



Hogeschool Inholland
Rotterdam
Rotterdam, Netherlands

Risk Control Report
Property and Business Interruption

Location: Rotterdam
Posthumalaan 90
Rotterdam 3072 AG
Netherlands

Date On Site: 21st April 2016
Consultant: Sander Verboog

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PARTICIPANTS

Name	Title	Company
M. Ruijsenaars	Adviseur Technische Zaken	Hogeschool Inholland

SUMMARY AND OPINION OF RISK

The purpose of this audit was to review the loss prevention systems and procedures and the physical layout and arrangement of the facility, and in so doing, identify options for improvement to minimise, at a reasonable cost, the potential physical and business interruption loss exposures.

This site has been graded using the RSA quantitative risk assessment (QRA). This is a method for the assessment of risk quality against commercial/industrial facilities in general. Two elements of risk are examined and compared in order to derive an overall risk quality rating:

- the inherent fire and business interruption hazards associated with the premises, occupancy and operations*
- the risk control features in place to mitigate the inherent hazards*

This facility is a school. Besides a normal school occupancy there are some associated services and technical service rooms. This is an ordinary hazard occupancy with a moderate fire load throughout.

The construction consists of a fire resistive and heavy non-combustible load bearing structure with a combustible roof.

The protection consists of an adequate sprinkler system. Furthermore several areas are additionally protected with a fire detection system.

Human element features are rated good. Generally fire inception hazards are well managed.

Building 2 has partly been constructed above the exposing student apartments. A fire in this apartment tower could affect building 2 severely.

In the event of a large catastrophe, outsourcing of the activities to external own and third party buildings is possible. However, it is not known whether there are the same possibilities for the long term.

The RSA QRA (Quantitative Risk Assessment) rating for this facility is 'Good' with the potential to achieve a 'Superior' rating upon completion of the submitted recommendations.

Based on all factors, including the scope of risk-improvements, this facility is deemed by RSA 'Desirable'.

CHANGES SINCE PREVIOUS SURVEY

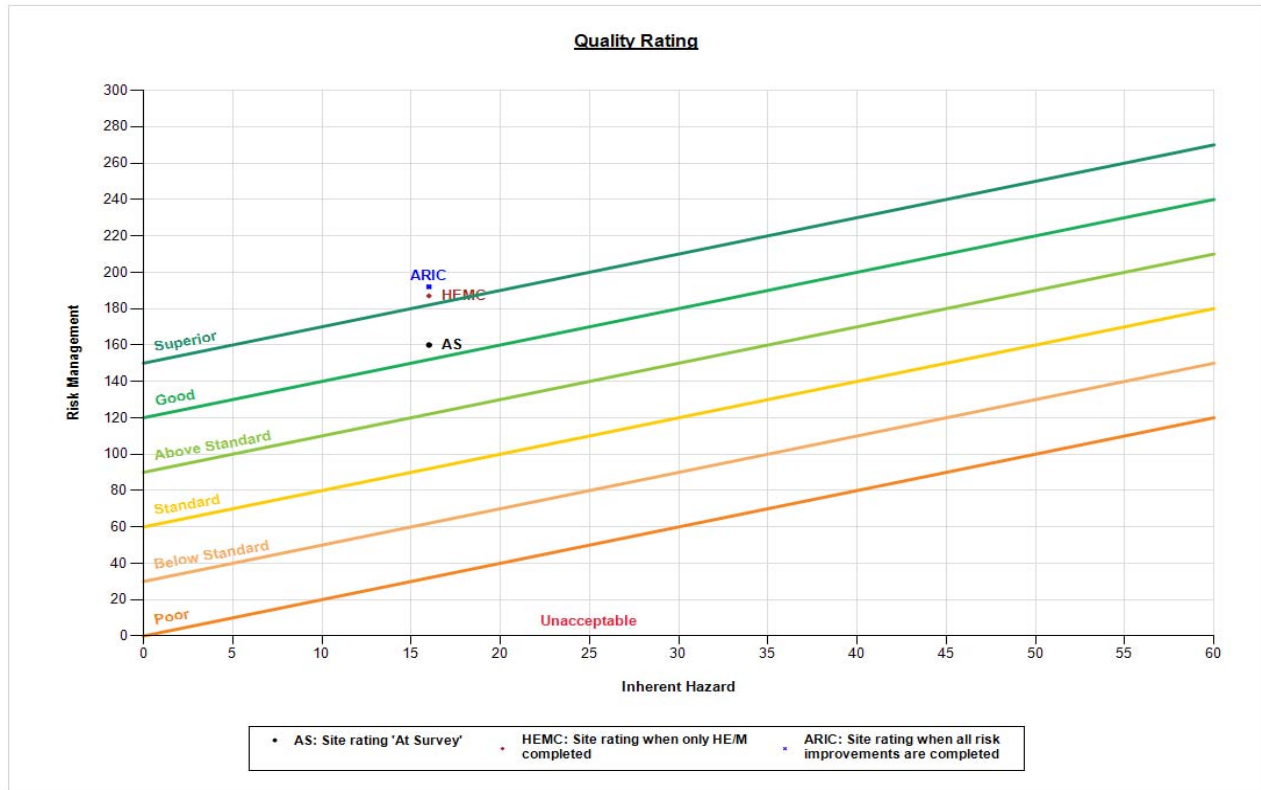
This is the initial full survey conducted by RSA. There have been no recent changes on site. In the short to midterm, the following changes are foreseen:

- Technical alarms from the building management system will be transmitted to the alarm station of the maintenance contractor. It is envisaged that this will be established within 1.5 years.
- The current CCTV camera system will be replaced whereby active monitoring of the camera footage will be realised.
- The fire alarm panels of both the old and new building will be replaced.
- The sprinkler system will be provided with own tanks. The tanks will be installed in 2016.
- The glass panel walls will be renovated.

