SAP 2012 Consultation

HBF Part L Seminar

March 2nd 2012

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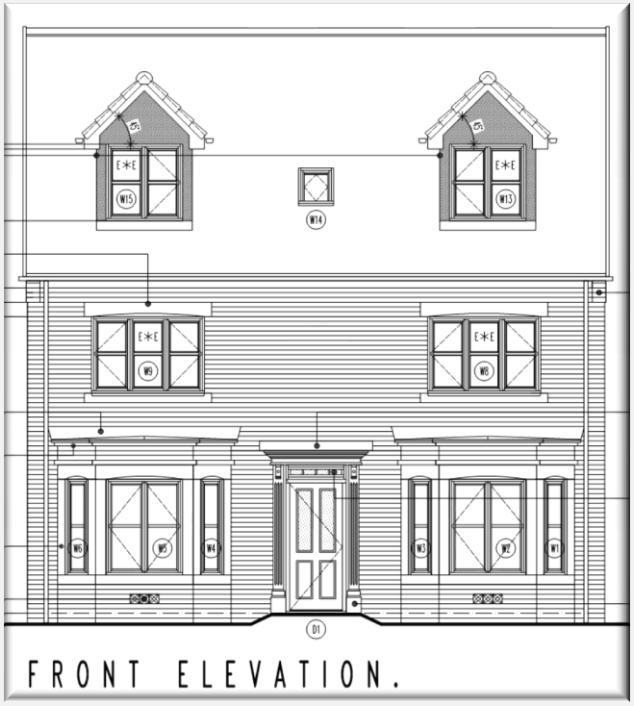
National Energy Services

SAP 2012 in a nutshell

- Thermal bridging
- Hot Water
- Carbon emissions
- Regional weather
- Solar thermal & PV outputs
- Boiler efficiency and controls
- Heat Pumps

Thermal Bridging



19 More junctions:

19 plus 23 = 42

Primarily junctions within a roof or room in the roof

SAP 2012 Reference Numbers

SAP Table K1 : Values of Ψ for different types of junctions

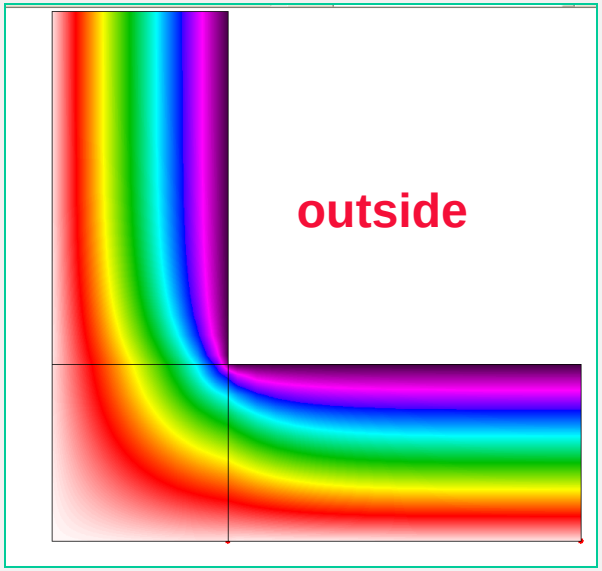
	Ref	Junction detail	Accredited Ψ (W/m·K)	Default Ψ (W/m·K)
Junctions with an external wall	E1	Steel lintel with perforated steel base plate	0.50	1.00
	E2	Other lintels (including other steel lintels)	0.30	
	E3	Sill	0.04	0.08
	E4	Jamb	0.05	0.10
	E5	Ground floor	0.16	0.32
	E6	Intermediate floor within a dwelling	0.07	0.14
	E7	Intermediate floor between dwellings (in blocks of flats) [a]	0.07	0.14
	E8	Balcony within a dwelling [b]	0.00	0.00 *
	E9	Balcony between dwellings [a] [b]	0.02	0.04 *
	E10	Eaves (insulation at ceiling level)	0.06	0.12
	E11	Eaves (insulation at rafter level)	0.04	0.08
	E12	Gable (insulation at ceiling level)	0.24	0.48
	E13	Gable (insulation at rafter level)	0.04	0.08
	E14	Flat roof	0.04	0.08
	E15	Flat roof with parapet	0.28	0.56
	E16	Corner (normal)	0.09	0.18
	E17	Corner (inverted – internal area greater than external area)	-0.09	0.00
	E18	Party wall between dwellings [a]	0.06	0.12
Junctions with a party wall [a]	P1	Ground floor	0.08	0.16
	P2	Intermediate floor within a dwelling	0.00	0.04
	P3	Intermediate floor between dwellings (in blocks of flats)	0.00	0.04
	P4	Roof (insulation at ceiling level)	0.12	0.24
	P5	Roof (insulation at rafter level)	0.02	0.04

New table K1: External Walls

	Ref	Junction detail	Approved Ψ (W/m·K)	Default Ψ (W/m·K)
Junctions with an external wall	E1	Steel lintel with perforated steel base plate	0.50	1.00
	E2	Other lintels (including other steel lintels)	0.30	1.00
	E3	Sill	0.04	0.08
	E4	Jamb	0.05	0.10
	E5	Ground floor (normal)	0.16	0.32
	E19	**Ground floor (inverted)**		**0.07**
	E20	**Exposed floor (normal)**		**0.32**
	E21	**Exposed floor (inverted)**		**0.32**
	E22	**Basement floor**		**0.07**
	E6	Intermediate floor within a dwelling	0.07	0.14
	E7	Intermediate floor between dwellings (in blocks of flats) [a]	0.07	0.14
	E8	Balcony within a dwelling, wall insulation continuous [b]	0.00	0.00
	E9	Balcony between dwellings, wall insulation continuous [a] [b]	0.02	0.04
	E23	**Balcony within or between dwellings, balcony support penetrates wall insulation**		**1.00**
	E10	Eaves (insulation at ceiling level)	0.06	0.12
	E24	**Eaves (insulation at ceiling level - inverted)**		**0.24**
	E11	Eaves (insulation at rafter level)	0.04	0.08
	E12	Gable (insulation at ceiling level)	0.24	0.48
	E13	Gable (insulation at rafter level)	0.04	0.08
	E14	Flat roof		0.08
	E15	Flat roof with parapet		0.56
	E16	Corner (normal)	0.09	0.18
	E17	Corner (inverted – internal area greater than external area)	-0.09	0.00
	E18	Party wall between dwellings [a]	0.06	0.12
	E25	**Staggered party wall between dwellings [a]**		**0.12**

[a] Value of Ψ is applied to each dwelling

[b] This is an externally supported balcony (the balcony slab is not a continuation of the floor slab) where the wall insulation is continuous and not bridged by the balcony slab or its supports

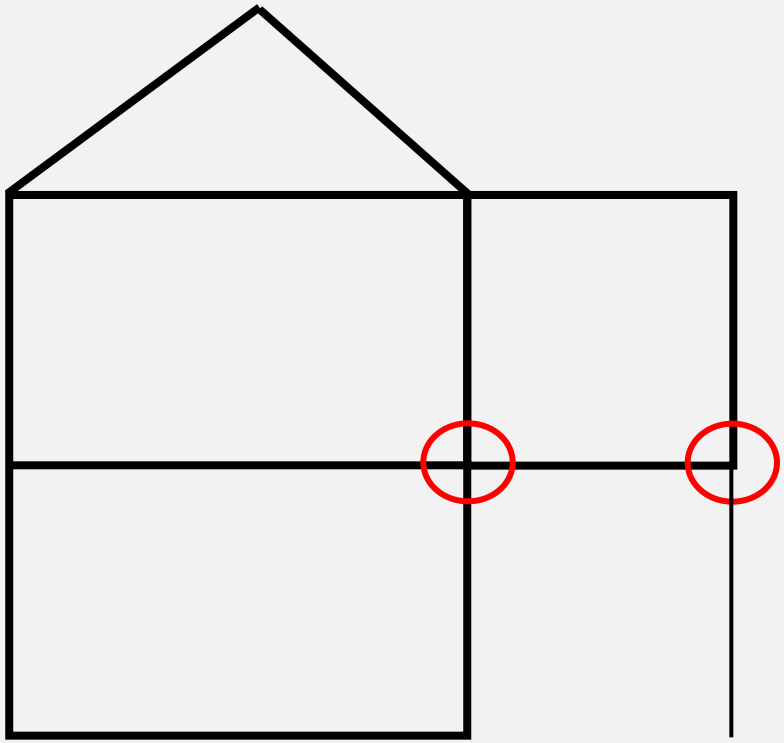


Inverted junctions have a larger internal area than external. Only one inverted junction in SAP 2009:

E17 Ext wall corner inverted

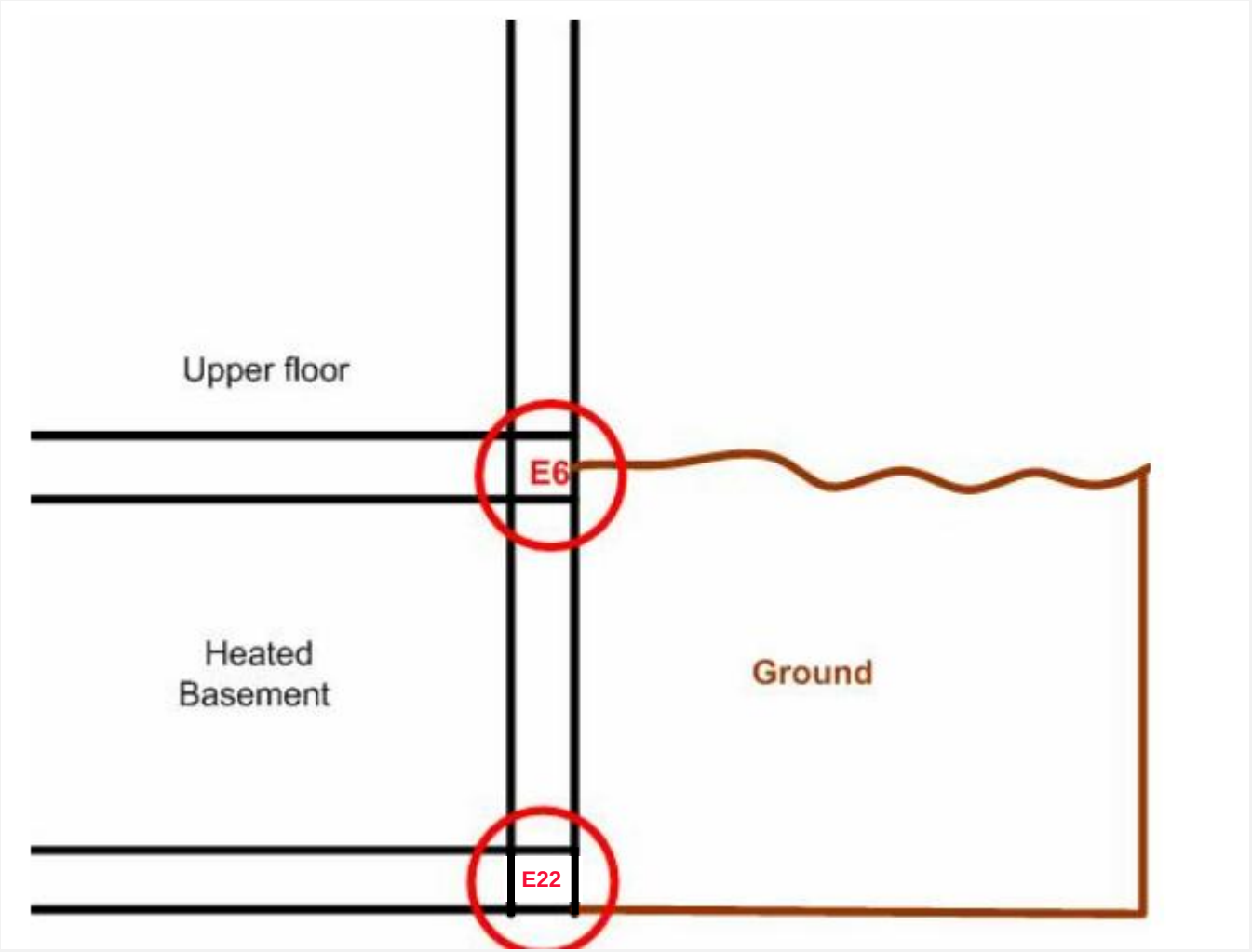
There are 7 more inverted junctions in SAP 2012.

