Homes for the Future – Technical Standard

West Midlands Homes for the Future - Technical Standard - Concept

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2030 target scenario - Achieve net zero carbon in construction and in operation	Embodied Carbon	Passive Design	Active Design	Renewables & Net Zero Targets	Construction Strategy	Evidence Required
Energy: • EUI: <35kWh/m2 operational energy use (including regulated and unregulated energy). • Space heating demand of <15KWh/m2/yr **Embodied Carbon:** • Embodied carbon calculation to verify target equivalent to <300kgCO2/m2 **Construction:** • All developments achieve PMV of 55%						
2025 target scenario - Achieve net zero carbon in operation						
Energy: • EUI: <35kWh/m2 operational energy use (including regulated and unregulated energy). • Space heating demand:15-20 KWh/m2/yr **Embodied Carbon** • Embodied carbon calculation to verify target equivalent to <400kgCO2/m2 **Construction:** • All developments achieve PMV of 50%						
2023 Minimum Standard						
Energy: • EUI: <70kWh/m2 operational energy use (including regulated and unregulated energy). • Space heating demand: 15-20KWh/m2/yr **Embodied Carbon** • Embodied carbon calculation to verify target equivalent to <500kgCO2/m2 **Construction:** • Preference for 50% PMV • Evidence that DfMA process guidance has been adhered to						
Statutory (plus enhanced measurement & monitoring)						
Energy • 31% reduction on Dwelling Emission Rate against the Target Emission Rate of Building Regulations Part L 2013. **Embodied Carbon** • As a minimum all delivery partners must measure embodied carbon impacts of the proposed construction. **Construction** • Review opportunity for PMV uplift across all MMC categories						

Granular description of how the standards can be achieved

Clearly defined trajectory increasing over time

Definition of the evidence required for funding purposes

West Midlands Homes for the Future: Technical Standard – 2030 target

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Commentary & Context

This standard sets the expectation of achieving net zero carbon in construction and operation in 2025. Again pilot projects may achieve this standard sooner, although it will require significant learning and sharing of intelligence about the design and construction solutions that enable this standard to be achieved. It will also require the construction sector and materials supply chain to respond to client demand to achieve this level of performance.

2030 target scenario - Achieve net zero carbon in construction and in operation (in accordance with UKGBC definition).	**Embodied Carbon**	**Passive Design**	**Active Design**

Energy:
• EUI: <35kWh/m2 operational energy use (including regulated and unregulated energy).
• Space heating demand of <15KWh/m2/yr
 	
Embodied Carbon:
• Up-front embodied carbon calculation to verify target equivalent to <300kgCO2/m2 (A1-A5).
 	
Construction:
• All developments achieve 55% PMV
	To achieve the embodied carbon performance in line with the 2030 targets we anticipate the following design strategies and component choices may be required.
	
	Lean design will be prioritised to avoid unnecessary finishes. Designs should be performance-based, and encourage maximum use of materials (e.g.., structural design should seek design utilisation factors are no less than 100% with no over-specification permitted).
	
	Design for Manufacture and Assembly should be considered to simplify the construction process, reducing material waste where possible.
	Design considerations to ensure a comprehensive approach to tackling the embodied carbon impacts of each building element:
	
	For low rise homes:
	• Substructure
	  ○ No basement construction
	  ○ Spread foundations with low-carbon concretes (>60% GGBS or equivalent)
	Superstructure
	  ○ Timber frame construction throughout, or significant use of recycled/ secondary components in steel or concrete.
	
	For medium scale housing, schemes are likely to require further innovation and commitment, including incorporation and validation of emerging technologies:
	• Substructure
	  ○ No basements
	  ○ Lean foundation systems, considering raft foundations in lieu of deep piles, where technically feasible, or ultra low-carbon concrete piles where not avoidable.
	
	• Superstructure
	  ○ Lean building design and massing, optimised to reduce structural grids (<5-6m), minimise facade areas/ form factor, avoid excavations.
	  ○ Increase structural floor zones to minimise material (e.g.. ribbed slabs in favour of flat slabs).
	  ○ Ultra-low carbon concretes (e.g.., using alternative cements/ AACMs etc.) and/or re-used steelwork components.
	  ○ Consideration of structural timber, including engagement with regulatory challenges in Building Regulations Part B.
	
