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30 September 2022

Our Ref: 35854

Dear Rhiannon

LAND NORTH OF RUDLOE DRIVE, KINGSWAY, QUEDGELEY, GLOUCESTER: RESERVED MATTERS SUBMISSION 22/00553/REM

On behalf of my client, Vistry Homes Limited, I enclose a package of revised information that has been prepared in relation to the reserved matters application for Land North of Rudloe Drive.

The submission has been prepared in response to the consultation responses that have been received in respect of the package of information that was provided to you on 1st September 2022. The feedback received has led to amendments to the proposals which are described below[1].

Submission

Below is table that lists the drawings that are being submitted and sets out how they relate to the original submission in May 2022 and the subsequent package of information that was submitted in September 2022.

Title	Reference	Notes
Consolidated Drawing and Document Schedule	30th September 2022	Supersedes Submission Schedule dated 1st September 2022
Site Layout Plan	RDQUE MCB ZZ ZZ DR A 0230 P5	Supersedes RDQUE MCB ZZ ZZ DR A 0230 P2
Materials and Boundaries Plan	RDQUE MCB ZZ ZZ DR A 0231 P4	Supersedes RDQUE MCB ZZ ZZ DR A 0231 P2
Surface Finishes Plan	RDQUE MCB ZZ ZZ DR A 0232 P5	Supersedes RDQUE MCB ZZ ZZ DR A 0232 P2
Parking Strategy Plan	RDQUE MCB ZZ ZZ DR A 0233 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0233 P2

[1] A separate response will be submitted in due course in respect of the consultation response from the Gloucester City Council Drainage Officer.

Title	Reference	Notes
Affordable Tenure Plan	RDQUE MCB ZZ ZZ DR A 0234 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0234 P2
Adoptable Management Plan	RDQUE MCB ZZ ZZ DR A 0235 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0235 P2
Refuse Strategy Plan	RDQUE MCB ZZ ZZ DR A 0236 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0236 P2
Knightley	RDQUE MCB ZZ ZZ DR A 0106 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0106 P2
Pembroke	RDQUE MCB ZZ ZZ DR A 0110 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0110 P2
Beckett	RDQUE MCB ZZ ZZ DR A 0113 P2	Supersedes RDQUE MCB ZZ ZZ DR A 0113 P1
Alwin	RDQUE MCB ZZ ZZ DR A 0117 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0117 P2
Alwin	RDQUE MCB ZZ ZZ DR A 0118 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0118 P2
Aldridge	RDQUE MCB ZZ ZZ DR A 0120 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0120 P2
Knightley	RDQUE MCB ZZ ZZ DR A 0122 P2	Supersedes RDQUE MCB ZZ ZZ DR A 0122 P1
Aldridge	RDQUE MCB ZZ ZZ DR A 0128 P2	Supersedes RDQUE MCB ZZ ZZ DR A 0128 P1
Ashbee	RDQUE MCB ZZ ZZ DR A 0130 P2	Supersedes RDQUE MCB ZZ ZZ DR A 0130 P1
Foulston	RDQUE MCB ZZ ZZ DR A 0131 P2	Supersedes RDQUE MCB ZZ ZZ DR A 0131 P1
Foulston	RDQUE MCB ZZ ZZ DR A 0132 P2	Supersedes RDQUE MCB ZZ ZZ DR A 0132 P1
Becket	RDQUE MCB ZZ ZZ DR A 0134 P1	New Drawing
AF1 Maisonette	RDQUE MCB ZZ ZZ DR A 0140 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0140 P2
Asher	RDQUE MCB ZZ ZZ DR A 0141 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0141 P2
Asher	RDQUE MCB ZZ ZZ DR A 0142 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0142 P2

Title	Reference	Notes
Asher	RDQUE MCB ZZ ZZ DR A 0143 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0143 P2
Cooper	RDQUE MCB ZZ ZZ DR A 0144 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0144 P2
Cooper	RDQUE MCB ZZ ZZ DR A 0145 P3	Supersedes RDQUE MCB ZZ ZZ DR A 0145 P2
Aldridge Section A-A	GROUP LIN CALD01 XX D2 A AS 0303	New Drawing
Ashbee Section A-A	GROUP LIN CASH00 XX D2 A AS 0302	New Drawing
Visibility Assessment	22-0196-SK01F	Supersedes 22-0196-SK01E
Onsite Swept Path Analysis - Refuse Vehicle	22-0196-SP01F	Supersedes 22-0196-SP01E
Onsite Swept Path Analysis - Fire Tender	22-0196-SP02F	Supersedes 22-0196-SP02E
Onsite Swept Path Analysis - Panel Van	22-0196-SP03F	Supersedes 22-0196-SP03E
Onsite Swept Path Analysis - Estate Car	22-0196-SP04F	Supersedes 22-0196-SP04E
Landscape General Arrangement	LA5530-001 C	Supersedes LA5530-001 A
Planting Plan 1 of 3	LA5530-002 C	Supersedes LA5530-002 A
Planting Plan 2 of 3	LA5530-003 C	Supersedes LA5530-003 A
Planting Plan 3 of 3	LA5530-004 C	Supersedes LA5530-004 A
Landscape Specification & Management Plan	LA5530-LSMP-01A	Supersedes LA5530-LSMP-01
Energy and Sustainability Statement	29.09.22	Supersedes 01.09.22

Consultation Responses

The table below set out our position in respect of the issues raised in the consultation responses and describes where amendments have been made to the proposals.

Issues Raised	Response
Gloucester City Council Planning Officer (23rd September 2022)	
Plot 4 – side facing window proposed looking towards no. 6. Unclear why these windows are necessary?	The side facing windows have been removed.

Issues Raised	Response
Plots 5 and 11 – section required which shows height of roof light in relation to first floor level to assess overlooking	The submission includes a section drawing (GROUP LIN CASH00 XX D2 A AS 0302) which shows that the roof light is a light well through the rafters and due to its height would not result in overlooking.
Plot 8 and 9 – side facing windows appear to overlook each other. Whilst side windows were requested to ensure surveillance of path, they should not result in overlooking to each other – please review	The side facing window has been removed from Plot 8. The side facing window in Plot 9 is retained to ensure surveillance of the path.
Plot 14 – can a side facing window be introduced to improve natural surveillance and prevent a blank elevation facing onto the street?	A side facing window has been added as requested.
Plot 17 – first floor side window. Is there a reason that tax windows are proposed rather than standard windows? Standard windows should be considered to improve street scene from Rudloe Drive.	Plot 17 has now been handed so that the windows face Rudloe Drive, with the tax windows on the first floor changed to standard windows. Furthermore, the ground floor living room window has been moved slightly to the left to so that the first floor bedroom window avoids the store.
Plot 44 – better parking solution needed. Parking is too far away from dwelling.	The parking number have been reallocated to address this issue.
Plots 47 and 64 – side facing windows appear to overlook each other. Again, windows requested to provide natural surveillance but they should not overlook each other. Please review	The side facing window has been removed from Plot 47. The side facing window in Plot 64 is retained to ensure surveillance of the path.
Plot 55- Poor outdoor amenity space surrounded by structures – outbuilding/ side elevation of no. 53. Please review	The garage and house have been swapped to address this issue.
Plot 77 – improvements needed to outdoor amenity space. The garden would be enclosed by two outbuildings and the side elevation of plot 58. The garden is also too small.	The garage for Plot 77 has been omitted to address this issue.
Plot 81 – No footpath shown to dwelling. Please amend.	Footpath added as requested.
Plot 81 – would be overlooked by plot 77 and 78 (only 9m between rear elevation of plot 77 and side elevation of garden of plot 81)	To address this issue Plots 78 and 110 have been pulled forward so that their rear elevations are aligned with Plots 79 and 109.
Plot 90 – Side facing windows proposed to ground floor and first floor. These would look towards side elevation of 89. Unclear why these windows are needed?	The side facing window on Plot 90 have been removed.

Issues Raised	Response
Plot 98 – First floor rear facing windows should be introduced to the Coach House to improve street frontage onto Rudloe Drive	First floor rear facing windows have been added as requested.
Plot 99 – Side boundary next to car parking area should be altered from fence to brick	The side boundary has been changed to brick as requested.
Plot 107 – side facing windows of 107 would overlook rear garden of 108	The side facing windows on Plot 107 have been omitted.
Plots 113 and 114 (proposed three storey town houses) Concern plot 113 would overbear and overshadow plot 112 due to height of building and relationship between the two dwellings. Two storey dwelling would be more appropriate in this location.	Plots 113 and 114 have been substituted from the 3 storey Foulston house type to the 2 storey Alwyn house type. To compensate for this in floorspace Plots 124 and 125 have been substitute from the 2 storey Alwyn house type to the 3 storey Foulston house type.
Plot 115 – first floor side facing window would overlook rear garden of 117. Distance will need to be increased or first floor window would need to be omitted.	Plot 115 has been handed and the windows on the first floor side elevation have been removed.
Plots 121 and 122 – It appears that the ground floor windows may overlook one another. Windows requested to improve natural surveillance but should not overlook each other.	The side facing window has been removed from Plot 141. The side facing window in Plot 122 is retained to ensure surveillance.
Plot 123 – Is there a reason that the first floor side facing window is a tax window rather than a standard window. Introduction of standard window would improve street scene.	Yes, one tax window is above a bath, while the other is into a small bedroom which already has a standard window on the rear elevation. No amendments are proposed.
Plot 124 and 115 – exposed side boundary next to parking court – Proposed fence should be altered to a wall	The side boundary has been changed to brick as requested.
Plot 138/ 139 – Ground floor side facing window should be normal windows rather than tax windows. This would improve frontage to Public Open Space.	The tax windows have been replaced with standard windows as requested.
Plot 143 – would overlook rear garden of 142 due to separation distance. Garden of 143 too small for a 3 bed family home and should be increased.	The house type proposed for Plot 143 has been changed to a Becket to increase the garden size. It has also been reoriented to face south to address the overlooking issue.
Plot 145 – Can side facing tax window be altered to a normal window?	The tax window has been replaced with a standard window as requested.
Please review back to back distances of dwellings (back to back distances should be 21m – examples not reaching this standard - plots 48 and 38, plots 102 and 91)	The first floor of Plot 48 has been reconfigured to prevent overlooking from a habitable window. Plots

