		
INI-F-06	The platform SHOULD minimize the need for repetitive data entry by providing automatic restoration of previously entered information without requiring explicit login.			S		
INI-F-07	The FireBIM platform SHOULD allow the user to generate a targeted report in BCF format, enabling them to make the required changes directly in their native authoring tool.		*C*	W		

6.1.7 Field data & acquisition

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-G-01	The user shall plan the digital survey with a pre-visit to the building, collecting constraints (access, lighting, obstructions, restricted areas) and any safety requirements. ***User Story:*** *As a user, I want to plan the digital survey in advance so that I can capture all required building characteristics efficiently and safely.*		W	S	W	**M**
INI-G-02	The user should have basic proficiency with laser scanning workflows to enable efficient acquisition and later registration of point clouds. ***User Story:*** *As a user, I want to understand the basics of laser scanning workflows so that I can acquire and register point clouds effectively.*		W	W	W	**M**

6.1.8 Non-functional aspects / roadmap

Req. ID	Requirement Description	Priority	4	7	9, 10	11
INI-H-01	The FireBIM platform COULD support scalability to handle many projects and concurrent users.	*c*	*C*	W	W	
INI-H-02	The FireBIM platform COULD provide enhanced usability features, such as tutorials, onboarding help, and integrated assistance.	*c*	S	S	S	
INI-H-03	The FireBIM platform WON'T automatically enforce regulations (beyond reporting standards).	w		W	W	
INI-H-04	Complex AI-driven compliance checking beyond MVP scope. (WON'T)	w				

6.2 Configuration Phase

6.2.1 Selection & management of BIM models

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-A-01	The FireBIM platform SHALL allow the main user to create and manage projects, including adding metadata such as project name, location, and version number. ***User Story:*** *As a main user, I want to create and manage projects with metadata (name, location, version), so that I can organize and track my work in FireBIM.*	**M**	**M**	W	**M**	
CNF-A-02	The user MUST be able to select, upload and store multiple BIM models in IFC format. The FireBIM platform SHALL support standardized IFC formats (e.g., IFC2x3, IFC4) and ensure compatibility with commonly used authoring tools. ***User Story:*** *As an Architect, I want to select, upload and store multiple BIM models in IFC format, naming them appropriately to distinguish between different disciplines, so that models are clearly identified and available on the FireBIM platform.*	**M**	**M**	**M**	**M**	**M**
CNF-A-03	The user SHALL be able to name the uploaded models with appropriate filename ***User Story:*** *As more than one type of aspect model is uploaded (architectural, structural, MEP, fire safety), a clear description via the filename will help identify the model*					
CNF-A-04	The uploaded IFCs SHOULD be visible on a dashboard showing upload date/time, original filename, uploading user, and the declared discipline/model type; the dashboard SHOULD highlight missing aspect models (e.g., architectural, structural, MEP, fire). ***User Story:*** *As a user, I want to see which models have been uploaded when, and be able to visually see in the dashboard which models are still missing*	S	S	S	S	
CNF-A-05	Users MUST be able to modify models they have uploaded in the project. The platform SHALL enable users to enrich uploaded models through metadata or parameter additions, without altering the original IFC geometry. How to cope with missing or incorrect information in uploaded IFC's? ***User Story:*** *As a user, I want to correct or enrich the model information I have uploaded, directly within the FireBIM platform, without altering the original IFC file, and be able to reapply or export these corrections to my native model when needed. Should the information be stored in the FireBIM platform, where it can be modified? Should the user upload the IFC in his environment and modify there before uploading back to the platform?*	**M**	**M**	S	**M**	
CNF-A-06	Users MUST be able to import IFC models back into their native software ***User Story:*** *As a user, I must be able to access the uploaded IFC model and modify it in my native software, before uploading it again to the FB platform*	S	*C*	W		
CNF-A-07	The FireBIM platform SHOULD allow the user to delete a project and all uploaded or enriched information. The platform SHALL request explicit confirmation before deletion and ensure that all associated data (models, enrichments, configurations) are permanently removed from the system, following data protection and traceability standards. ***User Story:*** *As an Architect, I expect FireBIM to clean up and completely remove a project and all its associated data, upon request. The platform will present a confirmation before this is executed.*	**M**	**M**	S	*C*	

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-A-08	Uploaded models SHOULD have a meaningful file name to help identify the model type (e.g. ARCH, STRUCT, MEP, HVAC…) ***User Story:*** *As more than one type of aspect model is uploaded (architectural, structural, MEP, fire safety), a clear description via the filename will help identify the model*		*C*	W	S	

