



NL Utrecht Universiteitsbibliotheek Risk Summary Report 2021 Aon

Onderwijsinstellingen

Location:	Heidelberglaan 3 UTRECHT Netherlands
Location code:	UU 527
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1. Introduction

1.1 Introduction

Scope of the report

The information in this report is based on a site visit and information provided by University Utrecht (hereafter: UU). A good impression could be gained from the housekeeping, risk awareness, fire protection installations, and fire compartmentation based on the visit. During the visit, the emphasis was on a random review of technical areas, fire-resistant separations, catering and areas for practicums. The survey has been supplemented with information insofar as it is provided by UU. The EML and MPL scenarios at the end of this report are based on these gathered impressions. The survey was held during the COVID epidemic. As a result, the occupancy of the buildings was less than normal.

1.2 Participants

Participants surveys

The survey (09-06-2021) has been accompanied by the following person from the UU organization:

Jos de Vries - Facility.

1.3 General

The UU has a broad variety of Education Programs, in all kinds of fields from practical studies to theoretical studies. There are 50 bachelor's programs and 154 master's programs that represent a cross-section of the entire scientific spectrum. The programs are part of organized units. There are several partnerships with international training institutions and collaborations with national and international companies. Research is done by students within several units. These activities are done under the strict supervision of the teaching staff. Every location has its own facility managers.

Utrecht University boasts seven faculties.

Faculties

Each faculty consists of a number of departments. Each department coordinates the research and teaching programmes of a specific field of science. Scientific staff are appointed at department level.

Faculty of Geosciences

Faculty of Humanities

Faculty of Law, Economics and Governance

Faculty of Medicine

Faculty of Science

Faculty of Social and Behavioural Sciences Faculty of Veterinary Medicine

There are 30,000+ students. In total the staff is 8035 persons of whom 4,316 persons are teaching staff

General information about Universiteitsbibliotheek (University library) location:

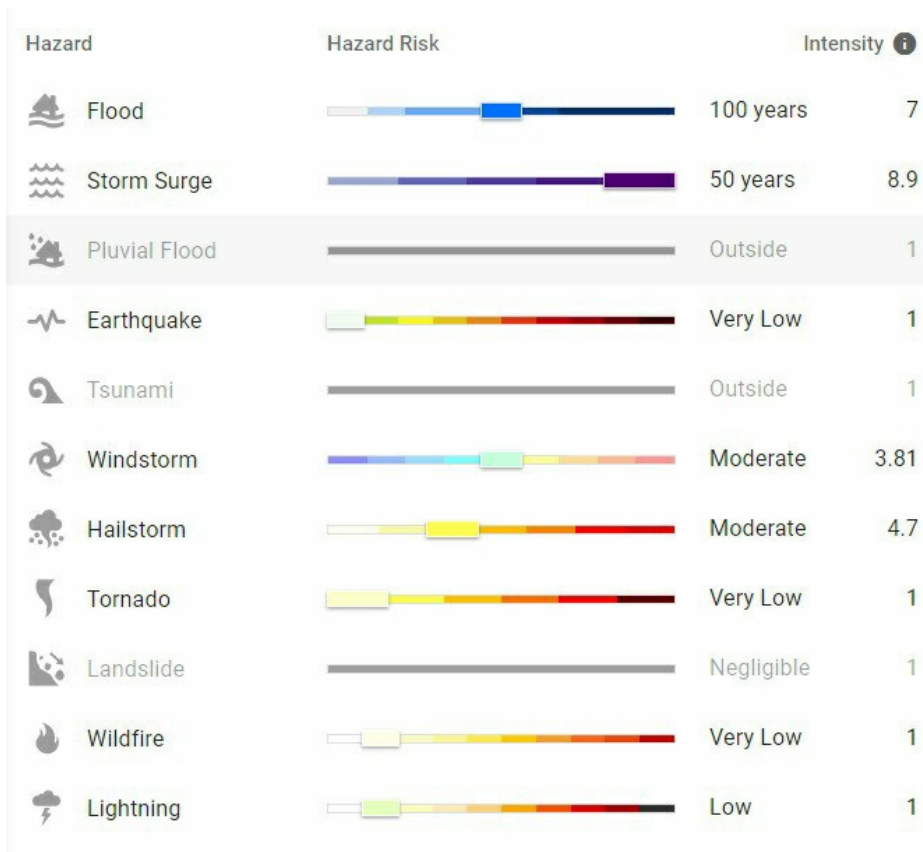
The so called "Universiteitsbibliotheek" is the main university library of the University of Utrecht. There is a subsidiary at the city centre. The building is built in 2001 and has 10 storey floors. The gross floor area is 28,879 m². This building has a double function. Partly it is in use for the storage and keeping of modern books, very ancient books and maps/plans. The second function of the building is that students use the numerous desks as quiet place to study for their exams or to work on their reports and projects.