LOSS HISTORY

In 2013, a severe water damage occurred due to a sprinkler pipe rupture. Some 1.5 million euro was claimed.

QUALITY RATING



Rating: 'Overall Rating' is derived from the 'inherent hazards', e.g. the type of process or storage, the type of construction and exposure hazards, evaluated against the loss control measures and risk management practices that will reduce the likelihood and/or severity of loss.

Superior:	Meets all and exceeds many best-practice risk management standards. All inherent hazards are well controlled.
Good:	Meets most best-practice risk management standards. All key inherent hazards are well controlled.
Above Standard:	Meets all or most normal risk management standards. Most key inherent hazards are well controlled.
Standard:	Meets minimum risk management standards. There may be some deficiencies in the control of inherent hazards.
Below Standard:	Gaps in application of minimum risk management standards. Inherent hazards are not thoroughly controlled.
Poor:	Numerous minimum risk management standards are missing. Inherent hazards are not controlled.
Unacceptable:	The risk has major deficiencies in more than one area (e.g. physical, procedural, process or attitude) that leads to a significant likelihood of a major loss.

RISK IMPROVEMENTS

Category:

Category 1: These are capital expenditure recommendations with a loss expectancy greater than 25% of the combined property damage and business interruption loss potential. Whilst funding for these items will normally require corporate approval, completion will significantly improve the risk profile of the site.

Category 2: These are recommendations either with a loss expectancy of less than 25% of the combined property damage and business interruption loss potential or that address important reliability issues. In some cases funding may require corporate approval.

Human Element / Maintenance (HE/M): These recommendations refer to management practice and procedures. Typically they carry no capital cost but address a wide range of local issues including the control of inception risks and training.

Priority:

- Priority A These Risk Improvements address deficiencies that feature one or both of the following:*
- high-frequency or imminent loss exposures that can typically be resolved by the implementation or improvement of procedures or practices, or by localised physical improvements*
 - loss exposures that are disproportionately large relative to the physical extent of the deficiency, or to the cost to complete the Risk Improvement*
- Priority B These Risk Improvements include procedural items that address loss exposures of moderate frequency, that may be more complex, and/or that are enhancements to existing arrangements.*
Also included are physical improvements which will reduce the likelihood and/or severity of losses, but that do not meet the criteria for Priorities A or C
- Priority C These Risk Improvements include items that represent a fundamental change or upgrade in loss control arrangements, probably as part of a longer term risk management strategy. Also included are enhancements to existing systems and practices or longer term projects aimed at achieving "best practice"*

Risk Improvement Summary

RI No	Summary	Category	Priority	Class	Status	Loss Estimate
2016-04:01	Implementeer procedure brandgev. werkzaamheden (Permits to Work including Hot Work Controls)	HE/M	B	Property	AR	
2016-04:02	Verbeter waterdetectie kelder. (Incident Response & Shutdown of Supplies)	HE/M	B	Property	AR	
2016-04:04	Verbeter de capaciteit van de dieselpomp. (Sprinkler Water Supplies)	HE/M	B	Property	AR	
2016-04:05	Verbeter de pomp testen. (Fire Systems Maintenance & Impairment Management)	HE/M	B	Property	AR	
2016-04:03	Verbeter de kabeldoorvoeren. (Compartmentation)	CAT 2	B	Property	AR	

Status Definitions

AR: Awaiting Response. This is the default status for all risk improvements pending site feedback
 UR: Under Review, including projects awaiting sign-off and funding
 IP: In Process, including projects for which funds have been approved and released and work is starting or due to start
 NP: Disagree / No Plans. There are no plans to complete the risk improvement
 DA: Deferred by RSA Account Manager

2016-04:01 : Implementeer procedure brandgev. werkzaamheden (Permits to Work including Hot Work Controls)

Risk Improvement:

Ontwikkel beleid dat tot doel heeft dat brandgevaarlijk werk veilig uitgevoerd wordt. Dit dient te resulteren in het gebruik van een formulier brandgevaarlijk werk en een checklist die gevolgd moet worden voorafgaand aan uitvoering van dergelijk werk. De procedure dient gecommuniceerd te worden met eigen personeel en aannemers. Alleen geautoriseerde mensen mogen werkvergunningen uitschrijven.