6.2.2 BIM data transfer & analysis

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-B-01	The user SHALL be able to initiate the transfer of BIM data, including but not limited to fire compartments, related building elements (e.g., walls, doors, ceilings), and their fire-related properties,specifically for fire compartments, from their BIM software to the FireBIM platform via the provided API. The data transfer SHALL follow standardized IFC schemas and predefined property sets relevant to fire safety analysis. The user SHALL be able to configure where compartment data resides (object parameters, spaces/rooms, generic objects) via a mapping step. ***User Story:*** *As an Architect, I want to send fire compartment data from my model to FireBIM so that the platform can process and analyze them according to standardized fire-safety data structures. analyze it.*	S	S	S	*C*	*C*
CNF-B-02	The transferred data for each fire compartment SHALL include, at a minimum: Compartment Name/Identifier, its Globally Unique Identifier (GUID) and surface area (with calculation method recorded and, where applicable, compliant with the local regulation). ***User Story:*** *As an Architect, I need FireBIM to receive the name and GUID of each compartment so that objects can be uniquely identified and referenced.*	**M**	**M**	**M**		**M**
CNF-B-03	The FireBIM platform SHALL analyze the received BIM data to detect any missing information required for the fire safety check including data missing from existing compartments and incomplete compartment coverage (e.g., unassigned spaces, fragmented/isolated spaces). ***User Story:*** *As an Architect, I want FireBIM to automatically identify if any necessary information for the fire safety check is missing from the data I've sent.*	**M**	**M**	**M**	**M**	**M**
CNF-B-04	The user SHALL be able to run a model check for missing or incorrect information. ***User Story:*** *As an Architect, I want to check my model against missing or incorrect information so that I can use my model in FireBIM.*	**M**	**M**	**M**		*C*
CNF-B-05	If missing information is detected, the user SHALL be notified by the FireBIM platform via a readable and actionable output. (e.g., list with element references, severity, suggested fixes) ***User Story:*** *As an Architect, I need to be clearly informed when FireBIM detects that some required information is missing.*	**M**	**M**	**M**	S	**M**
CNF-B-06	The user SHALL be able to indicate that some parts of the model should be ignored. ***User Story:*** *As an Architect, I want to be able to indicate that some parts of the model are ignored so that only the relevant part of the model is checked.*	**M**	S	S	W	
CNF-B-07	The user SHALL be able to indicate that some parts of the model check results may be ignored. Each ignored item SHALL be traceable, reversible, and linked to a justification or user comment, stored in the project's audit log. Reports SHALL clearly show skipped/waived checks.	**M**	S	S	W	

Req. ID	Requirement Description	Priority	4	7	9, 10	11
	User Story: *As an Architect, I want to be able to ignore some of the model check results so that I can pursue my work.*					

6.2.3 Data completion & enrichment

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-C-01	The user SHALL be able to input simple missing information directly into the FireBIM platform via text fields or dropdowns (e.g., area, room function, sprinkling, building height) according to the Fire Matrix and local regulation. ***User Story:*** *As an Architect, if simple data such as a compartment's area or name is missing, I want to be able to quickly type or select it into a field in FireBIM.*	**M**	**M**	**M**	*C*	S
CNF-C-02	The user SHALL be able to add or link more complex missing information by interacting with a 3D viewer of the BIM model within the FireBIM platform. ***User Story:*** *As an Architect, if information needs to be associated with a specific 3D object (e.g., identifying a specific wall type), I want to select it in a 3D view in FireBIM.*	S	S	S		**M**
CNF-C-03	When using the 3D viewer for data input, the user SHALL be able to select a BIM object and associate missing information with it. ***User Story:*** *As an Architect, I want to click on an object in the 3D viewer and then link the required missing data to that specific selected object.*	**M**	S		*C*	**M**
CNF-C-04	The FireBIM platform SHALL provide clear visual feedback in the 3D viewer to indicate which object(s) are selected or being interacted with. ***User Story:*** *As an Architect, I need to easily see which BIM object I have selected in the 3D viewer to avoid errors when adding information.*	**M**	S			**M**
CNF-C-05	The FireBIM platform SHALL save all user-provided information (general project info, and added/linked missing info) for the current session/project with autosave and re-linking by GUID/GlobalId on subsequent model updates. ***User Story:*** *As an Architect, I expect FireBIM to save all the information I input so that I don't have to re-enter it if I come back to the project.*	**M**	**M**	W		**M**
CNF-C-06	The FireBIM platform SHALL restore all user information when a session is re-opened. ***User Story:*** *As an Architect, I expect FireBIM to save all the information I input so that I don't have to re-enter it if I come back to the project.*	**M**	S		*C*	*C*
CNF-C-07	The FireBIM platform SHALL restore all user information when a newer version of a model is uploaded attempting GUID-based re-linking and providing a review queue for unmatched items. ***User Story:*** *As an Architect, I expect FireBIM to recover all enriched information (e.g., user-added information, project configuration) also when a model is replaced with a newer version.*	S	S		W	

6.2.4 Display & widgets

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-D-01	The FireBIM platform provides a Regulation Viewer, where (filtered) sections from the regulations can be displayed alongside the project. This view displays titles of the regulation and selected chapters, clause text and tables/images but also links to the original document section, where possible. ***User Story:*** *As an Architect (or fire expert), I can read the related articles from the applicable regulations, to better understand and inspect the fire safety rules.*	**M**	**M**	**M**	W	
CNF-D-02	The FireBIM platform provides a 3D viewer widget which allows 3D navigation, setting the camera position and orientation, viewing angle and toggle between perspective and axonometric projection. ***User Story:*** *As a user, I want to view the project as a 3D model and be able to navigate and view from any chosen direction.*	**M**	**M**	W	S	
CNF-D-03	The FireBIM platform has a project info panel, which displays the different characteristics of the project, such as location, address, country and per building unit the project type, occupancy or usage type, total floor area, number of storeys, building height … ***User Story:*** *As an Architect, I want to inspect the project summary to ascertain that the correct information is used to pick up applicable regulations.*	**M**	**M**	S	*C*	
CNF-D-04	The FireBIM platform has a properties or "info" widget, where the different characteristics (attributes, properties, quantities, classifications, assigned materials) of the selected object(s) are displayed. ***User Story:*** *As an Architect, I can inspect and consult all associated information with selected objects.*	**M**	**M**	**M**		
CNF-D-05	The FireBIM platform SHALL provide clear visual feedback across the viewing widgets to indicate which object(s) are selected or being interacted with. Selection and highlighting is shared (and synced) between the Spatial Tree, the 3D viewer and the properties/info panel. ***User Story:*** *As an Architect, I can select objects either in the Spatial Tree or in the 3D viewer to indicate selected or targeted objects. The info panel gets refreshed automatically*	**M**	**M**	**M**	S	

