

## PROPERTY RISK EVALUATION REPORT

### TILBURG UNIVERSITY

|               |                                                                           |
|---------------|---------------------------------------------------------------------------|
| Premises:     | Tilburg University (Stichting Katholieke Universiteit Brabant)            |
| Address:      | Warandelaan 2, 5037 DB Tilburg                                            |
| Date Visited: | 25 November 2020                                                          |
| Last Visit:   | 28 November 2019                                                          |
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# 1

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## Purpose and Scope

### Purpose

The purpose of this Property Risk Engineering report is to inform Tilburg University and existing or prospective insurance markets of physical conditions of this site. In addition, it is intended to assist Tilburg University with the implementation of a Risk Management Strategy to prioritize risk improvements and mitigation strategies.

### Scope

This survey was performed during our visit to Tilburg University on 25<sup>th</sup> November 2020 and involved a review of building construction, operations, fire protection systems, and fire protection features excluding life safety issues.

The visit comprised an inspection of all areas of the site. No tests were made or witnessed. The bases for the evaluation are interviews conducted with key personnel:

| Contact name       | Company            | Function                                                                         |
|--------------------|--------------------|----------------------------------------------------------------------------------|
| Mr. Eric Thomassen | Tilburg University | Manager Management and Maintenance<br>Facility Services / Real Estate Management |
|                    |                    |                                                                                  |

We assume that all information provided, whether it is written or verbal, is correct and reliable unless stated otherwise.

# 2

## Executive Summary

The complex of the Tilburg University (TU) houses approximately 26 buildings varying from low rise (building L, 3 floors) to high rise buildings (building K 14 floors and M 11 floors). The complex is located on the outer skirts of Tilburg near railway to Breda.

About 2,000 personnel are employed. Personnel operate during normal daytime hours. At approximately 17,400 students study; the university have over 71 Master, PhD and bachelor programs.

The buildings are in use as lecture rooms, class rooms and offices but also houses restaurants, cafés and sport center. In the basement of building L (library) a high fire load is present due to the storage of books on shelves. In all other buildings the fire load is considered low.

Each building is separated from adjacent buildings either by distance or by light fire separations with automatic self-closing doors, fire resistance varying from 30 to 60 minutes minimum. In most buildings the corridors and technical areas are provided with smoke detectors. In the future buildings will be provided with automatic fire detection systems in accordance with Dutch Civil Construction Regulations (Dutch: "Bouwbesluit"). At some buildings this meant reducing total coverage to partly coverage. All building fire alarm systems are connected to each other by glass fiber ring line. Alarms are detected at Building V (Vigilant) 24/7 manned security lodge and at a private alarm center.

The main equipment rooms in building G (Goossens) and building S (Simon) have been provided with local gaseous extinguishing systems in the rooms Argonite (S) and FM-200 (G).

Building T (Tias) have been provided partly with a wet sprinkler system to meet equivalence in accordance with the building legislation.

As part of Master plan new buildings will be built, some older buildings demolished and some buildings renovated /refurbished. Building K (Koopmans) is renovated now and reopened Q3 2019. TFT building is temporary rented out and will be demolished in 2020. Building P s and high (Prisma) will be demolished presumably summer 2021. At the moment building P is rented out to a third party for student housing. Building V (Vigilant) will be extended in 2020. New building is planned in the space between Building T (Tias) and the railway. The building of a parking garage at the parking at the south side of the complex is due to Covid-19 postponed.

Management of the TU has invested in several evacuation and emergency response plans, but business continuity plans do not exist. With these plans safety and incident responses have been centrally organized. The safety and fire protection systems are based on the life safety requirements from the government; The TU works in close cooperation with the local fire brigade. However, in general property damage risks at this complex are considered moderate.

There is a safety and security policy issued which resulted in several projects creating safety and security awareness under students and TU employees. This also includes training and awareness creation for the use of portable fire extinguishers and hose reels, evacuation drills and plans. Six times a year the 'taskforce safety' meeting is held to discuss inspection findings and changes in buildings and occupation.

# 3

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## Risk Observations and Comments

The most important activities are teaching and research.

The site is owned by Tilburg University. On the open site also are located a student housing facility managed by a third party.

Generally the buildings have a concrete load bearing construction, concrete roof and concrete and/or masonry exterior walls, insulated with mineral wool or non-insulated. Buildings F (Faculty club) and O (Olympia) have a steel load bearing construction. Building R (Restaurant) roof is insulated with PUR covered with bitumen.

The buildings have fire separations with 30 or 60 minutes minimum fire resistive walls in accordance with Dutch building legislation. The fire separations are well managed and visually openings are sealed in a proper way. Over the last two years all buildings were inspected by a third party and all shortcomings were reported in a bipartite fire safety report. A program to repair all shortcomings is implemented and partly finished already.

Main exposure is the railway to Breda at the north side of the complex at 100 meters. Exposure risk is considered low.

All buildings are protected with an automatic fire detection system with partial coverage, primarily to secure the safe evacuation of people. Some buildings have a total coverage. In the future buildings will be provided with automatic fire detection systems in accordance with the Dutch Civil Construction Regulations (Dutch: "Bouwbesluit"). In case of total loss of a building a BCM will be start up for temporary housing.

Only buildings Cube and T (Tias) have been provided with a (partial) wet sprinkler system, designed and installed in accordance with VAS 1987, in general this system is considered adequate. This sprinkler system is installed for life safety purposes.

Human elements are evaluated well.

Overall the complex is well managed and can be valued as a good risk.

# 4

## Loss Estimates

This section covers the results of loss estimating for this location based on the 25<sup>th</sup> November 2020, site visit to this location requested by Marsh Broking.

The Loss Estimates presented here are believed to be reasonable, based on industry experience, events postulated, and information provided by the client. The calculation of Loss Expectancies is based on the review of building construction, operations, fire protection systems, and fire protection features at the time of our assessment. The estimates are further based on conditions observed at the time of the visit. By their nature, these estimates contain some element of subjectivity. Accordingly, the estimates cannot be taken as absolutes and could be exceeded due to changes in physical conditions on site, or the initiating event or escalation being more severe than anticipated within the boundaries of the estimate.

All damage and loss potential figures presented pertain exclusively to primary property damage, associated contents damage, and associated business interruption recovery time loss, caused directly by (fire or explosion) as defined in our Loss Estimate.

### Values

| Date Values                            | 2020               | Currency                      | EUR               |
|----------------------------------------|--------------------|-------------------------------|-------------------|
| <b>Property Damage Values</b>          |                    | <b>Extra costs</b>            |                   |
| Buildings                              | 421,235,100        |                               |                   |
| Content/Equipment valuated             | 218,396,200        |                               |                   |
| Content/Equipment Tias Business School | 4,282,200          |                               |                   |
| Goods                                  | 100,000            |                               |                   |
| <b>Total Site P.D.</b>                 | <b>666,513,500</b> | <b>Total Site extra costs</b> | <b>22,500,000</b> |

These values are provided by the client unless otherwise specified. Unless stated differently, the PD values are assumed to be Replacement Cost Values (RCV), and the financial numbers are deemed to be for a fiscal year.

