A traveling fire in an open carpark

Master M4 Babette Mattheüs

Beoordeling: Ruud van Herpen MSc. FIFireE
R.A.P.v.Herpen@tue.nl
16 februari 2017
Notitie: 20170216.rhe (2 pagina's)

Het afstudeeronderzoek van Babette Mattheus behandelt twee hoofdvragen ten aanzien van een autobrand en de thermische consequenties daarvan:

- Wat is de thermische belasting ten gevolge van een lokaal brandscenario met een omvang van enkele auto's?
- Wat is de branduitbreidingssnelheid tussen auto's onderling, veroorzaakt door ontsteking van kunststof of rubber?

Voor de beantwoording van de eerste hoofdvraag is het empirische model Capafi vergeleken met een veldmodel in FDS. Daarvoor diende de open parkeergarage van Designer Outlet Centre Roermond als voorbeeldcasus. Het brandmodel dat eerder door Connie Wong (TUD) voor één auto was ontwikkeld is in deze casus toegepast en uitgebreid naar in totaal 8 auto's. De thermische belasting die met FDS wordt bepaald blijkt iets gunstiger te zijn dan de thermische belasting volgens Capafi. Dat is conform de verwachting, het brandmodel van Connie Wong kan dus worden geëxtrapoleerd naar meerdere auto's. Echter, de gevoeligheid voor het brandvermogensscenario is groot. Wanneer het piekvermogen van een auto met 0,2 MW toeneemt is het FDS scenario beduidend ongustiger dan het Capafi scenario en faalt de draagconstructie!

Uit de beantwoording van de tweede hoofdvraag blijkt dat de materiaaltemperatuur in vergelijking met de ontstekingstemperatuur van het materiaal het beste criterium is om de branduitbreidingssnelheid te bepalen. Echter, brandoverslag van de ene naar de andere auto treedt op in het tijdsbestek dat de ontwerp vermogenscurve van de brandende auto vrijwel constant is. Dat leidt tot zeer grote variatie (onzekerheid) in ontstekingstijd van de volgende auto. Kortom, met de huidige ontwerp vermogenscurve voor een autobrand is het niet mogelijk om de branduitbreidingssnelheid door FDS zelf te laten bepalen op basis van materiaaltemperatuur. De vaste tijden voor branduitbreiding tussen twee auto's, zoals het Capafi model hanteert, kunnen dus niet door een geavanceerder criterium worden vervangen.

Beoordeling

Het afstudeeronderzoek biedt praktische handvatten voor engineers en CFD-modelleurs. Echter, daarmee ontbreekt het enigszins aan diepgang en visie. Het onderzoek mist een wetenschappelijk kader, waarin vanuit een abstracte visie en een kritische houding ten aanzien van validatie van de simulatieresultaten concrete aanbevelingen worden gedaan. De rapportage is daardoor met een voldoende beoordeeld (6).

De presentatie van het afstudeeronderzoek was goed, gestructureerd en verhelderend. De presentatie is daarom beoordeeld met ruim voldoende (7).

Cijfer: 6,5

Eindhoven, 16 februari 2017

Ruud van Herpen MSc. FIFireE

Fellow Fire Safety Engineering

Technische Universiteit
Eindhoven
University of Technology

/ Department of the
Built Environment

Fire propagation in an open car park

A case study on the car park of the Designer Outlet Center Roermond

ing. C.E.L. Mattheus
0824107
16/02/2017

Where innovation starts

Eindhoven University of Technology
Department of the Built Environment
Master Building Physics and Services
Graduation project

C.E.L (Babette) Mattheus
Student number 0824107
babette.mattheus@hotmail.com

Version 3.0
2017

Supervisors:
prof. ir. W. Zeiler
ir. R.A.P van Herpen MSc. FlFireE
ir. A.D Lemaire (Efectis)

Photo front page:
REUTERS/Andrees Latif

Preface

I would like to express my sincere appreciation to several people for their help during this project. First of all, I want to thank prof. ir. Wim Zeiler and ir. Tony Lemaire, from Efectis, for their interest and enthusiasm in my research subject. Of course, I also want to thank them for the input of knowledge and criticism into this thesis.

I want to thank my daily supervisor ir. Ruud van Herpen for his faith and support in my abilities, making time for the guidance of this project and receiving valuable answers to all the questions I asked.

My sincere thanks goes out to consulting engineers Nieman where I got the possibility to use their workspaces, calculation computers and simulation programs. And of course Niemans employees for their input on my research.

I also want thank my fellow students at the Built Environment for the coffee and lunch breaks, input in the subject matter and being able to blow of some steam once in a while.

Lastly I want to thank my mother, father and brother for their unconditionally support during not only my graduation project but my entire studentship.

Babette Mattheus

Eindhoven, February 2017

Abstract

The goal of this thesis was to obtain more knowledge on the use of a new heat release rate (RHR) scenario, created in a research at the Delft University of Technology, in large car parks. And the possibilities in Fire Dynamic Simulator (FDS) to calculate the propagation time between two cars in the model instead of using an imposed time and the influence of the distance between the parked cars on the propagation time. The thesis was therefore divided into two parts, an analysis and a research.

In the first part an analysis was performed on the car park of the Designer Outlet Center (DOC) Roermond, a project of consultant engineers Nieman. In this project a calculation of the material temperatures of a steel beam was performed in Car Park Fire (CaPaFi) and FDS. The results were contradicting to the expectation because the results from FDS were more conservative than the results of CaPaFi. In this project the RHR scenario of the TUDelft, based on the RHR scenario of CaPaFi, was used.

The analysis focuses on the use of the fire scenario of the TUDelft in the DOC model and showed that there were five differences in the FDS scripts regarding the fire scenario. The difference with the most influence was the rate of heat release per unit area and with the correct adaption of this difference the results met the expectations.

Also in the analysis a test of the effect the smoke development and radiation on the temperature development was performed. It showed that the radiation is modelled according to expectations but the smoke development shows no effect on the temperature this contradicting expectations, because it would mean that the radiation flux of the smoke particles are not significant.

In the second part of the thesis a research of the possibilities of the propagation time in FDS was performed. With a new model where heat devices (heat switches based on gas temperature) were implemented the possibilities of these devices were tested. To fit the propagation time with the CaPaFi scenario, unrealistic low gas temperatures were obtained. Resulting in a large uncertainty in propagation time, due to the large eddies near the burning car, even when the cars were linked to multiple heat devices.

Besides the heat devices also the radiative heat flux was tested as a propagation criterion. But also the results from these devices were too instable to link to the ignition of the surrounding cars. Because ignition depends on both radiation flux and material properties, especially heat capacity of the adjacent car. A final research with surface temperatures as criterion shows that, although these temperatures are stable, the rate of heat release is not detailed enough implemented to calculate a reliable propagation time. Therefore it is not possible to realistically test the effect of the distance between the parked cars on the propagation time in CFD.

Table of contents

Table of figures

1 Introduction

Previous on this thesis a literature study was performed to research traveling fires in parking garages. Subjects that were research were the difference, regarding fire development, between open and closed car parks, the development of a fire in a car park, the propagation between two cars and different simulation tools to predict the fire behaviour such as Car Park Fire (CaPaFi) and Fire Dynamic Simulator (FDS) [1].

The literature study also explained the phenomenon 'traveling fire': a fire that is fuel controlled, where a compartment fire is oxygen controlled. Regarding a parking garage this means that the only combustible material present in a car park are the cars so when one car ignites the temperature will build till the point it propagates to the car parked next to it resulting into a fire development of this car till it propagates to the car parked next to that one. This will repeats itself throughout the car park, while in the meanwhile the fire of the original car will decrease resulting in a fire that 'travels through the car park, hence the name traveling fire.

Besides a literature study also a general analysis on the car park of Designer Outlet Center (DOC) Roermond was performed. This was a project of Nieman consulting engineers where a fire scenario developed by a research at the Delft University of Technology (TUDelft) was used [2]. However the material temperatures of the steel beam above the first ignited car were not as expected, chapter 2.1 will elaborate further on this project.

Form the literature study and the analysis on the DOC Roermond project some questions raised that will serve as the research questions for this thesis. A more thorough analysis of the DOC project needs to be performed to determine what the reason for the unexpected results of the temperature calculation is regarding the use of the fire scenario of the research report of the TUDelft. Although the DOC project is used as case study for this thesis it represents a common open car park, so results from the analysis can be applied in future car park designs.

Further the literature study showed that the propagation time, the fire expansion from one car to another, depends on different boundary conditions, such as the parking distance between cars. A simulation model in FDS that calculates the propagation time instead of using a set propagation time is therefore desirable. With such a model also the effect of the distance between two parked cars on the propagation time could be calculated.

This results in the following research questions for this thesis:

1. Is the FDS fire scenario of the Delft University of Technology suitable for large car parks, such as the Designer Outlet Center Roermond?
2. What are the possibilities in creating an FDS model where the model calculates the propagation time instead of using a set time?
3. What is the effect of the distance between the parked cars on the propagation time calculated in FDS?

To answer these questions the thesis is divided into two parts. The first part, the analysis, will focus on the first research question. An analysis of the DOC project and the TUDelft project is performed to determine whether the unexpected temperatures of the beam is a result of an incorrect adaption of the fire scenario from the research of the TUDelft or if this fire scenario is not suitable for large car park fires, in which more than one car is involved. The second part of the thesis, the research, will focus on question 2 and 3. A new model is created to research what the possibility is in FDS to calculate, instead of using a set, propagation time from one car to another. This is followed by variation of this model with different distances between the parked cars to determine the effect of this distance on the propagation time. The thesis concludes with an overall conclusion of both parts of the thesis.

2 Analysis

This chapter presents the analysis of a consultant engineers Nieman project: The car park of Designer Outlet Center (DOC) Roermond. First the project and the implementation of the fire scenario of the research of Delft University of Technology (TUDelft). Then the method used to determine how the unexpected calculated temperatures occurred is presented. Followed by the results and discussion of the analysis part of the thesis.

2.1 Designer Outlet Center Roermond

In March 2016 Consulting Engineers Nieman consulted a parking garage for Designer Outlet Center (DOC) in Roermond, Limburg. This considers a car park of 85 x 119 m^2 with five layers and a load baring structure made of unprotected steel that needs to resist a car fire scenario of at least 30 minutes [3]. Floorplans and cross-sections of the project can be found in Appendix I. To calculate the material temperatures of the steel beam across the car park above the car where the fire ignites two calculation were made. The first one was performed in an Excel sheet called Car Park Fire (CaPaFi) and the second one was a combination between Fire Dynamic Simulator (FDS) and Voltra.

CaPaFi is an excel sheet that is based upon results from experiments performed on car park fires [4]. Because CaPaFi is a rather simplified calculation tool it does not include the effects of boundary condition such as wind speed, wind direction, ambient temperature and smoke development. Therefore the simulation tool uses a high safety factor to obviate the uncertainty of these factors, this can however result in an over dimensioning of the construction so more material is used than actually necessary.

FDS is a Computational Fluid Dynamics (CFD) model that can calculate the fire development more precise than CaPaFi due to the fact it can take the boundary conditions mentioned above into account, therefor it does not need the high safety factor. For the DOC model Nieman calculated the temperatures around the steel beam in FDS and implemented those in Voltra, a thermal dynamic, to calculate the surface temperatures. More information on the simulation tools can be found in the literature study [1].

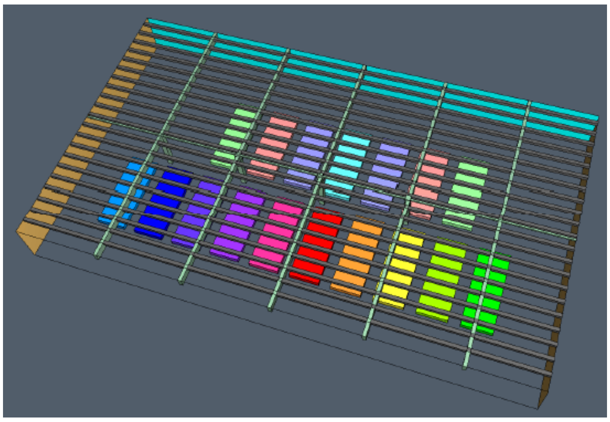
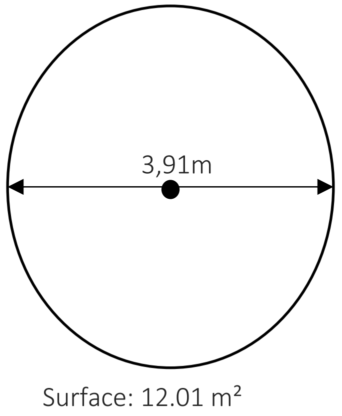


Figure 2-1 Overview of the model of the DOC project in FDS/Voltra

2.1.1 Fire scenario

For the DOC project a fire scenario created in a research at the TUDelft was used. In this research the Rate of Heat Release (RHR)[1] scenario of CaPaFi was implemented in FDS [2]. In CaPaFi a car on fire can be implemented with an X and Y coordinate representing the centre of the fire where the model will release a fire spread in a circle, with a diameter of 3.91m, around the inserted coordinates, see figure 2-2. The maximum RHR is 8.3MW, this is released over time as presented in the table of figure 2-2 and figure 2-3.



Time step [min]	RHR [MW]	Percentage of maximum
0	0.0	0.0
4	1.4	16.9
16	1.4	16.9
24	5.5	66.3
25	8.3	100.0
27	4.5	54.2
38	1.0	12.0
70	0.0	0.0

Figure 2-2 RHR scenario CaPaFi and deviation of the RHR over time.

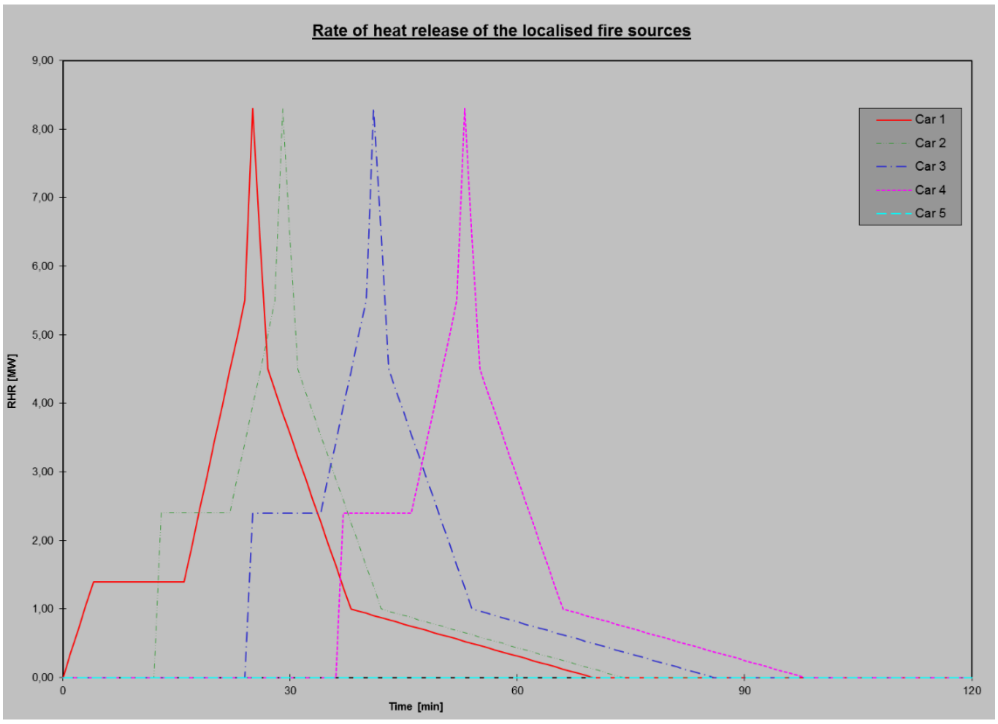


Figure 2-3 The RHR per car over time.

[1] Rate of Heat Release: the rate of heat generation by fire expressed in Watts[17]

In FDS the cars are implemented as square boxes, with the dimensions as presented in figure 2-4. The total surface of the cars in FDS is 12.6m^2, excluding the bottom. In FDS the RHR is implemented per unit area, this means that, with a maximum RHR of 8.3MW the RHR per unit area becomes:

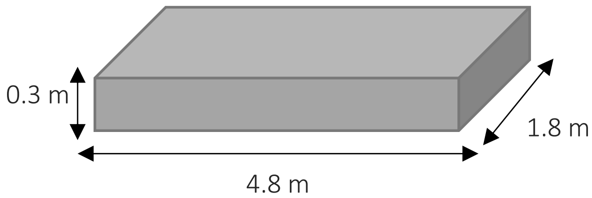


Figure 2-4 Dimensions of a car as implemented in FDS.

$$\frac{8.3*10^3}{12.6} = 658.73 \text{ kW/m}^2$$

Also this RHR is divided over time as presented in the table of figure 2-2. By using the RHR scenario of CaPaFi in FDS the temperatures calculated in the models can be compared with each other.

In the TUDelft research the RHR scenario was used for a simulation with 3 cars, arranged as presented in figure 2-5. The figure also shows that in this research the beams are situated perpendicular to the long side of the cars. The results of the research were that the surface temperatures calculated in CaPaFi are more conservative than the surface temperatures calculated in FDS, as shown in figure 2-6.

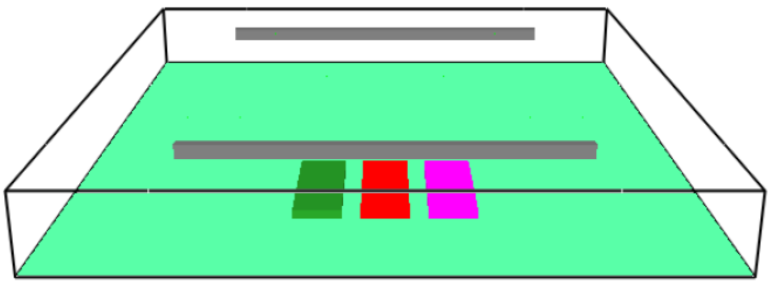


Figure 2-5 Overview of the emplacement of the simulations performed in the TUDelft research [2].

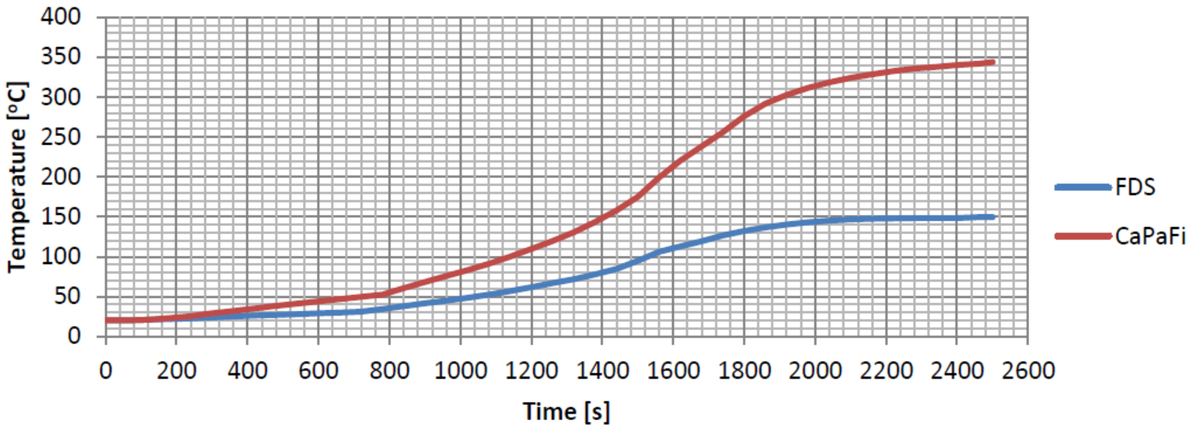


Figure 2-6 Comparison of the surface temperatures calculated on the bottom of the beam near the first car between CaPaFi and FDS in the research of the TUDelft [2].

2.1.2 Propagation scenario

The propagation time used for the DOC project is presented in figure 2-7. This is a rather extreme model, where the second car ignites already ten minutes after the first car and after 30 minutes there are eight cars on fire. In CaPaFi the default propagation time between two cars is 12 minutes, based upon findings during the experiments, which would result in the ignition of three cars after 30 minutes. For the calculations of the DOC the propagation time in CaPaFi was also set to the schedule presented in figure 2-7. These propagation times were used because it was part of a graduation project performed at consultant engineers Nieman [5] and the fire department of Roermond demanded the use of this diagram for the DOC project. However the diagram was created to test the fire resistance of hollow-core slabs and therefore not realistic, never the less it is used for this project and should not have an influence on the difference in surface temperatures calculated in the CaPaFi model and FDS/Voltra model because both models use the same propagation times.

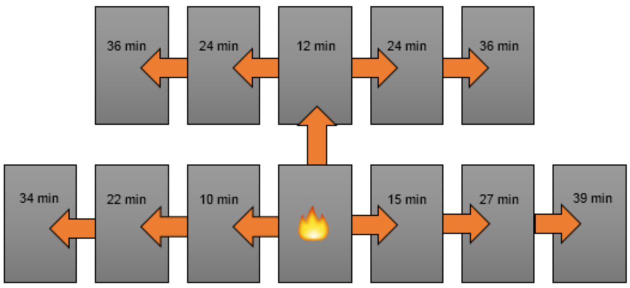


Figure 2-7 Propagation times used for the DOC project, resulting for a graduation research performed at Nieman.

2.1.3 Results of the calculations

Before any calculations were made it was expected that the results from CaPaFi would be more conservative because this was the case in the research project of the TUDelft and also considering the high safety factor that CaPaFi uses. However when the calculation were made the result showed that the temperatures at the surface of the bottom of the steel beam above the centre of the fire of the first car calculated in FDS/Voltra were higher than the temperatures at the same position calculated in CaPaFi. When looking at figure 2-8 and 2-9 the temperature calculated in CaPaFi after the required 30 minutes is 737 °C where the temperature calculated in FDS/Voltra at this moment is 857 °C, a difference of over 100 °C.

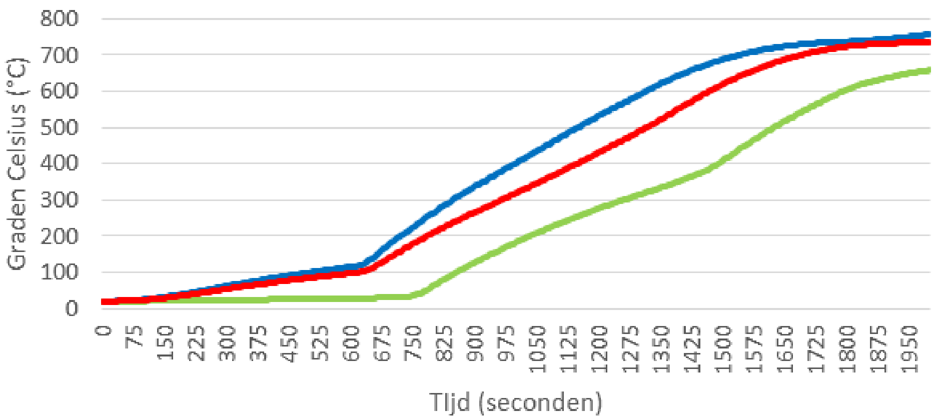


Figure 2-8 Temperature development on the surface of the beam above the centre of the fire of the first car Calculated in CaPaFi. Where the blue line is the temperature at the bottom, red the left side and green the right side of the beam [3].

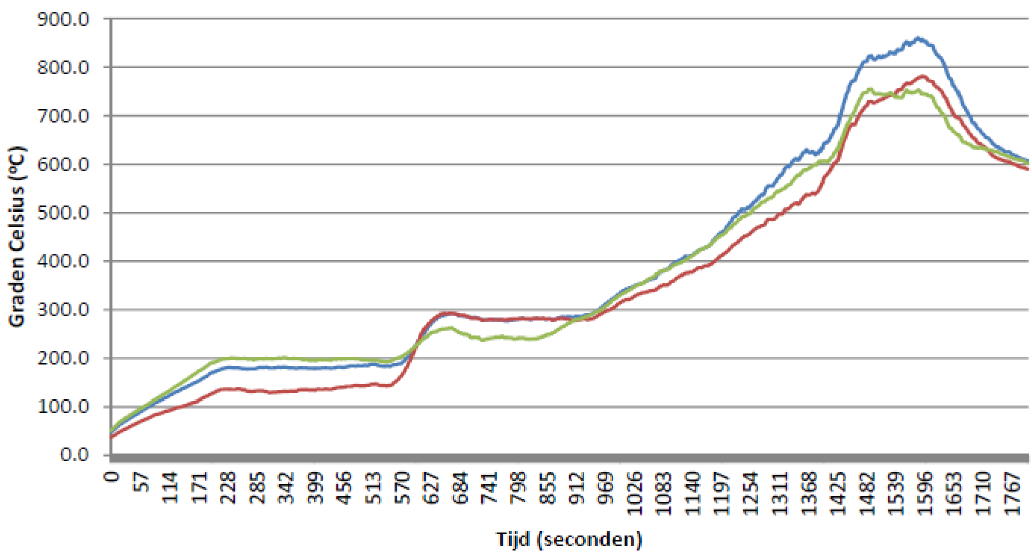


Figure 2-9 Temperature development on the surface of the beam above the centre of the fire of the first car Calculated in FDS/Voltra. Where the blue line is the temperature at the bottom, red the left side and green the right side of the beam [3].

2.2 Method

To determine if difference in the results in CaPaFi and FDS/Voltra of the DOC project contradict with expectation is due to a difference between the input of the TUDelft and Consulting Engineers Nieman, a comparison between the FDS script of the TUDelft and FDS script of the DOC project is made. Both scripts can be found in appendix II. In this Chapter the differences in the scripts and the method used to define the effects of these differences are presented.

2.2.1 Differences between the scripts

Comparing the FDS scripts resulted into five differences, the IDEAL setting, Surface ID of the cars, the upper limit of the RHR per unit area, the RHR and the measurement devices. In this paragraph these differences will be further discussed.

2.2.1.1 IDEAL setting

The first difference between the scripts is that the script of the TUDelft uses the IDEAL setting, mentioned in the Reaction ID of the script as rule:

&REAC IDEAL=.TRUE.

The IDEAL setting indicating whether or not the heat of combustion[2] represent a complete combustion (.TRUE.) or incomplete combustion (.FALSE.) i.e. the setting accounts for the specified SOOT_YIELD and CO_YIELD. If IDEAL=.FALSE., then FDS will internally adjust the heat of combustion to account for products of incomplete combustion [6].

An incomplete combustion occurs when there is not enough oxygen to allow the fuel to react completely and release less heat than a complete combustion. Therefore changing from an incomplete to a complete combustion will increase the temperatures near the beam. As mentioned in chapter 1 a traveling fire is fuel controlled, this means that car fire is a complete combustion and this setting should be set to .TRUE..

2.2.1.2 Surface ID of the cars

In FDS the material properties of a surface are implemented as surface ID's. When a surface is part of the fuel of a fire the surface ID in FDS is set as burner, In the DOC model all surface of the cars are set with the surface ID burner, where in the TUDelft model the bottom of the car is not identified as fuel of the car fire but set as inert and is therefore not part of the fuel of a car fire.

Identifying all surfaces as burner could lead to a higher heat release rate, because this is implemented per unit area as mentioned in paragraph 2.1.1. Therefore including the bottom of the car in the fuel can result in higher temperatures near the beam.

[2] Heat of combustion, the amount of energy released per unit mass of fuel consumed [6].

2.2.1.3 Upper limit rate of heat release per unit area

The Reaction ID of script of the TUDelft shows the rule:

&REAC ID HRRPUA_SHEET = 0

This rule sets the upper limit of heat release rate of a flame in a grid cell. The default setting is 200 kW/m^2. Without this limit, numerical instabilities could occur if too much heat is added to a grid cell too quickly. Physically, it is impossible for fuel and oxygen to react and produce such a large amounts of energy in a given cell, but since FDS uses a simple infinitely fast chemistry model, it could occur [7]. In the script of the TUDelft this parameter is set to 0.0.

In the DOC model this rule is not set because according to [7] this parameter has been removed due to a software update. The version used for the TUDelft model is 6.0.1 and the DOC model ran in version 6.4.1. With this update the combustion chemistry has been improved so the mixing time is controlled and large heat releases are prevented, therefore the ability to set the upper limit on the rate of heat release of a given cell is no longer necessary.

2.2.1.4 RHR

The fire scenario of DOC Roermond is based on the RHR scenario of the TUDelft, which based on the RHR scenario of CaPaFi as mentioned in paragraph 2.1.1. Table 1 shows the deviation over time of the rate of heat release per unit area for one car as implemented in FDS and the matching RHR with a car surface area of 12.6m^2. This RHR per unit area in the TUDelft script and DOC script is identical. However the dimensions of the cars in the TUDelft script and the dimensions of the cars in the DOC script are not equal. Where the cars in the TUDelft research are 1.8m*4.8m*0.3m the dimensions of the DOC model are 1.8m*4.9m*0.3m, which results in a surface of 12.84m^2. Table 1 shows what this larger surface does to the RHR, it shows that the maximum RHR, at 25 minutes, is 8.5MW instead of 8.3MW, the maximum RHR release in CaPaFi. To be able to compare the results from CaPaFi with the results from FDS these maximums need to be equal, because a higher maximum RHR can result in higher temperatures of the steel beam.

To prevent having to change all dimensions of the cars, the RHR per unit area can also be adapted. To maintain the maximum RHR of 8.3MW the RHR per unit area for the DOC script needs to be:

$$\frac{8.3*10\text{^}3}{12.84} = 646.42 \text{ kW/m}^2.$$

Table 1 Deviation of the RHR per unit area over time and the matching RHR with a surface of 12.6m² and 12.84m²

Time step [min]	RHR [kW/m²]	RHR with 12.6m² [MW]	RHR with 12.84m² [MW]
0	0.0	0,0	0.0
4	111.1	1.4	1.4
16	111.1	1.4	1.4
24	436.5	5.5	5.6
25	658,7	8.3	8.5
27	357.1	4.5	4.6
38	79.4	1.0	1.0
70	0.0	0.0	0.0

2.2.1.5 Measurement devices

In the DOC model the gas temperatures ten centimetres below and beside the steel beam were calculated and implemented in Voltra to calculate the surface temperatures of the beam, as mentioned in chapter 2.1. These temperatures are compared with the results from CaPaFi. In the research of the TUDelft the surface temperatures on the bottom of the beam are directly calculated in FDS and compared with the temperatures from the CaPaFi model.

To eliminate the possibility that the temperature differences are due to the implementation in Voltra the calculation of the surface temperatures should directly be performed in FDS. This way the comparison of the DOC between the CaPaFi and FDS calculation is equal to the comparison of the simulation tools in the TUDelft research.

2.2.2 Models

To determine wat the effect is of the differences mentioned in paragraph 2.2.1 three new models were created. In this chapter the adaptions per model are explained.

2.2.2.1 Model 1

The first model is focussed on the difference in IDEAL setting and the surface ID of the cars. In the original model of the DOC the IDEAL setting was switched off, so in model 1 this setting is switched on because a car fire is a complete combustion. The second adaption of model 1 is that the surface of the bottoms of the cars, (Z_{min} surface) are set to inert, where in the original model these were set as a burner including them to the fuel of the car. The used RHR scenario was not created to take this into account. Figure 2-10 shows an overview of the interface of PyroSim of model 1, the script can be found in appendix II.

When the results show significant differences with the original model two new models will be created to determine if the difference is due to the IDEAL setting or to the surface ID of the bottoms of the cars.

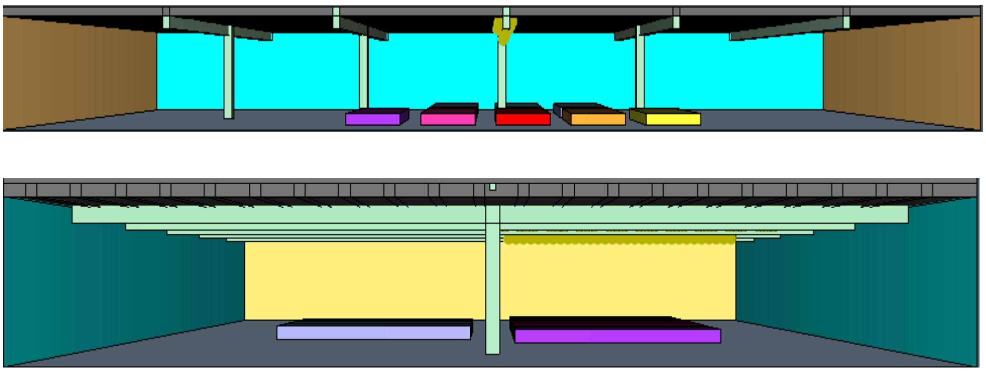


Figure 2-10 Overview of the first model, a remake of the DOC model where the IDEAL setting and surface ID of the bottoms of the cars are adapted.

2.2.2.2 Model 2

As mentioned in paragraph 2.2.1.3 the model of the TUDelft sets an upper limit of the rate of heat release per unit area in a grid cell to 0. Due to an update of the software this upper limit cannot be set anymore. To ascertain what the effect of this setting is a recreation of the model of the TUDelft is made, where all settings were kept equal to the original model except for the line:

&REAC HRRPUA_SHEET = 0.0,

This line is removed from the script, so by comparing the results from this script with the results from the original script the effect of the HRRPUA_SHEET setting will be revealed. Figure 2-11 presents an overview of the TUDelft model. The script for model 2 is presented in appendix II.

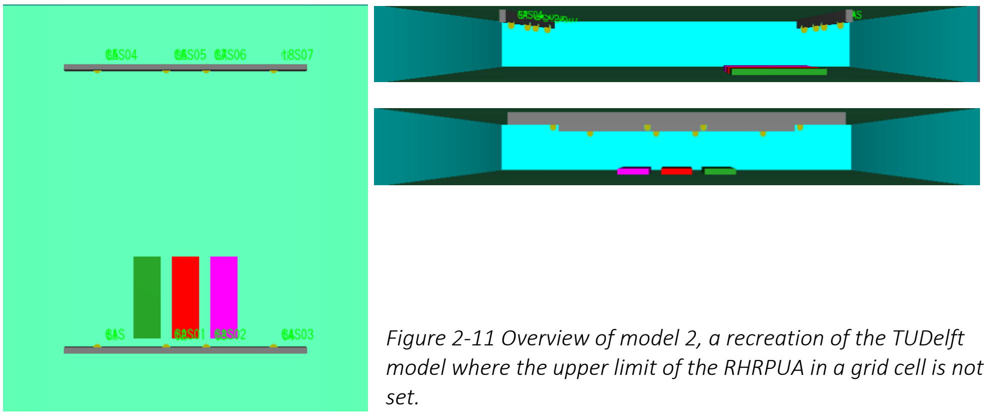


Figure 2-11 Overview of model 2, a recreation of the TUDelft model where the upper limit of the RHRPUA in a grid cell is not set.

2.2.2.3 Model 3

In the third model the effect of the adapted Rate of Heat Release per unit area is calculated. Thereby is in this model besides the gas temperature ten centimetres bellow the beam, to compare with the original model, the surface temperatures of the beam directly calculated in FDS, where these are mentioned as wall temperatures. These devices are located at the same position as the gas temperature devices except that they are not ten centimetres below the beam but directly at the surface of the beam, as shown in figure 2-12. The script of model 3 can be found in appendix II.

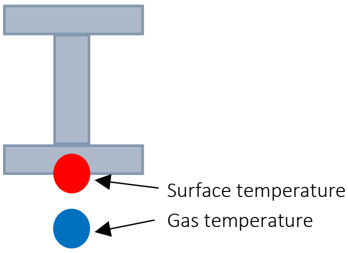


Figure 2-12 Location of the temperature devices pertaining to the steel beam.

To make a proper comparison between the gas and surface temperature calculation the gas temperature is also calculated in CaPaFi. An overview and the settings for this model are presented in figure 2-13.

Y / X	Position of the car(s) X [m]	Position of the car(s) Y [m]	Position of the calculated point(s) X [m]	Position of the calculated point(s) Y [m]			
1	1,889	2,886	0	0	H_f =	2,885	m
2	-2,578	2,886	0	2,886	H_b =	0,550	m
3	0,701	-2,886	0	4	H_s =	0,300	m
4	4,487	2,886	0	-2,886	Coeff beam =	0,850	
5	-3,277	2,886	0	-4	Fire diam D =	3,910	m
6	-1,887	-2,886	0,105	0	A_m/V =	999,00	m^{-1}
7	3,289	-2,886	0,105	2,886	A_m/V (box) =	0,00	m^{-1}
8	7,075	2,886	0,105	4	ρ_a =	7850	kg/m^3
9	-5,865	2,886	0,105	-2,886	α =	35	W/m²K
10	-4,475	-2,886	0,105	-4	ε =	0,7	

Figure 2-13 Overview of the settings of the CaPaFi model to calculate the gas temperature around the beam.

2.3 Results

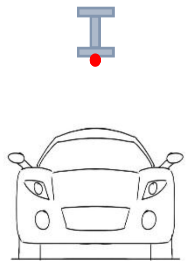


Figure 2-14 Location of the temperatures presented in this chapter.

In this chapter the results of the analysis part of the thesis are presented. During the calculations two extra models were created where in the fourth model FDS simulates without smoke development and in the fifth model the RHR as a result of radiation is not taken into account. An explanation for the choice of these models is given in chapter 2.4. All temperatures shown in this chapter are the temperatures under the bottom of the beam above the centre of the fire of the first car, see also figure 2-14.

2.3.1 Model 1

The results of the calculations of model 1 are presented in figure 2-15. In this graph the gas temperature of the original model is compared with the gas temperature of model 1. The graph shows that there is no significant difference in the gas temperature development over time, till 30 minutes after the first car ignites.

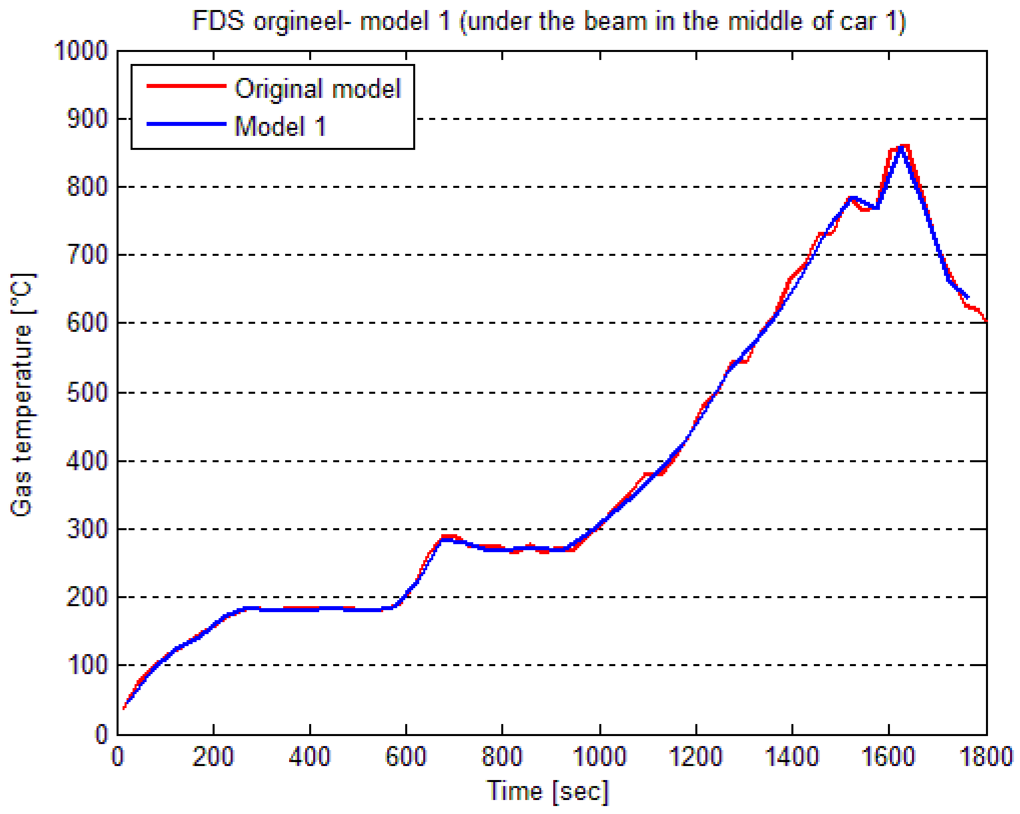


Figure 2-15 Comparison of the temperatures calculated in the original model with the temperatures calculated in model 1.

2.3.2 Model 2

The temperature development over time of model 2, the recreation of the TUDelft model, is presented in figure 2-16. In the graph the results of model 2 are compared with the results of the original CaPaFi and FDS model, this concerns surface temperatures. The graph shows that in a newer version of FDS, where the setting for the upper limit of the RHRPUA in a grid cell is excluded, the temperature development is slower than in an older version of FDS where this setting is set to zero. After 40 minutes, the end of the calculation, the temperature difference between the original FDS model and model 2 is 40 °C.

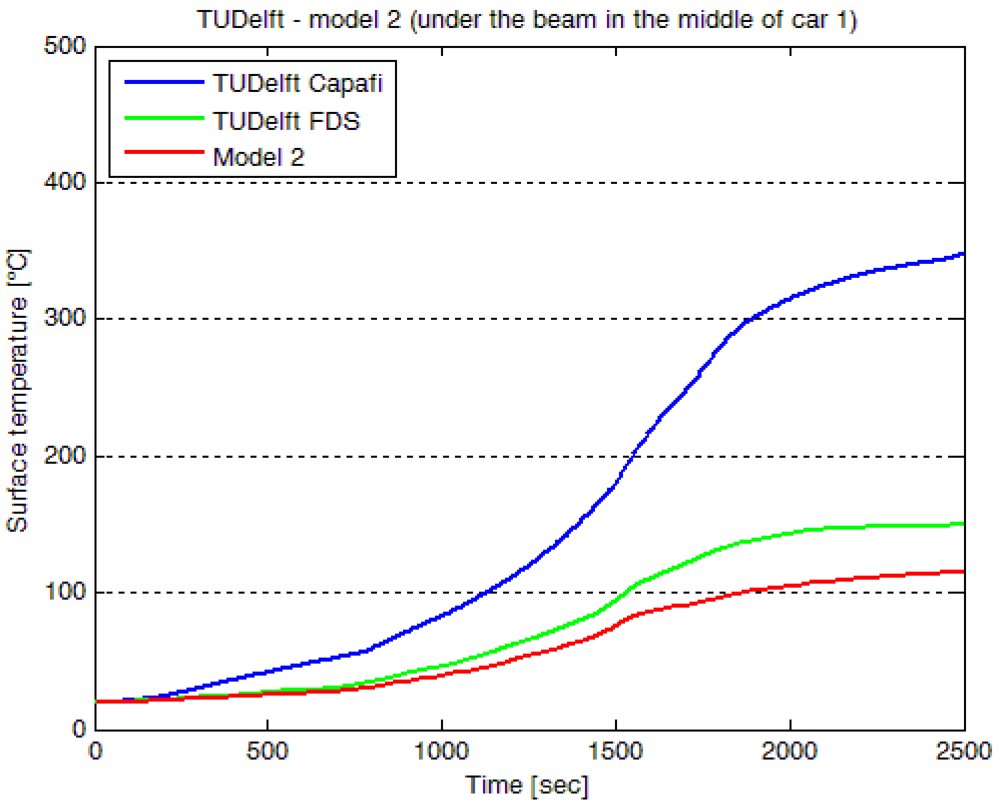


Figure 2-16 Comparison between the original CaPaFi and FDS model and model 2.

2.3.3 Model 3

Figure 2-17 shows the difference between the gas temperature calculated in the original model and model 3. The graph shows that the adapted RHR per unit area results in a temperature that is 50°C lower at the peak, after 1600 seconds, of the graph.

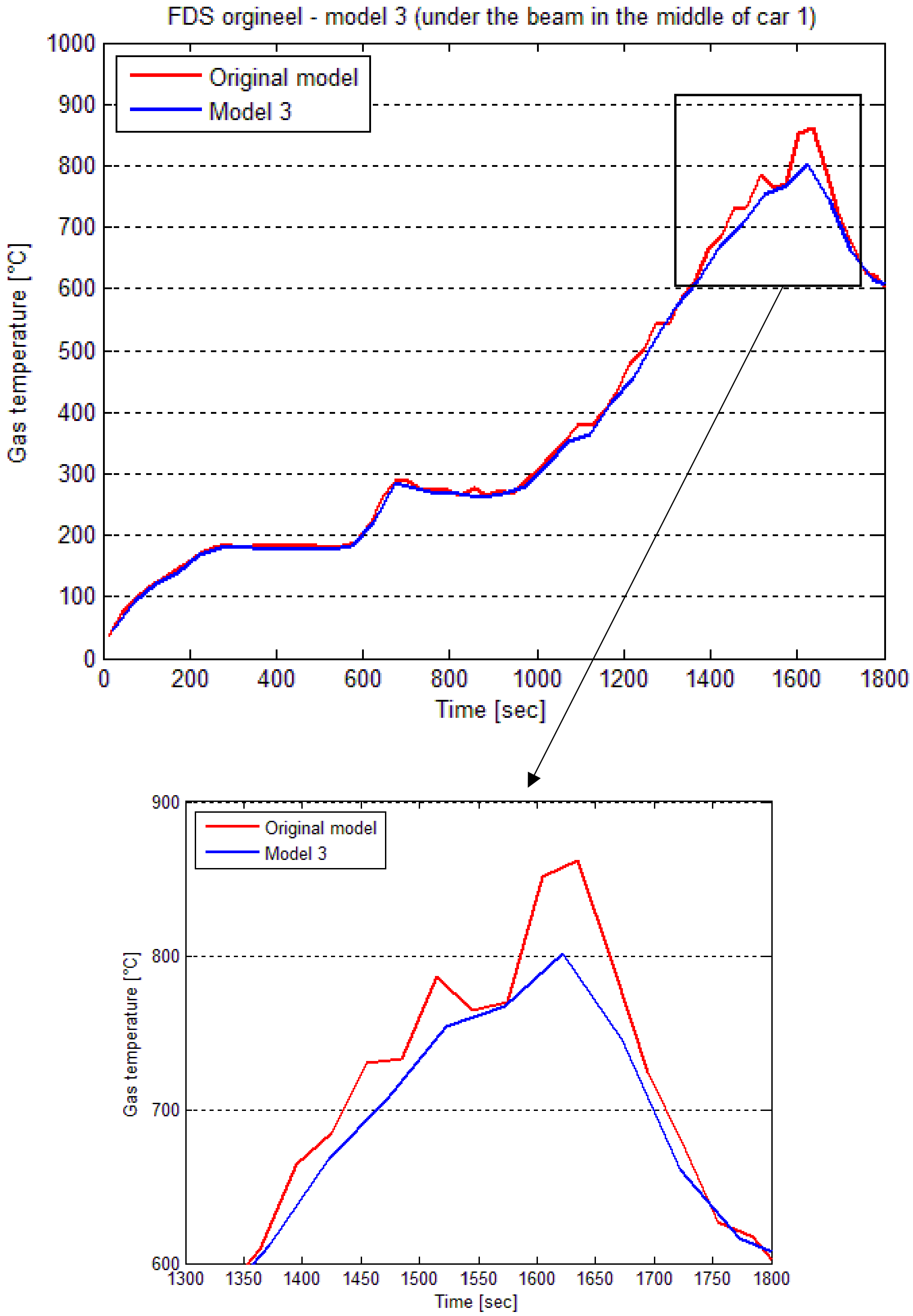


Figure 2-17 Comparison between the gas temperature calculated in the original model and model 3.

In model 3 the surface temperature is also calculated in FDS. The comparison between the CaPaFi model and model 3 is presented in figure 2-18. The figure shows that the temperature calculated in FDS is lower over the complete calculation time. Both graphs follow the same path except for near the end, 26 minutes, where the decrease of the temperature in model 3 is faster than the decrease calculated in CaPaFi.

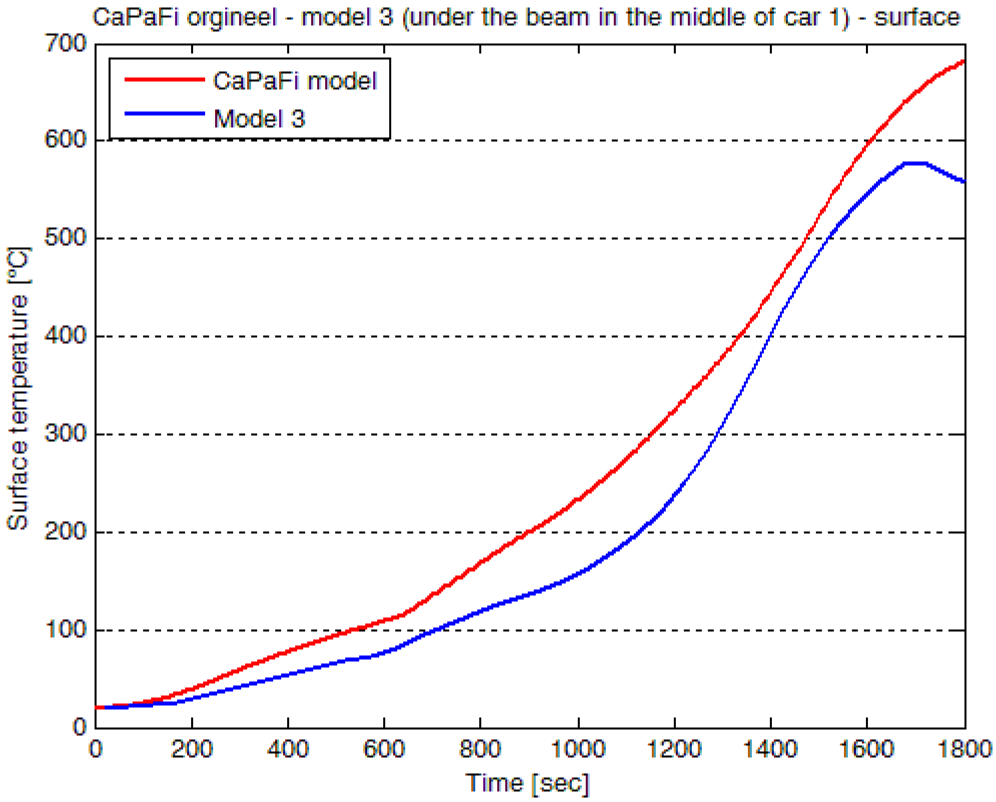


Figure 2-18 Surface temperatures comparison between CaPaFi model and model 3.

For model 3 also the gas temperature is calculated in the CaPaFi model, figure 2-19 shows a comparison between this temperature and the gas temperature calculated in model 3. In the beginning, till 3.5 minutes, the temperature calculated in FDS is higher than the temperatures calculated in CaPaFi. From 3.5 minutes both temperatures stay equal, although the temperature of model 3 is lower. From 11 minutes the temperatures in both models increase again though the temperature of model 3 is lower. Both models decrease in temperature after 27 minutes.

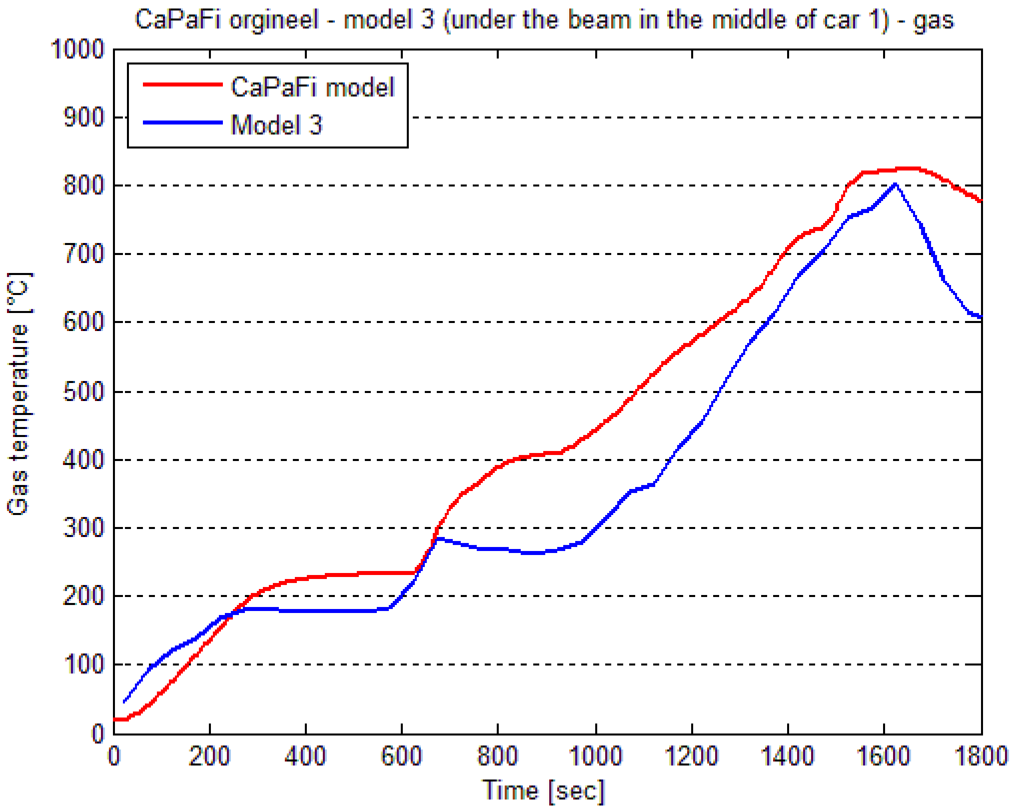


Figure 2-19 Gas temperatures comparison between CaPaFi model and model 3.