The operations can be divided per floor:

- Ground floor level: technical rooms, some storage facilities for books (non sprinkled), a non-sprinkled workshop, a coffee corner and a public area with desks for students.
- Mezzanine floor: storage of books in various fire divisions (modern books after 1900)
- Second floor level: reception / security, overhead corridor to Van Unnikbuilding, desks for students and some book storage
- Third floor: Offices and server room as well general room for students
- Fourth floor: offices, some book storage rooms, general library and desks for students
- Fifth floor: partly public area and partly storage rooms for the old unique collection (protected by clean agent total flooding systems)
- Sixth floor: partly public area and partly storage rooms for the old unique collection (protected by clean agent total flooding systems)
- seventh floor: partly public area (with library) and partly an area where people can view/read the ancient books at a special room
- eighth (mezzanine) floor: room with technical equipment.
- on top of the roof Pv-panels.

The University Library is located in a 2002 constructed modern building with an open character. Nearly all floors are interconnected with each other via the open atria. The open interconnected parts (about 60 % of the floor area) are provided with automatic sprinklers (classified as a life safety sprinkler). The high value collection (the books and maps before 1900) are located in special fire retardant rooms that are provided with a clean agent total flooding fire suppression system (about 10 % of the floor area). There are also book storage rooms with more modern books (after 1900) that are located in fire divisions of less than 500 m² with a rating of 60 minutes and provided with (only) fire detection (no automatic fire suppression system). It has to be mentioned that the number of ignition sources is very limited in these rooms (mostly limited to automatic switched on and off lighting). Overall it can be concluded that the fire prevention complies with the local construction standards, but is not developed for property protection.

The building has a concrete load bearing construction with concrete floors and some internal concrete panels. The exterior walls are mainly of glass façade walls. The roof is made of concrete with an insulation on top of the roof covered with a roof felt. The concrete roof can be classified as a thermal barrier. Overall the construction is classified as non-combustible. In general, the housekeeping is at an excellent level. Rooms with technical equipment are free of storage. Present fire protective systems and cable penetrations are well maintained, certified and checked by competent contractors. The state of maintenance of the building is at a good level.



* Source: CatNed SwissRe

Based on information from the Dutch Directorate-General for Public Works and Water Management, this location is located in an area that has no flood risk.

1.4 Future plans

There are no significant plans.

2. Construction

2.1 Construction

The building has a concrete load bearing construction with concrete floors and some internal concrete panels. The exterior walls are mainly of glass façade walls. The roof is made of concrete with an insulation (reportedly non-combustible) on top of the roof covered with a roof felt. The concrete roof can be classified as a thermal barrier. Overall the construction is classified as non-combustible.

3. Utilities

3.1 Utilities

The electrical installation is fed by a transformer that is owned and maintained by Stedin. Detailed information about the transformers was not available. The main distribution box is located in a closed area with a fire resistance of at least 60 minutes. The other distribution boxes in the buildings are located on every floor in the building

The installation is maintained by the installer. A (Dutch) NEN3140 inspection is done every 5 years, thermographic inspections included. Defects that emerge from the inspection will be remedied as soon as possible. Visually, the installation is in a good condition. The use of power strips is minimal. Separate electrical appliances are inspected annually, including private equipment that is allowed by UU.

The building is heated with district heating with a heat pump. The heat is transported through the building by air ducts. This installation is also able to cool.

Other installations are an air compressor installation and refrigerating compressors. These are well set up and are periodically maintained.

The power supply is reliable. In case of a power outage the building needs to be evacuated. This will not result into a business interruption. Emergency power supplies from UPS batteries are only applicable for the safety and security systems and for lighting etc.

The server is located at the second floor level. The room is provided with traditional automatic sprinklers (activation temperature 93°C) and a clean agent total flooding system as well. The room is provided with over pressure relieve vents.

4. Protection

4.1 Fire Protection

There is an automatic sprinkler system (estimated >60%). The automatic sprinkler is certified. The automatic sprinkler is installed in the open area's without compartmentalization. Therefore the sprinkler is installed as life safety system and not for property protection. If a fire starts in the area that is protected by automatic sprinklers it might be expected that it will be adequately controlled. However a fire starting in an area that is not provided with the sprinklers the fire might spread and can become larger than the sprinkler is designed for and might be overwhelmed.

The system is designed according to the Dutch standards VAS 1996 and N III installation meaning that the design area is 216 m² and the density is 5 litres/min/m². The system is fed by a single electrical driven pump with a capacity of 66 m³/h at a pressure of 5.2 bars. The sprinkler heads are fast response. The sprinkler pump is tested every two weeks by a specialized third party. Alarms are transmitted to a 24/7 alarm centre. The valves have open position monitoring. The installation is inspected twice a year.

It is recommended to extent the sprinkler to the total building.