### Breakdown of property values

| Building (name)           | Building   | Content/equipment | Total       |
|---------------------------|------------|-------------------|-------------|
| A (Academia)              | 19,058,000 | 4,859,249         | 23,917,249  |
| C (Cobbenhagen)           | 55,050,234 | 6,944,808         | 61,995,042  |
| Cube                      | 35,641,461 | 6,447,238         | 42,088,699  |
| D (Dante)                 | 20,320,111 | 7,818,203         | 28,138,314  |
| E (Esplanade)             | 4,794,484  | 1,688,562         | 6,483,046   |
| F (Faculty Club)          | 2,098,417  | 587,556           | 2,685,973   |
| G (Goossens)              | 19,788,866 | 6,727,783         | 26,516,649  |
| K (Koopmans) <sup>1</sup> | 79,100,975 | ---               | 79,100,975  |
| L (Library) <sup>2</sup>  | 24,304,446 | 121,121,269       | 145,425,715 |
| M (Montesquieu)           | 31,651,263 | 11,740,537        | 43,391,800  |

<sup>1</sup> During Q4 2020 survey value inventory was not existing

<sup>2</sup> Inventory including 'Brabant Collection'

| Building (name)           | Building   | Content/equipment | Total      |
|---------------------------|------------|-------------------|------------|
| O (Olympia building)      | 13,148,307 | 2,636,063         | 15,784,370 |
| O (Olympia sport grounds) | 3,240,593  | ---               | 3,240,593  |
| Sportsbar                 | 975,971    | ---               | 975,971    |
| P (Prisma)                | 26,628,642 | 10,438,385        | 37,067,028 |
| R (Restaurant)            | 5,086,668  | 2,037,920         | 7,124,588  |
| S (Simon)                 | 26,526,642 | 10,438,386        | 37,067,028 |
| T (Tias) <sup>3</sup>     | 30,812,194 | 4,282,279         | 35,094,473 |
| V (Vigilant)              | 597,650    | 127,039           | 724,689    |
| W (Warande)               | 7,437,426  | 1,222,752         | 8,660,178  |
| Z (Zwijzen)               | 537,885    | 84,693            | 622,578    |
| Theologie, Academielaan 9 | 8,566,321  | 1,778,548         | 10,344,869 |
| Reitse Toren building     | ---        | 3,795,295         | 3,795,295  |
| Reitse Poort building     | ---        | 2,667,823         | 2,667,823  |
| Deprez                    | ---        | 762,235           | 762,235    |
| Intermezzo building       | ---        | 1,386,844         | 1,386,844  |
| General                   | ---        | 11,608,205        | 11,608,205 |
| Grounds                   | 3,652,307  | ---               | 3,652,307  |

Source:

- Valuation report 00213313001, 16 October 2014, buildings
- Valuation report 00213313001, 12 April 2017, buildings 1<sup>st</sup> supplement
- Valuation report 00237771001, 14 June 2018, inventory (content/equipment valued)
- Valuation report 00213313001, 17 July 2018, buildings 2<sup>nd</sup> supplement

## Level I Loss Estimate

Definition Level I (Primary Protection Systems are functioning)

Scenario Fire in building L (Library)

### Assumptions and details for this scenario:

Considering a fire starts in building L (Library). This will be detected by the fire detection system. Due to the high fire load and the limited fire separations it cannot be excluded that although the fire brigade is alarmed by the fire detection system, the fire will spread throughout the building, resulting in a total loss of the building.

Credits can be given to the fire detection system (early fire alarm) and the fact that the building stands alone, with safe distances to adjacencies; under level I conditions the fire brigade will expectedly be able to prevent a fire spread to adjacent buildings.

The Level I figure is estimated at 27% of total insured value.

### Property Damage Loss Estimate - Level 1

|                     | Value of Loss | % of Involved Building Value | % of Total Site Value |
|---------------------|---------------|------------------------------|-----------------------|
| Building            | 24,304,446    | 100%                         | 4%                    |
| Content / Equipment | 121,121,269   | 100%                         | 19%                   |

<sup>3</sup> Including inventory Tias Business School

|                            | Value of Loss      | % of Involved Building Value | % of Total Site Value |
|----------------------------|--------------------|------------------------------|-----------------------|
| <b>Total Property Loss</b> | <b>145,425,715</b> | <b>100%</b>                  | <b>22%</b>            |

## Level II Loss Estimate

Definition Level II (Primary Protection Systems are not functioning)

Scenario Fire in building L (Library)

### Property Damage Loss Estimate – Level II

Assumptions and details for this scenario:

Considering an impairment of the automatic detection system (primary protection system) a fire starting in building L (Library) during idle hours can develop unnoticed for a longer time before being detected by security personnel during inspection rounds or by for example technical alarms. Due to the high fire load and the limited fire separations a complete loss of building L should again be taken into account, as for the level I scenario. The Level II figure is estimated at 27% of total insured value.

|                            | Value of Loss      | % of Involved Building Value | % of Total Site Value |
|----------------------------|--------------------|------------------------------|-----------------------|
| Building                   | 24,304,446         | 100%                         | 4%                    |
| Content / Equipment        | 121,121,269        | 100%                         | 19%                   |
| <b>Total Property Loss</b> | <b>145,425,715</b> | <b>100%</b>                  | <b>22%</b>            |

## Level III Loss Estimate

Definition Level III (No Primary Protection Systems functioning, no manual firefighting)

Scenario Fire in building L (Library)

### Property Damage Loss Estimate – Level III

Assumptions and details for this scenario:

According to the definition (see next page) for a level III loss scenario the building L can be subject to a total loss. The level III figure is therefore estimated at 27% of the total insured value.

|                            | Value of Loss      | % of Involved Building Value | % of Total Site Value |
|----------------------------|--------------------|------------------------------|-----------------------|
| Building                   | 24,304,446         | 100%                         | 4%                    |
| Content / Equipment        | 121,121,269        | 100%                         | 19%                   |
| <b>Total Property Loss</b> | <b>145,425,715</b> | <b>100%</b>                  | <b>22%</b>            |

## Business Interruption Loss Estimates (BI Loss Estimates)

Tilburg University is not insured for BI.

## Extra Costs Cover

Tilburg University has an extra costs cover for maximum Euro 22,500,000,- 52 weeks indemnity period included in the PD policy.

## Loss record

Over the last 5 years 4 losses were reported, but all losses were below deductible.

## The Loss Estimates Definitions applied:

| Level     | Loss Estimate Definition and Elaboration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level I   | <p><b>All protection systems are adequately functioning; adequate manual fire fighting</b></p> <p>A loss event in which damage is based on the nature of hazards and construction factors, and where:</p> <ul style="list-style-type: none"> <li>• All fire protection systems are in service and functioning as designed.</li> <li>• Full facility Emergency Response Team (fire brigade or Plant Emergency Organization) and Municipal Fire Department response expected.</li> <li>• Credit is given to all properly maintained fire barriers up to their design duration rating</li> <li>• Construction features function as designed.</li> </ul> <p>Under normal circumstances, the total damage would be confined to a relatively small area. Where inadequate protection is provided or unusual factors (e.g. smoke damage, burning liquid runoff, etc.) exists, the loss expectancy may be greater and even approach Level II.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Level II  | <p><b>Primary protection system is not functioning; adequate manual fire fighting</b></p> <p>A level II Loss Event is one which occurs when:</p> <ul style="list-style-type: none"> <li>• The fire protection system protection the area with the largest PD/BI potential is impaired or is rendered inoperative or ineffective due to the nature of the event. Adjacent fire protection systems are presumed operational unless rendered inoperative or ineffective due to structural failure. Same applies for the use of special extinguishing systems;</li> <li>• Credit can be given for adequate manual emergency response, defined as: <ul style="list-style-type: none"> <li>• A responding organization that is trained to address the hazards of the facility being evaluated;</li> <li>• Can arrive on site within a reasonable time of being notified to be effective in reducing or limiting impact;</li> <li>• Has up to date preplans or emergency response plans for the facility.</li> </ul> </li> <li>• Credit given to minimum adequately maintained (including fire doors and fire penetrations) 3 hour rated walls where the combustible loading is light to ordinary, structural failure is not expected, and roof assembly is a listed or approved noncombustible;</li> <li>• Combustible roof construction (including combustible or unknown metal deck assemblies) results in a contiguous structure loss.</li> </ul> <p>Damage may be limited to the area where the impaired protection system is located and the nearby surroundings or may extend to the nearest adequate separation or properly designed and approved construction cutoffs, depending on site conditions.</p> <p>In some cases, the size of this loss could approach the value associated with a Level III type event.</p> |
| Level III | <p><b>No Protection Systems functioning; no manual fire fighting</b></p> <p>A level III Loss Event is one which occurs when:</p> <ul style="list-style-type: none"> <li>• All fire protection systems throughout the entire site or facility are impaired.</li> <li>• No credit is given for manual emergency response.</li> <li>• Damage is limited only by adequate separation and/or free-standing 4-hours rated firewalls or equivalent (equivalencies must be well defined and proven).</li> <li>• Combustible roof construction (including combustible or unknown metal deck assemblies) results in a contiguous structure loss.</li> </ul> <p>The size of this loss can approach the value of the buildings of origin or an entire facility, depending on site layout.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# 5

