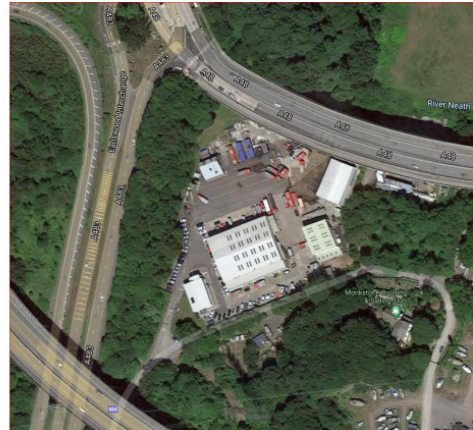


Carbonaceous Fire Training Unit

**MID & WEST WALES FIRE & RESCUE SERVICE Earlswood Transport Hub, Jersey Marine,
Swansea, Wales**

Domestic Building / CFBT – Location



Meeting the Training Needs of Mid & West Wales Fire & Rescue Service Operational Considerations

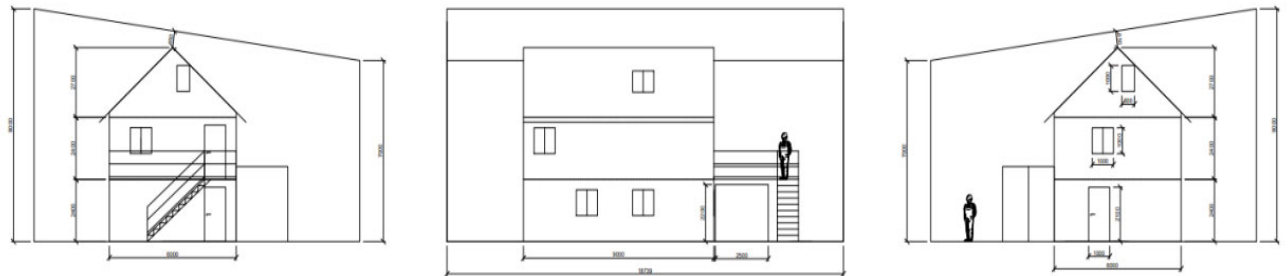
1. Carbonaceous Fire Training Facilities
2. Demonstrating Under, Over Pressure and Neutral Plane effects
3. Provides for demonstrating variable methods of combustion control and extinction including the effects of steam
4. Flexible Search and Rescue provision
5. PPV/Tac Vent Demonstration and Training provision
6. Waste Chute optional
7. Maximised Smoke Capture and Cleaning – 2-stage smoke capture system
8. Fully Integrated Safety and Monitoring System – Alarms, Emergency Smoke Extraction, Emergency Lighting, E-stop Facilities – DIN 14097 Part 1 – General Requirements – DIN 14097 Part 3 – Wood fired units 10 ©

Domestic Building/CFBT - General Building Design Option

The specification proposed focuses on Giraffe Building - Facilitating the Main Workshop for alternative use • Maximum size for a system in Giraffe Building is shown in drawings; - If this is deemed too small then Draeger can change the focus to Main Workshop • Filter unit, fan and stack outside - Maximises circulation space around Real Fire Training Building.

