Warwick District Council Net Zero Carbon Development Plan Document – Examination Submission Version

Examination Hearing Response: Review of the NZC DPD Examination Matter 3 Viability Testing and Assessment: Viability Note Addendum

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1.0 INTRODUCTION

1.1 This report sets out the conclusions of a review of the Warwick District Council NZC DPD Examination Matter 3 Viability Testing and Assessment: Viability Note Addendum[i] which has been produced by Bioregional on behalf of Warwick District Council (WDC) in response to matters raised at the Examination hearing on the 8th March 2023.

1.2 The review of the additional viability note addendum has been carried out to understand the justification of the proposed policy and ensure that the evidence base and scientific background is sound.

1.3 In addition, a notional SAP calculation has been undertaken on a typical 3 bed detached house, which shows the building specification uplift required over Part L 2013 to meet compliance with both Part L 2021, and the proposed WDC Net Zero DPD policy. This demonstrates the building specification required to show compliance with the proposed policies of the submission version of the DPD.

1.4 This review will be submitted as further comments on the Council's viability evidence in addition to the Regulation 19 consultation representations and the matters statement previously submitted by Barton Willmore, now Stantec on behalf of Taylor Wimpey and IM Land.

2.0 COMMENTS ON RESIDENTIAL BUILD COSTS

2.1 Paragraph 1.3 of the Viability Note Addendum point a) states that *"the Future Homes Standard (FHS) fabric requirement is taken from the Etude, Currie & Brown Cornwall energy review 2021 (page 34). This figure represents the full cost uplift for all parts of the notional building specification that are improved in Part L 2025 (FHS), which include uplifts to insulation (within walls, floors and roof) and glazing"* this appears to be in conflict with the Warwick District Council Net Zero Carbon DPD Regulation 22 Consultation Statement [SUB 7][ii] which states in paragraph 4.19 that *"Currie & Brown's itemised estimated fabric cost uplifts are relatively similar (£1977) to those of the FHS IA Option 2. Nevertheless, we used the higher FHS IA fabric estimate in our total cost impact estimation."* The reference to two different fabric cost uplift figures, despite being relatively similar, show a lack of soundness in the provided evidence and we recommend a more detailed cost modelling exercise is carried out to ensure accuracy and soundness.

2.2 Table 5 of the Viability Note Addendum shows two routes to achieve the regulated Net Zero performance after the minimum 63% carbon reduction has been achieved – one route is through carbon offset payments with a calculated build cost uplift of 2.6% and one route is by using on-site measures with a build cost uplift of 3.5%. As on-site measures are the preferred route to achieve compliance with the NZC DPD in line with policy NZC2(B) and the energy hierarchy, we suggest that for soundness the higher figure should have been used for viability testing.

2.3 There appears to be either a conflict or a change in justification of the 3% build cost uplift between the Net Zero Carbon DPD Reg.22 Consultation Statement [SUB 7] and the Viability Note Addendum. Paragraph 4.20 of the Reg.22 Consultation Statement confirms that the residential build cost uplift was calculated at a range of 2.6-2.7% but this *"was rounded up to 3% to allow a margin of error",* whereas the latter Viability Note Addendum summarises a build cost uplift range of 2.6-3.5% uplift in Table 5, and states that the uplift from 2.6% to 3% allows for both *"a margin of error and an allowance for the fact that some homes will use PV rather than offsetting"*. It is not clear that the tested 3% build cost uplift for residential projects provides sufficient allowance for the cost of PV as the preferred solution to achieving compliance with policy NZC1 and NZC2(B).

Supporting SAP model evidence

2.4 To provide clarity on the building performance uplift required by the proposed policy, we have carried out a notional SAP calculation on a typical 3 bed detached house, following a similar approach to that set out in the Part L 2025 (FHS) scenario of the Etude, Currie & Brown

Cornwall energy review 2021. Iterations of the assessment have been provided to show the building specification uplift required to meet compliance with the proposed Net Zero DPD policy including the provision of renewable technologies, and calculation of the estimated Carbon Offset payment where required.