## Management Programs

Our site visit, interviews and review of information provided leads us to the following maturity assessment of Management Programs in place to manage the risks at the location.

| Program Category                      | Maturity    | Comments                                                                                                                                                                                  |
|---------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Building Maintenance                  | Optimized   | Generally well maintained buildings                                                                                                                                                       |
| Business Continuity Planning          | Undeveloped | Several evacuation and emergency response plans regarding safety and incident responses have been centrally organized; however business continuity plans do not exist. See recommendation |
| Contractor Management                 | Embedded    | Generally valued adequate from information provided                                                                                                                                       |
| Electrical Maintenance                | Established | Is carried out by a dedicated supplier                                                                                                                                                    |
| Equipment Maintenance                 | Embedded    | Maintenance and repair is carried out by dedicated supplier(s)                                                                                                                            |
| Emergency Response Procedures         | Embedded    | There is cooperation with local fire brigade                                                                                                                                              |
| Housekeeping                          | Embedded    |                                                                                                                                                                                           |
| Smoking controls                      | Optimized   | The whole campus is 'smoke free zone' now                                                                                                                                                 |
| Fire protection System Maintenance    | Embedded    |                                                                                                                                                                                           |
| Fire Protection Impairment Management | Optimized   |                                                                                                                                                                                           |
| Self-Inspections                      | Embedded    | Security and facility employees carry out recorded inspection rounds                                                                                                                      |
| Hot Work system                       | Optimized   |                                                                                                                                                                                           |

In assessing the maturity of the Management Programs the following maturity scale was applied:

| Maturity Rank | Elaboration                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------|
| Unaware       | No awareness or recognition of the risk issue or need for associated controls.                            |
| Undeveloped   | Informal actions with little or no systematic procedures.                                                 |
| Formalized    | Programs and procedures are established. Full familiarity is uncertain.                                   |
| Established   | Programs and procedures are communicated throughout the organization. Orientation is ongoing.             |
| Embedded      | Ownership is established at most or all organizational levels. Training and some exercises are conducted. |
| Optimized     | Full ownership with active program maintenance, testing, exercising and continuous improvement.           |

### Maintenance

Own personnel carry out small-scale maintenance. Specialized work is carried out by contractor (Strukton).

### Electrical maintenance

The building and utility related electrical installations are maintained by third parties. The electrical installations are checked in accordance with NEN 3140 (every year a different part of the installation is checked, after 5 years the entire installation has been checked).

Thermal graphic scans are not always included in this electrical maintenance program (see recommendation).

### Housekeeping & waste collection

Housekeeping is generally maintained at an acceptable level (however, see recommendation).

Domestic waste is collected several times a week and disposed to two compactors.

### Smoking

Smoking is prohibited in all buildings and on the whole campus of the university. Smoking policy is controlled by recognizable stewards to help out people.

### Hot work procedure and permit

The necessary precautions are taken if hot work has to be performed. A written hot work permit system is used for all hot work activities. As part of the procedure security employees make an extra control round after the work is finished for the day.

### Environmental aspects

Asbestos is present in buildings built before July 1993. Some of these buildings are renovated over the last years and asbestos is removed.

All present asbestos has been listed and will be removed during the next scheduled renovation for that particular building.

It is planned that at the end of 2020, all asbestos is removed.

# 6

## Construction

| Rating          | Percentage | Comments                                            |
|-----------------|------------|-----------------------------------------------------|
| Combustible     | 30%        | Bitumen on the roofs, some roofs insulated with PUR |
| Non-combustible | 70         | Concrete roof and concrete and masonry walls        |
| Unconfirmed     | ---        |                                                     |

### Construction Description

Generally the buildings have a concrete load bearing construction, concrete roof and exterior walls, insulated with mineral wool insulation material or non-insulated.

Building Cube, O (Olympia) and R (Restaurant) have a (partly) steel load bearing construction.

See also construction summary on page 14.

### Compartmentalization and Fire Divisions

Each building is separated from adjacent buildings either by distance or by light fire separations with automatic self-closing doors, fire resistance varying from 30 to 60 minutes minimum in accordance with Dutch building legislation 'Bouwbesluit 2012'.

Internal compartmentalization of the buildings fire resistance is varying from 30 to 60 minutes minimum in accordance with Dutch building legislation 'Bouwbesluit 2012'.

During 2017 all fire separation and divisions were inspected and repaired by a specialized contractor. From now on a specialized contractor will monitor, inspect and repair a quarter of the total compartmentalization and fire divisions every year.

## Construction Summary

| Building Reference        | Structure                   | Roof                | Roof insulation | Exterior Walls                  | Walls insulation | Floor Construction  | Comb / Non-Comb | Construction Year | Renovation Years |
|---------------------------|-----------------------------|---------------------|-----------------|---------------------------------|------------------|---------------------|-----------------|-------------------|------------------|
| Academia                  | Reinforced concrete         | Reinforced concrete | Poly-urethane   | Masonry / concrete panels       | Mineral wool     | Reinforced concrete | 15/85%          | 1974              | 2010             |
| Cobbenhagen               | Reinforced concrete         | Reinforced concrete | Poly-urethane   | Masonry / natural stone panels  | None             | Reinforced concrete | 15/85%          | 1962              | 2012             |
| Cube                      | Reinforced concrete / steel | Steel               | Unknown         | Metal / stone / glass           | Mineral wool     | Reinforced concrete | 15/85%          | 2017              | ---              |
| Dante                     | Reinforced concrete         | Reinforced concrete | Mineral wool    | Concrete panels / glass         | Mineral wool     | Reinforced concrete | 5/95%           | 1994              | ---              |
| Esplanade                 | Reinforced concrete         | Reinforced concrete | Mineral wool    | Masonry                         | Mineral wool     | Reinforced concrete | 5/95%           | 1998              | 2008             |
| Faculty Club              | Exposed steel structure     | Metal deck          | Mineral wool    | Masonry / natural stone panels  | Mineral wool     | Reinforced concrete | 5/95%           | 2011              | ---              |
| Goossens                  | Reinforced concrete         | Reinforced concrete | Poly-urethane   | Masonry / panels with glass     | None             | Reinforced concrete | 15/85%          | 1972              | 2008             |
| Koopmans                  | Reinforced concrete         | Reinforced concrete | Poly-urethane   | Concrete / natural stone panels | None             | Reinforced concrete | 15/85%          | 1972              | 2018/2019        |
| Library                   | Reinforced concrete         | Reinforced concrete | Mineral wool    | Concrete / glass                | Mineral wool     | Reinforced concrete | 5/95%           | 1992              | 2011             |
| Montesquieu               | Reinforced concrete         | Reinforced concrete | Mineral wool    | Masonry / glass                 | Mineral wool     | Reinforced concrete | 5/95%           | 2005              | ---              |
| Olympia                   | Exposed steel structure     | Metal deck          | Mineral wool    | Masonry, panels, glass          | Mineral wool     | Reinforced concrete | 5/95%           | 1963              | 2014             |
| Olympia Changing building | Exposed steel structure     | Metal deck          | Mineral wool    | Masonry / glass                 | Mineral wool     | Reinforced concrete | 5/95%           | 2010              | ---              |
| Olympia Sport Canteen     | Exposed steel structure     | Metal deck          | Mineral wool    | Masonry / glass                 | Mineral wool     | Reinforced concrete | 5/95%           | 2017              | ---              |