2.3.4 Model 4

In Model 4 the calculation of the smoke development in FDS was switched off, to determine what the effect of the smoke development is on the temperature of the steel beam. Model 4 is an adaption of model 3 so also here the RHR per unit area is adapted and the surface temperature directly calculated in FDS. Figure 2-20 shows the surface temperature differences between model 3 and model 4 over time. The graph shows that up to 15 minutes there is no significant difference between the two models. From 15 minutes the temperature of model 4 is slightly higher, with a maximum difference of 10°C near the end, than the temperature calculated in model 3.

Figure 2-21 shows the difference in gas temperature between model 3 and model 4. Also this graph shows no difference between the temperatures in the beginning. From 18 minutes the temperatures variate where at some moments the temperature of model 3 are higher and at other point the temperature of model 4 are higher. The biggest difference occurs at 27 minutes, namely 20°C.

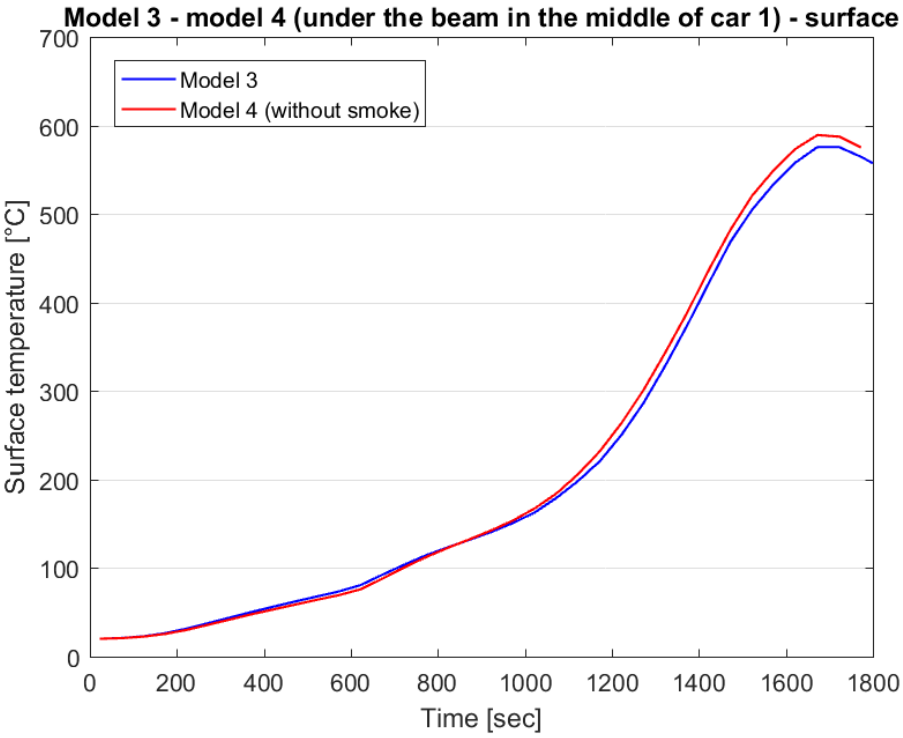


Figure 2-20 Surface temperatures comparison between model 3 and model 4.

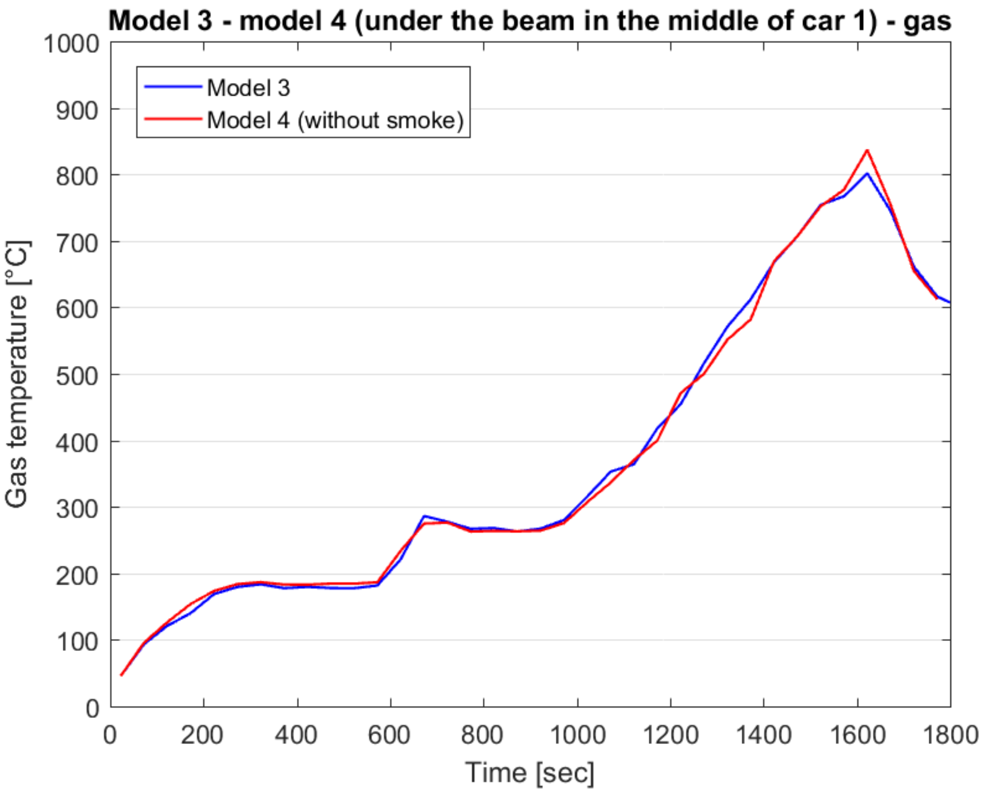


Figure 2-21 Gas temperatures comparison between model 3 and model 4.

2.3.5 Model 5

In model 5 the temperature increase as a result of radiation is not taken into account, to determine the effect of radiation in FDS. In the literature study [1] an extensive explanation of radiation is given. Model 5 is, like model 4, an adaption of model 3. Figure 2-22 shows the surface temperature differences between model 3 and model 5 over time. The graph shows that the surface temperature without radiation increases more constant where the increase of model 3 is steeper. The largest difference is 435°C, after 28 minutes.

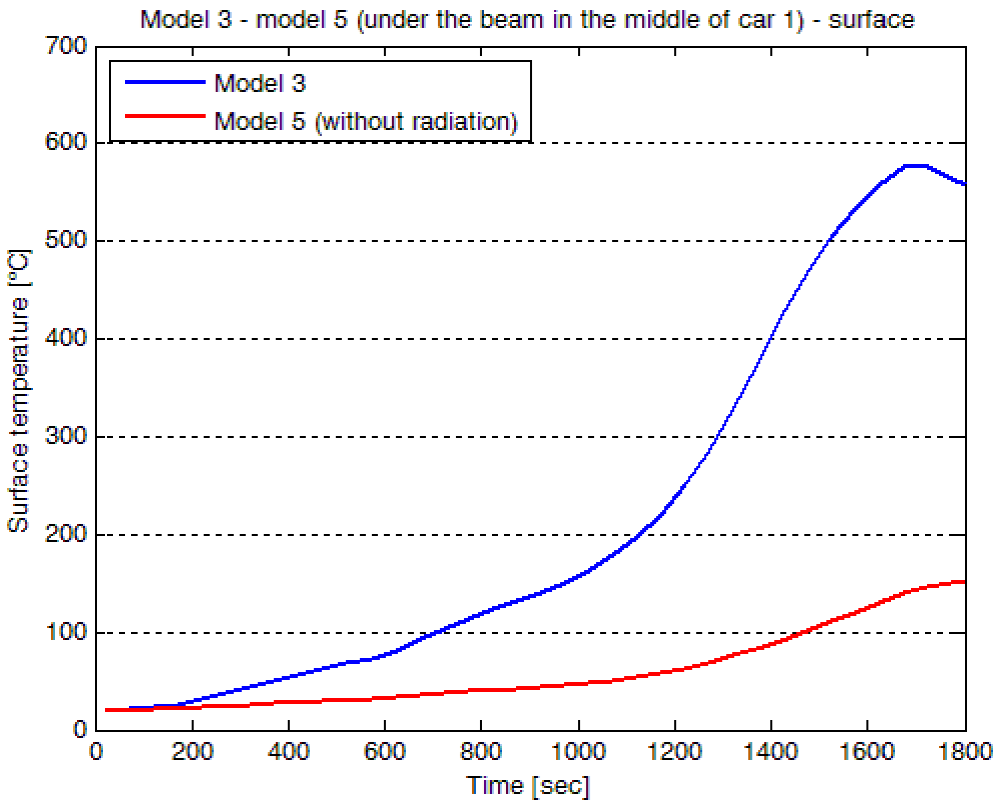


Figure 2-22 Surface temperatures comparison between model 3 and model 5.

Figure 2-23 shows the difference in gas temperature between model 3 and model 5. The graph shows that the first ten minutes the temperatures are equal. From ten till 17 minutes the gas temperature of model 5 are lower than the gas temperature of model 3. From 17 minutes the increase in temperature of model 5 is higher than the increase of model 3 with a maximum difference at 24 minutes, namely 125°C. After this point the decrease of model 5 is steeper, resulting in a temperature after 30 minutes that is equal in model 3 and model 5.

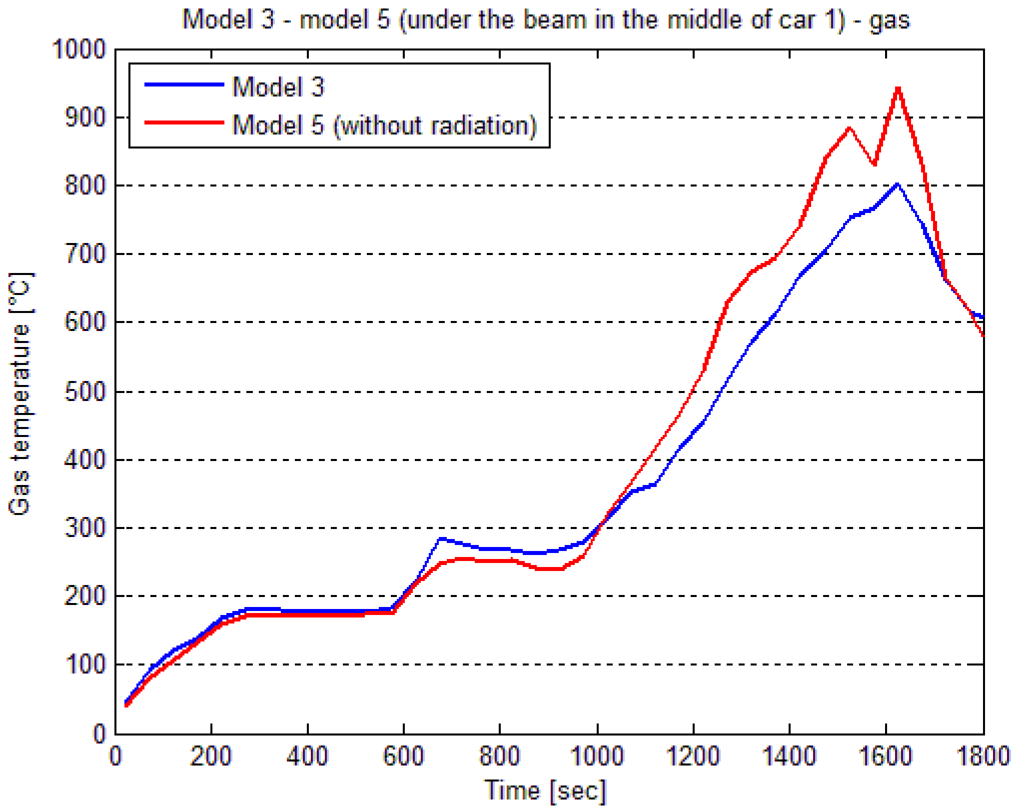


Figure 2-23 Gas temperatures comparison between model 3 and model 5.

2.4 Discussion

In this chapter first the general discussion points of the models and the differences between the DOC model and TUDelft model are discussed. Followed by the discussion of the results of the models of chapter 2.3.

2.4.1 General discussion

First point of discussion is the difference between the DOC model and the TUDelft model that are not mentioned as an adapted difference in paragraph 2.2.1, due to the fact these differences define the model. Besides that the amount of cars is larger in the DOC model also the concrete columns are modelled, which is not the case in the TUDelft model. Also in the TUDelft model the bottom and top of the mesh are defined as the material concrete with the material properties presented in figure 2-24. In the DOC model the bottom and top of the mesh are defined as inert and is the ceiling created with steel-concrete beams, with the properties shown in figure 2-24. Further is the height of the car park in the TUDelft model 2.8m and in the DOC model this height is 2.9 meter. The difference in the dimensions of the beams are presented in figure 2-25. And last of all in the TUDelft model the beams are orientated perpendicular to the long side of the cars, where in the DOC model the beams are parallel to the long side of the cars. Despite these differences a comparison between both models can be made because this research focuses on the difference with CaPaFi where the above mentioned differences are also implemented. Therefore the differences between the FDS and CaPaFi calculations of the TUDelft model should be equal to the differences in the calculations of the DOC model.

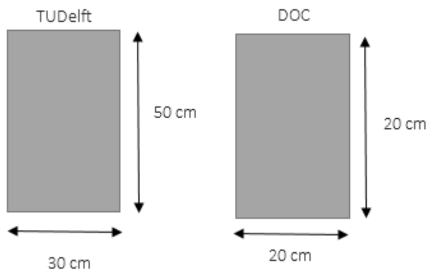


Figure 2-25 Dimensions of the steel beams of the TUDelft and DOC models.

Property	Steel TUDelft model	Steel DOC model	Concrete TUDelft model	Concrete DOC model
Specific heat	According to Ramp	0.53	According to Ramp	0.84
Conductivity	According to Ramp	52.0	According to Ramp	2.0
Density	7850	7800	2500	2400
Emissivity	0.7	0.8	x	x

Figure 2-24 Overview of material properties of steel and concrete in both TUDelft and DOC models

Another general point of discussion is the calculation time of the DOC model of 30 minutes. This time is based upon the requirement of Dutch Building Code, that a building with no residence function should withstand a fire duration of at least 30 minutes, so escape is possible [8]. This 30 minutes is however based upon the standard fire curve, therefore this cannot be directly translate in 30 minutes real time. To compare a fire to the standard fire curve the equivalent fire time is used. This is the fire time of the standard fire curve where the internal gas energy is equal to the internal gas energy of the fire [9]. However because in the original DOC model the calculation time of 30 minutes is used this is not adapted, because this does not contribute to the results of this research.

Finally the results show the temperature behaviour on the bottom of one steel beam, where the required dimension of all the beam are based on resulting in an exactable failure probability. However this is the failure probability of one beam, when the fire travels over multiple cars multiple beams will be exposed, resulting in an increase in the total failure probability of the car park.

2.4.2 Model 1

As mentioned in paragraph 2.3.1. The differences between the temperatures calculated in the original model and model 1 are not significant. This means that the adaption of the IDEAL setting and the surface ID of the bottom of the cars do not have an effect on the calculated temperature. For the second adaption this can be explained by the fact that in the scripts of the DOC the bottoms of the cars are also the bottoms of the mesh of the model, see figure 2-26. Therefore there are no grid cells bellow the cars, so any rate of heat release resulting from the bottom of the car is not calculated even when this is set as fuel of the fire.

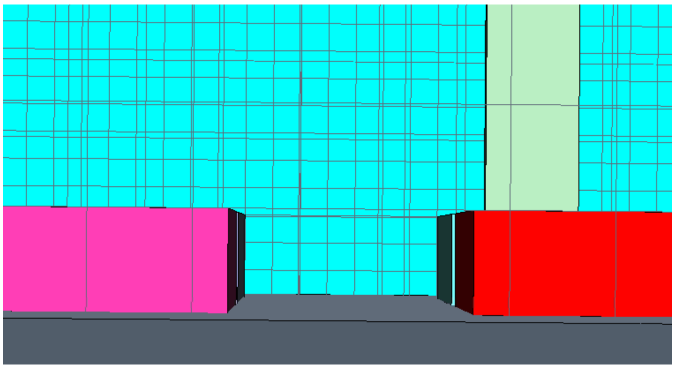


Figure 2-26 The bottoms of the cars are also the bottom of the mesh, there are no grid cells below the cars.

In the case of changing from an incomplete to a complete combustion it can be explained by the location of the line in the FDS script. It is implemented in the fuel defining part of the script and not in the part where the cars are defined. Therefore the IDEAL setting has no influence on the heat resulting from the fire but only on the smoke particles and carbon monoxide resulting from the fire. This raises the question how FDS simulates the smoke development and calculates the influence of the smoke development on the temperature, because a change in smoke development is expected to have an effect on the temperature near the beam.

To answer this question a fourth model is created where any form of smoke development is shut off. By comparing calculated temperatures with a model that includes smoke development a conclusion can be drawn on the way in which FDS takes the effect of the smoke development on the temperature development into account.

2.4.3 Model 2

The results of model 2 show that in a newer version of FDS, where an upper limit for the RHR per unit area increase in a grid cell cannot be set, the calculated surface temperature is lower than in an older version of FDS where this setting is set to zero. This implies that when the setting is set to 0 the setting is switched off, meaning that the increase of the RHR per unit area in a grid cell could be unrealistic high in the original TUDelft model.

Resulting from this model the expected difference between the FDS results and CaPaFi results should even be larger than expected in advance of this study, because the calculations of the DOC have been made in the newer version of FDS so the upper limit is not set.

During the analysis of the second model the question regarding the radiation calculation in FDS raised. To determine how the radiation in calculated in FDS a new model is created where the temperature development due to radiation is neglected. Therefore only the temperature development due to conduction and convection is taken into account, more information about the three types of heat transfer can be found in the literature study [1]. By comparing the results of this fifth model with a model where the radiation is taken into account the effect of the radiation on the temperature in FDS can be determined.

2.4.4 Model 3

Model 3, the model where the RHR per unit area was adapted shows a difference near the end of the calculation regarding the original model. This is as expected because when the RHR per unit area, in this case square meter, is decreased also the total RHR decreases. And with a lower RHR the temperature near the beam is also lower.

The second adaption of model 3 is that the calculation of the surface temperature is performed in FDS. Comparison of the FDS results with the CaPaFi calculation shows that the temperatures in CaPaFi are more conservative than the temperatures in FDS, as was expected in advance of the calculation. However it is the question if calculating the surface temperature in FDS is realistic due to its modelling. Where the actual I-profile is implemented in CaPaFi as an I-profile, the steel beam in FDS is modelled as a square beam, see figure 2-27. And however the dimensions can be adapted to fit the same profile factor[3] the adaption of specific heat and thermal conductivity[4] is more complex because it has to be adapted in two dimensions.

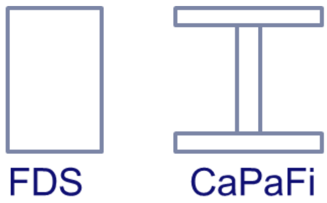


Figure 2-27 Shape of the beam as implemented in the different simulation tools.

It is therefore more reliably to compare the gas temperatures of FDS and CaPaFi around the beam with each other, also to make the calculation material independent. This comparison is also made for model 3 and, just as with the surface temperatures, the temperatures calculated in CaPaFi are higher than the temperatures calculated in FDS. This is due to the high safety factor used in CaPaFi to obviate unknown parameters.

Model 3 is the most promising model that shows the best results based upon expectations, literature study and the TUDelft research. The model shows that also with a larger car park, such as the car park of the Designer Outlet Center Roermond, the RHR scenario created in the TUDelft research can be used for a realistically prediction of the gas temperatures near a constructional beams due to a traveling fire. Resulting in more favourable temperatures than a CaPaFi calculation would for the same situation, which can lead to prevention of over dimensioning of the steel construction of the car park.

[3] Profile factor, the heated surface, in m2/m, divided over the volume of the steel profile, in m3/m [18].
[4] Thermal conductivity, the property of a material to conduct heat [19].

2.4.1 Model 4

Model 4 shows that the influence of the smoke development on the gas temperature development near a beam and the surface temperature of the beam in FDS is neglect able. This means that the smoke development in this scenario has no influence on the temperature near or on the beam in FDS. Because radiation, as a result of the smoke particles, does not have an effect on the gas temperature it is logical that this comparison shows no difference. However for the material temperature this should be the case looking at literature [1]. This would imply that the method used to define the effect of the smoke on the temperature is not completely correct defined in FDS and the smoke development calculation in FDS can only be used for the visibility distance, something also mentioned in the TUDelft research [2]. More research on this subject, with different situations besides car parks, is needed to determine if the preliminary conclusion that FDS incorrectly defines the effect of smoke development on the temperature is correct.

2.4.2 Model 5

In Model 5 the temperature development due to radiation is excluded. The graphs of paragraph 2.3.5 show that regarding the surface temperature the temperature without radiation stays lower than when the radiation is included. This can be explained by the fact that the heating of a steel beam is mostly due radiation, compared to the part that is due to convection and conduction [10]. The graph of the gas temperature shows that without radiation the temperature is higher than with radiation. This is due to the fact that without radiation it is more difficult to transport heat from the air to a surface such as the steel beam. The gas temperature around the beam is therefore higher than in a simulation with radiation because the heat is not transported to the steel beam.

From model 5 can be concluded that the method to determine the temperature development due to radiation in FDS is correct, looking at expectation based upon literature.

3 Research

For this chapter of the thesis a new model is created to determine what the possibilities regarding the propagation time in FDS is. The choice to create a new model, and not use the DOC model, is based upon calculation time and the reduction of it. The DOC is a large car park, where a small model with three cars will suffice for the research. Three triggers for the propagation are researched: gas temperature, radiative heat flux and surface temperatures. The scripts of the models for this chapter can be found in appendix III.

3.1 Basic model

As mentioned above a new model is created for this part of the thesis. The new model consist of three cars, of which two cars are parked next to each other and one car is parked across. The mesh of the model consist of a centre part that is five meters wide, ten meters long and three meters high with a grid of ten by ten by ten centimetres. Around this centre mesh a mesh with a grid of 20 by 20 by 20 centimetres is created so the total mesh of the simulation is 20 x 20 x 3 meter. The top and bottom of the model are defined as concrete and all sides are open. A steel beam with the dimensions of 20 x 50 centimetres over the total length of the mesh, on the top of the mesh, across the centre of two cars is added. Ten centimetres below the beam 7 gas temperature measurement devices are placed with a distance between the devices of two meter. Figure 3-1 shows an overview of the model in FDS. The RHR scenario used in the analysis, created in the research of the TUDelft, is also used for this model, see paragraph 2.1.1. The simulation starts with the ignition of the first car, after 12 minutes the second car ignites and 24 minutes after the first car the third car ignites. The distance between the cars is set to 70 centimetres between car 1 and car 2 and 110 centimetres between car 1 and car 3, based upon averages parking distances [11]

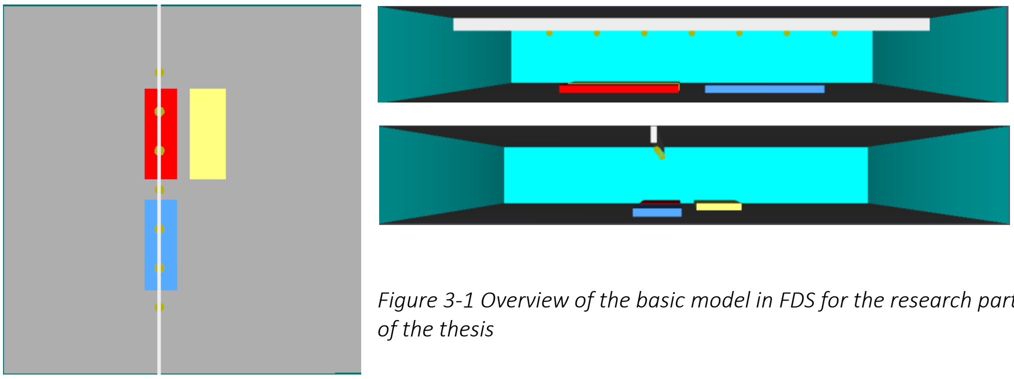
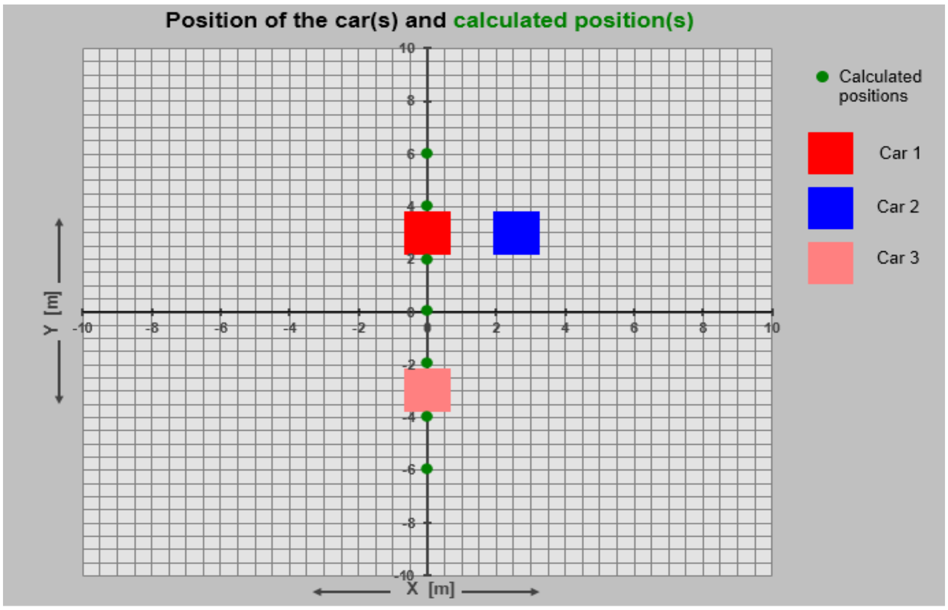


Figure 3-1 Overview of the basic model in FDS for the research part of the thesis

The same model is also created in CaPaFi to verify the calculated temperatures near the beam. Figure 3-2 presents the input settings for the CaPaFi model. Although when comparing the overviews it seems that that the distances between the cars are different in the CaPaFi model and FDS model the distance between the centres of the cars are equal. A sensitivity analysis has been perform to determine the sensitivity of the grid size, combustion model and rate of heat release. The results of the sensitivity analysis can be found in Appendix IV.



Position of the calculated point(s)	
X [m]	Y [m]
0	-6
0	-4
0	-2
0	0
0	2
0	4
0	6

H_f = Height of ceiling H_b = Height of the beam H_s = Height of the fire	H_b	Coeff beam
Fire under beam	real	0,85
Column (top part)	0,001	1,000
Fire more than 1m (horiz) from beam	0,001	1,000

Y / X	Position of the car(s)	
	X [m]	Y [m]
CAR 1	0	3
CAR 2	2,6	3
CAR 3	0	-3
CAR 4		
CAR 5		

H_f =	3,000	m
H_b =	0,500	m
H_s =	0,300	m
Coeff beam =	0,850	
Fire diam D =	3,910	m
A_m/V =	999	m^{-1}
A_m/V (box) =	0	m^{-1}
ρ_a =	7850	kg/m^3
α =	35	W/m^2K
ε =	0,7	

Figure 3-2 Overview of the model created in CaPaFi and its settings

3.1.1 Results

Figure 3-3 presents the comparison in gas temperature between the FDS and CaPaFi model at the bottom of the beam above the centre of the fire of the first car. The graph shows that the CaPaFi calculation gives a more gradual increase in temperature where the temperature calculated in FDS shows lower temperatures and a clear peak in temperature around 24 minutes.

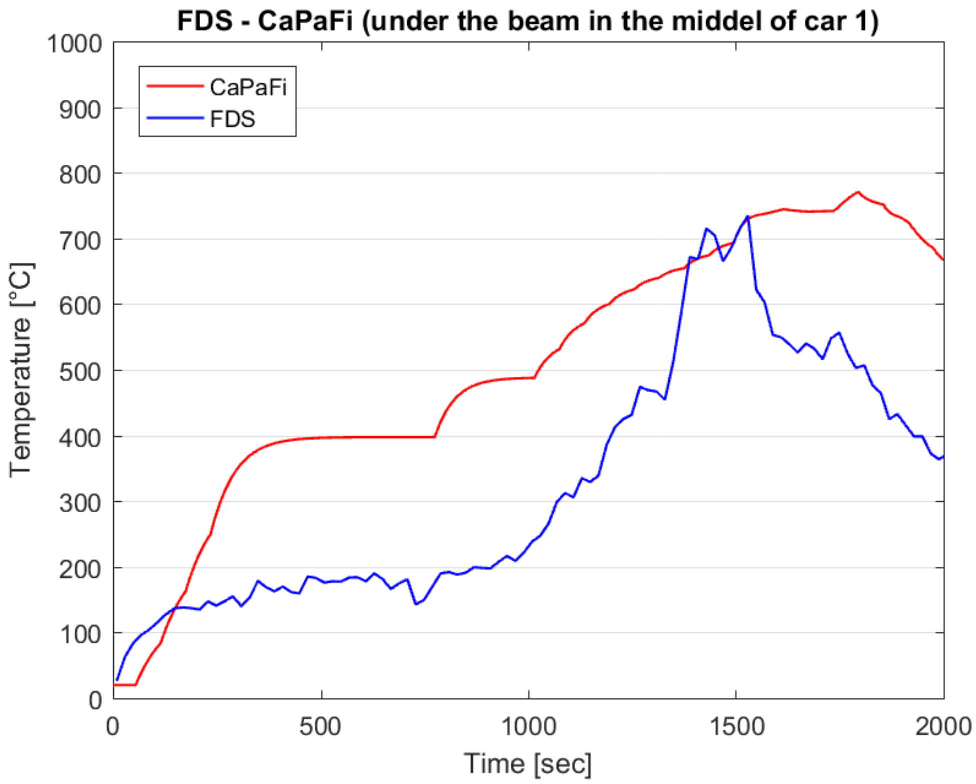


Figure 3-3 Comparison of the gas temperature near the steel beam calculated in FDS and CaPaFi

3.1.2 Discussion

The results of the basic model, model A, show that the temperatures calculated in CaPaFi variate from the temperatures calculated for the same model in FDS. Experiments performed in the past, such as the research of British Building Research Establishment (BRE) in 2010 [1,12] shown in figure 3-4 and 3-5, show that the temperatures follow the same pattern as the RHR. The RHR of model A is presented in figure 3-6 and shows an equal development as the temperature in figure 3-3 this suggests that the peak presented in the FDS calculation is more realistic than the results calculated in CaPaFi. The difference between the two models are due to the high safety factor used in CaPaFi. However a validation measurement is necessary to determine if these assumptions based upon literature are correct.

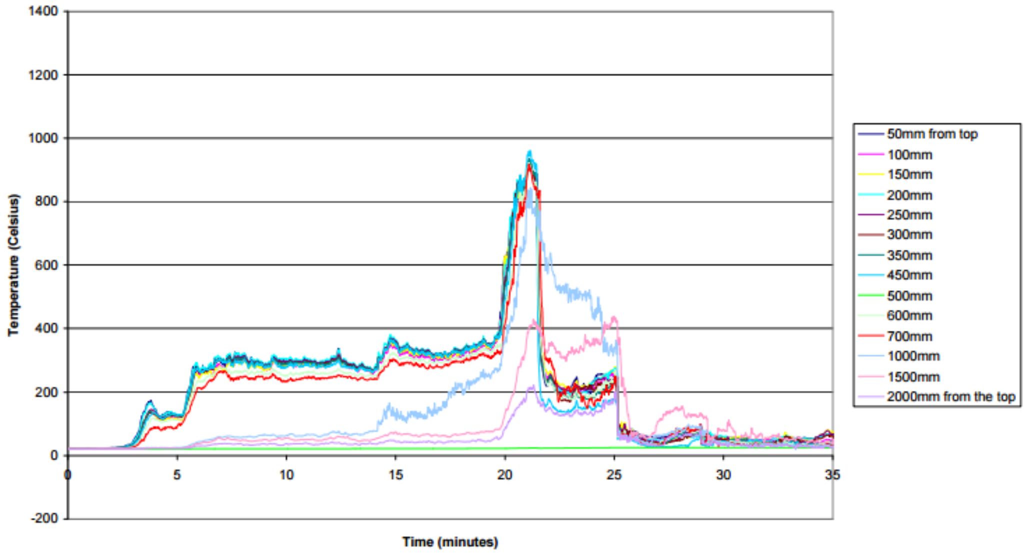


Figure 3-4 Temperatures measured near the ceiling between two cars by BRE [12]

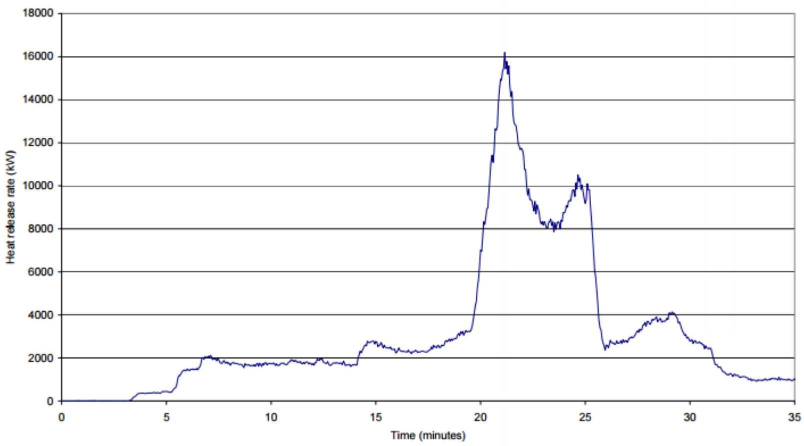


Figure 3-5 Rate of heat release measured in a fire experiment by BRE [12]

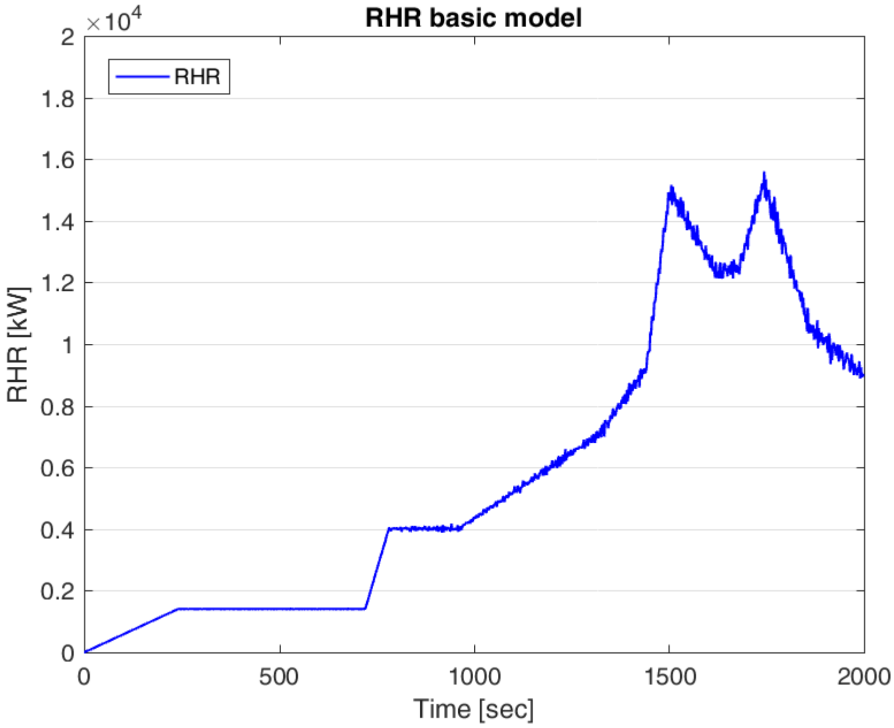


Figure 3-6 RHR development over time of the basic FDS and CaPaFi model.

3.2 Propagation criterion: Gas temperature

FDS has a function that is called heat device. This device calculates the gas temperature in a given coordinate of the model, with the possibility to link the device to an object and set an activation temperature. This means that in the case of this research the second and third car can be linked to these heat devices resulting in a model where the propagation time is calculated in FDS instead of using a set time.

The activation temperature for these heat devices is based upon the temperature measured in the basic model, where the devices were already implemented but not linked to the cars. Meaning that they only calculate the temperatures with no further actions. Each car has four heat devices placed above each other in the centre of the side facing the first car, with the lowest heat device on 150 centimetres above the ground and the highest on 1.05 meter, see figure 3-7. Multiple heat devices are used to determine on which height the temperature development is the most favourable.

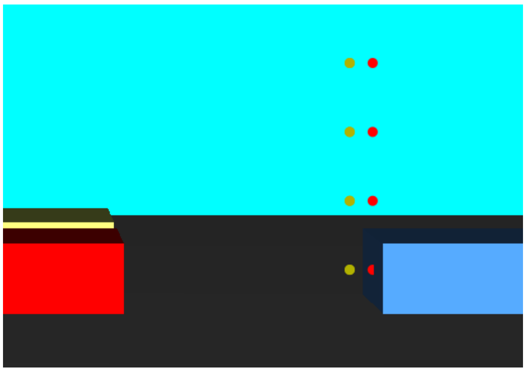


Figure 3-7 Location of the heat devices in the FDS model

Besides the heat devices also gas temperature and radiative heat flux devices are implemented ten centimetres in front of the heat devices facing the direction of the first car. This is done to verify the temperatures measured in the heat devices and to determine if the heat device itself does not have an influence on the temperature.

Figure 3-8 and 3-9 show the temperatures of the heat devices calculated in model A, the basic model. In the graphs the temperatures calculated in the heat devices at a height of 1.05 meter, the most stable height, are compared to the gas temperature in front of the devices. Figure 3-8 shows that up until the ignition of the second car, after 12 minutes, the temperature in the heat device and the gas temperature in front of the device are equal. The same comparison has been made for the heat device of the third car, see figure 3-9. Also this graph shows no difference between the temperatures up till the moment that the third car is ignited.

The graphs show that after 12 minutes the highest temperature reached at car 2 is 23°C. The heat device of the third car shows a temperature of 24°C after 24 minutes. In both heat devices these where the highest temperatures till that moment in time, resulting in an ignition after 12 and 24 minutes when the heat devices are set to these temperatures. Therefore these temperatures where used as activation temperatures for car 2 and 3.

To remain the RHR scenario the second and third car are set equal to the release over time of the first car. This means that when the heat device is activated the car will immediately ignite. In the second model the distance between the cars stay equal to the first model, which should result in a propagation time of 12 and 24 minutes. When this is the case a variation in distances between the cars can be made to determine the effect of the parking distance on the propagation time.

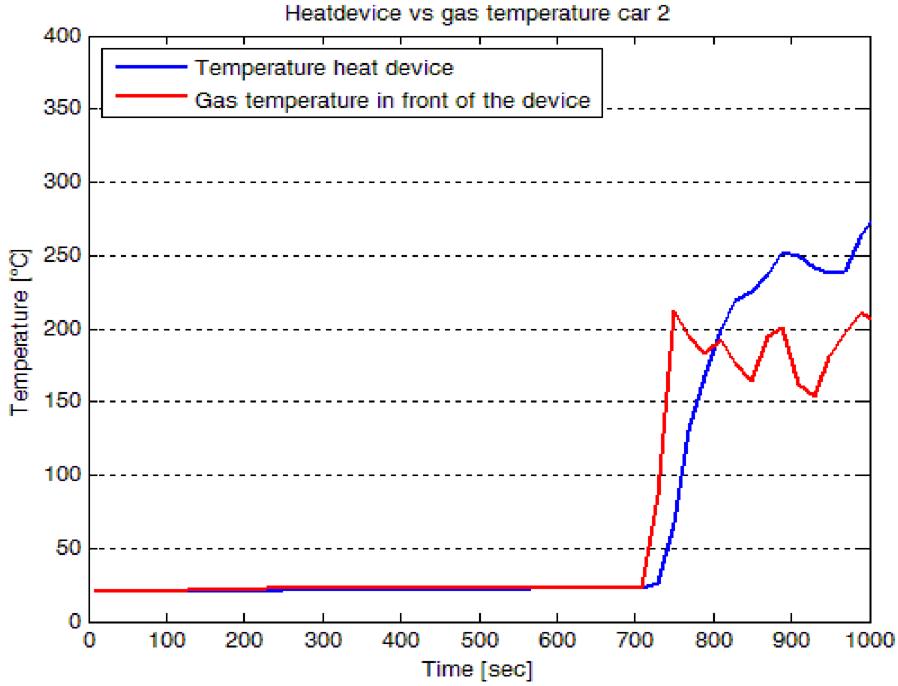


Figure 3-8 Comparison temperature calculated with heat device and gas temperature in front of car 2 at height 1.05m

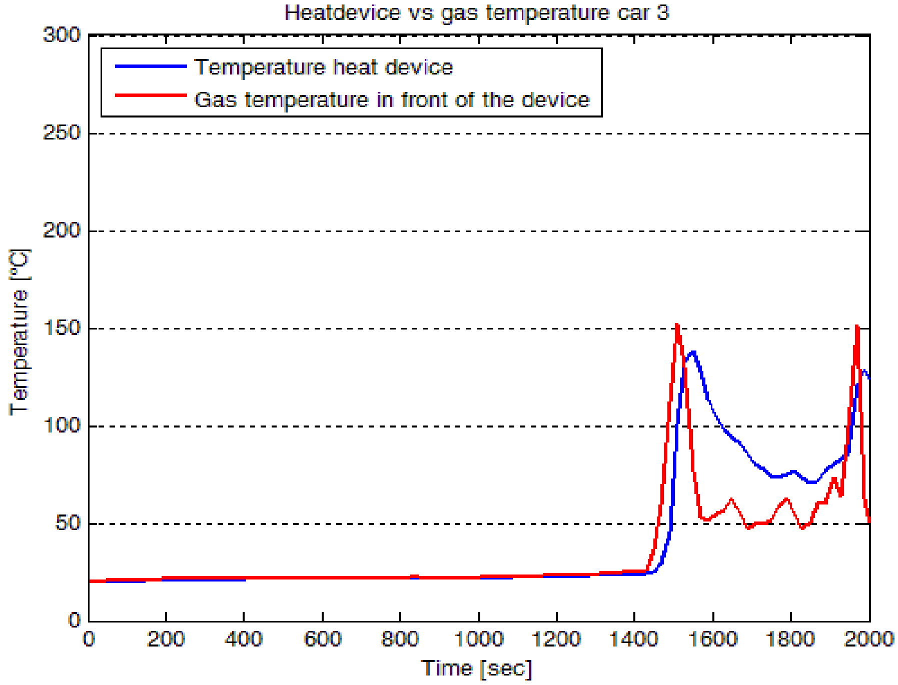


Figure 3-9 Comparison temperature calculated with heat device and gas temperature in front of car 3 at height 1.05m

3.2.1 Results

Model B

Figure 3-10 shows the comparison in gas temperatures at the bottom beam are located ten centimetres below the steel beam above the centre of the first car of model A and model B and the time when the second and third car ignite. The graph shows that in model B the second car ignites after 7.5 minutes, this is 4.5 minutes shorter than the propagation time of model A. The third car ignites after 24.5 minutes in model B this variates 30 seconds of model A. Figure 3-11 and 3-12 show the comparison of the temperature development in the heat device at 1.05 meter between model A and B, defining the ignition temperatures of the second, figure 3-11, and third, figure 3-12, car.

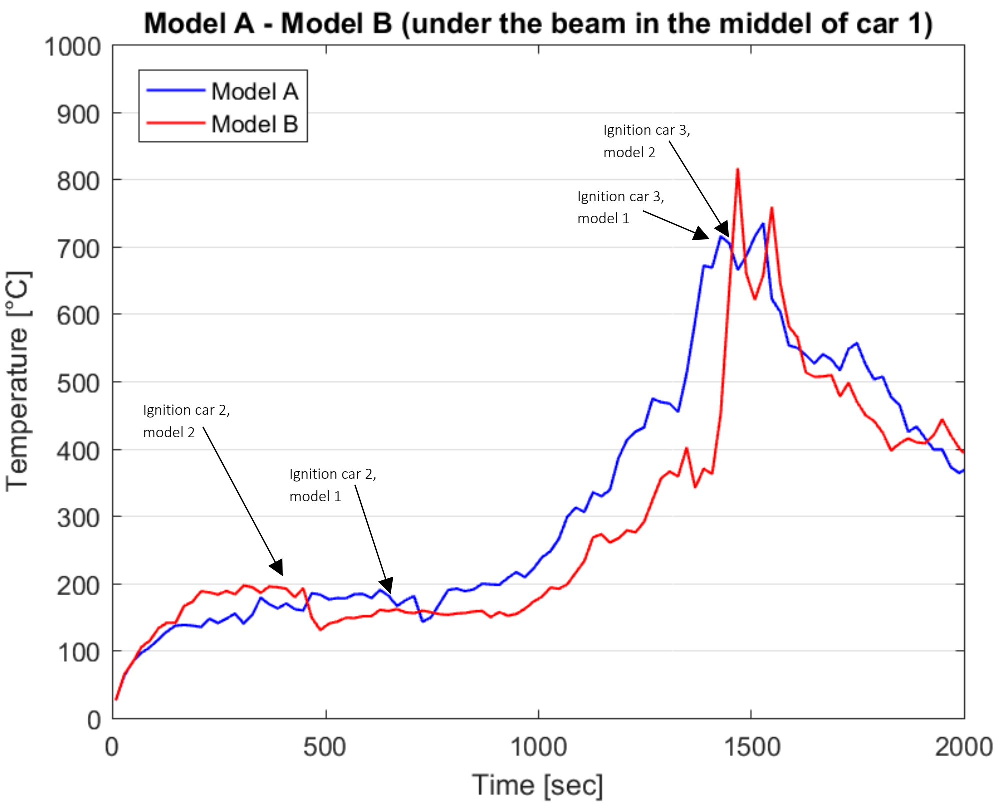


Figure 3-10 Comparison of temperature near the beam of model A and B with the propagation time to car 2 and 3

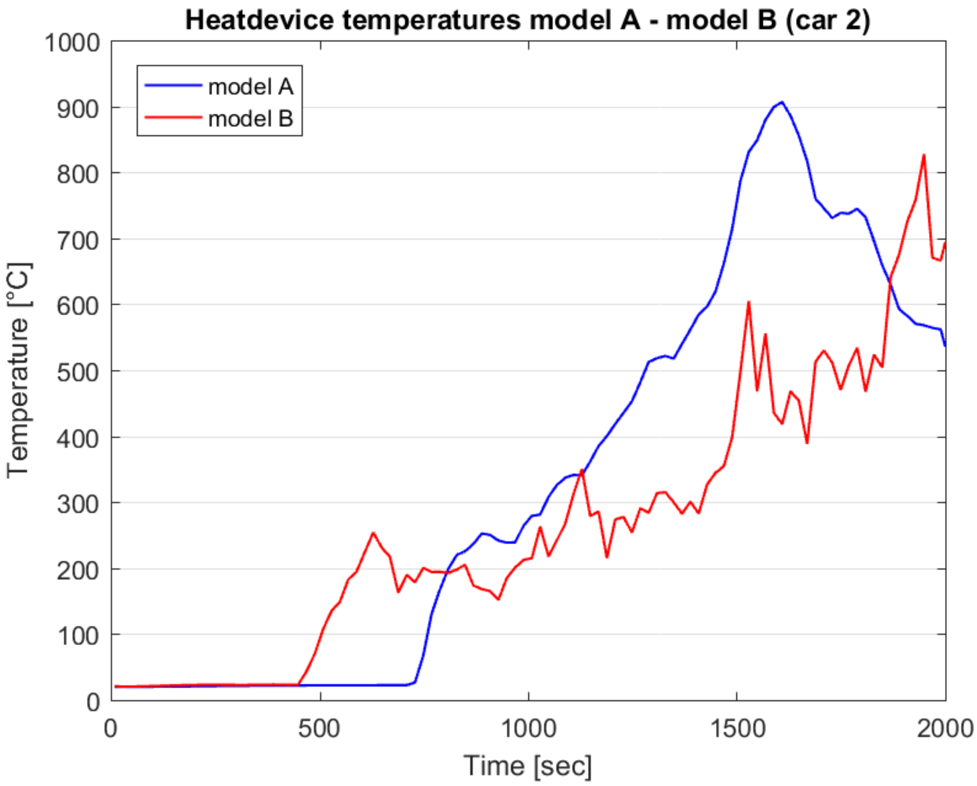


Figure 3-11 Temperature development in highest heat device car 2 comparing model A and B

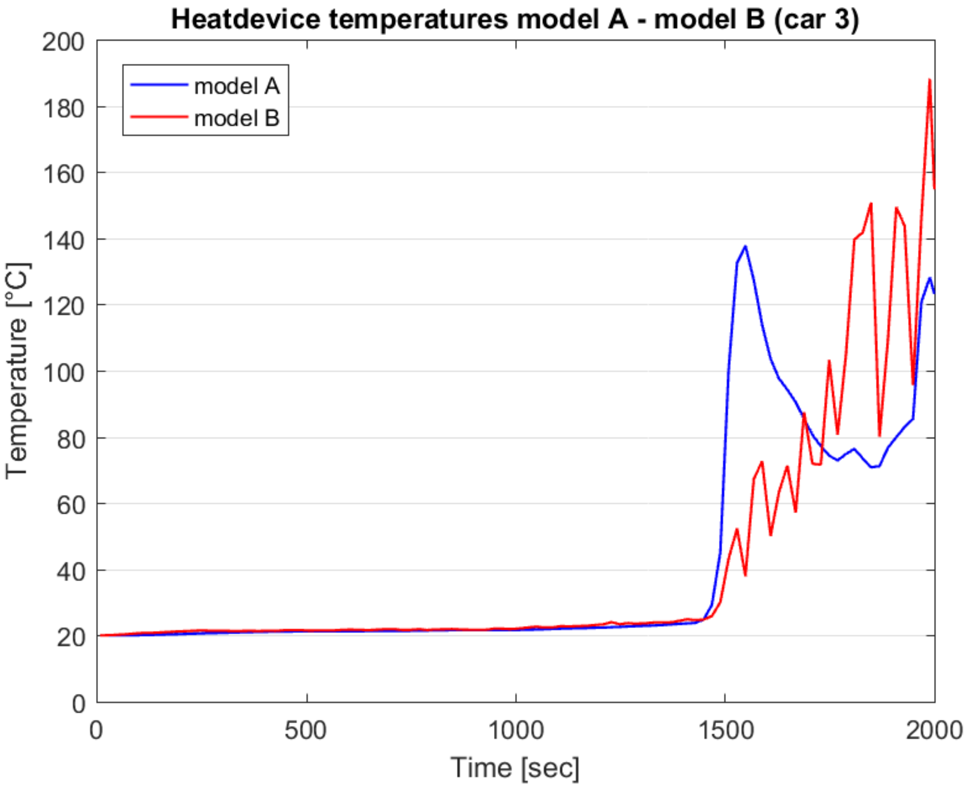


Figure 3-12 Temperature development in highest heat device car 3 comparing model A and B

<u>Model C</u>

Due to the instabilities in model B another model, model C, is created where the ignition is linked to two heat devices, see paragraph 3.2.2. Figure 3-13 shows the comparison in temperatures near the beam of model A and model C and the time when the second and third car ignite. The graph shows that the in model C the second car ignites after 19 minutes and the third car ignites after 25 minutes. Figure 3-14 and 3-15 show the comparison of the temperature development in the heat device at 1.05 meter between model A and C. Defining the ignition temperatures of the second, figure 3-14, and third, figure 3-15, car.