2.5 Table 1 compares a Part L 2021 compliant specification to the building specification that would be required to meet the proposed Net Zero DPD policy. Two options are presented, option 1 is based on achieving a minimum 63% on-site carbon emissions and a 10% improvement over the Target Fabric Energy Efficiency (TFEE) as per NZC1 and NZC2(A) respectively, with the remaining regulated carbon emissions met by carbon offsetting payment (assuming a static carbon offset method which does not allow for grid decarbonisation). Option 2 utilises renewable energy generation (PV panels) to achieve on-site operational regulated net zero carbon standard as per policy NZC2(B).

2.6 Option 2 of Table 2 shows the building specification that would be required to achieve on-site regulated operational net zero carbon performance. As the net zero standard is achieved through on-site measures, there is no carbon offset payment requirement. The building specification uplift from Part L 2021 compliance includes providing a heat pump, triple glazing, and 3 kWp of south facing PV which covers approximately 40% of the total roof space.

2.7 The 3 kWp of PV required under option 2 equates to 9.4 Solar Panels (of 320W each to align with the Currie & Brown's Energy Review and Modelling for the Cornwall Council Climate Emergency DPD[iii] which has been used as evidence in the Warwick NZC DPD Examination Hearing) and is required to the regulated emissions only in line with Policy NZC1 of the DPD. When accounting for the size discrepancy between our modelled SAP and Currie & Browns (100m^2 vs 93 m^2) this provision equates to 9 solar panels of 320W each. This provision of 9 solar panels exceeds that of the Viability Note Addendum's 6 solar panels.

2.8 It is possible that this discrepancy is caused by inaccurate extrapolation of build cost uplift data, or a variation in the modelling methodology used (SAP 2012, SAP 10 or PHPP). We therefore recommend that specific energy modelling is carried out in relation to the Warwick NZC DPD in order to soundly determine that the proposed policies are both feasible and viable.

2.9 There is a challenge presented by using the Currie & Brown Energy Review and Modelling as a source of cost uplift evidence, as the proposed Cornwall Council Climate Emergency DPD policies differ from those of the Warwick Net Zero Carbon DPD, and therefore the building specification required to meet the policies also differs.

	Part L 2021 standard* Gas Boiler + PV Option	Warwick DPD standard* Option 1 – minimise on-site measures	Warwick DPD standard* Option 2 – minimise carbon offset payment
Walls U-Value (W/m²K)	0.16	0.16	0.16
Wall thickness assuming mineral wool batt	420 mm	420 mm	420 mm
Floor U-Value (W/m²K)	0.09	0.09	0.09
Roof U-Value (W/m²K)	0.10	0.10	0.10
Windows (W/m²K)	1.3	**1.1**	**1.1**
Doors (W/m²K)	1.0	1.0	1.0
Thermal Bridging	Specialist lintel and ground floor details	Specialist lintel and ground floor details	Specialist lintel and ground floor details
Air permeability (m³/h.m²)	3	3	3
Heating system	Gas boiler	**Heat pump**	**Heat pump**
Ventilation system	Mechanical Ventilation with Heat Recovery (MVHR)	MVHR	MVHR
Renewables	2 kWp South Facing PV (approx. 14 m2)	None	**3 kWp South Facing PV (approx. 21 m2)**
Primary energy use (annual energy demand for lighting, heating & hot water)	40 kWh/m²	32 kWh/m²	- 6.8 kWh/m² (Energy positive)
CO2 emissions per m²	9.2 kg	2.9 kg	0 kg
EPC rating	A	B	A
Carbon Offset Payment	N/A	£214 per m²	None – net zero achieved on-site

*Table 1. *Calculated using beta SAP 10 FSAP software.*

2.10 An example of this which we believe has impacted the calculation of the build costs uplift is the PV uplift cost of £2,900 is take form the renewable energy cost associated with Scenario 2 as presented on page 34 of the Currie & Brown report. It can be seen however that when comparing the FHS 2025 and Scenario 2 build specification on page 34, that Scenario 2 varies for the FHS 2025 specification significantly and includes additional energy saving technology of mechanical ventilation with heat recovery (MVHR). The inclusion of MVHR improves energy efficiency and therefore carbon emissions, and so the PV allocation required to close the gap in Scenario 2 is likely higher than would be required to close the gap to Net Zero performance form the FHS 2025 standard as shown on pages 33 and 34 of the Currie & Brown report.