Water supply

The public water supply is expected to be adequate as it is also feeding the automatic sprinkler directly.

Fire Extinguishing Systems

Clean agent total flooding fire suppression systems are installed in the storage rooms for unique (expensive) books. These are in general the books that were made before 1900. The rooms are provided with over pressure relief venting. The system is checked twice per year by a contractor and also by a notified body.

Fire Detection System

A fire detection system in accordance with the local standards NEN 2535 is installed in the building. The security service is notified directly upon a fire alarm and will arrive within 5 minutes at the site. A fire alarm of the automatic sprinklers will be forwarded to the central station of the fire brigade directly.

Fire Rated Compartments

There are some 60 minutes fire retardant partitions present in the building especially between the different book storage sections, between sprinkler protected and non-sprinkled area's etc. However the sprinkler protected area (about 60 % of the total floor area) is in open connection with each other. A small fire can result into serious smoke and soot spread.

4.2 Security

The whole building is protected by an alarm system with motion detection and door magnets. The alarms are transmitted to a 24/7 alarm centre. In case of an alarm, a private security service is notified and will respond. In addition, also cameras with recording in and around the building are installed. The building is closed by the private security service at 22.00 p.m.

5. Loss Estimates

5.1 Values

Section/Property	Indemnity period	Value	Source	EML (%)	MPL (%)	Third party
Buildings		62,400,000 EUR	Policy	40	100	Aon

5.2 Breakdown of values

* The values provided in this report represent the best available at the time of the report. The primary use of these values is for estimating loss scenarios. They should not be used as definitive insurance values without further cross checking, and must never be used to try to demonstrate underinsurance.

5.3 Loss estimates summary table

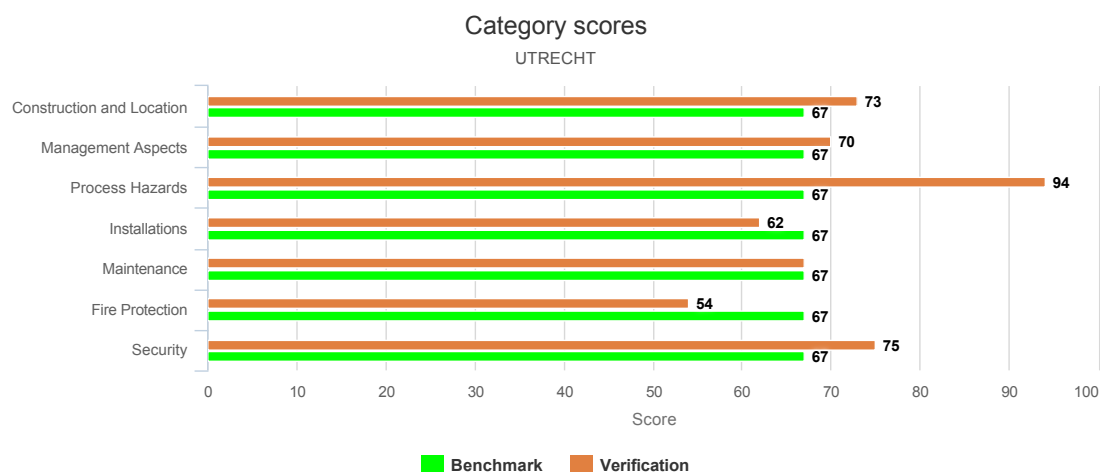
Property Damage / Business interruption	EML (%)	MPL (%)	EML (value)	MPL (value)
Material Damage	40%	100%	24,960,000 EUR	62,400,000 EUR
Business Interruption	0%	0%	0 EUR	0 EUR
Combined	40%	100%	24,960,000 EUR	62,400,000 EUR