In het bedrijf dienen plaatsen aangewezen te worden waar nooit brandgevaarlijk werk uitgevoerd mag worden en plaatsen waar dit is toegestaan. Beoordeel het beleid periodiek en pas het aan waar nodig. Het is noodzakelijk dat het management het beleid ondersteunt. Een strikte controle van brandgevaarlijk werk zal het risico op brand verminderen. Brandgevaarlijk werk kan gedefinieerd worden als elk werk dat open vuur met zich meebrengt, werk dat warmte veroorzaakt, werk dat vonken veroorzaakt zoals slijpen, solderen, lassen.

De volgende maatregelen dienen genomen te worden:

- Maak ruim voor aanvang van de werkzaamheden de uitvoerder bekend met de huisregels.
- Maak voor aanvang van de werkzaamheden de huisregels bekend en laat mensen een vuurvergunning brandgevaarlijke werkzaamheden ondertekenen. De vuurvergunning dient een geldigheid van niet langer dan een dag te hebben. Het bewust omgaan met brandgevaarlijk werk binnen uw bedrijf zal hierdoor vergroot worden.
- Dek voor aanvang van de werkzaamheden brandbare goederen af of verwijder deze. Een medewerker van uw bedrijf dient erop toe te zien dat dit gebeurt.
- Zorg voor voldoende kleine blusmiddelen in de directe omgeving van de werkzaamheden. Een medewerker van uw bedrijf dient erop toe te zien dat dit gebeurt. Zorg voor een brandwacht.
- Zorg ervoor dat de mensen een mobiele telefoon bij zich hebben om in geval van calamiteit zo snel mogelijk alarm te kunnen slaan.
- Controleer samen met de mensen 1 uur na afloop van de werkzaamheden de werkplek op de aanwezigheid van smeulende goederen.
- Voer geen brandgevaarlijke werkzaamheden uit aan het eind van een werkdag.

Door deze procedure zullen mensen zich meer bewust worden van de verantwoordelijkheid die zij op zich nemen. Deze procedure dient voor zowel eigen personeel als voor derden geïmplementeerd te worden.

Deficiency:

Ongecontroleerd brandgevaarlijk werk kan resulteren in brand.

Status: Awaiting Response **Est. Cost:** Revenue Only **Risk Rating Impact:** Moderate

Category: HE/M **Priority:** Priority B **Loss Estimate:**

Class: Property

Status Comments:

De heer Ruijsenaars is het eens met de aanbeveling en zal een procedure implementeren.

2016-04:02 : Verbeter waterdetectie kelder. (Incident Response & Shutdown of Supplies)

Risk Improvement:

Meld een alarm van het waterdetectiesysteem in de kelder door naar een constant bemande alarmcentrale.

Deficiency:

Met name in de weekenden en vakantieperiodes kan gedurende een zeer lange tijd water ongemerkt in de kelder lopen. Een zeer grote schade kan het gevolg zijn, mede doordat de hoofdverdeelinrichting van het elektrische systeem in de kelder staat opgesteld. Een stilstand van de activiteiten in de school gedurende de periode dat de elektravoorziening hersteld wordt, kan niet uitgesloten worden.

Status: Awaiting Response **Est. Cost:** Revenue Only **Risk Rating Impact:** Low

Category: HE/M **Priority:** Priority B **Loss Estimate:**

Class: Property

Status Comments:

De heer Ruijsenaars is het eens met de aanbeveling. Dit zal in de toekomst gerealiseerd gaan worden. Echter, wij denken dat dit op korte termijn gerealiseerd dient te worden door het urgente karakter van de aanbeveling.

2016-04:04 : Verbeter de capaciteit van de dieselpomp. (Sprinkler Water Supplies)

Risk Improvement:

Laat onderzoeken wat de reden is dat de dieselpomp te weinig druk levert ten opzichte van de ontwerpgegevens. Verbeter vervolgens de capaciteit.

Deficiency:

De dieselpomp levert te weinig druk ten opzichte van de ontwerpgegevens. De huidige druk bedraagt 8,2 bar bij 2,300 l/min terwijl de ontwerpdruk 9 bar bedraagt. Een onvoldoende druk kan resulteren in inadequate sprinklerbeveiliging.

Status: Awaiting Response **Est. Cost:** Not Known **Risk Rating Impact:** High

Category: HE/M **Priority:** Priority B **Loss Estimate:**

Class: Property

Status Comments:

Deze aanbeveling is niet besproken tijdens ons bezoek. De aanbeveling is het resultaat van de door de heer Ruijsenaars opgestuurde capaciteitstesten.

2016-04:05 : Verbeter de pomp testen. (Fire Systems Maintenance & Impairment Management)

Risk Improvement:

Laat twee maal per jaar gedurende de reguliere testen de water- en drukopbrengsten meten. Stuur de capaciteitsmetingen op naar RSA.

Deficiency:

Zonder deze pompcapaciteitsmetingen kan geen oordeel gegeven worden of de pompen voldoende water en druk leveren voor de adequate werking van het sprinklersysteem. Tevens kan de capaciteitsdegradatie van de pompen over de jaren heen niet in kaart gebracht worden.

Status: Awaiting Response **Est. Cost:** EUR 1 - 5,000 **Risk Rating Impact:** Low

Category: HE/M **Priority:** Priority B **Loss Estimate:**

Class: Property

Status Comments:

De heer Ruijsenaars is het eens met de aanbeveling.