| Building Reference | Structure               | Roof                | Roof insulation | Exterior Walls                  | Walls insulation | Floor Construction            | Comb / Non-Comb | Construction Year | Renovation Years       |
|--------------------|-------------------------|---------------------|-----------------|---------------------------------|------------------|-------------------------------|-----------------|-------------------|------------------------|
| Prisma             | Reinforced concrete     | Reinforced concrete | Unknown         | Masonry / glass                 | Mineral wool     | Reinforced concrete           | 15/85%          | 1971-86           | Summer 2021 demolition |
| Restaurant         | Exposed steel structure | Metal deck          | Poly-urethane   | Masonry / glass                 | Mineral wool     | Reinforced concrete           | 15/85%          | 1981              | ---                    |
| Simon              | Reinforced concrete     | Reinforced concrete | Mineral wool    | Concrete / natural stone panels | None             | Reinforced concrete           | 5/95%           | 1972              | 2015                   |
| Study center       | Reinforced concrete     | Reinforced concrete | Mineral wool    | Glass Panels                    | Mineral wool     | Reinforced concrete           | 5/95%           | 2018              | ---                    |
| Tias               | Reinforced concrete     | Reinforced concrete | Mineral wool    | Masonry / glass                 | Mineral wool     | Reinforced concrete           | 5/95%           | 2002              | ---                    |
| Vigilant           | Steel load bearing      | Metal deck          | Mineral wool    | Masonry / glass                 | Mineral wool     | Reinforced concrete           | 5/95%           | 1992              | ---                    |
| Warande            | Reinforced concrete     | Reinforced concrete | Mineral wool    | Masonry / glass                 | Mineral wool     | Reinforced concrete           | 5/95%           | 1994              | ---                    |
| Zwijzen            |                         | Metal deck          | Mineral wool    | Metal panels                    | Mineral wool     | Reinforced concrete           | 5/95%           | 1992              | 2014                   |
| Rented Real Estate |                         |                     |                 |                                 |                  |                               |                 |                   |                        |
| Deprez             | Exposed steel structure | Glass               | Poly-urethane   | Masonry and glass               | None             | Reinforced concrete           | 15/85%          | 1880              | 2010                   |
| Intermezzo         | Reinforced concrete     | Reinforced concrete | Mineral wool    | Concrete panels / glass         | Mineral wool     | Reinforced concrete           | 5/95%           | 2010              | -                      |
| Marienburg         | Masonry                 | Wood                | Mineral Wool    | Masonry / glass                 | None             | Partly concrete, wooden beams | 50/50%          | 1890              | 2017                   |
| Reitse Poort       | Reinforced concrete     | Reinforced concrete | Poly-urethane   | Concrete                        | Mineral wool     | Reinforced concrete           | 15/85%          | 1975              | 2016                   |
| Reitse Toren       | Reinforced concrete     | Reinforced concrete | Poly-urethane   | Concrete                        | Mineral wool     | Reinforced concrete           | 15/85%          | 1975              | 2017                   |

## 7

## Occupancy and Processes

The main research areas of the Tilburg University are:

- Economy and Management
- Rights
- Humanities
- Social Sciences
- Theology.

| Bldg./Area Reference | Floor                               | Occupancy                                           |
|----------------------|-------------------------------------|-----------------------------------------------------|
| Academia             | Ground                              | Offices, Canteen, Lecture rooms                     |
|                      | 1 <sup>st</sup> – 4 <sup>th</sup>   | Offices and Lecture rooms                           |
| Cobbenhagen          | Basement                            | Storage, Lecture Room, self-study, technical rooms  |
|                      | Ground                              | Auditorium, foyer, offices, canteen, lecture rooms  |
|                      | Intermediate                        | Office, meeting rooms                               |
|                      | 1 <sup>st</sup>                     | Offices, lecture rooms                              |
| Cube                 | Ground                              | Plaza with coffee corner, study tables, study rooms |
|                      | 1 <sup>st</sup> – 2 <sup>nd</sup>   | Lecture rooms and examination rooms                 |
| Dante                | Ground                              | Lecture rooms, lab, foyer                           |
|                      | 1 <sup>st</sup> – 3 <sup>rd</sup>   | Offices                                             |
|                      | 4 <sup>th</sup>                     | Offices, laboratory <sup>4</sup>                    |
|                      | 5 <sup>th</sup>                     | Technical room                                      |
| Esplanade            | Ground                              | Cafe, kitchen, Lecture room, ballet room            |
|                      | Intermediate                        | Technical room                                      |
|                      | 1 <sup>st</sup> and 2 <sup>nd</sup> | Offices                                             |
| Faculty Club         | Basement                            | Technical room and storage (cold)                   |
|                      | Ground                              | Meeting rooms, kitchen and dining area              |
| Goossens             | Basement                            | Storage and technical rooms                         |
|                      | Ground                              | Offices, lecture room, foyer                        |
|                      | 1 <sup>st</sup>                     | Lecture rooms, self-study area                      |
|                      | 2 <sup>nd</sup>                     | Offices, MER                                        |
| Koopmans             | Ground – 14 <sup>th</sup>           | Entrance, meeting area, technical rooms             |
|                      | 1 <sup>st</sup> – 14 <sup>th</sup>  | Offices, technical rooms                            |
| Library              | Basement                            | Storage books and 'Brabant Collection'              |
|                      | Ground                              | Storage, self-study area, offices                   |
|                      | 1 <sup>st</sup> and 2 <sup>nd</sup> | Offices, self-study area                            |
| Montesquieu          | Basement                            | Car parking, technical room                         |
|                      | Ground                              | Self-study area, foyer, lecture rooms, offices      |
|                      | 1 <sup>st</sup> – 9 <sup>th</sup>   | Offices                                             |

<sup>4</sup> Laboratory at TU is a room where students can do computer simulations, project work, etc., but has nothing to do with (bio)chemical experiences with hazardous goods and/or gasses.

| Bldg./Area Reference      | Floor                                | Occupancy                                                          |
|---------------------------|--------------------------------------|--------------------------------------------------------------------|
|                           | 10 <sup>th</sup>                     | Meeting rooms, technical room                                      |
| Olympia                   | Ground                               | Sport Center, offices                                              |
|                           | 1 <sup>st</sup>                      | Sport Center, fitness room and small sauna                         |
| Olympia Canteen           | Ground                               | Cafe, storage                                                      |
| Olympia Changing          | Ground                               | Changing rooms, technical room, storage                            |
| Prisma                    | Basement – 3 <sup>rd</sup>           | Will be demolished summer 2021                                     |
| Restaurant                | Ground                               | Food preparations, offices, freezers, canteen                      |
| Simon                     | Basement                             | Bunker, storage, laboratories <sup>3</sup> , technical rooms, MER  |
|                           | Ground                               | Offices, lecture room, technical rooms, meeting room               |
|                           | 1 <sup>st</sup> - 8 <sup>th</sup>    | Offices                                                            |
|                           | 9 <sup>th</sup> and 10 <sup>th</sup> | Technical rooms                                                    |
| Studycenter               | Ground                               | Lecture rooms, self-study area                                     |
|                           | 1 <sup>st</sup>                      | Lecture rooms, self-study rooms                                    |
| Tias                      | Ground                               | Lecture rooms, technical rooms, storage                            |
|                           | 1 <sup>st</sup>                      | Lecture rooms, offices                                             |
|                           | 2 <sup>nd</sup> - 5 <sup>th</sup>    | Offices                                                            |
|                           | 6 <sup>th</sup> - 7 <sup>th</sup>    | Offices and technical rooms                                        |
| Vigilant                  | Ground                               | Office                                                             |
| Warande                   | Ground                               | Lecture room, foyer                                                |
|                           | 1 <sup>st</sup> and 2 <sup>nd</sup>  | Lecture rooms                                                      |
|                           | 3 <sup>rd</sup>                      | Technical rooms                                                    |
| Zwijzen                   | Ground and 1 <sup>st</sup>           | Meeting room                                                       |
| <i>Rented Real Estate</i> |                                      |                                                                    |
| Utrecht                   |                                      |                                                                    |
| Intermezzo                | Basement                             | Car parking, storage                                               |
|                           | Ground                               | Meeting rooms, reception                                           |
|                           | 1 <sup>st</sup> - 7 <sup>th</sup>    | Offices                                                            |
| Deprez                    | Basement                             | Laboratories <sup>3</sup> (not in use yet)                         |
|                           | Ground                               | Laboratories <sup>3</sup> , lecture room, self-study area, offices |
|                           | 1 <sup>st</sup>                      | Offices                                                            |
|                           | 2 <sup>nd</sup>                      | Office and meeting room                                            |
| Marienburg                | Ground                               | Kitchen, common room, offices                                      |
|                           | 1 <sup>st</sup>                      | Lecture rooms, offices                                             |
|                           | 2 <sup>nd</sup>                      | Meeting rooms, self-study area                                     |
| Reitse Poort              | Ground – 2 <sup>nd</sup>             | Offices                                                            |
| Reitse Toren              | Ground                               | Lecture room, reception, storage                                   |
|                           | 1 <sup>st</sup> - 3 <sup>rd</sup>    | Lecture rooms and self-study                                       |
|                           | 4 <sup>th</sup>                      | Lecture rooms, SER, self-study                                     |
|                           | 5 <sup>th</sup>                      | Lecture rooms and self-study                                       |
|                           | 6 <sup>th</sup> and 7 <sup>th</sup>  | Offices                                                            |