6.2.5 Results & Reporting

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-E-01	The user SHALL view a summary of the fire safety checks and the results on screen. ***User Story:*** *As an Architect, I want to be able to view on the screen a summary of the fire safety checks and the results so that I have a preview before download.*	**M**	**M**	**M**	W	
CNF-E-02	The user SHALL be able to visualize results in a viewer. ***User Story:*** *As an Architect, I want to be able to visualise the results in a viewer so that I have the spatial representation (location) of the issues identified in the checks.*	**M**	**M**	**M**	*C*	
CNF-E-03	The user SHALL be able to read and download an output (BCF, PDF, Excel/CSV, Word) of the validity check. ***User Story:*** *As an Architect, I want to be able to read and download an output of the validity check so that I can report them.*	**M**	**M**	**M**	S	
CNF-E-04	The user SHALL be able to read and download an output (BCF, PDF, Excel/CSV, Word) of the fire safety checks.	**M**	**M**	**M**	W	

Req. ID	Requirement Description	Priority	4	7	9, 10	11
	User Story: *As an Architect, I want to be able to read and download the fire safety checks so that I can report them.*					
CNF-E-05	The user SHALL be able to download the resulting reports and the project datafiles for local storage. ***User Story:*** *As a user I want to export the reports and project datafiles so that I can locally back up my work.*	**M**	**M**	**M**	*C*	
CNF-E-06	The FireBIM platform SHALL allow to export the enriched information into a specific output (Excel, CSV, or connexion via an API). ***User Story:*** *As an Architect, I want to export the enriched information so that I can reinject it into the native model.*	S	*C*		S	S
CNF-E-07	The user SHALL be able to check the format of the information required by WP2. ***User Story:*** *As an Architect, I want to be able to check the format of the information required by WP2 so that I can perform the fire safety checks.*	**M**	**M**	**M**	W	
CNF-E-08	The user SHALL be able to check the (interpretation of) the IFC model against requirements from WP2. ***User Story:*** *As an Architect, I want to be able to check the IFC model so that I know if my project is compliant against requirements from WP2.*		S		W	
CNF-E-09	The user SHALL be able to download/consult the validity and compliance rules. ***User Story:*** *As an Architect, I want to be able to download/consult the validity and compliance rules so that I can edit the BIM models accordingly.*				W	
CNF-E-10	The user SHALL be able to select the type of fire safety check that needs to be performed. NOTE: Look in Fire Matrix Notion for the detailing of “fire safety check”. ***User Story:*** *As an Architect, I want to select the type of check that I want to perform so that I can start the analysis.*		**M**	**M**	W	

6.2.6 Support & documentation

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-F-01	The user SHALL be able to download IDS / example models / modelling guidelines. ***User Story:*** *As an Architect, I want to be able to download the IDS / example models / modelling guidelines so that I can edit the BIM model accordingly.*		S		W	
CNF-F-02	The user SHALL be able to consult the IDS / example models / modelling guidelines on the website. ***User Story:*** *As an Architect, I want to be able to consult the IDS / example models / modelling guidelines on the website so that I can edit the BIM models accordingly.*		S		W	

6.2.7 Collaboration

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-G-01	The main user COULD send a request to another user to upload a specific aspect model via the FireBIM platform ***User Story:*** *As the main user, I want to send, via the platform, a request by e-mail to another user, asking him to provide the requested info.*		*C*		*C*	

6.2.8 Point clouds & Python pipeline

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-H-01	The platform shall support asynchronous API execution of external Python pipeline for point-cloud processing. ***User Story:*** *As a user, I want the platform to be able to execute Python pipelines*		W		W	**M**
CNF-H-02	The platform shall accept point-cloud datasets as input (e.g., standardized formats such as .e57 or .ply) and make them available to processing pipelines. The specific application is responsible for file selection and parameter selection ***User Story:*** *As a user, I want to upload standardized point-cloud datasets so that they canbe processed by pipelines*		W		W	**M**
CNF-H-03	The user shall be able to adjust parameters in order to generate the most complete and accurate early-stage BIM model, with the possibility to preview intermediate results in the FireBIM viewer. ***User Story:*** *As a user, I want to adjust processing parameters and preview intermediate results in the FireBIM viewer so that I cangenerate the most completeand accurate early-stage BIM model*		W		W	**M**
CNF-H-04	The user shall be able to review, edit, and complete the model information produced by the add-in directly within the FireBIM platform. ***User Story:*** *As a user, I want to review,edit, and complete themodel inf ormation producedby the add-in directly withinthe FireBIM platf orm*		W		W	**M**
CNF-H-05	If integration as described in FR-CONF-029 andFR-CONF-030 is not f easible, the Python pipelineshall be executable via a terminal/commandprompt or within a dedicated developmentenvironment, allowing users to set parametersmanually and generate the early-stage BIM modeloutside the platf orm ***User Story:*** *As a user, I want to run the Python pipeline f rom aterminal or developmentenvironment, settingparameters manually, sothat I can still generate theearly-stage BIM model*		W		W	**M**
CNF-H-06	If integration as described in FR-CONF-031 andFR-CONF-032 is not available within the FireBIMplatf orm, the user shall be able to evaluate andref ine the early-stage BIM model using their ownappropriate sof tware, and subsequently import theenriched model back into FireBIM platf orm f or f ire-saf ety checking ***User Story:*** *As a user, I want to evaluate and ref ine theearly-stage BIM model inmy own sof tware and thenre-import it into the FireBIMplatf orm so that I canensure the model isenriched and suitable f orf ire-saf ety checking*		W		W	**M**