5.4 Loss Scenarios

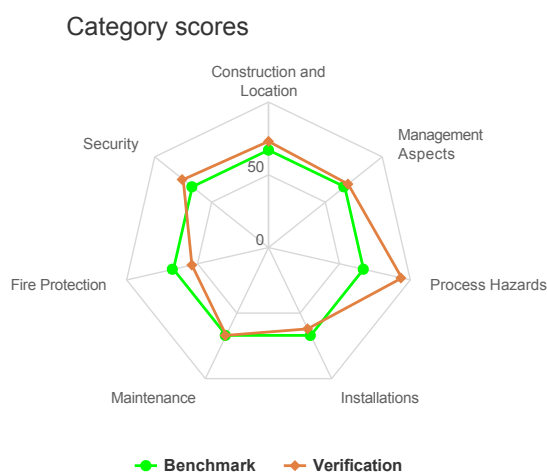
Name	Definition	Scenario
MPL	<i>Maximum Possible Loss scenario(s) according to the CEA 1999 definition. (The Maximum Possible Loss is that which may occur when, the most unfavourable circumstances being more or less exceptionally combined, the fire is only stopped by impassable obstacles or lack of substance).</i>	The MPL for this unit of the UU is estimated at 100% of the total insured value for Property Damage. This is based on: The building represents a single fire area. There are no perfect fire separations inside the buildings, the fire can spread throughout the whole complex in worst-case scenarios. This scenario is not likely, due to the presence of the fire department nearby, but cannot be ruled out completely. Therefore the MPL is set at 100%. In this scenario, it is expected the fire detection system is inactive.
EML	<i>Estimated Maximum Loss scenario(s) according to the CEA 1999 definition. (The Estimated Maximum Loss is that which could reasonably be sustained from the contingencies under consideration, as a result of a single incident considered to be within the realms of probability taking into account all factors likely to increase or lessen the extent of the loss, but excluding such coincidences and catastrophes which may be possible but remain unlikely).</i>	The EML for this unit of the UU is estimated at approx. 40% of the total insured value for Property Damage. This is based on: A fire starting in one of the compartments without sprinkler protection will be detected by the automatic fire detection. The security service will be alarmed who will arrive in 5 minutes to discover that there is a fire. the fire brigade will be alarmed and will start with fire fighting in about 15 to 20 minutes. At that moment there is a serious fire going on that is difficult to control. If the fire starts in a sprinkler protected area it will be controlled by the automatic sprinkler and there will be smoke and soot damage over a very large area.

6. Scorecard results

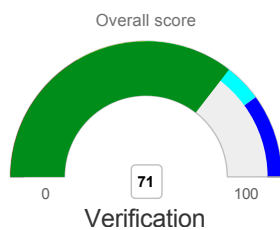
6.1 Category scores (histogram)



6.2 Category scores (spider web)



6.3 Overall scores



6.4 Scorecard results

		Category Weight	Subject Weight	Verification score	Comment
1	Construction and Location	10			
1-01	Building construction		1	3	N
1-02	Roof insulation		1	2	Y
1-03	Wall insulation		1	2	N
1-04	Combination solar panels vs. roof structure		1	2	Y

		Category Weight	Subject Weight	Verification score	Comment
1-05	adjacent buildings		1	2	Y
2	Management Aspects	10			
2-01	Risk Management Policy		1	2	N
2-02	Supervision outside opening hours		1	1	Y
2-03	Self-inspection		1	2	Y
2-04	Smoking policy		1	3	N
2-05	Hot work Procedure		1	3	Y
2-06	Waste handling inside		1	2	N
2-07	Waste handling outside		1	2	N
2-08	Housekeeping		1	2	Y
2-09	Housekeeping technical areas		1	2	N
2-10	Management of Change (MOC)		1	2	N
3	Process Hazards	10			
3-01	Practice rooms: gasses		1	N/A	N
3-02	Practice rooms: flammable liquids and aerosols		1	N/A	N
3-03	Practice rooms: wood working		1	N/A	N
3-04	Practice rooms: metal working		1	N/A	N
3-05	Practice rooms: plastic machining		1	N/A	N
3-06	Practice rooms: paint spraying		1	N/A	N
3-07	Practice rooms: experiments and research		1	N/A	N
3-08	Practice rooms: unmanned processes		1	N/A	N
3-09	Practice rooms: textile processing		1	N/A	N
3-10	Catering / restaurant		1	N/A	N
3-11	Battery charging (tools, etc.)		1	1	N
3-12	Theaters		1	N/A	N
4	Installations	10			
4-01	Electrical installation		1	2	N
4-02	Local heating		1	2	Y
4-03	Installations for cooling		1	2	N
4-04	Lightning and overvoltage protection		1	2	N
4-05	Air compressors		1	N/A	N
4-06	Solar panels		1	2	Y
4-07	Electric bicycles		1	0	Y
4-08	Charging of electric vehicles		1	3	Y
5	Maintenance	10			
5-01	Inspectie elektrische installatie en gereedschappen		1	2	Y
5-02	Inspectie PV installatie		1	2	Y
5-03	Onderhoudsprogramma		1	2	N

		<i>Category Weight</i>	<i>Subject Weight</i>	<i>Verification score</i>	<i>Comment</i>
6	Fire Protection	10			
6-01	Fire department		1	1	N
6-02	extinguishing water		1	2	Y
6-03	hand extinguishers		1	2	N
6-04	Fire hoses		1	2	N
6-05	Automatic fire detection		1	2	N
6-06	Fire separations		1	1	Y
6-07	Specific object fire protection		1	2	Y
6-08	Automatic sprinkler system		1	1	N
7	Security	10			
7-01	Access site and buildings		1	2	N
7-02	Burglary system		1	2	N
7-03	Security cameras		1	2	N
7-04	Specific computer equipment		1	N/A	N