## Occupational hazards

The fire load is low in most areas. A high fire load is present in the library because of the storage of a large amount of books in racks.

TU provides on all office floors in all buildings pantries with coffee machine, water cooker, small refrigerator, etc. In building E (Esplanade) during the survey (private) domestic electric equipment and extension cords were not found in rooms anymore. TU provided extra wall sockets for office equipment and provided one refrigerator per room. These appliances are included in the regular NEN 3140 maintenance program and all other not accepted/approved domestic appliances have to be removed during self-inspection rounds.

## Data Processing and Control Systems

Specific information about the electronic data processing and control systems in use at the site are as follows:

| Equipment Type                                                                                | Purpose & Importance                                                                     | Back-up Procedures                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rack cabinets in two main equipment rooms (MER) with servers, communication hardware and UPS. | EDP systems are used for administrative, study and planning purposes and R&D activities. | Adequate back-up procedures, daily back-ups. Data recovery is tested and part of standard procedures<br>Part of the systems is in the cloud and updated by the provider. |

The electronic data processing (EDP) network has a main server location at building G (Goossens) and back-up data center at building S (Simons). These main server rooms are connected. Each MER connects several satellite equipment rooms (SER) which are generally located several floors / buildings. The workstations are connected to the SER's.

The MER's are connected to the main locations by glass fibre. Also the internet connections are located in the main locations where two separate external connections are provided.

Processes on the network are mail and standard office applications. Financial systems and connections are separated from the rest of the network.

Maintenance of the network infrastructure (hardware) and office applications (software) is being done by the centralised IT department.

Support of local users, including back up of data is being done by the different faculties.

Storage of back-up data is arranged by IT department or by faculties self. In most cases a weekly back-up is stored outside the computer rooms.

Main locations in building G and S store each other's back-up daily. Both computer rooms are provided with UPS systems with a 30 minute power supply, and each room is connected to an emergency diesel generator.

## Storage of Combustible Materials

### Storage Configuration

| Location    | Method of Storage | Commodity/                                           | Storage Height |
|-------------|-------------------|------------------------------------------------------|----------------|
| L (Library) | Racks             | Storage of generally combustible books and magazines | 2 meters       |

Books are stored in building L (Library), stored in steel cabinets and steel racks with a storage height up to 2 m.

Except the above-mentioned library there is no large storage areas provided on-site where fire loads are considered high or very high.

## Utilities/Infrastructure

### Power

|                        |                                |                      |                                      |
|------------------------|--------------------------------|----------------------|--------------------------------------|
| Primary Supply to Site | Public grid                    | Site Feed            | Single supply line to every building |
| Incoming Voltage       | 400 V                          | Distribution on Site | Grid                                 |
| Back-up Power          | Two emergency power generators |                      |                                      |

Electricity is obtained from the public grid. There are 15 transformers in total on the complex in detached buildings and partly inside buildings in separated fire compartments, 60 minutes fire rated. Reportedly all transformers are leased and maintained by the local contractor 'Fudura'.

Two diesel emergency power generators, capacity 500 kVA each, are present outside building G (Goossens) and S (Simon). The emergency power generators are tested monthly (for approximately 30 minutes). The emergency power generators are intended to supply emergency power to all main buildings and to EPD equipment.

Since 2014 – 2019 several roofs of the buildings are provided with PV-panels. Panels are located direct on the roof at Olympia building (O) 130 PV-panels (July 2014) and Cube building 346 PV-panels (July 2018) and 286 PV-panels (August 2019) (appendix A3 Pictures). All PV-panel systems are cleaned, maintained and checked annually and are also part of the NEN 3140 risk inventory.

In the future all new PV-panel systems will be checked, inspected and certified in accordance to SCIOS Scope 12.

### Fuels/Energy Supplies

#### Gas

Tilburg University has a connection with the public natural gas grid for building F (Faculty Club) only. Gas is used for cooking and small heating boiler.

#### Fuel

Diesel for the emergency power generators is stored in a tank in the pedestal of each emergency power generator. Each tank has a capacity of 1,000 liter. Filling up is always done with two persons to prevent overfilling.

### Heating and air-conditioning

Heating is done with hot water from the district heating system.

The air inlet openings of the air treatment systems have been located in the outer walls. The air outlet openings have been located on the roofs. Each building has its own air conditioning installation.

### Water

Water is used for domestic use only in all buildings.

# 8

## Fire Protection

### Site Protection

Site protection overall is summarized as follows:

|                             | Public                          | Private |
|-----------------------------|---------------------------------|---------|
| Distance to Fire Department | 4 - 5 kilometers                | N/A     |
| Fire Department Type        | Fulltime                        | N/A     |
| Response Time (minutes)     | 8 – 10 minutes                  | N/A     |
| # of Hydrants on-site       | Unknown                         | N/A     |
| # of Hydrants off-site      | Unknown                         | N/A     |
| Hydrants Supply Type        | Municipal drinking water system | N/A     |

The professional public fire brigade of Tilburg will respond in case of an alarm. They are stationed at a distance of about 4 - 5 kilometers. The approach routes have no obstructions. The response times are estimated at eight minutes. The site is easily accessible for fire brigade trucks. A plan of attack is available. The fire brigades are familiar with the site.

Off- and on-site there is a number of hydrants available. The hydrants are connected to an Ø 100 mm water main.

Also on and in the vicinity east of the complex ponds are available with good accessibility for the fire brigade.

### Fire Protections Means

| Means               | Type(s)                                    | Buildings/Areas Protected                                                          |
|---------------------|--------------------------------------------|------------------------------------------------------------------------------------|
| Detections & Alarms | Smoke detectors and aspiration systems     | In all buildings partial coverage and VESDA systems in elevator shafts.            |
| Sprinklers          | Wet sprinkler system                       | Total in building Cube and partial in building T (Tias)                            |
| Special Protection  | Gaseous extinguishing systems              | In MER building G (Goossens) FM-200 system and building S (Simon) argonite system. |
|                     | Smoke and heat release system              | Located in roof building Cube.                                                     |
| Manual Protection   | Hose reels and portable fire extinguishers | All buildings                                                                      |

### Automatic Fire Detection Systems

All buildings are provided with automatic fire detection systems in accordance with NEN 2535. Most buildings have a partial coverage: detectors in the corridors and technical rooms. The MER room at building S (Simon) is provided with, but the MER room at building G (Goossens) is not provided with an aspiration smoke detection system (manufacturer: VESDA).

In Q1 2020 all automatic fire detection systems will be connected and communicate with each other by glass fiber ring. The automatic sprinkler system is connected to the ring by double GSM card.