6.2.9 Project stage adaptability (NEW – per Vaidotas' suggestion)

Req. ID	Requirement Description	Priority	4	7	9, 10	11
CNF-I-01	The FireBIM platform SHOULD allow configuration of project stage (e.g., Early Design / Detailed Design / Construction), with different element scopes, information parameter sets, and rule sets adapted to the chosen stage. ***User Story:*** *As a user, I want to configure the project stage (e.g., Early Design, Detailed Design, Construction) so that the platform automatically adapts the element scope, information parameters, and rule sets to the stage I am working in.*		*C*		W	
CNF-I-02	The platform COULD provide pre-defined IDS templates corresponding to each project stage (e.g., S2 Concept), to guide the level of detail and required information.		*C*		W	

Req. ID	Requirement Description	Priority	4	7	9, 10	11
	User Story: *As a user, I want to access pre-defined IDS templates for each project stage (e.g., S2 Concept) so that I am guided on the level of detail and information required for my model at that stage.*					

6.3 Pre-Check – Semantic

6.3.1 Preparation & configuration of the control

Req. ID	Requirement Description	Priority	4	7	9, 10	11
PRE-A-01	The user SHALL have the possibility to map IFC entities with a classification system (e.g., SfB, ISO/IEC 81346-1:2022 (used in LT), CCS). ***User Story:*** *As a user, I want to map IFC entities with a chosen classification system so that my model is consistently structured and aligned with industry standards.*	S	S			
PRE-A-02	The main user SHOULD be able to fill in, on the dashboard, what information is expected to be in which IFC file. to configure, on the dashboard, a mapping between the information required by FireBIM and the IFC files in which this information is stored. This mapping may be structured and optionally use the IDS syntax to ensure consistency and interoperability with compliance checks ***User Story:*** *The information required to make checks will most probably be split over multiple IFC's. Identifying which information can be found in which file will help correctly execute the checks. This could be managed with tick boxes on the dashboard. For example: wall type and thickness could be in both structural and architectural model. Required fire resistance of the compartment wall could be in multiple models. As a main user, I want to indicate which IFC file contains each piece of information required for compliance checks, so that FireBIM can correctly execute the checks. This mapping should be user-configurable and could be implemented with tick boxes or a structured approach compatible with IDS syntax.*	**M**	**M**	**M**	*C*	S
PRE-A-03	The FireBIM platform SHALL align the semantic pre-check with the requirements defined in WP2 (e.g., required attributes, data templates). ***User Story:*** *As a user, I want the semantic pre-check to be aligned with WP2 requirements so that I can ensure the model complies with agreed attribute sets and data templates.*		**M**	**M**	W	

6.3.2 Launching and executing the check

Req. ID	Requirement Description	Priority	4	7	9, 10	11
PRE-B-01	Once all relevant IFC's have been uploaded, the main user SHOULD be able to launch a check on the FireBIM platform to validate that all required information is filled in, based on a separate document listing all required data items. ***User Story:*** *The FB platform should look in the different IFC's if all required information about fire compartments is available, according to the list defined in the Data Requirements Document (e.g., WP2). These include, among other things, the type of walls, thickness, required fire resistance, size of the service...*	**M**	**M**	**M**	**M**	**M**

Req. ID	Requirement Description	Priority	4	7	9, 10	11
PRE-B-02	The FireBIM platform SHOULD check each IFC individually, for the information that is supposedly in that specific IFC . It checks the presence of information. ***User Story:*** *Depending on the tick boxes, the FireBIM could check if information is filled in in each of the fields. It checks the presence of information, not correctness of the information. For example, is a value entered in all the fire resistance fields.*	**M**				S
PRE-B-03	The FireBIM platform SHALL perform a completeness check, ensuring that all required information has been provided by the user and is not missing. ***User Story:*** *As a user, I want the platform to perform a completeness check so that I can identify any missing information before proceeding to compliance checks.*	**M**	**M**	**M**	*C*	
PRE-B-04	The FireBIM platform SHALL perform a validity check, ensuring that the provided information is in the correct format, type, or within allowed value ranges. ***User Story:*** *As a user, I want the platform to validate the correctness of my data so that I can be confident it follows the required formats, types, and value ranges.*	**M**	**M**	**M**	**M**	
PRE-B-05	The FireBIM platform SHALL store each pre-check execution with a timestamp, so that results can be compared across different versions. ***User Story:*** *As a user, I want each pre-check to be stored with a timestamp so that I can compare results across different model versions and track progress over time.*	**M**	*C*		*C*	S