2.11 It is also worth noting that whilst the inclusion of MVHR improves the dwelling energy efficiency and reduces space heating demand (as can be seen on page 35 of the Currie & Brown report), it does increase the build uplift cost associated with meeting the space heating demand limit as shown on page 34. This increases the fabric associated build uplift from £1,977 for the FHS 2025 specification up to £2,719 for Scenario 2. If this route was taken to achieve regulated

Net Zero carbon via on-site measures, the total build uplift would be closer to 5% rather than the modelled 3%.

2.12 This commentary shows that the associated build cost uplift depends greatly on the details of the policy targets and the allowable build specification. We therefore recommend that specific energy modelling is carried out in relation to the Warwick NZC DPD in order to soundly determine that the proposed policies are both feasible and viable.

3.0 COMMENTS ON NON-RESIDENTIAL BUILD COSTS

3.1 The correction of the evidence source quoted at paragraph 4.22 of the Viability report[iv] has been noted as Currie & Brown (2018) report: Cost of Carbon Reduction in New Buildings[v].

3.2 Paragraph 1.17 of the Viability Note Addendum states that *"the 6% uplift figure used in SUB6 (Paragraphs 4.22 – 4.23) represents a mid-point of the Currie and Brown 2018 assessment"*. We would question the soundness of taking the mid-point of this cost uplift rather than the upper figure of 7%. This appears to be in conflict with the justification of the 3% residential build cost uplift which was scaled up from 2.6% to 3% to allow for a margin of error. There doesn't appear to be a similar margin of error applied to the non-residential viability assessment.

4.0 CONCLUSION

4.1 There appears to be conflicts between the evidence prepared for Examination which impacts on the calculated build cost uplift and the assessment of soundness.

4.2 There is some discussion of allowing a margin for error in calculated build costs, however these have been reduced during the consultation and examination period for residential projects and appear not to have been considered for non-residential projects which would impact the soundness of the viability testing.

4.3 Detailed SAP calculations and a discussion of the extrapolation of build costs uplifts from the quoted sources has been provided to demonstrate the challenges of viability testing building performance policies without undertaking specific energy modelling which will affect the accuracy and soundness of the policy preparation.

4.4 We are in support of the proposed Net Zero Carbon DPD and Warwick District Council's Climate Change Commitments, but we recommend that further feasibility and viability testing should be carried out to ensure the policies are sound.

REFERENCES

[i] Warwick District Council (March 2023) NZC DPD Examination Matter 3 Viability Testing and Assessment: Viability Note Addendum [online] available at: https://www.warwickdc.gov.uk/downloads/file/7786/exam_11_-_wdc_-_matter_3_additional_viability_note_addendumpdf [last accessed 24th March 2023]

[ii] Warwick District Council (August 2022) - Net Zero Carbon DPD Regulation 22 Consultation Report [online] available at: https://www.warwickdc.gov.uk/downloads/file/7520/sub7_-_net_zero_carbon_dpd_reg22_consultation_statement [last accessed 24th March 2023]

[iii] Currie & Brown, and Etude (January 2021) Cornwall Council Climate Emergency DPD: Energy Review and Modelling [online] available at: https://www.swenergyhub.org.uk/wp-content/uploads/2021/04/20200359-Climate-Emergency-DPD-Energy-review-and-modelling-Rev-H.pdf [last accessed 24th March 2023]

[iv] BNP Paribas Real Estate (April 2022) Net-Zero Carbon Development Plan Document: Revised Viability Study [online] available at: https://www.warwickdc.gov.uk/downloads/file/7535/sub6_-_viability_assessment [last accessed 24th March 2023]

[v] Currie and Brown (October 2018) Cost of Carbon Reduction in New Buildings [online] available at: https://www.cse.org.uk/downloads/file/cost-of-carbon-reduction-in-new-buildings.pdf [last accessed 24th March 2023]