	For all building scales and typologies:
	• Envelope
	  ○ Low-carbon rainscreen cladding systems in timber or reclaimed materials (e.g. recycled PVC window frames or rainscreen cladding)
	  ○ Promote natural and recycled insulation materials, including engagement with regulatory challenges in Building Regulations Part B.
	• Services
	  ○ Best practice specifications for heat pump installations with low-GWP refrigerants (e.g.. R32 in place of R410A refrigerants in ASHPs)
	  ○ Careful routing to minimise material use, including distributed servicing systems.
	• Internal Finishes
	  ○ Alternative drylining materials with high recycled content (in preference to plasterboards).
	• External Works
	  ○ Eliminate bulk earthworks activities with no net export
		To achieve the passive performance in line with the 2030 targets we anticipate the following design strategies and component choices.
		
		Exemplary façade performance to be achieved through high performance materials specification and build ups:
		
		• **Floor (W/m2.K): 0.10**
		• **External wall (W/m2.K): 0.10**
		• **Roof (W/m2.K): 0.10**
		• **Windows (W/m2.K): 0.80**
		• **Air permeability (ach): 0.6**
		• **Airtightness levels to achieve 0.6 air changes per hour @50Pa.**
		
		Façade design (Glazing, solar gains and shading)
		• Layout and orientation of homes to be considered in context of the wider masterplan site to ensure potential solar gain benefits are achieved.
		• Glazing will be optimised to balance daylight and overheating requirements. This will account for up to 25% glazing ratio in southern elevations to avoid excessive heating demand in winter months whilst reducing the risk of summertime overheating.
		• Specification of triple glazing to limited heat loss and reduce cold draughts.
		• Dwelling design will carefully consider junction details to reduce heat loss and significantly reduce thermal bridges.
		• Potential for a natural ventilation strategy should be explored with priority given to cross ventilation.
			To achieve the operational performance in line with the 2030 targets we would anticipate the building to incorporate the following active systems:
			• All electric building services strategy: adopting high efficiency heat pumps specification.
			• **Active demand response measures to be considered to reduce peak energy demands and smooth energy consumption, including thermal and battery storage.**
			• All electric heating systems to capitalise on the decarbonisation of the UK's electricity grid.
			• Mechanical ventilation with heat recovery (MVHR) including air filtration, improving indoor air quality and reducing dust and allergens:
			  ○ MVHR heat recovery efficiency: >75%.
			  ○ MVHR electrical efficiency: <0.45Wh/m2.
			• Supplementary heating: Where heating demand is low due to the passive approach, priority will be given to low energy systems that take advantage of post-air heating units within the MVHR ventilation system and/or underfloor heating. Opportunities should also be to explored into the use of direct electric heating.
			• Shower wastewater heat recovery (SWWHR): to reclaim typically 40-60% waste heat from shower water.
			• Automated lighting controls: with daylight and occupancy sensing.
			• Primary energy appliances: Only highly efficient appliances (A rated washing machines, dishwashers etc.) and equipment (fans, pumps, lighting etc.) must be specified.

West Midlands Homes for the Future: Technical Standard – 2030 target (continued)

Commentary & Context

This standard sets the expectation of achieving net zero carbon in construction and operation in 2025. Again pilot projects may achieve this standard sooner, although it will require significant learning and sharing of intelligence about the design and construction solutions that enable this standard to be achieved. It will also require the construction sector and materials supply chain to respond to client demand to achieve this level of performance.