2016-04:03 : Verbeter de kabeldoorvoeren. (Compartmentation)

Risk Improvement:

Dicht alle kabel- en leidingdoorvoeren met een onbrandbare pasta. PVC leidingdoorvoeren dienen voorzien te worden van wurgmanchetten.

Deficiency:

Een brand kan zich door verschillende compartimenten voortplanten indien kabel- en leidingdoorvoeren onvoldoende zijn afgeschermd.

Status: Awaiting Response **Est. Cost:** EUR 10,001 - 25,000 **Risk Rating Impact:** Moderate

Category: CAT 2 **Priority:** Priority B **Loss Estimate:**

Class: Property

Status Comments:

De heer Ruijsenaars is het eens met de aanbeveling en een inventarisatie is al gestart om de tekortkomingen in kaart te brengen. De heer Ruijsenaars verwacht dat het project medio 2016 afgerond zal zijn.

LOSS ESTIMATES SUMMARY

The sums insured below are based on information provided to RSA.

We define Loss Estimate (LE) as the anticipated monetary loss for any particular scenario including both physical damage and business interruption costs.

Value and Loss Estimate Summary Table

PROPERTY DAMAGE	Total Sum Insured	EML Block		EML		CNLE		TNLE	
	EUR	% of TSI	EUR	% within the EML Block	EUR	% within the EML Block	EUR	% within the EML Block	EUR
Buildings	79,596,000	100	79,596,000	60	47,757,600	2	1,591,920	2	1,591,920
Plant & Equipment	11,000,000	100	11,000,000	60	6,600,000	5	550,000	5	550,000
Stock		100		60		5		5	
Other	25,000,000	100	25,000,000	60	15,000,000	5	1,250,000	5	1,250,000
Total PD Value	115,596,000								
Total PD Loss Estimate			115,596,000		69,357,600		3,391,920		3,391,920
BUSINESS INTERRUPTION	EUR	% of TSI	EUR	Days within the EML Block	EUR	Days within the EML Block	EUR	Days within the EML Block	EUR
Indemnity Period	24 months								
Total BI Value									
Total BI Loss Estimate		100		720		5		5	
Total PD + BI Value	115,596,000								
Total PD + BI Loss Estimate									

LOSS ESTIMATE SCENARIOS

EML Block

The largest block of value without adequate fire separation covers the entire building. The EML Block represents 100% of the total sum insured.

The exposed office buildings and apartment block are also included in this block.

Estimated Maximum Loss (EML)

An estimation of the maximum LE that could be sustained from a single incident, which is considered within the realms of probability but excluding losses that may be possible but remain unlikely. The primary fire protection, detection, or manual response system is ignored (e.g. sprinklers are ignored but credit is given for detection; if no sprinklers exist, detection is ignored), but a normal level of emergency response can be assumed (if applicable).

Excluded loss examples include fire following aircraft impact; fire following earthquake; or other natural catastrophe; and multiple seat arson.

This building is of combustible roof construction. The risk is considered an ordinary hazard occupancy.

With the automatic sprinkler system impaired, a fire originating anywhere in the building would eventually be detected by the partial automatic fire detection system or noticed by a passer-by. The late arriving fire brigade would encounter a smoke filled facility. Due to the heavy concrete or steel load bearing structure, it is likely that an internal attack could be performed. However, since the extent of compartmentation is rather limited in the new building and vertical fire spread is possible due to the presence of unprotected glass panels, it cannot be excluded that severe damage could occur in the entire new building and a part of the old building.

For the long term there are limited possibilities for outsourcing the activities. It is likely that temporary housing could be found for the short to middle term period.

The exposed office buildings and apartment block are also included in this block.

Current Normal Loss Expectancy (CNLE)

The largest LE determined at the time of survey when considering all aggravating and mitigating factors. This can only be equal to or less than the EML.

A fire originating anywhere in the building would be controlled by the automatic sprinkler system. The fire would be completely extinguished by the local fire brigade upon arrival. Peripheral heat and water damage would occur with varying amounts of smoke damage.

Target Normal Loss Expectancy (TNLE)

The largest LE after all loss prevention risk improvements have been completed. Depending on the risk improvements made at the time of survey this will typically be less than the EML, but could potentially still equal the CNLE and/or EML

A fire originating anywhere in the building would be controlled by the automatic sprinkler system. The fire would be completely extinguished by the local fire brigade upon arrival. Peripheral heat and water damage would occur with varying amounts of smoke damage.

RISK INFORMATION

Site Occupancy

This facility is a school. Besides this normal school occupancy there are some associated services located in the same building. These services comprise an employment agency, a radio studio for one of the studies, an underground parking garage, a restaurant with associated deep fat frying installation and IT study rooms. Furthermore there are several technical rooms housing the air treatment systems, central computer and sprinkler pumps. The top four floors of building 1 are vacant.

This school provides high education to some 3,000 students. Studies that can be followed comprise creative businesses, health and sports, Business/finance/law and education/innovation. It is estimated that students are normally in the range of 17 to 25 years.