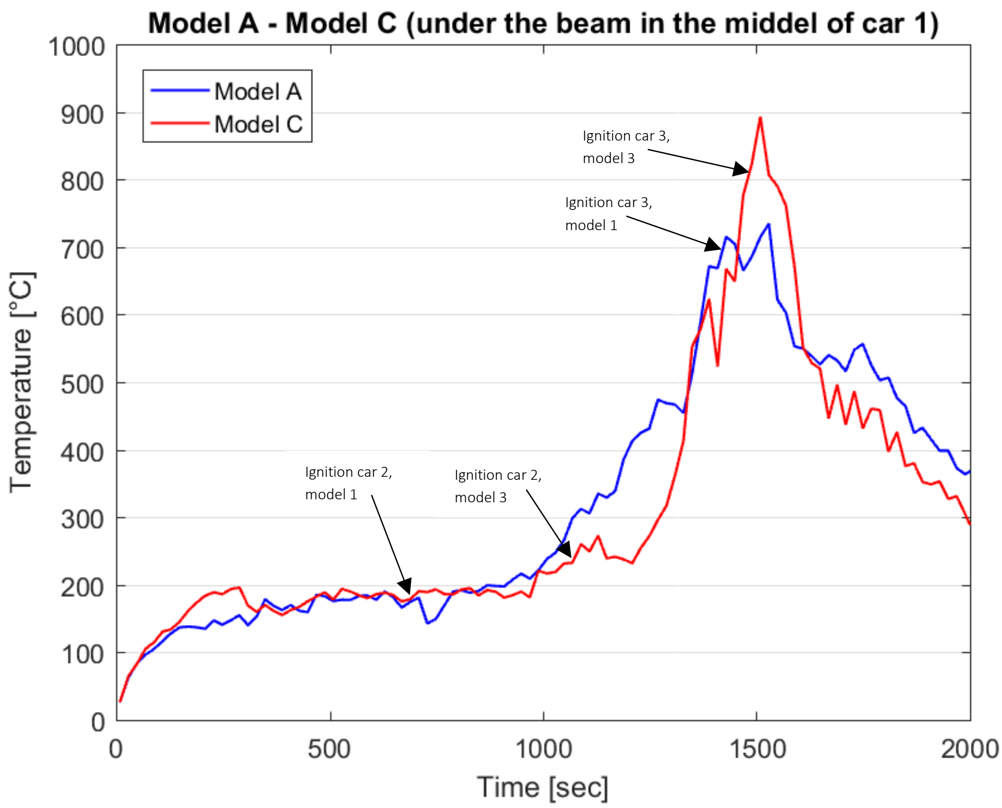


Figure 3-13 Comparison of temperature near the beam of model 1 and 3 with the propagation time to car 2 and 3

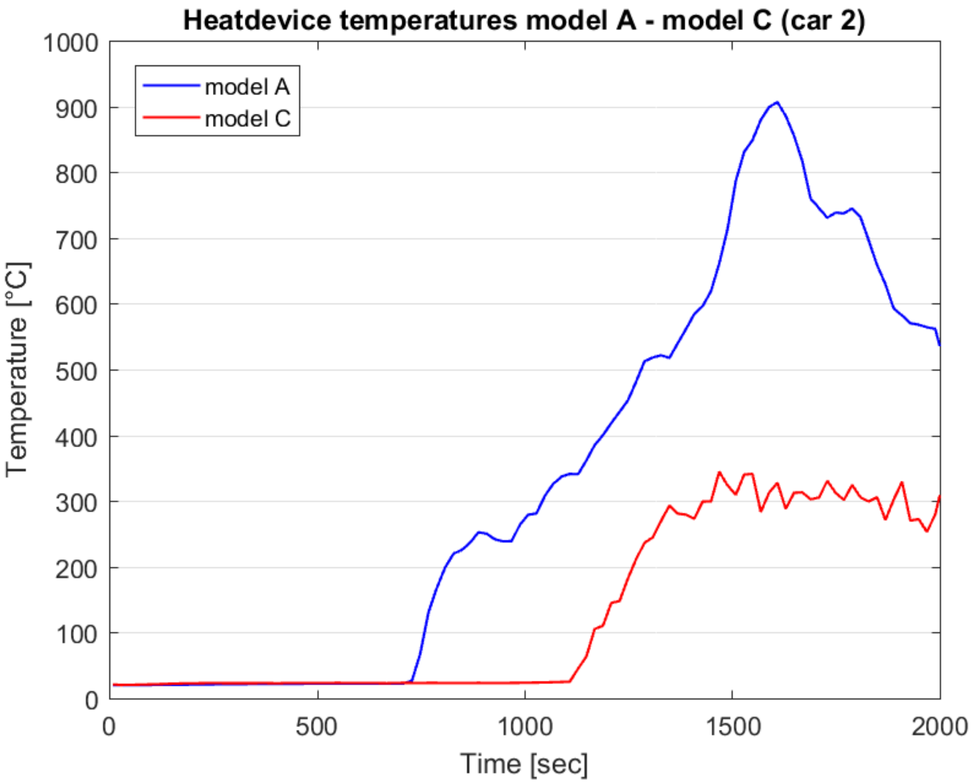


Figure 3-15 Temperature development in highest heat device car 2 comparing model A and C

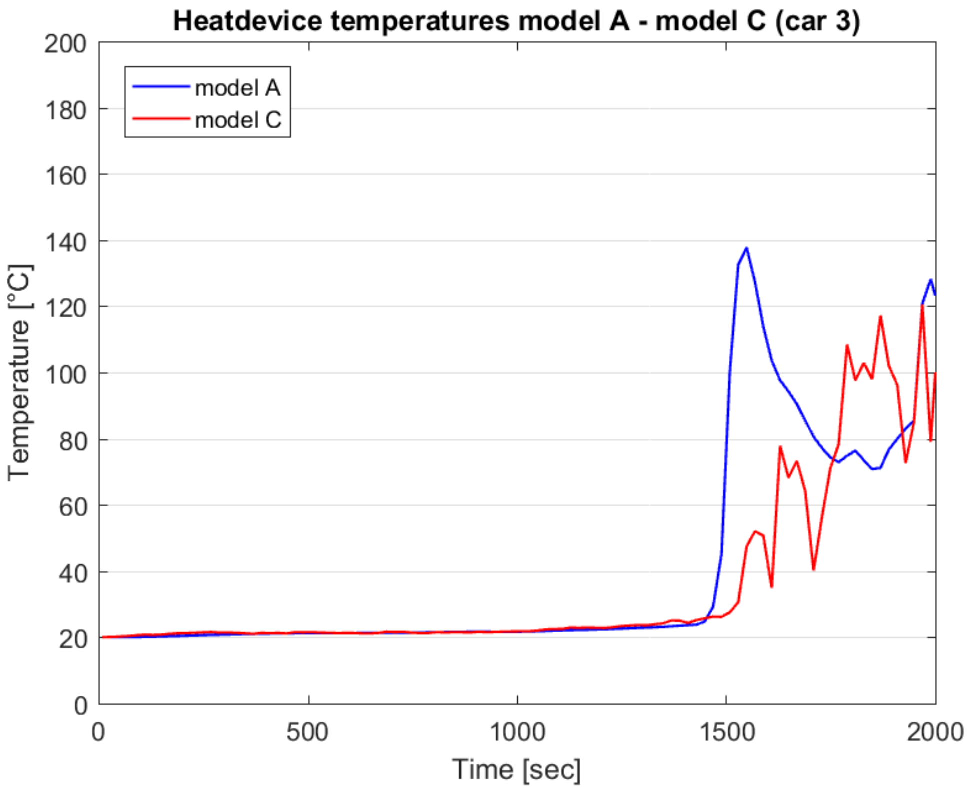


Figure 3-14 Temperature development in highest heat device car 3 comparing model A and C

3.2.2 Discussion

Model B

In model B the cars were linked to the highest heat device at 1.05 meter. The graph in figure 3-7 shows that the second car in model B is ignited 4.5 minutes before the second car was ignited in model A, where this was set at 12 minutes. Although the results from model 1 show that in the heat device 23°C is not reached before 12 minutes, the temperature is probably reached earlier due to the fluctuation in the calculated temperature. This is the result of the Large Eddies Simulation CFD method used in FDS. In this method Navier-Stokes equations [5] are filtered, this means that the small turbulent eddies are removed. The largest-scale motions of the flow are solved, while the small-scale motions are modelled: the filtering process generates additional unknowns that must be modelled in order to obtain closure [1]. This results in a fluctuation in the temperature calculation, it is probable that the temperature of 23°C is already reached earlier in model A but not displayed in the output.

To make the model more stable in a new model, model C, the cars are both linked to two heat devices. By linking the cars to not only the highest heat device but also to the second highest heat device and stating that the cars only ignite when both heat devices reach their temperatures the propagation time should be more stable.

Model C

The results from model C show that with the cars linked to two heat devices the cars still do not ignite at the same time as the first model. In this model the second car ignites not earlier but 7 minutes after the propagation occurs in model A, a larger difference than between model B and A. This is also the case for the third car, making the model still too unreliable to test the effect of the distance between the parked cars on the propagation time in FDS.

Resulting from this model can be concluded that calculating the propagation time in FDS with the use of heat device give unrealistic outcomes due to the low activation temperatures and the fluctuation.

[5] Navier Stokes equations: describe the motion of viscous fluid substances using newton's second law and the assumption that the stress in fluid is the sum of a viscous and pressure term [20].

3.3 Propagation criterion: Radiative heat flux

Another method to determine the propagation is to not use the gas temperature but the radiative heat flux. The advantage of the radiative heat flux is that this is more stable than the gas temperature. A disadvantage is that the car cannot directly be linked to the radiative heat flux calculation devices in FDS. So to calculate the effect of the distance between the parked cars first the radiative heat flux after 12 and 24 minutes with the average distance needs to be determined. Than the cars, including radiative heat flux devices, can be placed further or closer to each other and recalculate the radiative heat flux. The time corresponding with the radiative heat flux equal to the radiative heat flux at the propagations of the first model can then be set in another model to calculate the temperature development near the beam and determine the effect of the distance between the parked cars.

To test if the radiative heat flux is suitable to determine the propagation time the radiative heat flux of model A, B and C are compared. If the three models show the same radiative heat flux, till the moment the first propagation occurs in one of the models, this method can be used.

3.3.1 Results

Figure 3-16 shows the radiative heat flux of model A, B and C near the highest device of car 2. The graph shows that the radiative heat flux of model B till the first ignition, at 4.5 minutes, is higher than in model A, the same goes for model C.

For car 3 the radiative heat flux is presented in figure 3-17. This graph shows that the radiative heat flux of model A is higher than the other two models, till the 4.5 minutes where in model B the second car is ignited. From this point the radiative heat flux of model B is higher.

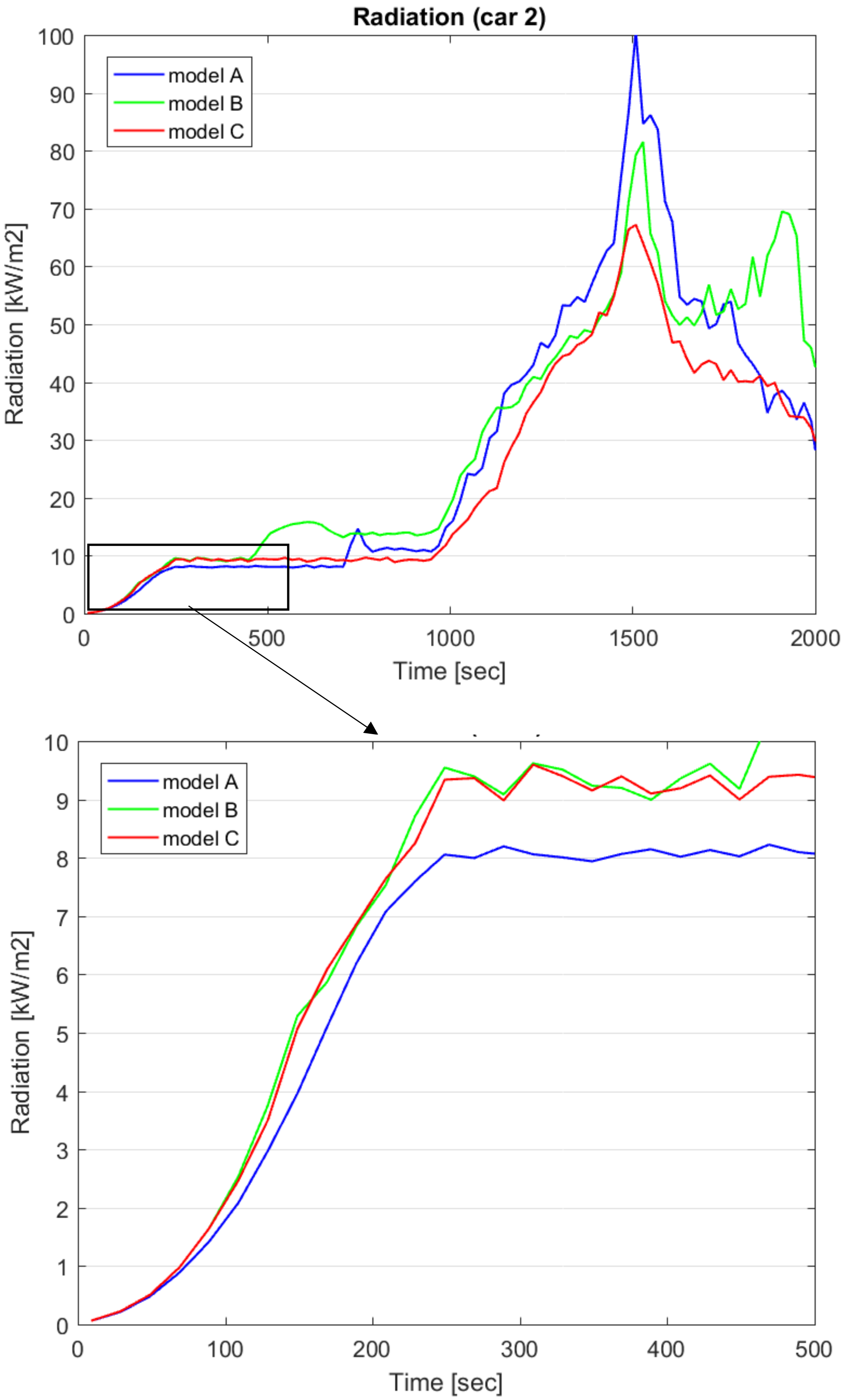


Figure 3-16 Radiative heat flux at 1.05m height at the centre of the side of car 2 facing car 1.

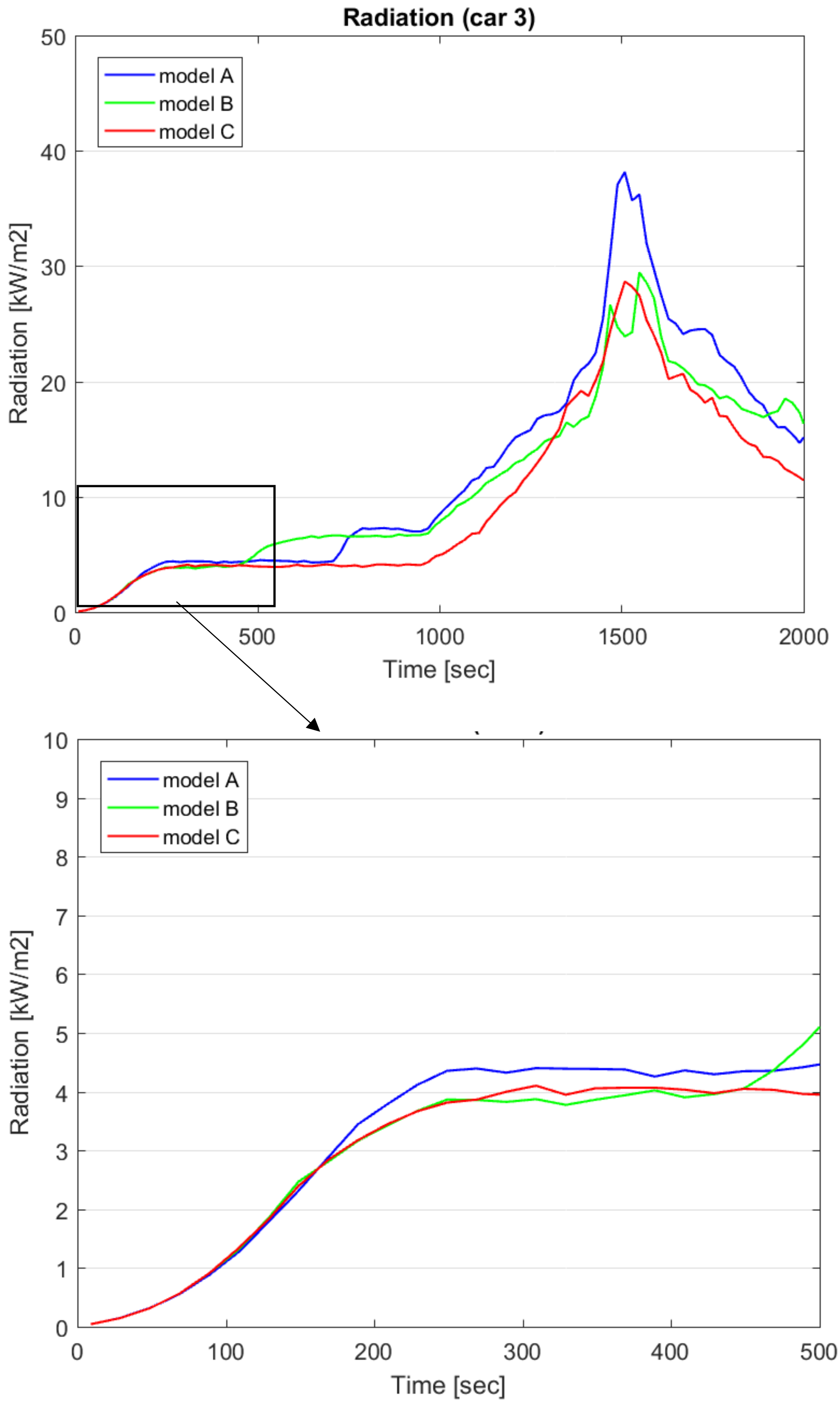


Figure 3-17 Radiative heat flux at 1.05m height at the centre of the front of car 3 facing car 1.

3.3.2 Discussion

As explained previously the radiative heat flux needed to be equal to ensure that the method works. Paragraph 3.2.4 however shows that this is not the case. The difference between the models is smaller than the difference in temperature but still too large to determine the propagation time on the calculated radiative heat flux.

Thereby according to equation 1 resulted from the literature study performed previous to the thesis the ignition of a material depends, besides the heat flux, also on the conductivity, density[6] and heat capacity [7][1]. When linking the propagation to the radiative heat flux the time delay resulting from warming up the material is not taken into a count. This means that the propagation time can also not depend on the radiative heat flux.

$$t_{ig} = \frac{\pi}{4}\bar{k}\rho c(\frac{T_{ig} - T_0}{q})^2$$ equation (1) [1]

Where,

t_{ig} = Time to auto ignite [s]
$\bar{k}$ = The material conductivity [W/m·°C]
ρ = Density [kg/m^3]
c = Specific heat capacity [J/K]
T_{ig} = Auto ignition temperature of the material [K]
T_0 = Initial temperature of the material [K]
q = Heat flux [W/m^2]

[6] Density, the ratio of the mass to the volume [21].
[7] heat capacity, the amount of heat required to change its temperature by one degree [22].

3.4 Propagation criterion: Surface temperature

As mentioned in the previous paragraph the conductivity, density and heat capacity of the material needs to be included to determine the propagation time. Therefor in a new model the surface temperatures are calculated. Because the surface temperature calculation devices in FDS can only be placed on surfaces car 2 and car 3 are replaced with slices with height of 1.5m creating a new basic model, see figure 3-19. The material properties (figure 3-18) of these slices are based upon the properties of the material with the lowest ignition temperature, rubber [1]. On both slices the surface calculation devices are placed in a grid of 0.5 * 1m. In a second model the slices are placed 25cm away from car 1, the third model this displacement becomes 50cm and in the last model the slices are placed 25cm towards the car. These model are created to determine the propagation time at with different distances between the parked cars. By determining the time when the temperature equal to the temperature of the basic model after 12 and 24 minutes, the default propagation time, the propagation time of the different distances can be established.

Property	Value
Density	920 kg/m^3
Specific Heat	1.88 kJ/kgK
Conductivity	0.13 W/mK

Figure 3-18 Material properties of rubber [13]

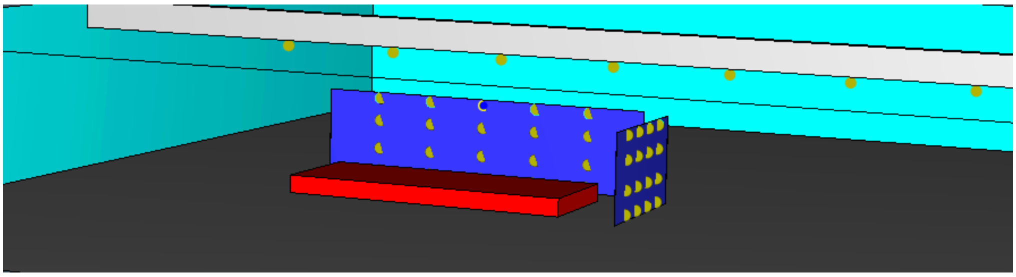


Figure 3-19 Overview of model where the surface temperatures are calculated.

3.4.1 Results

Figure 3-20 and 3-21 show the temperature development of the three models in the temperature devices 9 and 12 of the slice replacing car 2, these are de devices in the centre on a height of 1 and 1.4 meter. The black line in the graph is the temperature in the basic model after 12 minutes, the ignition temperature. Figure 3-22 and 3-23 show the same result for the slice replacing car 3, with a reference temperature calculated after 24 minutes. The graphs show that the temperature development is equal for all distances, with an increase in temperature regarding a shorter distance to the car fire.

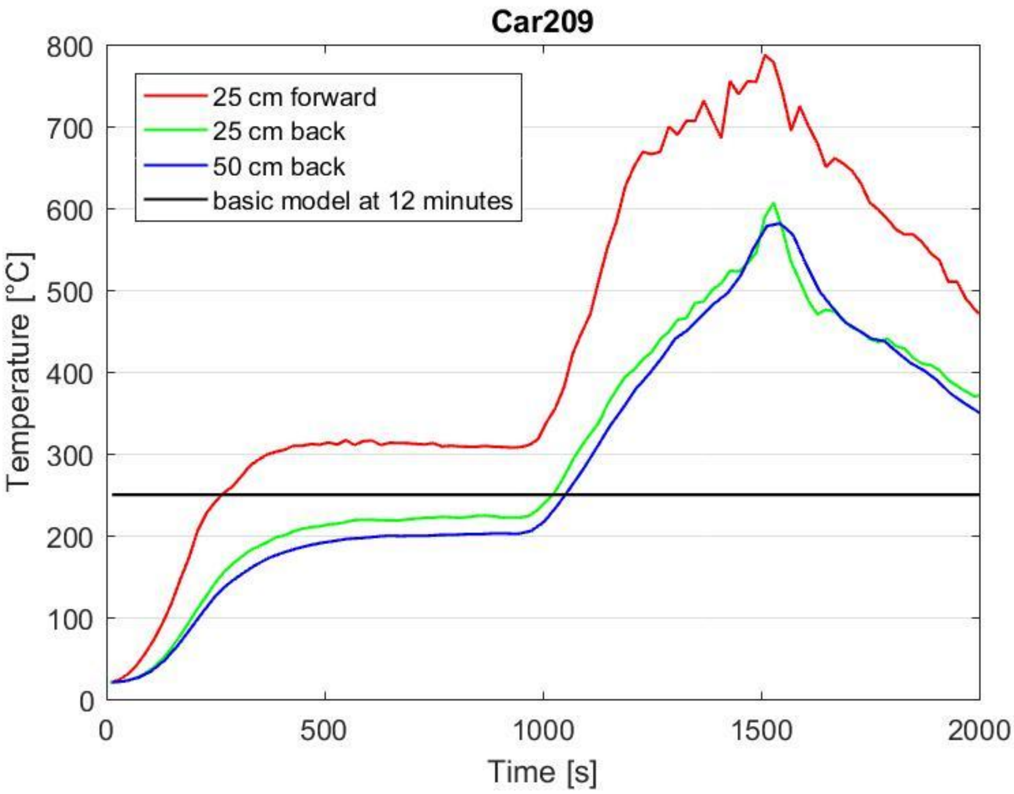


Figure 3-20 Temperature development of the three model compared to the basic model in device 9 of the slice replacing car 2

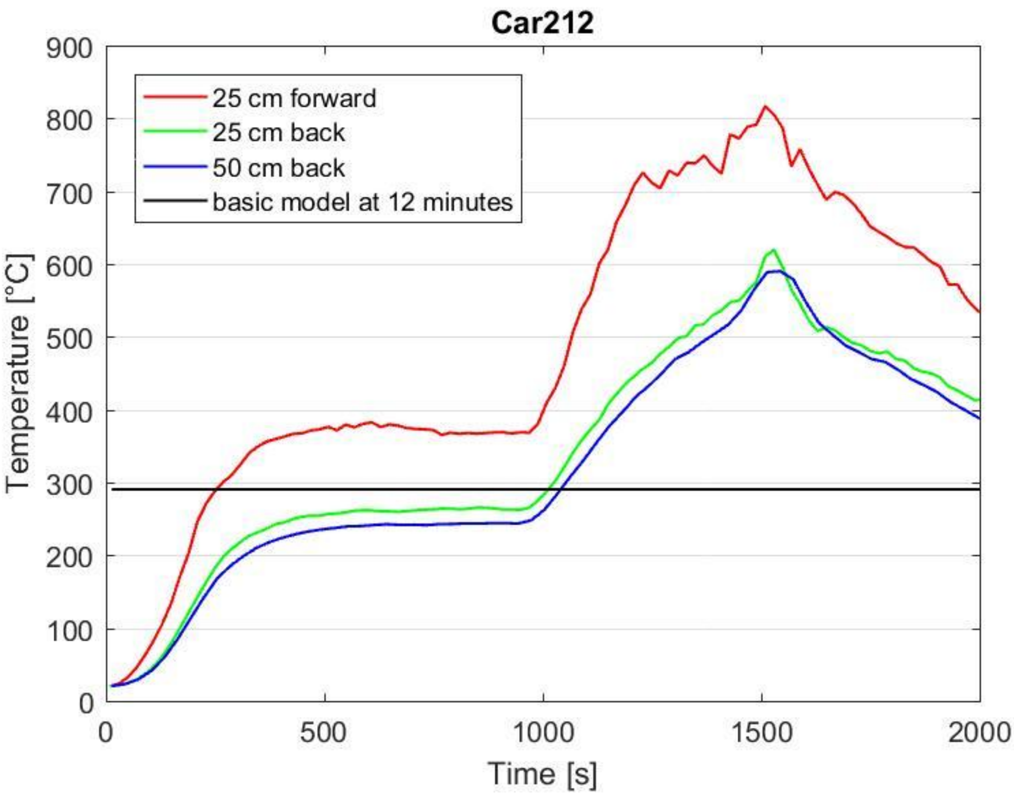


Figure 3-21 Temperature development of the three model compared to the basic model in device 12 of the slice replacing car 2

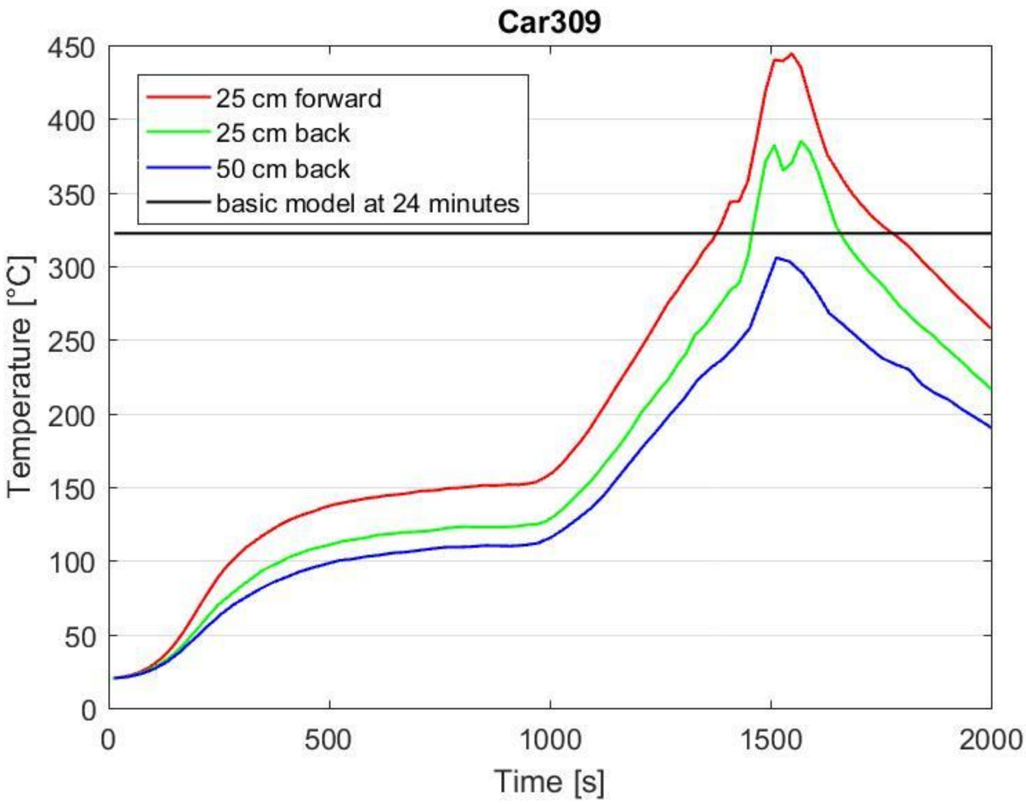


Figure 3-22 Temperature development of the three model compared to the basic model in device 9 of the slice replacing car 3

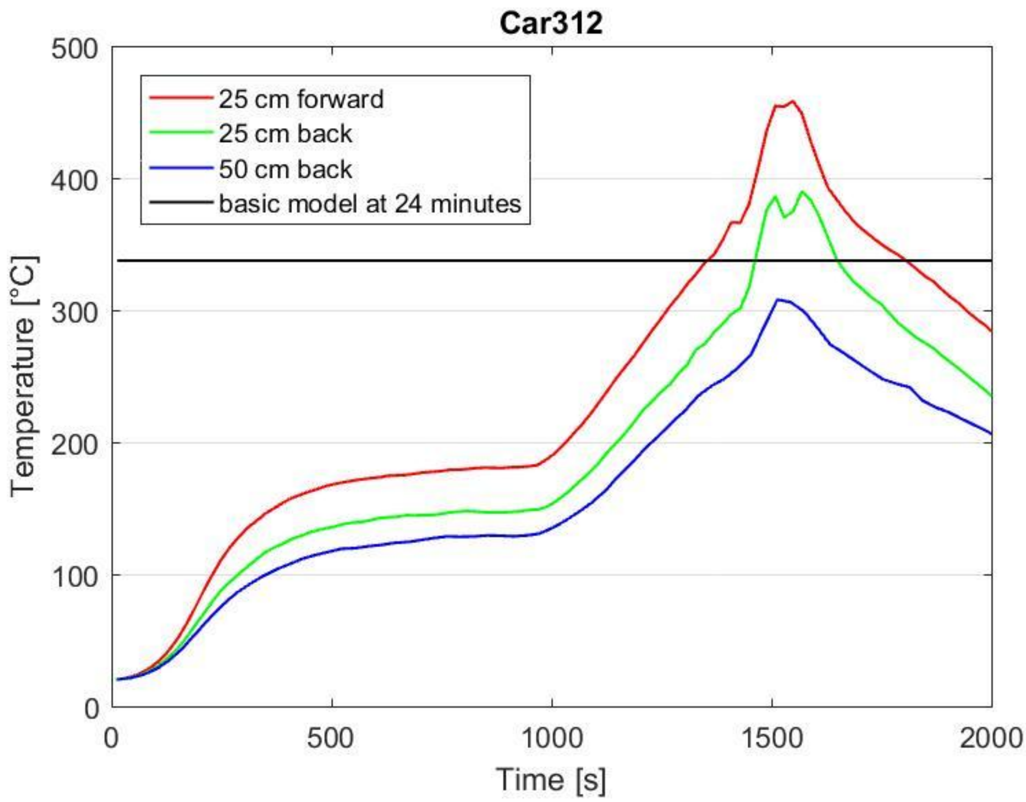


Figure 3-23 Temperature development of the three model compared to the basic model in device 12 of the slice replacing car 3

3.4.1 Discussion

The graphs in the previous paragraph show that temperature development over time is stable enough to determine the propagation time. However when looking at the RHR of the models, see figure 3-24, it shows that the temperature is high dependable on the rate of heat release, as also resulting from paragraph 3.1.2 and the sensitivity analysis in appendix IV. The rate of heat release development used for the simulations is based upon the RHR of CaPaFi. The development in CaPaFi is the result of measurements performed in the past and implemented as values at certain time steps. The development between those time steps is therefore not determined. Resulting in a high uncertainty about the accuracy of the RHR development. For example the RHR between 4 and 16 minutes stays stable, where there is actually some development. With a default propagation time of 12 minutes means that the temperature is reached earlier.

The results from these models and the results of the previous paragraphs shows that flame modelling as in [2] is suitable for predicting the heating of construction elements but is not suitable to determine the propagation time and using a set time is still the most reliable propagation criterion. A more detailed input of the RHR is necessary to increase the possibility of calculating the propagation time between two cars in FDS.

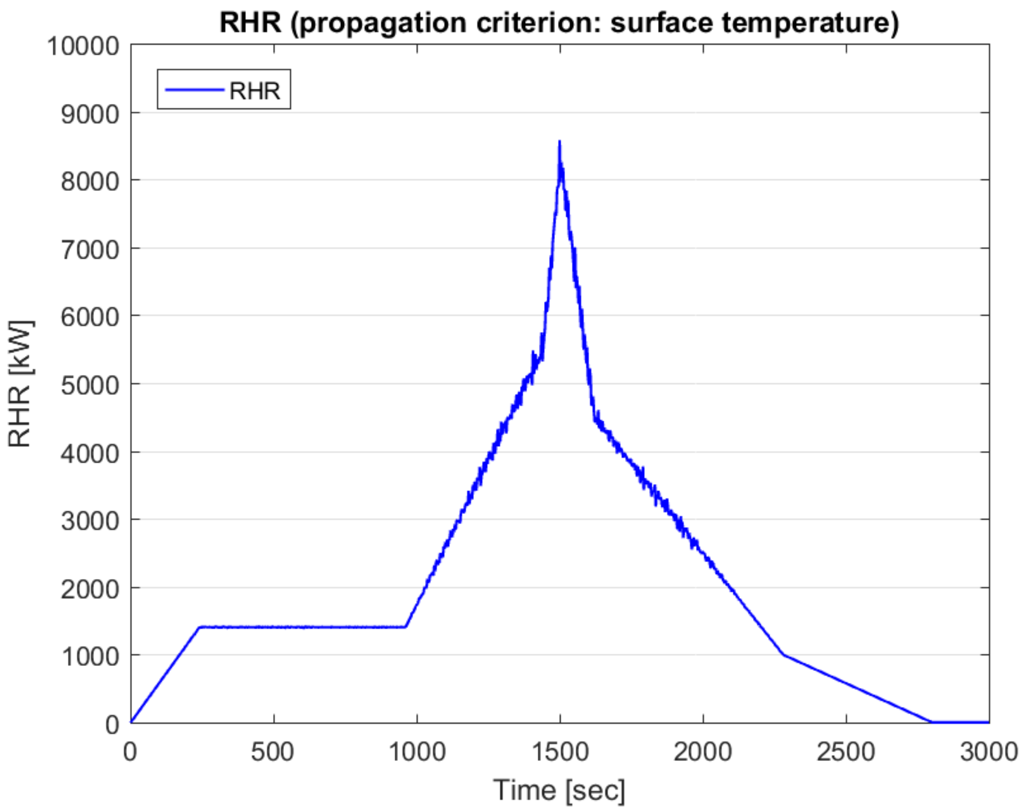


Figure 3-24 RHR development over time of model 4, where the slices are moved 50cm away from the car.

4 Conclusions and recommendations

This chapter concludes both parts, the analysis and research, of the thesis and answers the research questions set in the introduction. This followed by recommendation towards future research and software improvement.

4.1 Conclusions

In the beginning of this thesis the following research questions were drafted:

1. Is the FDS fire scenario of the Delft University of Technology suitable for large car parks, such as the Designer Outlet Center Roermond?
2. What are the possibilities in creating an FDS model where the model calculates the propagation time instead of using a set time?
3. What is the effect of the distance between the parked cars on the propagation time calculated in FDS?

As for the first question the analysis of the Designer Outlet Center shows that the difference in RHR per unit area between the DOC and TUDelft model was of the largest influence. With the correct RHR per unit area relating to the dimensions of the car the results became less conservative. This implies that also with a larger car park the fire scenario created in the TUDelft research can, when implemented correctly, be used for a realistically prediction of gas temperatures near a constructional beams due to a traveling fire. Resulting in more favourable temperatures than a CaPaFi calculation would for the same situation, which can lead to a prevention of an over dimensioning of the steel construction of the car park.

The second and third research questions are dealt with in the second part of the thesis, the research. The research part shows that with the use of a heat device the propagation time calculation in FDS is too instable. When the ignition of the second and third car were linked to one heat device the propagation time was 4.5 minutes faster than the default propagation time of 12 minutes. While with a link between the cars and two heat devices the propagation time was 7 minutes longer. This difference is due to the fluctuation in the calculated temperatures. These fluctuations are the result of the fact that FDS is based upon the Large Eddies Simulation method of CFD. Paragraph 3.3 showed that also the radiative heat flux calculated in FDS is too instable to link to a propagation time, due to the same fluctuations and the exclusion of the conductivity, density and heat capacity. The results of the research with the surface temperature as propagation criterion show that although the calculations of the surface temperatures are stable enough to determine the propagation time the RHR as it is implemented nowadays is not detailed enough to make a proper prediction of the propagation time.

Because the so far tested methods to calculate the propagation time in FDS, instead of using a set time, are not reliable enough a test on the effect of the distance between the parked cars on the propagation time will not give realistic results.

4.2 Recommendations

Based on this research study, this chapter gives recommendations for additional research needed to increase the knowledge on traveling fires in car parks and its simulations in FDS.

First there is a need for a validation experiment to determine if the assumable conclusions, now based on literature, are correct. Due to the unstable results of the research of the propagation time in FDS the effect of the distance between the parked cars on the propagation time remains unanswered. More research is therefore desirable, a good basis for this research could be the PHD research on “Multiple Vehicle Design Fire Scenarios in Car Parking Buildings” [14].

Other subject on this topic that need future research are:

- Designing the cars in FDS more as cars instead of square boxes with different material properties to create a more realistic fire scenario;
- Calculating the effect of the different sizes of cars, instead of using an average;
- Researching the effect of hybrid, electric and hydrogen cars, these have another fire scenario than a gasoline or diesel powered car;
- Testing the effect of other boundary condition, such as wind speed, - direction or ambient temperature, on the propagation time.

Recommendations regarding the software fire dynamic simulator are:

- Reconsideration of the method how the effect of smoke development on the temperature development is implemented;
- As also mentioned in [2] it is at the moment not possible to pause the model and resume another time in a windows operating system, which can be in some cases desirable;
- Creating the possibility to not only link the (de)activation of an object to a temperature but also other features such as heat flux.

5 References

[1] C. E. L. Mattheus, “Literature study : A traveling fire in an open car park A case study of the car park of Designer Outlet Centre Roermond,” 2016.

[2] C. Wong, Yan-Ying, “Steel structure in an open car park,” University of Technology Delft, 2014.

[3] R. A. Huizinga, N. Strating, and M. S. Drost-Hofman, “Brandbeveiligingsconcept: Parkeergarage Designer Outlet Center Roermond,” 2016.

[4] Difisek, “Car Park Fire (CaPaFi).” .

[5] R. Dijkstra, “Brandwerendheid bij een natuurlijke parkeergaragebrand,” Christelijke Hogeschool Windesheim, 2014.

[6] K. McGrattan, S. Hostikka, R. Mcdermott, J. Floyd, C. Weinschenk, and K. Overholt, “Fire Dynamics Simulator User ’ s Guide,” 2014.

[7] R. McDermott, “FDS release notes.” [Online]. Available: https://github.com/firemodels/fds-smv/wiki/FDS-Release-Notes.

[8] Dutch Ministry of the Interior and Kingdom Relations, “Dutch Building Decree (Bouwbesluit),” 2012.

[9] Nieman consultant engineers, *risicogebaseerde brandveiligheid van draagconstructies’*. 2014.

[10] M. Luciuk, “Temperature and Radiation.”

[11] E. Cresson, “Development of design rules for steel structures subjected to natural fires in closed car parks.”

[12] BRE, “Fire spread in car parks,” 2010.

[13] “Natural Rubber.” [Online]. Available: https://www.matbase.com/material-categories/natural-and-synthetic-polymers/elastomers/material-properties-of-natural-rubber-polyisoprene-ir.html#properties. [Accessed: 20-Dec-2016].

[14] M. Z. bin Mohd Tohir, “Multiple Vehicle Design Fire Scenarios in Car Parking Buildings by,” 2015.

[15] Nederlands Normalisatie-Instituut, “Nen 6055,” vol. 6055, 2011.

[16] B. Merci and Ghent University, “CFD in FSE.”

[17] Corrosionpedia, “Heat Release Rate (HRR).” [Online]. Available: https://www.corrosionpedia.com/definition/627/heat-release-rate-hrr. [Accessed: 08-Aug-2016].

[18] Bouwen met staal, “Profielfactor.” [Online]. Available: http://www.brandveiligmetstaal.nl/pag/295/1c_profielfactor.html. [Accessed: 26-Nov-2016].

[19] “Thermal conductivity.” [Online]. Available: https://en.wikipedia.org/wiki/Thermal_conductivity. [Accessed: 15-Jan-2017].

[20] "Navier–Stokes equations." [Online]. Available: https://en.wikipedia.org/wiki/Navier%E2%80%93Stokes_equations. [Accessed: 17-Dec-2016].

[21] "Density." [Online]. Available: http://www.introduction-to-physics.com/what-is-density.html. [Accessed: 15-Jan-2017].

[22] "Heat capacity." [Online]. Available: http://scienceworld.wolfram.com/physics/HeatCapacity.html. [Accessed: 15-Jan-2017].

[23] "Hydraulic Diameter." [Online]. Available: http://www.engineeringtoolbox.com/hydraulic-equivalent-diameter-d_458.html. [Accessed: 15-Jan-2017].

Appendix I: Overviews Designer Outlet Center

Locatie gegevens

Kadastrale Gemeente	Roermond
Kadastrale Sectie	K
Kadastraal Perceelnummer	11, 13, 14, 16, 17, 47, 48
Peilmaat	N.t.b.

Situatie

1 : 500

opdrachtgever :	DOC	werknr. :	67.02.31	d.d.	11/12/2015
werk :	DOC Roermond	teknr. :	OG-091	schaal :	1 : 500
onderdeel :	situatie			fase :	2
plaats :	Roermond	status :	definitief	form :	A1
				get. :	AMU

CONTINENTAL CAR PARKS

Continental Car Parks
Hietweideweg 10 || 7391 XX Twello
Postbus 69 || 7390 AB Twello
T 0571-277 340 E info@carparks.nl
F 0571-287 679 I www.carparks.nl

P

C:\Users\amu\Documents\Revit local files\670231_OVG_amu.rvt

11-12-2015 15:34:41

Bouwbesluittoetsing

Algemeen

- Maten in het werk te controleren.
- Alle afmetingen van staal-, en/of betonconstructies volgens statische berekeningen constructeur en/of opgave fabrikant.
- Toegankelijkheid: het gebouw is integraal toegankelijk.
- Fase 1 betreft stramien A tot Y (realisatie 2016)
- Fase 2 betreft stramien Y tot AJ (realisatie n.t.b.)
- De realisatie van het maaiveld en de terreinriolering zal door derden worden aangelegd en zal onderdeel uit maken van de aanlegvergunning van de Big Triangle.

Bouwbesluittoetsing

Algemeen

Het ontworpen gebouw is getoetst en voldoet aan de volgende, vigerende (wettelijke) bepalingen:
• Bouwbesluit 2012;
• Eurocode;
• Euroklassen;
• NEN, NEN-EN of EN-Normen (volgens de laatste uitgave van de van toepassing zijnde normen).

art. 1.2. Aantal personen
Er is geen nadere onderverdeling van gebruiksfuncties. De enige gebruiksfunctie die op het gebouw van toepassing is betreft "overige gebruiksfunctie".

Gebruiksfunctie	Aantal personen
• overige gebruiksfunctie, voor het personenvervoer:	geen eis.

art. 1.3. Gelijkwaardigheidsbepaling
Voor gelijkwaardigheidsbepaling wordt er gebruik gemaakt van uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

Veiligheid

afd. 2.1. Algemene sterkte van de bouwconstructie
Voor algemene sterkte van de bouwconstructie, zie constructief ontwerp en hoofdberekeningen constructie t.b.v. omgevingsvergunning van JVZ, d.d. 10-12-2015

afd. 2.2. Sterkte bij brand
Voor sterkte bij brand wordt gebruik gemaakt van de gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.3 Afscheiding van vloer, hellingbaan en trap
Voor afscheiding van vloer, trap en hellingbaan, zie tekening OG-100 t/m OG-109 & OG-300 t/m OG-302, d.d. 11-12-2015

Een voor personen bestemde vloer heeft bij een rand een niet beweegbare afscheiding als die rand meer dan 1 meter hoger ligt dan een aansluitende vloer, het aansluitende terrein of het aansluitende water. De vloeren hebben een vloerafscheiding van min. 1,0 meter hoog gemeten vanaf de vloer.
Artikel 2.19 – 1 een afscheiding heeft geen openingen groter dan een diameter van 0,5 meter, overeenkomstig met tabel 2.16. In afwijking van artikel 2.19 - 1 heeft een afscheiding als bedoeld in artikel 2.17 tot een hoogte van 0,7 m boven een vloer, een tredevlak of een vloer van een hellingbaan geen openingen waardoor een bol kan passeren met een doorsnede groter dan 0,1 m.
De horizontale afmeting tussen de afscheiding en vloer of trap mag niet meer bedragen dan 0,05 meter.
De bovenregel mag geen onderbreking hebben van meer dan 0,1 meter.
Een afscheiding heeft, ter voorkoming van het overklauteren, geen opstapmogelijkheden tussen 0,2 m en 0,7 m boven een vloer of een tredevlak.

afd. 2.4. Overbrugging van hoogteverschillen
Alle hoogteverschillen van meer dan 0,21 meter tussen vloeren waarover een vluchtroute voert worden overbrugd door middel van een trap of hellingbaan.

afd. 2.5. Trap
Voor trappen, zie tekening OG-100 t/m OG-109, d.d. 11-12-2015; OG-300 t/m OG-302, d.d. 11-12-2015

afd. 2.9. Beperking van het ontwikkelen van brand en rook
Voor beperking van het ontwikkelen van brand en rook, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-15.

afd. 2.10. Beperking van uitbreiding van brand
Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.11. Verdere beperking van uitbreiding van brand en beperking van verspreiding van rook
Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.12. Vluchtroutes
Voor de vluchtroutes, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015 en tekening OG-120, d.d. 11-12-2015.

Gezondheid

afd. 3.2. Bescherming tegen geluid van installaties
Het volgens NEN 5077 bepaald karakteristieke installatie-geluidsniveau (zie art. 3.8) is op een aangrenzend perceel gelegen verblijfsgebied zal niet hoger zijn dan 30 dB.

afd. 3.6. Luchtverversing
Een schacht voor een lift heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 3,2 dm^3/s per m^2 vloeroppervlakte van die liftschacht. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten of liftmachineruimte plaats.

De toilettenruimten zullen worden voorzien van luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 7 dm^3/s.

Een opslagruimte voor huishoudelijk afval met een vloeroppervlakte van meer dan 1,5 m^2 heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 10 dm^3/s per m^2 vloeroppervlakte van die ruimte. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten plaats.

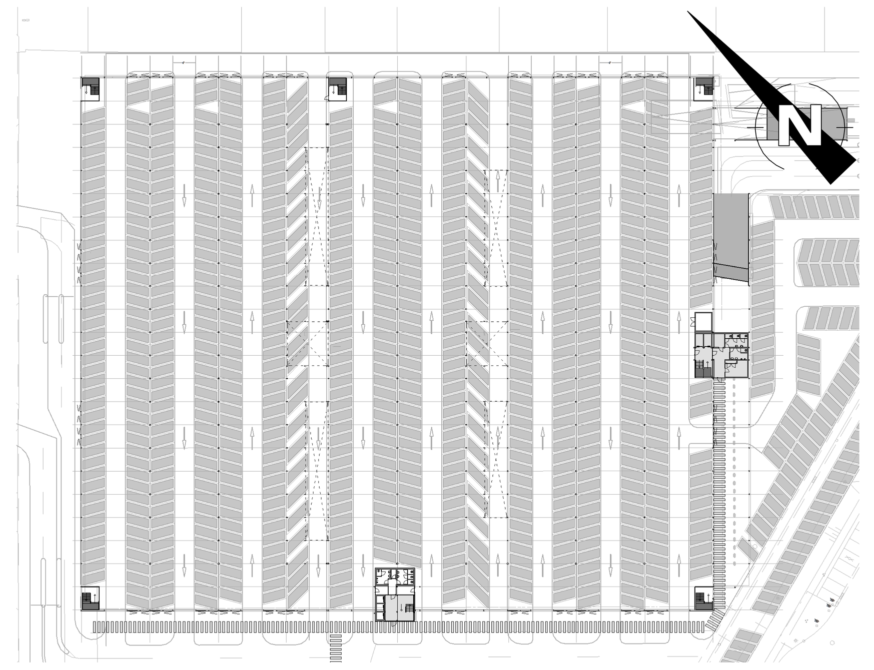
Renvooi

db	droge blusleiding
put	afvoerput hemelwater
hwa	standleiding hemelwaterafvoer
lm	lichtmast
dvb	doorvalbeveiliging 1000+ vloer
ap	aanrijpaal
	zelfsluitende deur
	30 min brandwerende wand
	meterkast
	hoogtemaat t.o.v. peil
	brandblusser, codering N=schuimblusser/ K=koolzuurblusser/ P=poederblusser, gewicht
	vluchtrouteaanduiding
nv	noodverlichting
0.0 [naam]	ruimtenummer inclusief naamgeving en gebruiksfunctie

aantal parkeerplaatsen

Verdieping	Fase	Aantal
1e verdieping	Fase 1	320
1e verdieping	Fase 2	341
2e verdieping	Fase 1	340
2e verdieping	Fase 2	334
3e verdieping	Fase 1	340
3e verdieping	Fase 2	334
4e verdieping	Fase 1	346
4e verdieping	Fase 2	340
		2695

← 74 vakken van fase 1 zijn van richting veranderd



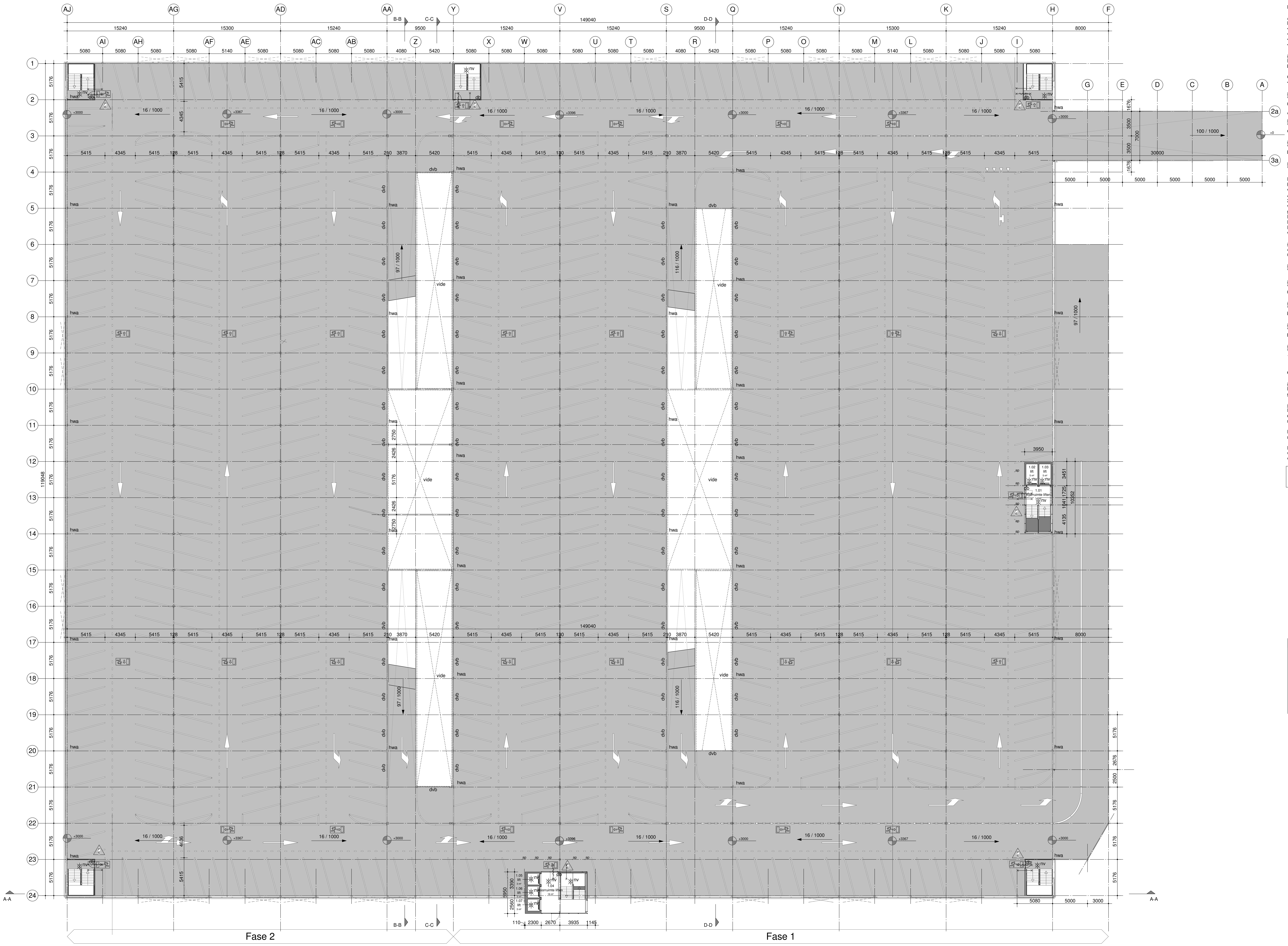
opdrachtgever :	DOC	werknr. :	67.02.31
werk :	DOC Roermond	teknr. :	OG-105
onderdeel :	begane grond - Fase 2	status :	definitief
plaats :	Roermond		

d.d. 11/12/2015
schaal : 1:200
fase : 2
form : A0
get. : rwu

CONTINENTAL CAR PARKS
Continental Car Parks
Hietweideweg 10 ॥ 7391 XX Twello
Postbus 69 ॥ 7390 AB Twello
T 0571-277 340 E info@carparks.nl
F 0571-287 679 I www.carparks.nl

C:\Users\amu\Documents\Revit local files\670231_OVG_amu.rvt

11-12-2015 15:13:33



Bouwbesluittoetsing

Algemeen

- Maten in het werk te controleren.
- Alle afmetingen van staal-, en/of betonconstructies volgens statische berekeningen constructeur en/of opgave fabrikant.
- Toegankelijkheid: het gebouw is integraal toegankelijk.
- Fase 1 betreft stramien A tot Y (realisatie 2016)
- Fase 2 betreft stramien Y tot AJ (realisatie n.t.b.)
- De realisatie van het maaiveld en de terreinriolering zal door derden worden aangelegd en zal onderdeel uit maken van de aanlegvergunning van de Big Triangle.