Renewables and Net Zero Targets	Construction Strategy	Evidence Required
Renewables • **100% annual energy requirement to be achieved through on-site generation.** • **Integrate dynamic, smart grid technology to facilitate demand response, ensuring the most efficient supply of electricity for masterplan residents.** • Battery storage technology will enhance resilience and optimise use with variable tariffs bringing benefits to consumers into the system (storing solar electricity generated during off-peak, cheaper hours, rather than buying more expensive grid electricity). Energy procurement • Ensure mechanisms are in place to enable purchase of 100% renewable energy from credible renewable energy sources. Renewable Energy Certificate's (REC) will be sought to validate the environmental claims of energy suppliers. **Net zero verification** • **Verification process to be carried out following the UKGBC guidance for net zero carbon verification. A minimum level of reporting of the buildings operational and construction performance and third-party audit of data will be required.**	A minimum of 55% PMV is required and the guidance document (to be developed) will specify the typical combinations of solutions that will achieve this. Selection decisions for MMC suppliers will be based in part on intelligence gathered through the operation of this standard in the years leading up to the 2030 standard being implemented. This will focus on the as-built and verified performance data gathered through earlier delivery projects. PMV targets will be established at the outset, alongside a commitment to DfMA principles and digitally enabled design and data capture approaches. PMV will be estimated at the design stage and validated post-completion.	The following evidence should be provided to demonstrate compliance with the target: <u>Planning</u> • Whole life carbon analysis to be carried out to estimate the predicted whole life carbon impacts of development in accordance with RICS Whole life carbon assessment for the built environment methodology. Evidence of optioneering to be carried out prior to planning to ensure an optimised construction solution is taken forward. Analysis should be undertaken using BREEAM compliant LCA tools with Environmental Product Declarations for key components. This requires designs to be sufficiently developed (RIBA Stage 3) to support an elemental bill of quantities assessment or a condition to undertake this through reserved matters. • Passivhaus Planning Package (PHPP) modelling to be carried out to ensure significantly reduced thermal bridges. • Design statement to demonstrate optimised approach including confirmation of structural utilisation factors. • Energy modelling to be carried out to verify as designed energy performance. This will include operational energy calculations designed to close the 'performance gap' associated with Building Regulations compliance calculations (e.g.. following CIBSE's TM54 Evaluating operational energy use at the design stage or Passivhaus PHPP methodology as a best practice) to calculate overall energy use intensity (EUI). • Undertake comprehensive overheating analysis of all habitable spaces across the scheme to ensure high levels of occupant comfort are achieved (e.g.. following CIBSE TM59 methodology for the overheating risk in homes). • **BRE Home Quality Mark (HQM) assessment. HQM measures the quality and sustainable value considering running costs, health and wellbeing, and environmental footprint. HQM assessment is carried out a numerous stages of the design process by an independent assessor to demonstrate high-quality homes within the marketplace**. • **Commitments to technologies and evidence of design strategies should be provided.** <u>Design verification</u> • Planning stage design statement should be submitted to verify that design development is in accordance with planning stage carbon statements and confirm proposals remain on track to meet their planning targets. <u>Construction</u> • Air tightness testing to be carried at construction stages to verify building airtightness against the strict targets required to achieve the low energy ambitions. • Construction stage verification of operational and embodied carbon performance and tracking any changes made, especially material or technology choices, and including site emissions of fuels/ power/ waste. <u>Post-occupancy</u> • POE verification on the buildings operational performance will be carried out to ensure a positive feedback loop to support future project delivery. POE evidence will include in-use energy consumption data and user satisfaction feedback. • All developments to have in place a recognised monitoring regime to assess energy use, indoor air quality and risk of overheating. • Energy use guidance to be provided to all residents to support reduced operational energy of all electrical equipment, including supplementary lighting. <u>DfMA & PMV</u> • DfMA and PMV reviews undertaken at key design stages • Verification of 55% PMV both in design and at completion

West Midlands Homes for the Future: Technical Standard – 2025 target

Commentary & Context

This standard sets the expectation of achieving net zero carbon in operation in 2025. Pilot projects will likely achieve this standard sooner, and it will replace the current minimum standard in 2025.

2025 target scenario - Achieve net zero carbon in operation (in accordance with UKGBC definition).	**Embodied Carbon**	**Passive Design**	**Active Design**

Energy:
• EUI: <35kWh/m2 operational energy use (including regulated and unregulated energy).
• Space heating demand:15-20 KWh/m2/yr
 	
Embodied Carbon
• Up-front embodied carbon calculation to verify target equivalent to <400kgCO2/m2 (A1-A5).
 	
Construction:
• All developments achieve PMV of 50%
	To demonstrate embodied carbon performance in line with the 2025 targets we anticipate designs will need to prioritise the following key construction items as a minimum:
	
	For low-rise housing (<11m):
	• Substructure -Incorporation of low carbon spread foundations (where technically feasible).
	• Superstructure- Lightweight construction (e.g.. timber or light gauge steel construction systems), or exemplar low-concrete specifications for in-situ or precast concrete systems.
	
	For medium scale housing, requiring further innovation and commitment:
	• Massing- Careful planning to minimise building envelope. Podium construction (e.g.. with ground level parking) should be avoided where possible, and basement construction is unlikely to be feasible without significant commitment to low-carbon construction methods.
	• Substructure - Lean foundation systems, considering raft foundations in lieu of deep piles, where technically feasible, or low-carbon concrete piles where not avoidable.
	• Superstructure - Exemplar low carbon concretes (>65% GGBS or equivalent) or high recycled content (Electric Arc Furnace) structural steelwork, where used
	
	For all building scales and typologies:
	• Envelope
	  ○ Lightweight facade systems (avoiding solid brick or pre-cast systems)
	  ○ Composite, timber or recycled plastic window framing (in preference to aluminum or PVC windows).
	  ○ Avoid plastic insulation products to roofs/facades, with mineral wool or natural insulation materials preferred.
	
