

## Change toolkit for digital building permit

Deliverable number	D8.2
Deliverable name	Quality and risk management Plan
Work package number	WP8
Deliverable leader	TUD
Dissemination Level (PU, SEN, EU classified*)	SEN

Status	Draft
Version Number	V1.0
Due date	M3
Submission date	31-12-2022

Project no. 101058559  
 Start date of project: 1 October 2022  
 Duration: 36 months  
 File name: CHEK\_D8.2\_Quality and risk management Plan\_vs1.0



This project has received funding from the European Union under the Horizon Europe Research & Innovation Programme 2021-2027 (grant agreement no. 101058559). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor granting authority can be held responsible for them.

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## Quality control

Author	Name	Date
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## Document history

Release	Who	Date	Comment
V0.1	Diana Keijzer	08-12-2022	First draft
V0.2	Marc Boonstra	13-12-2022	1 <sup>st</sup> Review
V1.0	Diana Keijzer	20-12-2022	Added critical Risk after review F. Noardo and finalized the deliverable.

## List of used abbreviations

DoA	-	Description of the Action
EC	-	European Commission
EU	-	European Union
GA	-	General Assembly
WP	-	Work Package
WPL	-	Work Package Leaders

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## 1. Introduction

### 1.1 Project summary

CHEK “Change Toolkit for Digital Building Permit” (hereinafter also referred as “CHEK” or “the project”), started on the 1st of October 2022 and has a duration of three years.

The aim of CHEK is to take away barriers for municipalities to adopt digital building permit processes by developing, connecting and aligning scalable solutions for regulatory and policy context, for open standards and interoperability (geospatial and BIM), for closing knowledge gaps through education, for renewed municipal processes and for technology deployment in order to reach TRL 7.

CHEK will do this by providing an innovative kit of both methodological and technical tools to digitise building permitting and automated compliance checks on building designs and renovations in European urban areas and regions.

The CHEK consortium consists of a multidisciplinary team covering GIS, BIM, municipal processes and planning, data integration and standardisation. In addition, the consortium is a multisectoral mix of research & education, AEC- and software-companies, governmental institutions, and international standardisation organisations. The multisectoral and multidisciplinary consortium is essential to align and connect all aspects of digital permit processes required to meet the highly ambitious project objectives.

Several partners are already collaborating in the European Network for Digital Building Permit (EUnet4DBP). The institutions in the advisory board, representing governments and municipalities of other European countries, will further assist the development, exploitation, and upscaling of results. The best practices and developed software following the logic of OpenAPI will enable replicability in any other European country.

### 1.2 Purpose of this document

This document addresses the monitoring and safeguarding of the quality of the work and describes risk management during the project lifetime. The deliverable is produced in the context of Work Package 8: Project Management and is related to tasks:

- Task 8.1 Scientific and technical coordination [M1-M36];
- Task 8.2: Non-technical project coordination [M1-M36];
- Task 8.3: Risk management [M1-M36].

**Quality Management.** Quality Control activities include the quality review of the scientific content of the deliverables and publications produced by the project. Deliverables are approved in a two-stage process: first at a work-package level and second via a review by another partner within the consortium. The Coordinator performs the final, administrative, check before submitting.

**Risk Assessment and Management.** This involves the identification, control and recording of risks, highlighting the consequences, mitigation plans and associated managerial actions. The preliminary risk analysis and respective contingency plans are presented in the DoA. Online meetings are scheduled on a monthly basis to detect and act on risk as soon as they occur.

The Scientific Coordinator, Project Coordinator and General Assembly will monitor and mitigate risks throughout the project lifetime. Each partner has the responsibility to immediately report any risk situation that arises and may affect the project objectives or its successful completion. Any serious risks and/or challenges that might arise will be discussed and resolved in consultation with the Project Officer to ensure that the original goals of the project are fulfilled.