E19 Ext wall to ground floor inverted

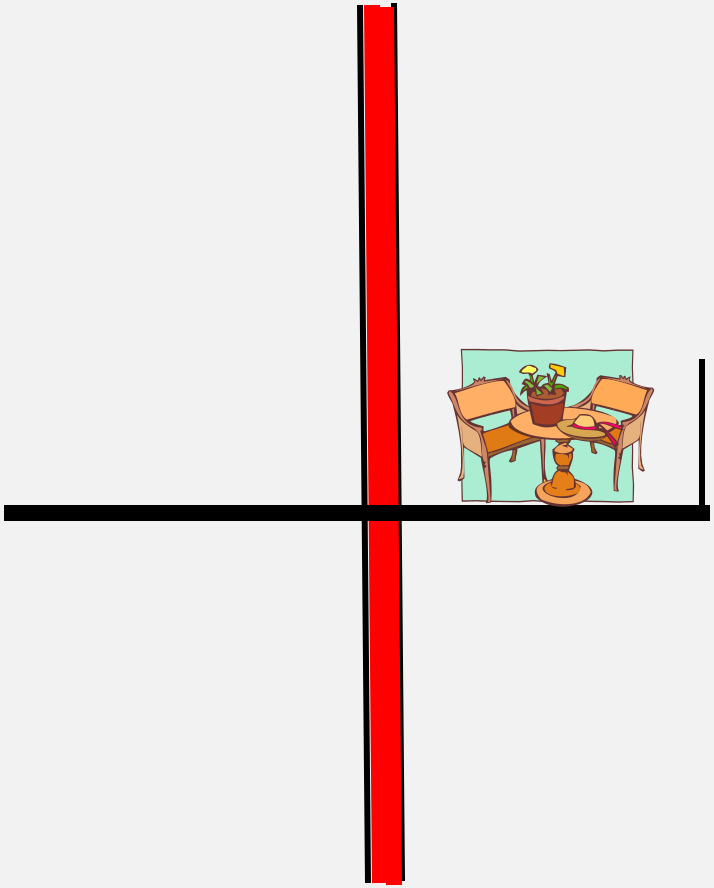


E20 Ext wall to exposed floor normal

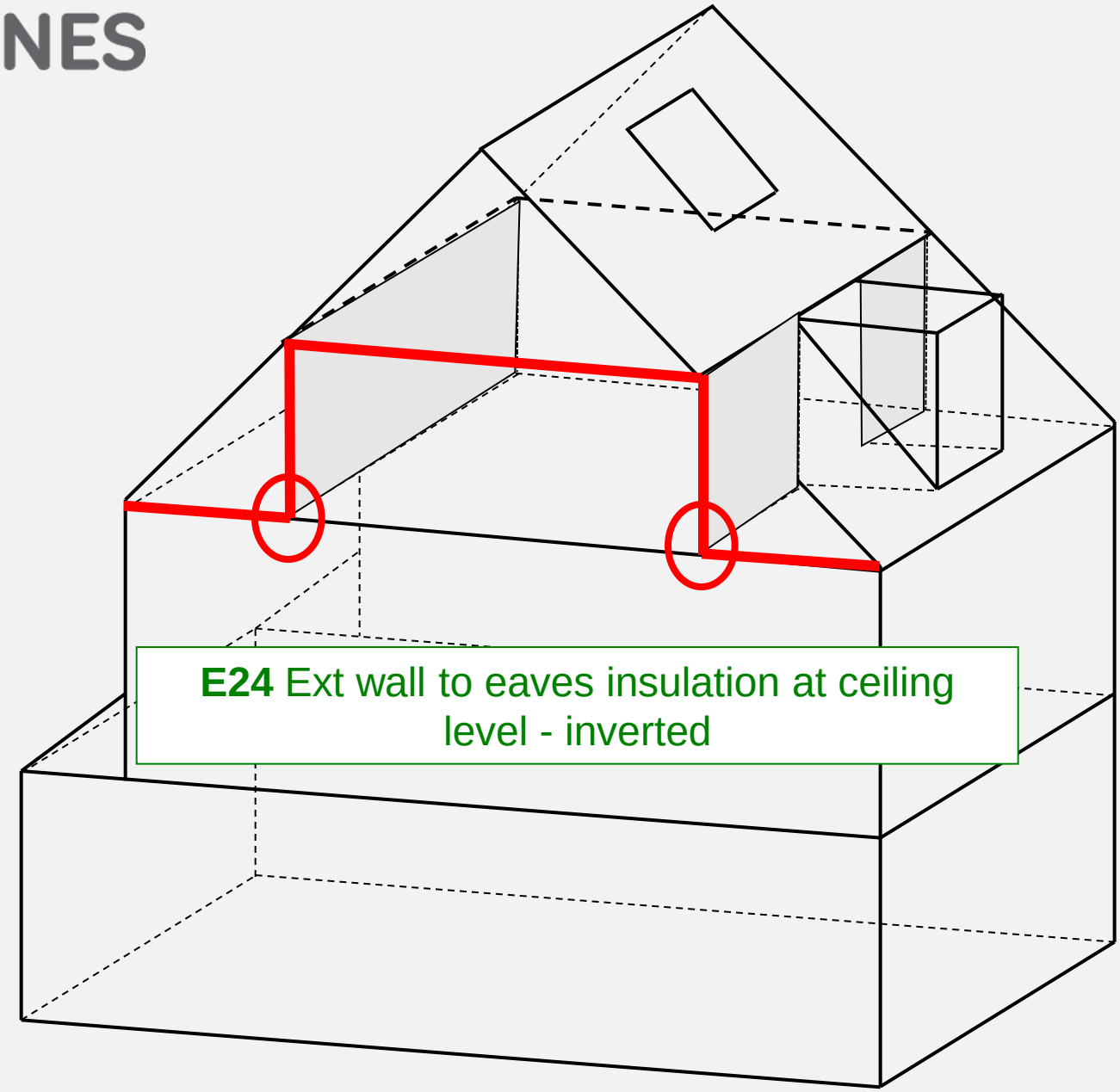
E21 Ext wall to exposed floor inverted



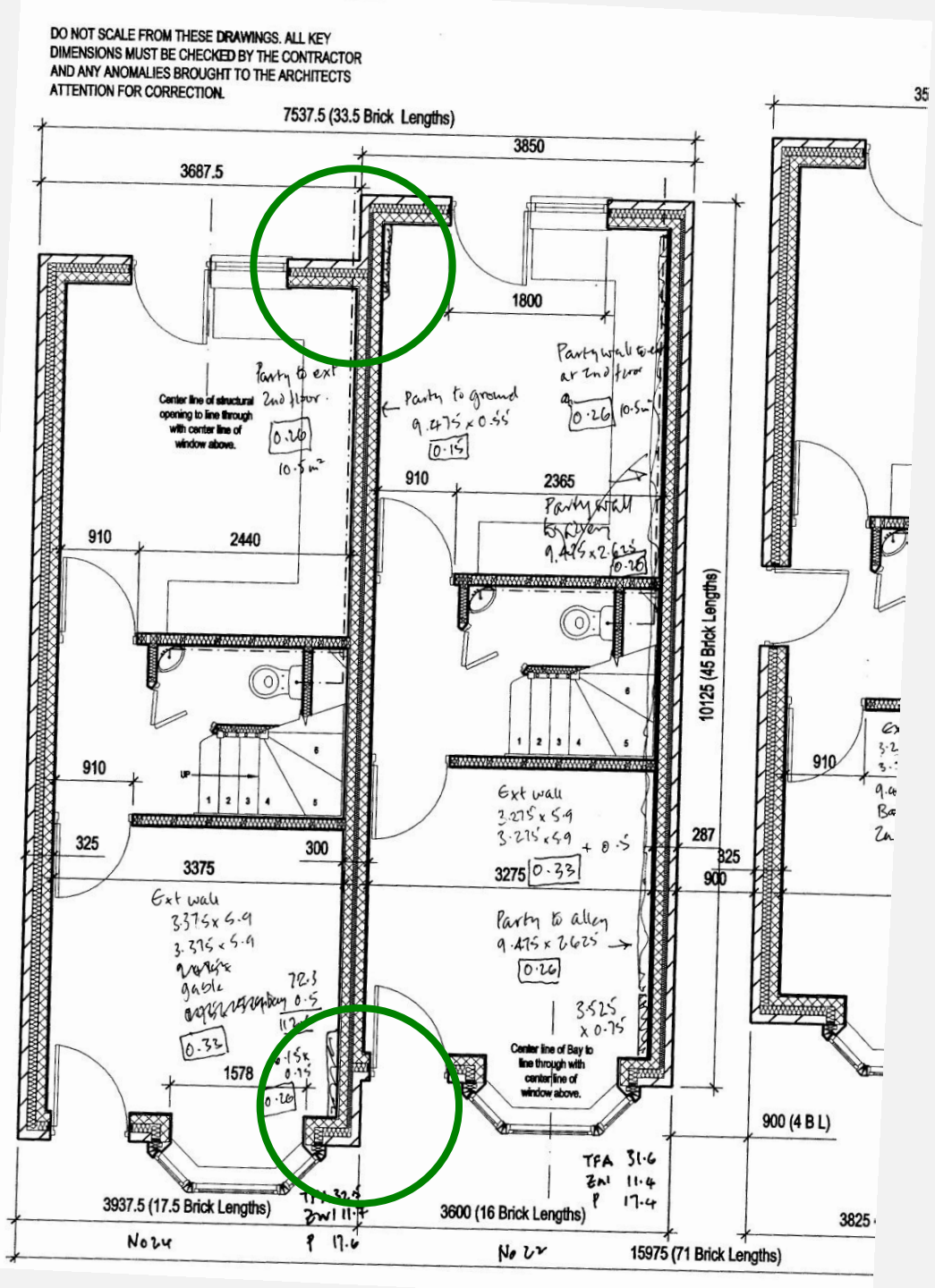
E22 Ext wall to basement floor



E23 Balcony penetrating wall insulation ψ = 1.0 W/mK !!!