Issues Raised	Response
	103 and 104 have been moved forward to achieve the 21m distance.
Aldridge house type – can a section be provided to show height of dormer and roof light in relation to first floor level. Please also confirm floor area of this dwelling type	A section drawing (GROUP LIN CALD01 XX D2 A AS 0303) has been included in the submission pack. It confirms that the floor area is 1,111 square feet.
Knightly House Types – A number of the Knightly House Types result in instances of overlooking due to proposed first floor side facing bedroom window. In instances where this bedroom also includes a rear facing window, the side window would need to be omitted or conditioned as obscure glazed and top opening (plots 20, 54 and 57) the rear facing bedroom window for these plots would need to be the primary window and should be larger to improve outlook for this bedroom. Plots 27, 28 and 32 need to be reviewed as they do not include rear facing windows and side bedroom unacceptable due to overlooking.	The first floor side windows in bedrooms 3 and 4 have been removed from Plots 20, 32, 54 and 57. As quested the widths of the rear first floor windows in those bedrooms has been increased. The first floor side windows in bedrooms 3 and 4 of Plot 27 have been retained. The rear facing windows have been removed. The house type for Plot 28 has been changed to a Pembroke.
Waste collection – not in accordance with standards for dragging distances as raised through previous email – this needs to be addressed	All bin collection points are now within 10 metres of the adopted highway. Please see the amended Refuse Strategy Plan.
Proposed 1.8m high masonry wall – please provide details of brick type	This detail has been added to the Materials and Boundaries Plan.
Central timber car ports adjacent to plots 45-66 – Car ports should be repositioned to form rear boundary of these properties. Area between fence and car port currently of concern in terms of security and safety	The car ports have been repositioned as requested.
Proposed brick for dwellings – Concern over proposed Alderley Orange Brick. Brick looks a bit too bright and lacks texture. One of the previously proposed bricks would be preferable and tie in with approved development to the south.	The Alderley Orange brick has been omitted and replaced with Brunswick Farmhouse Mixture.
Tiles – Russell Galloway Slate acceptable. Concern over the other two tiles proposed. Suggest you revert to Russell Galloway Cottage Red or similar.	The amended Materials and Boundaries Plan has been amended. The two tile types proposed for the development are Russell Galloway Cottage Red and Russell Galloway Slate Grey.

Issues Raised	Response
Levels – proposed levels sheet 3 of 3 – doesn't seem to include finished floor levels for dwellings? Sheet 1 only shows some of the finished floor levels. Could you check the plans. I'm unsure if there is a problem with how these plans have loaded or if the information has been omitted.	This appears to have been an upload issue. The levels should be shown on the amended version of the drawing that will be submitted in due course (see footnote on page 1).
Levels – additional/ amended levels plan required to show proposed levels of points throughout the site for ground outside of houses (garden, front path, parking area etc) so it is clear how the levels are changing through the site.	The external levels plans have been amended to show the requested information. They will be submitted in due course (see footnote on page 1).
Solar Panels – are you able to provide a plan which demonstrates which dwellings will benefit from solar panels and provide further details of the type of solar panels proposed?	A technical drawing for the proposed type of solar panel is included in this submission. It is not possible at the current time to provide a plan showing which of the units will be benefit from solar panels as the construction start date and the build route for the site is yet to be fixed. As set out in the amended Energy and Sustainability Statement it is likely that a portion of the development will fall under current Part L 2013 regulations and a portion will fall under Part L 2021. All units constructed under Part L 2021 will benefit from Solar PV systems.
Gloucester City Council Landscape Officer (23rd September 2022)	
Open space/play area/pitch adoption – it's a little unclear if this will be offered to the Local Authority for adoption (City Council or Quedgeley Town Council), or if the whole of the POS and facilities will be under a management company. The Adoptable Management Plan drawing appears to show the latter (management company) but potential adoption by the Local Authority is mentioned in the landscape management plan. Please can this be clarified. (N.b. the majority of the POS areas in the main Kingsway development, in Framework Plan areas 1-4, have to date been adopted by the city council with a commuted sum).	The public open space and playing pitch will be maintained by a management company.
Although I have looked through all the large pdfs, it's really difficult to find some details. I was not able to find the detail for the football pitch dugouts, or for the drainage headwalls in the SUDs basins. I wonder if these could be sent separately? I can see that the planning response notes say that these	The Landscape Officer has subsequently provided further advice on the type of dugouts that are required. A note has been added to Planting Plan (1 of 3) which confirms that there will be fully steel clad dugout shelters with integral steel benches, powder

Issues Raised	Response
items have been addressed, but I just can't find the right drawings to check.	coated in black on small concrete foundations fronted with a double row of slabs Drawings have been prepared in respect of the drainage headwalls in the SUDS basins. They will be submitted in due course (see footnote on page 1).
One comment on the planting spec – I would like the Cicuta virosa (northern water hemlock) removed from the marginal plant mix in the SUDS drainage basins, as this is a poisonous/toxic plant and probably not suitable for a residential development with children potentially exploring the basin spaces. Perhaps another native marginal plant could be substituted in (flag iris?).	Agreed. The amended landscaping drawings show that the species has been replaced with Iris pseudacorus.
The proposed climbing unit in the play area (Proludic Kanope unit J5614) has two slides (a higher and lower one for children of different ages), one of which is facing south in the site layout. Slides should not face south as they can become very hot in the summer months. As space is too limited to turn this unit 90 degrees, I would suggest selecting a different unit from the Kanope range, but one which still retains high play value for both older and younger children – the J5610 replaces the higher slide with banister rails, so would be a great alternative option. Alternatively J5608 provides a similar level of play value. The seats inside the play area should have paving under them, so they don't get muddy puddles where people sit.	The proposed climbing unit has been replaced with the suggested J5614 unit.
I note that the old section of road has been removed between the play area and pitch, which creates one larger POS. There is also now an entrance point indicated from Newhaven Rd between the pitch and play area. Ideally would like for a footpath to be paved across the whole space from the Newhaven Rd entrance, or joining with the play area path, but as a minimum, there should be a paved threshold area where the gap comes into the POS through the bollards from Newhaven Rd. Otherwise, this will also become a muddy puddled entrance point.	A paved area and hoggin path have been added as requested, linking the Newhaven Road footpath to the path leading to the play area
Gloucester City Council Housing Projects and Strategy Team Leader (26th September 2022)	
The application is not policy compliant in relation to Gloucester City Plan Policy F6: Nationally Described Space Standards. The three and four beds Affordable Homes and the	As set out in detail in the Planning Statement (paragraphs 5.6 to 5.10) the Council is not able to insist upon NDSS compliance at the reserved matters stage,

Issues Raised	Response
Elmslie Open Market units not meeting the required standards. It should be noted that the S106 provides for minimum standards. Policy F6 now has significant weight	unless it is specifically required by a planning condition or obligation. The outline permission for Rudloe Drive does not contain a condition or obligation requiring compliance with NDSS. However, it does set minimum dwellings sizes for the affordable unit. As set out the in Affordable Housing Statement the affordable units meet the minimum dwelling sizes. Notwithstanding the above it should be noted that the Elmslie unit is NDSS compliant.
The M4(2) Plots (12 to 16): • No details can be do found relating to parking for the M(4)2 homes. Parking spaces must comply with the regs section 2.12. It is recommended that detailed layouts/ plans are provided in line with plans provided for garages. • The approach and route from the car parking must comply with 2.6 onwards. This cannot be seen on the plans. Annotated drawings indicating the following • Bathroom walls should be strong enough upstairs and downstairs to accept grabrails. • Door widths and corridor widths. • All thresholds are accessible including rear double patio doors onto a level patio	The five M4(2) units are now Plots 13 to 17. The Site Layout and the relevant housetype drawings have been amended to show the required information.
M4(3)b Plot (138): As per the above comments annotated drawings indicating • the clear opening widths of the doorways and corridors • accessible thresholds as described in the regulations. • parking space to comply with section 3.12 – not shown on plans. • The approach to the property must comply with section 3A. • The bathroom shows a bath but must be an installed level access shower for M43b. • Walls must be strong enough to accept grabrails. • The rear door is accessible and step free. Access to a private outdoor space which is level and also accessible.	The Site Layout and the relevant housetype drawing has been amended to show the required information.

Issues Raised	Response
• There should be a wheelchair storage and transfer space somewhere (externally). Section 3.25. • That Kitchen worksurfaces should be height adjustable or able to be easily adjusted. Should include a pull-out shelf under the oven and meet generally the provisions set out in 3.34. • That the ceiling structure of the bedroom and bathroom should be able to accept a ceiling track hoist and be strong enough for that purpose. • WHB should be wall hung and wheelchair accessible in the bathroom. Section 3.36 • A door entry phone system should be included. • Heights of consumer unit, controls, switches and radiator controls should all comply. In addition to the above a wheelchair accessible washing line is a helpful addition. Turning circles for a wheelchair have been shown, advice from an Occupational Therapist is that they exceed the regs at 1700mm which is great for larger wheelchair users or those with a longer wheelchair (tilt in space). It recommended that this provision is controlled by Condition as this will require Building Control sign too ensure compliance.	
Gloucester City Council Tree Officer (5th July 2022)	
Tree protection measures in accordance with the submitted report can be put in place to ensure that construction works do not result in damage to the retained trees. This is with the exception of T44 which requires an additional arboricultural method statement to ensure that the TPO tree is suitably protected.	An Arboricultural Method Statement for Tree T44 was submitted to the Council on 28th September 2022.
There is potential for future subsidence claims in one area of the site. It is recommended that further information is provided, to address these concerns.	The Tree Officer has acknowledged in subsequent correspondence that this matter will be addressed at the Building Regulations stage.

Issues Raised	Response
Gloucester City Council Waste Collection Team (25th July 2022)	
Gloucester City Council Developers Guidance has to be followed at all stages. Waste collections: Dragging distances are 10m maximum. 26 ton RCV's will collect the refuse, all roads need to be adopted and of highway construction standard. Attention needs to be focused on access and road widths and turning areas for the RCV's, our developers guidance has our (Gloucester City Council) collection vehicle dimensions and the swept path dimensions needed for them to drive through the roads and to turn. The RCV's need to be able to turn and track through the roads without need for going on or overhanging the pavements and be able to pass other traffic. The crews will only collect from adopted roads, they will not collect from unadopted or private roads (there are a number of properties that appear to be accessed by private roads). Where properties have access via private roads a collection point will be needed at the junction with the adopted h/way. Large numbers of waste facilities presented together can block vision.	All bin collection points are now within 10 metres of the adopted highway. Please see the amended Refuse Strategy Plan.

I trust you will agree that this submission addresses the issues raised in the consultation responses received and would be grateful if you could confirm that you are now in a position to take the application to committee in November with a positive recommendation. Please feel free to contact me should you require further information or wish to discuss the submission in more detail.