6.5 Review comments

1-02	Roof insulation Reportedly the roof insulation consist of non-combustible material.	Peter Uri
1-04	Combination solar panels vs. roof structure The roof exist of concrete slabs.	Peter Uri
1-05	Adjacent buildings / exposures <u>North:</u> there is the Van Unnikbuilding that is interconnected by a single story overhead bridge. The bridge is not sprinkler protected but is provided at both sides with 60 minutes fire retardant sliding doors. The van Unnikbuilding is located at more than 50 meters distance and we classify these two buildings as different fire area's. <u>East:</u> There is a parking garage at about 10 meters distance, however the cars are parked at more than 20 meters distance. The parking has an open structure. and is not sprinkler protected. However due to the opening between the buildings it is expected under normal circumstances that heat and smoke will be adequately vented but can still result into damage to the insured building. The parking is not sprinkler protected. The risk is somewhat increased. <u>West</u> of the insured property is another building of the university located at 12 meters distance. The next door building has three floors. This belongs officially to the same fire area but does not represent an increased risk. <u>South:</u> At a remote distance a dormitory for students at more than 80 meters distance.	Peter Uri
2-02	Supervision outside opening hours The is no fence present. Therefore, the score is score 1.	Peter Uri
2-03	Self-inspection Self-inspections are being done on a regular basis. The housekeeping is perfect and the site is well managed. Documented fire safety self-inspection program in use covering hazards and essential fire safety elements	Peter Uri
2-05	Hot work Procedure There is a formal strict hot work procedure including a fire watch.	Peter Uri
2-08	Housekeeping In general, housekeeping is at a excellent level. The corridors are free of any storage. There is no yard storage. Adequate clearance to sprinkler heads (where installed) Aisles & passageways kept clear of obstructions. All work and storage areas well controlled and in good state. Combustible materials cleared from hazardous areas. Fire protection equipment easily accessible. No excess storage in process areas.	Peter Uri
4-02	Local heating The building is heated with district heating with a heat pump. The heat is transported through the building by air ducts.	Peter Uri
4-06	Solar panels The building has a PV installations. Recently a Scope 12 inspection has been conducted. During the survey the report was not available.	Peter Uri
4-07	Electric bicycles There is no strict policy yet. There are no charging stations available.	Peter Uri
4-08	Charging of electric vehicles There is no parking below the University library.	Peter Uri
5-01	Electrical equipment of installation Inspection of electrical equipment is done every 5 years according the Dutch NEN3140. Tools are inspected yearly.	Peter Uri
5-02	Solar panel installation A scope 12 inspection is recently conducted. The report was not yet available during the survey.	Peter Uri
6-02	Extinguishing water The public water supply consist of underground hydrants fed by the municipal water supply.	Peter Uri
6-06	Fire separations Openings in fire walls are sealed off with non-combustible material (documented). There are some 60 minutes fire retardant partitions present in the building especially between the different book storage sections, between sprinkler protected and non-sprinkled area's etc. However the sprinkler protected area (about 60 % of the total floor area) is in open connection with each other. A small fire can result into serious smoke and soot spread.	Peter Uri
6-07	Specific object fire protection In the storage rooms for unique (ancient) books a clean agent total flooding fire suppression systems are installed. These are in general the books that were made before 1900. The rooms are provided with over pressure relieve venting. The system is checked twice per year by a contractor and also by a notified body.	Peter Uri

7. Recommendations

7.1 Extend detection system

<i>ID</i>	2021001	<i>Issued by</i>	Aon
<i>Status</i>	New	<i>Currency</i>	
<i>Category</i>	Physical Protection	<i>Estimated costs</i>	
<i>Subcategory</i>	Smoke and Heat Detection	<i>Loss Estimate before</i>	
<i>Priority</i>	Medium	<i>Loss Estimate after</i>	

It was identified that there is no 'connected' automatic fire alarm (smoke detection) system in the small commercial shops at ground level. The shops are in a separate 60-minute fire resistant compartment. Nevertheless, it is recommended to extend the automatic fire alarm to all areas according to the Dutch NEN 2535. And connect it to an addressable alarm receiving panel (UU) located in 24 hr manned location. An addressable system will allow the security guards to identify the location of a (starting) fire quickly.

7.2 Remove extension cords

<i>ID</i>	2021002	<i>Issued by</i>	Aon
<i>Status</i>	New	<i>Currency</i>	
<i>Category</i>	Risks	<i>Estimated costs</i>	
<i>Subcategory</i>	Electrical Equipment	<i>Loss Estimate before</i>	
<i>Priority</i>	Medium	<i>Loss Estimate after</i>	

The use of electrical extension cords should be limited to temporary occasions (hours rather than days or months).

At several places in the building, there are very good examples of how to avoid the use of extension cords, however, at some places, loaders are used to charge mobile electronic devices with the use of 'domestic' extension cords. We recommend having these replaced by fixed electrical wall outlets or 'professional' extension cords.