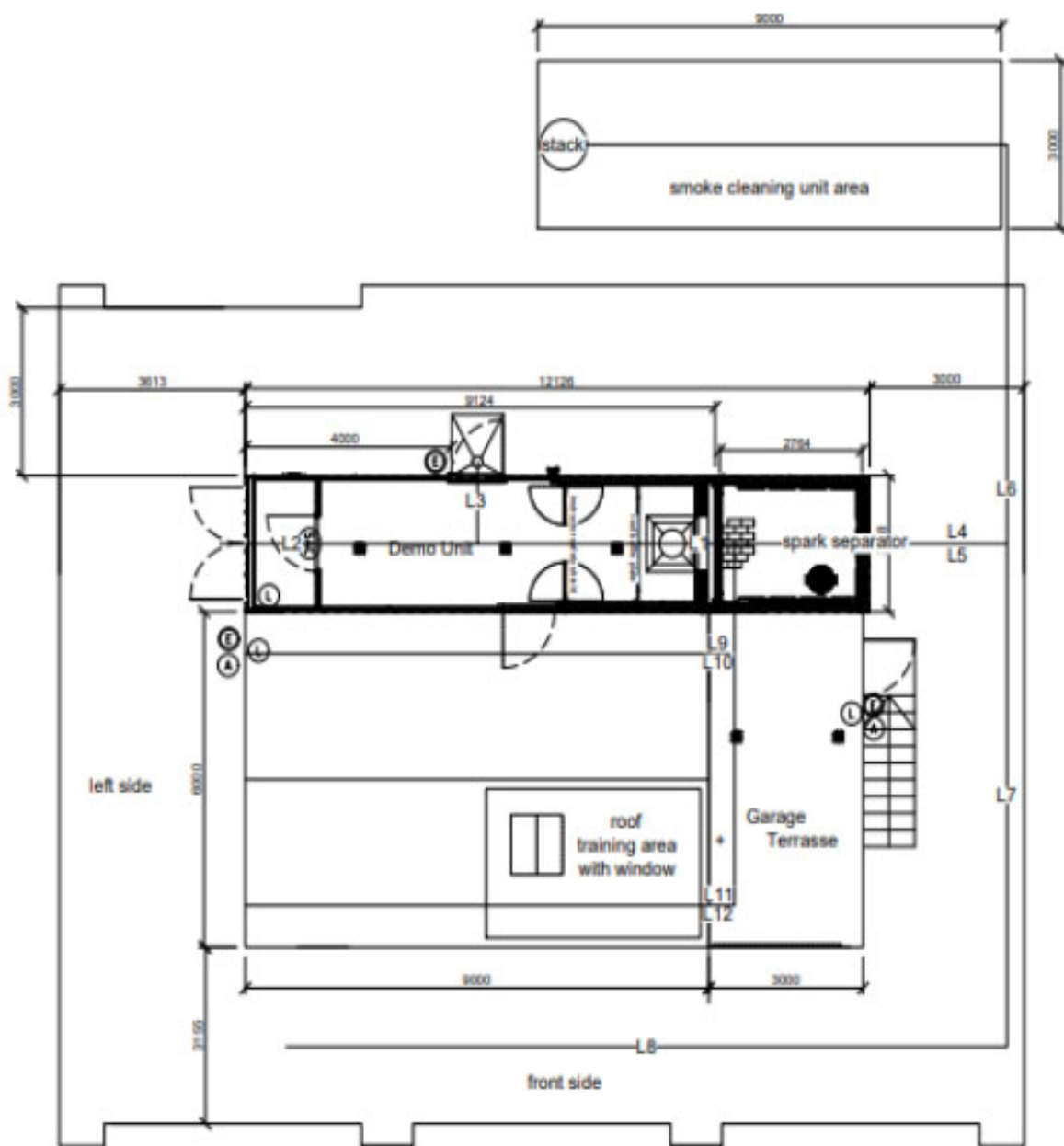
Meeting the General Requirements

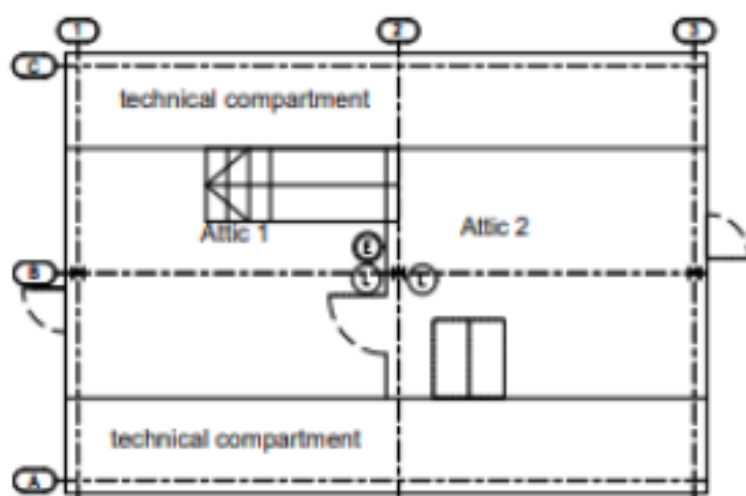
1. Design - Steel Framed Structure
2. Single Integrated Demo/Attack unit
3. Internal and External Staircases
4. Fixed and/or Mobile Cribbs/Fireplaces (Optional)
5. PPV/TacVent – multiple windows/doors (option to plan for sequential TacVent)
6. Forklift access to RFT building from inside Giraffe Building
7. Upper Floor External Walkway
8. Proposal comprises a 3 Storey Multi-purpose Building with Attic Provision
9. 2-Stage Smoke Capture and Smoke Cleaning System
10. Pitched Roof