Yours sincerely

[redacted]

Land North of Rudloe Drive, Kingsway, Gloucester (22/00553/REM)

Consolidated Drawing and Document Schedule

Drawings and Documents Submitted for Approval (Last Updated: 30th September 2022)

Consultant	Title	Reference	Date Submitted
McBains	Site Location Plan	RDQUE MCB ZZ ZZ DR A 0201 P1	27/05/2022
McBains	Site Layout Plan	RDQUE MCB ZZ ZZ DR A 0230 P5	30/09/2022
McBains	Materials and Boundaries Plan	RDQUE MCB ZZ ZZ DR A 0231 P4	30/09/2022
McBains	Surface Finishes Plan	RDQUE MCB ZZ ZZ DR A 0232 P5	30/09/2022
McBains	Parking Strategy Plan	RDQUE MCB ZZ ZZ DR A 0233 P3	30/09/2022
McBains	Affordable Tenure Plan	RDQUE MCB ZZ ZZ DR A 0234 P3	30/09/2022
McBains	Adoptable Management Plan	RDQUE MCB ZZ ZZ DR A 0235 P3	30/09/2022
McBains	Refuse Strategy Plan	RDQUE MCB ZZ ZZ DR A 0236 P3	30/09/2022
McBains	Illustrative Streetscenes	RDQUE MCB ZZ ZZ DR A 0250 P2	02/09/2022
McBains	Knightley	RDQUE MCB ZZ ZZ DR A 0105 P2	02/09/2022
McBains	Knightley	RDQUE MCB ZZ ZZ DR A 0106 P3	30/09/2022
McBains	Elmslie	RDQUE MCB ZZ ZZ DR A 0107 P2	02/09/2022
McBains	Elmslie	RDQUE MCB ZZ ZZ DR A 0108 P2	02/09/2022
McBains	Leverton	RDQUE MCB ZZ ZZ DR A 0109 P2	02/09/2022
McBains	Pembroke	RDQUE MCB ZZ ZZ DR A 0110 P3	30/09/2022
~~McBains~~	~~Mylne~~	~~RDQUE MCB ZZ ZZ DR A 0111 P1~~	~~27/05/2022~~
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0112 P2	02/09/2022
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0113 P2	30/09/2022
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0114 P2	02/09/2022

Consultant	Title	Reference	Date Submitted
~~McBains~~	~~Cartwright~~	~~RDQUE MCB ZZ ZZ DR A 0115 P1~~	~~27/05/2022~~
McBains	Alwin	RDQUE MCB ZZ ZZ DR A 0116 P2	02/09/2022
McBains	Alwin	RDQUE MCB ZZ ZZ DR A 0117 P3	30/09/2022
McBains	Alwin	RDQUE MCB ZZ ZZ DR A 0118 P3	30/09/2022
McBains	Alwin	RDQUE MCB ZZ ZZ DR A 0119 P2	02/09/2022
McBains	Aldridge	RDQUE MCB ZZ ZZ DR A 0120 P3	30/09/2022
McBains	Harford	RDQUE MCB ZZ ZZ DR A 0121 P2	02/09/2022
McBains	Knightley	RDQUE MCB ZZ ZZ DR A 0122 P2	30/09/2022
McBains	Knightley	RDQUE MCB ZZ ZZ DR A 0123 P1	02/09/2022
McBains	Leverton	RDQUE MCB ZZ ZZ DR A 0124 P1	02/09/2022
McBains	Leverton	RDQUE MCB ZZ ZZ DR A 0125 P1	02/09/2022
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0126 P1	02/09/2022
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0127 P1	02/09/2022
McBains	Aldridge	RDQUE MCB ZZ ZZ DR A 0128 P2	30/09/2022
McBains	Ashbee	RDQUE MCB ZZ ZZ DR A 0129 P1	02/09/2022
McBains	Ashbee	RDQUE MCB ZZ ZZ DR A 0130 P2	30/09/2022
McBains	Foulston	RDQUE MCB ZZ ZZ DR A 0131 P2	30/09/2022
McBains	Foulston	RDQUE MCB ZZ ZZ DR A 0132 P2	30/09/2022
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0133 P1	02/09/2022
McBains	Becket	RDQUE MCB ZZ ZZ DR A 0134 P1	30/09/2022
McBains	Windows Reveal and Tax Windows Details	RDQUE MCB ZZ ZZ DR A 0150 P1	02/09/2022
McBains	AF1 Maisonette	RDQUE MCB ZZ ZZ DR A 0140 P3	30/09/2022
McBains	Asher	RDQUE MCB ZZ ZZ DR A 0141 P3	30/09/2022
McBains	Asher	RDQUE MCB ZZ ZZ DR A 0142 P3	30/09/2022

Consultant	Title	Reference	Date Submitted
McBains	Asher	RDQUE MCB ZZ ZZ DR A 0143 P3	30/09/2022
McBains	Cooper	RDQUE MCB ZZ ZZ DR A 0144 P3	30/09/2022
McBains	Cooper	RDQUE MCB ZZ ZZ DR A 0145 P3	30/09/2022
McBains	Speirs	RDQUE MCB ZZ ZZ DR A 0146 P2	02/09/2022
McBains	Speirs	RDQUE MCB ZZ ZZ DR A 0147 P2	02/09/2022
McBains	Asher	RDQUE MCB ZZ ZZ DR A 0148 P2	02/09/2022
McBains	Asher	RDQUE MCB ZZ ZZ DR A 0149 P1	02/09/2022
McBains	Single and Double Garages	RDQUE MCB ZZ ZZ DR A 0160 P1	27/05/2022
McBains	Single and Double Garages - Plots 31, 32, 56	RDQUE MCB ZZ ZZ DR A 0161 P2	02/09/2022
McBains	Carport	RDQUE MCB ZZ ZZ DR A 0162 P1	02/09/2022
Rappor	Visibility Assessment	22-0196-SK01F	30/09/2022
Rappor	Onsite Swept Path Analysis - Refuse Vehicle	22-0196-SP01F	30/09/2022
Rappor	Onsite Swept Path Analysis - Fire Tender	22-0196-SP02F	30/09/2022
Rappor	Onsite Swept Path Analysis - Panel Van	22-0196-SP03F	30/09/2022
Rappor	Onsite Swept Path Analysis - Estate Car	22-0196-SP04F	30/09/2022
IDP	Landscape General Arrangement	LA5530-001 C	30/09/2022
IDP	Planting Plan 1 of 3	LA5530-002 C	30/09/2022
IDP	Planting Plan 2 of 3	LA5530-003 C	30/09/2022
IDP	Planting Plan 3 of 3	LA5530-004 C	30/09/2022
IDP	Landscape Specification & Management Plan	LA5530-LSMP-01A	30/09/2022
MHP	Arboricultural Survey, Impact Assessment and Protection Plan (V1)	V1	02/09/2022
MHP	Arboricultrual Method Statement for Tree T44	V2	28/09/2022

Consultant	Title	Reference	Date Submitted
PJA	External Levels (Sheet 1 of 3)	RDQUE-PJA-XX-D2-Y-0100-00 – P1	02/09/2022
PJA	External Levels (Sheet 2 of 3)	RDQUE-PJA-XX-D2-Y-0101-00 – P1	02/09/2022
PJA	External Levels (Sheet 3 of 3)	RDQUE-PJA-XX-D2-Y-0102-00 – P1	02/09/2022
PJA	Drainage Strategy (Sheet 1 of 3)	RDQUE-PJA-XX-D2-Y-0103-00 – P1	02/09/2022
PJA	Drainage Strategy (Sheet 2 of 3)	RDQUE-PJA-XX-D2-Y-0104-00 – P1	02/09/2022
PJA	Drainage Strategy (Sheet 3 of 3)	RDQUE-PJA-XX-D2-Y-0105-00 – P1	02/09/2022
PJA	S38 Agreement Plan	RDQUE-PJA-XX-D2-Y-0300-00 – P1	02/09/2022
PJA	S104 Agreement Plan	RDQUE-PJA-XX-D2-Y-0401-00 – P2	02/09/2022
PJA	Flood Routing Plan	RDQUE-PJA-XX-D2-Y-0402-00 – P2	02/09/2022
PJA	Area Contribution Plan	RDQUE-PJA-XX-D2-Y-0405-00	27/05/2022
PJA	Storm Sewer Design (Network 1)	27.05.22	27/05/2022
PJA	Storm Sewer Design (Network 4)	27.05.22	27/05/2022
PJA	Pond Cross Sections (Sheet 1 of 2)	RDQUE-PJA-XX-D2-Y-0416-00 –P0	02/09/2022
PJA	Pond Cross Sections (Sheet 2 of 2)	RDQUE-PJA-XX-D2-Y-0417-00 - P0	02/09/2022
PJA	Technical Note Drainage Strategy	06396 15.07.22	02/09/2022
PJA	2022.09.01 SW Network 1 Calcs	01.09.22	02/09/2022
PJA	2022.09.01 SW Network 2 Calcs	01.09.22	02/09/2022
PJA	2022.09.01 SW Network 3 Calcs	01.09.22	02/09/2022
PJA	2022.09.01 SW Network 4 Calcs	01.09.22	02/09/2022
Lighting Reality	Street Lighting Layout	433_001	27/05/2022
Lighting Reality	Street Lighting Schedule	433_101	27/05/2022
Lighting Reality	Outdoor Lighting Report	433_201	27/05/2022
AES	Energy and Sustainability Statement	29.09.22	02/09/2022
LF Acoustics	Noise Assessment	September 2022	02/09/2022

Drawings and Documents Submitted for Information

Consultant	Title	Reference	Date Submitted
Nexus	Affordable Housing Statement	May 2022	27/05/2022
Nexus	Waste Minimisation Statement	May 2022	27/05/2022
Nexus	CIL – Additional Information Form	May 2022	27/05/2022
McBains	Design Compliance Statement	May 2022	27/05/2022
Nexus	Planning Statement	June 2022	07/07/2022
Vistry	Aldridge Section A-A	GROUP LIN CALD01 XX D2 A AS 0303	30/09/2022
Vistry	Ashbee Section A-A	GROUP LIN CASH00 XX D2 A AS 0302	30/09/2022

Rudloe Drive Phase 2, Quedgeley

Vistry Homes Ltd, Cotswolds

Energy and Sustainability Statement

AES Sustainability Consultants Ltd

May 2022

AES Sustainability Consultants

	Author	Date	E-mail address
Produced By:	[redacted]	06.05.2022	[redacted]
Reviewed By:		13.05.2022	

Revision	Date	Comment
Initial Issue	13.05.2022	Initial Issue
Revision 1	18.05.2022	Summary of CO_2 saving, proposed approach to condition 19
Revision 2	01.09.2022	Amended site layout, PV & EV charging
Revision 3	29.09.2022	Amended number of dwellings to benefit from PV systems.

This statement has been commissioned by Vistry Homes Ltd, Cotswolds to detail the proposed approach to energy and CO_2 reduction to be employed in the development of Rudloe Drive Phase 2, Quedgeley. It should be noted that the details presented, including the proposed specifications, are subject to change as the detailed design of the dwellings progresses, whilst ensuring that the overall commitments will be achieved.