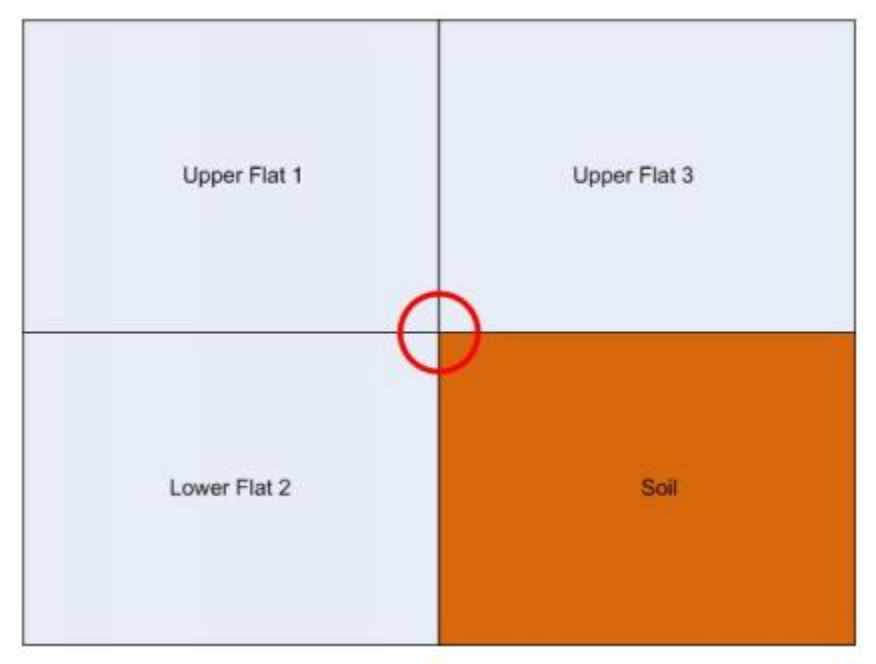

E24 Ext wall to eaves insulation at ceiling level - inverted

E25 Ext wall to staggered party wall between dwellings

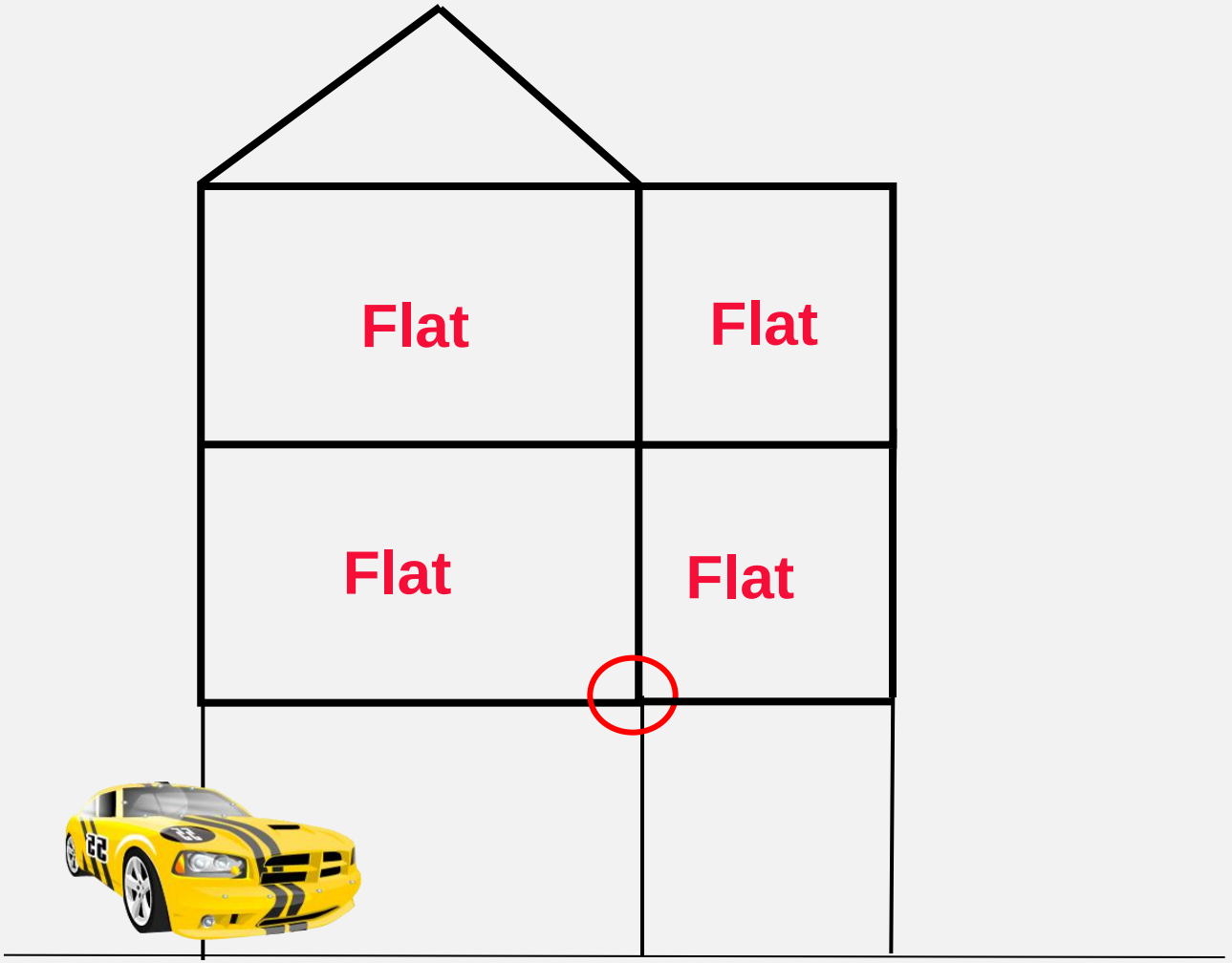


New table K1 Party Walls

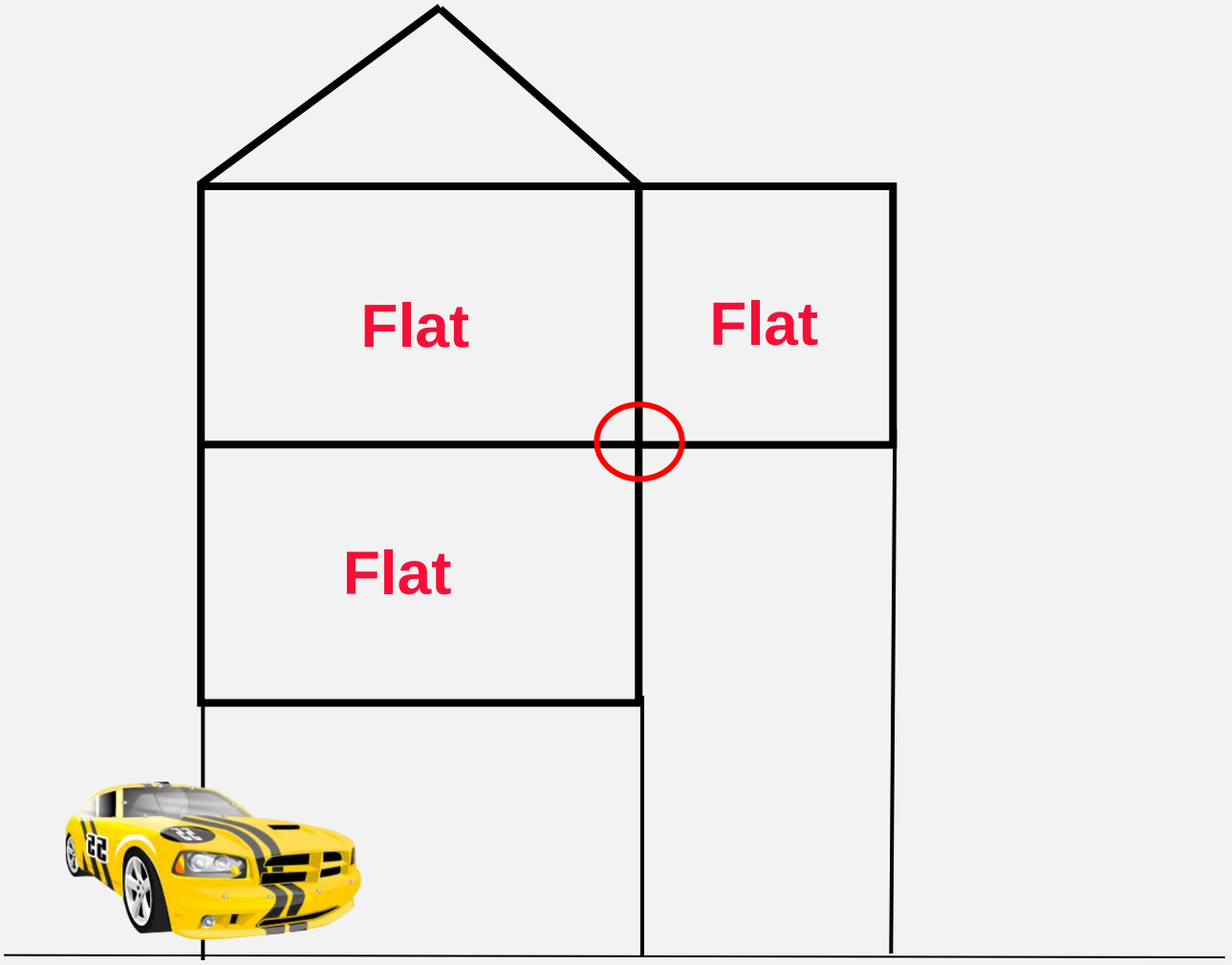
Junctions with a party wall a)	P1	Ground floor	0.08	0.16
	P6	**Ground floor (inverted)**		**0.07**
	P2	Intermediate floor within a dwelling	0.00	0.00
	P3	Intermediate floor between dwellings (in blocks of flats)	0.00	0.00
	P7	**Exposed floor (normal)**		**0.16**
	P8	**Exposed floor (inverted)**		**0.24**
	P4	Roof (insulation at ceiling level)	0.12	0.24
	P5	Roof (insulation at rafter level)	0.02	0.04