Bouwbesluittoetsing

Algemeen

Het ontworpen gebouw is getoetst en voldoet aan de volgende, vigerende (wettelijke) bepalingen:
- Bouwbesluit 2012;
- Eurocode;
- Euroklassen;
- NEN, NEN-EN of EN-Normen (volgens de laatste uitgave van de van toepassing zijnde normen).

art. 1.2. Aantal personen

Er is geen nadere onderverdeling van gebruiksfuncties. De enige gebruiksfunctie die op het gebouw van toepassing is betreft "overige gebruiksfunctie".

Gebruiksfunctie	Aantal personen
• overige gebruiksfunctie, voor het personenvervoer:	geen eis.

art. 1.3. Gelijkwaardigheidsbepaling

Voor gelijkwaardigheidsbepaling wordt er gebruik gemaakt van uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

Veiligheid

afd. 2.1. Algemene sterkte van de bouwconstructie

Voor algemene sterkte van de bouwconstructie, zie constructief ontwerp en hoofdberekeningen constructie t.b.v. omgevingsvergunning van JVZ, d.d. 10-12-2015

afd. 2.2. Sterkte bij brand

Voor sterkte bij brand wordt gebruik gemaakt van de gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.3 Afscheiding van vloer, hellingbaan en trap

Voor afscheiding van vloer, trap en hellingbaan, zie tekening OG-100 t/m OG-109 & OG-300 t/m OG-302, d.d. 11-12-2015

Een voor personen bestemde vloer heeft bij een rand een niet beweegbare afscheiding als die rand meer dan 1 meter hoger ligt dan een aansluitende vloer, het aansluitende terrein of het aansluitende water. De vloeren hebben een vloerafscheiding van min. 1,0 meter hoog gemeten vanaf de vloer.
Artikel 2.19 – 1 een afscheiding heeft geen openingen groter dan een diameter van 0,5 meter, overeenkomstig met tabel 2.16. In afwijking van artikel 2.19 - 1 heeft een afscheiding als bedoeld in artikel 2.17 tot een hoogte van 0,7 m boven een vloer, een tredevlak of een vloer van een hellingbaan geen openingen waardoor een bol kan passeren met een doorsnede groter dan 0,1 m.
De horizontale afmeting tussen de afscheiding en vloer of trap mag niet meer bedragen dan 0,05 meter.
De bovenregel mag geen onderbreking hebben van meer dan 0,1 meter.
Een afscheiding heeft, ter voorkoming van het overklauteren, geen opstapmogelijkheden tussen 0,2 m en 0,7 m boven een vloer of een tredevlak.

afd. 2.4. Overbrugging van hoogteverschillen

Alle hoogteverschillen van meer dan 0,21 meter tussen vloeren waarover een vluchtroute voert worden overbrugd door middel van een trap of hellingbaan.

afd. 2.5. Trap

Voor trappen, zie tekening OG-100 t/m OG-109, d.d. 11-12-2015; OG-300 t/m OG-302, d.d. 11-12-2015

afd. 2.9. Beperking van het ontwikkelen van brand en rook

Voor beperking van het ontwikkelen van brand en rook, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-15.

afd. 2.10. Beperking van uitbreiding van brand

Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.11. Verdere beperking van uitbreiding van brand en beperking van verspreiding van rook

Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.12. Vluchtroutes

Voor de vluchtroutes, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015 en tekening OG-120, d.d. 11-12-2015.

Gezondheid

afd. 3.2. Bescherming tegen geluid van installaties

Het volgens NEN 5077 bepaald karakteristieke installatie-geluidsniveau (zie art. 3.8) is op een aangrenzend perceel gelegen verblijfsgebied zal niet hoger zijn dan 30 dB.

afd. 3.6. Luchtverversing

Een schacht voor een lift heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 3,2 dm³/s per m² vloeroppervlakte van die liftschacht. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten of liftmachineruimte plaats.

De toilettenruimten zullen worden voorzien van luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 7 dm³/s.

Een opslagruimte voor huishoudelijk afval met een vloeroppervlakte van meer dan 1,5 m² heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 10 dm³/s per m² vloeroppervlakte van die ruimte. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten plaats.

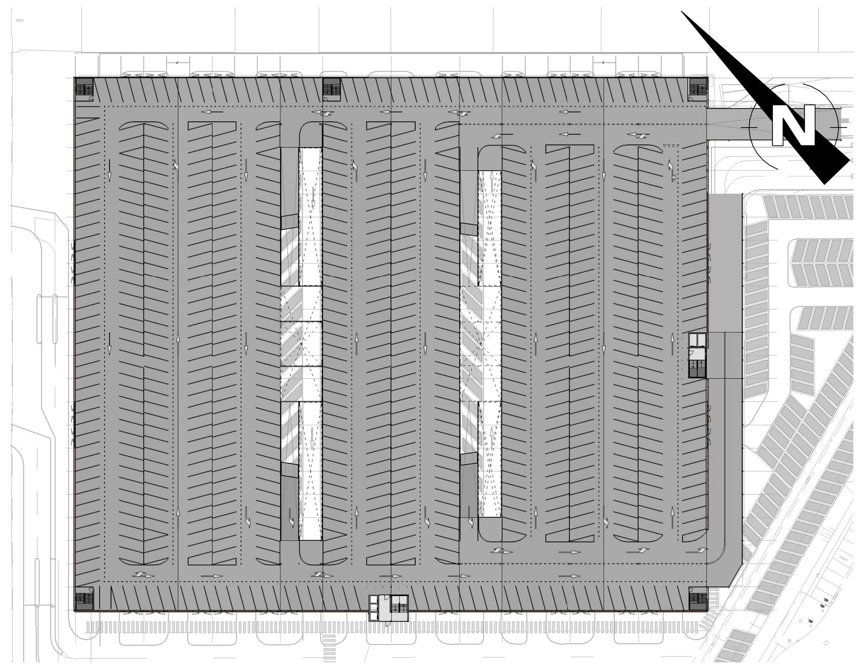
Renvooi

db	droge blusleiding
put	afvoerput hemelwater
hwa	standleiding hemelwaterafvoer
lm	lichtmast
dvb	doorvalbeveiliging 1000+ vloer
ap	aanrijpaal
—	zelfsluitende deur
—	30 min brandwerende wand
—	meterkast
—	hoogtemaat t.o.v. peil
—	brandblusser, codering N=schuimblusser/ K=koolzuurblusser/ P=poederblusser, gewicht
—	vluchtrouteaanduiding
nv	noodverlichting
0.0 [naam]	ruimtenummer inclusief naamgeving en gebruiksfunctie

aantal parkeerplaatsen

Verdieping	Fase	Aantal
1e verdieping	Fase 1	320
1e verdieping	Fase 2	341
2e verdieping	Fase 1	340
2e verdieping	Fase 2	334
3e verdieping	Fase 1	340
3e verdieping	Fase 2	334
4e verdieping	Fase 1	346
4e verdieping	Fase 2	340
		2695

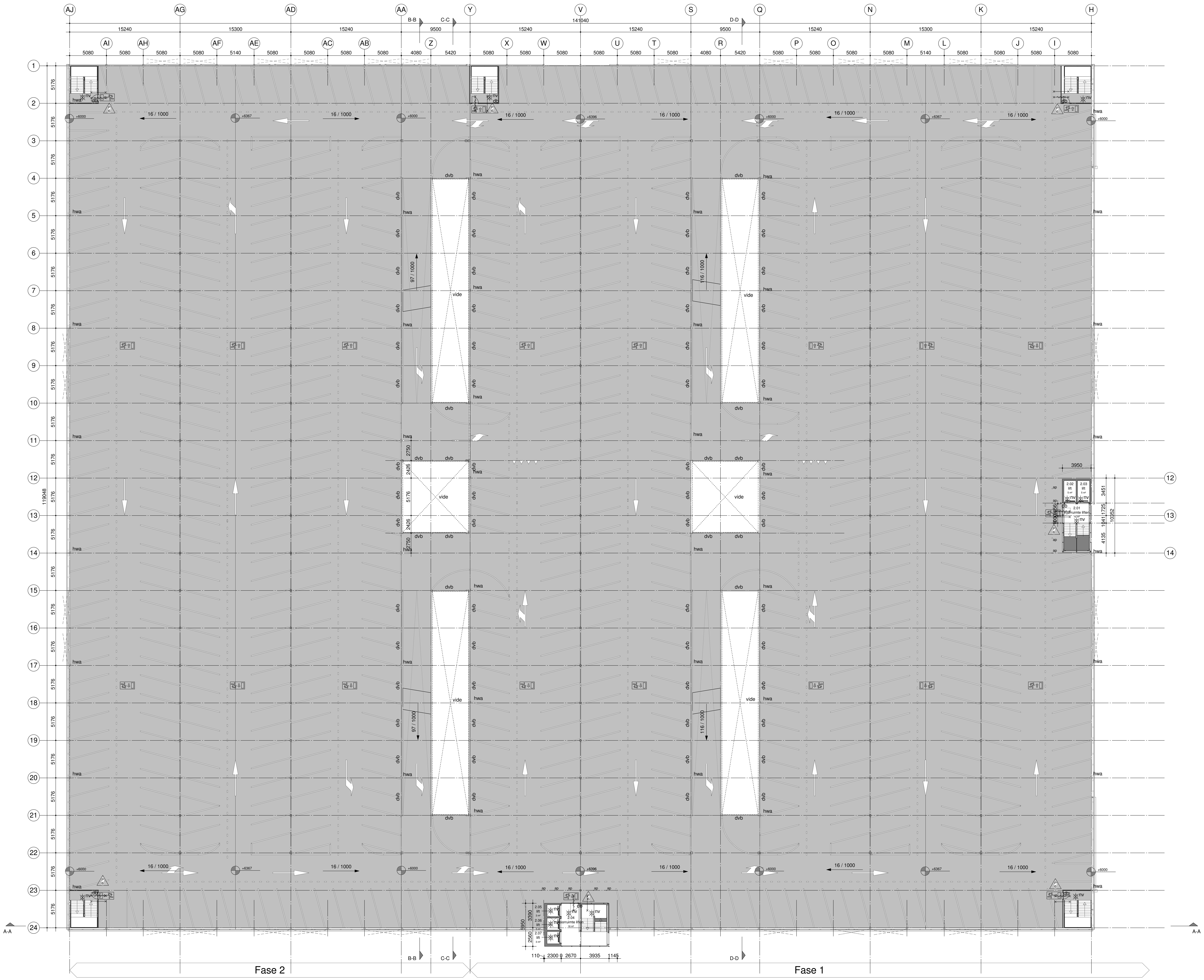
74 vakken van fase 1 zijn van richting veranderd



opdrachtgever : DOC	werknr. : 67.02.31	d.d.	11/12/2015
werk : DOC Roermond	teknr. : OG-106	schaal	: 1:200
onderdeel : 1e verdieping - Fase 2		fase	: 2
plaats : Roermond	status : definitief	form	: A0
		get.	: rwu

Continental Car Parks
Hietweideweg 10 ॥ 7391 XX Twello
Postbus 69 ॥ 7390 AB Twello
T 0571-277 340 E info@carparks.nl
F 0571-287 679 I www.carparks.nl

11-12-2015 15:13:54



Bouwbesluittoetsing

Algemeen
- Maten in het werk te controleren.
- Alle afmetingen van staal-, en/of betonconstructies volgens statische berekeningen constructeur en/of opgave fabrikant.
- Toegankelijkheid: het gebouw is integraal toegankelijk.
- Fase 1 betreft stramien A tot Y (realisatie 2016)
- Fase 2 betreft stramien Y tot AJ (realisatie n.t.b.)
- De realisatie van het maaiveld en de terreinriolering zal door derden worden aangelegd en zal onderdeel uit maken van de aanlegvergunning van de Big Triangle.

Bouwbesluittoetsing

Algemeen
Het ontworpen gebouw is getoetst en voldoet aan de volgende, vigerende (wettelijke) bepalingen:
- Bouwbesluit 2012;
- Eurocode;
- Euroklassen;
- NEN, NEN-EN of EN-Normen (volgens de laatste uitgave van de van toepassing zijnde normen).

art. 1.2. Aantal personen
Er is geen nadere onderverdeling van gebruiksfuncties. De enige gebruiksfunctie die op het gebouw van toepassing is betreft "overige gebruiksfunctie".

Gebruiksfunctie	Aantal personen
• overige gebruiksfunctie, voor het personenvervoer:	geen eis.

art. 1.3. Gelijkwaardigheidsbepaling
Voor gelijkwaardigheidsbepaling wordt er gebruik gemaakt van uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

Veiligheid
afd. 2.1. Algemene sterkte van de bouwconstructie
Voor algemene sterkte van de bouwconstructie, zie constructief ontwerp en hoofdberekeningen constructie t.b.v. omgevingsvergunning van JVZ, d.d. 10-12-2015

afd. 2.2. Sterkte bij brand
Voor sterkte bij brand wordt gebruik gemaakt van de gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.3 Afscheiding van vloer, hellingbaan en trap
Voor afscheiding van vloer, trap en hellingbaan, zie tekening OG-100 t/m OG-109 & OG-300 t/m OG-302, d.d. 11-12-2015

Een voor personen bestemde vloer heeft bij een rand een niet beweegbare afscheiding als die rand meer dan 1 meter hoger ligt dan een aansluitende vloer, het aansluitende terrein of het aansluitende water. De vloeren hebben een vloerafscheiding van min. 1,0 meter hoog gemeten vanaf de vloer.
Artikel 2.19 – 1 een afscheiding heeft geen openingen groter dan een diameter van 0,5 meter, overeenkomstig met tabel 2.16. In afwijking van artikel 2.19 - 1 heeft een afscheiding als bedoeld in artikel 2.17 tot een hoogte van 0,7 m boven een vloer, een tredevlak of een vloer van een hellingbaan geen openingen waardoor een bol kan passeren met een doorsnede groter dan 0,1 m.
De horizontale afmeting tussen de afscheiding en vloer of trap mag niet meer bedragen dan 0,05 meter.
De bovenregel mag geen onderbreking hebben van meer dan 0,1 meter.
Een afscheiding heeft, ter voorkoming van het overklauteren, geen opstapmogelijkheden tussen 0,2 m en 0,7 m boven een vloer of een tredevlak.

afd. 2.4. Overbrugging van hoogteverschillen
Alle hoogteverschillen van meer dan 0,21 meter tussen vloeren waarover een vluchtroute voert worden overbrugd door middel van een trap of hellingbaan.

afd. 2.5. Trap
Voor trappen, zie tekening OG-100 t/m OG-109, d.d. 11-12-2015; OG-300 t/m OG-302, d.d. 11-12-2015

afd. 2.9. Beperking van het ontwikkelen van brand en rook
Voor beperking van het ontwikkelen van brand en rook, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-15.

afd. 2.10. Beperking van uitbreiding van brand
Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.11. Verdere beperking van uitbreiding van brand en beperking van verspreiding van rook
Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.12. Vluchtroutes
Voor de vluchtroutes, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015 en tekening OG-120, d.d. 11-12-2015.

Gezondheid

afd. 3.2. Bescherming tegen geluid van installaties
Het volgens NEN 5077 bepaald karakteristieke installatie-geluidsniveau (zie art. 3.8) is op een aangrenzend perceel gelegen verblijfsgebied zal niet hoger zijn dan 30 dB.

afd. 3.6. Luchtverversing
Een schacht voor een lift heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 3,2 dm^3/s per m^2 vloeroppervlakte van die liftschacht. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten of liftmachineruimte plaats.

De toilettenruimten zullen worden voorzien van luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 7 dm^3/s.

Een opslagruimte voor huishoudelijk afval met een vloeroppervlakte van meer dan 1,5 m^2 heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 10 dm^3/s per m^2 vloeroppervlakte van die ruimte. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten plaats.

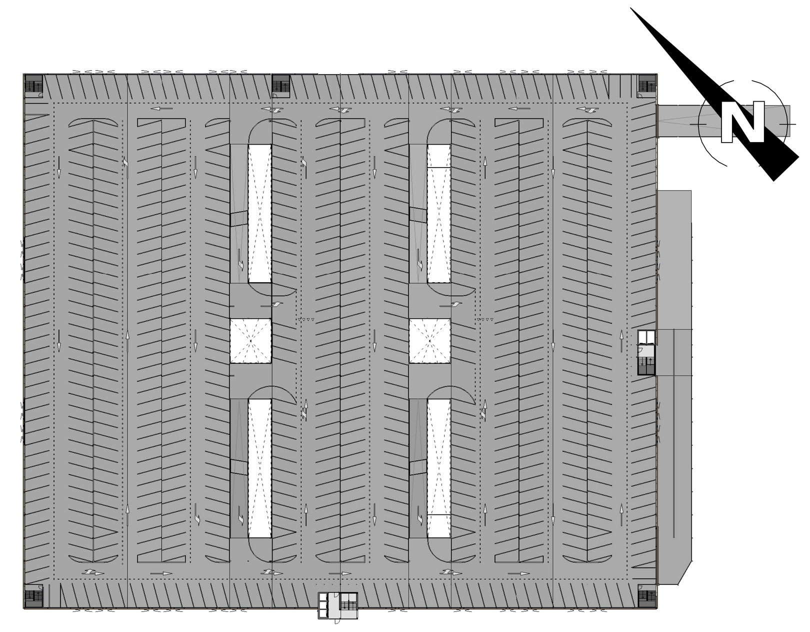
Renvooi

db	droge blusleiding
put	afvoerput hemelwater
hwa	standleiding hemelwaterafvoer
lm	lichtmast
dvb	doorvalbeveiliging 1000+ vloer
ap	aanrijpaal
	zelfsluitende deur
	30 min brandwerende wand
	meterkast
	hoogtemaat t.o.v. peil
N 6	brandblusser, codering N=schuimblusser/ K=koolzuurblusser/ P=poederblusser, gewicht
	vluchtrouteaanduiding
nv	noodverlichting
0.0 [naam]	ruimtenummer inclusief naamgeving en gebruiksfunctie

aantal parkeerplaatsen

Verdieping	Fase	Aantal
1e verdieping	Fase 1	320
1e verdieping	Fase 2	341
2e verdieping	Fase 1	340
2e verdieping	Fase 2	334
3e verdieping	Fase 1	340
3e verdieping	Fase 2	334
4e verdieping	Fase 1	346
4e verdieping	Fase 2	340
		2695

74 vakken van fase 1 zijn van richting veranderd

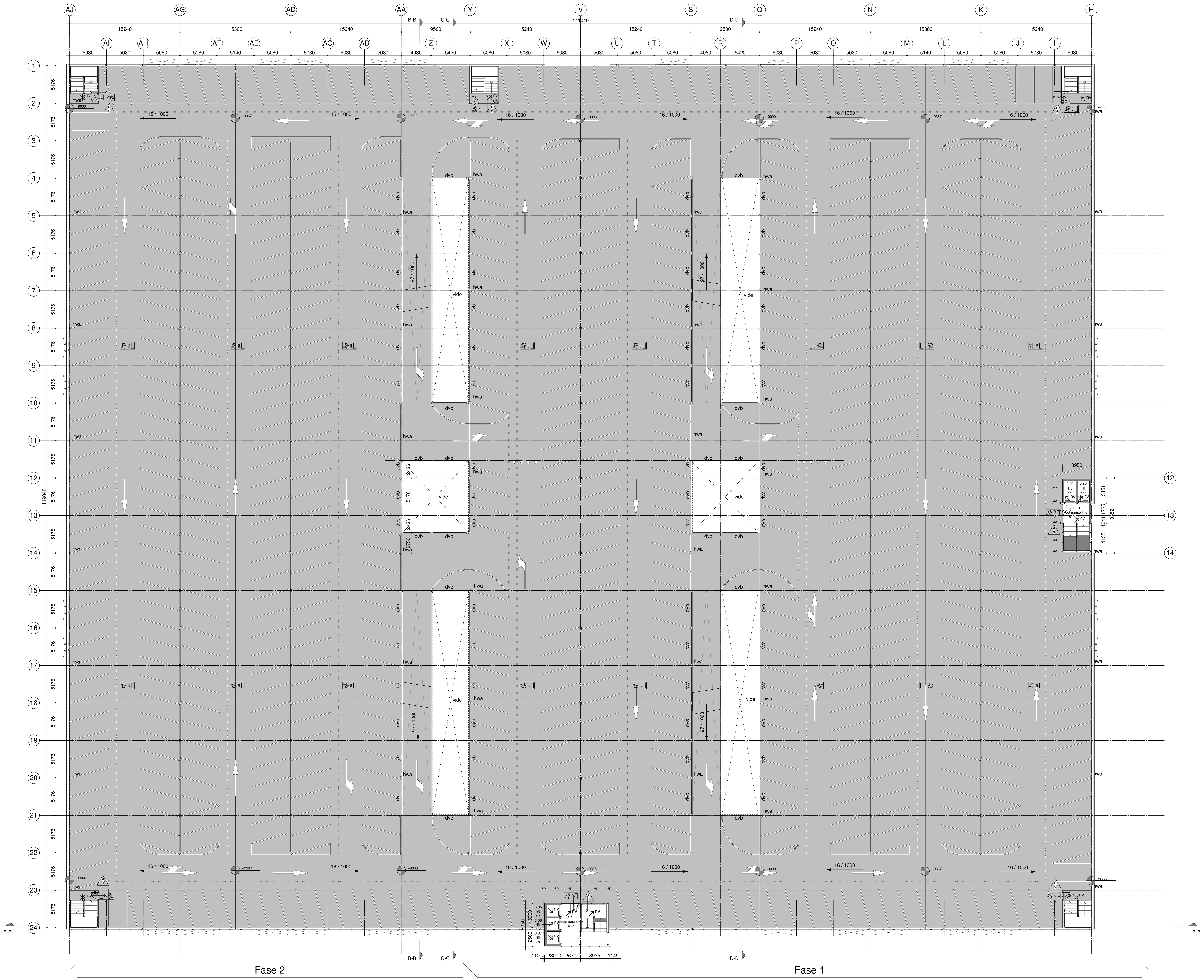


opdrachtgever	: DOC	werknr.	: 67.02.31	d.d.	11/12/2015
werk	: DOC Roermond	teknr.	: OG-107	schaal	: 1:200
onderdeel	: 2e verdieping - Fase 2			fase	: 2
plaats	: Roermond	status	: definitief	form	: A0
				get.	: rwu

Continental Car Parks
Hietweideweg 10 ॥ 7391 XX Twello
Postbus 69 ॥ 7390 AB Twello
T 0571-277 340 E info@carparks.nl
F 0571-287 679 I www.carparks.nl

C:\Users\amu\Documents\Revit local files\670231_OVG_amu.rvt

11-12-2015 15:14:12



Bouwbesluittoetsing

Algemeen

- Maten in het werk te controleren.
- Alle afmetingen van staal-, en/of betonconstructies volgens statische berekeningen constructeur en/of opgave fabrikant.
- Toegankelijkheid: het gebouw is integraal toegankelijk.
- Fase 1 betreft stramien A tot Y (realisatie 2016)
- Fase 2 betreft stramien Y tot AJ (realisatie n.t.b.)
- De realisatie van het maaiveld en de terreinriolering zal door derden worden aangelegd en zal onderdeel uit maken van de aanlegvergunning van de Big Triangle.

Bouwbesluittoetsing

Algemeen

Het ontworpen gebouw is getoetst en voldoet aan de volgende, vigerende (wettelijke) bepalingen:

• Bouwbesluit 2012;
• Eurocode;
• Euroklassen;
• NEN, NEN-EN of EN-Normen (volgens de laatste uitgave van de van toepassing zijnde normen).

art. 1.2. Aantal personen

Er is geen nadere onderverdeling van gebruiksfuncties. De enige gebruiksfunctie die op het gebouw van toepassing is betreft “overige gebruiksfunctie”.

Gebruiksfunctie	Aantal personen
• overige gebruiksfunctie, voor het personenvervoer:	geen eis.

art. 1.3. Gelijkwaardigheidsbepaling

Voor gelijkwaardigheidsbepaling wordt er gebruik gemaakt van uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

Veiligheid

afd. 2.1. Algemene sterkte van de bouwconstructie

Voor algemene sterkte van de bouwconstructie, zie constructief ontwerp en hoofdberekeningen constructie t.b.v. omgevingsvergunning van JVZ, d.d. 10-12-2015

afd. 2.2. Sterkte bij brand

Voor sterkte bij brand wordt gebruik gemaakt van de gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.3 Afscheiding van vloer, hellingbaan en trap

Voor afscheiding van vloer, trap en hellingbaan, zie tekening OG-100 t/m OG-109 & OG-300 t/m OG-302, d.d. 11-12-2015

Een voor personen bestemde vloer heeft bij een rand een niet beweegbare afscheiding als die rand meer dan 1 meter hoger ligt dan een aansluitende vloer, het aansluitende terrein of het aansluitende water. De vloeren hebben een vloerafscheiding van min. 1,0 meter hoog gemeten vanaf de vloer.
Artikel 2.19 – 1 een afscheiding heeft geen openingen groter dan een diameter van 0,5 meter, overeenkomstig met tabel 2.16. In afwijking van artikel 2.19 - 1 heeft een afscheiding als bedoeld in artikel 2.17 tot een hoogte van 0,7 m boven een vloer, een tredevlak of een vloer van een hellingbaan geen openingen waardoor een bol kan passeren met een doorsnede groter dan 0,1 m.
De horizontale afmeting tussen de afscheiding en vloer of trap mag niet meer bedragen dan 0,05 meter.
De bovenregel mag geen onderbreking hebben van meer dan 0,1 meter.
Een afscheiding heeft, ter voorkoming van het overklauteren, geen opstapmogelijkheden tussen 0,2 m en 0,7 m boven een vloer of een tredevlak.

afd. 2.4. Overbrugging van hoogteverschillen

Alle hoogteverschillen van meer dan 0,21 meter tussen vloeren waarover een vluchtroute voert worden overbrugd door middel van een trap of hellingbaan.

afd. 2.5. Trap

Voor trappen, zie tekening OG-100 t/m OG-109, d.d. 11-12-2015; OG-300 t/m OG-302, d.d. 11-12-2015

afd. 2.9. Beperking van het ontwikkelen van brand en rook

Voor beperking van het ontwikkelen van brand en rook, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-15.

afd. 2.10. Beperking van uitbreiding van brand

Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.11. Verdere beperking van uitbreiding van brand en beperking van verspreiding van rook

Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.12. Vluchtroutes

Voor de vluchtroutes, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015 en tekening OG-120, d.d. 11-12-2015.

Gezondheid

afd. 3.2. Bescherming tegen geluid van installaties

Het volgens NEN 5077 bepaald karakteristieke installatie-geluidsniveau (zie art. 3.8) is op een aangrenzend perceel gelegen verblijfsgebied zal niet hoger zijn dan 30 dB.

afd. 3.6. Luchtverversing

Een schacht voor een lift heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 3,2 dm^3/s per m^2 vloeroppervlakte van die liftschacht. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten of liftmachineruimte plaats.

De toilettenruimten zullen worden voorzien van luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 7 dm^3/s.

Een opslagruimte voor huishoudelijk afval met een vloeroppervlakte van meer dan 1,5 m^2 heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 10 dm^3/s per m^2 vloeroppervlakte van die ruimte. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten plaats.

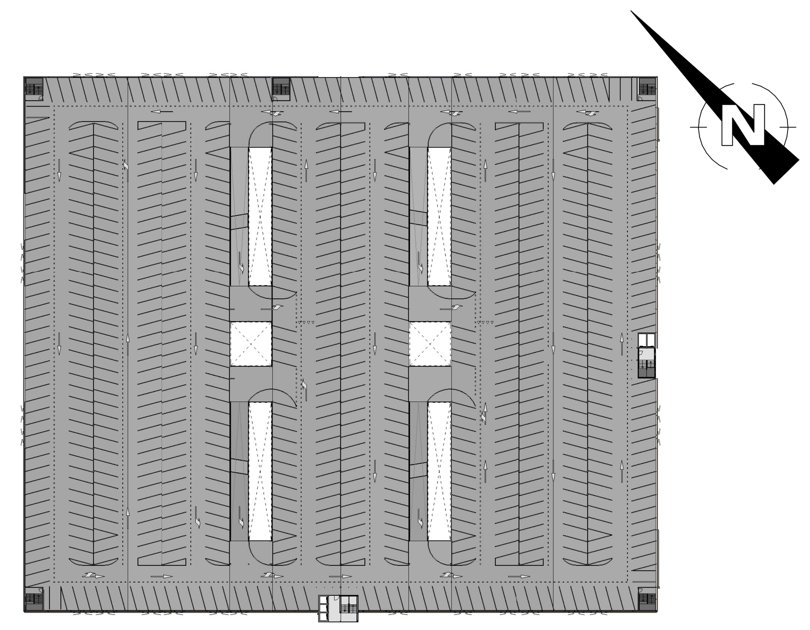
Renvooi

db	droge blusleiding
put	afvoerput hemelwater
hwa	standleiding hemelwaterafvoer
lm	lichtmast
dvb	doorvalbeveiliging 1000+ vloer
ap	aanrijpaal
	zelfsluitende deur
	30 min brandwerende wand
	meterkast
	hoogtemaat t.o.v. peil
N 6	brandblusser, codering N=schuimblusser/ K=koolzuurblusser/ P=poederblusser, gewicht
	vluchtrouteaanduiding
nv	noodverlichting
0.0 [naam]	ruimtenummer inclusief naamgeving en gebruiksfunctie

aantal parkeerplaatsen

Verdieping	Fase	Aantal
1e verdieping	Fase 1	320
1e verdieping	Fase 2	341
2e verdieping	Fase 1	340
2e verdieping	Fase 2	334
3e verdieping	Fase 1	340
3e verdieping	Fase 2	334
4e verdieping	Fase 1	346
4e verdieping	Fase 2	340
		2695

← 74 vakken van fase 1 zijn van richting veranderd

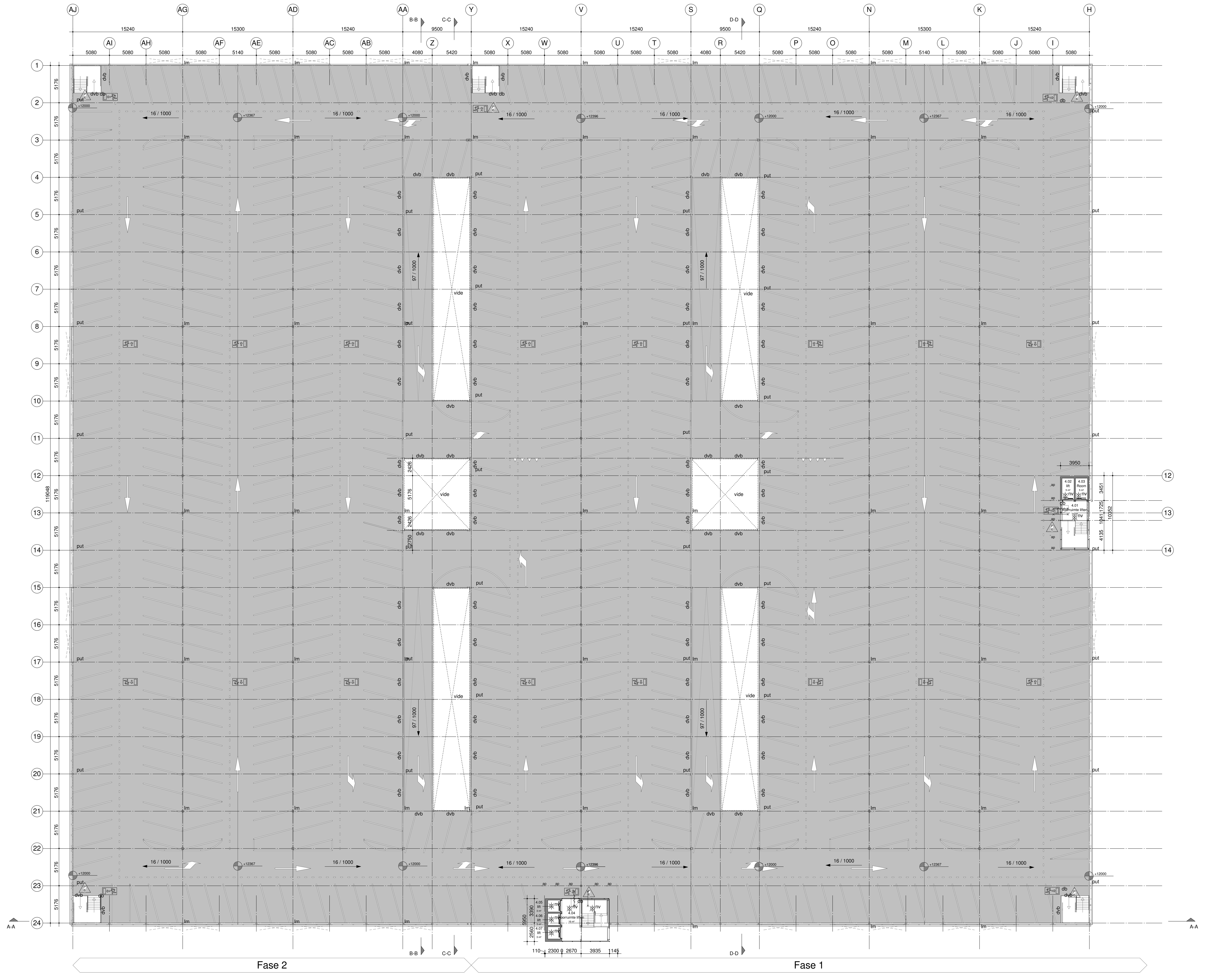


opdrachtgever : DOC	werknr. : 67.02.31	d.d.	11/12/2015
werk : DOC Roermond	teknr. : OG-108	schaal	: 1:200
onderdeel : 3e verdieping - Fase 2		fase	: 2
plaats : Roermond	status : definitief	form	: A0
		get.	: rwu

Continental Car Parks
Hietweideweg 10 ǁ 7391 XX Twello
Postbus 69 ǁ 7390 AB Twello
T 0571-277 340 E info@carparks.nl
F 0571-287 679 I www.carparks.nl

C:\Users\amu\Documents\Revit local files\670231_OVG_amu.rvt

11-12-2015 15:14:28



Bouwbesluittoetsing

Algemeen
- Maten in het werk te controleren.
- Alle afmetingen van staal-, en/of betonconstructies volgens statische berekeningen constructeur en/of opgave fabrikant.
- Toegankelijkheid: het gebouw is integraal toegankelijk.
- Fase 1 betreft stramien A tot Y (realisatie 2016)
- Fase 2 betreft stramien Y tot AJ (realisatie n.t.b.)
- De realisatie van het maaiveld en de terreinriolering zal door derden worden aangelegd en zal onderdeel uit maken van de aanlegvergunning van de Big Triangle.

Bouwbesluittoetsing

Algemeen
Het ontworpen gebouw is getoetst en voldoet aan de volgende, vigerende (wettelijke) bepalingen:
- Bouwbesluit 2012;
- Eurocode;
- Euroklassen;
- NEN, NEN-EN of EN-Normen (volgens de laatste uitgave van de van toepassing zijnde normen).

art. 1.2. Aantal personen
Er is geen nadere onderverdeling van gebruiksfuncties. De enige gebruiksfunctie die op het gebouw van toepassing is betreft "overige gebruiksfunctie".

Gebruiksfunctie	Aantal personen
• overige gebruiksfunctie, voor het personenvervoer:	geen eis.

art. 1.3. Gelijkwaardigheidsbepaling
Voor gelijkwaardigheidsbepaling wordt er gebruik gemaakt van uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

Veiligheid
afd. 2.1. Algemene sterkte van de bouwconstructie
Voor algemene sterkte van de bouwconstructie, zie constructief ontwerp en hoofdberekeningen constructie t.b.v. omgevingsvergunning van JVZ, d.d. 10-12-2015

afd. 2.2. Sterkte bij brand
Voor sterkte bij brand wordt gebruik gemaakt van de gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.3 Afscheiding van vloer, hellingbaan en trap
Voor afscheiding van vloer, trap en hellingbaan, zie tekening OG-100 t/m OG-109 & OG-300 t/m OG-302, d.d. 11-12-2015

Een voor personen bestemde vloer heeft bij een rand een niet beweegbare afscheiding als die rand meer dan 1 meter hoger ligt dan een aansluitende vloer, het aansluitende terrein of het aansluitende water. De vloeren hebben een vloerafscheiding van min. 1,0 meter hoog gemeten vanaf de vloer.
Artikel 2.19 – 1 een afscheiding heeft geen openingen groter dan een diameter van 0,5 meter, overeenkomstig met tabel 2.16. In afwijking van artikel 2.19 - 1 heeft een afscheiding als bedoeld in artikel 2.17 tot een hoogte van 0,7 m boven een vloer, een tredevlak of een vloer van een hellingbaan geen openingen waardoor een bol kan passeren met een doorsnede groter dan 0,1 m.
De horizontale afmeting tussen de afscheiding en vloer of trap mag niet meer bedragen dan 0,05 meter.
De bovenregel mag geen onderbreking hebben van meer dan 0,1 meter.
Een afscheiding heeft, ter voorkoming van het overklauteren, geen opstapmogelijkheden tussen 0,2 m en 0,7 m boven een vloer of een tredevlak.

afd. 2.4. Overbrugging van hoogteverschillen
Alle hoogteverschillen van meer dan 0,21 meter tussen vloeren waarover een vluchtroute voert worden overbrugd door middel van een trap of hellingbaan.

afd. 2.5. Trap
Voor trappen, zie tekening OG-100 t/m OG-109, d.d. 11-12-2015; OG-300 t/m OG-302, d.d. 11-12-2015

afd. 2.9. Beperking van het ontwikkelen van brand en rook
Voor beperking van het ontwikkelen van brand en rook, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-15.

afd. 2.10. Beperking van uitbreiding van brand
Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.11. Verdere beperking van uitbreiding van brand en beperking van verspreiding van rook
Voor beperking van uitbreiding van brand wordt gebruik gemaakt van gelijkwaardigheidsbepaling, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015.

afd. 2.12. Vluchtroutes
Voor de vluchtroutes, zie uitgangspunten brandveiligheidsconcept van Nieman, d.d. 09-12-2015 en tekening OG-120, d.d. 11-12-2015.

Gezondheid

afd. 3.2. Bescherming tegen geluid van installaties
Het volgens NEN 5077 bepaald karakteristieke installatie-geluidsniveau (zie art. 3.8) is op een aangrenzend perceel gelegen verblijfsgebied zal niet hoger zijn dan 30 dB.

afd. 3.6. Luchtverversing
Een schacht voor een lift heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 3,2 dm^3/s per m^2 vloeroppervlakte van die liftschacht. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten of liftmachineruimte plaats.

De toilettenruimten zullen worden voorzien van luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 7 dm^3/s.

Een opslagruimte voor huishoudelijk afval met een vloeroppervlakte van meer dan 1,5 m^2 heeft een niet afsluitbare voorziening voor luchtverversing met een volgens NEN 1087 bepaalde capaciteit van ten minste 10 dm^3/s per m^2 vloeroppervlakte van die ruimte. De toe- en afvoer van de luchtverversing vindt rechtstreeks van buiten plaats.

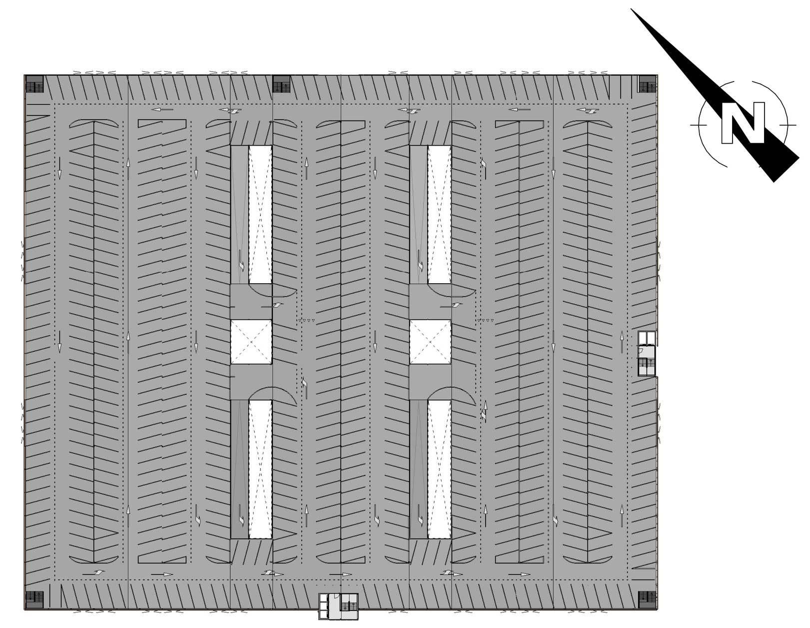
Renvooi

db	droge blusleiding
put	afvoerput hemelwater
hwa	standleiding hemelwaterafvoer
lm	lichtmast
dvb	doorvalbeveiliging 1000+ vloer
ap	aanrijpaal
	zelfsluitende deur
	30 min brandwerende wand
	meterkast
	hoogtemaat t.o.v. peil
N 6	brandblusser, codering N=schuimblusser/ K=koolzuurblusser/ P=poederblusser, gewicht
	vluchtrouteaanduiding
nv	noodverlichting
0.0 [naam]	ruimtenummer inclusief naamgeving en gebruiksfunctie

aantal parkeerplaatsen

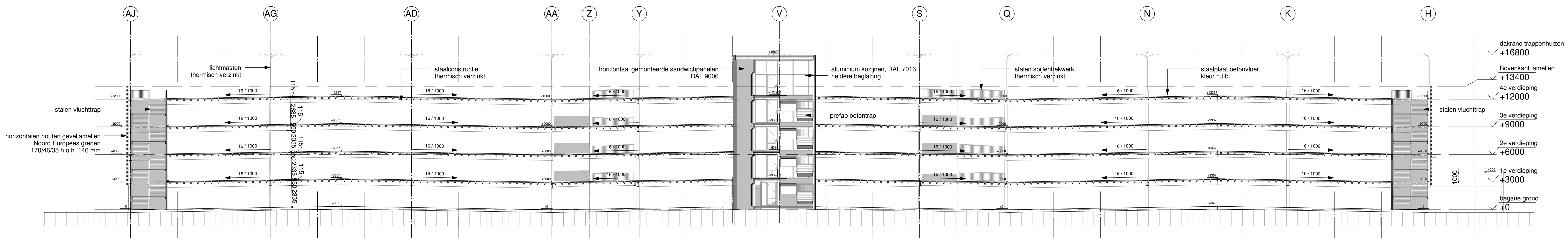
Verdieping	Fase	Aantal
1e verdieping	Fase 1	320
1e verdieping	Fase 2	341
2e verdieping	Fase 1	340
2e verdieping	Fase 2	334
3e verdieping	Fase 1	340
3e verdieping	Fase 2	334
4e verdieping	Fase 1	346
4e verdieping	Fase 2	340
		2695

74 vakken van fase 1 zijn van richting veranderd (← 1e verdieping Fase 2)



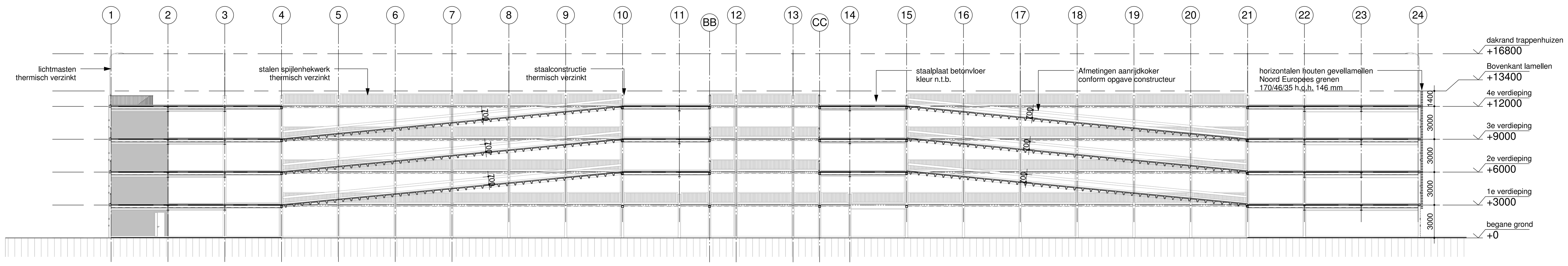
opdrachtgever	: DOC	werknr. : 67.02.31	d.d. 11/12/2015
werk	: DOC Roermond	teknr. : OG-109	schaal : 1:200
onderdeel	: 4e verdieping - Fase 2		fase : 2
plaats	: Roermond	status : definitief	form : A0
			get. : rwu

Continental Car Parks
Hietweideweg 10 ‖ 7391 XX Twello
Postbus 69 ‖ 7390 AB Twello
T 0571-277 340   E info@carparks.nl
F 0571-287 679   I www.carparks.nl



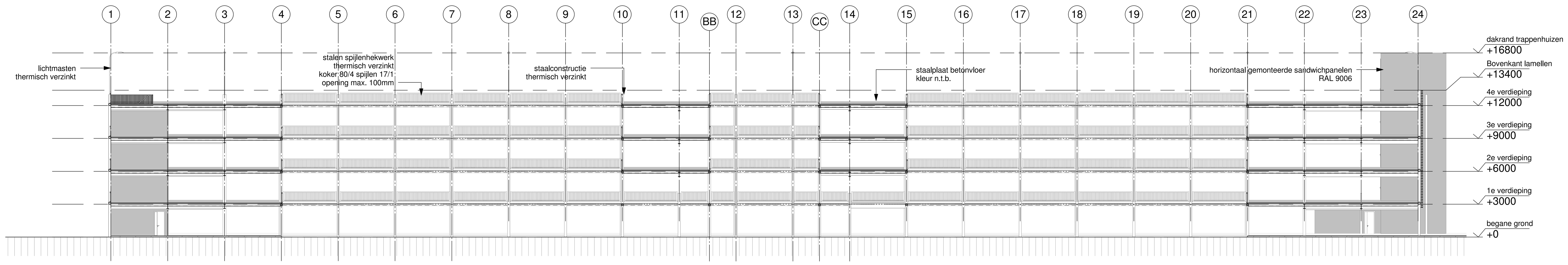
Doorsnede A-A

1 : 200



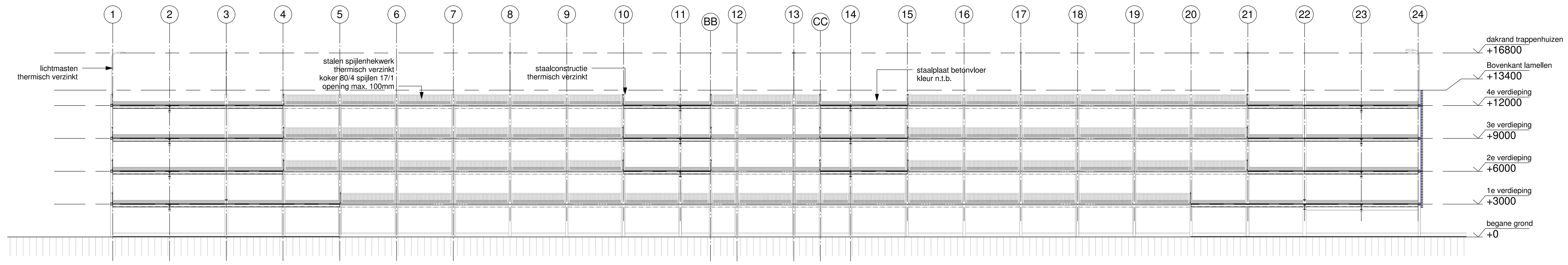
Doorsnede B-B

1 : 200



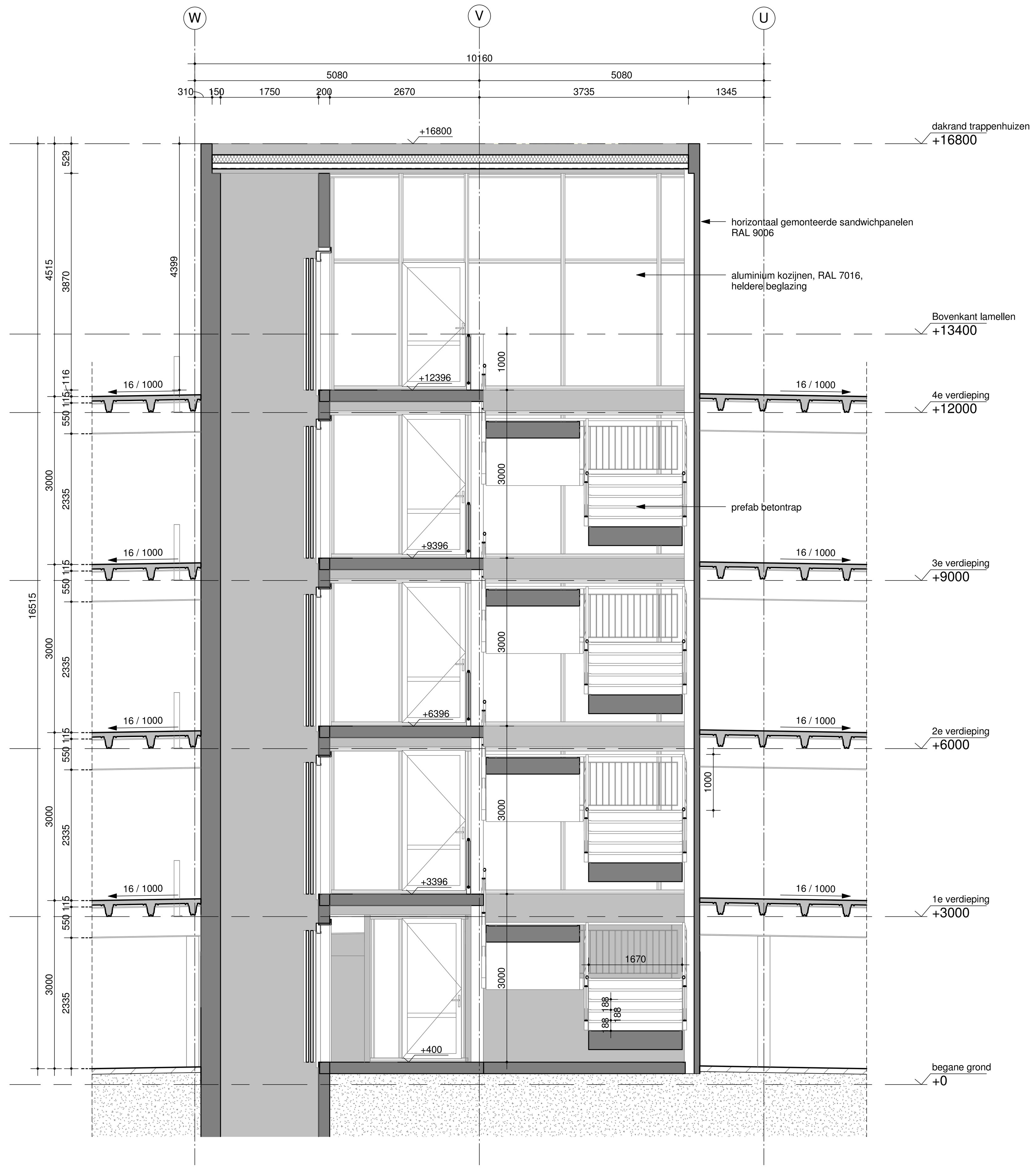
Doorsnede C-C

1 : 200



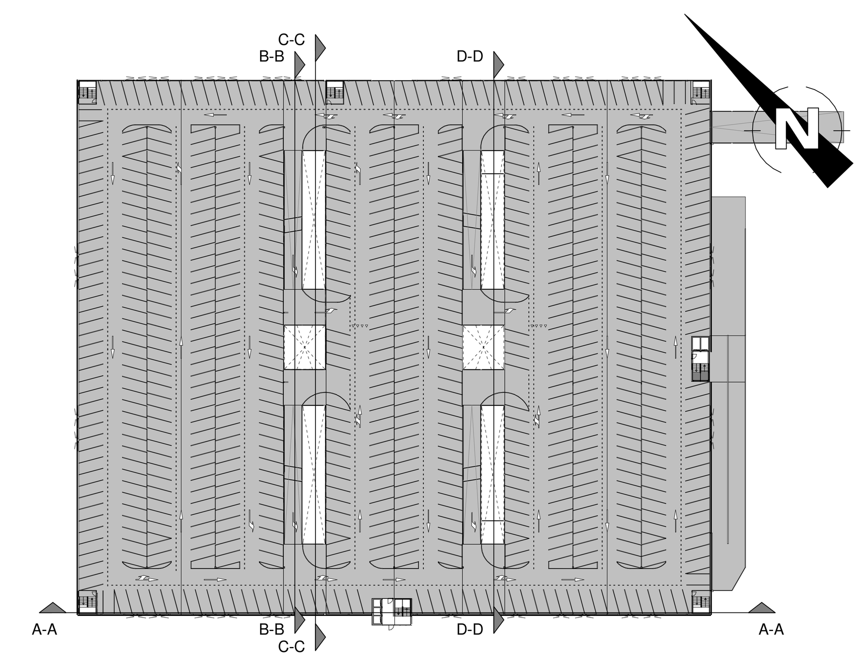
Doorsnede D-D

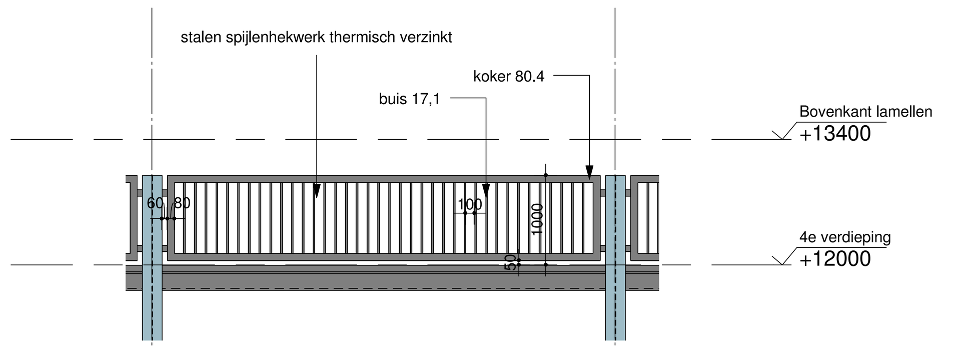
1 : 200



Doorsnede trappenhuis

1 : 50





Principe hekwerken

opdrachtgever : DOC	werknr. : 67.02.31	d.d.	11/12/2015
werk : DOC Roermond		schaal :	1 : 200 / 1 : 50
	teknr. : OG-300	fase :	2
onderdeel : Doorsneden - Fase 2		form :	A0
plaats : Roermond	status : definitief	get. :	amu