6.3.3 Results & feedback

Req. ID	Requirement Description	Priority	4	7	9, 10	11
PRE-C-01	The FireBIM platform SHOULD provide feedback to the main user on what information has been filled in and where information is missing in the different models. This feedback SHALL clearly indicate the location and type of missing data (e.g., object class, property name). ***User Story:*** *As a main user, I want to have an overview of all values filled in for a single property. I want to see clearly which information is missing or incomplete in each IFC model, so that I can correct data gaps before performing full compliance checks.*	**M**	S		S	S
PRE-C-02	The FireBIM platform SHOULD provide an overview of all values found for a specific property across all models, grouped by equal or equivalent values (e.g., “60”, “REI60”, “EI60”). Inconsistent or non-standard entries SHALL be highlighted. ***User Story:*** *As a main user, I want to review all values of a given property across all IFC models, so that I can easily detect inconsistencies (e.g., “EI60” vs “REI60”) and ensure coherence with FireBIM Modelling Guidelines.*	**M**	S		S	S
PRE-C-03	Note: The standardization of how fire safety requirements (e.g., R, EI, material classes) are defined within the BIM model should be specified in the FireBIM Modelling Guidelines, not enforced by the platform itself.					
PRE-C-04	The FireBIM platform SHOULD allow the main user (BIM modeler) to perform this check several times, updating the list of missing or wrong information, based on the minimum set of required properties defined in a separate Data Requirements Document.	S	S		S	S

Req. ID	Requirement Description	Priority	4	7	9, 10	11
	User Story: *As newer versions of the IFC's are uploaded, the FireBIM platform should re-run the check against the minimum required properties defined in the Data Requirements Document, updating the list of missing or wrong information accordingly.*					
PRE-C-05	The FireBIM platform SHOULD allow the user to export a report of the pre-check results (PDF, Excel, BCF) for sharing and documentation purposes. ***User Story:*** *As a user, I want to export the pre-check results in formats like PDF, Excel, or BCF so that I can share the findings with collaborators and keep proper documentation.*	S	S		S	S

6.3.4 Collaboration

Req. ID	Requirement Description	Priority	4	7	9, 10	11
PRE-D-01	The main user (BIM modeler) SHOULD be able to share the pre-check that information with other users responsible for the specific input, ensuring that shared data follows the standardized definitions and categories described in the FireBIM Modelling Guidelines. ***User Story:*** *A list showing where information is incomplete or wrong should be shareable with other users. To ensure consistency, the FireBIM platform should rely on standardized definitions and predefined categories as described in the Modelling Guidelines (e.g., "massive wall" instead of "brick wall").*	S	*C*		S	S

6.3.5 Correction & enrichment

Req. ID	Requirement Description	Priority	4	7	9, 10	11
PRE-E-01	The FireBIM platform COULD allow users to add, modify and correct the required information directly on the platform. ***User Story:*** *Instead of having to find out where in the properties of the IFC the info is missing, the information could directly be modified in the table and uploaded to the IFCs.*	*C*	*C*		*C*	*C*
PRE-E-02	When such edits are made,the new information COULD be implemented back into the IFC. ***User Story:*** *Instead of having to find out where in the properties of the IFC the info is missing, the information could directly be modified in the table and uploaded to the IFCs.*	*C*	*C*		*C*	*C*

6.4 Checking Phase

6.4.1 Compliance checking

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-A-01	The FireBIM platform MUST allow the user to choose which compliance check to perform. ***User Story:*** *As a user, I want to choose which checks to perform on my model.*	**M**	**M**	**M**	W

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-A-02	The FireBIM platform will suggest which checks would be useful, based on the available data / the results of the pre-check. ***User Story:*** *As a user, I want to know what checks are available based on the input I provided.*	**M**	**M**	S	W
CHK-A-03	The FireBIM platform MUST be able to perform the automated compliance check selected by the user. ***User Story:*** *As a user, I want to to perform automated compliance checks.*		**M**	**M**	
CHK-A-04	The FireBIM platform provides a Compliance Dashboard, as a series of output widgets, to display and visualize the compliance checking results. ***User Story:*** *As an Architect, I want to inspect the compliance checking results in a clear and visual way, summarizing the results of the calculations.*	**M**	**M**	**M**	W
CHK-A-05	The FireBIM platform SHALL list all compliance failures, which MUST be filterable and sortable using spreadsheet-like controls (e.g., by category, severity, location). ***User Story:*** *As an architect, I want to inspect all compliance failures and quickly select the most relevant ones, using typical spreadsheet-like sorting or filtering.*	**M**	**M**	**M**	*C*
CHK-A-06	When a user clicks on a compliance failure entry, the platform SHALL highlight the related BIM objects in the model (3D view) and model tree, and DISPLAY the corresponding failed regulation clause or rule reference. ***User Story:*** *As an architect, I want to know the objects that are not compliant, and the regulations or rules against which they have failed.*	**M**	**M**	**M**	S
CHK-A-07	The main user MUST be able to manually validate the detected compliance issues by marking them as accepted or rejected. ***User Story:*** *As a main user, I want to mark compliance failures as accepted or rejected (e.g. using a toggle in the list) so that irrelevant issues can be filtered out while still keeping a complete record of all issues.*	**M**	S		*C*
CHK-A-08	The platform MUST display a disclaimer clearly stating that the compliance report provides recommendations only, and that the BIM model remains the authoritative source of information. ***User Story:*** *As an architect, I should be aware that the report gives data that I should improve in the initial model.*	**M**	**M**	S	**M**
CHK-A-09	Note: if the platform only provides a report for the user to modify or adapt their 3D model, it is important to clearly indicate where the responsibility lies. The information must not be lost. ***User Story:*** *A reminder that the report is not the final result, but only a list of items to be modified. It is important to clearly state where the responsibility lies.*				**M**