AES Sustainability Consultants

Contents

List of figures & tables

1. Introduction

Preface

1.1. This Energy and Sustainability Statement has been prepared on behalf Vistry Homes Ltd, Cotswolds in support of the reserved matters application for development of the site known as Rudloe Drive Phase 2.

Development Description

1.2. The development site is located on the northern edge of Hardwicke, north of Rudloe Drive, a village 7 km south of the city of Gloucester, within the administrative boundary of Gloucester City Council.

1.3. Outline planning permission was granted in July 2021 (ref: 21/00490/OUT) for:

'Residential development (up to 150 dwellings), associated infrastructure, ancillary facilities, open space and landscaping. (Outline Application with all matters Reserved)"

1.4. The proposals for Rudloe Drive Phase 2 would deliver 150 dwellings across a mix of one to four bed detached, semi-detached, and terraced houses. The proposed site layout is shown in Figure 1.

Purpose and Scope of the Statement

1.5. The statement has been prepared to address Condition 18 of the outline planning permission (ref: 21/00490/OUT) as well as relevant national and local policies relating to sustainable development, including relevant policies within the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011-2031.

1.6. Future changes to national guidance affecting the application of these policies have additionally been reviewed, together with an examination of how the proposed strategy aligns with the revised Part L 2021 standards.

Figure 1. Proposed Site Layout

2. Planning Policy and Conditions

Local Planning Policy

2.1. This statement will address relevant policies within the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011-2031 relating to sustainable design and construction, in particular Policy SD3: Sustainable Design and Construction:

Policy SD3: Sustainable Design and Construction

1. Development proposals will demonstrate how they contribute to the aims of sustainability by increasing energy efficiency, minimising waste and avoiding the unnecessary pollution of air, harm to the water environment, and contamination of land or interference in other natural systems. In doing so, proposals (including changes to existing buildings) will be expected to achieve national standards

2. All development will be expected to be adaptable to climate change in respect of the design, layout, siting, orientation and function of both buildings and associated external spaces. Proposals must demonstrate that development is designed to use water efficiently, will not adversely affect water quality, and will not hinder the ability of a water body to meet the requirements of the Water Framework Directive;

3. All development will be expected to incorporate the principles of waste minimisation and re-use. Planning applications for major development must be accompanied by a waste minimisation statement, which demonstrates how any waste arising during the demolition, construction and subsequent occupation of the development will be minimised and sustainably managed

4. To avoid unnecessary sterilisation of identified mineral resources, prior extraction should be undertaken where it is practical, taking into account environmental acceptability and economic viability relating both to extraction of the mineral(s) and subsequent implementation of the non-minerals development of the site

5. Major planning applications must be submitted with an Energy Statement that clearly indicates the methods used to calculate predicted annual energy demand and associated annual Carbon Dioxide (CO2) emissions.

2.2. The statement will also address the proposals for the generation of energy from renewable resources, as outlined in Policy INF5: Renewable Energy/Low Carbon Energy Development:

Policy INF5: Renewable Energy/Low Carbon Energy Development

6. Proposals for the generation of energy from renewable resources, or low carbon energy development (with the exception of wind turbines), will be supported, provided the wider environmental, social or economic benefits of the installation would not be outweighed by a significant adverse impact on the local environment, taking into account the following factors:

    - The impact (or cumulative impact) of the scheme, including any associated transmission lines, buildings and access roads, on landscape character, local amenity, heritage assets or biodiversity.
    - Any effect on a protected area such as The Cotswolds AONB or other designated areas such as the Green Belt.
    - Any unacceptable adverse impacts on users and residents of the local area, including emissions, noise, odour and visual amenity.

7. Proposals are more likely to be supported when they demonstrate:

    - That they have been designed and sited so as to minimise any adverse impacts on the surrounding area.
    - Benefits arising directly from the scheme to the local economy, the community and achievement of national targets.
    - The feasibility and cost-effectiveness of removing any installation and re-instatement of the site in future years.
    - The net gain of carbon savings, taking into account carbon use through manufacturing and installation of the technology.

This policy contributes towards achieving Objectives 1, 3, 4 and 6

2.3. The statement will also address the proposals for dwelling to be fitted with Electric Vehicle Charging Points, as outlined in policy SD4: Design Requirements

Policy SD4: Design Requirements

New development should be designed to integrate, where appropriate, with existing development, and prioritise movement by sustainable transport modes, both through the application of legible connections to the wider movement network, and assessment of the hierarchy of transport modes set out in Table SD4a below. It should:

- Be well integrated with the movement network within and beyond the development itself
- Provide safe and legible connections to the existing walking, cycling and public transport networks;
- Ensure accessibility to local services for pedestrians and cyclists and those using public transport
- Ensure links to green infrastructure;
- Incorporate, where feasible, facilities for charging plug-in and other ultra-low emission vehicles;
- Be fully consistent with guidance, including that relating to parking provision, set out in the Manual for Gloucestershire Streets and other relevant guidance documents in force at the time.

2. Detailed requirements of masterplans and design briefs, should the Local Planning Authority consider they are required to accompany proposals, are set out in Table SD4d. These requirements are not exhaustive.

Planning Conditions

2.4. Outline planning permission for the development was granted in July 2021 under application reference 21/00490/OUT. This statement will address Conditions 18 and 19, extracted below:

Condition 18

Reserved Matters applications shall be accompanied by an Energy Statement that clearly sets out the predicted annual energy demand from the development and associated annual carbon dioxide emissions, and demonstrates how the development contributes to the aims of sustainability by increasing energy efficiency. The application shall include clear details of any proposed measures including detailing any external facilities on the submitted plans and/or associated documents.

Reason: To assess the contribution to sustainable design and construction.

Condition 19

The development hereby permitted shall not be first occupied until the proposed dwellings have been fitted with an electric vehicle charging point. The charging points shall comply with BS EN 62196 Mode 3 or 4 charging and BS EN 61851 and Manual for Gloucestershire Streets. The electric vehicle charging points shall be retained for the lifetime of the development unless they need to be replaced in which case the replacement charging points shall be of the same specification or a higher specification in terms of charging performance.

Reason: To promote sustainable travel and healthy communities.

National Planning Policy Framework

2.5. On the 20th July 2021, the Government published the revised National Planning Policy Framework (NPPF), which sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development

2.6. Chapter 14 of the NPPF outlines its energy and climate change policies. New development should be planned in ways that:

- avoid increased vulnerability to the range of impacts arising from climate change…
- can help to reduce greenhouse emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

2.7. In determining planning applications, local planning authorities should expect new developments to:

- comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable
- take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

2.8. This chapter also outlines the requirement of Local Plans to take account of climate change over the longer term, including factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. The key focus of the NPPF is to support local and regional planning authorities.

Current and Future National Policy Standards

2.9. Government policy in relation to the energy performance of buildings has been evolving over the past decade, following government commitments to reduce the emission of greenhouse gases – particularly CO_2. This obligation was enshrined in the Climate Change Act 2008, which commits the UK to achieving a mandatory 80% reduction in the UK's CO_2 emissions by 2050, compared with 1990 levels.

2.10. In 2016, the UK government ratified the Paris Agreement, which provides a framework for governments to pursue the target of limiting global warming below 2°C.

2.11. In June 2019, the Government announced it had set a new net zero greenhouse gas emission target for the UK by 2050, compared with the previous target of at least 80% reduction from 1990 levels.

2.12. The built environment has a key role to play in delivering on these international commitments, as it accounts for approximately a third of overall CO_2 emissions. These commitments have been translated into national policies within the built environment driven by, amongst other mechanisms, the EU Energy Performance of Buildings Directive and the 2012 Energy Efficiency Directive.

2.13. Following the introduction of the 2013 edition of Building Regulations Part L, the successive updates now require regulated CO_2 emissions levels from new build domestic buildings to be approximately 30% lower than 2006 levels.

2.14. The Government proposes that the Building Regulations are the appropriate mechanism to drive future standards with respect to energy consumption, with local authorities able to apply the optional requirements of the national technical standards with respect to water consumption and space.

2.15. As an acknowledgement of the challenge to the built environment in meeting future 'net zero' targets, the Government published the next revision to the Building Regulations Approved Document L1A (Part L) in December 2021.

2.16. The uplift to Part L 2021 will incorporate:

Higher Standards for Carbon Dioxide Emissions

2.17. The CO_2 emissions requirement is set at a 31% improvement on Part L 2013, expected to be met through a combination of efficient heating systems, improved fabric standards and on-site renewable energy generation.

Higher Standards for Fabric Energy Efficiency

2.18. The Building Regulations control thermal insulation requirements through setting an upper limit on space heating demand. These requirements will be further improved in Part L 2021, meaning that insulation standards will need to be improved.

Introduction of Primary Energy Demand Compliance Metric

2.19. The regulations will introduce a primary energy demand compliance metric. This is in order to align the regulations with the amended EU Energy Performance of Building Directive (2018), which states:

> "The energy performance of a building shall be expressed by a numeric indicator of primary energy use in kWh/ (m^2.y) for the purpose of both energy performance certification and compliance with minimum energy performance requirements."

2.20. Primary energy is an expression of the energy content available in a fuel / fuel source which has not undergone any conversion or transformation process. Individual factors are assigned to all fuel types to take account of upstream processes and energy use – e.g., mains electricity has a higher factor due to the additional transformation and distribution processes that the energy undergoes before it reaches the home, compared with gas where the fuel is burned directly within the dwelling.

2.21. Dwellings will therefore be assessed based on their primary energy consumption in a similar way to current carbon compliance.

Revised Transitional Arrangements

2.22. Revised transitional arrangements will apply once the new regulatory standards are introduced. Dwellings will now need to be covered by the building notice, initial notice, or full plans before July 2022 and individual plots commenced prior to July 2023 in order to continue under Part L 2013. Registration or commencement falling after these dates means that dwellings will be required to meet Part L 2021 standards.

Proposed Approach

2.23. Due to the development timescales, it is considered that a portion of the development is likely to fall under current Part L 2013 and a portion under Part L 2021.

2.24. In recognition of these variables, this Energy and Sustainability Statement has considered the likely impact of future Building Regulations requirements. With respect to carbon reduction, the dwellings built to meet Part L 2021 will deliver a >31% reduction compared with current regulatory standards, thereby satisfying the requirements as set out in the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011-2031 and Condition 18 of the outline planning permission (ref: 21/00490/OUT).

2.25. The development will achieve these carbon reductions through higher fabric standards and low carbon and renewable energy systems being installed to offset emissions and reduce fuel bills for residents.

2.26. This statement provides an indicative fabric specification and a strategy which would enable the dwellings to meet these higher standards, with the precise strategy to achieve this being subject to change as detailed design of the dwellings is progressed.