In 2021 the system will be extended with a second main fire report center at Building M (Montesquieu) to improve the main system to maximum redundancy.

Fire alarms are transmitted to the internal alarm center at the porters lodge building V (Vigilant) and at the moment directly to the public fire brigade. All alarms are transmitted to a private alarm center.

New buildings and/or for buildings, which are renovated or redecorated, will be provided with automatic fire detection in accordance with Dutch building legislation only. The goal of these systems is to detect fire at an early stage, alarm the own emergency organization to secure the safe evacuation of people as well to alarm the fire brigade as soon as possible and prevent property damage as much as possible.

## Automatic Extinguishing Systems

Building Cube and T (Tias) have been provided with an automatic sprinkler installation, Cube totally and Tias partial provided. The sprinkler system is installed for life safety purposes. The automatic sprinkler system for Cube is designed in accordance with NEN-EN 12845:2004 + A2:2009 + NEN 1073:2010, NFPA 13:2016 and NFPA 25:2014. The automatic sprinkler system for Tias is designed in accordance with NEN-EN 12845:2004 + A2:2009 + NEN 1073:2010 and/or VAS 1987. The systems are certified in accordance with mentioned sprinkler norms and NFPA standards.

## Sprinkler Systems Location and Demands

Automatic sprinklers and/or water mist systems are installed in various areas as follows:

| Protected Area                                                | System Type | Design               |                    | Design Standard Applied                                                   | Assessment             |
|---------------------------------------------------------------|-------------|----------------------|--------------------|---------------------------------------------------------------------------|------------------------|
|                                                               |             | Density / # of Heads | Area / Pressure    |                                                                           |                        |
| Building Cube<br>Offices, lecture rooms, corridors, bathrooms | Wet         | 4.1 mm/min           | 139 m <sup>2</sup> | NEN-EN 12845:2004 + A2:2009 + NEN 1073:2010 + NFPA 13:2016 + NFPA 25:2014 | Adequate (certificate) |
| Building Cube<br>Technical rooms, restaurant                  | Wet         | 6.1 mm/min           | 139 m <sup>2</sup> | NEN-EN 12845:2004 + A2:2009 + NEN 1073:2010 + NFPA 13:2016 + NFPA 25:2014 | Adequate (certificate) |
| Building Cube<br>Storage rooms                                | Wet         | 8.1 mm/min           | 139 m <sup>2</sup> | NEN-EN 12845:2004 + A2:2009 + NEN 1073:2010 + NFPA 13:2016 + NFPA 25:2014 | Adequate (certificate) |
| Building T (Tias)<br>Atrium and corridors                     | Wet         | 5 mm/min             | 216 m <sup>2</sup> | NEN-EN 12845:2004 + A2:2009 + NEN 1073:2010 + VAS 1987                    | Adequate (certificate) |

### Comments on sprinklers

A sprinkler system test was not part of the survey. The sprinkler system is well maintained by a contractor and inspected twice a year by a specialized inspection company (Bureau Veritas Inspections), and each inspection is finished with an inspection certificate when the system is considered adequate.

Alarms of the sprinkler system are automatically transmitted to the fire brigade through the porters lodge (V).

## Fire/Sprinkler Water Supply

### Water Supply Details

The sprinkler system is directly connected to the drinking water grid of the municipality of Tilburg. The water supply can be considered as adequate.

The demand and pressure of the hydrants are unknown.

### Pump Details Sprinkler (Tias)

| Tias                         |                    |                             |                 |                 |
|------------------------------|--------------------|-----------------------------|-----------------|-----------------|
| Pump Mfg.:                   | KSV-VAS            | Design Rating               |                 |                 |
| Pump Type:                   | KFP 65-160         | Flow (m³/h):                | Pressure (bar): | Speed (RPM):    |
| Gear Ratio:                  |                    |                             |                 |                 |
| Supply Source:               | Water main         | 81                          | 3.7             | 2,930           |
| Driver Details               |                    |                             |                 |                 |
| Driver Mfg.:                 | EMK                | Horsepower (kW):            | Speed (RPM):    | Frequency (HZ): |
| Driver Type:                 | KS160L-2           |                             |                 |                 |
|                              |                    | 18.5                        | 2,930           | 50              |
| Controller Details           |                    |                             |                 |                 |
| Controller Mfg.:             | Van Wijk en Boerma | Controller Type:            | WB882-E10       |                 |
| Pump Start Pressure (bar):   |                    | Pump Stop Pressure (bar):   |                 |                 |
| Jockey Start Pressure (bar): |                    | Jockey Stop Pressure (bar): |                 |                 |

### Pump Test Data Sprinkler

| Tias                      |                                 |                              |            |                |          |               |             |
|---------------------------|---------------------------------|------------------------------|------------|----------------|----------|---------------|-------------|
| Inspector:                |                                 |                              |            |                | Date:    |               |             |
| Test Summary              |                                 |                              |            |                |          |               |             |
|                           |                                 |                              |            | Required       |          |               |             |
| Working point / reference | Capacity (dm <sup>3</sup> /min) | Capacity (m <sup>3</sup> /h) | Head (bar) | Pressure (bar) | Pressure | Electric pump | Current (A) |
|                           |                                 |                              |            |                |          |               |             |
| Unfavorable               |                                 |                              |            |                |          |               |             |
|                           |                                 |                              |            |                |          |               |             |
| Favorable                 |                                 |                              |            |                |          |               |             |
|                           |                                 |                              |            |                |          |               |             |

### Pump Details Sprinkler (Cube)

| Cube           |              |                  |                 |                 |
|----------------|--------------|------------------|-----------------|-----------------|
| Pump Mfg.:     | Grundfos     | Design Rating    |                 |                 |
| Pump Type:     | WBJP20-7     | Flow (m³/h):     | Pressure (bar): | Speed (RPM):    |
| Gear Ratio:    |              |                  |                 |                 |
| Supply Source: | Drilled well | 21               | 16              | 2,919           |
| Driver Details |              |                  |                 |                 |
| Driver Mfg.:   | ESB          | Horsepower (kW): | Speed (RPM):    | Frequency (HZ): |
| Driver Type:   | ESB132       |                  |                 |                 |
|                |              | 7.5              | 2,920           | 50              |

| Cube                         |                    |                             |           |
|------------------------------|--------------------|-----------------------------|-----------|
| Controller Details           |                    |                             |           |
| Controller Mfg.:             | Van Wijk en Boerma | Controller Type:            | WB662-C90 |
| Pump Start Pressure (bar):   |                    | Pump Stop Pressure (bar):   |           |
| Jockey Start Pressure (bar): |                    | Jockey Stop Pressure (bar): |           |

### Pump Test Data Sprinkler

| Cube                      |                               |                 |            |                |          |              |             |
|---------------------------|-------------------------------|-----------------|------------|----------------|----------|--------------|-------------|
| Inspector:                | M. Post (R2B Inspecties B.V.) |                 |            |                | Date:    | 4 April 2018 |             |
| Test Summary              |                               |                 |            |                |          |              |             |
|                           |                               |                 |            | Required       |          |              |             |
| Working point / reference | Capacity (dm³/min)            | Capacity (m³/h) | Head (bar) | Pressure (bar) | Pressure | Well pump    | Current (A) |
|                           | 0                             | 0               | 10.7       | ---            | 10.0     |              | 35          |
| Unfavorable               | 1,234                         | 74              | 8.7        | ≥ 7.0          | 7.4      |              | 50          |
|                           | 1,345                         | 81              | 8.5        | ---            | 7.1      |              | 55          |
| Favorable                 | 1,602                         | 96              | 5.6        | ---            | 5.6      |              | ---         |
|                           |                               |                 |            |                |          |              |             |

## Special Protection systems

### Gas Fire Suppression System

The MER on the 2<sup>nd</sup> floor of building G (Goossens) and the MER room in the basement of the building S (Simon) are protected with a total flooding gaseous extinguishing system (FM-200 at G and Argonite at S).

Reportedly the detectors inside the cabinets shut down also the power supply to the computer system and the ventilation system in the room if smoke is detected.