### 1.3 Context

Quality and risk management within the project will be fixed topics on the agenda of the General Assembly (GA) meetings. The GA meetings are scheduled every six months for the duration of the project. In this report we present the current state of play. The Quality and Risk Management Plan is used as a living document and will be updated throughout the project lifetime (in the periodic reports).

## 2. Quality Management

### 2.1 Approval process of deliverables

In principle, WP leaders (WPL) are responsible for their WP deliverables. In agreement amongst the Partners, an internal review procedure is defined with appointed internal reviewers for each of the deliverables.

The quality review process should respect the timetable (Table 1).

Members of the AB can be consulted by the WPL during this whole process.

In case the deliverable production occurs in a period with, e.g. public holidays the author should – timely - agree on an alternative feasible timeline with the readers and the Project Coordinator.

### 2.2 Timetable of Quality Review Process

The table below describes the timetable of the quality review process for deliverables in a report format. ‘Other’ or ‘Demo’ deliverables should follow a similar timetable. The list of appointed consortium experts and scientific coordinator responsible for each deliverable is identified in the second table.

Table 1 Timetable of Quality Review

Submit date	Action
<b>6 weeks</b> before deadline of the deliverable	Project coordinator sends a request to the WPL for deliverable responsible to start the draft
Deliverable responsible has 2 weeks to write the first final draft of the deliverable	
<b>4 weeks</b> before deadline of the deliverable	Author sends the first final draft version of the deliverable to the WP leader and the project coordinator ( <a href="mailto:g.j.m.keijzer@tudelft.nl">g.j.m.keijzer@tudelft.nl</a> ). WPL sends draft to reviewer
WPL and reviewer have 1 weeks to review the first final draft	
<b>3 weeks</b> before deadline of the deliverable	WPL and reviewer, review the deliverable separately and send their feedback to the deliverable responsible (cc project coordinator <a href="mailto:g.j.m.keijzer@tudelft.nl">g.j.m.keijzer@tudelft.nl</a> )
Author has 2 weeks to improve the deliverable	
<b>1 weeks</b> before deadline of the deliverable	Author sends the second final draft version back to WPL. WPL sends the final deliverable to the to the scientific coordinator ( <a href="mailto:j.e.stoter@tudelft.nl">j.e.stoter@tudelft.nl</a> ) and project coordinator <a href="mailto:g.j.m.keijzer@tudelft.nl">g.j.m.keijzer@tudelft.nl</a>
Scientific coordinator does a final check and interacts with the author if adjustments are necessary.	
<b>2 Days</b> before the last working day of the month	The author sends the final document to the project coordinator ( <a href="mailto:g.j.m.keijzer@tudelft.nl">g.j.m.keijzer@tudelft.nl</a> ) and the WP leader.
<b>Last working day</b> of the month	Project coordinator uploads the final document to the EU Participant Portal and upload a copy on the Teams platform

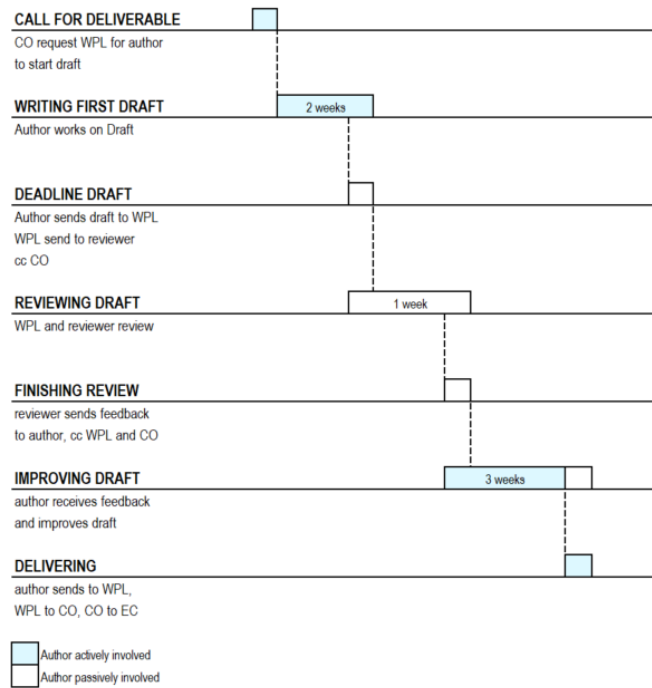


Figure 1 Quality assurance process

### 2.3 Implemented Quality Review process M1 – M18

During the first period M1-M18 the following deliverable overview and review planning is set in place.