	• Internal Finishes
	  ○ Avoid internal finishes where possible, promoting 'fair-faced' elements where possible, and prioritise natural or recycled finishes (e.g.. avoid plastic floors/ carpets and minimise plasterboard quantities where possible)
	• Services
	  ○ Best practice specifications for heat pump installations with low-GWP refrigerants (e.g.. R32 in place of R410A refrigerants in ASHPs)
	• External Works
	  ○ Careful specification of external works materials, promoting permeable surfaces and recycled surfacing in preference to asphalt or poured concrete surfacing.
		We anticipate the following passive design strategies and component choices to meet the 2025 targets:
		
		Fabric specification
		• Exemplary façade performance to be achieved through high performance materials specification and build ups:
		  ○ Floor (W/m2.K): 0.11
		  ○ External wall (W/m2.K): 0.15
		  ○ Roof (W/m2.K): 0.11
		  ○ Windows (W/m2.K): 0.80
		  ○ Air permeability (ach): 0.6
		• **Dwelling design will carefully consider junction details to reduce heat loss and significantly reduce thermal bridges.**
		
		Airtightness
		• **Airtightness levels to achieve 0.6 air changes per hour @50Pa. This will be achieved through rigorous standards in practice from good design to construction.**
		
		Façade design (Glazing, solar gains and shading)
		• **Specification of triple glazing to limited heat loss and reduce cold draughts.**
		• Layout and orientation of homes to be considered in context of the wider masterplan site to ensure potential solar gain benefits are achieved.
		• Glazing will be optimised to balance daylight and overheating requirements. This will account for up to 25% glazing ratio in southern elevations to avoid excessive heating demand in winter months whilst reducing the risk of summertime overheating.
		• Potential for a natural ventilation strategy should be explored with priority given to cross ventilation.
			To achieve operational energy performance in line with the 2025 targets we would anticipate the building to incorporate the following active systems:
			
			• All electric building services strategy adopting high efficiency heat pump technology.
			• Mechanical ventilation with heat recovery (MVHR) including air filtration, improving indoor air quality and reducing dust and allergens:
			  ○ MVHR heat recovery efficiency: >75%.
			  ○ MVHR electrical efficiency: <0.45Wh/m2.
			• Supplementary heating: Where heating demand is low due to the passive approach, priority will be given to low energy systems that take advantage of post-air heating units within the MVHR ventilation system and/or underfloor heating. Opportunities should also be to explored into the use of direct electric heating.
			• Shower wastewater heat recovery (SWWHR) to reclaim typically 40-60% waste heat from shower water.
			• Automated lighting controls with daylight and occupancy sensing.
			• **Primary energy appliances: Only highly efficient appliances (A rated washing machines, dishwashers etc.) and equipment (fans, pumps, lighting etc.) must be specified.**

West Midlands Homes for the Future: Technical Standard – 2025 target (continued)

Commentary & Context

This standard sets the expectation of achieving net zero carbon in operation in 2025. Pilot projects will likely achieve this standard sooner, and it will replace the current minimum standard in 2025.

Renewables and Net Zero Targets	Construction Strategy	Evidence Required
Renewables • Optimise the use of on-site renewable generation (15m2 PV/dwelling, 2.5m2/apartment). • Build additional resilience into the system through the introduction of battery storage technology at both masterplan and plot level. Consumers can store solar electricity they have generated during off-peak, cheaper hours, rather than buying more expensive grid electricity. Energy procurement • Ensure mechanisms are in place to enable purchase of 100% renewable energy from credible renewable energy sources. Renewable Energy Certificate's (REC) will be sought to validate the environmental claims of energy suppliers. **Net zero verification** **Verification process to be carried out following the UKGBC guidance for net zero carbon verification. A minimum level of reporting of the buildings' operational performance.**	A minimum of 50% PMV is required and the guidance document (to be developed) will specify the typical combinations of solutions that will achieve this. Developers should seek higher performing MMC solutions especially in relation to fabric efficiency to enable net zero homes in operation, but should also prioritise suppliers that can substantiate enhanced embodied carbon performance. PMV targets should be established at the outset, alongside a commitment to DfMA principles and likely digitally enabled design and data capture approaches. PMV should be estimated at the design stage and validated post-completion. Data on PMV performance should be shared alongside carbon performance to enable continuous learning and improvement at a system-wide level.	Planning • Whole life carbon analysis to be carried out to estimate the predicted whole life carbon impacts of development in accordance with RICS Whole life carbon assessment for the built environment methodology. Evidence of optioneering to be carried out prior to planning to ensure an optimised construction solution is taken forward. Analysis should be undertaken using BREEAM compliant LCA tools with Environmental Product Declarations for key components. This requires designs to be sufficiently developed (RIBA Stage 3) to support an elemental bill of quantities assessment or a condition to undertake this through reserved matters. • **Passivhaus Planning Package (PHPP) modelling to be carried out to ensure significantly reduced thermal bridges.** • **Energy modelling to be carried out to verify as designed energy performance. This will include operational energy calculations designed to close the 'performance gap' associated with Building Regulations compliance calculations (e.g.., following CIBSE's TM54 Evaluating operational energy use at the design stage or Passivhaus PHPP methodology as a best practice) to calculate overall energy use intensity (EUI).** • Undertake comprehensive overheating analysis of all habitable spaces across the scheme to ensure high levels of occupant comfort are achieved (e.g.., following CIBSE TM59 methodology for the overheating risk in homes). Design verification • Planning stage studies to be verified against design updates to ensure proposals remain on track to meet their planning targets. **Construction** • **Air tightness testing to be carried at construction stages to verify building airtightness against the strict targets required to achieve the low energy ambitions.** Post-occupancy • POE verification on the buildings operational performance will be carried out to ensure a positive feedback loop to support future project delivery. POE evidence will include in-use energy consumption data and user satisfaction feedback. • **Energy use guidance to be provided to all residents to support reduced operational energy of all electrical equipment, including supplementary lighting** DfMA & PMV • DfMA and PMV reviews undertaken at key design stages • Verification of 50% PMV both in design and at completion