Continental Car Parks
Hietweideweg 10 || 7391 XX Twello
Postbus 69 || 7390 AB Twello
T 0571-277 340 E info@carparks.nl
F 0571-287 679 I www.carparks.nl

11-12-2015 14:57:02

C:\Users\amu\Documents\Revit local files\670231_OVG_amu.rvt

Appendix II: FDS scripts of the Analysis

<u>FDS script of original DOC model</u>

parkeergarage_midden_(definitief).fds
Generated by PyroSim - Version 2015.2.0604
25-feb-2016 11:43:01

```
&HEAD CHID='parkeergarage_midden_(definiti'/
&TIME T_END=3600.0/
&DUMP RENDER_FILE='parkeergarage_midden_(definiti.ge1', DT_RESTART=100.0, NFRAMES=3600/
&MISC RESTART=.FALSH./

&MESH ID='raster01', IJK=10,58,10, XB=-4.0,-1.0,6.6,24.0,0.0,3.0/
&MESH ID='raster02', IJK=81,10,10, XB=-28.3,-4.0,6.6,9.6,0.0,3.0/
&MESH ID='raster03', IJK=81,10,10, XB=-28.3,-4.0,21.0,24.0,0.0,3.0/
&MESH ID='raster04', IJK=9,58,10, XB=-31.0,-28.3,6.6,24.0,0.0,3.0/
&MESH ID='raster05', IJK=243,114,30, XB=-28.3,-4.0,9.6,21.0,0.0,3.0/


&REAC ID='autobrand_TUDelft',
    FYI='autobrand',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4/
```

Gas temperature devices

```
&DEVC ID='GAS A', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS A11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS Ar1', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar01', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar02', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar03', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar04', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar05', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar06', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar07', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar08', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar09', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar10', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar11', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ar12', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Al1', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al01', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al02', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al03', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al04', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.9, ORIENTATION=1.0,0.0,0.0/
```

```
&DEVC ID='GAS Al05', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al06', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al07', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al08', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al09', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al10', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al11', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Al12', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Aa1', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS Aa11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='GAS L1', QUANTITY='TEMPERATURE', XYZ=-15.5,14.8,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS L01', QUANTITY='TEMPERATURE', XYZ=-15.5,14.6,2.3/
&DEVC ID='GAS L02', QUANTITY='TEMPERATURE', XYZ=-15.5,14.4,2.3/
&DEVC ID='GAS L03', QUANTITY='TEMPERATURE', XYZ=-15.5,14.2,2.3/
&DEVC ID='GAS L04', QUANTITY='TEMPERATURE', XYZ=-15.5,14.0,2.3/
&DEVC ID='GAS L05', QUANTITY='TEMPERATURE', XYZ=-15.5,13.8,2.3/
&DEVC ID='GAS L06', QUANTITY='TEMPERATURE', XYZ=-15.5,13.6,2.3/
&DEVC ID='GAS L07', QUANTITY='TEMPERATURE', XYZ=-15.5,13.4,2.3/
&DEVC ID='GAS L08', QUANTITY='TEMPERATURE', XYZ=-15.5,13.2,2.3/
&DEVC ID='GAS L09', QUANTITY='TEMPERATURE', XYZ=-15.5,13.0,2.3/
&DEVC ID='GAS L10', QUANTITY='TEMPERATURE', XYZ=-15.5,12.8,2.3/
&DEVC ID='GAS L11', QUANTITY='TEMPERATURE', XYZ=-15.5,12.6,2.3/
&DEVC ID='GAS L12', QUANTITY='TEMPERATURE', XYZ=-15.5,12.4,2.3/
&DEVC ID='GAS L13', QUANTITY='TEMPERATURE', XYZ=-15.5,12.2,2.3/
&DEVC ID='GAS L14', QUANTITY='TEMPERATURE', XYZ=-15.5,12.0,2.3/
&DEVC ID='GAS L15', QUANTITY='TEMPERATURE', XYZ=-15.5,11.8,2.3/
&DEVC ID='GAS L16', QUANTITY='TEMPERATURE', XYZ=-15.5,11.6,2.3/
&DEVC ID='GAS L17', QUANTITY='TEMPERATURE', XYZ=-15.5,11.4,2.3/
&DEVC ID='GAS L18', QUANTITY='TEMPERATURE', XYZ=-15.5,11.2,2.3/
&DEVC ID='GAS L19', QUANTITY='TEMPERATURE', XYZ=-15.5,11.0,2.3/
&DEVC ID='GAS L20', QUANTITY='TEMPERATURE', XYZ=-15.5,10.8,2.3/
&DEVC ID='GAS L21', QUANTITY='TEMPERATURE', XYZ=-15.5,10.6,2.3/
&DEVC ID='GAS L22', QUANTITY='TEMPERATURE', XYZ=-15.5,10.4,2.3/
&DEVC ID='GAS L23', QUANTITY='TEMPERATURE', XYZ=-15.5,10.2,2.3/
&DEVC ID='GAS L24', QUANTITY='TEMPERATURE', XYZ=-15.5,10.0,2.3/
&DEVC ID='GAS L25', QUANTITY='TEMPERATURE', XYZ=-15.5,9.8,2.3/
&DEVC ID='GAS L26', QUANTITY='TEMPERATURE', XYZ=-15.5,9.6,2.3/
&DEVC ID='GAS L27', QUANTITY='TEMPERATURE', XYZ=-15.5,9.4,2.3/
&DEVC ID='GAS L28', QUANTITY='TEMPERATURE', XYZ=-15.5,9.2,2.3/
&DEVC ID='GAS L29', QUANTITY='TEMPERATURE', XYZ=-15.5,9.0,2.3/
&DEVC ID='GAS L30', QUANTITY='TEMPERATURE', XYZ=-15.5,8.8,2.3/
&DEVC ID='GAS Ll01', QUANTITY='TEMPERATURE', XYZ=-15.7,14.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll03', QUANTITY='TEMPERATURE', XYZ=-15.7,14.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll04', QUANTITY='TEMPERATURE', XYZ=-15.7,14.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll05', QUANTITY='TEMPERATURE', XYZ=-15.7,14.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll06', QUANTITY='TEMPERATURE', XYZ=-15.7,13.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll07', QUANTITY='TEMPERATURE', XYZ=-15.7,13.5,2.6, ORIENTATION=-1.0,0.0,0.0/
```

```
&DEVC ID='GAS Ll08', QUANTITY='TEMPERATURE', XYZ=-15.7,13.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll09', QUANTITY='TEMPERATURE', XYZ=-15.7,12.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll10', QUANTITY='TEMPERATURE', XYZ=-15.7,12.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll11', QUANTITY='TEMPERATURE', XYZ=-15.7,12.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll12', QUANTITY='TEMPERATURE', XYZ=-15.7,12.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll13', QUANTITY='TEMPERATURE', XYZ=-15.7,11.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll14', QUANTITY='TEMPERATURE', XYZ=-15.7,11.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll15', QUANTITY='TEMPERATURE', XYZ=-15.7,11.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll16', QUANTITY='TEMPERATURE', XYZ=-15.7,11.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll17', QUANTITY='TEMPERATURE', XYZ=-15.7,10.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll18', QUANTITY='TEMPERATURE', XYZ=-15.7,10.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll19', QUANTITY='TEMPERATURE', XYZ=-15.7,10.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll20', QUANTITY='TEMPERATURE', XYZ=-15.7,10.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll21', QUANTITY='TEMPERATURE', XYZ=-15.7,9.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll22', QUANTITY='TEMPERATURE', XYZ=-15.7,9.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll23', QUANTITY='TEMPERATURE', XYZ=-15.7,9.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll24', QUANTITY='TEMPERATURE', XYZ=-15.7,8.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll25', QUANTITY='TEMPERATURE', XYZ=-15.7,8.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll26', QUANTITY='TEMPERATURE', XYZ=-15.7,8.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll30', QUANTITY='TEMPERATURE', XYZ=-15.7,8.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll31', QUANTITY='TEMPERATURE', XYZ=-15.7,7.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll32', QUANTITY='TEMPERATURE', XYZ=-15.7,7.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Lr01', QUANTITY='TEMPERATURE', XYZ=-15.3,14.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr02', QUANTITY='TEMPERATURE', XYZ=-15.3,14.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr03', QUANTITY='TEMPERATURE', XYZ=-15.3,14.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr04', QUANTITY='TEMPERATURE', XYZ=-15.3,14.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr05', QUANTITY='TEMPERATURE', XYZ=-15.3,13.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr06', QUANTITY='TEMPERATURE', XYZ=-15.3,13.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr07', QUANTITY='TEMPERATURE', XYZ=-15.3,13.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr08', QUANTITY='TEMPERATURE', XYZ=-15.3,12.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr09', QUANTITY='TEMPERATURE', XYZ=-15.3,12.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr10', QUANTITY='TEMPERATURE', XYZ=-15.3,12.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr11', QUANTITY='TEMPERATURE', XYZ=-15.3,11.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr12', QUANTITY='TEMPERATURE', XYZ=-15.3,12.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr13', QUANTITY='TEMPERATURE', XYZ=-15.3,11.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr14', QUANTITY='TEMPERATURE', XYZ=-15.3,11.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr15', QUANTITY='TEMPERATURE', XYZ=-15.3,11.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr16', QUANTITY='TEMPERATURE', XYZ=-15.3,10.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr17', QUANTITY='TEMPERATURE', XYZ=-15.3,10.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr18', QUANTITY='TEMPERATURE', XYZ=-15.3,10.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr19', QUANTITY='TEMPERATURE', XYZ=-15.3,10.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr20', QUANTITY='TEMPERATURE', XYZ=-15.3,9.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr21', QUANTITY='TEMPERATURE', XYZ=-15.3,9.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr22', QUANTITY='TEMPERATURE', XYZ=-15.3,9.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr23', QUANTITY='TEMPERATURE', XYZ=-15.3,8.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr24', QUANTITY='TEMPERATURE', XYZ=-15.3,8.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr25', QUANTITY='TEMPERATURE', XYZ=-15.3,8.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr26', QUANTITY='TEMPERATURE', XYZ=-15.3,7.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr27', QUANTITY='TEMPERATURE', XYZ=-15.3,8.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr28', QUANTITY='TEMPERATURE', XYZ=-15.3,7.7,2.6, ORIENTATION=1.0,0.0,0.0/
```

Heat flux devices

```
&DEVC ID='GHF A01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='GHF A02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.3, IOR=-2/
&DEVC ID='GHF A03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='GHF A04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='GHF A05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.9, IOR=-2/
```

```
&DEVC ID='GHF A06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='GHF A07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='GHF A08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='GHF A09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='GHF A10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='GHF A11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='GHF A12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='GHF Al1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='GHF Al01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='GHF Al02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='GHF Al03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='GHF Al04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='GHF Al05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='GHF Al06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='GHF Al07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='GHF Al08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='GHF Al09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='GHF Al10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='GHF Al11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='GHF Al12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='GHF Al13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='GHF Ar1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='GHF Ar01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='GHF Ar02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='GHF Ar03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='GHF Ar04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='GHF Ar05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='GHF Ar06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='GHF Ar07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='GHF Ar08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='GHF Ar09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='GHF Ar10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='GHF Ar11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='GHF Ar12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='GHF Ar13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='GHF Aa1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='GHF Aa01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='GHF Aa02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='GHF Aa03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='GHF Aa04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='GHF Aa05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='GHF Aa06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='GHF Aa07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='GHF Aa08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='GHF Aa09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='GHF Aa10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='GHF Aa11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.3, IOR=2/
&DEVC ID='GHF L1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.8,2.4, IOR=-3/
&DEVC ID='GHF L01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='GHF L02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='GHF L03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='GHF L04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='GHF L05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='GHF L06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='GHF L07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='GHF L08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='GHF L09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.0,2.4, IOR=-3/
```

```
&DEVC ID='GHF L10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='GHF L11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='GHF L12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='GHF L13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='GHF L14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='GHF L15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='GHF L16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='GHF L17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='GHF L18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='GHF L19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='GHF L20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.8,2.4, IOR=-3/
&DEVC ID='GHF L21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.6,2.4, IOR=-3/
&DEVC ID='GHF L22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='GHF L23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.2,2.4, IOR=-3/
&DEVC ID='GHF L24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='GHF L25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='GHF L26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='GHF L27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='GHF L28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='GHF L29', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='GHF Ll01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='GHF Ll02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='GHF Ll03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='GHF Ll04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='GHF Ll05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='GHF Ll06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='GHF Ll07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='GHF Ll08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='GHF Ll09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='GHF Ll10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='GHF Ll11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='GHF Ll12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='GHF Ll13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='GHF Ll14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='GHF Ll15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='GHF Ll16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='GHF Ll17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='GHF Ll18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='GHF Ll19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='GHF Ll20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.3,2.6, IOR=-1/
&DEVC ID='GHF Ll21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='GHF Ll22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='GHF Ll23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.5,2.6, IOR=-1/
&DEVC ID='GHF Ll24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.9,2.6, IOR=-1/
&DEVC ID='GHF Ll25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='GHF Ll26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='GHF Ll27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='GHF Ll28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='GHF Lr1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='GHF Lr02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='GHF Lr03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='GHF Lr04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='GHF Lr01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.7,2.6, IOR=1/
&DEVC ID='GHF Lr05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='GHF Lr06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='GHF Lr07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='GHF Lr08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.7,2.6, IOR=1/
```

```
&DEVC ID='GHF Lr09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='GHF Lr10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='GHF Lr11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='GHF Lr12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='GHF Lr13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='GHF Lr14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='GHF Lr15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='GHF Lr16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='GHF Lr17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='GHF Lr18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='GHF Lr19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.7,2.6, IOR=1/
&DEVC ID='GHF Lr20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.5,2.6, IOR=1/
&DEVC ID='GHF Lr21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='GHF Lr22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.9,2.6, IOR=1/
&DEVC ID='GHF Lr23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='GHF Lr24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='GHF Lr25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='GHF Lr26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='GHF Lr27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.7,2.6, IOR=1/
```

Material & Surface properties

```
&MATL ID='Steel',
    FYI='Steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    FYI='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/

&SURF ID='K250 Steel 12,5 mm',
    RGB=146,202,166,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='K120 Steel 4,0 mm',
    RGB=146,202,166,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.004,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='IPE500 Steel 12,5 mm01',
    RGB=146,202,166,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125,
```

```
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='staal-beton',
    COLOR='GRAY 40',
    BACKING='INSULATED',
    MATL_ID(1,1)='Steel',
    MATL_ID(2,1)='Concrete',
    MATL_MASS_FRACTION(1,1)=1.0,
    MATL_MASS_FRACTION(2,1)=1.0,
    THICKNESS(1:2)=0.0015,0.075,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='auto 01',
    COLOR='RED',
    HRRPUA=658.73,
    RAMP_Q='auto 01_RAMP_Q'/
&RAMP ID='auto 01_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 01_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='auto 01_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='auto 01_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='auto 01_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='auto 01_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='auto 02',
    RGB=255,51,153,
    HRRPUA=658.73,
    RAMP_Q='auto 02_RAMP_Q'/
&RAMP ID='auto 02_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=600.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=660.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1200.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1560.0, F=0.663/
&RAMP ID='auto 02_RAMP_Q', T=1620.0, F=1.0/
&RAMP ID='auto 02_RAMP_Q', T=1740.0, F=0.542/
&RAMP ID='auto 02_RAMP_Q', T=2400.0, F=0.12/
&RAMP ID='auto 02_RAMP_Q', T=4320.0, F=0.0/
&SURF ID='auto 03',
    RGB=255,153,51,
    HRRPUA=658.73,
    RAMP_Q='auto 03_RAMP_Q'/
&RAMP ID='auto 03_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=900.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=960.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1860.0, F=0.663/
&RAMP ID='auto 03_RAMP_Q', T=1920.0, F=1.0/
&RAMP ID='auto 03_RAMP_Q', T=2040.0, F=0.542/
&RAMP ID='auto 03_RAMP_Q', T=2700.0, F=0.12/
&RAMP ID='auto 03_RAMP_Q', T=4620.0, F=0.0/
&SURF ID='auto 04',
    RGB=153,51,255,
    HRRPUA=658.73,
    RAMP_Q='auto 04_RAMP_Q'/
&RAMP ID='auto 04_RAMP_Q', T=0.0, F=0.0/
```

```
&RAMP ID='auto 04_RAMP_Q', T=1320.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1380.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=1920.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=2280.0, F=0.663/
&RAMP ID='auto 04_RAMP_Q', T=2340.0, F=1.0/
&RAMP ID='auto 04_RAMP_Q', T=2460.0, F=0.542/
&RAMP ID='auto 04_RAMP_Q', T=3120.0, F=0.12/
&RAMP ID='auto 04_RAMP_Q', T=5040.0, F=0.0/
&SURF ID='auto 05',
    RGB=255,255,51,
    HRRPUA=658.73,
    RAMP_Q='auto 05_RAMP_Q'/
&RAMP ID='auto 05_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1620.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1680.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2220.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2580.0, F=0.663/
&RAMP ID='auto 05_RAMP_Q', T=2640.0, F=1.0/
&RAMP ID='auto 05_RAMP_Q', T=2760.0, F=0.542/
&RAMP ID='auto 05_RAMP_Q', T=3420.0, F=0.12/
&RAMP ID='auto 05_RAMP_Q', T=5340.0, F=0.0/
&SURF ID='auto 06',
    RGB=102,51,255,
    HRRPUA=658.73,
    RAMP_Q='auto 06_RAMP_Q'/
&RAMP ID='auto 06_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 06_RAMP_Q', T=2040.0, F=0.0/
&RAMP ID='auto 06_RAMP_Q', T=2100.0, F=0.289/
&RAMP ID='auto 06_RAMP_Q', T=2640.0, F=0.289/
&RAMP ID='auto 06_RAMP_Q', T=3000.0, F=0.663/
&RAMP ID='auto 06_RAMP_Q', T=3060.0, F=1.0/
&RAMP ID='auto 06_RAMP_Q', T=3180.0, F=0.542/
&RAMP ID='auto 06_RAMP_Q', T=3840.0, F=0.12/
&RAMP ID='auto 06_RAMP_Q', T=5760.0, F=0.0/
&SURF ID='auto 07',
    RGB=153,255,0,
    HRRPUA=658.73,
    RAMP_Q='auto 07_RAMP_Q'/
&RAMP ID='auto 07_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 07_RAMP_Q', T=2340.0, F=0.0/
&RAMP ID='auto 07_RAMP_Q', T=2400.0, F=0.289/
&RAMP ID='auto 07_RAMP_Q', T=2940.0, F=0.289/
&RAMP ID='auto 07_RAMP_Q', T=3300.0, F=0.663/
&RAMP ID='auto 07_RAMP_Q', T=3360.0, F=1.0/
&RAMP ID='auto 07_RAMP_Q', T=3480.0, F=0.542/
&RAMP ID='auto 07_RAMP_Q', T=4140.0, F=0.12/
&RAMP ID='auto 07_RAMP_Q', T=6060.0, F=0.0/
&SURF ID='auto 08',
    COLOR='BLUE',
    HRRPUA=658.73,
    RAMP_Q='auto 08_RAMP_Q'/
&RAMP ID='auto 08_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 08_RAMP_Q', T=2760.0, F=0.0/
&RAMP ID='auto 08_RAMP_Q', T=2820.0, F=0.289/
&RAMP ID='auto 08_RAMP_Q', T=3360.0, F=0.289/
&RAMP ID='auto 08_RAMP_Q', T=3720.0, F=0.663/
&RAMP ID='auto 08_RAMP_Q', T=3780.0, F=1.0/
```

```
&RAMP ID='auto 08_RAMP_Q', T=3900.0, F=0.542/
&RAMP ID='auto 08_RAMP_Q', T=4560.0, F=0.12/
&RAMP ID='auto 08_RAMP_Q', T=6480.0, F=0.0/
&SURF ID='auto 09',
    COLOR='GREEN',
    HRRPUA=658.73,
    RAMP_Q='auto 09_RAMP_Q'/
&RAMP ID='auto 09_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 09_RAMP_Q', T=3060.0, F=0.0/
&RAMP ID='auto 09_RAMP_Q', T=3120.0, F=0.289/
&RAMP ID='auto 09_RAMP_Q', T=3660.0, F=0.289/
&RAMP ID='auto 09_RAMP_Q', T=4020.0, F=0.663/
&RAMP ID='auto 09_RAMP_Q', T=4080.0, F=1.0/
&RAMP ID='auto 09_RAMP_Q', T=4200.0, F=0.542/
&RAMP ID='auto 09_RAMP_Q', T=4860.0, F=0.12/
&RAMP ID='auto 09_RAMP_Q', T=6780.0, F=0.0/
&SURF ID='auto 10',
    RGB=0,153,255,
    HRRPUA=658.73,
    RAMP_Q='auto 10_RAMP_Q'/
&RAMP ID='auto 10_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 10_RAMP_Q', T=3480.0, F=0.0/
&RAMP ID='auto 10_RAMP_Q', T=3540.0, F=0.289/
&RAMP ID='auto 10_RAMP_Q', T=4080.0, F=0.289/
&RAMP ID='auto 10_RAMP_Q', T=4440.0, F=0.663/
&RAMP ID='auto 10_RAMP_Q', T=4500.0, F=1.0/
&RAMP ID='auto 10_RAMP_Q', T=4620.0, F=0.542/
&RAMP ID='auto 10_RAMP_Q', T=5280.0, F=0.12/
&RAMP ID='auto 10_RAMP_Q', T=7200.0, F=0.0/
&SURF ID='auto 11',
    RGB=102,255,255,
    HRRPUA=658.73,
    RAMP_Q='auto 11_RAMP_Q'/
&RAMP ID='auto 11_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1320.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='auto 11_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='auto 11_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='auto 11_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='auto 11_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='auto 12 en 13',
    RGB=153,153,255,
    HRRPUA=658.73,
    RAMP_Q='auto 12 en 13_RAMP_Q'/
&RAMP ID='auto 12 en 13_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='auto 12 en 13_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='auto 12 en 13_RAMP_Q', T=5160.0, F=0.0/
&SURF ID='auto 14 en 15',
    RGB=255,153,153,
```

```
    HRRPUA=658.73,
    RAMP_Q='auto 14 en 15_RAMP_Q'/
&RAMP ID='auto 14 en 15_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 14 en 15_RAMP_Q', T=2160.0, F=0.0/
&RAMP ID='auto 14 en 15_RAMP_Q', T=2220.0, F=0.289/
&RAMP ID='auto 14 en 15_RAMP_Q', T=2760.0, F=0.289/
&RAMP ID='auto 14 en 15_RAMP_Q', T=3120.0, F=0.663/
&RAMP ID='auto 14 en 15_RAMP_Q', T=3180.0, F=1.0/
&RAMP ID='auto 14 en 15_RAMP_Q', T=3300.0, F=0.542/
&RAMP ID='auto 14 en 15_RAMP_Q', T=3960.0, F=0.12/
&RAMP ID='auto 14 en 15_RAMP_Q', T=5880.0, F=0.0/
&SURF ID='auto 16 en 17',
    RGB=153,255,153,
    HRRPUA=658.73,
    RAMP_Q='auto 16 en 17_RAMP_Q'/
&RAMP ID='auto 16 en 17_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 16 en 17_RAMP_Q', T=2880.0, F=0.0/
&RAMP ID='auto 16 en 17_RAMP_Q', T=2940.0, F=0.289/
&RAMP ID='auto 16 en 17_RAMP_Q', T=3480.0, F=0.289/
&RAMP ID='auto 16 en 17_RAMP_Q', T=3840.0, F=0.663/
&RAMP ID='auto 16 en 17_RAMP_Q', T=3900.0, F=1.0/
&RAMP ID='auto 16 en 17_RAMP_Q', T=4020.0, F=0.542/
&RAMP ID='auto 16 en 17_RAMP_Q', T=4680.0, F=0.12/
&RAMP ID='auto 16 en 17_RAMP_Q', T=6600.0, F=0.0/
```

Columns

```
&OBST XB=-10.5,-10.2,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/ Obstruction
&OBST XB=-15.7,-15.4,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/ Obstruction
&OBST XB=-20.9,-20.6,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/ Obstruction
&OBST XB=-26.0,-25.7,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/ Obstruction
&OBST XB=-10.5,-10.2,15.1,15.4,0.0,3.0, SURF_ID='K250 Steel 12,5 mm'/ Obstruction
```

Beams

```
&OBST XB=-31.0,-1.0,15.2,15.3,2.8,2.9, SURF_ID='K120 Steel 4,0 mm'/ Obstruction
&OBST XB=-26.0,-25.8,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/ Obstruction
&OBST XB=-20.8,-20.6,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/ Obstruction
&OBST XB=-15.6,-15.4,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/ Obstruction
&OBST XB=-10.4,-10.2,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/ Obstruction
&OBST XB=-5.196,-4.996,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/ Obstruction
&OBST XB=-31.0,-1.0,7.4,7.6,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,8.2,8.4,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,9.0,9.2,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,9.8,10.0,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,10.6,10.8,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,11.4,11.6,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,12.2,12.4,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,13.0,13.2,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,13.8,14.0,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,14.6,14.8,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,15.4,15.6,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,16.2,16.4,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,17.0,17.2,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,17.8,18.0,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,18.6,18.8,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,19.4,19.6,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,20.2,20.4,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,21.0,21.2,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
```

&OBST XB=-31.0,-1.0,21.8,22.0,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,22.6,22.8,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,23.4,23.6,2.7,2.9, SURF_ID='staal-beton'/ Obstruction
&OBST XB=-31.0,-1.0,6.6,24.0,2.7,3.0, SURF_ID='staal-beton'/ Obstruction

Cars
&OBST XB=-15.8,-14.0,9.8,14.7,0.0,0.3, SURF_ID='auto 01'/ Auto1
&OBST XB=-18.3,-16.5,9.8,14.7,0.0,0.3, SURF_ID='auto 02'/ Auto 2
&OBST XB=-13.3,-11.5,9.8,14.7,0.0,0.3, SURF_ID='auto 03'/ Auto 3
&OBST XB=-20.8,-19.0,9.8,14.7,0.0,0.3, SURF_ID='auto 04'/ Auto 4
&OBST XB=-10.8,-9.0,9.8,14.7,0.0,0.3, SURF_ID='auto 05'/ Auto 5
&OBST XB=-23.3,-21.5,9.8,14.7,0.0,0.3, SURF_ID='auto 06'/ Auto 6
&OBST XB=-8.3,-6.5,9.8,14.7,0.0,0.3, SURF_ID='auto 07'/ Auto 7
&OBST XB=-25.8,-24.0,9.8,14.7,0.0,0.3, SURF_ID='auto 08'/ Auto 8
&OBST XB=-5.8,-4.0,9.8,14.7,0.0,0.3, SURF_ID='auto 09'/ Auto 9
&OBST XB=-28.3,-26.5,9.8,14.7,0.0,0.3, SURF_ID='auto 10'/ Auto 10
&OBST XB=-15.8,-14.0,15.8,20.7,0.0,0.3, SURF_ID='auto 11'/ Auto 11
&OBST XB=-18.3,-16.5,15.8,20.7,0.0,0.3, SURF_ID='auto 12 en 13'/ Auto 12
&OBST XB=-13.3,-11.5,15.8,20.7,0.0,0.3, SURF_ID='auto 12 en 13'/ Auto 13
&OBST XB=-20.8,-19.0,15.8,20.7,0.0,0.3, SURF_ID='auto 14 en 15'/ Auto 14
&OBST XB=-10.8,-9.0,15.8,20.7,0.0,0.3, SURF_ID='auto 14 en 15'/ Auto 15
&OBST XB=-23.3,-21.5,15.8,20.7,0.0,0.3, SURF_ID='auto 16 en 17'/ Auto 16
&OBST XB=-8.3,-6.5,15.8,20.7,0.0,0.3, SURF_ID='auto 16 en 17'/ Auto 17

Properties of the sides of the mesh
&VENT SURF_ID='OPEN', XB=-31.0,-1.0,24.0,24.0,0.0,2.9/ Vent04
&VENT SURF_ID='OPEN', XB=-31.0,-1.0,6.6,6.6,0.0,2.9/ Vent06
&VENT SURF_ID='INERT', XB=-31.0,-31.0,6.6,24.0,0.0,2.9/ Vent05
&VENT SURF_ID='INERT', XB=-1.0,-1.0,6.6,24.0,0.0,2.7/ Vent

Temperature Slices
&SLCF QUANTITY='TEMPERATURE', PBZ=2.1/
&SLCF QUANTITY='TEMPERATURE', PBY=15.2/
&SLCF QUANTITY='TEMPERATURE', PBX=-10.3/
&SLCF QUANTITY='TEMPERATURE', PBX=-15.5/
&SLCF QUANTITY='TEMPERATURE', PBX=-20.7/

&TAIL /

FDS script of original model TUDelft research

```
&HEAD CHID='model6', TITLE='model6'/ For 3 cars with obstacles: 2 beams
&TIME T_END=2500/
MISC RESTART=.TRUE.
```

Fuel

```
&REAC ID='EFECTIS_HEPTANE',
FYI='SFPE',
FUEL='REAC_FUEL',
FORMULA='C7H16',
HRRPUA_SHEET=0.0,
CO_YIELD=0.01,
SOOT_YIELD=0.037,
HEAT_OF_COMBUSTION=4.46E4,
IDEAL=.TRUE./
```

Spaces

```
&MESH IJK=150,160,28, XB=0,15,0,16,0,2.8/ With the cars 10cm mesh ->150,160,28)
&MESH IJK=22.5,120,14, XB=-4.5,0,-4,20,0,2.8/Mesh 2 (meshes of 20cm )
&MESH IJK=22.5,120,14, XB=15,19.5,-4,20,0,2.8/ Mesh 3 (meshes of 20cm)
&MESH IJK=75,20,14, XB=0,15,-4,0,0,2.8/ Mesh 4 (meshes of 20cm)
&MESH IJK=75,20,14, XB=0,15,16,20,0,2.8/ Mesh 5 (meshes of 20cm)
```

Cars and the properties

```
&SURF ID='car1',
color='RED',
HRRPUA= 658.730,
RAMP_Q='car1_fire'/ (OPPERVLAKTE DAT IN BRAND STAAT IS 12.6M2 WANT 4.8X1.8+
2x4.8x0.3+ 2x1.8x0.3)
&RAMP ID='car1_fire', T=0, F=0.0/
&RAMP ID='car1_fire', T=240, F=0.169/
&RAMP ID='car1_fire', T=960, F=0.169 /
&RAMP ID='car1_fire', T=1440, F=0.663 /
&RAMP ID='car1_fire', T=1500, F=1.0 /
&RAMP ID='car1_fire', T=1620, F=0.542 /
&RAMP ID='car1_fire', T=2280, F=0.120 /
&RAMP ID='car1_fire', T=2800, F=0 /
&SURF ID='car2',
RGB=34,139,34,
HRRPUA= 658.730,
RAMP_Q='car2_fire'/ (Green car, burning surface is 12.6M2: 4.8X1.8+ 2x4.8x0.3+ 2x1.8x0.3)
&RAMP ID='car2_fire', T=0, F=0.0/
&RAMP ID='car2_fire', T=720, F=0.0/
&RAMP ID='car2_fire', T=780, F=0.289 /
&RAMP ID='car2_fire', T=1320, F=0.289/
&RAMP ID='car2_fire', T=1680, F=0.663 /
&RAMP ID='car2_fire', T=1740, F=1.0 /
&RAMP ID='car2_fire', T=1860, F=0.542 /
&RAMP ID='car2_fire', T=2520, F=0.12 /
&RAMP ID='car2_fire', T=4440, F=0.0 /
&SURF ID='car3',
RGB=255,0,255,
HRRPUA= 658.730,
RAMP_Q='car3_fire'/ (Magenta car, burning surface is 12.6M2: 4.8X1.8+ 2x4.8x0.3+ 2x1.8x0.3)
&RAMP ID='car3_fire', T=0, F=0.0/
&RAMP ID='car3_fire', T=1440, F=0.0 /
```

&RAMP ID='car3_fire', T=1500, F=0.289/
&RAMP ID='car3_fire', T=2040, F=0.289 /
&RAMP ID='car3_fire', T=2400, F=0.663 /
&RAMP ID='car3_fire', T=2460, F=1.00 /
&RAMP ID='car3_fire', T=2580, F=0.542/
&RAMP ID='car3_fire', T=3240, F=0.12 /
&RAMP ID='car3_fire', T=5160, F=0.0 /
&OBST XB= 6.6, 8.4, 0.4,5.2, 0,0.3, SURF_ID6='car1','car1','car1','car1','INERT','car1'/ (top side and the sides are on fire)
&OBST XB= 4.1,5.9, 0.4,5.2, 0,0.3, SURF_ID6='car2','car2','car2','car2','INERT','car2'/ (top side and the sides are on fire)
&OBST XB= 9.1,10.9, 0.4,5.2, 0,0.3, SURF_ID6='car3','car3','car3','car3','INERT','car3'/ top side and the sides are on fire)

Properties of steel beams

&MATL ID='STEEL_EURO',
SPECIFIC_HEAT_RAMP='STEEL_EURO_SPECIFIC_HEAT_RAMP',
CONDUCTIVITY_RAMP='STEEL_EURO_CONDUCTIVITY_RAMP',
DENSITY=7850.0,
EMISSIVITY=0.7/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=0.0, F=0.425/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=580, F=0.738/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=650.0, F=0.8/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=700.0, F=1.0/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=720.0, F=1.4/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=730.0, F=2.3/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=735.0, F=5.0/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=740.0, F=2.5/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=750.0, F=1.5/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=770.0, F=1.0/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=800.0, F=0.8/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=900.0, F=0.65/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=1370.0, F=0.65/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=2000.0, F=0.65/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=0.0, F=54.0/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=20.0, F=53.33/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=100.0, F=50.67/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=200.0, F=47.34/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=300.0, F=44.01/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=400.0, F=40.68/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=500.0, F=37.35/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=600.0, F=34.02/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=700.0, F=30.69/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=790.0, F=27.69/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=800.0, F=27.3/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=900.0, F=27.3/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=1500.0, F=27.3/
&SURF ID='STEEL1',
MATL_ID = 'STEEL_EURO',
HEAT_TRANSFER_COEFFICIENT=35,
THICKNESS= 0.032
RGB=105,105,105/
&OBST XB= 0,15, 0,0.3, 2.3,2.8, RGB= 105,105,105,
SURF_ID6='INERT','INERT','STEEL1','STEEL1','STEEL1','INERT'/ fictitious beam "my profile"
&OBST XB= 0,15, 15.7,16, 2.3,2.8, RGB= 105,105,105,
SURF_ID6='INERT','INERT','STEEL1','STEEL1','STEEL1','INERT'/ fictitious beam "my profile"

Concrete properties
&MATL ID='CONCRETE_EURO',
SPECIFIC_HEAT_RAMP='CONCRETE_EURO_SPECIFIC_HEAT_RAMP',
CONDUCTIVITY_RAMP='CONCRETE_EURO_CONDUCTIVITY_RAMP',
DENSITY=2500/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=20, F=0.9/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=40, F=0.9/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=100, F=0.9/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=101, F=2.02/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=115, F=2.02/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=200, F=1.0/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=201, F=1.0005/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=250, F=1.025/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=300, F=1.075/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=400, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=500, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=600, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=700, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=1200,F=1.1/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=20.0, F=1.951/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=100.0, F=1.766/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=150.0, F=1.656/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=200.0, F=1.553/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=300.0, F=1.361/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=400.0, F=1.191/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=500.0, F=1.042/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=600.0, F=0.915/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=700.0, F=0.809/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=800.0, F=0.724/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=900.0, F=0.661/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=1000.0, F=0.619/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=1100.0, F=0.599/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=1200.0, F=0.600/
&SURF ID='CONCRETE',
MATL_ID = 'CONCRETE_EURO',
THICKNESS=0.4
RGB=84,255,159/

Floor and ceiling
&VENT SURF_ID='CONCRETE', MB='ZMIN'/ floor
&VENT SURF_ID='CONCRETE', MB='ZMAX'/ ceiling

walls
&VENT SURF_ID='OPEN',MB='YMIN', COLOR='INVISIBLE'/ front side
&VENT SURF_ID='OPEN',MB='YMAX' , COLOR='INVISIBLE'/ back side
&VENT SURF_ID='OPEN',MB= 'XMIN', COLOR='INVISIBLE'/ left side
&VENT SURF_ID='OPEN',MB= 'XMAX' , COLOR='INVISIBLE'/ right side

Devices
Devices 5,6,7,11,12 on the ceiling terwijl 1,2,3,4,8,9,10 are on the member
&DEVC ID='INC-FLUX1', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2 , 0.15 , 2.3, IOR= -3/
&DEVC ID='INC-FLUX2', QUANTITY='INCIDENT HEAT FLUX', XYZ= 6.3, 0.15 , 2.3, IOR= -3/
&DEVC ID='INC-FLUX3', QUANTITY='INCIDENT HEAT FLUX', XYZ= 8.8, 0.15 , 2.3, IOR= -3/
&DEVC ID='INC-FLUX4', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13 , 0.15 , 2.3, IOR= -3/
&DEVC ID='INC-FLUX5', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2 , 15.85, 2.3, IOR= -3/
&DEVC ID='INC-FLUX6', QUANTITY='INCIDENT HEAT FLUX', XYZ= 6.3, 15.85, 2.3, IOR= -3/
&DEVC ID='INC-FLUX7', QUANTITY='INCIDENT HEAT FLUX', XYZ= 8.8, 15.85, 2.3, IOR= -3/

```
&DEVC ID='INC-FLUX8', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13 , 15.85, 2.3, IOR= -3/
&DEVC ID='INC-FLUX9', QUANTITY='INCIDENT HEAT FLUX', XYZ= 0, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX10', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX11', QUANTITY='INCIDENT HEAT FLUX', XYZ= 5, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX12', QUANTITY='INCIDENT HEAT FLUX', XYZ= 7.5, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX13', QUANTITY='INCIDENT HEAT FLUX', XYZ= 10, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX14', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX15', QUANTITY='INCIDENT HEAT FLUX', XYZ= 15, 2.8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX16', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2, 8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX17', QUANTITY='INCIDENT HEAT FLUX', XYZ= 5, 8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX18', QUANTITY='INCIDENT HEAT FLUX', XYZ= 7.5, 8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX19', QUANTITY='INCIDENT HEAT FLUX', XYZ= 10, 8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX20', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13, 8, 2.8, IOR= -3/
&DEVC ID='INC-FLUX21', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2, 12, 2.8, IOR= -3/
&DEVC ID='INC-FLUX22', QUANTITY='INCIDENT HEAT FLUX', XYZ= 5, 12, 2.8, IOR= -3/
&DEVC ID='INC-FLUX23', QUANTITY='INCIDENT HEAT FLUX', XYZ= 7.5, 12, 2.8, IOR= -3/
&DEVC ID='INC-FLUX24', QUANTITY='INCIDENT HEAT FLUX', XYZ= 10, 12, 2.8, IOR= -3/
&DEVC ID='INC-FLUX25', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13, 12, 2.8, IOR= -3/
&DEVC ID='INC-FLUX26', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX27', QUANTITY='INCIDENT HEAT FLUX', XYZ= 5, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX28', QUANTITY='INCIDENT HEAT FLUX', XYZ= 6.3, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX29', QUANTITY='INCIDENT HEAT FLUX', XYZ= 7.5, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX30', QUANTITY='INCIDENT HEAT FLUX', XYZ= 8.8, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX31', QUANTITY='INCIDENT HEAT FLUX', XYZ= 10, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX32', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13, 0.3, 2.6, IOR= 2/
&DEVC ID='INC-FLUX33', QUANTITY='INCIDENT HEAT FLUX', XYZ= 2, 15.7, 2.6, IOR= -2/
&DEVC ID='INC-FLUX34', QUANTITY='INCIDENT HEAT FLUX', XYZ= 6.3, 15.7, 2.6, IOR= -2/
&DEVC ID='INC-FLUX35', QUANTITY='INCIDENT HEAT FLUX', XYZ= 8.8, 15.7, 2.6, IOR= -2/
&DEVC ID='INC-FLUX36', QUANTITY='INCIDENT HEAT FLUX', XYZ= 13, 15.7, 2.6, IOR= -2/
&DEVC ID='NET-FLUX1', QUANTITY='NET HEAT FLUX', XYZ= 2, 0.15, 2.3, IOR=-3/
&DEVC ID='NET-FLUX2', QUANTITY='NET HEAT FLUX', XYZ= 6.3, 0.15, 2.3, IOR=-3/
&DEVC ID='NET-FLUX3', QUANTITY='NET HEAT FLUX', XYZ= 8.8, 0.15, 2.3, IOR=-3/
&DEVC ID='NET-FLUX4', QUANTITY='NET HEAT FLUX', XYZ= 13, 0.15, 2.3, IOR=-3/
&DEVC ID='NET-FLUX5', QUANTITY='NET HEAT FLUX', XYZ= 2, 15.85, 2.3, IOR=-3/
&DEVC ID='NET-FLUX6', QUANTITY='NET HEAT FLUX', XYZ= 6.3, 15.85, 2.3, IOR=-3/
&DEVC ID='NET-FLUX7', QUANTITY='NET HEAT FLUX', XYZ= 8.8, 15.85, 2.3, IOR=-3/
&DEVC ID='NET-FLUX8', QUANTITY='NET HEAT FLUX', XYZ= 13, 15.85, 2.3, IOR=-3/
&DEVC ID='NET-FLUX9', QUANTITY='NET HEAT FLUX', XYZ= 0, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX10', QUANTITY='NET HEAT FLUX', XYZ= 2, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX11', QUANTITY='NET HEAT FLUX', XYZ= 5, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX12', QUANTITY='NET HEAT FLUX', XYZ= 7.5, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX13', QUANTITY='NET HEAT FLUX', XYZ= 10, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX14', QUANTITY='NET HEAT FLUX', XYZ= 13, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX15', QUANTITY='NET HEAT FLUX', XYZ= 15, 2.8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX16', QUANTITY='NET HEAT FLUX', XYZ= 2, 8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX17', QUANTITY='NET HEAT FLUX', XYZ= 5, 8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX18', QUANTITY='NET HEAT FLUX', XYZ= 7.5, 8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX19', QUANTITY='NET HEAT FLUX', XYZ= 10, 8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX20', QUANTITY='NET HEAT FLUX', XYZ= 13, 8, 2.8, IOR=-3/
&DEVC ID='NET-FLUX21', QUANTITY='NET HEAT FLUX', XYZ= 2, 12, 2.8, IOR=-3/
&DEVC ID='NET-FLUX22', QUANTITY='NET HEAT FLUX', XYZ= 5, 12, 2.8, IOR=-3/
&DEVC ID='NET-FLUX23', QUANTITY='NET HEAT FLUX', XYZ= 7.5, 12, 2.8, IOR=-3/
&DEVC ID='NET-FLUX24', QUANTITY='NET HEAT FLUX', XYZ= 10, 12, 2.8, IOR=-3/
&DEVC ID='NET-FLUX25', QUANTITY='NET HEAT FLUX', XYZ= 13, 12, 2.8, IOR=-3/
&DEVC ID='NET-FLUX26', QUANTITY='NET HEAT FLUX', XYZ= 2, 0.3, 2.6, IOR= 2/
&DEVC ID='NET-FLUX27', QUANTITY='NET HEAT FLUX', XYZ= 5, 0.3, 2.6, IOR= 2/
&DEVC ID='NET-FLUX28', QUANTITY='NET HEAT FLUX', XYZ= 6.3, 0.3, 2.6, IOR= 2/
```

```
&DEVC ID='NET-FLUX29', QUANTITY='NET HEAT FLUX', XYZ= 7.5, 0.3, 2.6, IOR= 2/
&DEVC ID='NET-FLUX30', QUANTITY='NET HEAT FLUX', XYZ= 8.8, 0.3, 2.6, IOR= 2/
&DEVC ID='NET-FLUX31', QUANTITY='NET HEAT FLUX', XYZ= 10, 0.3, 2.6, IOR= 2/
&DEVC ID='NET-FLUX32', QUANTITY='NET HEAT FLUX', XYZ= 13, 0.3, 2.6, IOR= 2/
&DEVC ID='NET-FLUX33', QUANTITY='NET HEAT FLUX', XYZ= 2, 15.7, 2.6, IOR= -2/
&DEVC ID='NET-FLUX34', QUANTITY='NET HEAT FLUX', XYZ= 6.3, 15.7, 2.6, IOR= -2/
&DEVC ID='NET-FLUX35', QUANTITY='NET HEAT FLUX', XYZ= 8.8, 15.7, 2.6, IOR= -2/
&DEVC ID='NET-FLUX36', QUANTITY='NET HEAT FLUX', XYZ= 13, 15.7, 2.6, IOR= -2/
&DEVC ID='RAD-FLUX1', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 0.15, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX2', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 6.3, 0.15, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX3', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 8.8, 0.15, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX4', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 0.15, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX5', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 15.85, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX6', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 6.3, 15.85, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX7', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 8.8, 15.85, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX8', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 15.85, 2.3, IOR=-3/
&DEVC ID='RAD-FLUX9', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 0, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX10', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX11', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 5, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX12', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 7.5, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX13', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 10, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX14', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX15', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 15, 2.8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX16', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX17', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 5, 8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX18', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 7.5, 8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX19', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 10, 8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX20', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 8, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX21', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 12, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX22', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 5, 12, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX23', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 7.5, 12, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX24', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 10, 12, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX25', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 12, 2.8, IOR=-3/
&DEVC ID='RAD-FLUX26', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX27', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 5, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX28', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 6.3, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX29', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 7.5, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX30', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 8.8, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX31', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 10, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX32', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 0.3, 2.6, IOR= 2/
&DEVC ID='RAD-FLUX33', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 2, 15.7, 2.6, IOR= -2/
&DEVC ID='RAD-FLUX34', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 6.3, 15.7, 2.6, IOR= -2/
&DEVC ID='RAD-FLUX35', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 8.8, 15.7, 2.6, IOR= -2/
&DEVC ID='RAD-FLUX36', QUANTITY='RADIATIVE HEAT FLUX', XYZ= 13, 15.7, 2.6, IOR= -2/
&DEVC ID='CONV-FLUX1', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 0.15, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX2', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 6.3, 0.15, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX3', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 8.8, 0.15, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX4', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 0.15, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX5', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 15.85, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX6', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 6.3, 15.85, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX7', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 8.8, 15.85, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX8', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 15.85, 2.3, IOR=-3/
&DEVC ID='CONV-FLUX9', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 0, 2.8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX10', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 2.8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX11', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 5, 2.8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX12', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 7.5, 2.8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX13', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 10, 2.8, 2.8, IOR=-3/
```

```
&DEVC ID='CONV-FLUX14', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 2.8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX15', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 15, 2.8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX16', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX17', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 5, 8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX18', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 7.5, 8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX19', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 10, 8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX20', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 8, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX21', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 12, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX22', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 5, 12, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX23', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 7.5, 12, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX24', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 10, 12, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX25', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 12, 2.8, IOR=-3/
&DEVC ID='CONV-FLUX26', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX27', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 5, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX28', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 6.3, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX29', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 7.5, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX30', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 8.8, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX31', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 10, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX32', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 0.3, 2.6, IOR= 2/
&DEVC ID='CONV-FLUX33', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 2, 15.7, 2.6, IOR= -2/
&DEVC ID='CONV-FLUX34', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 6.3, 15.7, 2.6, IOR= -2/
&DEVC ID='CONV-FLUX35', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 8.8, 15.7, 2.6, IOR= -2/
&DEVC ID='CONV-FLUX36', QUANTITY='CONVECTIVE HEAT FLUX', XYZ= 13, 15.7, 2.6, IOR= -2/
&DEVC ID='Tmember-1', QUANTITY ='WALL TEMPERATURE', XYZ= 2, 0.15, 2.3, IOR=-3/
&DEVC ID='Tmember-2', QUANTITY ='WALL TEMPERATURE', XYZ= 6.3, 0.15, 2.3, IOR=-3/
&DEVC ID='Tmember-3', QUANTITY ='WALL TEMPERATURE', XYZ= 8.8, 0.15, 2.3, IOR=-3/
&DEVC ID='Tmember-4', QUANTITY ='WALL TEMPERATURE', XYZ= 13, 0.15, 2.3, IOR=-3/
&DEVC ID='Tmember-5', QUANTITY ='WALL TEMPERATURE', XYZ= 2, 15.85, 2.3, IOR=-3/
&DEVC ID='Tmember-6', QUANTITY ='WALL TEMPERATURE', XYZ= 6.3, 15.85, 2.3, IOR=-3/
&DEVC ID='Tmember-7', QUANTITY ='WALL TEMPERATURE', XYZ= 8.8, 15.85, 2.3, IOR=-3/
&DEVC ID='Tmember-8', QUANTITY ='WALL TEMPERATURE', XYZ= 13, 15.85, 2.3, IOR=-3/
&DEVC ID='Tmember-9', QUANTITY ='WALL TEMPERATURE', XYZ= 0, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-10', QUANTITY ='WALL TEMPERATURE', XYZ= 2, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-11', QUANTITY ='WALL TEMPERATURE', XYZ= 5, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-12', QUANTITY ='WALL TEMPERATURE', XYZ= 7.5, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-13', QUANTITY ='WALL TEMPERATURE', XYZ= 10, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-14', QUANTITY ='WALL TEMPERATURE', XYZ= 13, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-15', QUANTITY ='WALL TEMPERATURE', XYZ= 15, 2.8, 2.8, IOR=-3/
&DEVC ID='Tmember-16', QUANTITY ='WALL TEMPERATURE', XYZ= 2, 8, 2.8, IOR=-3/
&DEVC ID='Tmember-17', QUANTITY ='WALL TEMPERATURE', XYZ= 5, 8, 2.8, IOR=-3/
&DEVC ID='Tmember-18', QUANTITY ='WALL TEMPERATURE', XYZ= 7.5, 8, 2.8, IOR=-3/
&DEVC ID='Tmember-19', QUANTITY ='WALL TEMPERATURE', XYZ= 10, 8, 2.8, IOR=-3/
&DEVC ID='Tmember-20', QUANTITY ='WALL TEMPERATURE', XYZ= 13, 8, 2.8, IOR=-3/
&DEVC ID='Tmember-21', QUANTITY ='WALL TEMPERATURE', XYZ= 2, 12, 2.8, IOR=-3/
&DEVC ID='Tmember-22', QUANTITY ='WALL TEMPERATURE', XYZ= 5, 12, 2.8, IOR=-3/
&DEVC ID='Tmember-23', QUANTITY ='WALL TEMPERATURE', XYZ= 7.5, 12, 2.8, IOR=-3/
&DEVC ID='Tmember-24', QUANTITY ='WALL TEMPERATURE', XYZ= 10, 12, 2.8, IOR=-3/
&DEVC ID='Tmember-25', QUANTITY ='WALL TEMPERATURE', XYZ= 13, 12, 2.8, IOR=-3/
&DEVC ID='Tmember-26', QUANTITY='WALL TEMPERATURE', XYZ= 2, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-27', QUANTITY='WALL TEMPERATURE', XYZ= 5, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-28', QUANTITY='WALL TEMPERATURE', XYZ= 6.3, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-29', QUANTITY='WALL TEMPERATURE', XYZ= 7.5, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-30', QUANTITY='WALL TEMPERATURE', XYZ= 8.8, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-31', QUANTITY='WALL TEMPERATURE', XYZ= 10, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-32', QUANTITY='WALL TEMPERATURE', XYZ= 13, 0.3, 2.6, IOR= 2/
&DEVC ID='Tmember-33', QUANTITY='WALL TEMPERATURE', XYZ= 2, 15.7, 2.6, IOR= -2/
&DEVC ID='Tmember-34', QUANTITY='WALL TEMPERATURE', XYZ= 6.3, 15.7, 2.6, IOR= -2/
```

```
&DEVC ID='Tmember-35', QUANTITY='WALL TEMPERATURE', XYZ= 8.8, 15.7, 2.6, IOR= -2/
&DEVC ID='Tmember-36', QUANTITY='WALL TEMPERATURE', XYZ= 13, 15.7, 2.6, IOR= -2/
&DEVC ID='Tgas-1',QUANTITY='GAS TEMPERATURE', XYZ= 2, 0.15, 2.3, IOR=-3/
&DEVC ID='Tgas-2',QUANTITY='GAS TEMPERATURE', XYZ= 6.3, 0.15, 2.3, IOR=-3/
&DEVC ID='Tgas-3',QUANTITY='GAS TEMPERATURE', XYZ= 8.8, 0.15, 2.3, IOR=-3/
&DEVC ID='Tgas-4',QUANTITY='GAS TEMPERATURE', XYZ= 13, 0.15, 2.3, IOR=-3/
&DEVC ID='Tgas-5',QUANTITY='GAS TEMPERATURE', XYZ= 2, 15.85, 2.3, IOR=-3/
&DEVC ID='Tgas-6',QUANTITY='GAS TEMPERATURE', XYZ= 6.3, 15.85, 2.3, IOR=-3/
&DEVC ID='Tgas-7',QUANTITY='GAS TEMPERATURE', XYZ= 8.8, 15.85, 2.3, IOR=-3/
&DEVC ID='Tgas-8',QUANTITY='GAS TEMPERATURE', XYZ= 13, 15.85, 2.3, IOR=-3/
&DEVC ID='Tgas-9',QUANTITY='GAS TEMPERATURE', XYZ= 0, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-10',QUANTITY='GAS TEMPERATURE', XYZ= 2, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-11',QUANTITY='GAS TEMPERATURE', XYZ= 5, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-12',QUANTITY='GAS TEMPERATURE', XYZ= 7.5, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-13',QUANTITY='GAS TEMPERATURE', XYZ= 10, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-14',QUANTITY='GAS TEMPERATURE', XYZ= 13, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-15',QUANTITY='GAS TEMPERATURE', XYZ= 15, 2.8, 2.8, IOR=-3/
&DEVC ID='Tgas-16',QUANTITY='GAS TEMPERATURE', XYZ= 2, 8, 2.8, IOR=-3/
&DEVC ID='Tgas-17',QUANTITY='GAS TEMPERATURE', XYZ= 5, 8, 2.8, IOR=-3/
&DEVC ID='Tgas-18',QUANTITY='GAS TEMPERATURE', XYZ= 7.5, 8, 2.8, IOR=-3/
&DEVC ID='Tgas-19',QUANTITY='GAS TEMPERATURE', XYZ= 10, 8, 2.8, IOR=-3/
&DEVC ID='Tgas-20',QUANTITY='GAS TEMPERATURE', XYZ= 13, 8, 2.8, IOR=-3/
&DEVC ID='Tgas-21',QUANTITY='GAS TEMPERATURE', XYZ= 2, 12, 2.8, IOR=-3/
&DEVC ID='Tgas-22',QUANTITY='GAS TEMPERATURE', XYZ= 5, 12, 2.8, IOR=-3/
&DEVC ID='Tgas-23',QUANTITY='GAS TEMPERATURE', XYZ= 7.5, 12, 2.8, IOR=-3/
&DEVC ID='Tgas-24',QUANTITY='GAS TEMPERATURE', XYZ= 10, 12, 2.8, IOR=-3/
&DEVC ID='Tgas-25',QUANTITY='GAS TEMPERATURE', XYZ= 13, 12, 2.8, IOR=-3/
&DEVC ID='Tgas-26', QUANTITY='GAS TEMPERATURE', XYZ= 2, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-27', QUANTITY='GAS TEMPERATURE', XYZ= 5, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-28', QUANTITY='GAS TEMPERATURE', XYZ= 6.3, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-29', QUANTITY='GAS TEMPERATURE', XYZ= 7.5, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-30', QUANTITY='GAS TEMPERATURE', XYZ= 8.8, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-31', QUANTITY='GAS TEMPERATURE', XYZ= 10, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-32', QUANTITY='GAS TEMPERATURE', XYZ= 13, 0.3, 2.6, IOR= 2/
&DEVC ID='Tgas-33', QUANTITY='GAS TEMPERATURE', XYZ= 2, 15.7, 2.6, IOR= -2/
&DEVC ID='Tgas-34', QUANTITY='GAS TEMPERATURE', XYZ= 6.3, 15.7, 2.6, IOR= -2/
&DEVC ID='Tgas-35', QUANTITY='GAS TEMPERATURE', XYZ= 8.8, 15.7, 2.6, IOR= -2/
&DEVC ID='Tgas-36', QUANTITY='GAS TEMPERATURE', XYZ= 13, 15.7, 2.6, IOR= -2/
```