Table 2 Deliverables – reviewers M1 – M18

Deliverable	Title	Lead Beneficiary	Reviewer	Due Month	Due Date	Dissemination level		Call for Deliverable   CO to WPL -WPL to author   6 weeks in advance	Author send draft to WP-lead   WP-lead sends to reviewer, cc CO   4 weeks in advance	Reviewer sends feedback to author, cc WPL and CO   3 weeks in advance	Author has 3 week to improve and finalise the deliverable   Author then sends to WPL, and WPL to CO   1 week in advance	Submission   CO to EC
D7.1	CHEK project identity and display window	SIA	ZWE	M3	31-12-2022	PU		19-11-2022	03-12-2022	10-12-2022	24-12-2022	31-12-2022
D8.1	Project handbook	TUD	OGC	M3	31-12-2022	SEN		19-11-2022	03-12-2022	10-12-2022	24-12-2022	31-12-2022
D8.2	Quality and risk management Plan	TUD	OGC	M3	31-12-2022	SEN		19-11-2022	03-12-2022	10-12-2022	24-12-2022	31-12-2022
D1.1	CHEK DBP process Map	FHI	UBS	M6	31-03-2023	PU		17-2-2023	03-03-2023	10-03-2023	24-03-2023	31-03-2023
D7.2	Communication and Dissemination plan	TUD	OGC	M6	31-03-2023	SEN		17-2-2023	03-03-2023	10-03-2023	24-03-2023	31-03-2023
D8.3	Data Management Plan	TUD	OGC	M6	31-03-2023	PU		17-2-2023	03-03-2023	10-03-2023	24-03-2023	31-03-2023
D8.4	Lecture about Open Science principles and practice	TUD	OGC	M6	31-03-2023	PU		17-2-2023	03-03-2023	10-03-2023	24-03-2023	31-03-2023
D8.5	Interim Management Report M6	TUD	OGC	M6	31-03-2023	SEN		17-2-2023	03-03-2023	10-03-2023	24-03-2023	31-03-2023
D4.1	Results of user requirements	FHI	UM	M7	30-04-2023	PU		19-3-2023	02-04-2023	09-04-2023	23-04-2023	30-04-2023
D4.2	Design Sprint results	OGC	CYPE	M9	30-06-2023	SEN		19-5-2023	02-06-2023	09-06-2023	23-06-2023	30-06-2023
D8.6	Interim Management Report M12	TUD	OGC	M12	30-09-2023	SEN		19-8-2023	02-09-2023	09-09-2023	23-09-2023	30-09-2023
D1.2	CHEK Maturity Model and Roadmap	FHI	OGC	M13	31-10-2023	PU		19-9-2023	03-10-2023	10-10-2023	24-10-2023	31-10-2023