6.4.2 Automated clash detection

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-B-01	The FireBIM platform SHOULD allow the main user to perform automated clash detections between services and compartment boundaries. between selected IFC models (starting with two, and allowing extension to more). ***User Story:*** *Once all IFC have been validated, the main user should be able to start a clash detection. The goal is to make a complete list of detected clashes. select which IFC models to compare (e.g. MEP vs Architecture) and start a clash detection, generating a complete list of detected clashes.*	S	W		S
CHK-B-02	The FireBIM platform SHOULD allow the main user to configure clash detection rules, including the definition of clash sets (A and B), filters, tolerances, and exceptions.	*C*	W		*C*

Req. ID	Requirement Description	Priority	4	7	9, 10
	User Story: *As a main user, I want to define and adjust clash detection configurations (e.g. filters for elements, tolerance thresholds, and exceptions), so that I can tailor the clash detection results to the project's needs.*				
CHK-B-03	The FireBIM MUST create a list or database with all detected clashes in the project. The list must be visible to the main user. Each clash entry MUST include a unique ID and metadata such as clash type, involved objects, fire rating, boundary type, building storey, and room location. ***User Story:*** *As a main user, I want to be to understand and locate the clashes that have been identified. It is not sufficient to have a list with an ID, a type of penetration, a fire resistance, a type of wall, thickness… . We probably need more information to guide the user: on which floor the clash has been detected, in which room… .*	**M**	W		**M**
CHK-B-04	The FireBIM 3D viewer SHALL enable the user to visualize a specific clash/issue in the model by clicking on the ID number in the clash/issue list widget (table) ***User Story:*** *As a user, I want to click on a clash/issue ID and see it directly in a 3D viewer so that I can better understand the location and context of the issue in the model.*	**M**	**M**		**M**
CHK-B-05	The FireBIM 3D viewer SHOULD provide clash-specific visualization features, including highlighting the involved objects, displaying other objects in wireframe or ghost mode, hiding unrelated storeys, and automatically adjusting the camera to center and zoom on the clash bounding box. ***User Story:*** *As a user, when I open a clash in the 3D viewer, I want the involved objects to be highlighted, other elements to be minimally displayed (wireframe/ghost), and the camera to automatically focus on the clash area, so that I can immediately see the problem in its correct spatial context.*	S	S		S
CHK-B-06	The main user MUST be able to manually validate the detected clashes by marking them as accepted or rejected, rather than deleting them. ***User Story:*** *As a main user, I want to mark clashes as accepted or rejected (e.g. using a toggle in the list) so that irrelevant clashes can be filtered out while still keeping a complete record of all detected clashes.*	**M**	N/A		**M**
CHK-B-07	The main user MUST be able to manually add clashes that were missed by the automated clash detection. Manually added clashes must be linked to corresponding objects in the BIM model and be visible in the 3D viewer. ***User Story:*** *As a main user, I want to add clashes that were not automatically detected, link them to the relevant model objects, and visualize them in the 3D viewer, so that all issues are documented consistently even if they were not caught by the automated detection.*	**M**	N/A		**M**
CHK-B-08	The main user SHOULD be able to sort the table of clashes according to different categories based on a wide range of metadata attributes. Since each clash is a data item generated from the clash detection report, it must include attributes that enable advanced management, refinement (e.g. accept/reject status), and sorting by criteria such as discipline, source model, building storey, entity class, classification, or any selected property or quantity. ***User Story:*** *As a main user, I want to be able to sort the table according to the type of penetration, and/or the floor in the building, the size of the opening… and filter clashes not only by physical aspects such as penetration type or floor, but also by other metadata derived from the model (discipline, source model, classification, or custom properties), so that I can better organize, analyze, and prioritize the clashes according to the project's needs.*	S	N/A		S
CHK-B-09	The main user SHOULD be able to download the full list of detected clashes in multiple formats, including Excel, CSV, and BCF, to support both reporting and integration with existing BIM workflows. ***User Story:*** *As a BIM modeler, I want to be able to download the full list of clashes in different formats(in excel, CSV…). This list can be used for other purposes, like calculating the total cost of the sealing, creating a bill of materials… so that I can either use it for cost and quantity calculations or integrate it into other BIM coordination tools and workflows.*	S	N/A		S

6.4.3 Design and creation of a database of solutions to restore fire resistance of each service penetration in a compartment boundary