There are some 350 employees. Mondays and Thursdays employees work from 7:30 until 22:30. Tuesdays, Wednesdays and Fridays they work from 7:30 until 18:00. There are no activities during the weekends.

Occupancy Fire Load

There are no warehouse areas. The largest storage room has a 100 m² footprint and is located at the 12th storey floor. Combustible furniture is stored on the ground with a storage height up to 1.5 m.

Compartmentation

The old and new building have fire resistively been segregated. This partition consists of two fire resistive walls. One of the walls should be upgraded. This is envisaged for the short term.

Building 1 consists of a single fire area. Building 2 consists of three compartments per storey floor. Building 3 consists of 2 compartments per storey floor. Building 4 to 8 consists of 5 compartments. The partition walls have been provided with fire doors that are activated upon activation of the fire detection system or sprinkler system.

Cable penetrations are sealed. Facility management does not know exactly the quality of all cable penetrations. Therefore a project has been initiated to check and amend all cable penetrations.

Vertical shafts are solely vertically compartmented. These shafts have not been provided with a fire detection system or sprinkler system. The fire load is limited. Water pipes and the air treatment ducting system have been installed in these shafts. The air treatment ducting system has been provided with fire shutters that are activated upon activation of a fire alarm. Electrical cables have been installed in dedicated shafts. These shafts have been cut off horizontally.

Construction

Building Name	Main Occupancy	Year Built	Construction Information			Overall Classification Summary	% Sprinklers Adequate	% Sprinklers Deficient	Storeys	Ground Floor Area (m ²)	Total Building Area (m ²)	Estimated Property Value Split (%)
			Roof	Walls	Insulation							
Entire Complex	Office	2000,2008	Highly Combustible	Light Non-combustible	Cellular plastic - non-approved	Light Non-combustible	100	0	18	4,000	30,000	100

Construction Definition	% of Total Building Area
Light Non-combustible	100

This building consists of an old building that has been built in 2000 and a new building that has been built in 2008. Both buildings have an equal footprint. The total area amounts to some 30,000 m². The new building consists of building numbers 1, 2 and 3. The old building consists of building numbers 4 to 8.

The old building consists of a concrete load bearing structure with glass panel walls and a steel deck roof. The roof has been insulated with combustible polystyrene insulation material. The new building consists of a heavy steel load bearing structure with glass panel walls and a steel deck roof. The roof has been insulated with combustible polystyrene insulation material. Storey floors are concrete throughout. The new building has been provided with a PVC weather proof layer.

Buildings 3 and 6 are segregated by a glass panel roof corridor from the ground floor up to storey level 3. Buildings 1 and 5/6 are segregated by a corridor from the ground floor up to the storey level 8.

Building 1 consists of a ground floor and 16 storey floors. Building 2 consists of storey floors from storey level 4 up to storey level 12. Building 2 has partly been constructed above the exposing student apartments. Building 3 consists of a ground floor and 2 storey floors. Building 4 consists of a basement, a ground floor and 8 storey floors. Building 5 consists of a basement, a ground floor and 3 storey floors. Building 6 consists of a basement, a ground floor and 8 storey floors. Building 7 consists of a basement and a storey floor. This building consists entirely of an atrium from the ground floor up to the roof on the 8th floor. Building 8 consists of storey floors from storey level 3 up to storey level 8.

Process Hazards

Summary Table

Operations comprise normal office and school activities. Special hazards are the deep fat fry installation in the kitchen, possible smoke and soot distribution by the air treatment system and a limited storage arrangement in the storage room on the 12th storey floor.

Utilities Infrastructure

Electricity and Lightning

Electrical power is supplied by the public grid. It is stepped down on site by a total of 4 transformers. These transformers have been installed in concrete vaults. In the new building there are two dry transformers with capacities of 650 kVA respectively 1,000 kVA. Details of the transformers in the old building are not known.

Heating and Cooling

The old building has been provided with a municipal hot water system. Warm water is supplied to the building by a fixed underground water main. This presents a negligible exposure to the facility.

The new building has been provided with a warm and cold water heat exchange system using the earth underneath the facility as storage capacity of water and heat. The warm and cold water is transported into the buildings using an electrically driven heat pump. The system is backed-up by the municipal hot water system.

In the old building, cooled air is produced by two heat exchangers that have been installed on the roof. In the new building cooled air is produced by the above mentioned warm and cold water heat exchange system. Cooled air is distributed throughout the building using the air treatment systems.

There are two air treatment systems in building 1 on the 16th storey floor and a single air treatment system in building 2 on the 12th storey floor. The old building has been provided with 8 air treatment systems. 7 systems have been installed in a single room.

Gases and Liquids

No natural gas is used in this facility.

Arson Exposure

This facility is directly situated along the public streets. There is no fence and there are no combustible materials stored against the wall.

External Exposures

There are several office buildings at distances of 25 m from this facility. A student apartment block is situated partly underneath building 2. These exposures are all included in the EML Block.

Human Element and Maintenance Control Programs

Electrical Maintenance

The electrical installations are checked every five years according to the Dutch standard NEN3140. Thermographic inspection are included. Any deficiencies are reported and corrected promptly.