West Midlands Homes for the Future: Technical Standard – 2023 Minimum Standard

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Commentary & Context

This is the proposed target standard for developers in WMCA to achieve in 2023. It is a challenging but achievable standard, which requires a better fabric performance than the Future Homes Standards combined with a focus on reducing embodied carbon and a pragmatic utilisation of MMC focussed principally on structural solutions. The energy and embodied carbon targets align with the WMCA Net Zero Carbon Roadmap. The MMC trajectory is a simplified yet more ambitious version of the Homes England requirement for MMC, requiring at the very least an enhanced MMC framing solution combined with other pre-manufactured elements.

2023 Minimum Standard	Embodied Carbon	Passive Design	Active Design	Renewables and Net Zero Targets	Construction Strategy	Evidence Required

Energy:
• EUI: <70kWh/m2 operational energy use (including regulated and unregulated energy).
• Space heating demand: 15-20KWh/m2/yr
 	
Embodied Carbon
• Embodied carbon calculation to verify target equivalent to <500kgCO2/m2
 	
Construction:
• Preference for 50% PMV
• Evidence that DfMA process guidance has been adhered to
	To achieve the embodied carbon performance in line with the minimum targets an assessment will be undertaken, and the selection of the following design strategies and components should be considered. Particular care will be needed to embed low-carbon materials and design features in taller buildings > 11m in height or with challenging ground conditions:
	
	• Substructure
	  ○ No basements.
	  ○ Standard building foundation design with low carbon concrete, avoiding unnecessary mass fill.
	• Superstructure
	  ○ Efficient building grid systems with typical structural spans <8m.
	  ○ Avoidance of complex and carbon intensive design features (e.g.., deep basements, long-span transfer structures)
	  ○ Traditional construction materials (steel, concrete, masonry) will require good practice specifications to promote local supply chains, low carbon specifications (e.g.., higher %age cement replacement in concretes).
	• Services
	  ○ Good practice specifications for heat pump installations with low-GWP refrigerants (e.g.., R32 in place of R410A refrigerants in ASHPs)
	• Envelope
	  ○ Avoid heavyweight cladding systems (in pre-cast or aluminum unitised cladding).
		We anticipate the following passive design strategies and component choices to meet the 2025 targets:
		
		Fabric specification
		• Fabric performance will go beyond current building regulation compliance standards. We would expect design to prioritise materials and build-ups as such:
		  ○ **Floor (W/m2.K): 0.11**
		  ○ **External wall (W/m2.K): 0.15**
		  ○ **Roof (W/m2.K): 0.11**
		  ○ **Windows (W/m2.K): 0.80**
		  ○ **Air permeability (m3/(h.m2): 5.0**
		
		Façade design (Glazing, solar gains and shading)
		
		• **Layout and orientation of homes to be considered in context of the wider masterplan site to ensure potential solar gain benefits are achieved.**
		• **Glazing will be optimised to balance daylight and overheating requirements. This will account for up to 25% glazing ratio in southern elevations to avoid excessive heating demand in winter months whilst reducing the risk of summertime overheating.**
		• **Potential for a natural ventilation strategy should be explored with priority given to cross ventilation.**
			To achieve operational energy performance in line with minimum targets we would anticipate the building to incorporate the following active systems:
			