D2.1	Regulations interpretation and needs identification for CHEK DBP	UBS	UM	M13	31-10-2023	PU		19-9-2023	03-10-2023	10-10-2023	24-10-2023	31-10-2023
D4.7	3D City Model Viewer for pilot uses-cases	VCS	TUD	M13	31-10-2023	SEN		19-9-2023	03-10-2023	10-10-2023	24-10-2023	31-10-2023
D5.1	Wiki training materials and glossary related to DBP.	UM	UBS	M13	31-10-2023	PU		19-9-2023	03-10-2023	10-10-2023	24-10-2023	31-10-2023
D6.1	Plan for demonstration of CHEK Digital Building Permit process on demo sites	MST	GAI	M13	31-10-2023	PU		19-9-2023	03-10-2023	10-10-2023	24-10-2023	31-10-2023
D7.3	Exploitation plan	CYP	VCS	M13	31-10-2023	SEN		19-9-2023	03-10-2023	10-10-2023	24-10-2023	31-10-2023
D2.2	CHEK IFC specification	RDF	BSI	M18	31-03-2024	PU		18-2-2024	03-03-2024	10-03-2024	24-03-2024	31-03-2024
D2.3	CHEK CityGML specification	OGC	TUD	M18	31-03-2024	PU		18-2-2024	03-03-2024	10-03-2024	24-03-2024	31-03-2024
D3.2	IFC georeferencing tool	TUD	BSI	M18	31-03-2024	PU		18-2-2024	03-03-2024	10-03-2024	24-03-2024	31-03-2024

## 2.4 Implemented Quality Review process M19 – M36

During the second period M19-M36 the following deliverable overview and review planning is set in place.

Table 3 Deliverables – reviewers M19 – M36

Deliverable	Title	Lead Beneficiary	Reviewer	Due Month	Due Date	Dissemination level		Call for Deliverable   CO to WPL -WPL to author   6 weeks in advance	Author send draft to WP-lead   WP-lead sends to reviewer, cc CO   4 weeks in advance	Reviewer sends feedback to author, cc WPL and CO   3 weeks in advance	Author has 3 week to improve and finalise the deliverable   Author then sends to WPL, and WPL to CO   1 week in advance	Submission   CO to EC
D8.7	Interim Management Report M24	TUD	OGC	M24	30-09-2024	SEN		19-8-2024	02-09-2024	09-09-2024	23-09-2024	30-09-2024
D1.4	Testing phase – preliminary results	FHI	UBS	M25	31-10-2024	PU		19-9-2024	03-10-2024	10-10-2024	24-10-2024	31-10-2024
D2.5	Exchange Information Requirements for DBP	UM	UBS	M25	31-10-2024	PU		19-9-2024	03-10-2024	10-10-2024	24-10-2024	31-10-2024
D3.1	Geo to BIM tool/procedure	RDF	TUD	M25	31-10-2024	PU		19-9-2024	03-10-2024	10-10-2024	24-10-2024	31-10-2024
D3.3	BIM to Geo conversion tool and procedure	TUD	OGC	M25	31-10-2024	PU		19-9-2024	03-10-2024	10-10-2024	24-10-2024	31-10-2024
D2.4	CHEK data validity-supporting tools	TUD	OGC	M26	30-11-2024	PU		19-10-2024	02-11-2024	09-11-2024	23-11-2024	30-11-2024