7.3 Bicycle battery charging (Lithium-ion battery)

<i>ID</i>	2021003	<i>Issued by</i>	Aon
<i>Status</i>	New	<i>Currency</i>	
<i>Category</i>	Risks	<i>Estimated costs</i>	
<i>Subcategory</i>	Electrical Equipment	<i>Loss Estimate before</i>	
<i>Priority</i>	Medium	<i>Loss Estimate after</i>	

There are no bicycle charge stations or policy for charging bicycle batteries. In general, a bicycle battery is a lithium-ion type. The most likely failure scenario

of a lithium-ion energy carrier is that it heats up too much (thermal runaway). This can have several causes: for example, as a result of a production error, due to impact as a result of a fall or collision, overloading or an excessively high operating temperature. At the moment, there are no specific rules or laws for this kind of hazards. The best option is to store and charge the batteries outside at a safe distance from the building (>10 meters). If the batteries are stored indoors or close to the building, we recommend storing and charge lithium-ion battery in fire safety cabinets. Such a cabinet should be in accordance with NEN-EN-14470-1.

For indoor storage, it is recommended to connect the cabinet to a decentralized extraction system, with a self-closing fire damper on the cabinet. Also, consider a fire-resistant penetration of the electrical supply to the cabinet. The most obvious is to keep the doors of the cabinet locked in an open position (for easy use and cooling/ventilation under normal operating conditions) and to have the smoke detector above the cabinet interlocked to automatically close its doors. This can be done with the help of adhesive magnets. Activation of the smoke detector can then simultaneously interrupt the energy supply of the cabinet and generate an alarm. Naturally, project the smoke detector in accordance with NEN 2535.

The connection of the electricity in the cabinet should be in accordance with NEN 1010, with sufficient connections to prevent looping through of sockets in the cabinet. You can additionally choose to realize the electrical connection from the cabinet to the fixed network using a CEE plug. If desired, this leaves the fire brigade the option to put the cabinet outside in case of fire. Whether this will eventually happen is a decision of the fire brigade commander, so you cannot simply assume that. Hence, the intrinsic fire resistance of the cabinet is crucial if one decides to concentrate the batteries in one place.

Finally, keep the cabinets spacious and free of flammable storage and easily accessible.

7.4 Additional Sprinkler Protection (Chubb)

<i>ID</i>	18-0312-03	<i>Issued by</i>	CHUBB
<i>Status</i>	New	<i>Currency</i>	
<i>Category</i>	Physical Protection	<i>Estimated costs</i>	
<i>Subcategory</i>	Automatic Sprinkler	<i>Loss Estimate before</i>	
<i>Priority</i>	Medium	<i>Loss Estimate after</i>	

Chubb: Parts of the building lack sprinkler protection. Uncontrolled fires in non sprinkler protected areas can spread rapidly, and in some cases, to the sprinkler protected areas at which point the installation may not be able to cope with such a large fire. We recommend that the sprinkler installation be extended to currently unprotected areas in full accordance to codes and standards.