2.27. With regard to condition 19, mode 3 charging points will be provided to all dwellings through dedicated wall boxes with control electronics built in. Where possible these will be positioned within garages, where plot parking is provided these will be positioned on the external gable wall adjacent to the driveway. For houses and maisonettes with front parking, where possible, the charging points will be positioned on the front elevation, adjacent to the front door.

2.28. Additional sustainable construction considerations are additionally addressed, including overheating risk, climate resilience, waste and water consumption.

2.29. The image below shows an example EV charging unit. These (or similar) will be provided to all dwellings.

3. Energy and CO_2 Reduction Strategy

3.1. As shown in Table 1, the CO_2 reduction standards contained within Part L were increased in 2010 and 2013, reducing the 'Target Emission Rate' (TER) by approximately 25% and a further 6% (9% for non-residential) respectively, requiring substantial improvements to thermal insulation and heating services, or a significant increase in on-site renewable energy provision.

3.2. The 2021 uplift to the regulations will require a further 31% reduction in emissions, delivering dwellings with emissions levels less than half of homes built to L1A 2006 standards.

Table 1. CO_2 Emissions improvements from successive Part L editions

Building Regulations	CO_2 emissions improvements
L1A 2006	-
L1A 2010	25%
L1A 2013	6%
L1A 2021	31%

Energy Reduction Strategy – Fabric First

3.3. It is proposed that the energy demand reduction strategy for the development incorporates further improvements beyond a Part L compliant specification and initially concentrates finance and efforts on reducing energy demand as the first stage of the Energy Hierarchy (Figure 2).

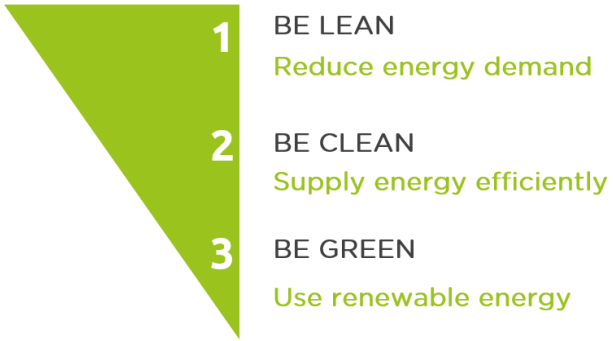

Figure 2. The Energy Hierarchy

Be Lean – reduce energy demand

3.4. The design of a development - from the masterplan to individual building design - will assist in reducing energy demand in a variety of ways, with a focus on minimising heating, cooling and lighting loads. Key considerations include:

- Building orientation – maximise passive solar gain and daylight
- Building placement – control overshading and wind sheltering
- Landscaping – control daylight, glare and mitigate heat island effects
- Building design – minimise energy demand through fabric specification

Be Clean – supply energy efficiently

3.5. The design and specification of building services to utilise energy efficiently is the next stage of the hierarchy, taking into account:

- High efficiency heating and cooling systems
- Ventilation systems (with heat recovery where applicable)
- Low energy lighting
- High efficiency appliances and ancillary equipment

Be Green – use low carbon / renewable energy

3.6. Low carbon and renewable energy systems form the final stage of the energy hierarchy and can be used to directly supply energy to buildings, or offset energy carbon emissions arising from unavoidable demand. This may be in the form of:

- Low carbon fuel sources – e.g., biomass
- Heat pump technologies
- Building scale renewable energy systems
- Small-scale heat networks
- Development-scale heat networks

3.7. As this hierarchy demonstrates, designing out energy use is weighted more highly than the generation of low-carbon or renewable energy to offset unnecessary demand. Applied to the development, this approach is referred to as 'fabric first' and concentrates finance and efforts on improving U-values, reducing thermal bridging, improving airtightness, and installing energy efficient ventilation and heating services.

3.8. This approach has been widely supported by industry and government for some time, particularly in the residential sector, with the Zero Carbon Hub[1] and the Energy Savings Trust[2] having both stressed the importance of prioritising energy demand as a key factor in delivering resilient, low energy buildings.

3.9. The benefits to prospective homeowners of following the Fabric First approach are summarised in Table 2.

Table 2. Benefits of the Fabric First approach

	Fabric energy efficiency measures	Bolt-on renewable energy technologies
Energy/CO_2/fuel bill savings applied to all dwellings	✓	×
Savings built-in for life of dwelling	✓	×
Highly cost-effective	✓	×
Increases thermal comfort	✓	×
Potential to promote energy conservation	✓	✓
Minimal ongoing maintenance / replacement costs	✓	×
Significant disruption to retrofit post occupation	✓	×

Building Regulations Standards – Fabric Energy Efficiency

3.10. In addition to the CO_2 reduction targets, the importance of energy demand reduction was further supported by the introduction of a minimum fabric standard into Part L1A 2013, based on energy use for heating and cooling a dwelling. This is referred to as the 'Target Fabric Energy Efficiency' (TFEE), and expressed in kWh/m²/year.

3.11. This standard enables the decoupling of energy use from CO_2 emissions and serves as an acknowledgement of the importance of reducing demand, rather than simply offsetting CO_2 emissions through low carbon or renewable energy technologies.

3.12. The TFEE is calculated based on the specific dwelling being assessed with reference values for the fabric elements contained within Approved Document L1A. These reference values are described as 'statutory guidance' as opposed to mandatory requirements, allowing full flexibility in design approach and balances between different aspects of dwelling energy performance to be struck so that the ultimate goal of achieving the TFEE is met.

[1] Zero Carbon Hub, Zero Carbon Strategies for tomorrow's new homes, Feb 2013

[2] Energy Savings Trust, Fabric first: Focus on fabric and services improvements to increase energy performance in new homes, 2010

3.13. These standards will be tightened under Part L 2021, The proposed approach and indicative construction specifications are set out in the following sections of this Strategy.

Fabric Standards

3.14. In order to ensure that the energy demand of the development is reduced, the dwellings have been designed to minimise heat loss through the fabric wherever possible. Table 3 details the proposed fabric specification of the major building elements, with the first column in this table setting out the Part L1A 2013 and Part L1A 2021 limiting fabric parameters in order to demonstrate the potential improvements.

Table 3. Proposed Construction Specification – Main Elements

	Part L1a 2013 Limiting Fabric Parameters	Part L1a 2021 Limiting Fabric Parameters	Indicative Specification
External wall – u-value	0.30 W/m²K	0.26 W/m²K	0.20 – 0.23 W/m²K
Party wall – u-value	0.20 W/m²K	0.20 W/m²K	0.00 W/m²K
Plane roof – u-value	0.20 W/m²K	0.16 W/m²K	0.11 W/m²K
Ground floor – u-value	0.25 W/m²K	0.18 W/m²K	0.12 – 0.17 W/m²K
Windows – u-value	2.00 W/m²K	1.60 W/m²K	1.20 – 1.40 W/m²K
Doors – u-value	2.00 W/m²K	1.60 W/m²K	1.1 W/m²K
Air Permeability	10.00 m³/h.m² at 50 Pa	8.00 m³/h.m² at 50 Pa	4.00 – 5.00 m³/h.m² at 50 Pa
Thermal Bridging	Y = 0.150 (default)	Y = 0.150 (default)	Y = ≤ 0.040 (estimated)

Thermal Bridging

3.15. The significance of thermal bridging as a potentially major source of fabric heat losses is increasingly understood. Improving the U-values for the main building fabric without accurately addressing the thermal bridging will not achieve the desired energy and CO_2 reduction targets.

3.16. The specification seeks to minimise unnecessary bridging of the insulation layers, with avoidable heat loss therefore being reduced wherever possible. Accurate calculation of these heat losses forms an integral part of the SAP calculations undertaken to establish energy demand of the dwellings, and as such thermal modelling will be undertaken to assess the performance of all main building junctions.

Energy Efficient Heating and Lighting

3.17. Heat generation and distribution systems will be designed to give the occupants a high level of control over their use, encouraging and allowing energy-efficient behaviour. High efficiency combi boilers should be installed to properties to eliminate the need for hot water cylinders where feasible. Primary pipework should be fully insulated.

3.18. Internal lighting will be low energy wherever possible. External security and space lighting should be low energy and fitted with PIR and daylight sensors where appropriate.

3.19. Where necessary, units will be installed with Waste Water Heat Recovery (WWHR) systems. WWHR retrieves thermal energy from hot water used in a shower before it disappears down the drain. This happens through a heat exchanger, in which cold mains water is passed around a copper waste pipe to gain a temperature rise, before continuing to the boiler 'pre heated'. This in turn relieves the workload of the boiler, reducing energy demand.

3.20. Where necessary, units will be installed with a Flue Gas Heat Recovery (FGHR) system. FGHR recovers waste heat from flue gases. The recovered heat is used to preheat the cold water entering the boiler, decreasing the energy required to warm the water up to the required level.

Passive Design Measures and Overheating Risk Mitigation

3.21. Glazing will be specified with a solar transmittance value (g-value) to strike the balance between useful solar gain in the winter and unwanted solar gain in the summer.

3.22. Where feasible, dwellings will be fitted with high-efficiency combination boilers, removing the need for hot water cylinders which would lose useful heat to the dwelling at the rate of around 1.5kWh/day, or circa 550kWh over the course of a year.

3.23. Due to these measures to reduce internal heat gain, natural ventilation provided through window openings and the opportunity for cross ventilation will allow sufficient air exchange rates to purge any heat build-up. Active cooling systems are therefore not proposed.

3.24. By following these principles, the development will be designed to build in resilience to a potentially changing climate over the lifetime of the buildings and minimise overheating risk,

which can be exacerbated by the drive to build better insulated, more airtight homes if not considered within the design and construction process.

Air Leakage

3.25. After conductive heat losses through building elements are reduced, convective losses through draughts are the next major source of energy wastage. The proposal adopts an airtightness standard of < 4.00 - 5.00m^3/h.m^2 at 50Pa, with pressure testing of all dwellings to be undertaken on completion to confirm that the design figure has been met.

Provisions for Energy-Efficient Operation of the Dwelling

3.26. The occupant of the dwelling should be provided with all necessary literature and guidance relating to the energy efficient operation of fixed building services. Currently it is assumed that all dwellings will be provided with modern gas-fired heating systems.

4. Low Carbon and Renewable Energy

4.1. A range of technologies have been assessed for potential incorporation into the scheme in accordance with Regulation 25A of the Building Regulations and to assess the systems which may be applicable on site to future Regulatory standards.

Combined Heat and Power (CHP) and District Energy Networks

4.2. A CHP unit is capable of generating heat and electricity from a single fuel source. The electricity generated by the CHP unit is used to displace electricity that would otherwise be supplied from the national grid, with the heat generated as effectively a by-product utilised for space and water heating. However, the reduced emissions from the national grid due now means that CHP systems will not deliver CO_2 savings.