<b>D1.3</b>	CHEK change Management Virtual Assistant	FHI	UM	M30	31-03-2025	PU		17-2-2025	03-03-2025	10-03-2025	24-03-2025	31-03-2025
<b>D1.5</b>	Testing phase - Final results	FHI	UBS	M30	31-03-2025	PU		17-2-2025	03-03-2025	10-03-2025	24-03-2025	31-03-2025
<b>D4.3</b>	CHEK process and data management platform	CYPE	DIR	M31	30-04-2025	SEN		19-3-2025	02-04-2025	09-04-2025	23-04-2025	30-04-2025
<b>D4.4</b>	Open API for CHEK platform and integration manual	CYPE	VCS	M31	30-04-2025	PU		19-3-2025	02-04-2025	09-04-2025	23-04-2025	30-04-2025
<b>D4.5</b>	IFC digital signature module	DIR	CYPE	M31	30-04-2025	PU		19-3-2025	02-04-2025	09-04-2025	23-04-2025	30-04-2025
<b>D4.6</b>	Tools for BIM based urbanism and accessibility	CYPE	XNP	M31	30-04-2025	SEN		19-3-2025	02-04-2025	09-04-2025	23-04-2025	30-04-2025
<b>D4.8</b>	Checking tolls for the CHEK regulations	VCS	TUD	M31	30-04-2025	SEN		19-3-2025	02-04-2025	09-04-2025	23-04-2025	30-04-2025
<b>D4.9</b>	Software documentation and workshops	CYPE	OGC	M32	31-05-2025	PU		19-4-2025	03-05-2025	10-05-2025	24-05-2025	31-05-2025
<b>D6.2</b>	Results Demonstration Scenario 1- CHEK DBP for new building construction	SIA	IPR	M34	31-07-2025	PU		19-6-2025	03-07-2025	10-07-2025	24-07-2025	31-07-2025
<b>D6.3</b>	Results Demonstration Scenario 2- CHEK DBP for building renovations	ZWE	LIS	M34	31-07-2025	PU		19-6-2025	03-07-2025	10-07-2025	24-07-2025	31-07-2025
<b>D7.4</b>	Final (digital) event	TUD	OGC	M34	31-07-2025	PU		19-6-2025	03-07-2025	10-07-2025	24-07-2025	31-07-2025
<b>D3.4</b>	OGC-bSI GeoBIM documents with final CHEK specs	OGC	BSI	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D4.10</b>	Business cases and go to market plan	OGC	CYPE	M36	30-09-2025	SEN		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D5.2</b>	Materials for different types of users	UM	OGC	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D5.3</b>	Training sessions for different types of users	UM	LIS	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D5.4</b>	Technical-scientific DBP course and materials	UM	TUD	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D6.4</b>	Report on the Pilots' assessment and stakeholders' feedback	FHI	UBS	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D6.5</b>	Best practices and scalability guidelines	FHI	IPR	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D7.5</b>	Informative booklet about DBP	FHI	UBS	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D7.6</b>	Standard and Best practices	TUD	OGC	M36	30-09-2025	PU		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025
<b>D8.8</b>	Interim Management Report M36	TUD	OGC	M36	30-09-2025	SEN		19-8-2025	02-09-2025	09-09-2025	23-09-2025	30-09-2025

### 3. Risk Management

#### 3.1 Risk identified at the outset of the project

In the proposal, eighteen risks were identified. These risks are assessed every six months during the General Assembly meetings. One other risk (risk nineteen) was identified in the third month of the project.

##### **Critical risks for implementation**

###### [a] Foreseen risks as in DoA

Right from the beginning of the project, all partners were urged to continuously assess the status of the risks identified in the project proposal and to identify new risks.

This exercise is to be repeated every six months.

###### [b] Unforeseen Risks identified during project lifetime

A regular assessment is set in place in order to identify new risks in time and anticipate on the consequences. Thus, come up with appropriate mitigation measures and contingency plans.

This exercise is to be repeated every six months.

#### 3.2 Risk Matrix

Table 4 Critical Risks

Risk ID	Description of risk	Indicate level of (L) likelihood: Low/Medium/High	Indicate level of (S) severity: Low/Medium/High	WP(s) involved	Status	Proposed risk-mitigation measures
R.1	Tools not effective in supporting the Municipalities in setting up their own strategy to adopt the CHEK building permit process.	L:Low	S:Medium	WP1	open	The communication and exploitation activities will be enhanced and intensified to provide effective and tailored results potentially limited by different local and national regulations.
R.2	The necessary datasets and information are not available and new acquisition or integration is necessary.	L: Medium	S: High	WP2	open	The involved municipalities are already part of the planning and are aware of the kind of data to be provided. The use of open data (e.g. Open street map) can be an alternative. Some budget were reserved for subcontracting possible integration and processing of geodata
R.3	The regulations are very ambiguous	L: High	S: Low	WP2	open	The direct involvement of municipality officers will prevent it by providing their expertise.
R.4	Issues with input data.	L: Medium	S: High	WP3	open	We will use the data requirements specified and validated in WP2 to use reliable data
R.5	Bugs or missing features in library dependencies.	L: Medium	S: High	WP3	open	use well-known open source libraries; develop the software iteratively to detect issues early; unit testing
R.6	Unforeseen complexities in the process.	L:Medium	S: High	WP3	open	Make a preliminary plan (and research protocol) of the workflow to explicit the steps and point out possible weakness early
R.7	Not all the user and regulations requirements can be addressed	L:Medium	S:Medium	WP4	open	Guide users in the use of the software and provide technical specifications to support them. We will address the risk in the planning phase choosing regulations that will have the most advantage from automated checking.
R.8	Software, Platform or API doesn't work properly or prototypes are not delivered in time	L:Low	S:High	WP4	open	The process will be done iteratively, different versions will be developed and tested to ensure correct functioning and delivery of prototypes in time.
R.9	WP4 internal dependencies between tasks and with WP1,2,3 can cause waterfall delays and failure in addressing requirements.	L:Medium	S:Medium	WP4	open	Process is iterative and incremental. Small effort is allocated both for WP4 participants to observe and consult WP1-3 and to all the partners to join the validation of the WP4 and ensure fit for purpose implementation.