General Maintenance

The building and technical installations seem visually in a good state of repair.

Permits to Work including Hot Work Controls

No specific procedure is in place. Due to the combustible roof insulation, an adequate procedure should be implemented.

Contractor Controls

A formal contractor management policy is in effect at this facility. The management always tends to use the same contractors and sub-contractors that are familiar with the site and the specific safety rules. Specific safety instructions are discussed with senior level personnel of this facility. Only new contractors receive these instructions. Prior to any work, contractors have to register at the reception desk. Subsequently a contractor pass is handed-out that allows contractors to perform their work.

Housekeeping and Loss Control Self-inspection

An adequate program is in place with good standards maintained across the entire site.

A formal program is in place with daily control rounds conducted by facility management. Deficiencies are entered onto the school's intranet system. Every student and employee are allowed and encouraged to enter data into this system. Deficiencies are corrected promptly.

Waste is collected in plastic containers throughout the building. Domestic waste is processed in a compactor. Paper waste is collected in roll containers. Containers are situated inside the building and they are sprinkler protected.

Control of External Exposures

The surroundings of the building is regularly visited.

Management of Change

A management of change procedure is in place. All major changes are completed in close cooperation with the facility department.

Smoking Controls

Smoking is prohibited inside the building. There was no evidence of illicit smoking and the policy appeared well implemented. Smoking is confined to designated and adequate areas outside the facility.

Process Hazard Controls

Plant and Equipment Installations

All equipment is installed to a good standard in line with local code and best practice at the time of installation.

Kitchen appliances are electric. Natural gas is not used in the building.

Instrumentation and Controls

There are two building management systems. The old building and new building have each been provided with such a system. Technical alarms are monitored by these systems. However, there is no external alarm transmission to contractor alarm stations. It is envisaged that this transmission will be established within 1.5 years. Currently, due to the lack of alarm transmission, the value of this system is limited.

Safe Shutdown Systems

In the event of a fire alarm either generated by the sprinkler system or the fire detection system, the air treatment systems are switched to full capacity. Due to the position of the air inlet and air outlet ducts, a relative small fire could result in smoke and soot distribution throughout the associated building parts. Switching the air treatment system like this was required by the local fire brigade.

Furthermore the central staircase in the old building is over pressurised in the event of a fire alarm.

Maintenance and Management

All maintenance is outsourced to third party specialised contractors. This maintenance is supervised by the facility department. A preventive maintenance program is in place. Maintenance is mainly initiated by the contractors.

Hazardous Goods and Spillage Response

There are no specific requirements relating to this occupancy.

Operator Training

All employees have received a safety instruction once. This training is not repeated. Due to the limited occupational hazards, the current procedure is considered adequate.

Location and Construction

Technical rooms have been installed in cut off rooms.

Extraction Systems

A deep fat fry installation has been installed in the kitchen. The hoods are daily cleaned. The exhaust pipe is inspected and cleaned on an annual basis.

Electrical Installations

All electrical equipment has been installed in line with the Dutch standard NEN1010. All cable run in suitable loaded conduit or cable trays. There is no redundant cabling. Transformers are well arranged. The equipment is visually in a good condition.

Response Factors

Security and Access Control

Access is controlled from the reception desk at the ground floor. However, this is an open organisation where people may enter the building uncontrolled. Access to non-public areas is controlled by individually programmed access cards.

Automatic Fire Detection

In the old building, automatic fire detection has been installed near the fire partition walls and the corridors. The alarm is transmitted to the fire brigade.

Water Supplies for Manual Fire Fighting

Extinguishing water can be obtained from the underground public hydrants which are situated along the public roads. The hydrants are connected to the public water main. It is not known whether the public water main is maintained. The pressure and flow characteristics of the hydrants are unknown.

An unlimited supply of extinguishing water can be obtained from the nearby river at a distance of 50 meters from the premises.

Public Fire Brigade

The public fire brigade is situated at a distance of 1 km with a response time of less than 10 minutes. No familiarisation visits to the facility are completed by the fire brigade.

Dry risers have been installed in the staircases of the old and the building. Two dry risers have been installed in the old building and three dry risers have been installed in the new building.

Incident Response and Shutdown of Supplies

The site has an incipient emergency response team as part of Dutch legislative requirements. The team is trained to deal with fires using portable fire extinguishers and hose reels. The team receives an annual training. The primary purpose of this team is evacuation and life safety.

Water detection has been provided in the basement. However, the alarm is not transmitted externally. The main electricity distribution switch boards have been installed in the basement. It is likely that the operations would stop immediately in the event that the basement would be flooded.

Fire Extinguishing Appliances

Suitable portable fire extinguishers and hose reels are provided throughout the site, which are serviced annually by a specialised contractor.

Fire Systems Maintenance and Impairment Management

The fire detection system is maintained on an annual basis.