Slices

```
&SLCF PBZ=2.3, QUANTITY='TEMPERATURE'/
&SLCF PBZ=2.8, QUANTITY='TEMPERATURE'/
&SLCF PBX=0, QUANTITY='TEMPERATURE'/
&SLCF PBX=2, QUANTITY='TEMPERATURE'/
&SLCF PBX=5, QUANTITY='TEMPERATURE'/
&SLCF PBX=6.3, QUANTITY='TEMPERATURE'/
&SLCF PBX=7.5, QUANTITY='TEMPERATURE'/
&SLCF PBX=8.8, QUANTITY='TEMPERATURE'/
&SLCF PBX=10, QUANTITY='TEMPERATURE'/
&SLCF PBX=13, QUANTITY='TEMPERATURE'/
&SLCF PBX=15, QUANTITY='TEMPERATURE'/
&SLCF PBY=0, QUANTITY='TEMPERATURE'/
&SLCF PBY=0.4, QUANTITY='TEMPERATURE'/
&SLCF PBY=2.8, QUANTITY='TEMPERATURE'/
&SLCF PBY=8, QUANTITY='TEMPERATURE'/
&SLCF PBY=15.7, QUANTITY='TEMPERATURE'/
&SLCF PBY=16, QUANTITY='TEMPERATURE'/
```

```
&BNDF QUANTITY='WALL TEMPERATURE' /
&TAIL/
```

FDS script of model 1

Ideal en surface aangepast.fds
Generated by PyroSim - Version 2016.1.0425
18-aug-2016 9:07:10

```
&HEAD CHID='ideal_en_surface_aangepast'/
&TIME T_END=1800.0/
&DUMP RENDER_FILE='ideal_en_surface_aangepast.ge1', DT_RESTART=100.0, NFRAMES=360/
```

Spaces

```
&MESH ID='raster01', IJK=10,58,10, XB=-4.0,-1.0,6.6,24.0,0.0,3.0/
&MESH ID='raster02', IJK=81,10,10, XB=-28.3,-4.0,6.6,9.6,0.0,3.0/
&MESH ID='raster03', IJK=81,10,10, XB=-28.3,-4.0,21.0,24.0,0.0,3.0/
&MESH ID='raster04', IJK=9,58,10, XB=-31.0,-28.3,6.6,24.0,0.0,3.0/
&MESH ID='raster05', IJK=243,114,30, XB=-28.3,-4.0,9.6,21.0,0.0,3.0/
```

Fuel

```
&REAC ID='autobrand_TUDelft',
    FYI='autobrand',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature Devices

```
&DEVC ID='GAS L1', QUANTITY='TEMPERATURE', XYZ=-15.5,14.8,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='GAS L01', QUANTITY='TEMPERATURE', XYZ=-15.5,14.6,2.3/
&DEVC ID='GAS L02', QUANTITY='TEMPERATURE', XYZ=-15.5,14.4,2.3/
&DEVC ID='GAS L03', QUANTITY='TEMPERATURE', XYZ=-15.5,14.2,2.3/
&DEVC ID='GAS L04', QUANTITY='TEMPERATURE', XYZ=-15.5,14.0,2.3/
&DEVC ID='GAS L05', QUANTITY='TEMPERATURE', XYZ=-15.5,13.8,2.3/
&DEVC ID='GAS L06', QUANTITY='TEMPERATURE', XYZ=-15.5,13.6,2.3/
&DEVC ID='GAS L07', QUANTITY='TEMPERATURE', XYZ=-15.5,13.4,2.3/
&DEVC ID='GAS L08', QUANTITY='TEMPERATURE', XYZ=-15.5,13.2,2.3/
&DEVC ID='GAS L09', QUANTITY='TEMPERATURE', XYZ=-15.5,13.0,2.3/
&DEVC ID='GAS L10', QUANTITY='TEMPERATURE', XYZ=-15.5,12.8,2.3/
&DEVC ID='GAS L11', QUANTITY='TEMPERATURE', XYZ=-15.5,12.6,2.3/
&DEVC ID='GAS L12', QUANTITY='TEMPERATURE', XYZ=-15.5,12.4,2.3/
&DEVC ID='GAS L13', QUANTITY='TEMPERATURE', XYZ=-15.5,12.2,2.3/
&DEVC ID='GAS L14', QUANTITY='TEMPERATURE', XYZ=-15.5,12.0,2.3/
&DEVC ID='GAS L15', QUANTITY='TEMPERATURE', XYZ=-15.5,11.8,2.3/
&DEVC ID='GAS L16', QUANTITY='TEMPERATURE', XYZ=-15.5,11.6,2.3/
&DEVC ID='GAS L17', QUANTITY='TEMPERATURE', XYZ=-15.5,11.4,2.3/
&DEVC ID='GAS L18', QUANTITY='TEMPERATURE', XYZ=-15.5,11.2,2.3/
&DEVC ID='GAS L19', QUANTITY='TEMPERATURE', XYZ=-15.5,11.0,2.3/
&DEVC ID='GAS L20', QUANTITY='TEMPERATURE', XYZ=-15.5,10.8,2.3/
&DEVC ID='GAS L21', QUANTITY='TEMPERATURE', XYZ=-15.5,10.6,2.3/
&DEVC ID='GAS L22', QUANTITY='TEMPERATURE', XYZ=-15.5,10.4,2.3/
&DEVC ID='GAS L23', QUANTITY='TEMPERATURE', XYZ=-15.5,10.2,2.3/
&DEVC ID='GAS L24', QUANTITY='TEMPERATURE', XYZ=-15.5,10.0,2.3/
&DEVC ID='GAS L25', QUANTITY='TEMPERATURE', XYZ=-15.5,9.8,2.3/
&DEVC ID='GAS L26', QUANTITY='TEMPERATURE', XYZ=-15.5,9.6,2.3/
&DEVC ID='GAS L27', QUANTITY='TEMPERATURE', XYZ=-15.5,9.4,2.3/
&DEVC ID='GAS L28', QUANTITY='TEMPERATURE', XYZ=-15.5,9.2,2.3/
```

```
&DEVC ID='GAS L29', QUANTITY='TEMPERATURE', XYZ=-15.5,9.0,2.3/
&DEVC ID='GAS L30', QUANTITY='TEMPERATURE', XYZ=-15.5,8.8,2.3/
&DEVC ID='GAS Ll01', QUANTITY='TEMPERATURE', XYZ=-15.7,14.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll03', QUANTITY='TEMPERATURE', XYZ=-15.7,14.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll04', QUANTITY='TEMPERATURE', XYZ=-15.7,14.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll05', QUANTITY='TEMPERATURE', XYZ=-15.7,14.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll06', QUANTITY='TEMPERATURE', XYZ=-15.7,13.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll07', QUANTITY='TEMPERATURE', XYZ=-15.7,13.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll08', QUANTITY='TEMPERATURE', XYZ=-15.7,13.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll09', QUANTITY='TEMPERATURE', XYZ=-15.7,12.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll10', QUANTITY='TEMPERATURE', XYZ=-15.7,12.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll11', QUANTITY='TEMPERATURE', XYZ=-15.7,12.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll12', QUANTITY='TEMPERATURE', XYZ=-15.7,12.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll13', QUANTITY='TEMPERATURE', XYZ=-15.7,11.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll14', QUANTITY='TEMPERATURE', XYZ=-15.7,11.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll15', QUANTITY='TEMPERATURE', XYZ=-15.7,11.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll16', QUANTITY='TEMPERATURE', XYZ=-15.7,11.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll17', QUANTITY='TEMPERATURE', XYZ=-15.7,10.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll18', QUANTITY='TEMPERATURE', XYZ=-15.7,10.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll19', QUANTITY='TEMPERATURE', XYZ=-15.7,10.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll20', QUANTITY='TEMPERATURE', XYZ=-15.7,10.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll21', QUANTITY='TEMPERATURE', XYZ=-15.7,9.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll22', QUANTITY='TEMPERATURE', XYZ=-15.7,9.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll23', QUANTITY='TEMPERATURE', XYZ=-15.7,9.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll24', QUANTITY='TEMPERATURE', XYZ=-15.7,8.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll25', QUANTITY='TEMPERATURE', XYZ=-15.7,8.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll26', QUANTITY='TEMPERATURE', XYZ=-15.7,8.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll30', QUANTITY='TEMPERATURE', XYZ=-15.7,8.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll31', QUANTITY='TEMPERATURE', XYZ=-15.7,7.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Ll32', QUANTITY='TEMPERATURE', XYZ=-15.7,7.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='GAS Lr01', QUANTITY='TEMPERATURE', XYZ=-15.3,14.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr02', QUANTITY='TEMPERATURE', XYZ=-15.3,14.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr03', QUANTITY='TEMPERATURE', XYZ=-15.3,14.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr04', QUANTITY='TEMPERATURE', XYZ=-15.3,14.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr05', QUANTITY='TEMPERATURE', XYZ=-15.3,13.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr06', QUANTITY='TEMPERATURE', XYZ=-15.3,13.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr07', QUANTITY='TEMPERATURE', XYZ=-15.3,13.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr08', QUANTITY='TEMPERATURE', XYZ=-15.3,12.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr09', QUANTITY='TEMPERATURE', XYZ=-15.3,12.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr10', QUANTITY='TEMPERATURE', XYZ=-15.3,12.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr11', QUANTITY='TEMPERATURE', XYZ=-15.3,11.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr12', QUANTITY='TEMPERATURE', XYZ=-15.3,12.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr13', QUANTITY='TEMPERATURE', XYZ=-15.3,11.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr14', QUANTITY='TEMPERATURE', XYZ=-15.3,11.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr15', QUANTITY='TEMPERATURE', XYZ=-15.3,11.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr16', QUANTITY='TEMPERATURE', XYZ=-15.3,10.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr17', QUANTITY='TEMPERATURE', XYZ=-15.3,10.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr18', QUANTITY='TEMPERATURE', XYZ=-15.3,10.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr19', QUANTITY='TEMPERATURE', XYZ=-15.3,10.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr20', QUANTITY='TEMPERATURE', XYZ=-15.3,9.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr21', QUANTITY='TEMPERATURE', XYZ=-15.3,9.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr22', QUANTITY='TEMPERATURE', XYZ=-15.3,9.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr23', QUANTITY='TEMPERATURE', XYZ=-15.3,8.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr24', QUANTITY='TEMPERATURE', XYZ=-15.3,8.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr25', QUANTITY='TEMPERATURE', XYZ=-15.3,8.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr26', QUANTITY='TEMPERATURE', XYZ=-15.3,7.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='GAS Lr27', QUANTITY='TEMPERATURE', XYZ=-15.3,8.1,2.6, ORIENTATION=1.0,0.0,0.0/
```

```
&DEVC ID='GAS Lr28', QUANTITY='TEMPERATURE', XYZ=-15.3,7.7,2.6, ORIENTATION=1.0,0.0,0.0/
```

Material and Surface Properties

```
&MATL ID='Steel',
      FYI='Steel',
      SPECIFIC_HEAT=0.53,
      CONDUCTIVITY=52.0,
      DENSITY=7800.0,
      EMISSIVITY=0.8/
&MATL ID='Concrete',
      FYI='Concrete',
      SPECIFIC_HEAT=0.84,
      CONDUCTIVITY=2.0,
      DENSITY=2400.0/

&SURF ID='K250 Steel 12,5 mm',
      RGB=146.0,202.0,166.0,
      BACKING='VOID',
      MATL_ID(1,1)='Steel',
      MATL_MASS_FRACTION(1,1)=1.0,
      THICKNESS(1)=0.0125,
      GEOMETRY='CARTESIAN',
      LENGTH=0.0,
      WIDTH=0.0/
&SURF ID='K120 Steel 4,0 mm',
      RGB=146.0,202.0,166.0,
      BACKING='VOID',
      MATL_ID(1,1)='Steel',
      MATL_MASS_FRACTION(1,1)=1.0,
      THICKNESS(1)=0.004,
      GEOMETRY='CARTESIAN',
      LENGTH=0.0,
      WIDTH=0.0/
&SURF ID='IPE500 Steel 12,5 mm01',
      RGB=146.0,202.0,166.0,
      BACKING='VOID',
      MATL_ID(1,1)='Steel',
      MATL_MASS_FRACTION(1,1)=1.0,
      THICKNESS(1)=0.0125,
      GEOMETRY='CARTESIAN',
      LENGTH=0.0,
      WIDTH=0.0/
&SURF ID='staal-beton',
      COLOR='GRAY 40',
      BACKING='INSULATED',
      MATL_ID(1,1)='Steel',
      MATL_ID(2,1)='Concrete',
      MATL_MASS_FRACTION(1,1)=1.0,
      MATL_MASS_FRACTION(2,1)=1.0,
      THICKNESS(1:2)=0.0015,0.075,
      GEOMETRY='CARTESIAN',
      LENGTH=0.0,
      WIDTH=0.0/
&SURF ID='auto 01',
      COLOR='RED',
      HRRPUA=658.73,
      RAMP_Q='auto 01_RAMP_Q'/
```

```
&RAMP ID='auto 01_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 01_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='auto 01_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='auto 01_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='auto 01_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='auto 01_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='auto 02',
    RGB=255.0,51.0,153.0,
    HRRPUA=658.73,
    RAMP_Q='auto 02_RAMP_Q'/
&RAMP ID='auto 02_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=600.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=660.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1200.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1560.0, F=0.663/
&RAMP ID='auto 02_RAMP_Q', T=1620.0, F=1.0/
&RAMP ID='auto 02_RAMP_Q', T=1740.0, F=0.542/
&RAMP ID='auto 02_RAMP_Q', T=2400.0, F=0.12/
&RAMP ID='auto 02_RAMP_Q', T=4320.0, F=0.0/
&SURF ID='auto 03',
    RGB=255.0,153.0,51.0,
    HRRPUA=658.73,
    RAMP_Q='auto 03_RAMP_Q'/
&RAMP ID='auto 03_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=900.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=960.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1860.0, F=0.663/
&RAMP ID='auto 03_RAMP_Q', T=1920.0, F=1.0/
&RAMP ID='auto 03_RAMP_Q', T=2040.0, F=0.542/
&RAMP ID='auto 03_RAMP_Q', T=2700.0, F=0.12/
&RAMP ID='auto 03_RAMP_Q', T=4620.0, F=0.0/
&SURF ID='auto 04',
    RGB=153.0,51.0,255.0,
    HRRPUA=658.73,
    RAMP_Q='auto 04_RAMP_Q'/
&RAMP ID='auto 04_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1320.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1380.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=1920.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=2280.0, F=0.663/
&RAMP ID='auto 04_RAMP_Q', T=2340.0, F=1.0/
&RAMP ID='auto 04_RAMP_Q', T=2460.0, F=0.542/
&RAMP ID='auto 04_RAMP_Q', T=3120.0, F=0.12/
&RAMP ID='auto 04_RAMP_Q', T=5040.0, F=0.0/
&SURF ID='auto 05',
    RGB=255.0,255.0,51.0,
    HRRPUA=658.73,
    RAMP_Q='auto 05_RAMP_Q'/
&RAMP ID='auto 05_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1620.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1680.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2220.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2580.0, F=0.663/
&RAMP ID='auto 05_RAMP_Q', T=2640.0, F=1.0/
```

```
&RAMP ID='auto 05_RAMP_Q', T=2760.0, F=0.542/
&RAMP ID='auto 05_RAMP_Q', T=3420.0, F=0.12/
&RAMP ID='auto 05_RAMP_Q', T=5340.0, F=0.0/
&SURF ID='auto 11',
    RGB=102.0,255.0,255.0,
    HRRPUA=658.73,
    RAMP_Q='auto 11_RAMP_Q'/
&RAMP ID='auto 11_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1320.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='auto 11_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='auto 11_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='auto 11_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='auto 11_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='auto 12 en 13',
    RGB=153.0,153.0,255.0,
    HRRPUA=658.73,
    RAMP_Q='auto 12 en 13_RAMP_Q'/
&RAMP ID='auto 12 en 13_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='auto 12 en 13_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='auto 12 en 13_RAMP_Q', T=5160.0, F=0.0/
```

Columns

```
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-15.7,-15.4,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-20.9,-20.6,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.7,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,3.0, SURF_ID='K250 Steel 12,5 mm'/
```

Beams

```
&OBST ID='Obstruction', XB=-31.0,-1.0,15.2,15.3,2.8,2.9, SURF_ID='K120 Steel 4,0 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.8,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-20.8,-20.6,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-15.6,-15.4,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-10.4,-10.2,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-5.196,-4.996,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-31.0,-1.0,7.4,7.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,8.2,8.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.0,9.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.8,10.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,10.6,10.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,11.4,11.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,12.2,12.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.0,13.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.8,14.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,14.6,14.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,15.4,15.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,16.2,16.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.0,17.2,2.7,2.9, SURF_ID='staal-beton'/
```

&OBST ID='Obstruction', XB=-31.0,-1.0,17.8,18.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,18.6,18.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,19.4,19.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,20.2,20.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,21.0,21.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,21.8,22.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,22.6,22.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,23.4,23.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,6.6,24.0,2.7,3.0, SURF_ID='staal-beton'/

Cars
&OBST ID='Auto1', XB=-15.8,-14.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 01','auto 01','INERT'/
&OBST ID='Auto 2', XB=-18.3,-16.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 02','auto 02','INERT'/
&OBST ID='Auto 3', XB=-13.3,-11.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 03','auto 03','INERT'/
&OBST ID='Auto 4', XB=-20.8,-19.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 04','auto 04','INERT'/
&OBST ID='Auto 5', XB=-10.8,-9.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 05','auto 05','INERT'/
&OBST ID='Auto 11', XB=-15.8,-14.0,15.8,20.7,0.0,0.3, SURF_IDS='auto 11','auto 11','INERT'/
&OBST ID='Auto 12', XB=-18.3,-16.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/
&OBST ID='Auto 13', XB=-13.3,-11.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/

Properties of the sides of the mesh
&VENT ID='Vent04', SURF_ID='OPEN', XB=-31.0,-1.0,24.0,24.0,0.0,2.9/
&VENT ID='Vent06', SURF_ID='OPEN', XB=-31.0,-1.0,6.6,6.6,0.0,2.9/
&VENT ID='Vent05', SURF_ID='INERT', XB=-31.0,-31.0,6.6,24.0,0.0,2.9/
&VENT ID='Vent', SURF_ID='INERT', XB=-1.0,-1.0,6.6,24.0,0.0,2.7/

&TAIL /

FDS script of model 2

Conny2.fds
Generated by PyroSim - Version 2016.1.0425
23-aug-2016 15:08:08

&HEAD CHID='Conny2'/
&TIME T_END=2500.0/
&DUMP RENDER_FILE='Conny2.ge1'/

Spaces
&MESH ID='Mesh01', IJK=150,160,28, XB=0.0,15.0,0.0,16.0,0.0,2.8/
&MESH ID='Mesh02', IJK=22,120,14, XB=-4.5,0.0,-4.0,20.0,0.0,2.8/
&MESH ID='Mesh03', IJK=22,120,14, XB=15.0,19.5,-4.0,20.0,0.0,2.8/
&MESH ID='Mesh04', IJK=75,20,14, XB=0.0,15.0,-4.0,0.0,0.0,2.8/
&MESH ID='Mesh05', IJK=75,20,14, XB=0.0,15.0,16.0,20.0,0.0,2.8/

Fuel
&REAC ID='autobrand',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./

Gas temperature Devices
&DEVC ID='GAS', QUANTITY='TEMPERATURE', XYZ=2.0,0.15,2.2/
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=6.3,0.15,2.2/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.8,0.15,2.2/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=13.0,0.15,2.2/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=2.0,15.85,2.2/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=6.3,15.85,2.2/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.8,15.85,2.2/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=13.0,15.85,2.2/
&DEVC ID='t1', QUANTITY='WALL TEMPERATURE', XYZ=2.0,0.15,2.3, IOR=-3/
&DEVC ID='t2', QUANTITY='WALL TEMPERATURE', XYZ=6.3,0.15,2.3, IOR=-3/
&DEVC ID='t3', QUANTITY='WALL TEMPERATURE', XYZ=8.8,0.15,2.3, IOR=-3/
&DEVC ID='t4', QUANTITY='WALL TEMPERATURE', XYZ=13.0,0.15,2.3, IOR=-3/
&DEVC ID='t5', QUANTITY='WALL TEMPERATURE', XYZ=2.0,15.85,2.3, IOR=-3/
&DEVC ID='t6', QUANTITY='WALL TEMPERATURE', XYZ=6.3,15.85,2.3, IOR=-3/
&DEVC ID='t7', QUANTITY='WALL TEMPERATURE', XYZ=8.8,15.85,2.3, IOR=-3/
&DEVC ID='t8', QUANTITY='WALL TEMPERATURE', XYZ=13.0,15.85,2.3, IOR=-3/

Material and Surface Properties
&MATL ID='STEEL_EURO',
    SPECIFIC_HEAT_RAMP='STEEL_EURO_SPECIFIC_HEAT_RAMP',
    CONDUCTIVITY_RAMP='STEEL_EURO_CONDUCTIVITY_RAMP',
    DENSITY=7850.0,
    EMISSIVITY=0.7/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=0.0, F=0.425/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=580.0, F=0.738/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=650.0, F=0.8/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=700.0, F=1.0/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=720.0, F=1.4/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=730.0, F=2.3/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=735.0, F=5.0/

```
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=740.0, F=2.5/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=750.0, F=1.5/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=770.0, F=1.0/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=800.0, F=0.8/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=900.0, F=0.65/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=1370.0, F=0.65/
&RAMP ID='STEEL_EURO_SPECIFIC_HEAT_RAMP', T=2000.0, F=0.65/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=0.0, F=54.0/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=20.0, F=53.33/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=100.0, F=50.67/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=200.0, F=47.34/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=300.0, F=44.01/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=400.0, F=40.68/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=500.0, F=37.35/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=600.0, F=34.02/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=700.0, F=30.69/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=790.0, F=27.69/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=800.0, F=27.3/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=900.0, F=27.3/
&RAMP ID='STEEL_EURO_CONDUCTIVITY_RAMP', T=1500.0, F=27.3/
&MATL ID='CONCRETE_EURO',
    SPECIFIC_HEAT_RAMP='CONCRETE_EURO_SPECIFIC_HEAT_RAMP',
    CONDUCTIVITY_RAMP='CONCRETE_EURO_CONDUCTIVITY_RAMP',
    DENSITY=2500.0/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=20.0, F=1.951/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=100.0, F=1.766/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=150.0, F=1.656/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=200.0, F=1.553/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=300.0, F=1.361/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=400.0, F=1.191/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=500.0, F=1.042/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=600.0, F=0.915/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=700.0, F=0.809/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=800.0, F=0.724/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=900.0, F=0.661/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=1000.0, F=0.619/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=1100.0, F=0.599/
&RAMP ID='CONCRETE_EURO_CONDUCTIVITY_RAMP', T=1200.0, F=0.6/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=20.0, F=0.9/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=40.0, F=0.9/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=100.0, F=0.9/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=101.0, F=2.02/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=115.0, F=2.02/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=200.0, F=1.0/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=201.0, F=1.0005/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=250.0, F=1.025/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=300.0, F=1.075/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=400.0, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=500.0, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=600.0, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=700.0, F=1.1/
&RAMP ID='CONCRETE_EURO_SPECIFIC_HEAT_RAMP', T=1200.0, F=1.1/

&SURF ID='STEEL1',
    COLOR='DIM GRAY',
    BACKING='VOID',
    MATL_ID(1,1)='STEEL_EURO',
```

```
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.032/
&SURF ID='CAR1',
    COLOR='RED',
    HRRPUA=658.73,
    RAMP_Q='CAR1_RAMP_Q'/
&RAMP ID='CAR1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='CAR1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='CAR1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='CAR1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='CAR1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='CAR1_RAMP_Q', T=1620.0, F=0.12/
&RAMP ID='CAR1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='CAR2',
    COLOR='FOREST GREEN',
    HRRPUA=658.73,
    RAMP_Q='CAR2_RAMP_Q'/
&RAMP ID='CAR2_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='CAR2_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='CAR2_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='CAR2_RAMP_Q', T=1320.0, F=0.289/
&RAMP ID='CAR2_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='CAR2_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='CAR2_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='CAR2_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='CAR2_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='CAR3',
    COLOR='MAGENTA',
    HRRPUA=658.73,
    RAMP_Q='CAR3_RAMP_Q'/
&RAMP ID='CAR3_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='CAR3_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='CAR3_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='CAR3_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='CAR3_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='CAR3_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='CAR3_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='CAR3_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='CAR3_RAMP_Q', T=5160.0, F=0.0/
&SURF ID='CONCRETE',
    COLOR='SEA GREEN',
    BACKING='VOID',
    MATL_ID(1,1)='CONCRETE_EURO',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.4/
```

Columns

Beams

```
&OBST ID='BEAM ', XB=0.0,15.0,0.0,0.3,2.3,2.8, COLOR='DIM GRAY',
SURF_ID6='INERT','INERT','STEEL1','STEEL1','STEEL1','INERT'/
&OBST ID='BEAM2', XB=0.0,15.0,15.7,16.0,2.3,2.8, COLOR='DIM GRAY',
SURF_ID6='INERT','INERT','STEEL1','STEEL1','STEEL1','INERT'/
```

Cars

```
&OBST ID='CAR 1', XB=6.6,8.4,0.4,5.2,0.0,0.3, SURF_IDS='CAR1','CAR1','INERT'/
```

&OBST ID='CAR2', XB=4.1,5.9,0.4,5.2,0.0,0.3, SURF_IDS='CAR2','CAR2','INERT'/
&OBST ID='CAR3', XB=9.1,10.9,0.4,5.2,0.0,0.3, SURF_IDS='CAR3','CAR3','INERT'/

Properties of the sides of the mesh
&VENT ID='Mesh Vent: Mesh01 [ZMAX]', SURF_ID='CONCRETE', XB=0.0,15.0,0.0,16.0,2.8,2.8/
&VENT ID='Mesh Vent: Mesh01 [ZMIN]', SURF_ID='CONCRETE', XB=0.0,15.0,0.0,16.0,0.0,0.0/
&VENT ID='Mesh Vent: Mesh02 [XMIN]', SURF_ID='OPEN', XB=-4.5,-4.5,-4.0,20.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh02 [YMAX]', SURF_ID='OPEN', XB=-4.5,0.0,20.0,20.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh02 [YMIN]', SURF_ID='OPEN', XB=-4.5,0.0,-4.0,-4.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh02 [ZMAX]', SURF_ID='CONCRETE', XB=-4.5,0.0,-4.0,20.0,2.8,2.8/
&VENT ID='Mesh Vent: Mesh02 [ZMIN]', SURF_ID='CONCRETE', XB=-4.5,0.0,-4.0,20.0,0.0,0.0/
&VENT ID='Mesh Vent: Mesh03 [XMAX]', SURF_ID='OPEN', XB=19.5,19.5,-4.0,20.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh03 [YMAX]', SURF_ID='OPEN', XB=15.0,19.5,20.0,20.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh03 [YMIN]', SURF_ID='OPEN', XB=15.0,19.5,-4.0,-4.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh03 [ZMAX]', SURF_ID='CONCRETE', XB=15.0,19.5,-4.0,20.0,2.8,2.8/
&VENT ID='Mesh Vent: Mesh03 [ZMIN]', SURF_ID='CONCRETE', XB=15.0,19.5,-4.0,20.0,0.0,0.0/
&VENT ID='Mesh Vent: Mesh04 [YMIN]', SURF_ID='OPEN', XB=0.0,15.0,-4.0,-4.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh04 [ZMAX]', SURF_ID='CONCRETE', XB=0.0,15.0,-4.0,0.0,2.8,2.8/
&VENT ID='Mesh Vent: Mesh04 [ZMIN]', SURF_ID='CONCRETE', XB=0.0,15.0,-4.0,0.0,0.0,0.0/
&VENT ID='Mesh Vent: Mesh05 [YMAX]', SURF_ID='OPEN', XB=0.0,15.0,20.0,20.0,0.0,2.8/
&VENT ID='Mesh Vent: Mesh05 [ZMAX]', SURF_ID='CONCRETE', XB=0.0,15.0,16.0,20.0,2.8,2.8/
&VENT ID='Mesh Vent: Mesh05 [ZMIN]', SURF_ID='CONCRETE', XB=0.0,15.0,16.0,20.0,0.0,0.0/

&TAIL /

FDS script of model 3

```
model 5.fds
Generated by PyroSim - Version 2016.1.0425
21-sep-2016 9:32:53

&HEAD CHID='model_5'/
&TIME T_END=1800.0/
&DUMP RENDER_FILE='model_5.ge1', DT_RESTART=100.0, NFRAMES=360/
```

Spaces

```
&MESH ID='raster01', IJK=10,58,10, XB=-4.0,-1.0,6.6,24.0,0.0,3.0/
&MESH ID='raster02', IJK=81,10,10, XB=-28.3,-4.0,6.6,9.6,0.0,3.0/
&MESH ID='raster03', IJK=81,10,10, XB=-28.3,-4.0,21.0,24.0,0.0,3.0/
&MESH ID='raster04', IJK=9,58,10, XB=-31.0,-28.3,6.6,24.0,0.0,3.0/
&MESH ID='raster05', IJK=243,114,30, XB=-28.3,-4.0,9.6,21.0,0.0,3.0/
```

Fuel

```
&REAC ID='autobrand_TUDelft',
    FYI='autobrand',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices beams

```
&DEVC ID='L1', QUANTITY='TEMPERATURE', XYZ=-15.5,14.8,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='L01', QUANTITY='TEMPERATURE', XYZ=-15.5,14.6,2.3/
&DEVC ID='L02', QUANTITY='TEMPERATURE', XYZ=-15.5,14.4,2.3/
&DEVC ID='L03', QUANTITY='TEMPERATURE', XYZ=-15.5,14.2,2.3/
&DEVC ID='L04', QUANTITY='TEMPERATURE', XYZ=-15.5,14.0,2.3/
&DEVC ID='L05', QUANTITY='TEMPERATURE', XYZ=-15.5,13.8,2.3/
&DEVC ID='L06', QUANTITY='TEMPERATURE', XYZ=-15.5,13.6,2.3/
&DEVC ID='L07', QUANTITY='TEMPERATURE', XYZ=-15.5,13.4,2.3/
&DEVC ID='L08', QUANTITY='TEMPERATURE', XYZ=-15.5,13.2,2.3/
&DEVC ID='L09', QUANTITY='TEMPERATURE', XYZ=-15.5,13.0,2.3/
&DEVC ID='L10', QUANTITY='TEMPERATURE', XYZ=-15.5,12.8,2.3/
&DEVC ID='L11', QUANTITY='TEMPERATURE', XYZ=-15.5,12.6,2.3/
&DEVC ID='L12', QUANTITY='TEMPERATURE', XYZ=-15.5,12.4,2.3/
&DEVC ID='L13', QUANTITY='TEMPERATURE', XYZ=-15.5,12.2,2.3/
&DEVC ID='L14', QUANTITY='TEMPERATURE', XYZ=-15.5,12.0,2.3/
&DEVC ID='L15', QUANTITY='TEMPERATURE', XYZ=-15.5,11.8,2.3/
&DEVC ID='L16', QUANTITY='TEMPERATURE', XYZ=-15.5,11.6,2.3/
&DEVC ID='L17', QUANTITY='TEMPERATURE', XYZ=-15.5,11.4,2.3/
&DEVC ID='L18', QUANTITY='TEMPERATURE', XYZ=-15.5,11.2,2.3/
&DEVC ID='L19', QUANTITY='TEMPERATURE', XYZ=-15.5,11.0,2.3/
&DEVC ID='L20', QUANTITY='TEMPERATURE', XYZ=-15.5,10.8,2.3/
&DEVC ID='L21', QUANTITY='TEMPERATURE', XYZ=-15.5,10.6,2.3/
&DEVC ID='L22', QUANTITY='TEMPERATURE', XYZ=-15.5,10.4,2.3/
&DEVC ID='L23', QUANTITY='TEMPERATURE', XYZ=-15.5,10.2,2.3/
&DEVC ID='L24', QUANTITY='TEMPERATURE', XYZ=-15.5,10.0,2.3/
&DEVC ID='L25', QUANTITY='TEMPERATURE', XYZ=-15.5,9.8,2.3/
&DEVC ID='L26', QUANTITY='TEMPERATURE', XYZ=-15.5,9.6,2.3/
&DEVC ID='L27', QUANTITY='TEMPERATURE', XYZ=-15.5,9.4,2.3/
&DEVC ID='L28', QUANTITY='TEMPERATURE', XYZ=-15.5,9.2,2.3/
```

```
&DEVC ID='L29', QUANTITY='TEMPERATURE', XYZ=-15.5,9.0,2.3/
&DEVC ID='L30', QUANTITY='TEMPERATURE', XYZ=-15.5,8.8,2.3/
&DEVC ID='Ll01', QUANTITY='TEMPERATURE', XYZ=-15.7,14.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll03', QUANTITY='TEMPERATURE', XYZ=-15.7,14.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll04', QUANTITY='TEMPERATURE', XYZ=-15.7,14.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll05', QUANTITY='TEMPERATURE', XYZ=-15.7,14.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll06', QUANTITY='TEMPERATURE', XYZ=-15.7,13.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll07', QUANTITY='TEMPERATURE', XYZ=-15.7,13.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll08', QUANTITY='TEMPERATURE', XYZ=-15.7,13.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll09', QUANTITY='TEMPERATURE', XYZ=-15.7,12.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll10', QUANTITY='TEMPERATURE', XYZ=-15.7,12.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll11', QUANTITY='TEMPERATURE', XYZ=-15.7,12.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll12', QUANTITY='TEMPERATURE', XYZ=-15.7,12.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll13', QUANTITY='TEMPERATURE', XYZ=-15.7,11.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll14', QUANTITY='TEMPERATURE', XYZ=-15.7,11.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll15', QUANTITY='TEMPERATURE', XYZ=-15.7,11.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll16', QUANTITY='TEMPERATURE', XYZ=-15.7,11.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll17', QUANTITY='TEMPERATURE', XYZ=-15.7,10.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll18', QUANTITY='TEMPERATURE', XYZ=-15.7,10.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll19', QUANTITY='TEMPERATURE', XYZ=-15.7,10.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll20', QUANTITY='TEMPERATURE', XYZ=-15.7,10.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll21', QUANTITY='TEMPERATURE', XYZ=-15.7,9.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll22', QUANTITY='TEMPERATURE', XYZ=-15.7,9.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll23', QUANTITY='TEMPERATURE', XYZ=-15.7,9.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll24', QUANTITY='TEMPERATURE', XYZ=-15.7,8.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll25', QUANTITY='TEMPERATURE', XYZ=-15.7,8.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll26', QUANTITY='TEMPERATURE', XYZ=-15.7,8.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll30', QUANTITY='TEMPERATURE', XYZ=-15.7,8.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll31', QUANTITY='TEMPERATURE', XYZ=-15.7,7.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll32', QUANTITY='TEMPERATURE', XYZ=-15.7,7.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Lr01', QUANTITY='TEMPERATURE', XYZ=-15.3,14.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr02', QUANTITY='TEMPERATURE', XYZ=-15.3,14.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr03', QUANTITY='TEMPERATURE', XYZ=-15.3,14.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr04', QUANTITY='TEMPERATURE', XYZ=-15.3,14.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr05', QUANTITY='TEMPERATURE', XYZ=-15.3,13.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr06', QUANTITY='TEMPERATURE', XYZ=-15.3,13.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr07', QUANTITY='TEMPERATURE', XYZ=-15.3,13.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr08', QUANTITY='TEMPERATURE', XYZ=-15.3,12.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr09', QUANTITY='TEMPERATURE', XYZ=-15.3,12.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr10', QUANTITY='TEMPERATURE', XYZ=-15.3,12.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr11', QUANTITY='TEMPERATURE', XYZ=-15.3,11.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr12', QUANTITY='TEMPERATURE', XYZ=-15.3,12.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr13', QUANTITY='TEMPERATURE', XYZ=-15.3,11.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr14', QUANTITY='TEMPERATURE', XYZ=-15.3,11.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr15', QUANTITY='TEMPERATURE', XYZ=-15.3,11.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr16', QUANTITY='TEMPERATURE', XYZ=-15.3,10.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr17', QUANTITY='TEMPERATURE', XYZ=-15.3,10.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr18', QUANTITY='TEMPERATURE', XYZ=-15.3,10.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr19', QUANTITY='TEMPERATURE', XYZ=-15.3,10.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr20', QUANTITY='TEMPERATURE', XYZ=-15.3,9.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr21', QUANTITY='TEMPERATURE', XYZ=-15.3,9.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr22', QUANTITY='TEMPERATURE', XYZ=-15.3,9.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr23', QUANTITY='TEMPERATURE', XYZ=-15.3,8.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr24', QUANTITY='TEMPERATURE', XYZ=-15.3,8.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr25', QUANTITY='TEMPERATURE', XYZ=-15.3,8.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr26', QUANTITY='TEMPERATURE', XYZ=-15.3,7.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr27', QUANTITY='TEMPERATURE', XYZ=-15.3,8.1,2.6, ORIENTATION=1.0,0.0,0.0/
```

```
&DEVC ID='Lr28', QUANTITY='TEMPERATURE', XYZ=-15.3,7.7,2.6, ORIENTATION=1.0,0.0,0.0/
```

Wall temperature devices beams

```
&DEVC ID='W01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='W02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='W03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='W04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='W05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='W06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='W07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='W08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='W09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.0,2.4, IOR=-3/
&DEVC ID='W10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='W11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='W12', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='W13', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='W14', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='W15', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='W16', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='W17', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='W18', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='W19', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='W20', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.8,2.4, IOR=-3/
&DEVC ID='W21', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.6,2.4, IOR=-3/
&DEVC ID='W22', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='W23', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.2,2.4, IOR=-3/
&DEVC ID='W24', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='W25', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='W26', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='W27', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='W28', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='W29', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='W30', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,8.8,2.4, IOR=-3/
&DEVC ID='Wr1', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='Wl01', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='Wl03', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='Wl04', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='Wl05', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='Wl06', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='Wl07', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='Wl08', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='Wl09', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='Wl10', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='Wl11', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='Wl12', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='Wl13', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='Wl14', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='Wl15', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='Wl16', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='Wl17', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='Wl18', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='Wl19', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='Wl20', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='Wl21', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='Wl22', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='Wl23', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.3,2.6, IOR=-1/
&DEVC ID='Wl24', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.9,2.6, IOR=-1/
```

&DEVC ID='Wl25', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='Wl26', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.5,2.6, IOR=-1/
&DEVC ID='Wl30', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='Wl31', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='Wl32', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='Wr01', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='Wr02', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='Wr03', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='Wr04', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='Wr05', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='Wr06', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.6,2.6, IOR=1/
&DEVC ID='Wr07', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='Wr08', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.7,2.6, IOR=1/
&DEVC ID='Wr09', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='Wr10', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='Wr11', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='Wr12', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='Wr13', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='Wr14', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='Wr15', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='Wr16', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='Wr17', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='Wr18', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='Wr19', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='Wr20', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.5,2.6, IOR=1/
&DEVC ID='Wr21', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.7,2.6, IOR=1/
&DEVC ID='Wr22', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='Wr23', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='Wr24', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.9,2.6, IOR=1/
&DEVC ID='Wr25', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='Wr26', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='Wr27', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='Wr28', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,7.7,2.6, IOR=1/

Heat flux devices beams
&DEVC ID='GHF L1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.8,2.4, IOR=-3/
&DEVC ID='GHF L01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='GHF L02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='GHF L03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='GHF L04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='GHF L05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='GHF L06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='GHF L07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='GHF L08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='GHF L09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.0,2.4, IOR=-3/
&DEVC ID='GHF L10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='GHF L11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='GHF L12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='GHF L13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='GHF L14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='GHF L15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='GHF L16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='GHF L17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='GHF L18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='GHF L19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='GHF L20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.8,2.4, IOR=-3/
&DEVC ID='GHF L21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.6,2.4, IOR=-3/

```
&DEVC ID='GHF L22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='GHF L23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.2,2.4, IOR=-3/
&DEVC ID='GHF L24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='GHF L25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='GHF L26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='GHF L27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='GHF L28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='GHF L29', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='GHF Ll01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='GHF Ll02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='GHF Ll03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='GHF Ll04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='GHF Ll05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='GHF Ll06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='GHF Ll07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='GHF Ll08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='GHF Ll09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='GHF Ll10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='GHF Ll11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='GHF Ll12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='GHF Ll13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='GHF Ll14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='GHF Ll15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='GHF Ll16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='GHF Ll17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='GHF Ll18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='GHF Ll19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='GHF Ll20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.3,2.6, IOR=-1/
&DEVC ID='GHF Ll21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='GHF Ll22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='GHF Ll23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.5,2.6, IOR=-1/
&DEVC ID='GHF Ll24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.9,2.6, IOR=-1/
&DEVC ID='GHF Ll25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='GHF Ll26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='GHF Ll27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='GHF Ll28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='GHF Lr1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='GHF Lr02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='GHF Lr03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='GHF Lr04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='GHF Lr01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.7,2.6, IOR=1/
&DEVC ID='GHF Lr05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='GHF Lr06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='GHF Lr07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='GHF Lr08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.7,2.6, IOR=1/
&DEVC ID='GHF Lr09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='GHF Lr10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='GHF Lr11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='GHF Lr12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='GHF Lr13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='GHF Lr14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='GHF Lr15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='GHF Lr16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='GHF Lr17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='GHF Lr18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='GHF Lr19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.7,2.6, IOR=1/
&DEVC ID='GHF Lr20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.5,2.6, IOR=1/
```

```
&DEVC ID='GHF Lr21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='GHF Lr22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.9,2.6, IOR=1/
&DEVC ID='GHF Lr23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='GHF Lr24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='GHF Lr25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='GHF Lr26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='GHF Lr27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.7,2.6, IOR=1/
```

Gas temperature devices columns

```
&DEVC ID='A01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A12', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='Ar01', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar02', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar03', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar04', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar05', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar06', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar07', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar08', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar09', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar10', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar11', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar12', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar13', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Al01', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al02', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al03', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al04', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al05', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al06', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al07', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al08', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al09', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al10', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al11', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al12', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al13', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Aa1', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.9, ORIENTATION=0.0,1.0,0.0/
```

```
&DEVC ID='Aa10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.3, ORIENTATION=0.0,1.0,0.0/
```

Wall temperature devices columns

```
&DEVC ID='AW01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='AW02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.3, IOR=-2/
&DEVC ID='AW03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='AW04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='AW05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.9, IOR=-2/
&DEVC ID='AW06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='AW07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='AW08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='AW09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='AW10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='AW11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='AW12', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='AWr1', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='AWr01', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='AWr02', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='AWr03', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='AWr04', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='AWr05', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='AWr06', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='AWr07', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='AWr08', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='AWr09', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='AWr10', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='AWr11', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='AWr12', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='AWr13', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='AWl1', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='AWl01', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='AWl02', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='AWl03', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='AWl04', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='AWl05', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='AWl06', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='AWl07', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='AWl08', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='AWl09', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='AWl10', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='AWl11', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='AWl12', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='AWl13', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='AWa1', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='AWa01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='AWa02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='AWa03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='AWa04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='AWa05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='AWa06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='AWa07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='AWa08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='AWa09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='AWa10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='AWa11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,2.3, IOR=2/
```

Heat flux devices columns

```
&DEVC ID='GHF A01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='GHF A02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.3, IOR=-2/
&DEVC ID='GHF A03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='GHF A04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='GHF A05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.9, IOR=-2/
&DEVC ID='GHF A06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='GHF A07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='GHF A08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='GHF A09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='GHF A10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='GHF A11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='GHF A12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='GHF Al1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='GHF Al01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='GHF Al02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='GHF Al03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='GHF Al04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='GHF Al05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='GHF Al06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='GHF Al07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='GHF Al08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='GHF Al09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='GHF Al10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='GHF Al11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='GHF Al12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='GHF Al13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='GHF Ar1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='GHF Ar01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='GHF Ar02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='GHF Ar03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='GHF Ar04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='GHF Ar05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='GHF Ar06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='GHF Ar07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='GHF Ar08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='GHF Ar09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='GHF Ar10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='GHF Ar11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='GHF Ar12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='GHF Ar13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='GHF Aa1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='GHF Aa01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='GHF Aa02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='GHF Aa03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='GHF Aa04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='GHF Aa05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='GHF Aa06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='GHF Aa07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='GHF Aa08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='GHF Aa09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='GHF Aa10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='GHF Aa11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.3, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
    FYI='Steel',
```

```
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    FYI='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/

&SURF ID='K250 Steel 12,5 mm',
    RGB=146.0,202.0,166.0,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='K120 Steel 4,0 mm',
    RGB=146.0,202.0,166.0,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.004,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='IPE500 Steel 12,5 mm01',
    RGB=146.0,202.0,166.0,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='staal-beton',
    COLOR='GRAY 40',
    BACKING='INSULATED',
    MATL_ID(1,1)='Steel',
    MATL_ID(2,1)='Concrete',
    MATL_MASS_FRACTION(1,1)=1.0,
    MATL_MASS_FRACTION(2,1)=1.0,
    THICKNESS(1:2)=0.0015,0.075,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='auto 01',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='auto 01_RAMP_Q'/
&RAMP ID='auto 01_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 01_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='auto 01_RAMP_Q', T=1500.0, F=1.0/
```

```
&RAMP ID='auto 01_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='auto 01_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='auto 01_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='auto 02',
    RGB=255.0,51.0,153.0,
    HRRPUA=646.42,
    RAMP_Q='auto 02_RAMP_Q'/
&RAMP ID='auto 02_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=600.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=660.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1200.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1560.0, F=0.663/
&RAMP ID='auto 02_RAMP_Q', T=1620.0, F=1.0/
&RAMP ID='auto 02_RAMP_Q', T=1740.0, F=0.542/
&RAMP ID='auto 02_RAMP_Q', T=2400.0, F=0.12/
&RAMP ID='auto 02_RAMP_Q', T=4320.0, F=0.0/
&SURF ID='auto 03',
    RGB=255.0,153.0,51.0,
    HRRPUA=646.42,
    RAMP_Q='auto 03_RAMP_Q'/
&RAMP ID='auto 03_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=900.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=960.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1860.0, F=0.663/
&RAMP ID='auto 03_RAMP_Q', T=1920.0, F=1.0/
&RAMP ID='auto 03_RAMP_Q', T=2040.0, F=0.542/
&RAMP ID='auto 03_RAMP_Q', T=2700.0, F=0.12/
&RAMP ID='auto 03_RAMP_Q', T=4620.0, F=0.0/
&SURF ID='auto 04',
    RGB=153.0,51.0,255.0,
    HRRPUA=646.42,
    RAMP_Q='auto 04_RAMP_Q'/
&RAMP ID='auto 04_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1320.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1380.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=1920.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=2280.0, F=0.663/
&RAMP ID='auto 04_RAMP_Q', T=2340.0, F=1.0/
&RAMP ID='auto 04_RAMP_Q', T=2460.0, F=0.542/
&RAMP ID='auto 04_RAMP_Q', T=3120.0, F=0.12/
&RAMP ID='auto 04_RAMP_Q', T=5040.0, F=0.0/
&SURF ID='auto 05',
    RGB=255.0,255.0,51.0,
    HRRPUA=646.42,
    RAMP_Q='auto 05_RAMP_Q'/
&RAMP ID='auto 05_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1620.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1680.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2220.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2580.0, F=0.663/
&RAMP ID='auto 05_RAMP_Q', T=2640.0, F=1.0/
&RAMP ID='auto 05_RAMP_Q', T=2760.0, F=0.542/
&RAMP ID='auto 05_RAMP_Q', T=3420.0, F=0.12/
&RAMP ID='auto 05_RAMP_Q', T=5340.0, F=0.0/
&SURF ID='auto 11',
    RGB=102.0,255.0,255.0,
```

```
    HRRPUA=646.42,
    RAMP_Q='auto 11_RAMP_Q'/
&RAMP ID='auto 11_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1320.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='auto 11_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='auto 11_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='auto 11_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='auto 11_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='auto 12 en 13',
    RGB=153.0,153.0,255.0,
    HRRPUA=646.42,
    RAMP_Q='auto 12 en 13_RAMP_Q'/
&RAMP ID='auto 12 en 13_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='auto 12 en 13_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='auto 12 en 13_RAMP_Q', T=5160.0, F=0.0/
```

Columns

```
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-15.7,-15.4,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-20.9,-20.6,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.7,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,3.0, SURF_ID='K250 Steel 12,5 mm'/
```

Beams

```
&OBST ID='Obstruction', XB=-31.0,-1.0,15.2,15.3,2.8,2.9, SURF_ID='K120 Steel 4,0 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.8,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-20.8,-20.6,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-15.6,-15.4,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-10.4,-10.2,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-5.196,-4.996,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-31.0,-1.0,7.4,7.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,8.2,8.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.0,9.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.8,10.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,10.6,10.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,11.4,11.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,12.2,12.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.0,13.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.8,14.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,14.6,14.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,15.4,15.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,16.2,16.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.0,17.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.8,18.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,18.6,18.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,19.4,19.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,20.2,20.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,21.0,21.2,2.7,2.9, SURF_ID='staal-beton'/
```

```
&OBST ID='Obstruction', XB=-31.0,-1.0,21.8,22.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,22.6,22.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,23.4,23.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,6.6,24.0,2.7,3.0, SURF_ID='staal-beton'/
```

Cars

```
&OBST ID='Auto1', XB=-15.8,-14.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 01','auto 01','INERT'/
&OBST ID='Auto 2', XB=-18.3,-16.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 02','auto 02','INERT'/
&OBST ID='Auto 3', XB=-13.3,-11.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 03','auto 03','INERT'/
&OBST ID='Auto 4', XB=-20.8,-19.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 04','auto 04','INERT'/
&OBST ID='Auto 5', XB=-10.8,-9.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 05','auto 05','INERT'/
&OBST ID='Auto 11', XB=-15.8,-14.0,15.8,20.7,0.0,0.3, SURF_IDS='auto 11','auto 11','INERT'/
&OBST ID='Auto 12', XB=-18.3,-16.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/
&OBST ID='Auto 13', XB=-13.3,-11.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/
```