P6 Party wall to ground floor - inverted



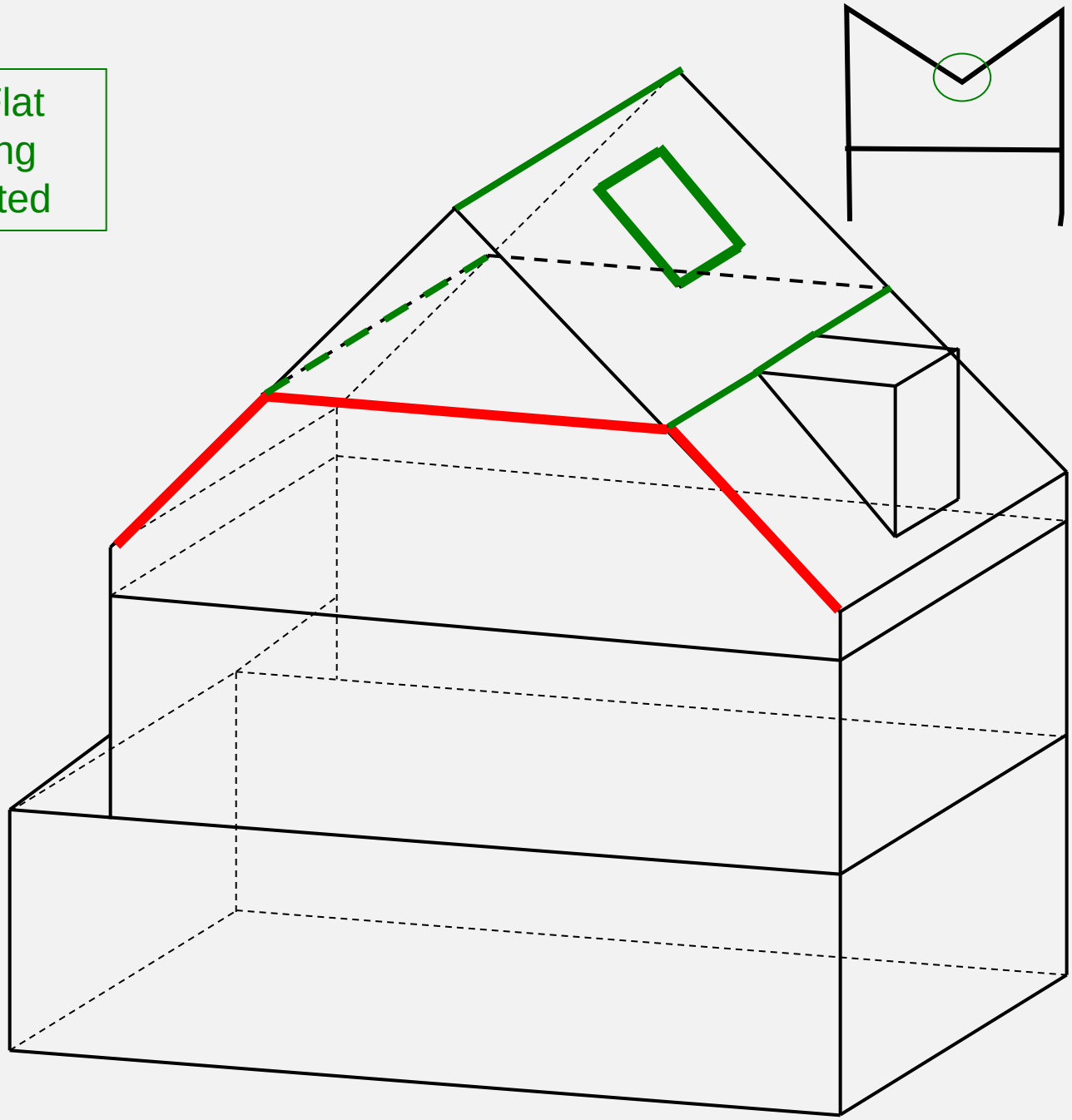
P7 Party wall to exposed floor normal



P8 Party wall to exposed floor inverted

New table K1: Roofs

			Approved	Default
	Ref	Junction detail	Ψ (W/m·K)	Ψ (W/m·K)
Junctions within a roof or with a room-in-roof	R1	Head		0.08
	R2	Sill		0.06
	R3	Jamb		0.08
	R4	Ridge (vaulted ceiling)		0.08
	R5	Ridge (inverted)		0.04
	R6	Flat ceiling		0.06
	R7	Flat ceiling (inverted)		0.04
	R8	Roof wall (rafter)		0.06
	R9	Roof wall (flat ceiling)		0.04