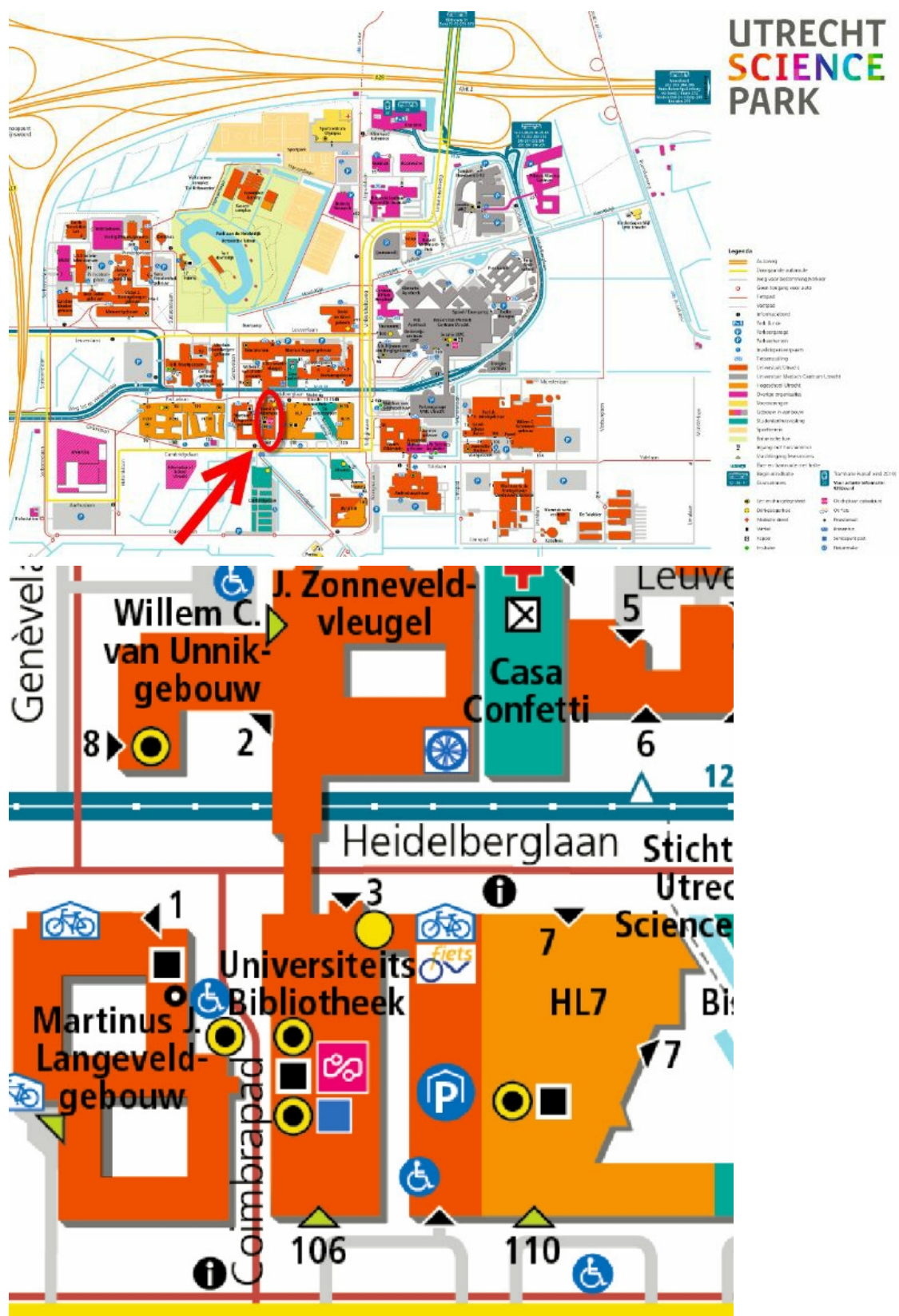
7.5 Compartmentalization (Chubb)

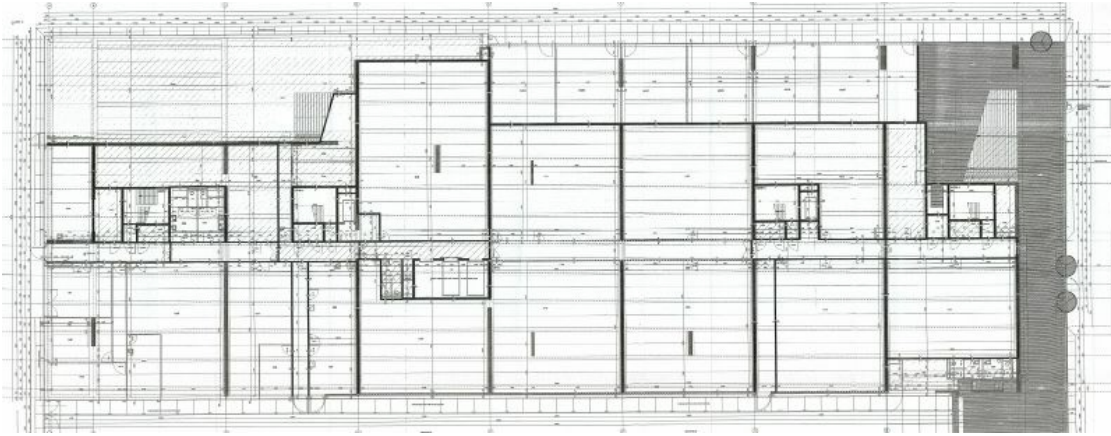
<i>ID</i>	18-0312-04	<i>Issued by</i>	CHUBB
<i>Status</i>	New	<i>Currency</i>	
<i>Category</i>	Miscellaneous Physical Protection	<i>Estimated costs</i>	
<i>Subcategory</i>	Fire Separations, Partitions, Seals	<i>Loss Estimate before</i>	
<i>Priority</i>	Medium	<i>Loss Estimate after</i>	

The total fire prevention concept is based on the minimum required safety for life safety. About 60 % of the site is in open connection with each other. As a requirement of the Authority Having Jurisdiction (AHJ) this large part is provided with sprinkler protection. The sprinkler is designed to control the fire to prevent further fire spread (so that the fire brigade can extinguish the fire). During this period smoke and soot will spread through the building resulting into a large financial damage and a long lasting business interruption. To prevent smoke and soot spread it is recommended to install additional fire or at least smoke retardant compartmentalization.