Properties of the sides of the mesh

```
&VENT ID='Vent04', SURF_ID='OPEN', XB=-31.0,-1.0,24.0,24.0,0.0,2.9/
&VENT ID='Vent06', SURF_ID='OPEN', XB=-31.0,-1.0,6.6,6.6,0.0,2.9/
&VENT ID='Vent05', SURF_ID='INERT', XB=-31.0,-31.0,6.6,24.0,0.0,2.9/
&VENT ID='Vent', SURF_ID='INERT', XB=-1.0,-1.0,6.6,24.0,0.0,2.7/


&TAIL /
```

FDS script of model 4

model 6.fds
Generated by PyroSim - Version 2016.1.0425
21-sep-2016 9:30:53

```
&HEAD CHID='model_6'/
&TIME T_END=1800.0/
&DUMP RENDER_FILE='model_6.ge1', DT_RESTART=100.0, NFRAMES=360/
```

Spaces

```
&MESH ID='raster01', IJK=10,58,10, XB=-4.0,-1.0,6.6,24.0,0.0,3.0/
&MESH ID='raster02', IJK=81,10,10, XB=-28.3,-4.0,6.6,9.6,0.0,3.0/
&MESH ID='raster03', IJK=81,10,10, XB=-28.3,-4.0,21.0,24.0,0.0,3.0/
&MESH ID='raster04', IJK=9,58,10, XB=-31.0,-28.3,6.6,24.0,0.0,3.0/
&MESH ID='raster05', IJK=243,114,30, XB=-28.3,-4.0,9.6,21.0,0.0,3.0/
```

Fuel

```
&REAC ID='autobrand_TUDelft',
    FYI='autobrand',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices beams

```
&DEVC ID='L1', QUANTITY='TEMPERATURE', XYZ=-15.5,14.8,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='L01', QUANTITY='TEMPERATURE', XYZ=-15.5,14.6,2.3/
&DEVC ID='L02', QUANTITY='TEMPERATURE', XYZ=-15.5,14.4,2.3/
&DEVC ID='L03', QUANTITY='TEMPERATURE', XYZ=-15.5,14.2,2.3/
&DEVC ID='L04', QUANTITY='TEMPERATURE', XYZ=-15.5,14.0,2.3/
&DEVC ID='L05', QUANTITY='TEMPERATURE', XYZ=-15.5,13.8,2.3/
&DEVC ID='L06', QUANTITY='TEMPERATURE', XYZ=-15.5,13.6,2.3/
&DEVC ID='L07', QUANTITY='TEMPERATURE', XYZ=-15.5,13.4,2.3/
&DEVC ID='L08', QUANTITY='TEMPERATURE', XYZ=-15.5,13.2,2.3/
&DEVC ID='L09', QUANTITY='TEMPERATURE', XYZ=-15.5,13.0,2.3/
&DEVC ID='L10', QUANTITY='TEMPERATURE', XYZ=-15.5,12.8,2.3/
&DEVC ID='L11', QUANTITY='TEMPERATURE', XYZ=-15.5,12.6,2.3/
&DEVC ID='L12', QUANTITY='TEMPERATURE', XYZ=-15.5,12.4,2.3/
&DEVC ID='L13', QUANTITY='TEMPERATURE', XYZ=-15.5,12.2,2.3/
&DEVC ID='L14', QUANTITY='TEMPERATURE', XYZ=-15.5,12.0,2.3/
&DEVC ID='L15', QUANTITY='TEMPERATURE', XYZ=-15.5,11.8,2.3/
&DEVC ID='L16', QUANTITY='TEMPERATURE', XYZ=-15.5,11.6,2.3/
&DEVC ID='L17', QUANTITY='TEMPERATURE', XYZ=-15.5,11.4,2.3/
&DEVC ID='L18', QUANTITY='TEMPERATURE', XYZ=-15.5,11.2,2.3/
&DEVC ID='L19', QUANTITY='TEMPERATURE', XYZ=-15.5,11.0,2.3/
&DEVC ID='L20', QUANTITY='TEMPERATURE', XYZ=-15.5,10.8,2.3/
&DEVC ID='L21', QUANTITY='TEMPERATURE', XYZ=-15.5,10.6,2.3/
&DEVC ID='L22', QUANTITY='TEMPERATURE', XYZ=-15.5,10.4,2.3/
&DEVC ID='L23', QUANTITY='TEMPERATURE', XYZ=-15.5,10.2,2.3/
&DEVC ID='L24', QUANTITY='TEMPERATURE', XYZ=-15.5,10.0,2.3/
&DEVC ID='L25', QUANTITY='TEMPERATURE', XYZ=-15.5,9.8,2.3/
&DEVC ID='L26', QUANTITY='TEMPERATURE', XYZ=-15.5,9.6,2.3/
&DEVC ID='L27', QUANTITY='TEMPERATURE', XYZ=-15.5,9.4,2.3/
&DEVC ID='L28', QUANTITY='TEMPERATURE', XYZ=-15.5,9.2,2.3/
&DEVC ID='L29', QUANTITY='TEMPERATURE', XYZ=-15.5,9.0,2.3/
```

```
&DEVC ID='L30', QUANTITY='TEMPERATURE', XYZ=-15.5,8.8,2.3/
&DEVC ID='Ll01', QUANTITY='TEMPERATURE', XYZ=-15.7,14.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll03', QUANTITY='TEMPERATURE', XYZ=-15.7,14.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll04', QUANTITY='TEMPERATURE', XYZ=-15.7,14.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll05', QUANTITY='TEMPERATURE', XYZ=-15.7,14.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll06', QUANTITY='TEMPERATURE', XYZ=-15.7,13.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll07', QUANTITY='TEMPERATURE', XYZ=-15.7,13.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll08', QUANTITY='TEMPERATURE', XYZ=-15.7,13.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll09', QUANTITY='TEMPERATURE', XYZ=-15.7,12.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll10', QUANTITY='TEMPERATURE', XYZ=-15.7,12.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll11', QUANTITY='TEMPERATURE', XYZ=-15.7,12.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll12', QUANTITY='TEMPERATURE', XYZ=-15.7,12.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll13', QUANTITY='TEMPERATURE', XYZ=-15.7,11.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll14', QUANTITY='TEMPERATURE', XYZ=-15.7,11.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll15', QUANTITY='TEMPERATURE', XYZ=-15.7,11.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll16', QUANTITY='TEMPERATURE', XYZ=-15.7,11.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll17', QUANTITY='TEMPERATURE', XYZ=-15.7,10.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll18', QUANTITY='TEMPERATURE', XYZ=-15.7,10.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll19', QUANTITY='TEMPERATURE', XYZ=-15.7,10.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll20', QUANTITY='TEMPERATURE', XYZ=-15.7,10.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll21', QUANTITY='TEMPERATURE', XYZ=-15.7,9.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll22', QUANTITY='TEMPERATURE', XYZ=-15.7,9.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll23', QUANTITY='TEMPERATURE', XYZ=-15.7,9.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll24', QUANTITY='TEMPERATURE', XYZ=-15.7,8.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll25', QUANTITY='TEMPERATURE', XYZ=-15.7,8.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll26', QUANTITY='TEMPERATURE', XYZ=-15.7,8.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll30', QUANTITY='TEMPERATURE', XYZ=-15.7,8.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll31', QUANTITY='TEMPERATURE', XYZ=-15.7,7.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll32', QUANTITY='TEMPERATURE', XYZ=-15.7,7.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Lr01', QUANTITY='TEMPERATURE', XYZ=-15.3,14.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr02', QUANTITY='TEMPERATURE', XYZ=-15.3,14.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr03', QUANTITY='TEMPERATURE', XYZ=-15.3,14.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr04', QUANTITY='TEMPERATURE', XYZ=-15.3,14.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr05', QUANTITY='TEMPERATURE', XYZ=-15.3,13.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr06', QUANTITY='TEMPERATURE', XYZ=-15.3,13.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr07', QUANTITY='TEMPERATURE', XYZ=-15.3,13.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr08', QUANTITY='TEMPERATURE', XYZ=-15.3,12.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr09', QUANTITY='TEMPERATURE', XYZ=-15.3,12.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr10', QUANTITY='TEMPERATURE', XYZ=-15.3,12.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr11', QUANTITY='TEMPERATURE', XYZ=-15.3,11.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr12', QUANTITY='TEMPERATURE', XYZ=-15.3,12.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr13', QUANTITY='TEMPERATURE', XYZ=-15.3,11.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr14', QUANTITY='TEMPERATURE', XYZ=-15.3,11.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr15', QUANTITY='TEMPERATURE', XYZ=-15.3,11.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr16', QUANTITY='TEMPERATURE', XYZ=-15.3,10.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr17', QUANTITY='TEMPERATURE', XYZ=-15.3,10.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr18', QUANTITY='TEMPERATURE', XYZ=-15.3,10.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr19', QUANTITY='TEMPERATURE', XYZ=-15.3,10.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr20', QUANTITY='TEMPERATURE', XYZ=-15.3,9.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr21', QUANTITY='TEMPERATURE', XYZ=-15.3,9.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr22', QUANTITY='TEMPERATURE', XYZ=-15.3,9.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr23', QUANTITY='TEMPERATURE', XYZ=-15.3,8.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr24', QUANTITY='TEMPERATURE', XYZ=-15.3,8.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr25', QUANTITY='TEMPERATURE', XYZ=-15.3,8.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr26', QUANTITY='TEMPERATURE', XYZ=-15.3,7.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr27', QUANTITY='TEMPERATURE', XYZ=-15.3,8.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr28', QUANTITY='TEMPERATURE', XYZ=-15.3,7.7,2.6, ORIENTATION=1.0,0.0,0.0/
```

Wall temperature devices beams

```
&DEVC ID='W01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='W02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='W03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='W04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='W05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='W06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='W07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='W08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='W09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.0,2.4, IOR=-3/
&DEVC ID='W10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='W11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='W12', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='W13', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='W14', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='W15', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='W16', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='W17', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='W18', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='W19', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='W20', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.8,2.4, IOR=-3/
&DEVC ID='W21', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.6,2.4, IOR=-3/
&DEVC ID='W22', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='W23', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.2,2.4, IOR=-3/
&DEVC ID='W24', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='W25', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='W26', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='W27', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='W28', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='W29', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='W30', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,8.8,2.4, IOR=-3/
&DEVC ID='Wr1', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='Wl01', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='Wl03', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='Wl04', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='Wl05', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='Wl06', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='Wl07', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='Wl08', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='Wl09', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='Wl10', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='Wl11', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='Wl12', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='Wl13', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='Wl14', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='Wl15', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='Wl16', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='Wl17', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='Wl18', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='Wl19', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='Wl20', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='Wl21', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='Wl22', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='Wl23', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.3,2.6, IOR=-1/
&DEVC ID='Wl24', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.9,2.6, IOR=-1/
&DEVC ID='Wl25', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='Wl26', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.5,2.6, IOR=-1/
```

```
&DEVC ID='Wl30', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='Wl31', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='Wl32', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='Wr01', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='Wr02', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='Wr03', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='Wr04', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='Wr05', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='Wr06', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.6,2.6, IOR=1/
&DEVC ID='Wr07', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='Wr08', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.7,2.6, IOR=1/
&DEVC ID='Wr09', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='Wr10', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='Wr11', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='Wr12', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='Wr13', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='Wr14', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='Wr15', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='Wr16', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='Wr17', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='Wr18', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='Wr19', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='Wr20', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.5,2.6, IOR=1/
&DEVC ID='Wr21', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.7,2.6, IOR=1/
&DEVC ID='Wr22', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='Wr23', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='Wr24', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.9,2.6, IOR=1/
&DEVC ID='Wr25', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='Wr26', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='Wr27', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='Wr28', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,7.7,2.6, IOR=1/
```

Heat flux devices beams

```
&DEVC ID='GHF L1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.8,2.4, IOR=-3/
&DEVC ID='GHF L01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='GHF L02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='GHF L03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='GHF L04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='GHF L05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='GHF L06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='GHF L07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='GHF L08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='GHF L09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.0,2.4, IOR=-3/
&DEVC ID='GHF L10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='GHF L11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='GHF L12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='GHF L13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='GHF L14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='GHF L15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='GHF L16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='GHF L17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='GHF L18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='GHF L19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='GHF L20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.8,2.4, IOR=-3/
&DEVC ID='GHF L21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.6,2.4, IOR=-3/
&DEVC ID='GHF L22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='GHF L23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.2,2.4, IOR=-3/
```

```
&DEVC ID='GHF L24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='GHF L25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='GHF L26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='GHF L27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='GHF L28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='GHF L29', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='GHF Ll01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='GHF Ll02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='GHF Ll03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='GHF Ll04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='GHF Ll05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='GHF Ll06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='GHF Ll07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='GHF Ll08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='GHF Ll09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='GHF Ll10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='GHF Ll11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='GHF Ll12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='GHF Ll13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='GHF Ll14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='GHF Ll15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='GHF Ll16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='GHF Ll17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='GHF Ll18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='GHF Ll19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='GHF Ll20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.3,2.6, IOR=-1/
&DEVC ID='GHF Ll21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='GHF Ll22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='GHF Ll23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.5,2.6, IOR=-1/
&DEVC ID='GHF Ll24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.9,2.6, IOR=-1/
&DEVC ID='GHF Ll25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='GHF Ll26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='GHF Ll27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='GHF Ll28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='GHF Lr1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='GHF Lr02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='GHF Lr03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='GHF Lr04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='GHF Lr01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.7,2.6, IOR=1/
&DEVC ID='GHF Lr05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='GHF Lr06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='GHF Lr07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='GHF Lr08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.7,2.6, IOR=1/
&DEVC ID='GHF Lr09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='GHF Lr10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='GHF Lr11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='GHF Lr12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='GHF Lr13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='GHF Lr14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='GHF Lr15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='GHF Lr16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='GHF Lr17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='GHF Lr18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='GHF Lr19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.7,2.6, IOR=1/
&DEVC ID='GHF Lr20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.5,2.6, IOR=1/
&DEVC ID='GHF Lr21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='GHF Lr22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.9,2.6, IOR=1/
```

```
&DEVC ID='GHF Lr23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='GHF Lr24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='GHF Lr25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='GHF Lr26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='GHF Lr27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.7,2.6, IOR=1/
```

Gas temperature devices columns

```
&DEVC ID='A01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A12', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='Ar01', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar02', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar03', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar04', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar05', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar06', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar07', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar08', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar09', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar10', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar11', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar12', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar13', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Al01', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al02', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al03', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al04', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al05', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al06', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al07', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al08', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al09', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al10', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al11', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al12', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al13', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Aa1', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.3, ORIENTATION=0.0,1.0,0.0/
```

Wall temperature devices columns

```
&DEVC ID='AW01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='AW02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.3, IOR=-2/
&DEVC ID='AW03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='AW04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='AW05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.9, IOR=-2/
&DEVC ID='AW06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='AW07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='AW08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='AW09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='AW10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='AW11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='AW12', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='AWr1', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='AWr01', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='AWr02', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='AWr03', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='AWr04', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='AWr05', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='AWr06', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='AWr07', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='AWr08', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='AWr09', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='AWr10', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='AWr11', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='AWr12', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='AWr13', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='AWl1', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='AWl01', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='AWl02', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='AWl03', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='AWl04', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='AWl05', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='AWl06', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='AWl07', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='AWl08', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='AWl09', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='AWl10', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='AWl11', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='AWl12', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='AWl13', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='AWa1', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='AWa01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='AWa02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='AWa03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='AWa04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='AWa05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='AWa06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='AWa07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='AWa08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='AWa09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='AWa10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='AWa11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,2.3, IOR=2/
```

Heat flux devices columns

```
&DEVC ID='GHF A01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='GHF A02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.3, IOR=-2/
```

```
&DEVC ID='GHF A03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='GHF A04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='GHF A05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.9, IOR=-2/
&DEVC ID='GHF A06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='GHF A07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='GHF A08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='GHF A09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='GHF A10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='GHF A11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='GHF A12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='GHF Al1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='GHF Al01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='GHF Al02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='GHF Al03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='GHF Al04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='GHF Al05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='GHF Al06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='GHF Al07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='GHF Al08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='GHF Al09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='GHF Al10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='GHF Al11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='GHF Al12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='GHF Al13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='GHF Ar1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='GHF Ar01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='GHF Ar02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='GHF Ar03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='GHF Ar04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='GHF Ar05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='GHF Ar06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='GHF Ar07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='GHF Ar08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='GHF Ar09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='GHF Ar10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='GHF Ar11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='GHF Ar12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='GHF Ar13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='GHF Aa1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='GHF Aa01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='GHF Aa02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='GHF Aa03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='GHF Aa04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='GHF Aa05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='GHF Aa06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='GHF Aa07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='GHF Aa08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='GHF Aa09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='GHF Aa10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='GHF Aa11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.3, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
     FYI='Steel',
     SPECIFIC_HEAT=0.53,
     CONDUCTIVITY=52.0,
     DENSITY=7800.0,
```

```
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    FYI='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/

&SURF ID='K250 Steel 12,5 mm',
    RGB=146.0,202.0,166.0,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='K120 Steel 4,0 mm',
    RGB=146.0,202.0,166.0,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.004,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='IPE500 Steel 12,5 mm01',
    RGB=146.0,202.0,166.0,
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='staal-beton',
    COLOR='GRAY 40',
    BACKING='INSULATED',
    MATL_ID(1,1)='Steel',
    MATL_ID(2,1)='Concrete',
    MATL_MASS_FRACTION(1,1)=1.0,
    MATL_MASS_FRACTION(2,1)=1.0,
    THICKNESS(1:2)=0.0015,0.075,
    GEOMETRY='CARTESIAN',
    LENGTH=0.0,
    WIDTH=0.0/
&SURF ID='auto 01',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='auto 01_RAMP_Q'/
&RAMP ID='auto 01_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 01_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='auto 01_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='auto 01_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='auto 01_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='auto 01_RAMP_Q', T=2800.0, F=0.0/
```

```
&SURF ID='auto 02',
     RGB=255.0,51.0,153.0,
     HRRPUA=646.42,
     RAMP_Q='auto 02_RAMP_Q'/
&RAMP ID='auto 02_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=600.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=660.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1200.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1560.0, F=0.663/
&RAMP ID='auto 02_RAMP_Q', T=1620.0, F=1.0/
&RAMP ID='auto 02_RAMP_Q', T=1740.0, F=0.542/
&RAMP ID='auto 02_RAMP_Q', T=2400.0, F=0.12/
&RAMP ID='auto 02_RAMP_Q', T=4320.0, F=0.0/
&SURF ID='auto 03',
     RGB=255.0,153.0,51.0,
     HRRPUA=646.42,
     RAMP_Q='auto 03_RAMP_Q'/
&RAMP ID='auto 03_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=900.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=960.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1860.0, F=0.663/
&RAMP ID='auto 03_RAMP_Q', T=1920.0, F=1.0/
&RAMP ID='auto 03_RAMP_Q', T=2040.0, F=0.542/
&RAMP ID='auto 03_RAMP_Q', T=2700.0, F=0.12/
&RAMP ID='auto 03_RAMP_Q', T=4620.0, F=0.0/
&SURF ID='auto 04',
     RGB=153.0,51.0,255.0,
     HRRPUA=646.42,
     RAMP_Q='auto 04_RAMP_Q'/
&RAMP ID='auto 04_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1320.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1380.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=1920.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=2280.0, F=0.663/
&RAMP ID='auto 04_RAMP_Q', T=2340.0, F=1.0/
&RAMP ID='auto 04_RAMP_Q', T=2460.0, F=0.542/
&RAMP ID='auto 04_RAMP_Q', T=3120.0, F=0.12/
&RAMP ID='auto 04_RAMP_Q', T=5040.0, F=0.0/
&SURF ID='auto 05',
     RGB=255.0,255.0,51.0,
     HRRPUA=646.42,
     RAMP_Q='auto 05_RAMP_Q'/
&RAMP ID='auto 05_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1620.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1680.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2220.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2580.0, F=0.663/
&RAMP ID='auto 05_RAMP_Q', T=2640.0, F=1.0/
&RAMP ID='auto 05_RAMP_Q', T=2760.0, F=0.542/
&RAMP ID='auto 05_RAMP_Q', T=3420.0, F=0.12/
&RAMP ID='auto 05_RAMP_Q', T=5340.0, F=0.0/
&SURF ID='auto 11',
     RGB=102.0,255.0,255.0,
     HRRPUA=646.42,
     RAMP_Q='auto 11_RAMP_Q'/
&RAMP ID='auto 11_RAMP_Q', T=0.0, F=0.0/
```

&RAMP ID='auto 11_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1320.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='auto 11_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='auto 11_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='auto 11_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='auto 11_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='auto 12 en 13',
  RGB=153.0,153.0,255.0,
  HRRPUA=646.42,
  RAMP_Q='auto 12 en 13_RAMP_Q'/
&RAMP ID='auto 12 en 13_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='auto 12 en 13_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='auto 12 en 13_RAMP_Q', T=5160.0, F=0.0/

Columns
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-15.7,-15.4,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-20.9,-20.6,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.7,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,3.0, SURF_ID='K250 Steel 12,5 mm'/

Beams
&OBST ID='Obstruction', XB=-31.0,-1.0,15.2,15.3,2.8,2.9, SURF_ID='K120 Steel 4,0 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.8,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-20.8,-20.6,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-15.6,-15.4,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-10.4,-10.2,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-5.196,-4.996,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-31.0,-1.0,7.4,7.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,8.2,8.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.0,9.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.8,10.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,10.6,10.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,11.4,11.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,12.2,12.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.0,13.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.8,14.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,14.6,14.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,15.4,15.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,16.2,16.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.0,17.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.8,18.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,18.6,18.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,19.4,19.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,20.2,20.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,21.0,21.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,21.8,22.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,22.6,22.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,23.4,23.6,2.7,2.9, SURF_ID='staal-beton'/

```
&OBST ID='Obstruction', XB=-31.0,-1.0,6.6,24.0,2.7,3.0, SURF_ID='staal-beton'/
```

<u>*Cars*</u>

```
&OBST ID='Auto1', XB=-15.8,-14.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 01','auto 01','INERT'/
&OBST ID='Auto 2', XB=-18.3,-16.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 02','auto 02','INERT'/
&OBST ID='Auto 3', XB=-13.3,-11.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 03','auto 03','INERT'/
&OBST ID='Auto 4', XB=-20.8,-19.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 04','auto 04','INERT'/
&OBST ID='Auto 5', XB=-10.8,-9.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 05','auto 05','INERT'/
&OBST ID='Auto 11', XB=-15.8,-14.0,15.8,20.7,0.0,0.3, SURF_IDS='auto 11','auto 11','INERT'/
&OBST ID='Auto 12', XB=-18.3,-16.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/
&OBST ID='Auto 13', XB=-13.3,-11.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/
```

<u>*Properties of the sides of the mesh*</u>

```
&VENT ID='Vent04', SURF_ID='OPEN', XB=-31.0,-1.0,24.0,24.0,0.0,2.9/
&VENT ID='Vent06', SURF_ID='OPEN', XB=-31.0,-1.0,6.6,6.6,0.0,2.9/
&VENT ID='Vent05', SURF_ID='INERT', XB=-31.0,-31.0,6.6,24.0,0.0,2.9/
&VENT ID='Vent', SURF_ID='INERT', XB=-1.0,-1.0,6.6,24.0,0.0,2.7/

&TAIL /
```

FDS script of model 5

model 7.fds
Generated by PyroSim - Version 2016.1.0425
21-sep-2016 9:52:13

```
&HEAD CHID='model_7'/
&TIME T_END=1800.0/
&DUMP RENDER_FILE='model_7.ge1', DT_RESTART=100.0, NFRAMES=360/
&RADI RADIATION=.FALSE./
```

Spaces

```
&MESH ID='raster01', IJK=10,58,10, XB=-4.0,-1.0,6.6,24.0,0.0,3.0/
&MESH ID='raster02', IJK=81,10,10, XB=-28.3,-4.0,6.6,9.6,0.0,3.0/
&MESH ID='raster03', IJK=81,10,10, XB=-28.3,-4.0,21.0,24.0,0.0,3.0/
&MESH ID='raster04', IJK=9,58,10, XB=-31.0,-28.3,6.6,24.0,0.0,3.0/
&MESH ID='raster05', IJK=243,114,30, XB=-28.3,-4.0,9.6,21.0,0.0,3.0/
```

Fuel

```
&REAC ID='autobrand_TUDelft',
    FYI='autobrand',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices beams

```
&DEVC ID='L1', QUANTITY='TEMPERATURE', XYZ=-15.5,14.8,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='L01', QUANTITY='TEMPERATURE', XYZ=-15.5,14.6,2.3/
&DEVC ID='L02', QUANTITY='TEMPERATURE', XYZ=-15.5,14.4,2.3/
&DEVC ID='L03', QUANTITY='TEMPERATURE', XYZ=-15.5,14.2,2.3/
&DEVC ID='L04', QUANTITY='TEMPERATURE', XYZ=-15.5,14.0,2.3/
&DEVC ID='L05', QUANTITY='TEMPERATURE', XYZ=-15.5,13.8,2.3/
&DEVC ID='L06', QUANTITY='TEMPERATURE', XYZ=-15.5,13.6,2.3/
&DEVC ID='L07', QUANTITY='TEMPERATURE', XYZ=-15.5,13.4,2.3/
&DEVC ID='L08', QUANTITY='TEMPERATURE', XYZ=-15.5,13.2,2.3/
&DEVC ID='L09', QUANTITY='TEMPERATURE', XYZ=-15.5,13.0,2.3/
&DEVC ID='L10', QUANTITY='TEMPERATURE', XYZ=-15.5,12.8,2.3/
&DEVC ID='L11', QUANTITY='TEMPERATURE', XYZ=-15.5,12.6,2.3/
&DEVC ID='L12', QUANTITY='TEMPERATURE', XYZ=-15.5,12.4,2.3/
&DEVC ID='L13', QUANTITY='TEMPERATURE', XYZ=-15.5,12.2,2.3/
&DEVC ID='L14', QUANTITY='TEMPERATURE', XYZ=-15.5,12.0,2.3/
&DEVC ID='L15', QUANTITY='TEMPERATURE', XYZ=-15.5,11.8,2.3/
&DEVC ID='L16', QUANTITY='TEMPERATURE', XYZ=-15.5,11.6,2.3/
&DEVC ID='L17', QUANTITY='TEMPERATURE', XYZ=-15.5,11.4,2.3/
&DEVC ID='L18', QUANTITY='TEMPERATURE', XYZ=-15.5,11.2,2.3/
&DEVC ID='L19', QUANTITY='TEMPERATURE', XYZ=-15.5,11.0,2.3/
&DEVC ID='L20', QUANTITY='TEMPERATURE', XYZ=-15.5,10.8,2.3/
&DEVC ID='L21', QUANTITY='TEMPERATURE', XYZ=-15.5,10.6,2.3/
&DEVC ID='L22', QUANTITY='TEMPERATURE', XYZ=-15.5,10.4,2.3/
&DEVC ID='L23', QUANTITY='TEMPERATURE', XYZ=-15.5,10.2,2.3/
&DEVC ID='L24', QUANTITY='TEMPERATURE', XYZ=-15.5,10.0,2.3/
&DEVC ID='L25', QUANTITY='TEMPERATURE', XYZ=-15.5,9.8,2.3/
&DEVC ID='L26', QUANTITY='TEMPERATURE', XYZ=-15.5,9.6,2.3/
&DEVC ID='L27', QUANTITY='TEMPERATURE', XYZ=-15.5,9.4,2.3/
```

```
&DEVC ID='L28', QUANTITY='TEMPERATURE', XYZ=-15.5,9.2,2.3/
&DEVC ID='L29', QUANTITY='TEMPERATURE', XYZ=-15.5,9.0,2.3/
&DEVC ID='L30', QUANTITY='TEMPERATURE', XYZ=-15.5,8.8,2.3/
&DEVC ID='Ll01', QUANTITY='TEMPERATURE', XYZ=-15.7,14.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll03', QUANTITY='TEMPERATURE', XYZ=-15.7,14.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll04', QUANTITY='TEMPERATURE', XYZ=-15.7,14.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll05', QUANTITY='TEMPERATURE', XYZ=-15.7,14.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll06', QUANTITY='TEMPERATURE', XYZ=-15.7,13.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll07', QUANTITY='TEMPERATURE', XYZ=-15.7,13.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll08', QUANTITY='TEMPERATURE', XYZ=-15.7,13.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll09', QUANTITY='TEMPERATURE', XYZ=-15.7,12.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll10', QUANTITY='TEMPERATURE', XYZ=-15.7,12.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll11', QUANTITY='TEMPERATURE', XYZ=-15.7,12.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll12', QUANTITY='TEMPERATURE', XYZ=-15.7,12.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll13', QUANTITY='TEMPERATURE', XYZ=-15.7,11.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll14', QUANTITY='TEMPERATURE', XYZ=-15.7,11.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll15', QUANTITY='TEMPERATURE', XYZ=-15.7,11.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll16', QUANTITY='TEMPERATURE', XYZ=-15.7,11.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll17', QUANTITY='TEMPERATURE', XYZ=-15.7,10.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll18', QUANTITY='TEMPERATURE', XYZ=-15.7,10.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll19', QUANTITY='TEMPERATURE', XYZ=-15.7,10.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll20', QUANTITY='TEMPERATURE', XYZ=-15.7,10.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll21', QUANTITY='TEMPERATURE', XYZ=-15.7,9.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll22', QUANTITY='TEMPERATURE', XYZ=-15.7,9.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll23', QUANTITY='TEMPERATURE', XYZ=-15.7,9.3,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll24', QUANTITY='TEMPERATURE', XYZ=-15.7,8.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll25', QUANTITY='TEMPERATURE', XYZ=-15.7,8.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll26', QUANTITY='TEMPERATURE', XYZ=-15.7,8.5,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll30', QUANTITY='TEMPERATURE', XYZ=-15.7,8.1,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll31', QUANTITY='TEMPERATURE', XYZ=-15.7,7.9,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ll32', QUANTITY='TEMPERATURE', XYZ=-15.7,7.7,2.6, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Lr01', QUANTITY='TEMPERATURE', XYZ=-15.3,14.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr02', QUANTITY='TEMPERATURE', XYZ=-15.3,14.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr03', QUANTITY='TEMPERATURE', XYZ=-15.3,14.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr04', QUANTITY='TEMPERATURE', XYZ=-15.3,14.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr05', QUANTITY='TEMPERATURE', XYZ=-15.3,13.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr06', QUANTITY='TEMPERATURE', XYZ=-15.3,13.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr07', QUANTITY='TEMPERATURE', XYZ=-15.3,13.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr08', QUANTITY='TEMPERATURE', XYZ=-15.3,12.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr09', QUANTITY='TEMPERATURE', XYZ=-15.3,12.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr10', QUANTITY='TEMPERATURE', XYZ=-15.3,12.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr11', QUANTITY='TEMPERATURE', XYZ=-15.3,11.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr12', QUANTITY='TEMPERATURE', XYZ=-15.3,12.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr13', QUANTITY='TEMPERATURE', XYZ=-15.3,11.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr14', QUANTITY='TEMPERATURE', XYZ=-15.3,11.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr15', QUANTITY='TEMPERATURE', XYZ=-15.3,11.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr16', QUANTITY='TEMPERATURE', XYZ=-15.3,10.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr17', QUANTITY='TEMPERATURE', XYZ=-15.3,10.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr18', QUANTITY='TEMPERATURE', XYZ=-15.3,10.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr19', QUANTITY='TEMPERATURE', XYZ=-15.3,10.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr20', QUANTITY='TEMPERATURE', XYZ=-15.3,9.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr21', QUANTITY='TEMPERATURE', XYZ=-15.3,9.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr22', QUANTITY='TEMPERATURE', XYZ=-15.3,9.3,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr23', QUANTITY='TEMPERATURE', XYZ=-15.3,8.7,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr24', QUANTITY='TEMPERATURE', XYZ=-15.3,8.9,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr25', QUANTITY='TEMPERATURE', XYZ=-15.3,8.5,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr26', QUANTITY='TEMPERATURE', XYZ=-15.3,7.9,2.6, ORIENTATION=1.0,0.0,0.0/
```

&DEVC ID='Lr27', QUANTITY='TEMPERATURE', XYZ=-15.3,8.1,2.6, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Lr28', QUANTITY='TEMPERATURE', XYZ=-15.3,7.7,2.6, ORIENTATION=1.0,0.0,0.0/

Wall temperature devices beams
&DEVC ID='W01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='W02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='W03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='W04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='W05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='W06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='W07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='W08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='W09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,13.0,2.4, IOR=-3/
&DEVC ID='W10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='W11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='W12', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='W13', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='W14', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='W15', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='W16', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='W17', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='W18', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='W19', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='W20', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.8,2.4, IOR=-3/
&DEVC ID='W21', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.6,2.4, IOR=-3/
&DEVC ID='W22', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='W23', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.2,2.4, IOR=-3/
&DEVC ID='W24', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='W25', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='W26', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='W27', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='W28', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='W29', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='W30', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,8.8,2.4, IOR=-3/
&DEVC ID='Wr1', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='Wl01', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='Wl03', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='Wl04', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='Wl05', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='Wl06', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='Wl07', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='Wl08', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='Wl09', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='Wl10', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='Wl11', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='Wl12', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='Wl13', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='Wl14', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='Wl15', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='Wl16', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='Wl17', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='Wl18', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='Wl19', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='Wl20', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='Wl21', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='Wl22', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='Wl23', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,9.3,2.6, IOR=-1/

```
&DEVC ID='Wl24', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.9,2.6, IOR=-1/
&DEVC ID='Wl25', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='Wl26', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.5,2.6, IOR=-1/
&DEVC ID='Wl30', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='Wl31', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='Wl32', QUANTITY='WALL TEMPERATURE', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='Wr01', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='Wr02', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='Wr03', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='Wr04', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='Wr05', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='Wr06', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.6,2.6, IOR=1/
&DEVC ID='Wr07', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='Wr08', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.7,2.6, IOR=1/
&DEVC ID='Wr09', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='Wr10', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='Wr11', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='Wr12', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='Wr13', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='Wr14', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='Wr15', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='Wr16', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='Wr17', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='Wr18', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='Wr19', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='Wr20', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.5,2.6, IOR=1/
&DEVC ID='Wr21', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.7,2.6, IOR=1/
&DEVC ID='Wr22', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='Wr23', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='Wr24', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.9,2.6, IOR=1/
&DEVC ID='Wr25', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='Wr26', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='Wr27', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='Wr28', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,7.7,2.6, IOR=1/
```

Heat flux devices beams

```
&DEVC ID='GHF L1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.8,2.4, IOR=-3/
&DEVC ID='GHF L01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.6,2.4, IOR=-3/
&DEVC ID='GHF L02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.4,2.4, IOR=-3/
&DEVC ID='GHF L03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.2,2.4, IOR=-3/
&DEVC ID='GHF L04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,14.0,2.4, IOR=-3/
&DEVC ID='GHF L05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.8,2.4, IOR=-3/
&DEVC ID='GHF L06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.6,2.4, IOR=-3/
&DEVC ID='GHF L07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.4,2.4, IOR=-3/
&DEVC ID='GHF L08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.2,2.4, IOR=-3/
&DEVC ID='GHF L09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,13.0,2.4, IOR=-3/
&DEVC ID='GHF L10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.8,2.4, IOR=-3/
&DEVC ID='GHF L11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.6,2.4, IOR=-3/
&DEVC ID='GHF L12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.4,2.4, IOR=-3/
&DEVC ID='GHF L13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.2,2.4, IOR=-3/
&DEVC ID='GHF L14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,12.0,2.4, IOR=-3/
&DEVC ID='GHF L15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.8,2.4, IOR=-3/
&DEVC ID='GHF L16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.6,2.4, IOR=-3/
&DEVC ID='GHF L17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.4,2.4, IOR=-3/
&DEVC ID='GHF L18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.2,2.4, IOR=-3/
&DEVC ID='GHF L19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,11.0,2.4, IOR=-3/
&DEVC ID='GHF L20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.8,2.4, IOR=-3/
```

```
&DEVC ID='GHF L21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.6,2.4, IOR=-3/
&DEVC ID='GHF L22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.4,2.4, IOR=-3/
&DEVC ID='GHF L23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.2,2.4, IOR=-3/
&DEVC ID='GHF L24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,10.0,2.4, IOR=-3/
&DEVC ID='GHF L25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.8,2.4, IOR=-3/
&DEVC ID='GHF L26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.6,2.4, IOR=-3/
&DEVC ID='GHF L27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.4,2.4, IOR=-3/
&DEVC ID='GHF L28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.2,2.4, IOR=-3/
&DEVC ID='GHF L29', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,9.0,2.4, IOR=-3/
&DEVC ID='GHF Ll01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.9,2.6, IOR=-1/
&DEVC ID='GHF Ll02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.5,2.6, IOR=-1/
&DEVC ID='GHF Ll03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.3,2.6, IOR=-1/
&DEVC ID='GHF Ll04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,14.1,2.6, IOR=-1/
&DEVC ID='GHF Ll05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.3,2.6, IOR=-1/
&DEVC ID='GHF Ll06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.7,2.6, IOR=-1/
&DEVC ID='GHF Ll07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,13.5,2.6, IOR=-1/
&DEVC ID='GHF Ll08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.5,2.6, IOR=-1/
&DEVC ID='GHF Ll09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.9,2.6, IOR=-1/
&DEVC ID='GHF Ll10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.7,2.6, IOR=-1/
&DEVC ID='GHF Ll11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.7,2.6, IOR=-1/
&DEVC ID='GHF Ll12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,12.1,2.6, IOR=-1/
&DEVC ID='GHF Ll13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.9,2.6, IOR=-1/
&DEVC ID='GHF Ll14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.9,2.6, IOR=-1/
&DEVC ID='GHF Ll15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.3,2.6, IOR=-1/
&DEVC ID='GHF Ll16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,11.1,2.6, IOR=-1/
&DEVC ID='GHF Ll17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.1,2.6, IOR=-1/
&DEVC ID='GHF Ll18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.5,2.6, IOR=-1/
&DEVC ID='GHF Ll19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,10.3,2.6, IOR=-1/
&DEVC ID='GHF Ll20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.3,2.6, IOR=-1/
&DEVC ID='GHF Ll21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.7,2.6, IOR=-1/
&DEVC ID='GHF Ll22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,9.5,2.6, IOR=-1/
&DEVC ID='GHF Ll23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.5,2.6, IOR=-1/
&DEVC ID='GHF Ll24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.9,2.6, IOR=-1/
&DEVC ID='GHF Ll25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.7,2.6, IOR=-1/
&DEVC ID='GHF Ll26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.7,2.6, IOR=-1/
&DEVC ID='GHF Ll27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,8.1,2.6, IOR=-1/
&DEVC ID='GHF Ll28', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.6,7.9,2.6, IOR=-1/
&DEVC ID='GHF Lr1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.9,2.6, IOR=1/
&DEVC ID='GHF Lr02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.5,2.6, IOR=1/
&DEVC ID='GHF Lr03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.3,2.6, IOR=1/
&DEVC ID='GHF Lr04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,14.1,2.6, IOR=1/
&DEVC ID='GHF Lr01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.7,2.6, IOR=1/
&DEVC ID='GHF Lr05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.5,2.6, IOR=1/
&DEVC ID='GHF Lr06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,13.3,2.6, IOR=1/
&DEVC ID='GHF Lr07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.9,2.6, IOR=1/
&DEVC ID='GHF Lr08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.7,2.6, IOR=1/
&DEVC ID='GHF Lr09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.5,2.6, IOR=1/
&DEVC ID='GHF Lr10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,12.1,2.6, IOR=1/
&DEVC ID='GHF Lr11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.9,2.6, IOR=1/
&DEVC ID='GHF Lr12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.7,2.6, IOR=1/
&DEVC ID='GHF Lr13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.3,2.6, IOR=1/
&DEVC ID='GHF Lr14', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,11.1,2.6, IOR=1/
&DEVC ID='GHF Lr15', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.9,2.6, IOR=1/
&DEVC ID='GHF Lr16', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.5,2.6, IOR=1/
&DEVC ID='GHF Lr17', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.3,2.6, IOR=1/
&DEVC ID='GHF Lr18', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,10.1,2.6, IOR=1/
&DEVC ID='GHF Lr19', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.7,2.6, IOR=1/
```

```
&DEVC ID='GHF Lr20', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.5,2.6, IOR=1/
&DEVC ID='GHF Lr21', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,9.3,2.6, IOR=1/
&DEVC ID='GHF Lr22', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.9,2.6, IOR=1/
&DEVC ID='GHF Lr23', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.7,2.6, IOR=1/
&DEVC ID='GHF Lr24', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.5,2.6, IOR=1/
&DEVC ID='GHF Lr25', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,8.1,2.6, IOR=1/
&DEVC ID='GHF Lr26', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.9,2.6, IOR=1/
&DEVC ID='GHF Lr27', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,7.7,2.6, IOR=1/
```

Gas temperature devices columns

```
&DEVC ID='A01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,0.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.5, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.7, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,1.9, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.1, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='A12', QUANTITY='TEMPERATURE', XYZ=-15.5,15.0,2.3, ORIENTATION=0.0,-1.0,0.0/
&DEVC ID='Ar01', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar02', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar03', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar04', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar05', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,0.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar06', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar07', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar08', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar09', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.7, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar10', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,1.9, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar11', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.1, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar12', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.3, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ar13', QUANTITY='TEMPERATURE', XYZ=-15.3,15.3,2.5, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Al01', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al02', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al03', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al04', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al05', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,0.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al06', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al07', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al08', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al09', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.7, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al10', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,1.9, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al11', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.1, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al12', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.3, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Al13', QUANTITY='TEMPERATURE', XYZ=-15.8,15.3,2.5, ORIENTATION=1.0,0.0,0.0/
&DEVC ID='Aa1', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa01', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa02', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa03', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.7, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa04', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,0.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa05', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa06', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.3, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa07', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.5, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa08', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.7, ORIENTATION=0.0,1.0,0.0/
```

```
&DEVC ID='Aa09', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,1.9, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa10', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.1, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Aa11', QUANTITY='TEMPERATURE', XYZ=-15.5,15.5,2.3, ORIENTATION=0.0,1.0,0.0/
```

Wall temperature devices columns

```
&DEVC ID='AW01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='AW02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.3, IOR=-2/
&DEVC ID='AW03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='AW04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='AW05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,0.9, IOR=-2/
&DEVC ID='AW06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='AW07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='AW08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='AW09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='AW10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='AW11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='AW12', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='AWr1', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='AWr01', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='AWr02', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='AWr03', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='AWr04', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='AWr05', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='AWr06', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='AWr07', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='AWr08', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='AWr09', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='AWr10', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='AWr11', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='AWr12', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='AWr13', QUANTITY='WALL TEMPERATURE', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='AWl1', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='AWl01', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='AWl02', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='AWl03', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='AWl04', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='AWl05', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='AWl06', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='AWl07', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='AWl08', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='AWl09', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='AWl10', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='AWl11', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='AWl12', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='AWl13', QUANTITY='WALL TEMPERATURE', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='AWa1', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='AWa01', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='AWa02', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='AWa03', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='AWa04', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='AWa05', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='AWa06', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='AWa07', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='AWa08', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='AWa09', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='AWa10', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='AWa11', QUANTITY='WALL TEMPERATURE', XYZ=-15.5,15.4,2.3, IOR=2/
```

Heat flux devices columns

```
&DEVC ID='GHF A01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.1, IOR=-2/
&DEVC ID='GHF A02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.3, IOR=-2/
&DEVC ID='GHF A03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.5, IOR=-2/
&DEVC ID='GHF A04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.7, IOR=-2/
&DEVC ID='GHF A05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,0.9, IOR=-2/
&DEVC ID='GHF A06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.1, IOR=-2/
&DEVC ID='GHF A07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.3, IOR=-2/
&DEVC ID='GHF A08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.5, IOR=-2/
&DEVC ID='GHF A09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.7, IOR=-2/
&DEVC ID='GHF A10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,1.9, IOR=-2/
&DEVC ID='GHF A11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.1, IOR=-2/
&DEVC ID='GHF A12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.1,2.3, IOR=-2/
&DEVC ID='GHF Al1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.1, IOR=-1/
&DEVC ID='GHF Al01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.3, IOR=-1/
&DEVC ID='GHF Al02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.5, IOR=-1/
&DEVC ID='GHF Al03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.7, IOR=-1/
&DEVC ID='GHF Al04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,0.9, IOR=-1/
&DEVC ID='GHF Al05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.1, IOR=-1/
&DEVC ID='GHF Al06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.3, IOR=-1/
&DEVC ID='GHF Al07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.5, IOR=-1/
&DEVC ID='GHF Al08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.7, IOR=-1/
&DEVC ID='GHF Al09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,1.9, IOR=-1/
&DEVC ID='GHF Al10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.1, IOR=-1/
&DEVC ID='GHF Al11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.3, IOR=-1/
&DEVC ID='GHF Al12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.5, IOR=-1/
&DEVC ID='GHF Al13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.7,15.3,2.6, IOR=-1/
&DEVC ID='GHF Ar1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.1, IOR=1/
&DEVC ID='GHF Ar01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.3, IOR=1/
&DEVC ID='GHF Ar02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.5, IOR=1/
&DEVC ID='GHF Ar03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.7, IOR=1/
&DEVC ID='GHF Ar04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,0.9, IOR=1/
&DEVC ID='GHF Ar05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.1, IOR=1/
&DEVC ID='GHF Ar06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.3, IOR=1/
&DEVC ID='GHF Ar07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.5, IOR=1/
&DEVC ID='GHF Ar08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.7, IOR=1/
&DEVC ID='GHF Ar09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,1.9, IOR=1/
&DEVC ID='GHF Ar10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.1, IOR=1/
&DEVC ID='GHF Ar11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.3, IOR=1/
&DEVC ID='GHF Ar12', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.5, IOR=1/
&DEVC ID='GHF Ar13', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.4,15.3,2.6, IOR=1/
&DEVC ID='GHF Aa1', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.1, IOR=2/
&DEVC ID='GHF Aa01', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.3, IOR=2/
&DEVC ID='GHF Aa02', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.5, IOR=2/
&DEVC ID='GHF Aa03', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.7, IOR=2/
&DEVC ID='GHF Aa04', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,0.9, IOR=2/
&DEVC ID='GHF Aa05', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.1, IOR=2/
&DEVC ID='GHF Aa06', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.3, IOR=2/
&DEVC ID='GHF Aa07', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.5, IOR=2/
&DEVC ID='GHF Aa08', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.7, IOR=2/
&DEVC ID='GHF Aa09', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,1.9, IOR=2/
&DEVC ID='GHF Aa10', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.1, IOR=2/
&DEVC ID='GHF Aa11', QUANTITY='GAUGE HEAT FLUX', XYZ=-15.5,15.4,2.3, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
     FYI='Steel',
```

```
     SPECIFIC_HEAT=0.53,
     CONDUCTIVITY=52.0,
     DENSITY=7800.0,
     EMISSIVITY=0.8/
&MATL ID='Concrete',
     FYI='Concrete',
     SPECIFIC_HEAT=0.84,
     CONDUCTIVITY=2.0,
     DENSITY=2400.0/

&SURF ID='K250 Steel 12,5 mm',
     RGB=146.0,202.0,166.0,
     BACKING='VOID',
     MATL_ID(1,1)='Steel',
     MATL_MASS_FRACTION(1,1)=1.0,
     THICKNESS(1)=0.0125,
     GEOMETRY='CARTESIAN',
     LENGTH=0.0,
     WIDTH=0.0/
&SURF ID='K120 Steel 4,0 mm',
     RGB=146.0,202.0,166.0,
     BACKING='VOID',
     MATL_ID(1,1)='Steel',
     MATL_MASS_FRACTION(1,1)=1.0,
     THICKNESS(1)=0.004,
     GEOMETRY='CARTESIAN',
     LENGTH=0.0,
     WIDTH=0.0/
&SURF ID='IPE500 Steel 12,5 mm01',
     RGB=146.0,202.0,166.0,
     BACKING='VOID',
     MATL_ID(1,1)='Steel',
     MATL_MASS_FRACTION(1,1)=1.0,
     THICKNESS(1)=0.0125,
     GEOMETRY='CARTESIAN',
     LENGTH=0.0,
     WIDTH=0.0/
&SURF ID='staal-beton',
     COLOR='GRAY 40',
     BACKING='INSULATED',
     MATL_ID(1,1)='Steel',
     MATL_ID(2,1)='Concrete',
     MATL_MASS_FRACTION(1,1)=1.0,
     MATL_MASS_FRACTION(2,1)=1.0,
     THICKNESS(1:2)=0.0015,0.075,
     GEOMETRY='CARTESIAN',
     LENGTH=0.0,
     WIDTH=0.0/
&SURF ID='auto 01',
     COLOR='RED',
     HRRPUA=646.42,
     RAMP_Q='auto 01_RAMP_Q'/
&RAMP ID='auto 01_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 01_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='auto 01_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='auto 01_RAMP_Q', T=1500.0, F=1.0/
```

```
&RAMP ID='auto 01_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='auto 01_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='auto 01_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='auto 02',
      RGB=255.0,51.0,153.0,
      HRRPUA=646.42,
      RAMP_Q='auto 02_RAMP_Q'/
&RAMP ID='auto 02_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=600.0, F=0.0/
&RAMP ID='auto 02_RAMP_Q', T=660.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1200.0, F=0.289/
&RAMP ID='auto 02_RAMP_Q', T=1560.0, F=0.663/
&RAMP ID='auto 02_RAMP_Q', T=1620.0, F=1.0/
&RAMP ID='auto 02_RAMP_Q', T=1740.0, F=0.542/
&RAMP ID='auto 02_RAMP_Q', T=2400.0, F=0.12/
&RAMP ID='auto 02_RAMP_Q', T=4320.0, F=0.0/
&SURF ID='auto 03',
      RGB=255.0,153.0,51.0,
      HRRPUA=646.42,
      RAMP_Q='auto 03_RAMP_Q'/
&RAMP ID='auto 03_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=900.0, F=0.0/
&RAMP ID='auto 03_RAMP_Q', T=960.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 03_RAMP_Q', T=1860.0, F=0.663/
&RAMP ID='auto 03_RAMP_Q', T=1920.0, F=1.0/
&RAMP ID='auto 03_RAMP_Q', T=2040.0, F=0.542/
&RAMP ID='auto 03_RAMP_Q', T=2700.0, F=0.12/
&RAMP ID='auto 03_RAMP_Q', T=4620.0, F=0.0/
&SURF ID='auto 04',
      RGB=153.0,51.0,255.0,
      HRRPUA=646.42,
      RAMP_Q='auto 04_RAMP_Q'/
&RAMP ID='auto 04_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1320.0, F=0.0/
&RAMP ID='auto 04_RAMP_Q', T=1380.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=1920.0, F=0.289/
&RAMP ID='auto 04_RAMP_Q', T=2280.0, F=0.663/
&RAMP ID='auto 04_RAMP_Q', T=2340.0, F=1.0/
&RAMP ID='auto 04_RAMP_Q', T=2460.0, F=0.542/
&RAMP ID='auto 04_RAMP_Q', T=3120.0, F=0.12/
&RAMP ID='auto 04_RAMP_Q', T=5040.0, F=0.0/
&SURF ID='auto 05',
      RGB=255.0,255.0,51.0,
      HRRPUA=646.42,
      RAMP_Q='auto 05_RAMP_Q'/
&RAMP ID='auto 05_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1620.0, F=0.0/
&RAMP ID='auto 05_RAMP_Q', T=1680.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2220.0, F=0.289/
&RAMP ID='auto 05_RAMP_Q', T=2580.0, F=0.663/
&RAMP ID='auto 05_RAMP_Q', T=2640.0, F=1.0/
&RAMP ID='auto 05_RAMP_Q', T=2760.0, F=0.542/
&RAMP ID='auto 05_RAMP_Q', T=3420.0, F=0.12/
&RAMP ID='auto 05_RAMP_Q', T=5340.0, F=0.0/
&SURF ID='auto 11',
      RGB=102.0,255.0,255.0,
```

```
     HRRPUA=646.42,
     RAMP_Q='auto 11_RAMP_Q'/
&RAMP ID='auto 11_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='auto 11_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1320.0, F=0.289/
&RAMP ID='auto 11_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='auto 11_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='auto 11_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='auto 11_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='auto 11_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='auto 12 en 13',
     RGB=153.0,153.0,255.0,
     HRRPUA=646.42,
     RAMP_Q='auto 12 en 13_RAMP_Q'/
&RAMP ID='auto 12 en 13_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='auto 12 en 13_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='auto 12 en 13_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='auto 12 en 13_RAMP_Q', T=5160.0, F=0.0/
```

Columns

```
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-15.7,-15.4,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-20.9,-20.6,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.7,15.1,15.4,0.0,2.9, SURF_ID='K250 Steel 12,5 mm'/
&OBST ID='Obstruction', XB=-10.5,-10.2,15.1,15.4,0.0,3.0, SURF_ID='K250 Steel 12,5 mm'/
```

Beams

```
&OBST ID='Obstruction', XB=-31.0,-1.0,15.2,15.3,2.8,2.9, SURF_ID='K120 Steel 4,0 mm'/
&OBST ID='Obstruction', XB=-26.0,-25.8,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-20.8,-20.6,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-15.6,-15.4,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-10.4,-10.2,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-5.196,-4.996,6.6,24.0,2.4,2.9, SURF_ID='IPE500 Steel 12,5 mm01'/
&OBST ID='Obstruction', XB=-31.0,-1.0,7.4,7.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,8.2,8.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.0,9.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,9.8,10.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,10.6,10.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,11.4,11.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,12.2,12.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.0,13.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,13.8,14.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,14.6,14.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,15.4,15.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,16.2,16.4,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.0,17.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,17.8,18.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,18.6,18.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,19.4,19.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,20.2,20.4,2.7,2.9, SURF_ID='staal-beton'/
```