R7 Flat ceiling inverted

R6 Flat ceiling

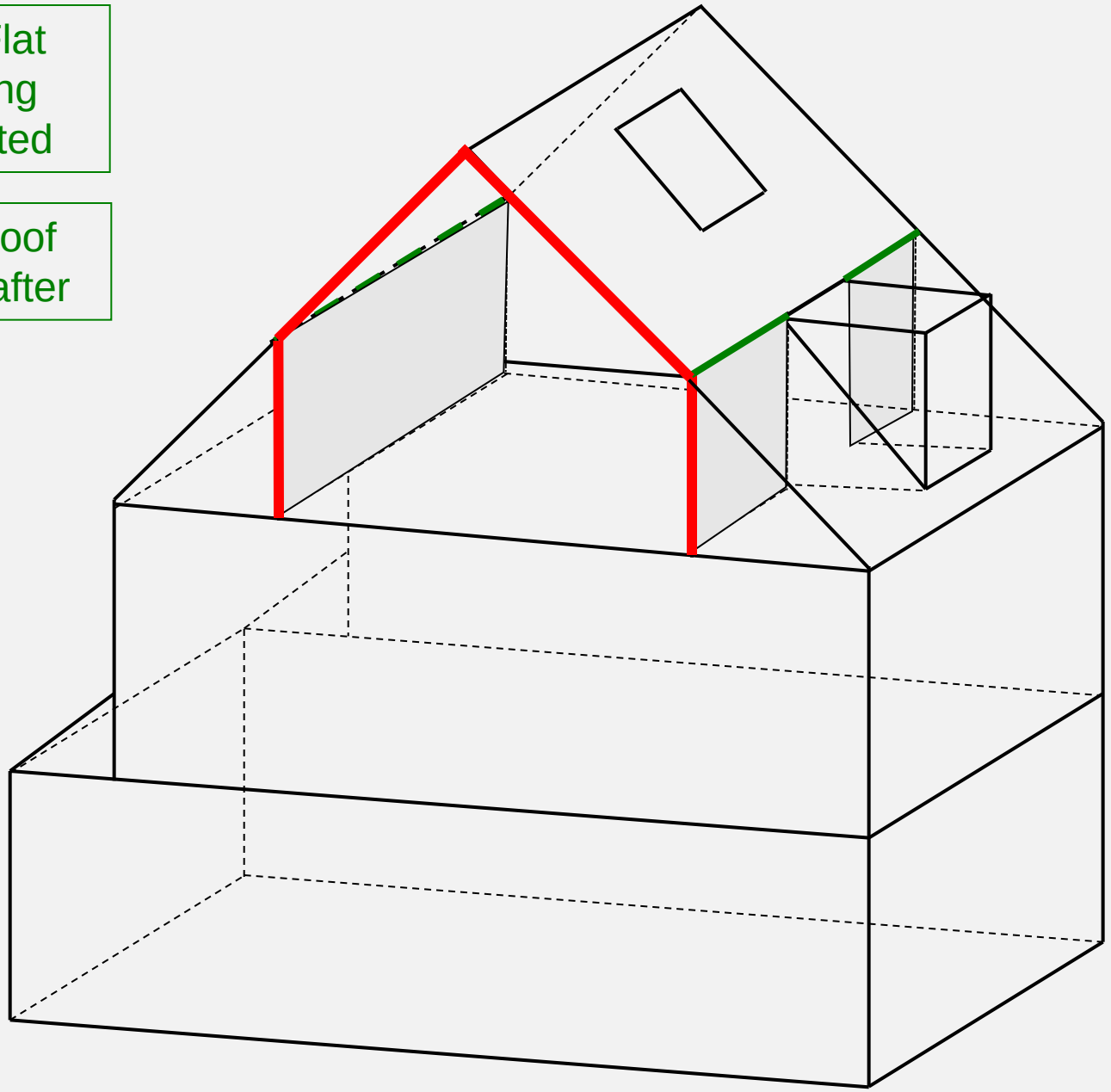
R5 Ridge inverted

R4 Ridge

R3 Jamb

R2 Sill

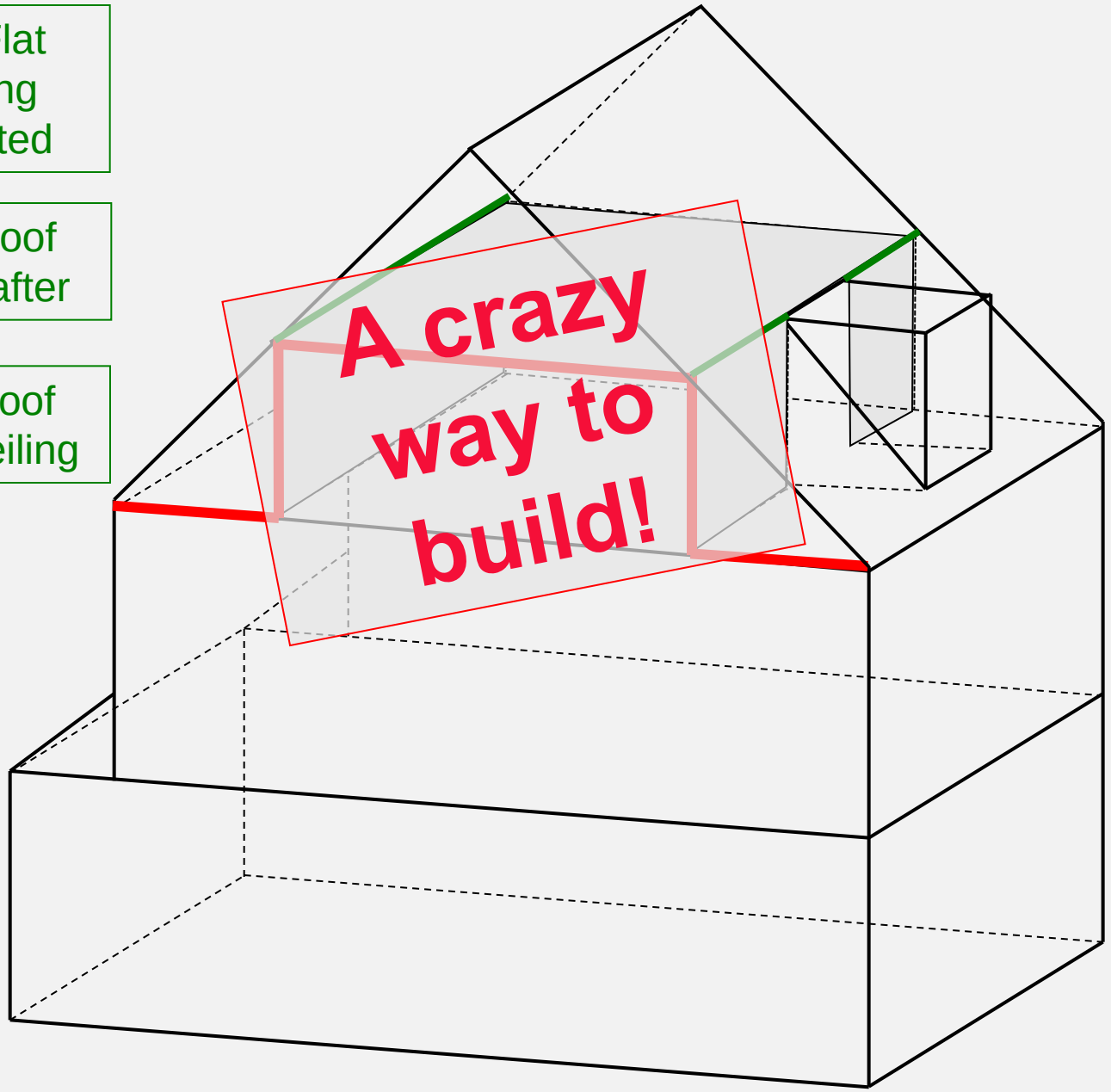
R1 Head


R7 Flat ceiling inverted
R8 Roof wall rafter
R6 Flat ceiling
R5 Ridge inverted
R4 Ridge
R3 Jamb
R2 Sill
R1 Head

R7 Flat ceiling inverted

R8 Roof wall rafter

R9 Roof wall ceiling



R6 Flat ceiling

R5 Ridge inverted

R4 Ridge

R3 Jamb

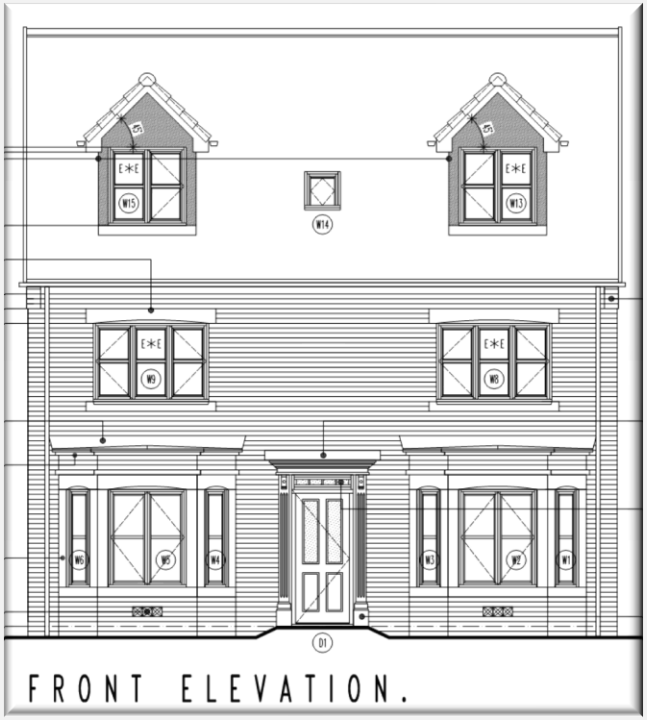
R2 Sill

R1 Head

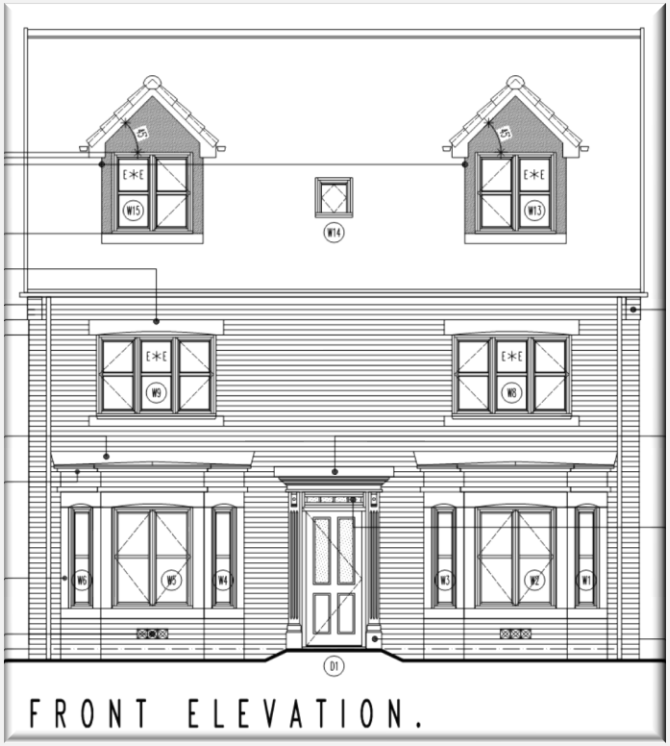
Thermal Bridging

No confidence factors:

i.e. no “plus 25% or 0.02 w/m²/K” added to psi values



Thermal Bridging



No change to:

- **default y = 0.15**
- **y value calculation**

Hot Water

SAP 2009:

- **Primary Pipework Insulated: Yes / No?**

Hot Water

SAP 2012:

1. Uninsulated
2. First 1m from cylinder insulated
3. All accessible pipework insulated
4. Fully insulated pipework

Hot Water

- Length of pipework not a variable – should it be?
- If so, primary and secondary