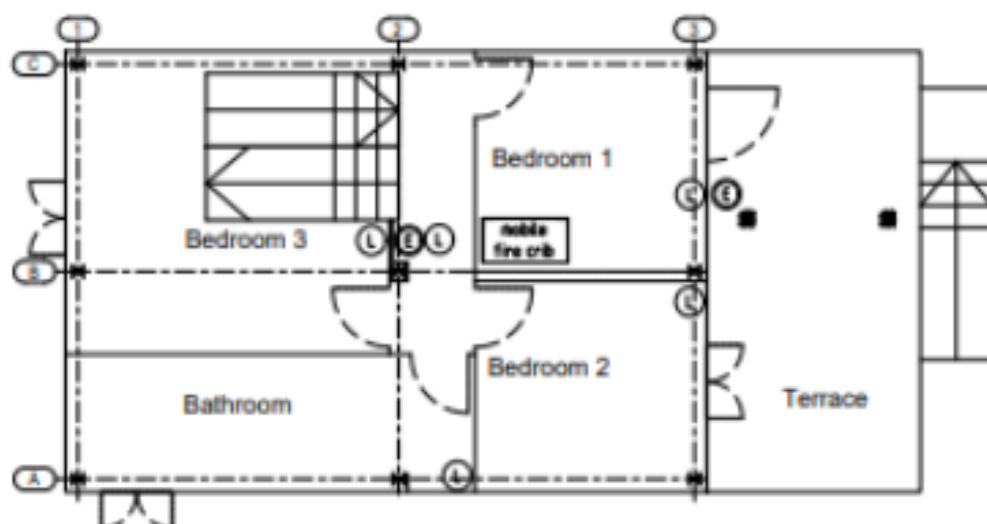
Dimensions

~ 12m x 8m inc Garage & Demo/Attack

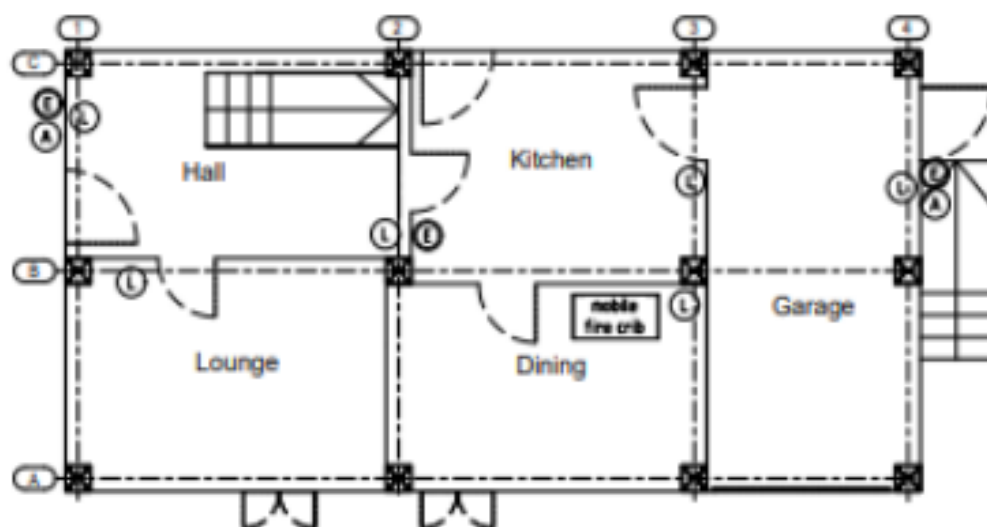




2nd floor

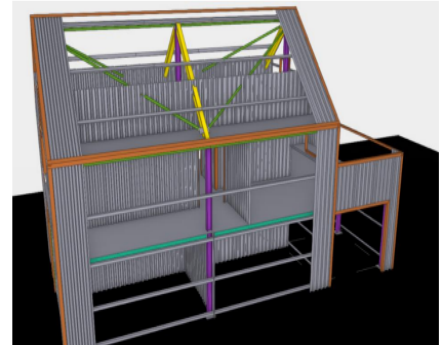
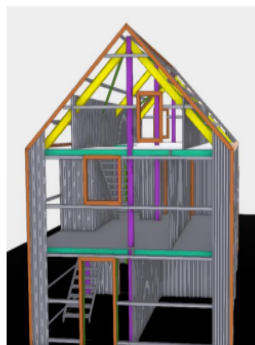
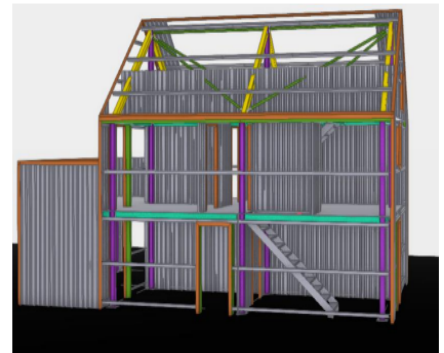
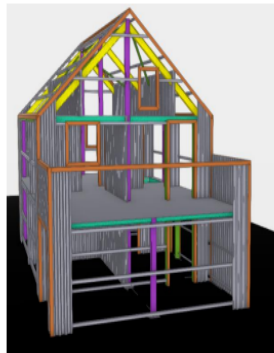