R.10	Business case analysis does not proof proper scalability and applicability of the solution to wide market influencing negatively project impact.	L:Medium	S:Medium	WP4	open	The solution shall address requirements most common and critical to known markets with highest priority and ensure extendability and configurability of the technical stack.
R.11	Terminologies are too different and 1-to-1 correspondences make it impossible to produce a glossary of global reach	L:Medium	S:Medium	WP5	open	Reach of glossary reduced in breadth (both content and countries involved) as to keep it useful, rather than a mere theoretical exercise
R.12	Resistance of institutions and workers to host/participate in the training and education provided.	L:Medium	S:High	WP5	open	The communication and promotion of the project and related communication will start early, so that there will be time to negotiate with the involved institutions and to organize the courses.
R.13	CHEK tools are not mature enough for training in time for the activities of WP5 to operate as planned.	L:Medium	S:Medium	WP5	open	Create a mixed training kit, involving CHEK tools, but also local tools developed at the members of CHEK, which are likely to be more mature because of less need for generality
R.14	Number of registered attendants in the Summer school is small	L:Low	S:Medium	WP5	open	Keep the course. Make it hybrid/online, hence increasing reach. Record for later use by new interested parties (both trainees or prospective trainers)
R.15	Delay in the other WPs delay the demonstration or change its premises.	L:Medium	S: High	WP6	open	Provisional results will be shared in the consortium during the developments in order to ensure early warning and change the demonstration plan consequently.
R.16	Lack of commitment in the external advisory board	L:Low	S:Low	WP1, WP2, WP6,WP7	open	The CHEK consortium represents internally the skills and expertise necessary to the development of a successful project. The involvement of the AB extends it further, benefitting the project results consistency, replicability and uptake, but a possible lack of commitment does not prevent the overall success of the project.
R.17	Delays and unavailability of the team due to covid pandemic or similar unexpected issue			WP1 - WP8 (all)	open	Limit the number of physical meetings; organising the onsite events in low-risk months; trying to plan the activities as resiliently as possible.
R.18	Technical and security disruptions cause loss of the data or unavailability of the shared environment.	L:Low	S: High	WP8	open	Ensure security (data and services access limited and protected as reasonable) and redundancy on each endpoint (at least backups either on the cloud or central storage).
R.19	Misalignment of achieved results by initial tasks with respect to expectations and needs by following ones.	L:Medium	S:High	ALL WP	open	Filling WP plans describing in detail the methodology planned, as well as input required and output expected

## 4. Conclusion

As result of a well-defined internal peer review procedure for the CHEK deliverables, and monitoring the defined risk matrix, we will ensure the writing process is at all times under expert supervision and the risks are mitigated on time.

This will give a better prospect of having the submitted deliverables approved by the European Commission.

The next update of this deliverable will be done at the first reporting period M1 (Oct 2022) - M18 (March 2024).

## 5. References

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