Hot water

Default heat losses from storage combi boilers increased

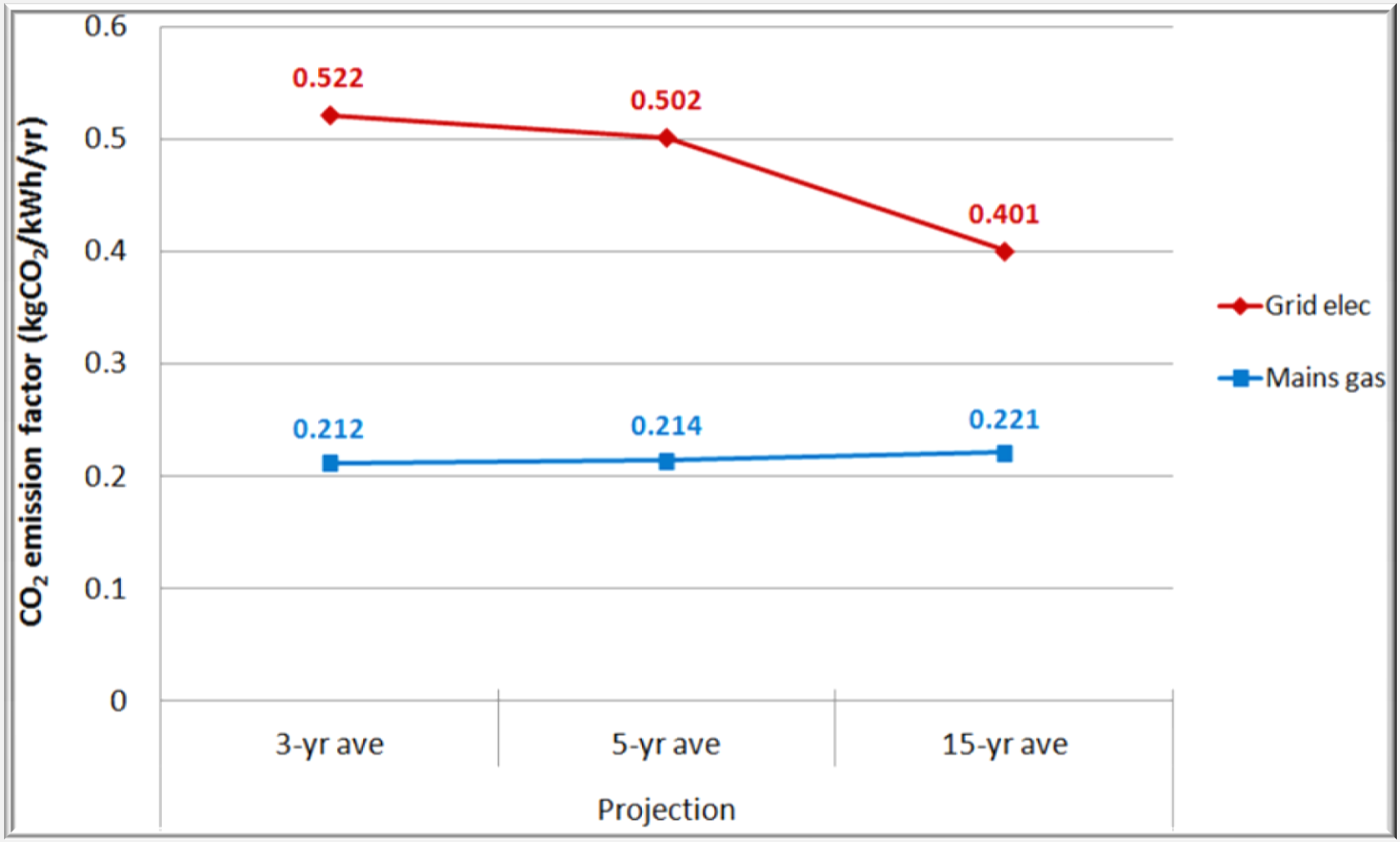
Carbon emissions

- Transportation of fuel
- Methane & nitrous oxide included
- 3 year not 5 year averages

Carbon emissions

- Same factor for import and export
- 15 year averages output as well

Carbon emissions



Carbon emissions

Fuel type	SAP 2009	SAP 2012
Mains gas	0.198	0.212
Grid electricity	0.517	0.522
Electricity exported to grid	0.529	0.522
Domestic heating oil	0.274	0.292
LPG	0.245	0.242
Wood chip	0.009	0.016
Wood pellets	0.028	0.039

Regional Weather

- External temperature
- Solar radiation
- Wind speed
- Heating season length

Regional weather

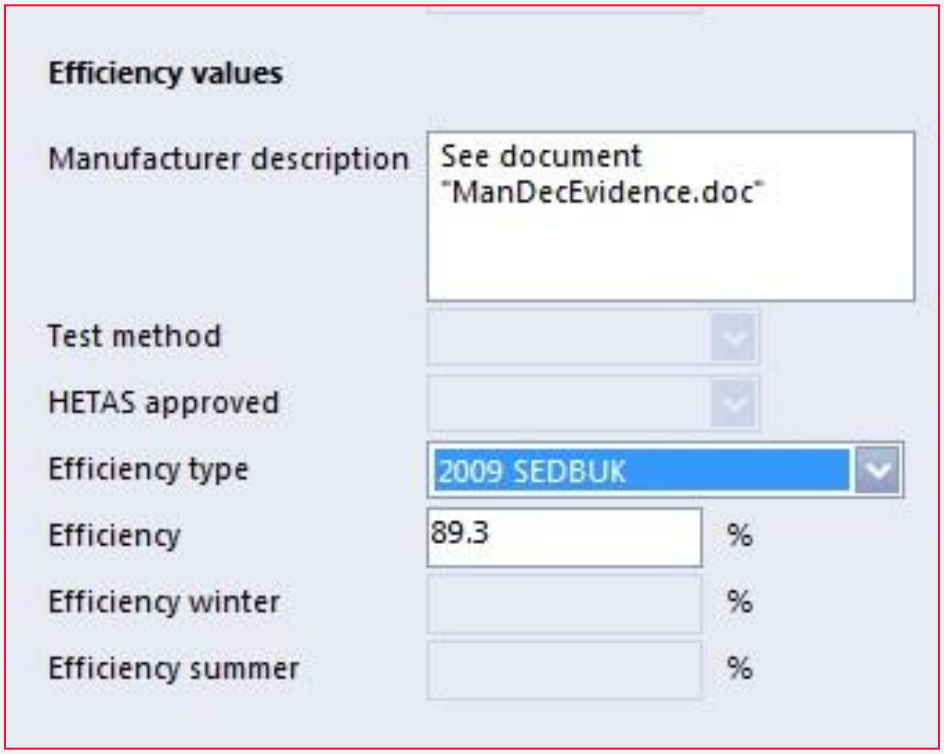
- Cooling no longer sensitive to region for Building Regulations
- Climate regions defined by postcode

Solar

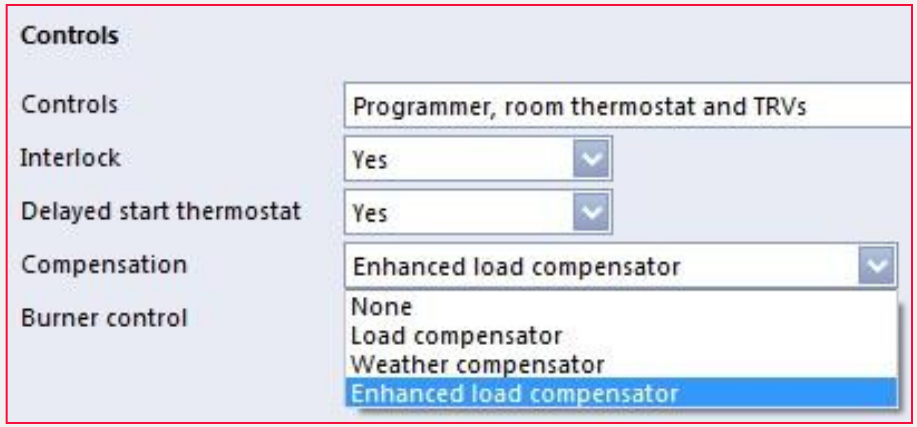
- New procedure for calculating solar radiation from orientation and tilt
- Revised heat losses from solar thermal panels

Boiler Efficiency

- Manufacturers Declared efficiency option removed at As Built stage
- EU Eco Design Regulations – little impact on SAP