4.3. In addition, the economic and technical viability of a CHP system is largely reliant on a consistent demand for heat throughout the day to ensure that it operates for over 5000 hours per year. Heat demand from mainly residential schemes is not conducive to efficient system operation, with a defined heating season and intermittent daily profile, with peaks in the morning and the evening. For this reason, the use of a CHP system is considered unfeasible for this development.

4.4. There are currently no heat networks which extend near the proposed development. High network heat losses associated with distribution to individual houses, as opposed to large high-rise apartment blocks and commercial developments mean that a new heat network to serve the area is not considered viable or an environmentally preferred option.

4.5. The adjacent Countryside development discounts heat network solutions on the same basis, therefore there is no potential for a combined network serving both developments.

Wind Power

4.6. Locating wind turbines adjacent to areas with buildings presents a number of potential obstacles to deployment. These include the area of land onsite required for effective operation, installation and maintenance access, environmental impact from noise and vibration, visual impact on landscape amenity and potential turbulence caused by adjacent obstacles, including the significant amount of woodland on and around the development.

4.7. A preliminary examination of the BERR wind speed database indicates that average wind speeds at 10m above ground level are around 4.50m/s [3]. Wind turbines at this site are therefore unlikely to generate sufficient quantities of electrical energy to be cost effective[4]. For these reasons wind power is not considered feasible.

Building Scale Systems

4.8. The remaining renewable or low carbon energy systems considered potentially feasible are at a building scale. These are as follows;

- Individual biomass heating
- Solar thermal
- Solar photo-voltaic (PV)
- Air Source Heat Pumps (ASHPs)
- Ground Source Heat Pump (GSHPs)

4.9. The advantages and disadvantages of these technologies are evaluated in Tables 4-8.

[3] NOABL Wind Map (http://www.rensmart.com/Weather/BERR)

[4] CIBSE TM38:2006. Renewable energy sources for buildings.

Table 4. Individual biomass heating feasibility appraisal

Potential Advantages	Risks & Disadvantages
• Potential to significantly reduce CO_2 emissions as the majority of space and water heating will be supplied by a renewable fuel • Decreased dependence on fossil fuel supply	• A local fuel supply is required to avoid increased transport emissions • Fuel delivery, management and security of supply are critical • Space is required to store fuel, a thermal store and plant • A maintenance regime would be required even though modern systems are relatively low maintenance • Building users or a management company must be able to ensure fuel is supplied to the boiler as required. • Local environmental impacts potentially include increased NO_x and particulate emissions
Estimated costs and benefits	
• Cost £2,000 upwards for a wood-pellet boiler, not including cost of fuel • Not eligible for RHI payments as new-build properties	
Conclusions	
Biomass heating is considered technically feasible in large dwellings provided sufficient space can be accommodated for fuel supply, delivery and management however air quality concerns mean that it is not considered appropriate.	

Table 5. Solar thermal systems feasibility appraisal

Potential Advantages	Risks & Disadvantages
• Mature and reliable technology offsetting the fuel required for heating water (typically gas) • Solar thermal systems require relatively low maintenance • Typically, ~50% of hot water demand in dwellings can be met annually	• Installation is restricted to favourable orientations on an individual building basis • The benefit of installation is limited to the water heating demand of the building • Safe access must be considered for maintenance and service checks • Buildings need to be able to accommodate a large solar hot water cylinder • Distribution losses can be high if long runs of hot water pipes are required • Visual impact may be a concern in special landscape designations (e.g. AONB)
Estimated costs and benefits	
• Cost £2,000 - 5,000 for standard installation • Not eligible for RHI payments as new-build properties • Ongoing offset of heating fuel, minimal maintenance requirements	
Conclusions	
Solar thermal systems are considered technically feasible on all buildings with suitable roof orientations.	

Table 6. Solar photovoltaic systems feasibility appraisal

Potential Advantages	Risks & Disadvantages
• The technology offsets the high carbon content of grid supplied electricity used for lighting, pumps and fans, appliances and equipment • Mature and well proven technology that is relatively easily integrated into building fabric • Adaptable to future system expansion • Solar resource is not limited by energy loads of the dwelling as any excess generation can be transferred to the national grid • PV systems generally require very little maintenance • Service and maintenance requirement minimal, and 2-3 storey buildings should not require significant additional safety measures (mansafe systems etc) for roof access	• Poor design and installation can lead to lower than expected yields (e.g. from shaded locations) • Installation is restricted to favourable orientations • Feed in Tariff support mechanism has been discontinued • Safe access must be considered for maintenance and service checks • Visual impact may be a concern in special landscape designations (e.g. AONB) or conservation areas • Reflected light may be a concern in some locations
Estimated costs and benefits	
• Cost £1,500 upwards (1kWp+) and scalable • Ongoing offset of electricity fuel costs, minimal maintenance requirements	
Conclusions	
PV panels are considered technically feasible for all buildings with suitable roof orientations. The relatively low cost, carbon saving potential and limited additional impacts mean that PV is considered a feasible option for this development.	

Table 7. Air Source Heat Pump systems feasibility appraisal

Potential Advantages	Risks & Disadvantages
• Heat pumps are relatively mature technology providing heat using the reverse vapor compression refrigeration cycle • Heat pumps are a highly efficient way of providing heat using electricity, with manufacturers reporting efficiencies from 250% • Can be of increased benefit where cooling is also required, therefore particularly relevant to commercial buildings • With grid decarbonisation will be a low carbon heating source in future	• Air source heat pumps are powered by electricity, with a significantly higher unit price than gas, leading to potentially increased running costs • It is critical that heat pump systems are designed and installed correctly to ensure efficient operation can be achieved. Users must be educated in how heat pump systems should be operated for optimal efficiency • Air source heat pump plant should be integrated into the building design to mitigate concerns regarding the visual impact of bolt-on technology • Noise in operation may be an issue particularly when operating at high output
Estimated costs and benefits	
• Cost £5,000 - £7,000 for standard installation • Not eligible for RHI payments as new-build properties	
Conclusions	
Air source heat pumps are technically feasible for the buildings in this scheme. However, the capital and running cost increases in comparison to a gas baseline means that they are not considered a preferred low carbon technology at this stage.	

Table 8. Ground Source Heat Pump systems feasibility appraisal

Potential Advantages	Risks & Disadvantages
• Heat pumps are relatively mature technology providing heat using the reverse vapor compression refrigeration cycle • Heat pumps are a highly efficient way of providing heat using electricity, with manufacturers reporting efficiencies from 320% • Can be of increased benefit where cooling is also required, therefore particularly relevant to commercial buildings • With grid decarbonisation will be a low carbon heating source in future	• Low temperature heating circuits (underfloor heating) would be required to maximise the efficiency of heat pumps • A hot water cylinder would also be required for both space and water heating • Ground source heat pumps are powered by electricity with a significantly higher unit price than gas, leading to potentially increased running costs • It is critical that heat pump systems are designed and installed correctly to ensure efficient operation can be achieved • Ground source heat pumps either require significant land to incorporate a horizontal looped system or significant expense to drill a bore hole for a vertical looped system
Estimated costs and benefits	
• Cost circa £10,000+ • Running cost linked to COP of heat pump, circa 3.0 equates to 66% reduction vs electricity or around 5-6p/kWh (higher than mains gas) • Additional costs to upgrade electricity infrastructure currently unknown	
Conclusions	
Ground source heat pumps are considered technically feasible for buildings in this scheme. However, the cost and difficulty associated with vertical boreholes at this site means that they are not considered a preferred low carbon technology at this stage.	

Summary

4.10. Following this feasibility assessment, it is considered that as biomass heating systems would require significant storage space for fuel as well as regular deliveries at different times to all dwellings, they are not appropriate for this development.

4.11. Roof-mounted systems are therefore likely to be most suited to the development:

- Solar thermal systems to dwellings that have space to incorporate a hot water cylinder and a suitable roof orientation.
- Solar photovoltaic modules to dwellings that have suitable roof orientations.

4.12. It is considered that solar PV systems are most appropriate in meeting a significant proportion of energy demand without introducing additional energy loss through larger hot water cylinders. These will be installed to south and east/west facing roof pitches, with the specific units and system sizes to be assessed when bringing forward designs for each phase of development as required. It is proposed that Solar PV systems will be installed to all units that will fall under Part L 2021. The image below shows an example of the roof integrated Solar PV systems to be installed at the development.

AES Sustainability Consultants

5. As-Designed Performance

5.1. It is expected that a proportion of the development will be built to current Part L 2013 and a proportion to Part L 2021. It will be ensured as design progresses that revised calculations will be undertaken on a plot-by-plot basis under the relevant Part L to accurately represent the final CO_2 emissions of the development.

5.2. Through following the strategy described, the dwellings built under Part L 2013 Building Regulations will significantly reduce energy demand and consequent CO_2 emissions beyond a Part L compliant level of performance through improvements to the dwelling fabric.

5.3. Table 9 provides an overview of the typical as-designed CO_2 emissions of the sample dwellings assessed under Part L 2013 to with the proposed fabric first strategy applied.

Table 9. Sample dwelling as-designed CO_2 emissions (Part L 2013)

House Type	Part L 2013 Target CO_2 Emissions ($kgCO_2/yr$)	As-Designed CO_2 Emissions ($kgCO_2/yr$)	Reduction %
2 Bed End Terrace	1,560	1,544	1.01
3 Bed End Terrace	1,763	1,714	2.78
4 Bed Detached	2,037	2,022	0.74
2 Bed Mid Terrace	1,364	1,299	4.76
3 Bed End Terrace	1,630	1,608	1.32
3 Bed Semi Detached	1,628	1,581	2.86
4 Bed Detached	2,151	2,142	0.42

5.4. Table 10 demonstrates the site-wide savings over and above the Part L 2013 compliant baseline that will be delivered.

Table 10. Site-wide as-designed energy demand and CO_2 emissions after fabric measures (Part L 2013)

	CO_2 Emissions ($kgCO_2/yr$)	
Part L compliant (Part L 2013)	258,864	
After fabric measures (Part L 2013)	254,721	
	$kgCO_2/yr$	%
Total site-wide savings	4,143	1.60

Future Regulations – Part L 2021

5.5. Through following the strategy described, the dwellings built under Part L 2021 will deliver a >31% reduction compared with current regulatory standards. These carbon reductions will be achieved through higher fabric standards, and the use of Waste Water Heat Recovery systems (WWHR), Flue Gas Heat Recovery systems (FGHR), and the use of solar PV systems.

5.6. Using Beta SAP software (final version still pending release at time of writing), a sample range of dwellings have been assessed under Part L 2021 to establish the baseline CO_2 emissions of the dwellings that will be constructed under Part L 2021, with the proposed fabric strategy applied to provide an overview of the typical as-designed CO_2 emissions. The results of these calculations are shown in Table 11.