The sprinkler system is the subject of 6 monthly checks. Due to an administrative deficiency, no certificate was issued during the last inspection. The sprinkler system is considered adequate for this type of risk. Maintenance by the installer of the system is carried out every 12 months. The pump is tested every 2 weeks by third parties. The pump is tested for at least 30 minutes. No pump performance test was conducted during the last inspection. This should be re-established. Sprinkler impairments are communicated with the emergency team and the security. During sprinkler impairments, no hot work is allowed. A fire watch is deployed in case of impairments beyond schedule. This latter procedures are not formalised.

Fire Protection Systems**Automatic Sprinkler Protection**

A summary of building protection systems are listed below:

System Name / No.	Protected Area	Design Code	System Type	Design (est.) (mm/min, m ²)	No. of Sprinkler Heads / Min pressure (bar)	Sprinkler Heads (°C/K-Factor)	Available flow / pressure (lpm@bar)	Design flow / pressure (lpm@bar)	Required Design (mm/min, m2 OR No. / bar)	Available Design (mm/min, m ² OR No. / bar)	Adequate Per Code
Entire Complex											
1	Basement old building	VAS, NFPA	Wet - CMDA	5/216							Yes
2	Basement new building	VAS, NFPA	Wet - CMDA	6.1/180							Yes
3	Ground floor up to 3 storey floor	VAS, NFPA	Wet - CMDA	5/216							Yes
4	New building	NFPA	Wet - CMDA	6.1/139							Yes
5	4th storey floor up to 8th storey floor	VAS, NFPA	Wet - CMDA	5/144							Yes

The entire facility has been provided with a sprinkler system.

In the old building, the basement is protected on a 5 mm/min at a remote area of 216 m2 design density. The ground floor up to 3rd storey floor is protected on a 5 mm/min at a remote area of 216 m2 design density. The 4th storey floor up to 8th storey floor is protected on a 5 mm/min at a remote area of 144 m2 design density. The new building is protected on a 6.1 mm/min at a remote area of 180 m2 design density.

The sprinkler system is a wet system overall. A dry sprinkler system has been installed in the basement.

The fire pumps of the new building have been installed in the basement, in a dedicated room adjacent to the parking garage. Since combustion air is taken from this garage, a fire in the parking garage could smother the diesel driven pump. The electrically driven fire pump is the primary pump.

The rated pump duty of the diesel driven pump of the new building amounts to 9 bar at 2,300 l/min. These data are obtained from the pump nameplate. At this rated flow, the discharge pressure amounts to 9,3 bar, the net flow pressure amounts to 8,2 bar and the adjusted pressure amounts to 8,5 bar.

According to the NFPA25 standard (Inspection, testing, maintenance of water-based fire protection systems), the fire pump assembly is considered acceptable if no more than 5% degradation of the performance characteristics as indicated on the pump nameplate are shown during a test. At the rated flow the variation of the discharge pressure, the net pressure and adjusted pressure is calculated at respectively 3,6%, -9,0% and -5,7% from the rated pump pressure.

The discharge pressure at rated pump flow is adequate. The net pressure and adjusted pressure are more than 5% excess of the rated pump pressure. (9% respectively 5,7% degradation). The net pressure and the adjusted pressure are considered inadequate. An investigation is required to reveal the cause of degraded performance.

The electrically driven pumps of the new and old building are considered to provide adequate protection.

Fire Water Supplies

The system in the new building consists of a diesel driven fire pump and an electrically driven fire pump (design capacities: diesel: 138 m³/hr, 9 bar, 2200 rpm; electrical: 138 m³/hr, 9 bar, 2970 rpm). The system in the old building consists of an electrically driven fire pump (design capacity: 66 m³/hr, 6 bar, 2980 rpm).

Water is taken from the public grid and is considered to be adequate. Within a couple of months dedicated water tanks will be installed in the basement. The water tanks are already present on site and are currently waiting to be installed.

Test Results

Test Date	Supply ID	Flow (lpm)	Pump RPM	Churn / Static Pressure (bar)	Pump Suction Pressure (bar)	Discharge / Residual Pressure (bar)	Pump Net Pressure (bar)	Pump Adjusted Flow (lpm)	Pump Adjusted Net Pressure (bar)
21/02/2014	Diesel#1, New building	0	2215		2.6	12.6	10.0	0.0	9.9
21/02/2014	Diesel#1, New building	500	2205		2.6	12.4	9.8	499.0	9.8
21/02/2014	Diesel#1, New building	1000	2195		2.3	11.8	9.5	1002.0	9.5
21/02/2014	Diesel#1, New building	1500	2184		2.0	11.2	9.2	1511.0	9.3

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21/02/2014	Diesel#1, New building	2000	2174		1.6	10.1	8.5	2024.0	8.8
21/02/2014	Diesel#1, New building	2583	2157		0.8	8.6	7.8	2634.0	8.1
21/02/2014	Electric#1, New building	0	2970		2.6	13.2	10.6	0.0	10.6
21/02/2014	Electric#1, New building	500	2970		2.5	13.2	10.7	500.0	10.7
21/02/2014	Electric#1, New building	1000	2970		2.3	12.9	10.6	1000.0	10.6
21/02/2014	Electric#1, New building	1500	2970		1.9	12.4	10.5	1500.0	10.5
21/02/2014	Electric#1, New building	2000	2970		1.5	11.6	10.1	2000.0	10.1
21/02/2014	Electric#1, New building	2583	2970		0.9	10.4	9.5	2583.0	9.5
21/02/2014	Electric#1, Old building	0	2970		2.0	8.4	6.4	0.0	6.4
21/02/2014	Electric#1, Old building	1000	2970		1.5	7.8	6.3	1003.0	6.3
21/02/2014	Electric#1, Old building	1350	2970		1.3	7.5	6.2	1355.0	6.2
21/02/2014	Electric#1, Old building	1800	2970		0.7	6.8	6.1	1806.0	6.1

Fire Suppression System(s)

The server room has been provided with an automatic double-knock Argonite gaseous extinguishing system. Nozzles have been installed above and underneath the raised floor. The system is annually maintained.