			• **All electric building services strategy adopting high efficiency heat pump technology.**
			• **Mechanical ventilation with heat recovery (MVHR) including air filtration, improving indoor air quality and reducing dust and allergens:**
			  ○ **MVHR heat recovery efficiency: >75%.**
			  ○ **MVHR electrical efficiency: <0.45Wh/m2.**
			• **Supplementary heating: Where heating demand is low due to the passive approach, priority will be given to low energy systems that take advantage of post-air heating units within the MVHR ventilation system and/or underfloor heating. Opportunities should also be to explored into the use of direct electric heating.**
			• **Automated lighting controls with daylight and occupancy sensing.**
				Renewables
				
				• Optimise on-site renewable generation.
				• **Build additional resilience into the system through the introduction of battery storage technology at both masterplan and plot level. Consumers can store solar electricity they have generated during off-peak, cheaper hours, rather than buying more expensive grid electricity.**
				
				Energy procurement
				
				• **Ensure mechanisms are in place to enable purchase of 100% renewable energy from credible renewable energy sources. Renewable Energy Certificate's (REC) will be sought to validate the environmental claims of energy suppliers.**
					MMC will be critical to achieving the enhanced embodied carbon and fabric performance expectations set out on the left.
					
					The design process should accommodate informed reviews of construction methodology and material selection, with a focus on optimising PMV.
					
					An MMC strategy that achieves a PMV of 50% is likely to require either a category one 3d volumetric solution or alternatively a combination of a range of all other categories (2-6) especially utilising a 2d frame (cat 2) with pre-manufactured components such as pre-manufactured bathroom and utility pods.
					
					To achieve this the design process should adopt DfMA principles in line with the MMC guidance (note: to be developed) along with early supply chain engagement and structured PMV reviews at key design stages.
						<u>Planning</u>
						
						• **Whole life carbon analysis to be carried out to estimate the predicted whole life carbon impacts of development in accordance with RICS Whole life carbon assessment for the built environment methodology. Evidence of optioneering to be carried out prior to planning to ensure an optimised construction solution is taken forward. Analysis should be undertaken using BREEAM compliant LCA tools with Environmental Product Declarations for key components. This requires designs to be sufficiently developed (RIBA Stage 3) to support an elemental bill of quantities assessment or a condition to undertake this through reserved matters.**
						• Overheating analysis to be undertaken for all habitable spaces across the scheme to ensure high levels of occupant comfort are achieved (e.g.., following CIBSE TM59 Design methodology for the overheating risk in homes).
						
						<u>Design verification</u>
						• Planning stage studies to be verified against design updates to ensure proposals remain on track to meet their planning targets.
						
						<u>Post-occupancy</u>
						• The effectiveness of measures will be reviewed as part of the post completion works to ensure as-designed
						
						<u>Construction:</u>
						• PMV estimate pre-construction and verification on completion, or
						• Verification of DfMA process adherence per guidance document (to be developed)

West Midlands Homes for the Future: Technical Standard – "Statutory Plus" Requirement

Commentary & Context

A "statutory (plus enhanced measurement & monitoring)" standard has been developed to enable the incremental implementation of the 2023 minimum standard. It is certain to be the case that developments will come forward that are at an advanced design stage and are therefore limited in the extent to which an enhanced specification can be deployed. The statutory plus standard will respond in those cases by requiring additional considerations of developers, such as a requirement to measure both whole life carbon and PMV assessments before and after completion. This is intended to drive up understanding of the core issues, solutions for enhanced performance, and ensure that as a minimum all developments start to consider the steps that will be mandatory in future.