### Wet Chemical Fire Suppression System

In building E (Esplanade) the hood ventilation systems above the deep fryers have been provided with wet chemical extinguishing systems.

Only the restaurants in buildings O (Olympia), F (Faculty Club) and R (Restaurant) are not protected with hood protection system. We recommend installing this system in these locations too.

## Small firefighting equipment

A sufficient number of hose reels and portable fire extinguishers have been distributed throughout the buildings. All small firefighting equipment is maintained and checked annually by a specialized contractor.

## Emergency response team

The emergency response team is organized within the TU organization. The goal is to create safety and security awareness on the complex. Several projects are currently carried out including evacuation drills, updating of emergency plans in the buildings, etc.

The emergency response team consists of number of employees per building. The members of the emergency response team conduct evacuation drills throughout the whole complex, with over 10 evacuation drills scheduled each year. Furthermore regular fire drills are conducted. Each building should have at least one drill each year.

A number of employees are part of the first aid team, who will respond when first aid is required, this is a separate team.

Also approximately 150 employees are part of the evacuation team in case of emergency. The goal is to have at least two evacuation staff members for each building floor of the entire complex.

# 9

## Site Characteristics and Exposures

The Tilburg University is located at the western suburbs of the municipality of Tilburg next to a residential area. Flood risk is considered low. The estate is located along a railway from Breda to the south of The Netherlands; TU is located about 150m from this infra-structure.

### Location

|           |            |
|-----------|------------|
| Latitude  | 51.5635 N  |
| Longitude | 5.0427 E   |
| Elevation | + 17 meter |

### Boundary Exposures

|       |                               |
|-------|-------------------------------|
| North | Railroad and residential area |
| East  | Residential area              |
| South | Wood and residential area     |
| West  | Woods                         |

The exposures from the neighbors can be generally considered low, because they are residential areas. Under normal conditions the overall exposures from (cargo) trains can be considered as low. But in case of an incident explosions caused by chemicals or flammables a directly increased exposure cannot be excluded and may cause damages to client property. The TU premises is surrounded by public roads.

### NatCat Exposures<sup>5</sup>

| Type                 | Hazard rating | Comments                                             |
|----------------------|---------------|------------------------------------------------------|
| Earthquake           | Zone 1        | Modified Mercalli scale VI                           |
| Volcanoes            | No hazard     |                                                      |
| Tsunami              | No hazard     |                                                      |
| Tropical cyclone     | No hazard     |                                                      |
| Extra tropical storm | Zone 3        | 161 – 200 km/h                                       |
| Hail                 | Zone 2        | Frequency and intensity of hailstorms                |
| Tornado              | Zone 3        | Frequency and intensity of tornados                  |
| Lightning            | Zone 2        | 1 – 4 lightning strokes per km <sup>2</sup> and year |
| Wildfire             | Zone 1        | Low                                                  |
| River flood          | Zone 0        | Minimal flood risk                                   |
| Flash flood          | Zone 2        | Frequency and intensity of flash floods              |
| Strom surge          | No hazard     |                                                      |

Hazard Score Rating, overall Risk Score 'medium'.

<sup>5</sup> MunichRe NATHAN Single Risk Assessment Report

| Type                    | Hazard *) | Comments                                                                                                               |
|-------------------------|-----------|------------------------------------------------------------------------------------------------------------------------|
| Rain                    | Moderate  | Generally adequately maintained buildings with extra rain water discharge openings in the roof eaves, no loss expected |
| Subsidence Sink Holes   | None      | No mining or other subsoil activities in wide area                                                                     |
| Landslide/Mudslide      | None      |                                                                                                                        |
| Snow/Ice                | Low       | Normal risk for climate in The Netherlands, building constructions considered adequate                                 |
| Chemical Transportation | Moderate  | Nearby railway with chemical goods traffic                                                                             |
| Adjacent Spill Exposure | None      |                                                                                                                        |
| Adjacent Fire Exposure  | None      |                                                                                                                        |

\*) Ranking: extreme → very high → high → moderate → low → none

# 10

## Security

### Threat Target Risk

|                                |                                                                                                                                             |               |          |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|
| High Value                     | No                                                                                                                                          | Unrest Labor  | Low risk |
| Terrorism Target               | No                                                                                                                                          | Protest Group | No risk  |
| Unrest Civil                   | Low risk                                                                                                                                    | Neighborhood  | Low risk |
| Vulnerability Assessment       | No                                                                                                                                          |               |          |
| Threat Target Risk Description | Site is located near residential area. Buildings are not particularly attractive for burglary. Neighborhood has no bad records on burglary. |               |          |

### Control Features

|                         |                         |                   |          |
|-------------------------|-------------------------|-------------------|----------|
| Site Perimeter          |                         |                   |          |
| Vehicle Access          | Yes                     | Perimeter Fencing | Partly   |
| Entry Provisions Posted | Yes                     | Fencing Height    | 2 meters |
| No Trespassing Signs    | No, it is a public site | Exterior Lighting | Yes      |

|                             |     |                      |     |
|-----------------------------|-----|----------------------|-----|
| Building Physical Features  |     |                      |     |
| Ground Level Windows Secure | Yes | Lock and Key Control | Yes |

|                         |     |                  |                                                               |
|-------------------------|-----|------------------|---------------------------------------------------------------|
| Security Staff / Guards |     |                  |                                                               |
| On-site Guards          | Yes | Recorded Rounds  | Yes                                                           |
| Visiting Patrols        | Yes | Rounds Frequency | Unknown                                                       |
| Police Surveillance     | No  | CCTV             | Yes, outside at important entrances and inside some buildings |

|                    |                                       |                    |                                     |
|--------------------|---------------------------------------|--------------------|-------------------------------------|
| Intruder Detection |                                       | Access Management  |                                     |
| Motion Sensors     | Some buildings                        | Access Monitored   | No                                  |
| Beams              | No                                    | ID Cards/Badges    | Yes for employees, restricted areas |
| Door Contacts      | All buildings                         | Visitors Monitored | No                                  |
| Alarm transmission | Porter lodge and private alarm center |                    |                                     |

|                                  |                       |                       |     |
|----------------------------------|-----------------------|-----------------------|-----|
| Other Security Programs/Controls |                       |                       |     |
| Emergency Response               | Yes                   | Bomb Threat           | N/A |
| Employee Screening               | No official screening | Cash/Check Management | N/A |
| Safe/Vaults                      | N/A                   | Parking               | Yes |