&OBST ID='Obstruction', XB=-31.0,-1.0,21.0,21.2,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,21.8,22.0,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,22.6,22.8,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,23.4,23.6,2.7,2.9, SURF_ID='staal-beton'/
&OBST ID='Obstruction', XB=-31.0,-1.0,6.6,24.0,2.7,3.0, SURF_ID='staal-beton'/

Cars
&OBST ID='Auto1', XB=-15.8,-14.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 01','auto 01','INERT'/
&OBST ID='Auto 2', XB=-18.3,-16.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 02','auto 02','INERT'/
&OBST ID='Auto 3', XB=-13.3,-11.5,9.8,14.7,0.0,0.3, SURF_IDS='auto 03','auto 03','INERT'/
&OBST ID='Auto 4', XB=-20.8,-19.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 04','auto 04','INERT'/
&OBST ID='Auto 5', XB=-10.8,-9.0,9.8,14.7,0.0,0.3, SURF_IDS='auto 05','auto 05','INERT'/
&OBST ID='Auto 11', XB=-15.8,-14.0,15.8,20.7,0.0,0.3, SURF_IDS='auto 11','auto 11','INERT'/
&OBST ID='Auto 12', XB=-18.3,-16.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/
&OBST ID='Auto 13', XB=-13.3,-11.5,15.8,20.7,0.0,0.3, SURF_IDS='auto 12 en 13','auto 12 en 13','INERT'/

Properties of the sides of the mesh
&VENT ID='Vent04', SURF_ID='OPEN', XB=-31.0,-1.0,24.0,24.0,0.0,2.9/
&VENT ID='Vent06', SURF_ID='OPEN', XB=-31.0,-1.0,6.6,6.6,0.0,2.9/
&VENT ID='Vent05', SURF_ID='INERT', XB=-31.0,-31.0,6.6,24.0,0.0,2.9/
&VENT ID='Vent', SURF_ID='INERT', XB=-1.0,-1.0,6.6,24.0,0.0,2.7/

&TAIL /

Appendix III: FDS scripts of the Research

FDS script model 1

model_4.fds
Generated by PyroSim - Version 2016.1.0425
17-nov-2016 13:09:18

&HEAD CHID='model_4'/
&TIME T_END=2000.0/
&DUMP RENDER_FILE='model_4.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/

Spaces
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/

Fuel
&REAC ID='TuDelft',
FUEL='REAC_FUEL',
FORMULA='C7H16',
CO_YIELD=0.01,
SOOT_YIELD=0.037,
HEAT_OF_COMBUSTION=4.46E4,
IDEAL=.TRUE./

Heat devices settings
&PROP ID='Default', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=35.6/

Gas temperature devices beams
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/

Gas temperature, heat flux and heat devices car 3
&DEVC ID='Car 3 middle front01', PROP_ID='Default', XYZ=8.75,9.45,0.15, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature01', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.15,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation01', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.15/
&DEVC ID='Car 3 middle front02', PROP_ID='Default', XYZ=8.75,9.45,0.45, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature02', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.45,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation02', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.45,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 middle front03', PROP_ID='Default', XYZ=8.75,9.45,0.75, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature03', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.75,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation03', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.75,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 middle front04', PROP_ID='Default', XYZ=8.75,9.45,1.05, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature04', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,1.05,
ORIENTATION=0.0,1.0,0.0/

&DEVC ID='Car 3 radiation04', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,1.05, ORIENTATION=0.0,1.0,0.0/

Gas temperature, heat flux and heat devices car 2

&DEVC ID='Car 2 middle side01', PROP_ID='Default', XYZ=10.35,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature01', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation01', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side02', PROP_ID='Default', XYZ=10.35,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature02', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation02', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side03', PROP_ID='Default', XYZ=10.35,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature03', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation03', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side04', PROP_ID='Default', XYZ=10.35,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature04', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation04', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/

Material and Surface Properties

```
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='car 2',
    RGB=230.0,253.0,108.0,
    HRRPUA=646.42,
    RAMP_Q='car 2_RAMP_Q'/
&RAMP ID='car 2_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car 2_RAMP_Q', T=720.0, F=0.0/
&RAMP ID='car 2_RAMP_Q', T=780.0, F=0.289/
&RAMP ID='car 2_RAMP_Q', T=1320.0, F=0.289/
```

```
&RAMP ID='car 2_RAMP_Q', T=1680.0, F=0.663/
&RAMP ID='car 2_RAMP_Q', T=1740.0, F=1.0/
&RAMP ID='car 2_RAMP_Q', T=1860.0, F=0.542/
&RAMP ID='car 2_RAMP_Q', T=2520.0, F=0.12/
&RAMP ID='car 2_RAMP_Q', T=4440.0, F=0.0/
&SURF ID='car 3',
    RGB=72.0,143.0,228.0,
    HRRPUA=646.42,
    RAMP_Q='car 3_RAMP_Q'/
&RAMP ID='car 3_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car 3_RAMP_Q', T=1440.0, F=0.0/
&RAMP ID='car 3_RAMP_Q', T=1500.0, F=0.289/
&RAMP ID='car 3_RAMP_Q', T=2040.0, F=0.289/
&RAMP ID='car 3_RAMP_Q', T=2400.0, F=0.663/
&RAMP ID='car 3_RAMP_Q', T=2460.0, F=1.0/
&RAMP ID='car 3_RAMP_Q', T=2580.0, F=0.542/
&RAMP ID='car 3_RAMP_Q', T=3240.0, F=0.12/
&RAMP ID='car 3_RAMP_Q', T=5160.0, F=0.0/
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
    MATL_ID(1,1)='Concrete',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='car 2', XB=10.35,12.35,10.55,15.45,0.0,0.3, SURF_IDS='car 2','car 2','INERT'/
&OBST ID='car 3', XB=7.85,9.65,4.55,9.45,0.0,0.3, SURF_IDS='car 3','car 3','INERT'/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/


&TAIL /
```

FDS script model 2

model 5.fds
Generated by PyroSim - Version 2016.1.0425
17-nov-2016 13:09:43

&HEAD CHID='model_5'/
&TIME T_END=2000.0/
&DUMP RENDER_FILE='model_5.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/

Spaces
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/

Fuel
&REAC ID='TuDelft',
FUEL='REAC_FUEL',
FORMULA='C7H16',
CO_YIELD=0.01,
SOOT_YIELD=0.037,
HEAT_OF_COMBUSTION=4.46E4,
IDEAL=.TRUE./

Heat devices settings
&PROP ID='Default', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=35.6/
&PROP ID='Car3', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=24.0/
&PROP ID='Car2', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=22.4/
&CTRL ID='Control_car2', FUNCTION_TYPE='ALL', LATCH=.TRUE., INPUT_ID='Car 2 middle side04'/
&CTRL ID='Control_car3', FUNCTION_TYPE='ALL', LATCH=.TRUE., INPUT_ID='Car 3 middle front04'/

Gas temperature devices beams
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/

Gas temperature, heat flux and heat devices car 3
&DEVC ID='Car 3 middle front01', PROP_ID='Default', XYZ=8.75,9.45,0.15, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature01', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.15,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation01', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.15/
&DEVC ID='Car 3 middle front02', PROP_ID='Default', XYZ=8.75,9.45,0.45, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature02', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.45,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation02', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.45,
ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 middle front03', PROP_ID='Default', XYZ=8.75,9.45,0.75, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature03', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.75,
ORIENTATION=0.0,1.0,0.0/

&DEVC ID='Car 3 radiation03', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.75, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 middle front04', PROP_ID='Car3', XYZ=8.75,9.45,1.05, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature04', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,1.05, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation04', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,1.05, ORIENTATION=0.0,1.0,0.0/

Gas temperature, heat flux and heat devices car 2

&DEVC ID='Car 2 middle side01', PROP_ID='Default', XYZ=10.35,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature01', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation01', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side02', PROP_ID='Default', XYZ=10.35,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature02', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation02', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side03', PROP_ID='Default', XYZ=10.35,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature03', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation03', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side04', PROP_ID='Car2', XYZ=10.35,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature04', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation04', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/

Material and Surface Properties

```
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
```

```
    MATL_ID(1,1)='Concrete',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='car 2', XB=10.35,12.35,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT', CTRL_ID='Control_car2'/
&OBST ID='car 3', XB=7.85,9.65,4.55,9.45,0.0,0.3, SURF_IDS='car1','car1','INERT', CTRL_ID='Control_car3'/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/


&TAIL /
```

<u>FDS script model 3</u>

model 6.fds
Generated by PyroSim - Version 2016.1.0425
11-nov-2016 12:41:53

&HEAD CHID='model_6'/
&TIME T_END=2000.0/
&DUMP RENDER_FILE='model_6.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/

Spaces
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/

Fuel
&REAC ID='TuDelft',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./

Heat devices settings
&PROP ID='Default', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=35.6/
&PROP ID='Car3', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=24.0/
&PROP ID='Car2', QUANTITY='LINK TEMPERATURE', ACTIVATION_TEMPERATURE=23.0/
&CTRL ID='Control_car2', FUNCTION_TYPE='ALL', LATCH=.TRUE., INPUT_ID='and'/
&CTRL ID='and', FUNCTION_TYPE='ALL', LATCH=.FALSE., INPUT_ID='Car 2 middle side03','Car 2 middle side04'/
&CTRL ID='Control_car3', FUNCTION_TYPE='ALL', LATCH=.TRUE., INPUT_ID='and2'/
&CTRL ID='and2', FUNCTION_TYPE='ALL', LATCH=.FALSE., INPUT_ID='Car 3 middle front03','Car 3 middle front04'/

Gas temperature devices beams
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/

Gas temperature, heat flux and heat devices car 3
&DEVC ID='Car 3 middle front01', PROP_ID='Default', XYZ=8.75,9.45,0.15, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature01', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.15, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation01', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.15/
&DEVC ID='Car 3 middle front02', PROP_ID='Default', XYZ=8.75,9.45,0.45, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature02', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.45, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation02', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.45, ORIENTATION=0.0,1.0,0.0/

&DEVC ID='Car 3 middle front03', PROP_ID='Car3', XYZ=8.75,9.45,0.75, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature03', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,0.75, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation03', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,0.75, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 middle front04', PROP_ID='Car3', XYZ=8.75,9.45,1.05, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 gas temperature04', QUANTITY='TEMPERATURE', XYZ=8.75,9.55,1.05, ORIENTATION=0.0,1.0,0.0/
&DEVC ID='Car 3 radiation04', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=8.75,9.55,1.05, ORIENTATION=0.0,1.0,0.0/

Gas temperature, heat flux and heat devices car 2
&DEVC ID='Car 2 middle side01', PROP_ID='Default', XYZ=10.35,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature01', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation01', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.15, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side02', PROP_ID='Default', XYZ=10.35,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature02', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Ccr 2 radiation02', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.45, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side03', PROP_ID='Car2', XYZ=10.35,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature03', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation03', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,0.75, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 middle side04', PROP_ID='Car2', XYZ=10.35,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 gas temperature04', QUANTITY='TEMPERATURE', XYZ=10.25,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/
&DEVC ID='Car 2 radiation04', QUANTITY='RADIATIVE HEAT FLUX GAS', XYZ=10.25,13.0,1.05, ORIENTATION=-1.0,0.0,0.0/

Material and Surface Properties
```
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
```

```
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
    MATL_ID(1,1)='Concrete',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='car 2', XB=10.35,12.35,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT', CTRL_ID='Control_car2'/
&OBST ID='car 3', XB=7.85,9.65,4.55,9.45,0.0,0.3, SURF_IDS='car1','car1','INERT', CTRL_ID='Control_car3'/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/


&TAIL /
```

FDS script model 4 (basic)

basic.fds
Generated by PyroSim - Version 2016.1.0425
23-dec-2016 12:44:26

```
&HEAD CHID='basic'/
&TIME T_END=1500.0/
&DUMP RENDER_FILE='basic.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/
```

Spaces

```
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/
```

Fuel

```
&REAC ID='TuDelft',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices

```
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/
```

Wall temperature devices car 2

```
&DEVC ID='Car2_01', QUANTITY='WALL TEMPERATURE', XYZ=10.35,11.0,0.1, IOR=-1/
&DEVC ID='Car2_02', QUANTITY='WALL TEMPERATURE', XYZ=10.35,11.0,0.5, IOR=-1/
&DEVC ID='Car2_03', QUANTITY='WALL TEMPERATURE', XYZ=10.35,11.0,1.0, IOR=-1/
&DEVC ID='Car2_04', QUANTITY='WALL TEMPERATURE', XYZ=10.35,11.0,1.4, IOR=-1/
&DEVC ID='Car2_05', QUANTITY='WALL TEMPERATURE', XYZ=10.35,12.0,1.4, IOR=-1/
&DEVC ID='Car2_06', QUANTITY='WALL TEMPERATURE', XYZ=10.35,12.0,0.1, IOR=-1/
&DEVC ID='Car2_07', QUANTITY='WALL TEMPERATURE', XYZ=10.35,12.0,0.5, IOR=-1/
&DEVC ID='Car2_08', QUANTITY='WALL TEMPERATURE', XYZ=10.35,12.0,1.0, IOR=-1/
&DEVC ID='Car2_09', QUANTITY='WALL TEMPERATURE', XYZ=10.35,13.0,1.4, IOR=-1/
&DEVC ID='Car2_10', QUANTITY='WALL TEMPERATURE', XYZ=10.35,13.0,0.1, IOR=-1/
&DEVC ID='Car2_11', QUANTITY='WALL TEMPERATURE', XYZ=10.35,13.0,0.5, IOR=-1/
&DEVC ID='Car2_12', QUANTITY='WALL TEMPERATURE', XYZ=10.35,13.0,1.0, IOR=-1/
&DEVC ID='Car2_13', QUANTITY='WALL TEMPERATURE', XYZ=10.35,14.0,1.4, IOR=-1/
&DEVC ID='Car2_14', QUANTITY='WALL TEMPERATURE', XYZ=10.35,14.0,0.1, IOR=-1/
&DEVC ID='Car2_15', QUANTITY='WALL TEMPERATURE', XYZ=10.35,14.0,0.5, IOR=-1/
&DEVC ID='Car2_16', QUANTITY='WALL TEMPERATURE', XYZ=10.35,14.0,1.0, IOR=-1/
&DEVC ID='Car2_17', QUANTITY='WALL TEMPERATURE', XYZ=10.35,15.0,1.4, IOR=-1/
&DEVC ID='Car2_18', QUANTITY='WALL TEMPERATURE', XYZ=10.35,15.0,0.1, IOR=-1/
&DEVC ID='Car2_19', QUANTITY='WALL TEMPERATURE', XYZ=10.35,15.0,0.5, IOR=-1/
&DEVC ID='Car2_20', QUANTITY='WALL TEMPERATURE', XYZ=10.35,15.0,1.0, IOR=-1/
```

Wall temperature devices car 3

```
&DEVC ID='Car3_01', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.45,0.1, IOR=2/
&DEVC ID='Car3_02', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.45,0.5, IOR=2/
&DEVC ID='Car3_03', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.45,1.0, IOR=2/
&DEVC ID='Car3_04', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.45,1.4, IOR=2/
&DEVC ID='Car3_05', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.45,1.4, IOR=2/
&DEVC ID='Car3_06', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.45,0.1, IOR=2/
&DEVC ID='Car3_07', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.45,0.5, IOR=2/
&DEVC ID='Car3_08', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.45,1.0, IOR=2/
&DEVC ID='Car3_09', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.45,1.4, IOR=2/
&DEVC ID='Car3_10', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.45,0.1, IOR=2/
&DEVC ID='Car3_11', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.45,0.5, IOR=2/
&DEVC ID='Car3_12', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.45,1.0, IOR=2/
&DEVC ID='Car3_13', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.45,1.4, IOR=2/
&DEVC ID='Car3_14', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.45,0.1, IOR=2/
&DEVC ID='Car3_15', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.45,0.5, IOR=2/
&DEVC ID='Car3_16', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.45,1.0, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Rubber',
    SPECIFIC_HEAT=1.88,
    CONDUCTIVITY=0.13,
    DENSITY=920.0,
    EMISSIVITY=0.88/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
    MATL_ID(1,1)='Concrete',
```

```
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Rubber',
    RGB=51.0,51.0,255.0,
    BACKING='VOID',
    MATL_ID(1,1)='Rubber',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.003/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='Car 2', XB=10.35,10.353,10.0,16.0,0.0,1.5, SURF_ID='Rubber'/
&OBST ID='Car 3', XB=7.5,10.0,9.447,9.45,0.0,1.5, SURF_ID='Rubber'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/
```

Slices

```
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBX=8.75/
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBY=13.0/


&TAIL /
```

<u>FDS script model 5 (25 cm back)</u>

25cmback.fds
Generated by PyroSim - Version 2016.1.0425
23-dec-2016 12:51:28

```
&HEAD CHID='25cmback'/
&TIME T_END=2000.0/
&DUMP RENDER_FILE='25cmback.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/
```

Spaces

```
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/
```

Fuel

```
&REAC ID='TuDelft',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices

```
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/
```

Wall temperature devices car 2

```
&DEVC ID='Car2_01', QUANTITY='WALL TEMPERATURE', XYZ=10.6,11.0,0.1, IOR=-1/
&DEVC ID='Car2_02', QUANTITY='WALL TEMPERATURE', XYZ=10.6,11.0,0.5, IOR=-1/
&DEVC ID='Car2_03', QUANTITY='WALL TEMPERATURE', XYZ=10.6,11.0,1.0, IOR=-1/
&DEVC ID='Car2_04', QUANTITY='WALL TEMPERATURE', XYZ=10.6,11.0,1.4, IOR=-1/
&DEVC ID='Car2_05', QUANTITY='WALL TEMPERATURE', XYZ=10.6,12.0,1.4, IOR=-1/
&DEVC ID='Car2_06', QUANTITY='WALL TEMPERATURE', XYZ=10.6,12.0,0.1, IOR=-1/
&DEVC ID='Car2_07', QUANTITY='WALL TEMPERATURE', XYZ=10.6,12.0,0.5, IOR=-1/
&DEVC ID='Car2_08', QUANTITY='WALL TEMPERATURE', XYZ=10.6,12.0,1.0, IOR=-1/
&DEVC ID='Car2_09', QUANTITY='WALL TEMPERATURE', XYZ=10.6,13.0,1.4, IOR=-1/
&DEVC ID='Car2_10', QUANTITY='WALL TEMPERATURE', XYZ=10.6,13.0,0.1, IOR=-1/
&DEVC ID='Car2_11', QUANTITY='WALL TEMPERATURE', XYZ=10.6,13.0,0.5, IOR=-1/
&DEVC ID='Car2_12', QUANTITY='WALL TEMPERATURE', XYZ=10.6,13.0,1.0, IOR=-1/
&DEVC ID='Car2_13', QUANTITY='WALL TEMPERATURE', XYZ=10.6,14.0,1.4, IOR=-1/
&DEVC ID='Car2_14', QUANTITY='WALL TEMPERATURE', XYZ=10.6,14.0,0.1, IOR=-1/
&DEVC ID='Car2_15', QUANTITY='WALL TEMPERATURE', XYZ=10.6,14.0,0.5, IOR=-1/
&DEVC ID='Car2_16', QUANTITY='WALL TEMPERATURE', XYZ=10.6,14.0,1.0, IOR=-1/
&DEVC ID='Car2_17', QUANTITY='WALL TEMPERATURE', XYZ=10.6,15.0,1.4, IOR=-1/
&DEVC ID='Car2_18', QUANTITY='WALL TEMPERATURE', XYZ=10.6,15.0,0.1, IOR=-1/
&DEVC ID='Car2_19', QUANTITY='WALL TEMPERATURE', XYZ=10.6,15.0,0.5, IOR=-1/
&DEVC ID='Car2_20', QUANTITY='WALL TEMPERATURE', XYZ=10.6,15.0,1.0, IOR=-1/
```

Wall temperature devices car 3

```
&DEVC ID='Car3_01', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.2,0.1, IOR=2/
&DEVC ID='Car3_02', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.2,0.5, IOR=2/
&DEVC ID='Car3_03', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.2,1.0, IOR=2/
&DEVC ID='Car3_04', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.2,1.4, IOR=2/
&DEVC ID='Car3_05', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.2,1.4, IOR=2/
&DEVC ID='Car3_06', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.2,0.1, IOR=2/
&DEVC ID='Car3_07', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.2,0.5, IOR=2/
&DEVC ID='Car3_08', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.2,1.0, IOR=2/
&DEVC ID='Car3_09', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.2,1.4, IOR=2/
&DEVC ID='Car3_10', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.2,0.1, IOR=2/
&DEVC ID='Car3_11', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.2,0.5, IOR=2/
&DEVC ID='Car3_12', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.2,1.0, IOR=2/
&DEVC ID='Car3_13', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.2,1.4, IOR=2/
&DEVC ID='Car3_14', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.2,0.1, IOR=2/
&DEVC ID='Car3_15', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.2,0.5, IOR=2/
&DEVC ID='Car3_16', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.2,1.0, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Rubber',
    SPECIFIC_HEAT=1.88,
    CONDUCTIVITY=0.13,
    DENSITY=920.0,
    EMISSIVITY=0.88/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
    MATL_ID(1,1)='Concrete',
```

```
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Rubber',
    RGB=51.0,51.0,255.0,
    BACKING='VOID',
    MATL_ID(1,1)='Rubber',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.003/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='Car 2', XB=10.6,10.6,10.0,16.0,0.0,1.5, SURF_ID='Rubber'/
&OBST ID='Car 3', XB=7.5,10.0,9.2,9.2,0.0,1.5, SURF_ID='Rubber'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/
```

Slices

```
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBX=8.75/
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBY=13.0/


&TAIL /
```

FDS script model 6 (50 cm back)

```
50cmback.fds
Generated by PyroSim - Version 2016.1.0425
23-dec-2016 12:50:37

&HEAD CHID='50cmback'/
&TIME T_END=3000.0/
&DUMP RENDER_FILE='50cmback.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/
```

Spaces

```
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/
```

Fuel

```
&REAC ID='TuDelft',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices

```
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/
```

Wall temperature devices car 2

```
&DEVC ID='Car2_01', QUANTITY='WALL TEMPERATURE', XYZ=10.85,11.0,0.1, IOR=-1/
&DEVC ID='Car2_02', QUANTITY='WALL TEMPERATURE', XYZ=10.85,11.0,0.5, IOR=-1/
&DEVC ID='Car2_03', QUANTITY='WALL TEMPERATURE', XYZ=10.85,11.0,1.0, IOR=-1/
&DEVC ID='Car2_04', QUANTITY='WALL TEMPERATURE', XYZ=10.85,11.0,1.4, IOR=-1/
&DEVC ID='Car2_05', QUANTITY='WALL TEMPERATURE', XYZ=10.85,12.0,1.4, IOR=-1/
&DEVC ID='Car2_06', QUANTITY='WALL TEMPERATURE', XYZ=10.85,12.0,0.1, IOR=-1/
&DEVC ID='Car2_07', QUANTITY='WALL TEMPERATURE', XYZ=10.85,12.0,0.5, IOR=-1/
&DEVC ID='Car2_08', QUANTITY='WALL TEMPERATURE', XYZ=10.85,12.0,1.0, IOR=-1/
&DEVC ID='Car2_09', QUANTITY='WALL TEMPERATURE', XYZ=10.85,13.0,1.4, IOR=-1/
&DEVC ID='Car2_10', QUANTITY='WALL TEMPERATURE', XYZ=10.85,13.0,0.1, IOR=-1/
&DEVC ID='Car2_11', QUANTITY='WALL TEMPERATURE', XYZ=10.85,13.0,0.5, IOR=-1/
&DEVC ID='Car2_12', QUANTITY='WALL TEMPERATURE', XYZ=10.85,13.0,1.0, IOR=-1/
&DEVC ID='Car2_13', QUANTITY='WALL TEMPERATURE', XYZ=10.85,14.0,1.4, IOR=-1/
&DEVC ID='Car2_14', QUANTITY='WALL TEMPERATURE', XYZ=10.85,14.0,0.1, IOR=-1/
&DEVC ID='Car2_15', QUANTITY='WALL TEMPERATURE', XYZ=10.85,14.0,0.5, IOR=-1/
&DEVC ID='Car2_16', QUANTITY='WALL TEMPERATURE', XYZ=10.85,14.0,1.0, IOR=-1/
&DEVC ID='Car2_17', QUANTITY='WALL TEMPERATURE', XYZ=10.85,15.0,1.4, IOR=-1/
&DEVC ID='Car2_18', QUANTITY='WALL TEMPERATURE', XYZ=10.85,15.0,0.1, IOR=-1/
&DEVC ID='Car2_19', QUANTITY='WALL TEMPERATURE', XYZ=10.85,15.0,0.5, IOR=-1/
&DEVC ID='Car2_20', QUANTITY='WALL TEMPERATURE', XYZ=10.85,15.0,1.0, IOR=-1/
```

Wall temperature devices car 3

```
&DEVC ID='Car3_01', QUANTITY='WALL TEMPERATURE', XYZ=8.0,8.95,0.1, IOR=2/
&DEVC ID='Car3_02', QUANTITY='WALL TEMPERATURE', XYZ=8.0,8.95,0.5, IOR=2/
&DEVC ID='Car3_03', QUANTITY='WALL TEMPERATURE', XYZ=8.0,8.95,1.0, IOR=2/
&DEVC ID='Car3_04', QUANTITY='WALL TEMPERATURE', XYZ=8.0,8.95,1.4, IOR=2/
&DEVC ID='Car3_05', QUANTITY='WALL TEMPERATURE', XYZ=8.5,8.95,1.4, IOR=2/
&DEVC ID='Car3_06', QUANTITY='WALL TEMPERATURE', XYZ=8.5,8.95,0.1, IOR=2/
&DEVC ID='Car3_07', QUANTITY='WALL TEMPERATURE', XYZ=8.5,8.95,0.5, IOR=2/
&DEVC ID='Car3_08', QUANTITY='WALL TEMPERATURE', XYZ=8.5,8.95,1.0, IOR=2/
&DEVC ID='Car3_09', QUANTITY='WALL TEMPERATURE', XYZ=9.0,8.95,1.4, IOR=2/
&DEVC ID='Car3_10', QUANTITY='WALL TEMPERATURE', XYZ=9.0,8.95,0.1, IOR=2/
&DEVC ID='Car3_11', QUANTITY='WALL TEMPERATURE', XYZ=9.0,8.95,0.5, IOR=2/
&DEVC ID='Car3_12', QUANTITY='WALL TEMPERATURE', XYZ=9.0,8.95,1.0, IOR=2/
&DEVC ID='Car3_13', QUANTITY='WALL TEMPERATURE', XYZ=9.5,8.95,1.4, IOR=2/
&DEVC ID='Car3_14', QUANTITY='WALL TEMPERATURE', XYZ=9.5,8.95,0.1, IOR=2/
&DEVC ID='Car3_15', QUANTITY='WALL TEMPERATURE', XYZ=9.5,8.95,0.5, IOR=2/
&DEVC ID='Car3_16', QUANTITY='WALL TEMPERATURE', XYZ=9.5,8.95,1.0, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Rubber',
    SPECIFIC_HEAT=1.88,
    CONDUCTIVITY=0.13,
    DENSITY=920.0,
    EMISSIVITY=0.88/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
    MATL_ID(1,1)='Concrete',
```

```
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Rubber',
    RGB=51.0,51.0,255.0,
    BACKING='VOID',
    MATL_ID(1,1)='Rubber',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.003/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='Car 2', XB=10.8,10.9,10.0,16.0,0.0,1.5, SURF_ID='Rubber'/
&OBST ID='Car 3', XB=7.5,10.0,8.9,8.9,0.0,1.5, SURF_ID='Rubber'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/
```

Slices

```
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBX=8.75/
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBY=13.0/


&TAIL /
```

FDS script model 7 (25 cm forward)

```
25cmforward.fds
Generated by PyroSim - Version 2016.1.0425
23-dec-2016 12:49:38

&HEAD CHID='25cmforward'/
&TIME T_END=2000.0/
&DUMP RENDER_FILE='25cmforward.ge1', COLUMN_DUMP_LIMIT=.TRUE., DT_RESTART=300.0/
```

Spaces

```
&MESH ID='centre', IJK=60,120,30, XB=7.0,13.0,4.0,16.0,0.0,3.0/
&MESH ID='right', IJK=35,60,15, XB=0.0,7.0,4.0,16.0,0.0,3.0/
&MESH ID='left', IJK=35,60,15, XB=13.0,20.0,4.0,16.0,0.0,3.0/
&MESH ID='front', IJK=100,20,15, XB=0.0,20.0,0.0,4.0,0.0,3.0/
&MESH ID='back', IJK=100,20,15, XB=0.0,20.0,16.0,20.0,0.0,3.0/
```

Fuel

```
&REAC ID='TuDelft',
    FUEL='REAC_FUEL',
    FORMULA='C7H16',
    CO_YIELD=0.01,
    SOOT_YIELD=0.037,
    HEAT_OF_COMBUSTION=4.46E4,
    IDEAL=.TRUE./
```

Gas temperature devices

```
&DEVC ID='GAS01', QUANTITY='TEMPERATURE', XYZ=8.75,4.0,2.4/
&DEVC ID='GAS02', QUANTITY='TEMPERATURE', XYZ=8.75,6.0,2.4/
&DEVC ID='GAS03', QUANTITY='TEMPERATURE', XYZ=8.75,8.0,2.4/
&DEVC ID='GAS04', QUANTITY='TEMPERATURE', XYZ=8.75,10.0,2.4/
&DEVC ID='GAS05', QUANTITY='TEMPERATURE', XYZ=8.75,12.0,2.4/
&DEVC ID='GAS06', QUANTITY='TEMPERATURE', XYZ=8.75,14.0,2.4/
&DEVC ID='GAS07', QUANTITY='TEMPERATURE', XYZ=8.75,16.0,2.4/
```

Wall temperature devices car 2

```
&DEVC ID='Car2_01', QUANTITY='WALL TEMPERATURE', XYZ=10.1,11.0,0.1, IOR=-1/
&DEVC ID='Car2_02', QUANTITY='WALL TEMPERATURE', XYZ=10.1,11.0,0.5, IOR=-1/
&DEVC ID='Car2_03', QUANTITY='WALL TEMPERATURE', XYZ=10.1,11.0,1.0, IOR=-1/
&DEVC ID='Car2_04', QUANTITY='WALL TEMPERATURE', XYZ=10.1,11.0,1.4, IOR=-1/
&DEVC ID='Car2_05', QUANTITY='WALL TEMPERATURE', XYZ=10.1,12.0,1.4, IOR=-1/
&DEVC ID='Car2_06', QUANTITY='WALL TEMPERATURE', XYZ=10.1,12.0,0.1, IOR=-1/
&DEVC ID='Car2_07', QUANTITY='WALL TEMPERATURE', XYZ=10.1,12.0,0.5, IOR=-1/
&DEVC ID='Car2_08', QUANTITY='WALL TEMPERATURE', XYZ=10.1,12.0,1.0, IOR=-1/
&DEVC ID='Car2_09', QUANTITY='WALL TEMPERATURE', XYZ=10.1,13.0,1.4, IOR=-1/
&DEVC ID='Car2_10', QUANTITY='WALL TEMPERATURE', XYZ=10.1,13.0,0.1, IOR=-1/
&DEVC ID='Car2_11', QUANTITY='WALL TEMPERATURE', XYZ=10.1,13.0,0.5, IOR=-1/
&DEVC ID='Car2_12', QUANTITY='WALL TEMPERATURE', XYZ=10.1,13.0,1.0, IOR=-1/
&DEVC ID='Car2_13', QUANTITY='WALL TEMPERATURE', XYZ=10.1,14.0,1.4, IOR=-1/
&DEVC ID='Car2_14', QUANTITY='WALL TEMPERATURE', XYZ=10.1,14.0,0.1, IOR=-1/
&DEVC ID='Car2_15', QUANTITY='WALL TEMPERATURE', XYZ=10.1,14.0,0.5, IOR=-1/
&DEVC ID='Car2_16', QUANTITY='WALL TEMPERATURE', XYZ=10.1,14.0,1.0, IOR=-1/
&DEVC ID='Car2_17', QUANTITY='WALL TEMPERATURE', XYZ=10.1,15.0,1.4, IOR=-1/
&DEVC ID='Car2_18', QUANTITY='WALL TEMPERATURE', XYZ=10.1,15.0,0.1, IOR=-1/
&DEVC ID='Car2_19', QUANTITY='WALL TEMPERATURE', XYZ=10.1,15.0,0.5, IOR=-1/
&DEVC ID='Car2_20', QUANTITY='WALL TEMPERATURE', XYZ=10.1,15.0,1.0, IOR=-1/
```

Wall temperature devices car 3

```
&DEVC ID='Car3_01', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.7,0.1, IOR=2/
&DEVC ID='Car3_02', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.7,0.5, IOR=2/
&DEVC ID='Car3_03', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.7,1.0, IOR=2/
&DEVC ID='Car3_04', QUANTITY='WALL TEMPERATURE', XYZ=8.0,9.7,1.4, IOR=2/
&DEVC ID='Car3_05', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.7,1.4, IOR=2/
&DEVC ID='Car3_06', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.7,0.1, IOR=2/
&DEVC ID='Car3_07', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.7,0.5, IOR=2/
&DEVC ID='Car3_08', QUANTITY='WALL TEMPERATURE', XYZ=8.5,9.7,1.0, IOR=2/
&DEVC ID='Car3_09', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.7,1.4, IOR=2/
&DEVC ID='Car3_10', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.7,0.1, IOR=2/
&DEVC ID='Car3_11', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.7,0.5, IOR=2/
&DEVC ID='Car3_12', QUANTITY='WALL TEMPERATURE', XYZ=9.0,9.7,1.0, IOR=2/
&DEVC ID='Car3_13', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.7,1.4, IOR=2/
&DEVC ID='Car3_14', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.7,0.1, IOR=2/
&DEVC ID='Car3_15', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.7,0.5, IOR=2/
&DEVC ID='Car3_16', QUANTITY='WALL TEMPERATURE', XYZ=9.5,9.7,1.0, IOR=2/
```

Material and Surface Properties

```
&MATL ID='Steel',
    FYI='steel',
    SPECIFIC_HEAT=0.53,
    CONDUCTIVITY=52.0,
    DENSITY=7800.0,
    EMISSIVITY=0.8/
&MATL ID='Concrete',
    SPECIFIC_HEAT=0.84,
    CONDUCTIVITY=2.0,
    DENSITY=2400.0/
&MATL ID='Rubber',
    SPECIFIC_HEAT=1.88,
    CONDUCTIVITY=0.13,
    DENSITY=920.0,
    EMISSIVITY=0.88/

&SURF ID='car1',
    COLOR='RED',
    HRRPUA=646.42,
    RAMP_Q='car1_RAMP_Q'/
&RAMP ID='car1_RAMP_Q', T=0.0, F=0.0/
&RAMP ID='car1_RAMP_Q', T=240.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=960.0, F=0.169/
&RAMP ID='car1_RAMP_Q', T=1440.0, F=0.663/
&RAMP ID='car1_RAMP_Q', T=1500.0, F=1.0/
&RAMP ID='car1_RAMP_Q', T=1620.0, F=0.542/
&RAMP ID='car1_RAMP_Q', T=2280.0, F=0.12/
&RAMP ID='car1_RAMP_Q', T=2800.0, F=0.0/
&SURF ID='Steel',
    COLOR='GRAY 80',
    BACKING='VOID',
    MATL_ID(1,1)='Steel',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.0125/
&SURF ID='Concrete',
    COLOR='GRAY 60',
    BACKING='VOID',
    MATL_ID(1,1)='Concrete',
```

```
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.2/
&SURF ID='Rubber',
    RGB=51.0,51.0,255.0,
    BACKING='VOID',
    MATL_ID(1,1)='Rubber',
    MATL_MASS_FRACTION(1,1)=1.0,
    THICKNESS(1)=0.003/
```

Beams

```
&OBST ID='Obstruction', XB=8.65,8.85,0.0,20.0,2.5,3.0, SURF_ID='Steel'/
```

Cars

```
&OBST ID='Car 1', XB=7.85,9.65,10.55,15.45,0.0,0.3, SURF_IDS='car1','car1','INERT'/
&OBST ID='Car 2', XB=10.1,10.1,10.0,16.0,0.0,1.5, SURF_ID='Rubber'/
&OBST ID='Car 3', XB=7.5,10.0,9.7,9.7,0.0,1.5, SURF_ID='Rubber'/
```

Properties of the sides of the mesh

```
&VENT ID='Left', SURF_ID='OPEN', XB=0.0,0.0,0.0,20.0,0.0,3.0/
&VENT ID='Right', SURF_ID='OPEN', XB=20.0,20.0,0.0,20.0,0.0,3.0/
&VENT ID='Front', SURF_ID='OPEN', XB=0.0,20.0,0.0,0.0,0.0,3.0/
&VENT ID='Back', SURF_ID='OPEN', XB=0.0,20.0,20.0,20.0,0.0,3.0/
&VENT ID='Bottom', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,0.0,0.0/
&VENT ID='Top', SURF_ID='Concrete', XB=0.0,20.0,0.0,20.0,3.0,3.0/
```

Slices

```
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBX=8.75/
&SLCF QUANTITY='TEMPERATURE', VECTOR=.TRUE., PBY=13.0/


&TAIL /
```

Appendix IV: Sensitivity analysis

To determine if the reliability of the results a sensitivity analysis has been performed on the parameters combustion model, the size of the grid cells and the Rate of Heat Release. The adaptions made, relative to the basic model, are presented in the table below. For each adaption a model is created with a stationary Rate of Heat release of one car, simulated over 120 seconds. Per adapted parameter the effects on the results are discussed.

Parameter		Basic	Combustion model	Grid	RHR
Combustion model		C7H16	C4H6O3	C7H16	C7H16
Grid	*Max*	10 x 10 x 10 cm	10 x 10 x 10 cm	20 x 20 x 20 cm	10 x 10 x 10 cm
	Min			5 x 5 x 5 cm	
RHR	*Max*	646.42	646.42	646.42	807.50
	Min				484.82

Combustion model

The combustion model used in the research of the thesis is a hydrocarbon fire (C7H16) and in the adapted model for the sensitivity analysis a cellulose fire (C4H6O3) [15]. Figure 0-1 shows the gas temperatures of the hydrocarbon and celluloses fires below the bottom of the beam above the centre of the fire. The graph shows that with a cellulose fire the temperature is an average of 65°C lower than with a hydrocarbon fire. This is 10% of the average temperature of the hydrocarbon fire, meaning the model is not highly sensitive on the combustion model.

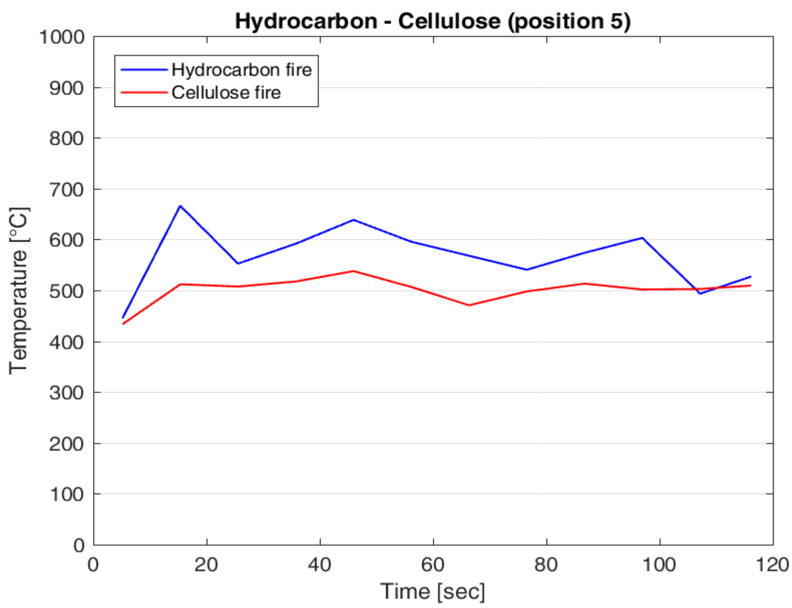


Figure 0-1 Temperature development of a hydrocarbon and cellulose fire

Grid size adaption

The effect of the adaption of the grid size is based on an analysis of the flow during the fire. Figure 0-2 shows the flow for the basic model where the grid of the centre is 10 x 10 x 10 centimetres after 25, 50, 75 and 100 seconds. Figure 0-3 and 0-4 show the same for the model with a grid of 20 x 20 x 20 and 5 x 5 x 5 centimetres. The temperature development is average over 10 seconds to avoid results due to large eddies. The figures show that although the flow of the smallest grid is more detailed the overall flow is equal in all three models. According to [16] a Rule of thumb is that a model should have at least ten cells across the hydraulic diameter of the fire source. The hydraulic diameter[8] is determined with the following equation:

$$D = 2 W H / (W + H) \qquad \text{(equation 2) [16]}$$

Where,

D = hydraulic diameter [m]
W = width of the duct [m]
H = height of the duct [m]

According to this equation the hydraulic diameter of a car with the dimensions 1.8 * 4.9 meter is 2.6 meter. This means that the grid size should be at least 26 centimetres in all directions. With a grid size of 10 * 10 *10 centimetres the model meets the requirements.

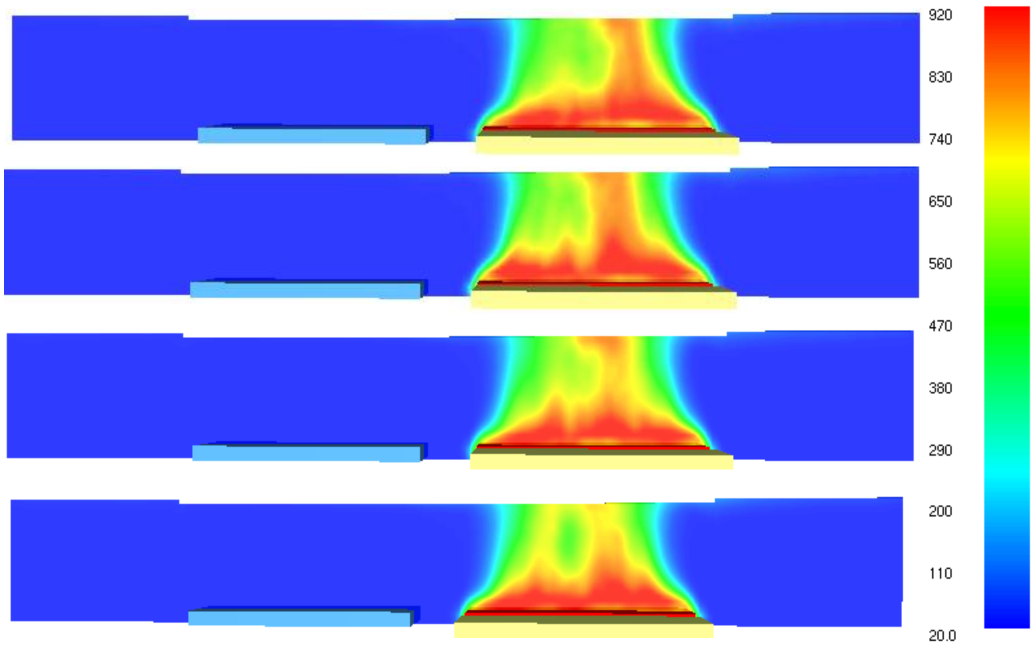


Figure 0-2 flow of the model with a grid size of 10 centimetres in all directions after 25, 50, 75 and 100 seconds.

[8] Hydraulic diameter is the "characteristic length" used to calculate the dimensionless Reynolds Number to determine if a flow is turbulent or laminar [23]

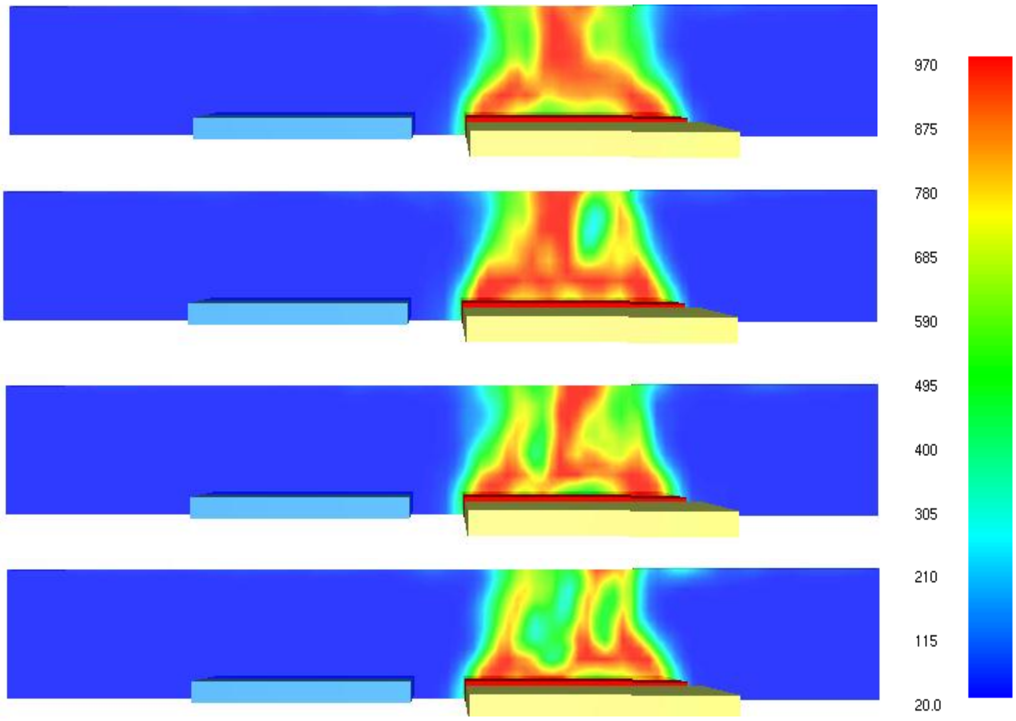


Figure 0-3 flow of the model with a grid size of 20 centimetres in all directions after 25, 50, 75 and 100 seconds.

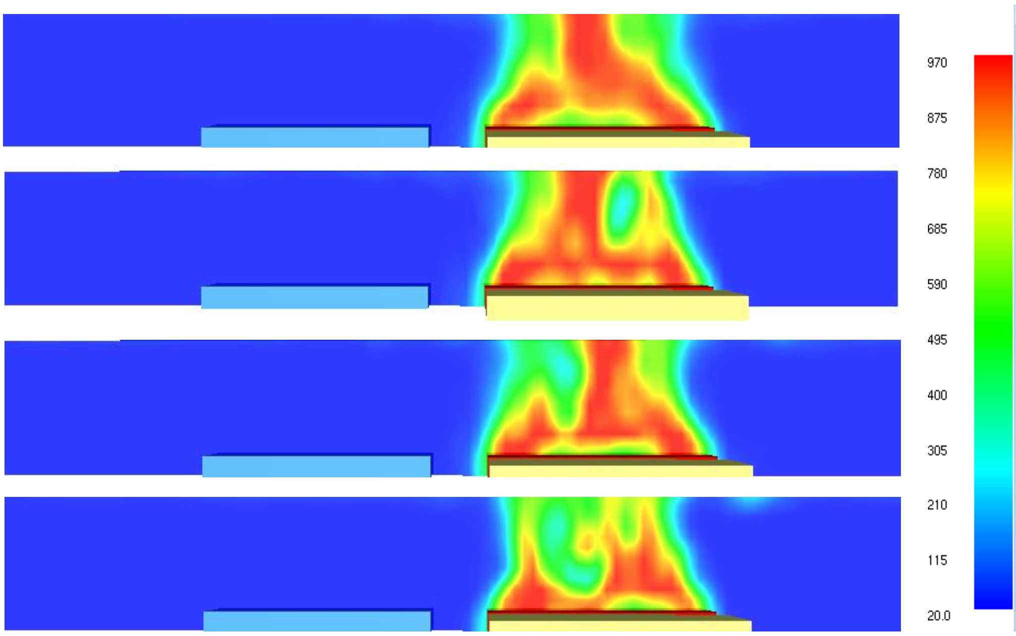
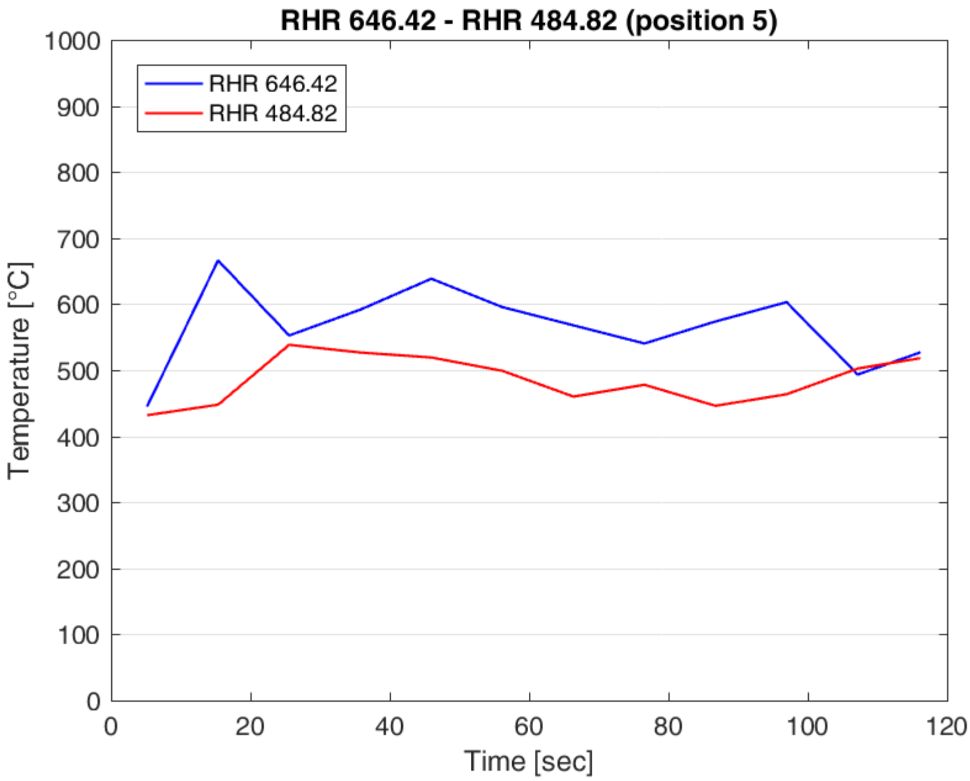
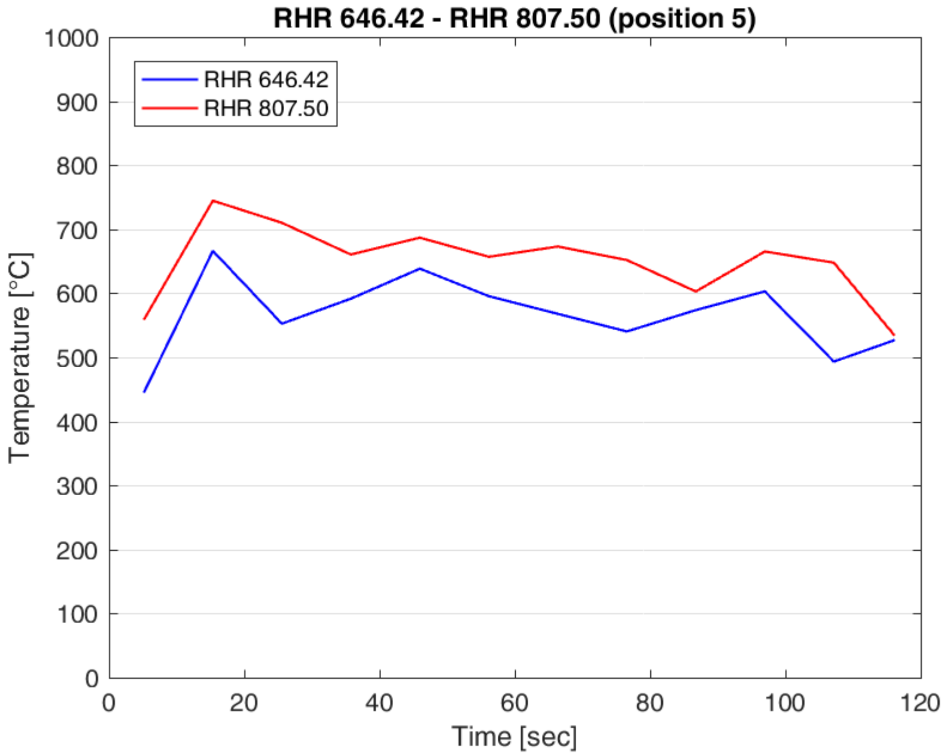


Figure 0-4 flow of the model with a grid size of 5 centimetres in all directions after 25, 50, 75 and 100 seconds.

Rate of Heat Release

The rate of heat release used in the model is 646.42 kW/m^2, based upon the RHR of the default CaPaFi model (paragraph 2.1.1). The results of chapter 2 shows already shows that the model is relatively sensitive on the RHR. To substantiate this result a model with a RHR 25% smaller (484.82 kW/m^2) and 25% larger (807.5 kW/m^2) were created. Figure 0-5 and 0-6 show the temperature development of these models compared to the basic RHR. The graph of figure 0-5 shows that the model with a RHR of 484.82 kW/m^2 has an average lower temperature of 80°C, this is 15% in degrees Celsius which equals 10% in degrees Kelvin. As can be seen in figure 0-6 the average temperature is 85°C higher with a RHR of 807.5 kW/m^2 than the basic model. These results confirm the preliminary conclusion resulting from chapter 2 that the model is relatively sensitive on the rate of heat release.





RHR 646.42 - RHR 807.50 (position 5)
RHR 646.42
RHR 807.50
Temperature [°C]
Time [sec]
0
100
200
300
400
500
600
700
800
900
1000
0
20
40
60
80
100
120