8. Layout, drawing & pictures

8.1 Layout, drawing



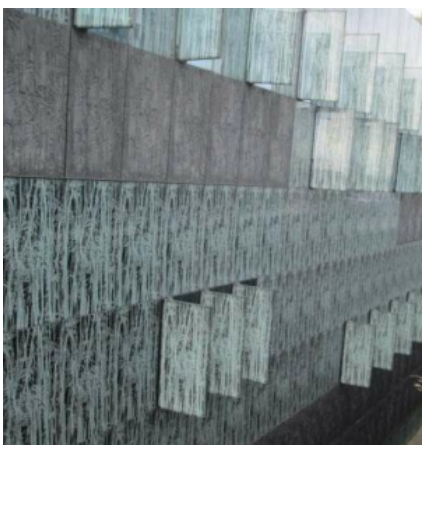
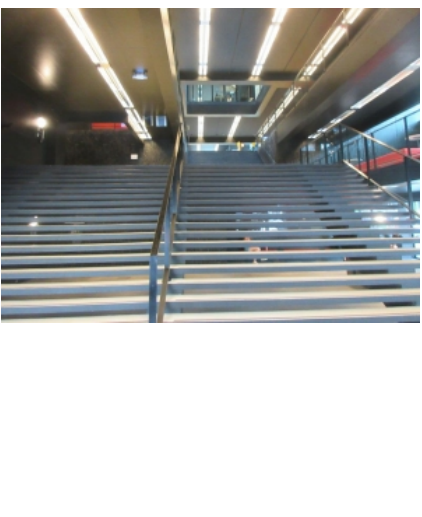
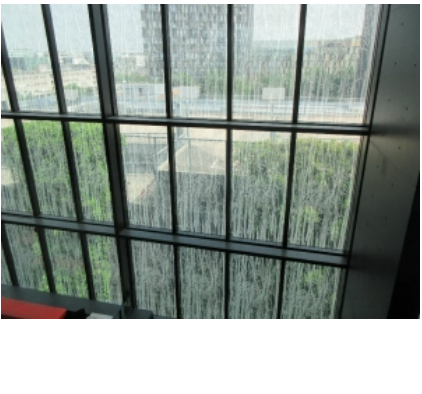
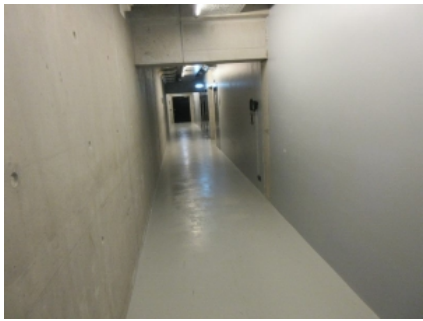


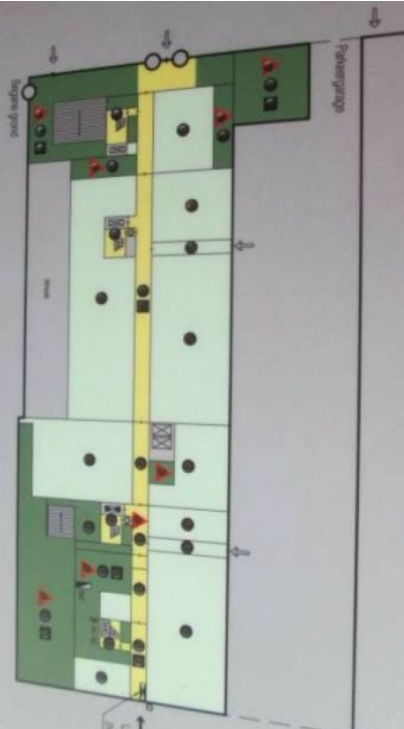
Ground floor

8.2 Aerial view



8.3 Pictures

		
Front side	West side façade	Stairs to reception - main entrance
		
Low voltage room	Atrium	Glass façade
		
Concrete hallways	One of the vaults for the storage of (very) old and high value books	The corridor between Van Unnikbuilding and Library
		
The corridor between Van Unnik building and Library	PV-installation	Extinguishing gas cylinders

		
Plans of several floors of building Red = clean agent total flooded storage rooms, dark green = sprinkler protected areas, light green is only fire detection and white is atrium.	Ground floor	Second floor area with connection to van Unnikbuilding
		
Sprinkler pump	Library (view from Van Unnikbuilding)	3 commercial shops at Ground floor level

9. About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

All inspections, reports and recommendations are purely advisory and for the purpose of assisting clients and insureds in risk control and safety procedures. Observations and recommendations are the result of practices and conditions observed and information made available to us at the time of our visit and do not purport to refer to or to guarantee compliance with local, state or federal regulations which may be applicable to such practice and conditions. This report should not be considered a definitive listing of all existing hazards nor an absolute solution to all indicated hazards. No responsibility for the implementation, management and operation of risk control and safety procedures is assumed by Aon Risk Solutions.