Statutory (plus enhanced measurement & monitoring)	Embodied Carbon	Passive Design	Active Design	Renewables and Net Zero Targets	Construction Strategy	Evidence Required
Energy • 31% reduction on Dwelling Emission Rate against the Target Emission Rate of Building Regulations Part L 2013. **Embodied Carbon** • As a minimum all delivery partners must measure embodied carbon impacts of the proposed construction. **Construction** • Review opportunity for PMV uplift across all MMC categories	To demonstrate performance in line with requirements set out under the Statutory Plus target, we anticipate the following as a minimum: • Design stage lifecycle assessment of embodied carbon in accordance with BS EN 15978 and in the built environment. Reporting standards should be aligned with relevant industry guidance at the time of assessment (RICS Professional Statement for Whole Life Carbon Assessment) **Key reporting standards from 2023:** ○ Assessment to include all works elements (including services, FFE, internal finishes, external works) and min., 95% of building elements as measured by cost, with the exception of on-site renewables and associated infrastructure (e.g.. battery storage), which should be reported separately. Generic values may be used for non-fixed elements (FFE) where no data available. ○ 'Up-front' carbon reporting (life-cycle modules A1-A5) should exclude sequestration (e.g., in timber materials).	The following passive design strategies meet the Statutory Plus performance requirements: • At masterplan-level, priority will be given to higher density accommodation for its improved form factor and associated reductions in heat loss and overall improved massing efficiency. • Design of dwellings will go beyond current building regulation fabric performance standards. Therefore, we would expect dwellings to target the following fabric performance as a minimum: ○ Floor (W/m2.K): 0.13 ○ External wall (W/m2.K): 0.18 ○ Roof (W/m2.K): 0.13 ○ Windows (W/m2.K): 1.40 ○ Air permeability (m3/(h.m2): 5.00	To achieve operational performance in line with the statutory plus target we anticipate the design to consider the following key features as a minimum: • Commitment to no new gas installations across the entire masterplan. • A low zero carbon feasibility study will be used to identify the key measures for implementation at both a site-wide masterplan level and building level.	<u>Renewables</u> • Maximise on-site renewable energy generation irrespective of whether carbon reduction targets are already met. • Roof-top solar PV should be optimised across the site.	The design process should accommodate an informed reviews of construction methodology and material selection, with a focus on optimising PMV. PMV should be estimated at the design stage, updated to reflect which MMC options have been selected, and subsequently re-measured post-completion.	<u>Planning</u> • Building Regulations compliance modelling to be carried out to verify as-designed energy and carbon performance against target reductions. • Overheating analysis to be undertaken for all habitable spaces across the scheme to ensure high levels of occupant comfort are achieved (e.g.. following CIBSE TM59 Design methodology for the overheating risk in homes). • Elemental life cycle analysis to be carried out establish the embodied carbon impact of the development. <u>Design verification</u> • Planning stage studies to be verified against design updates to ensure proposals remain on track to meet their planning targets. <u>DfMA & PMV</u> • PMV estimate at design stage and updated PMV following MMC options review. • Output of MMC options review • Verification of outturn PMV and MMC solutions deployed

Homes for the Future –Wider Considerations for the Promotion of Sustainable Placemaking

West Midlands Homes for the Future: "Wider Standards for Sustainable Placemaking“ - Mobility & Accessibility

Commentary & Context

The following pages set out a series of wider recommended principles that are intended to guide sustainable development at a project level and to inform wider placemaking. The principles are organised into themes, the first of which relates to **Mobility & Accessibility**

Site Selection	Masterplan	Homes	Operation
• Sites for housing should be located in close proximity to existing public transport and local amenities and local services.	Aspire to car free development by: • Providing local services based on a principles of 5 minute neighbourhood/15 minute city. Provision should be informed by a local needs assessment and community engagement to ensure the broad ranging community needs are adequately addressed. • Prioritising active travel modes catering for a wide range of mobility needs. • Support shared mobility services such as rapid bus/light rail, car clubs and bike clubs. • Mobility hubs to be considered for site-wide integration on mobility services including car clubs and communal on-street cycle storage. • Consolidating logistics movements to reduce transport emissions and improve overall efficiency. • Future proof development, avoiding predict and provide models, envisaging the future mobility and transition taking account of trends and changing patterns in demand. • Infrastructure to be designed with inclusivity in mind. Include the specification of dropped curbs / level pavements and roadways to enable wheelchair and buggy use, as well as the provision of good street lighting so residents feel safe walking or cycling after dark. • Speed limits set across the masterplan and in particular in denser residential areas to promote inclusivity and sustainable travel options. This should look to integrate with school streets initiative to improve safety for children. • Cycle storage needs to support a range of bike types for all stages of life - cargo bikes for families through to mobility scooters. Inclusive design must ensure that those with additional needs and disabilities are also catered for.	• Incorporate secure cycle storage within all dwellings. • Actively promote local carsharing services amongst residents, designed to serve clusters of dwellings. • Design for ease of access and mobility for all users to ensure inclusive spaces across the scheme.	• As part of wider Post Occupancy Evaluation (POE), engagement with residents will be used to evaluate mobility and accessibility performance. Assessment will address both masterplan and dwelling-level ease of access and mobility. Findings will be used to support potential future enhancements of the masterplan.