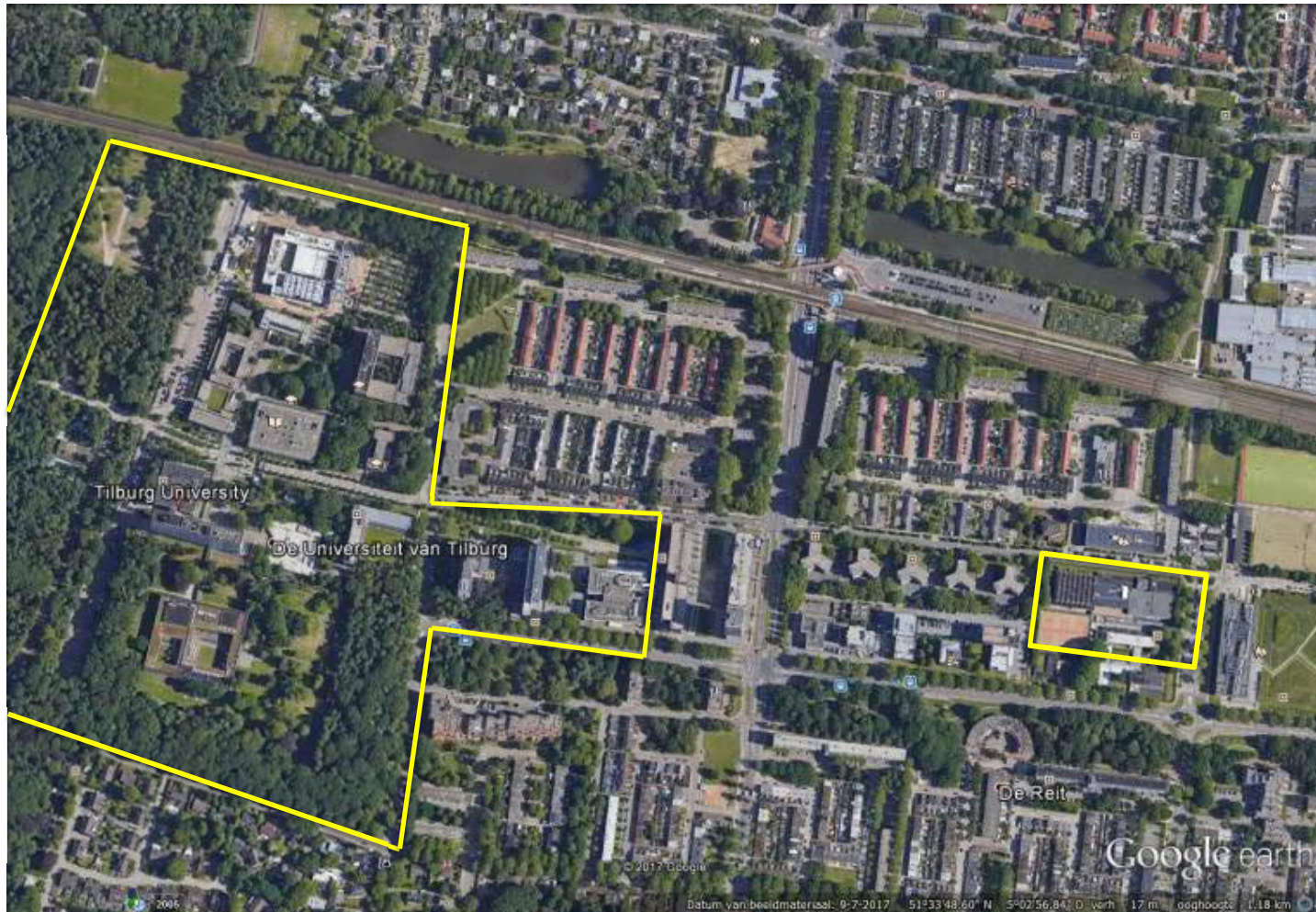
| Other Security Programs/Controls |    |
|----------------------------------|----|
| Mobile Equipment Storage         | No |

Burglary alarm systems are limited to several reed contacts on doors and windows in most of the buildings at lower floors. Alarms are transmitted to building V (Vigilant) the porter's lodge and to a private alarm center. Furthermore a CCTV system is present on almost all building inside and/or outside buildings, images are being recorded.

Currently 24 hours a day at least 2 security employees are on site, of which one is carrying out recorded inspection rounds, and the other stays in the porters lodge. The watchmen are contractors and are also responsible for internal checks, and self-inspections like closing of fire doors, small firefighting equipment, opening and closing rounds, etc.

## Appendix

### A1 Aerial view



Premises: Tilburg University  
Date Visited: 25 November 2020

File No.: 20201214-HS-R-Tilburg University 2020.docx  
Report Date: 14 December 2020

## A2 Lay-out plan



Premises: Tilburg University  
Date Visited: 25 November 2020

File No.: 20201214-HS-R-Tilburg University 2020.docx  
Report Date: 14 December 2020

## A3 Photos



Buildings G (Goossens low part) and K  
(Koopmans high rise)



Building D (Dante)



Building A (Academia)



Building E (Esplanade)



Building P (Prisma)



Building Cube west



Building Cube north



Building O (Olympia)



Emergency power generator next to building S



Argonite gas extinguishing system building S



FM-200 gas extinguishing system building G



Sprinkler pump building T (Tias)



Sprinkler valves building T



Alarm valves building Cube

## A4 Recommendations

| 2017-03         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Electrical office equipment |                  |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|
| Status          | Agreed/Open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Status Date                 | 28 November 2019 |
| Priority        | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Type                        | Small capital    |
| Description     |  <p>In buildings E (Esplanade) an overload on extension cords and connected extension cords was found. These cords are a serious risk when you take into account that 54% of all fire causes is these overloaded cords.</p> <p>We recommend installing more wall mounted sockets and reduce the extension cords. Also starts every study year with a workshop about fire safety, especially about these items and old household appliances as found here.</p> |                             |                  |
| Client Response | We will investigate what to do.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                  |
| 2018            | <p>On-going and even worse. We strongly recommend installing mounting rails along the walls with wall sockets for 'Wieland' connectors only and delivering extension cords with 'Wieland' connectors. All other extension cords have to be removed and are prohibited in the future.</p> <p>We recommend maintaining this by self-inspections rounds monthly.</p>                                                                                                                                                                               |                             |                  |
| 2019            | <p>On-going even worse. Due to expected dramatically increasing premium of the PD/BI insurance we recommend solving this recommendation before renewal of the insurance policy 2020. Electric installations are recognized as source of fire in case of 55% of all investigated losses. Immediately action is required now.</p>                                                                                                                                                                                                                 |                             |                  |
| 2020            | Recommendation is solved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |                  |

| 2017-05         |                                                                                                                                                                                                                                                                                                                         | Business Continuity Plan |                  |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|
| Status          | Agreed/Open                                                                                                                                                                                                                                                                                                             | Status Date              | 28 November 2019 |
| Priority        | High                                                                                                                                                                                                                                                                                                                    | Type                     | Small capital    |
| Description     | <p>At the moment business continuity plan does not exist. In case of a major event serious problems will occur to move and startup operations at another location and/or building.</p> <p>We recommend preparing business continuity plan based on fire &amp; related perils to avoid a long business interruption.</p> |                          |                  |
| Client Response | Due to a power outage earlier this year total BCM plan is under review and will be extended.                                                                                                                                                                                                                            |                          |                  |
| 2019            | Still on going. Due to increasing student numbers it is opportune to have availability about a good Business Continuity Plan.                                                                                                                                                                                           |                          |                  |

| 2019-01 |             | Automatic Sprinkler Protection |                  |
|---------|-------------|--------------------------------|------------------|
| Status  | Agreed/Open | Status Date                    | 28 November 2019 |

| 2019-01         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Automatic Sprinkler Protection |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------|
| Priority        | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type                           | Small capital |
| Description     | <p>In the near future more buildings will be erected at the campus to teach the increasing numbers of students. Upfront Tilburg University can avoid business continuity problems in case of an accident by providing new building(s) and/or renovated building(s) with an automatic suppression system. With an automatic suppression system the extent of damage will be limited and expected down time of occupancy of a building will be reduce considerably.</p> <p>Second advantage will be with an automatic suppression system fire rated walls and doors can be reduced in rating and therefor in costs.</p> |                                |               |
| Client Response | We will investigate what to do.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |               |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |               |

## A5 Points for attention

| 2017-01         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Un allowed household appliances |                  |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------|
| Status          | Open                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Status Date                     | 28 November 2018 |
| Priority        | Moderate                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Type                            | Organizational   |
| Description     | <p>During the survey in lots of pantry areas (private) domestic electric equipment were still found, like water cookers, coffee machines, toasters, microwaves, small fridges, etc. These are often old systems which creates an increased fire risk. These appliances are not included in the regular NEN 3140 maintenance program. This is a serious point of attention.</p> <p>We recommend removing of all these (private) domestic electric equipment.</p> |                                 |                  |
| Client Response | The recommendation is understood and has to be part of self-inspections.                                                                                                                                                                                                                                                                                                                                                                                        |                                 |                  |
| 2018            | Especially building E (Esplanade) rooms needs more attention due to the number of fridges per room.                                                                                                                                                                                                                                                                                                                                                             |                                 |                  |
| 2019            | With consideration of recommendation 2017-03 it is strongly recommended to take immediately action.                                                                                                                                                                                                                                                                                                                                                             |                                 |                  |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                 |                  |



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