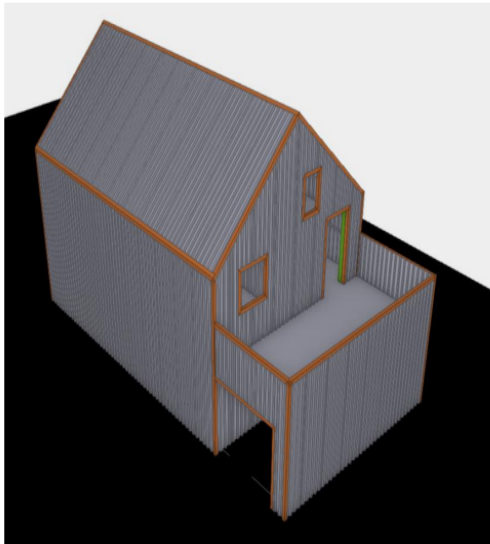


1st floor

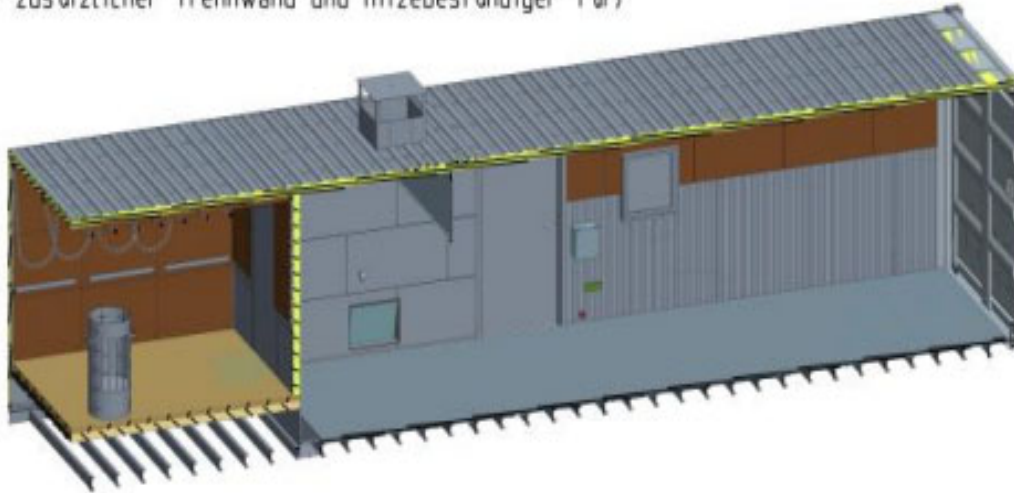


Ground floor

Domestic Building layout



3D section view of Rollover container
 (with additional partition wall and heat resistant door) /
 3D-Schnittansicht von Rollover-Container
 (mit zusätzlicher Trennwand und hitzebeständiger Tür)