Table 11. Sample dwelling as-designed CO^2 emissions (Part L 2021)

House Type	Part L 2021 Target CO_2 Emissions ($kgCO_2/yr$)	As-Designed CO_2 Emissions ($kgCO_2/yr$)	Reduction %
2 Bed End Terrace	963	922	4.23
3 Bed End Terrace	1,129	1,090	3.39
4 Bed Detached	1,199	1,174	2.11
2 Bed Mid Terrace	836	791	5.45
3 Bed End Terrace	985	953	3.27
3 Bed Semi Detached	1,041	1,006	6.28
4 Bed Detached	1,251	1,157	7.55

6. Sustainable Design

6.1. This section sets out details of additional resource efficiency and sustainable design principles to be applied at the development.

Materials

6.2. The impacts of construction materials range from the depletion of natural resources to the greenhouse gas emissions and water use associated with their manufacture and installation.

6.3. Within the development choices will be made in order to reduce the consumption of primary resources and using materials with fewer negative impacts on the environment, including but not limited to the following;

- Use fewer resources and less energy through designing buildings more efficiently
- Specify and select materials and products that strike a responsible balance between social, economic and environmental factors
- Incorporate recycled content, use resource-efficient products and give due consideration to end-of-life uses
- Influence, specify and source increasing amounts of materials which can be reused and consider future deconstruction and recovery
- All insulating materials will have a Global Warming Potential (GWP) of < 5 in manufacture and installation.
- All materials used in construction will be responsibly sourced, with certification obtained wherever possible. Materials with a low environmental impact as per the BRE Green Guide will be preferred.

Waste

6.4. Sending waste to landfill has various environmental impacts, such as the release of local pollution, ecological degradation and methane emissions, in addition to exacerbating resource depletion. Waste in housing comes from two main streams; construction waste and domestic waste during occupation.

Household waste

6.5. In this respect regard has been given to the policy advice contained in the NPPF together with the Council's current guidance to ensure that the new dwellings are provided with adequate storage facilities for both waste and recyclable materials.

6.6. Gloucester City Council currently operates domestic waste collection services through which households are able to recycle materials including paper and cardboard, plastic bottles and food containers, tins, glasses and metal foils, together with garden waste.

Construction waste

6.7. The construction process will be managed to effectively and appropriately monitor and manage construction site waste. Target benchmarks for resource efficiency will be set in accordance with best practice – e.g., m^3 of waste per $100m^2$ / tonnes waste per m^2.

6.8. Wherever possible materials will be diverted from landfill through re-use on site, reclamation for re-use, returned to the supplier where a 'take-back' scheme is in place or recovered and recycled using an approved waste management contractor.

Electrical Vehicle Charging Points

6.9. There is a government ambition for all new cars to be effectively zero emission by 2035. The 'Road to Zero' strategy set out a £1.5b package of support for the transition. A number of initiatives are already in place including grants, as well as road tax and vehicle excise duty exemptions.

6.10. It is recognised that there is a need to ensure that the development is adaptable to accommodate a future shift in personal transportation to electric vehicles, to promote sustainable transport and to minimise air pollution. As Electric Vehicle (EV) ownership increases, developers have an increasing responsibility to provide EV charging points for occupants.

6.11. The development will ensure adequate provision of electric vehicle charging points, satisfying condition 19 of the outline permission (Ref: 21/00490/OUT). It is proposed that EV charging points will be installed to all dwellings.

6.12. Further technical details of the charger along with locations will be provided at the appropriate time as preparation for the development progresses.

Water Conservation

6.13. In line with Policy SD3 and current Building Regulations, water use will be managed effectively throughout the development through the incorporation of appropriate efficiency measures.

6.14. Water efficiency measures including the use of efficient dual flush WCs, low flow showers and taps and appropriately sized baths will be encouraged with the aim to limit the use of water during the operation of the development to limit water use.

6.15. Table 12 shows how the development could achieve a total water consumption of 125 litres/occupier/day for the intended specification, in line with current regulatory standards.

Table 12. Typical Water Demand Calculation

Installation Type	Unit of measure	Capacity/ flow rate	Litres/Person/Day
WC (dual flush)	Full flush (l)	4	5.84
	Part flush (l)	2.6	7.70
Taps (excluding kitchen taps)	flow rate (l/min)	5	9.48
Bath	Capacity to overflow (l)	181	19.91
Shower	Flow rate (l/min)	8	34.96
Kitchen sink taps	Flow rate (l/min)	3.8	12.03
Calculated Use			111.6
Normalisation Factor			0.91
Total Internal Consumption (L)			101.5
External Use			5.0
Building Regulations 17.K			106.5

7. Conclusions

7.1. This Energy and Sustainability Statement has been prepared by AES Sustainability Consultants Ltd on behalf of Vistry Homes Ltd, Cotswolds to detail the proposed approach to sustainable construction to be employed at the development known as Rudloe Drive Phase 2, Quedgeley.

7.2. The development site is located on the northern edge of Hardwicke, north of Rudloe Drive, a village 7 km south of the city of Gloucester, within the administrative boundary of Gloucester City Council. The proposals would deliver 150 dwellings across a mix of one to four bed detached, semi-detached, and terraced houses

7.3. The statement has been prepared to address Condition 18 of the outline planning permission (ref: 21/00490/OUT) as well as relevant national and local policies relating to sustainable development, including 'Policy SD3: Sustainable Design and Construction' and 'Policy SD4: Design Requirements' of the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011-2031.

7.4. Due to the development timescales, it is considered that a portion of the development is likely to fall under current Part L 2013 and a portion under Part L 2021.

7.5. In recognition of these variables, this Energy and Sustainability Statement has considered the likely impact of future Building Regulations requirements. With respect to carbon reduction, the dwellings built to meet Part L 2021 will deliver a >31% reduction compared with current regulatory standards, thereby satisfying the requirements as set out in the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011-2013 and Condition 18 of the outline planning permission (ref: 21/00490/OUT).

7.6. The statement sets out a fabric first approach to sustainable construction, demonstrating that decisions about the built form, orientation and design as well as improvements in insulation specification, a reduction in thermal bridging, unwanted air leakage paths and further passive design measures will reduce energy demand in line with the Energy Hierarchy.

7.7. A range of potentially appropriate technologies have been assessed for feasibility in delivering further reductions as required by future Regulatory standards, concluding that solar PV constitutes both the preferred and viable technology for this site. Dwellings built to Part L 2021 regulatory standards will benefit from Solar PV systems.

7.8. The statement additionally addresses further sustainable construction considerations, including overheating risk, climate resilience, waste and water consumption.

7.9. Part of the scheme will be built under Part L 2013 Building Regulations, providing an estimated overall CO_2 saving of 1.6% above current regulatory standards. The remainder of the development will be built to Part L 2021 Building Regulations and will provide a >31% improvement over Part L 2013. These standards will be achieved through improved fabric standards combined with the use of solar PV.

7.10. To accommodate the future shift to electric vehicle transportation, all dwellings will be provided with Electric Vehicle Charging Points.

VISTRY GROUP

PROPOSED RESIDENTIAL DEVELOPMENT,
RUDLOE DRIVE, QUEDGELEY

Landscape Specification & Management Plan

May 2022 | LA5530-LSMP-01A

Placemaking for life

Quality Assurance

ISO 9001 & 14001 Registered Firm

IDP Landscape Ltd is a practice of Chartered Landscape Architects and a registered company with the Landscape Institute. This report has been prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment 3rd Edition, and the opinions expressed within it are those of qualified Landscape Architects, whose professional judgement is relied upon.

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TABLE OF CONTENTS

For detailed soft landscape design refer to:

Soft Landscape Proposals LA5530-001C; 002C; 003C and 004C

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1.0 INTRODUCTION

1.1. IDP Landscape Ltd are appointed by Vistry Group (Cotswolds) to provide the landscape specification management plan for the proposed housing development on land off Rudloe Drive, Quedgeley. The development is subject to outline planning approval (Application Reference: 21/00490/OUT) and planning conditions which require the submission of details of planting and maintenance schedules. This report is intended to discharge condition 13 which is attached to the outline planning approval.

1.2. This LSMP will include long term objectives for the landscape scheme, management responsibilities, and appropriate maintenance schedules etc. for all landscape areas in line with the condition. The maintenance schedules for this site cover a 5-year period, although it is anticipated that it will remain in place for ongoing maintenance by those responsible for the long-term management of the site.

1.3. Best practise working procedures will be adhered to at all times during the construction works, and key works will be undertaken by fully trained operatives. A copy of this management plan will be kept on site where it would be available at all times.

1.4. For detailed soft landscape plans refer to Soft Landscape Proposals LA5530-001C; 002C, 003C and 004C.

2.0 CONTRACTOR SCOPE OF WORKS

2.1. All planting works will be carried out by the Landscape Contractor in accordance with the approved drawings and implemented in accordance with the phased programme of implementation.

2.2. The soft landscape areas for this phase of implementation are illustrated on the Soft Landscape Proposals LA5530-001C; 002C, 003C and 004C. All areas of public open space should be implemented and maintained as per this document while other construction works are ongoing. This would aid establishment of green infrastructure on site and minimise losses through vandalism. The remaining areas of soft landscaping can come forwards when construction works on site are complete.

2.3. The main contractor is responsible for the preliminary external works package to include:

- Site clearance works including areas of existing vegetation which is necessary and agreed.
- Erection of protective fencing to all existing trees, hedges and structural vegetation as shown on the Tree Protection Plan.
- Soil stripping and stock piling as necessary in accordance with BS3882:2015
- Removal of subsoil as necessary.
- Preparation of sub-grade and main excavation works.

2.4. For the implementation of the soft landscape scheme, the Landscape Contractor is responsible for the following:

- Supply, delivery and storage of the specified plants as listed in the approved landscape drawings.
- Preparation of the subsoil to all planting areas and tree pits.
- Supply and delivery of the approved topsoil, and confirmation of the soil analysis and amelioration.
- Topsoil spreading, grading and profiling.
- Drainage medium to tree pits.
- Carrying out of all planting works including associated works.
- Carrying out of seeding and/or turfing to grass areas.

- 12 months rectification period and maintenance post Practical Completion for trees and planted areas.

The Landscape Contractor should report to the Landscape Architect/Contract Administrator where necessary for clarifications on this specification.

3.0 LANDSCAPE SPECIFICATION

GENERAL

3.1. All plants should be supplied in accordance with BS 3936 Specification for Nursery Stock and the HTA 'National Plant Specification'. Delivery and handling of all plant material to be in accordance with BS 3936: Part 1, Part 4, Part 5. All planting is to be undertaken in accordance with BS 4428 Code of Practice for General Landscape Operations.

3.2. Excavation for planting beds and subsequent planting should not take place during periods of bad weather, if the ground is waterlogged or frozen to avoid damaging the soil structure.