West Midlands Homes for the Future: "Wider Standards for Sustainable Placemaking“ - Resilient Ecosystems

Commentary & Context

These pages set out a series of wider recommended principles that are intended to guide sustainable development at a project level and to inform wider placemaking. The principles are organised into themes, and this page sets out the principles related to **Resilient Ecosystems**

Site Selection	Masterplan	Homes	Operation
• Prioritise the use of brownfield sites to ensure masterplans do not accelerate the expansion into greenbelt land and the associated ecological impact this has. • Prioritise sites that have limited vulnerability to climate hazards, and avoid sites that are at risk of flooding taking account of future climate scenarios.	• All development sites should ensure a Climate Change Risk Assessment is carried out to identify the potential future risks and establish mitigation responses. • Grey infrastructure should be limited, through optimisation of street layouts, giving space over to landscape and biodiversity. • A 10% biodiversity net gain on all sites and Urban Greening Factor of 0.3 for brownfield sites should be targeted as a minimum. • Prioritise nature based solutions for managing surface water, and avoid plastic attenuation tanks. • Nature based solutions will be pursued to mitigate the increased frequency of overheating events associated with climate change. Shading will be provide via green infrastructure and tree canopy.	• Prioritise space for home growing. Where denser living is specified as part of masterplan, provide community gardens and growing spaces. • Minimise water consumption to 80l/p/d.	• Community stewardship initiatives should be sought to help foster community engagement activities such maintenance of allotments/outdoor space. • Community engagement with ecosystems monitoring to ensure the value and enhancement of greenspace over the long term.

West Midlands Homes for the Future: "Wider Standards for Sustainable Placemaking“ - Well-Being & Inclusion

Commentary & Context

These pages set out a series of wider recommended principles that are intended to guide sustainable development at a project level and to inform wider placemaking. The principles are organised into themes, and this page sets out the principles related to **Well-Being & Inclusion**

Site Selection	Masterplan	Homes	Operation
• Choose sites that are near to existing services and community facilities. • Understand key site characteristics including microclimate and air quality.	• Undertake early stage microclimate modelling (daylight, sunlight, wind) to inform massing and orientation studies (commence at RIBA 2) and implement mitigation measures. • Ensure healthy streets and permeability as part of the design to encourage play and culture for all residents. • Ensure sufficient provision of green space for play, events, reflection and exercise. This includes both public and private access to outdoor space such as parks and green space within close proximity. • Community infrastructure to be provided based on local needs assessment and community engagement. • Ensure efficient use of land to achieve social impact greater. • Develop a Social Value Strategy which places development in context of regional ambitions including regeneration, skills, delivery of new homes and careers within the green economy. • Provision of green space needs to consider both quality and quantity. Spaces should be accessible to diverse user groups.	• Daylight and sunlight studies: Undertaken in accordance with the latest BRE209 guidance. Home design to ensure exemplar levels of daylight are achieved, providing the best possible occupant experience. • Overheating mitigation: Ensure the risks associated with overheating and poor thermal comfort are addressed through comprehensive thermal modelling (e.g. following CIBSE TM59 Design methodology for the overheating risk in homes). • Space for the every day stuff – drying, etc.	• Facilitate ongoing engagement through community events, activities and engagements programmed into the operation of the development to support community well being and sense of belonging. • Identify opportunities for community stewardship of key facilities. • Post Occupancy Evaluation (POE) to be carried to capture feedback on resident wellbeing and place performance. Ensure mechanisms are in place to implement improvements.

West Midlands Homes for the Future: "Wider Standards for Sustainable Placemaking“ - Circular Economy

Commentary & Context

These pages set out a series of wider recommended principles that are intended to guide sustainable development at a project level and to inform wider placemaking. The principles are organised into themes, the last of which relates to **Circular Economy**

Site Selection	Masterplan	Homes	Operation
• Prioritise the selection of sites in proximity to developed urban areas to reduce transport/travel emissions and enable connection to existing modes of low carbon travel. • Encourage the development of sites where there are opportunities for reuse of existing buildings and infrastructure.	• Ensure passive principles inform the masterplan design including solar analysis to inform massing optimisation. • Ensure masterplan layout responds to site topography to minimise earthworks movements. • Measure and reduce infrastructure and public realm carbon in accordance with PAS 2080. • Consider the incorporation of a 5th generation energy networks to facilitate energy exchange between buildings on the masterplan. • Review potential for onsite solar array.	• New homes to achieve aspire to achieving the 2030 target scenario. Refer to the Carbon Standard. • Design homes to facilitate future disassembly, adaptability and reuse in line with circular economy principles, adopting buildings as materials banks principles. • Design homes to incorporate recycled/secondary materials. • Co-benefits and wider supply chain issues should be considered as part of the materials specification and responsible sourcing process.	• Soft landings approach to be pursued through a recognised performance gap tool. Tool will be used to minimise gap between design aspirations and the completed development. • Develop a Home User Guide to support home owners and tenants. As per a soft landings approach ensure a handover pack/Building User Guide for all building occupants to ensure all occupants have a sufficient understanding of the building systems operations to help improve their energy efficiency, reducing associated energy costs. • Facilitate reuse and sharing of products and spaces across the scheme through shared community spaces resource hubs, shared mobility. • Encourage on site recycling and composting of green waste.