3D section view of Heat exposure container /
 3D-Schnittansicht von Wärmegewöhnungscontainer



Figure 1. Fire Training unit (Demo/Attack)

Emissions and Waste Management

There are no UK/EU defined standards for smoke emissions from Fire Training Facilities

*

DIRECTIVE (EU) 2015/2193 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 25 November 2015
on the limitation of emissions of certain pollutants into the air from medium combustion plants

Emission limit values (mg/Nm³) for new medium combustion plants other than engines and gas turbines

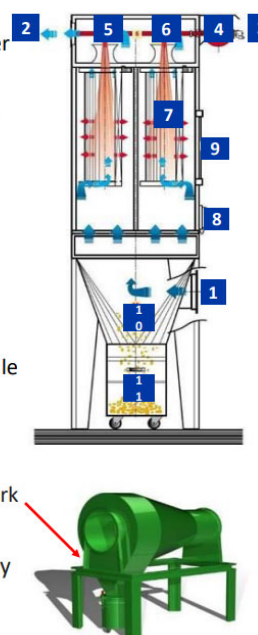
Pollutant	Solid biomass	Other solid fuels	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO ₂	200 ⁽¹⁾	400	—	350 ⁽²⁾	—	35 ⁽³⁾ ⁽⁴⁾
NO _x	300 ⁽⁵⁾	300 ⁽⁵⁾	200	300 ⁽⁶⁾	100	200
Dust	20 ⁽⁷⁾	20 ⁽⁷⁾	—	20 ⁽⁸⁾	—	—

⁽⁷⁾ Emission limit values are only applicable above 70 % load.

^{*} Similar to German directive "TA-Luft"
(Technical Requirements for ambient Air)

Waste Management

- Polluted air arrives in the lower part of the sleeves through an inlet (1) at the level of the hopper (10)
- Large dust particulates contained in the extracted air fall directly into the dust container due to the sudden reduction in their velocity (11)
- The lighter dust will be retained by the filter media of the bags (7)
- The filtered air comes out at the top via the stack and is perfectly clean (2)
- Smoke particulate cleaning is ensured by the compressed air injection clogging system (4) controlled by a cyclically controlled timer (8) of the solenoid valves (3), cleaning one row of cartridges at a time
- The compressed air counter-blowing (5-6) is amplified by "venturi" positioned above each handle
- This results in an almost constant level of pressure drop and air flow
- An inspection door (9) allows the maintenance of the filter elements to be carried out
- Any sparks present in the extracted smoke are projected, by cyclonic effect, into a spark separator retention tank provided for this purpose
- 3 dust collection bins on wheels with manual isolation damper -occasionally be emptied by hand.
- Ash composition depends on fuel and additives for flue gas cleaning, but is not hazardous



- Minimal Electrical Energy required to power fans
- No Gas Fuel required to clean smoke
- No Waste Water from Smoke Cleaning System
- Steel Frame v Containerised solution – extended life
- Dry Hose Filter System with high performance and low lifecycle costs
- Use of smaller Giraffe Building – more efficient smoke capture and extraction capability (smaller volume overbuilding)
- Sufficient company capacity and robust financial standing to ensure long-term sustainability of the project

Standards and Technical Compliance

- **Safety Standards for Fire Training Unit**
 - DIN 14097 Part 1 – General Requirements
 - DIN 14097 Part 3 – Wood Fired Units (Safety Items)
- **Fully Integrated Safety and Monitoring System**
 - Alarms
 - Emergency Smoke Extraction
 - Emergency Lighting
 - E-stops
- **Environmental (Emissions) Compliance**
 - EU Directive - 2015/2193: Limitation of Emissions from Medium Combustion Plants
- **Electrical Safety Standards**
 - IEC 60346 – International Wiring Standard, Low Voltage Electrical Installations