Compensators

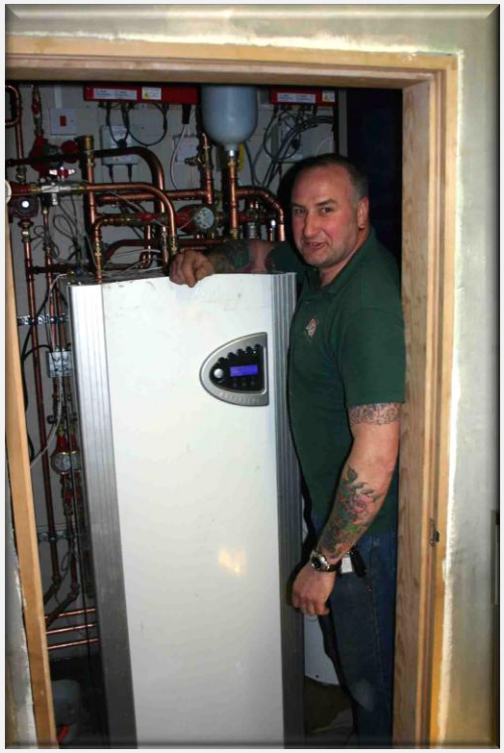


Weather / enhanced load compensators only available from PCDF

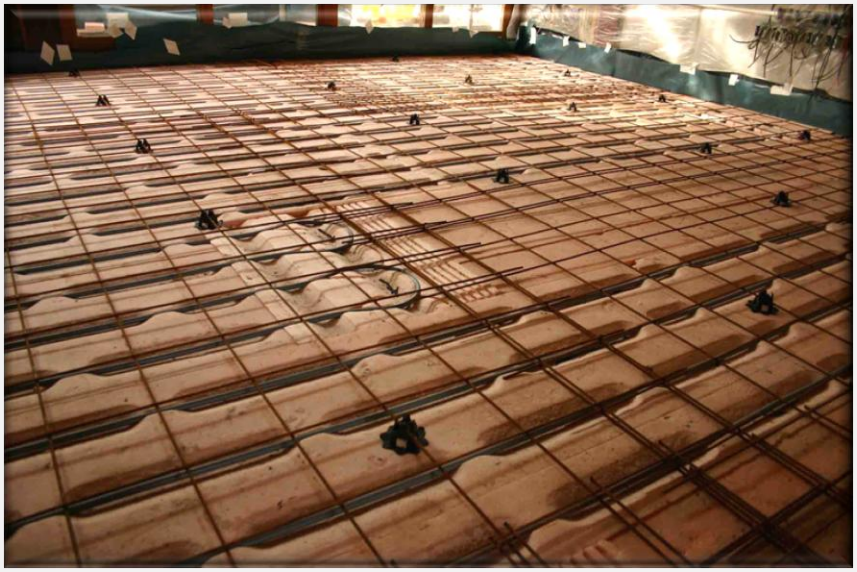
Zone Control

- **Removed benefit for smaller dwellings – area?**
- **Communicating TRVs to count as zone control**

Heat Pumps



Lower default efficiencies



Heat Pumps

Type	Current “typical” COP	Proposed “default” COP
GSHP + underfloor heating	3.2	2.3
GSHP + radiators	2.24	1.6
ASHP + underfloor heating	2.5	2.3
ASHP + radiators	1.75	1.6

Community Heating

- Two extra control options allowing two or more room thermostats
- Biomass system can now have negative CO_2 if FEE target met

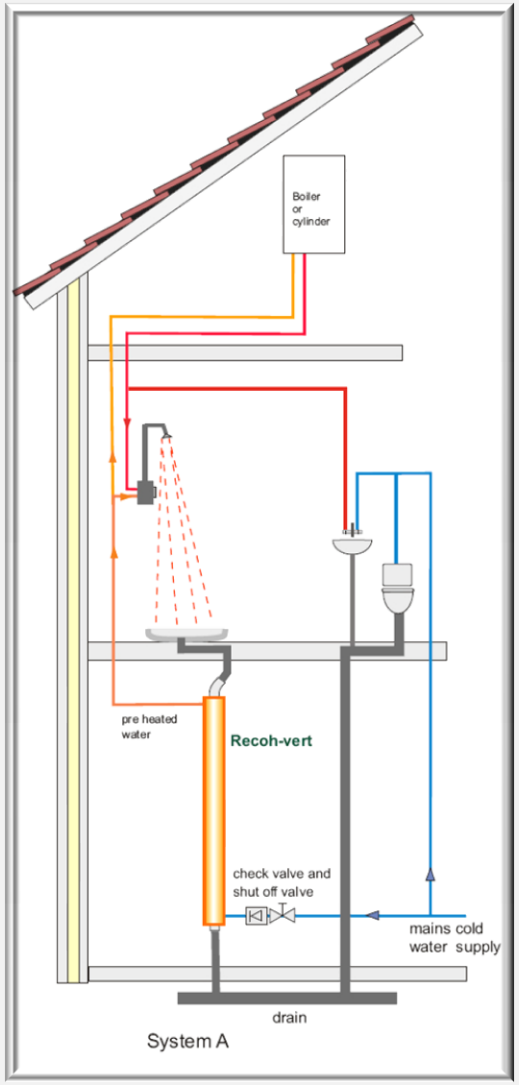
PV on blocks of flats

- When connected to the landlords supply, current impact apportioned between flats
- Only carbon emissions will now be apportioned

3 year averages updated

- **Fuel cost**
- **Primary energy factor**

Waste Water Heat Recovery



Water throughput assumptions amended – slightly reduces effectiveness

SAP Integrity Group

- DECC
- Independent
- Development
- Scientific integrity
- Green Deal too

SAP 2015?

- Overheating and space cooling
- Solar panels for heating
- Low energy lighting
- Heating patterns / temperatures
- Community heating database
- Low temperature heating

SAP 2015?

- Heating controls
- Review ventilation
- In use factors per technology
- DHW only Micro CHP
- Review occupancy factors

cSAP

Criterion 1: Predicted CO2 emission from proposed dwelling does not exceed the target

Dwelling Emission Rate (DER), kgCO2/m2.annum	**15.19**		
Emission rate from notional building, kgCO2/m2.annum	17.65		
Target Emission Rate (TER), kgCO2/m2.annum	**Fuel Factor Consultation Options**		
Target CO2 Emissions Equation Consultation Options	Full	Reduced	None
FEES + efficient services approach	**25.87**	**21.25**	**17.65**
Half-way point absolute target approach	**18.93**	**15.6**	**13**

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Consultation Questions

Agree with approach to CO_2?

✓8 questions

Consultation Questions

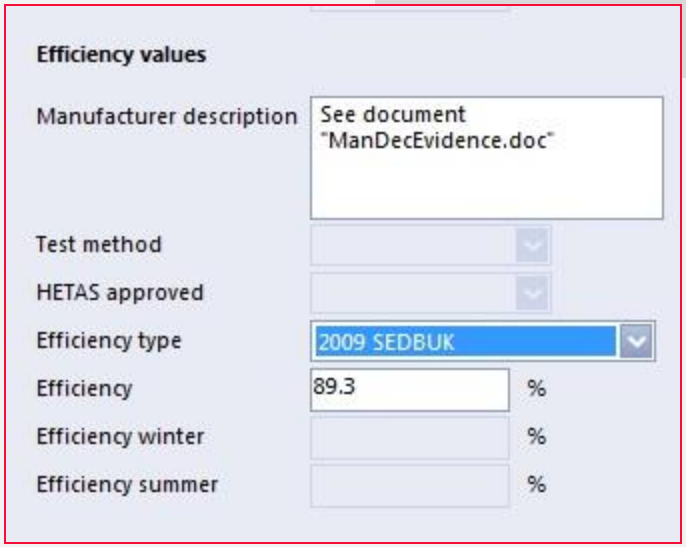
Agree with approach to regional weather?

- ✓ **Wind Speed**
- ✓ **Solar radiation based on orientation and pitch**

Consultation Questions

Agree with approach to heating systems / boilers?

✓ **5 questions**



Consultation Questions

Agree with approach to hot water and primary pipework

✓2 questions

SAP 2012

Consultation closes : 28th March

www.decc.gov.uk/en/content/cms/consultations/sap/sap.aspx