Business Interruption Information

In the event of a large catastrophe, the activities could be outsourced to the Rotterdam event centre named Ahoy, temporarily installed portacabins and to Inholland schools in Den Haag, Dordrecht, Delft, Amsterdam, Diemen and Alkmaar. These are short term solutions. It is not known whether there are long term solutions. It is expected that interruption of activities would occur during the rebuilding time.

Since business interruption has not been insured, no RSA QRA rating has been included.

Contingency Plans

There is no contingency plan.

Natural Catastrophe Exposures

Earthquake/Volcano

This site is located in a hazard zone 0 (Munich Re rating system where 0 represents a low hazard and 4 a high hazard).

Hurricane/Cyclone/Tornado

This site is located in a tornado hazard zone 3 (Munich Re rating system where 0 represents a low hazard and 4 a high hazard). According to the Munich Re rating there is no Tropical Cyclone & Hurricane hazard.

Winter Storm

This site is located in a hazard zone 3 (Munich Re rating system where 0 represents a low hazard and 4 a high hazard).

Flood (River, Coastal, Surface Water)

General

Approximately one third of the Netherlands is built below the mean sea level. These areas are subdivided into 53 main dike rings and approximately 40 small dike rings. The latter dike rings are situated along the river Maas in the south of the Netherlands. Dike rings are exposed to the sea, to rivers or both to the sea and rivers. All dike rings are surrounded by either dunes and dikes or levees along the rivers. Government experts have calculated the probability of a dike failure and flooding of the specific dike ring.

Dike ring #14

This site is exposed to the sea and rivers. The premises are exposed to the North sea, Nieuwe Maas and Nieuwe waterweg. This site is located in dike ring #14 named 'Zuid-Holland'. The government data shows the probability of a flood of this site as one in 2,500 every year. The total surface area of this dike ring amounts to 2,226 km². The total length of the dike ring amounts to 236 km. The governmental rating of this dike ring is qualified as good and partly not determined. This dike ring has been subdivided in smaller areas by non classified dikes. The distance to the nearest classified dike ring is 20 km.

Sea

The site elevation is 3 m above sea level. The site elevation is above the expected sea flood level. The site would probably not be flooded in case of a breakthrough of a sea dune or a sea dike.

River

According to Dutch government data a river dike breakthrough would result in an inundation depth of 2,5 m. The entire basement would be flooded. This is a rough estimate. As mentioned above the probability of a flood is one in 2500 every year. This is considered a normal risk.

Non classified bodies of water

Besides the risk of inundation from the sea and major rivers, there is always a chance that inundation occurs from non classified ditches, rivers, canals etc. There are no inundation data for these bodies of water available. The nearest non classified body of water is located at 50 m from the premises.

Lightning/Hail

This site is located in a lightning and hail hazard zone 2 (Munich Re rating system where 0 represents a low hazard and 6 a high hazard).

Snow/Collapse

No excessive snow fall is expected in this part of the Netherlands. The roofs are inspected and cleaned on a regular basis.

Other Natural Catastrophe

N/A

OTHER CLASSES: COMMENTS

Crime

General Description

In total there are some 60 relatively expensive Apple computers. These computers have been installed for educational purposes. The computers are considered a high theft demand. Related to the portability of the goods the probability of theft is considered high. The computers have not been installed on the ground floor.

Theft EML

The theft EML is based on the theft of all Apple computers and is the result of an organised attack based on removal by articulated lorry. The value of the computers could not be given by Mr. Ruijssenaars. It is estimated that the value could be up to 60,000 euro.

Physical Security

The premises have not been fenced in. Windows and doors have been provided with standard type hinges and locks.

Intruder Alarms

The entire facility has been provided with an intruder detection system. The protection consists of anti mask type passive infra red in the entire facility. Additionally the doors have been provided with magnetic contacts and the windows have been provided with vibration detection. Alarm is transmitted to a permanently manned central alarm station. The alarm station will alert a private security company. The watchman would go to the facility in order to verify the alarm and call out the police.

Other Security

A large number of CCTV camera's have been installed throughout the building. The camera footage is recorded but not actively monitored. Therefore, the value of the system is limited to police investigation purposes after an incident.

During opening rounds, two watchmen are present. They perform frequent control rounds.

M&E

A machinery breakdown assessment was not undertaken, as this is only a school occupancy. As such, no major machinery is present.

APPENDIX

Site Plans and Photographs