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-C-01	The FireBIM platform MUST include one or more databases of solutions from which users can select solutions to restore fire resistance for the detected clashes provide access to one or more external or internal databases of fire-resistance restoration solutions. These databases SHOULD include structured information (product references, descriptive data, links to standards, and associations with relevant building elements such as walls, ceilings, ducts, pipes, or cable trays). ***User Story:*** *The database should include solutions for a number of different service penetrations (ventilation ducts, pipes, cable trays…). This pleads for separate databases, as solutions differ as well as the European standards they are linked to. As a main user, I want to access one or more structured solution databases (possibly external to FireBIM) containing fire-resistance restoration systems for various service penetrations (ducts, pipes, cable trays, etc.), including their product references, descriptive details, and applicable standards, so that I can select the most suitable solution for each clash.*	**M**	W		**M**
CHK-C-02	The application developer MUST have access to the databases, to be able to add new and/or alternative sealing solutions. ***User Story:*** *The application developer is the one providing the tool. He can populate the tool with certified solutions that comply with the regulations. It is his responsibility to validate the solutions. Solutions can include certificates (DoPs) to prove compliance to users.*	**M**	W		**M**
CHK-C-03	All sealing solutions included in the database SHOULD be subject to validation by an independent external advisor or testing institute to ensure reliability and compliance. Validated solutions can be marked with a quality indicator (e.g. certification label or star rating). ***User Story:*** *As a user of the FireBIM platform, I want to clearly see which sealing solutions have been validated by an independent testing institute, so that I can select only reliable and certified options for my project.*	S	W		S
CHK-C-04	The main user SHOULD be able to add project-specific or non-listed solutions to the database. Such additions MUST undergo a validation process by the application developer or an external expert before integration into the shared database ***User Story:*** *Possible solutions could also include solutions that have been agreed upon for that specific project, or solutions not (yet) implemented in the database of solutions.*	S	W		S
CHK-C-05	All solutions added by the main user SHOULD undergo a validation process before being integrated into the shared database. The validation can be performed by the application developer or an external expert to ensure compliance with fire-safety regulations. ***User Story:*** *As a main user, when I add a new or project-specific solution to the database, I want it to be reviewed and validated before other users can access it, so that I can ensure that the database remains reliable and compliant.*	S	W		S

6.4.4 Automated proposal of compliant solutions to restore the fire resistance of each service penetration in a compartment boundary

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-D-01	The FireBIM platform MUST be able to match the information from the table of clashes with the database of compliant solutions ***User Story:*** *The main user (BIM modeler) will, once the database of clashes has been validated, ask the platform for solutions for each clash. More than one solution can be proposed per clash. The validation of the match is based on the type of service and size, fire resistance requirements (EI(S)), type of boundary, thickness, sealing method…*	**M**	W		**M**
CHK-D-02	The platform MUST allow validation of the proposed matches based on service type, dimension, fire-resistance requirement (EI(S)), boundary type, thickness, and sealing method.		W		**M**
CHK-D-03	The solutions proposed by the FireBIM platform SHOULD incorporate an explanation and/or drawing showing in detail the proposed sealing method. This information SHALL be created within the FireBIM project based on general European fire-resistance standards (e.g. EN 1363-1) and not directly imported from manufacturer databases. ***User Story:*** *The main user should get sufficient information to understand what the proposed solution(s) is and to be able to make a choice. The information could include generic drawings of the solution(s) and a list of materials used. This includes generic drawings and lists of materials generated within the FireBIM project according to European standards, ensuring consistent and neutral presentation of each sealing method.*	S	W		S
CHK-D-04	The main user MUST choose one (of the) solution(s) for each clash in the database. This could be a drop-down menu or tick box to validate the choice ***User Story:*** *As a main user, I want to select a solution for each clash from a list of options so that I can ensure every detected issue is addressed with an appropriate method.*	**M**	W		**M**
CHK-D-05	The main user MUST be allowed to leave blanks as a choice for a solution for a clash in the database. Instead of a blank (which is the default when you start using the tool), the user could choose in the drop-down menu "not decided yet" or "alternative solution" ***User Story:*** *As a user I might scroll through the different options in the drop-down menu and either not be able to decide yet which solution I want to implement for a clash or not find a suitable solution in the list. Instead of forcing the user to choose something, I must be able to indicate that this clash doesn't have a validated solution yet or that I need an alternative solution that is not in the database.*		W		**M**
CHK-D-06	The main user MUST be able to add comments next to the chosen solution. These comments must appear next to the solution choosen in the drop-down menu. The comments should be a text field and appear in the clash database, next to the choosen solution from the drop-down menu. ***User Story:*** *As a user I want to be able to make annotation to the choices I made, for myself or for 3rd parties. These comments could be about fo example specific products to be used, references to detailed drawings, references to alternative validation documents...*		W		**M**
CHK-D-07	The main user SHOULD be able to manually copy solutions (and comments) to other penetrations with optional automatic suggestions based on similarity templates. ***User Story:*** *In most projects same penetrations are to be found, for example same location on different floors. It would be good to minimize the repetitive work of choosing the same solution for similar clashes in the building.*		W		S
CHK-D-08	The FireBIM platform COULD suggest suitable sealing solutions for new penetrations based on similarity templates (e.g., location, dimensions, position, materials). The system SHOULD learn from previously validated solutions to propose the most plausible option for similar clashes.	*C*	W		*C*

Req. ID	Requirement Description	Priority	4	7	9, 10
	Following Cedric's remark: could be a user induced solution where he selects a solution afirst time and then "flags" it as a favorite. The tool could then select the favorite solution first for every similar clash (similar clash defined as same type of wall, same fire resistance, same penetration service). ***User Story:*** *As a main user, when adding or validating a new penetration, I want the system to automatically suggest the most appropriate sealing solution based on previous similar cases, so that I can reduce repetitive manual work and ensure consistency across the project.*				
CHK-D-09	The FireBIM platform MUST be able to link and display add the chosen solution next to each clash in the single database within the 3D viewer. When visualizing a clash, a popup window SHOULD show the description, properties, and related documentation of the selected solution. ***User Story:*** *As a user I want to see all the information in a single dashboard. As before, the incorporated 3D viewer should allow to visualize each clash As a user, I want to click on a clash and immediately see the description, documentation, and 3D location of the chosen solution in a popup window, so I can quickly understand how the issue is resolved.*		W		**M**
CHK-D-10	The FireBIM platform COULD allow the insertion of the selected sealing product (e.g., fire damper, collar, wrap) into the model, linking it to the related clash location. This integration SHOULD be compatible with IFC export and preserve the link between the clash, the applied solution, and the corresponding product instance. ***User Story:*** *As a BIM modeler, I want the chosen solution (e.g., fire damper) to be inserted directly into the model, so that I can update the BIM file automatically and maintain consistency between the clash database and the 3D model.*		W		*C*
CHK-D-11	The FireBIM platform COULD allow to link a sealing object or an aperture object to the chosen solution. These objects MUST also be linked to the clash in the database. ***User Story:*** *Each solution to restore compartmentation requires a defined aperture around the service and sealing method. As a user I want to be able to add those objects to the clash.*		W		*C*

6.4.5 Outputs to be generated

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-E-01	The main user SHALL be able to export the generated database ***User Story:*** *As a modeler, I want to be able to export the generated database to make a bill of materials, an estimation of costs and/or an index of penetrations to be shared with other partners in the project*		W		S
CHK-E-02	The main user SHALL be able to link BCF's to specific penetrations and share them with 3rd parties. Each BCF record SHALL remain linked to its corresponding entry in the FireBIM database. ***User Story:*** *As a modeler, I want to create BCFs of specific penetrations, and add information such as generic drawings and certificates that are linked to that record in the database the BCFs I create or export to remain linked to the penetration records in the FireBIM database, so that shared information stays consistent and traceable across platforms.*		W		S
CHK-E-03	The FireBIM platform SHOULD be able to automatically generate enriched BCFs for each detected clash or penetration. Each BCF SHALL include the view settings (camera position, selected objects), metadata, and a link to the selected solution (e.g., permalink to the FireBIM database or manufacturer's product page).		W		

Req. ID	Requirement Description	Priority	4	7	9, 10
	User Story: *As a user, I want the system to automatically generate enriched BCF files including visual context (screenshot, camera view) and direct links to the chosen sealing solution, so that I can easily share complete and standardized information with other stakeholders.*				
CHK-E-04	The main user SHOULD be able to visualize generate an overview of a floor (floorplan) with all referenced penetrations and their unique IDs superimposed on it ***User Story:*** *As a modeler, I want to be able to make floorplans with indication of all service penetrations with their unique ID on them. This can be shared with executing parties I want to upload or select a floorplan and automatically display all service penetrations with their unique IDs, so that I can easily share a clear overview with executing parties.*		W		S
CHK-E-05	The FireBIM platform SHALL NOT include a full 2D drawing generation module based on IFC geometry, but SHOULD allow integration with external tools or applications capable of producing technical blueprints if required.		W		
CHK-E-06	The FireBIM platform COULD integrate a machine learning or rule-based suggestion engine that analyses previously validated solutions and user interactions to improve the accuracy of future automated recommendations.		W		
CHK-E-07	The floorplans COULD have a link to the BCF or ID record in the database ***User Story:*** *As a modeler, I want to be able to navigate on the floorplan and open directly specific penetrations and see which sealing solution has been chosen and how the sealing has to be made*		W		*C*

6.4.6 Display & Widgets

Req. ID	Requirement Description	Priority	4	7	9, 10
CHK-F-01	The FireBIM platform has an issues widget, where the FireBIM compliance checks (fail/pass, clashes, other results) can be presented to the user. ***User Story:*** *As an Architect, I can consult results of the FireBIM checking tools in an interactive table*	**M**	**M**		**M**
CHK-F-02	The FireBIM platform shall ensure that the different widgets (Regulation Viewer, 3D Viewer widget, project infopanel and object info panel) are synced and aligned with selections across all of them. ***User Story:*** *As an architect/user, I expect that the different widgets show coherent information: select an object in 3D or object tree? Also filter related regulation rules and relatted compliance issues and vice verse. This type of interactivity is much deeper than what you can provide with a basic results report.*	**M**	**M**		**M**

7 Conclusion

This User Requirement Document (URD) establishes a comprehensive foundation for the development and deployment of the FireBIM platform, addressing the needs of architects, engineers, fire safety experts, and project owners across both custom and industrial applications. By systematically capturing user journeys, mapping them to real-world use cases, and detailing functional and technical requirements, the document ensures that the platform will be robust, user-centred, and aligned with industry standards.

The approach outlined in this URD not only supports regulatory compliance and data quality but also fosters collaboration, transparency, and innovation throughout the building lifecycle. By leveraging automation, interoperability, and open standards, FireBIM is positioned to streamline fire safety compliance processes, reduce manual effort, and enhance traceability and accountability for all stakeholders.

As the FireBIM project progresses, this document will serve as a living reference for development teams, stakeholders, and future contributors. It will guide the ongoing validation, refinement, and extension of platform features, ensuring that FireBIM remains adaptable and relevant in the face of evolving regulations, technologies, and user needs. Ultimately, the URD's structured methodology and clear vision will help drive the successful adoption and impact of FireBIM across the construction sector.