3.3. The Landscape Contractor should be aware of the proximity to underground services, overhead cables, buildings and boundaries prior to planting operations.

3.4. The Landscape Contractor should minimise tracking over the site or storage of materials prior to planting to avoid damage to the existing soil conditions.

3.5. All existing trees and vegetation to be retained within the site should be protected in accordance with BS 5837 (2012) Trees in Relation to Design, Demolition and Construction. Refer to Arboriculturalist's drawings for details of tree protection and methods of construction close to retained trees.

3.6. Except where otherwise specified, all materials and workmanship shall be in accordance with appropriate British Standards.

PREPARATION

3.7. **Site clearance:**

3.7.1. Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil.

3.7.2. Remove stones with any dimension exceeding 75 mm.

3.7.3. Remove material containing toxins, pathogens or other extraneous substances harmful to plant, animal or human life.

3.7.4. Clear any scrub and vegetation to ground level by flail mowing and remove arisings; retain and protect trees indicated on drawings.

3.7.5. Large roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.

3.8. **Subsoil:**

3.8.1. In areas where subsoil is retained for required profiles and levels this should be in accordance with BS 8601 '*Specification for subsoil*' and requirements for use.

3.8.2. When loosening:

- Light and non-cohesive subsoils: When ground conditions are reasonably dry, loosen thoroughly to a depth of 300 mm.
- Stiff clay and cohesive subsoils: When ground conditions are reasonably dry, loosen thoroughly to a depth of 450 mm.
- Rock and chalk subgrades: Lightly scarify to promote free drainage.
- Wet conditions: Do not loosen subsoils.
- Compacted areas: Ripped and de-compacted to promote free drainage.

3.8.3. Immediately before spreading topsoil, remove stones larger than 50 mm.

3.8.4. Remove from site and arisings, contaminants and debris and builders rubble.

3.9. **Topsoil:**

3.9.1. Existing topsoil stock-pilled on site should be sampled in accordance with BS 3882 *'Specification for Topsoil'*, to ensure it is suitable for the intended use.

3.9.2. Where imported topsoil is used the Landscape Contractor should ensure that the topsoil supplier provides the topsoil specification in accordance with BS 3882. Documentation for all imported topsoil should be submitted at handover.

3.9.3. A report detailing soil analyst's recommendations should be submitted to the client with any recommendations from the soil analyst for soil amelioration and/or soil handling to be approved by the client or client's representative.

3.9.4. Topsoil should be stored in heaps in an appropriate location in accordance with BS 3882. Formation should be loose tip and shape from the side only, without running machinery on the heap at any time. Where necessary it should be fenced and covered to avoid contamination and compaction.

3.10. **Topsoil handling:**

3.10.1. Do not contaminate topsoil with:

- Subsoil, stone, hardcore, rubbish or material from demolition work.
- Other grades of topsoil.

3.10.2. Keep multiple handling to a minimum. Use or stockpile topsoil immediately after stripping.

3.10.3. Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall or when it is wetter than the plastic limit less 3%, to BS 1377-2.

3.11. **Topsoil depths:** Shrub/grass areas should not exceed 300mm. Suitable (loosened) subsoil should provide the remainder of the minimum rooting depths. The minimum rooting depths should be as follows:

- 450mm for grass (150mm of topsoil)
- 600mm for shrubs and native hedgerows (300mm of topsoil)
- Tree pits as specified (refer to section below)

3.12. **Spreading topsoil:**

3.12.1. Carry out spreading activities in accordance with BS 3882.

3.12.2. Temporary roads/ surfacing: Remove before spreading topsoil.

3.12.3. Layers:

- Gently firm each layer before spreading the next.
- Ensure correct planting depth is achieved after firming and settlement

3.12.4. Crumb structure: Do not compact topsoil. Preserve a friable texture of separate visible crumbs wherever possible.

3.12.5. Soil levels should be 50mm lower than adjacent kerbs and paving after settlement, and not less than 150mm below DPC of adjoining buildings.

3.13. **Fertiliser:**

3.13.1. Prior to cultivation, apply organic soil ameliorant for all grassed areas and shrub beds to a depth of 150mm, at a reasonable rate.

3.13.2. A suitable fertilizer should be applied to proposed areas of seeding/ turfing 3-5 days before final cultivation according to manufacturer's instructions.

3.13.3. A suitable fertilizer should be applied generally to proposed planting areas immediately before final cultivation.

3.13.4. Fertiliser should be spread evenly in traverse directions.

3.13.5. Fertiliser must not be used on proposed areas of Wildflower seeding.

3.14. **Weed Control:** Use herbicide to supress perennial weeds if necessary, no more than 2 weeks prior to final cultivation.

SEEDING/ TURFING

3.15. **Turfing:**

3.15.1. Extents of areas to be turfed to be determined by client.

3.15.2. Timing: Autumn or early winter.

3.15.3. Cultivated turf for all grassed areas should be Rowlawn Medallion or equivalent, produced on a well-drained sandy loam.

3.15.4. Following cultivation operations lay turf with minimum possible delay after lifting. If delay occurs, lay turf out on topsoil and keep moist. Stacking height should be maximum of 1m. Dried out or deteriorated turf should not be used.

3.15.5. Lay turf preferably along a straight side in a row, butting closely end to end. On subsequent rows, stagger the joints in brickwork fashion. Do not leave gaps between the turf.

3.15.6. Use planks laid on previously laid turf. Do not walk on prepared bed or newly laid turf.

3.16. **Seeding general:**

3.16.1. Timing: Between March and October, where possible in calm weather conditions. In areas prone to waterlogging preferably before late autumn.

3.16.2. Seeds to be purchased fresh for each growing season and where possible be of local provenance. Suggested supplier Emorsgate (Tel: 01553 829028), or similar approved. Refer to soft landscape drawings LA5530-001 to 004 for specifications.

3.16.3. Seeding shall be repeated as necessary until an evenly distributed dense sward is established over the seeded area to the satisfaction of the Contract Administrator. The Landscape Contractor should allow for protection and cutting of all grass areas until this is achieved.

3.17. **Amenity grass:**

3.17.1. Specification: EG22C Strong lawn mixture with clover or similar approved sown at a rate of 25g/m^2.

3.17.2. Following cultivation operations detailed above seed shall be spread evenly at the rates specified

in two equal sowings in transverse directions.

3.17.3. After sowing the ground should be lightly raked or harrowed and subsequently firmed with a lightweight roller.

3.18. **Grass & Wildflower meadow:**

3.18.1. Specification: Emorsgate EM10 Tussock mixture or similar approved sown at a rate of 4gm^2.

3.18.2. Prior to seeding, ensure seed bed is free of perennial weeds using herbicide where necessary in accordance with section 3.11 and cultivating in accordance with 3.13. Pesticides used near or within waterbodies should be checked by the contractor for suitability.

3.18.3. Prior to seeding the soil will be brought to a fine tilth in accordance with 3.13. The base of the SuDS features should be left undisturbed to avoid conflict with its functionality. Following an even distribution of seed the area is to be lightly harrowed.

3.19. **Wetland meadow:**

3.19.1. Specification: Emorsgate EP1 Pond edge mixture or similar approved sown at a rate of 4gm^2.

3.19.2. Prior to seeding, ensure seed bed is free of perennial weeds using herbicide where necessary in accordance with section 3.11 and cultivating in accordance with 3.13. Pesticides used near or within waterbodies should be checked by the contractor for suitability.

3.19.3. Prior to seeding the soil will be brought to a fine tilth in accordance with 3.13. The base of the SuDS features should be left undisturbed to avoid conflict with its functionality. Following an even distribution of seed the area is to be lightly harrowed.

PLANTING

3.20. **Times of year for planting**

- Deciduous trees and shrubs: Late October to late March.
- Conifers and evergreens: September/ October or April/ May.
- Herbaceous plants (including marginal): September/ October or March/ April.
- Container grown plants: At any time if ground and weather conditions are favourable.
- Watering and weed control: Provide as necessary.
- Dried bulbs, corms and tubers: September/ October.
- Green bulbs: After flowering in spring.
- Wildflower plugs: Late August to mid-November or March/ April.

- Aquatic plants: May/ June or September/ October.

3.21. **Plants/ Tree general:**

3.21.1. Condition: Materially undamaged, sturdy, healthy and vigorous.

3.21.2. Appearance: Of good shape and without elongated shoots.

3.21.3. Hardiness: Grown in a suitable environment and hardened off.

3.21.4. Health: Free from pests, diseases, discoloration, weeds and physiological disorders.

3.21.5. Budded or grafted plants: Bottom worked.

3.21.6. Root system and condition: Balanced with branch system.

- Standard: The relevant parts of BS 3936.

3.21.7. Species: True to name.

3.21.8. Origin/ Provenance: British grown.

3.21.9. Definition: Origin and Provenance have the meaning given in the National Plant Specification.

3.22. **Container grown plants/ trees:**

3.22.1. Growing medium: With adequate nutrients for plants to thrive until permanently planted.

3.22.2. Plants: Centred in containers, firmed and well watered.

3.22.3. Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.

3.22.4. Hardiness: Grown in the open for at least two months before being supplied.

3.22.5. Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

3.23. **Labelling and information:**

- General: Provide each plant/ tree or group of plants/ trees of a single species or cultivar with supplier's labelling to BS 3936 for delivery to site, showing:

- Full botanical name.
- Total number.
- Number of bundles.
- Part bundles.
- Supplier's name.
- Employer's name and project reference.

- Plant specification, in accordance with scheduled National Plant Specification categories.

3.24. **Plant handling, storage transport and planting:**

3.24.1. Standards to be kept in line with CPSE Code of Practice for 'Handling and Establishing Landscape Plants, Parts I, II and III.

3.24.2. Protect plants from frost.

3.24.3. Handle plants with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.

3.25. **Planting Shrub/Herbaceous:**

3.25.1. Timing: Late October to late March. Or where container grown at any time where weather conditions are favourable.

3.25.2. Following cultivation, weed control and fertilizer operations described above plants should be laid out as per the Planting Plans.

3.25.3. In accordance with BS 4428 planting holes should be approximately 150 mm wider than the root spread. The shrubs should be set in the holes so that the soil level, after settlement, will be at the original root collar level on the stem of the shrub.

3.25.4. The holes should be backfilled to half their depth and should be firmed by treading. The remainder of the topsoil should then be returned and again firmed by treading

3.26. **Planting Bulbs:**

3.26.1. Timing: To be planted in the appropriate season to a depth of approximately 3x the bulb diameter. Bases to have contact with the topsoil at the bottom of the holes.

3.27. **Planting Hedgerows:**

3.27.1. Specification: for locations and specification refer to Planting Plans

3.27.2. Timing: Late October to late March.

3.27.3. Following cultivation, weed control and fertilizer operations described above hedgerow plants are to be planted into a trench with a minimum depth of 400mm and a width of between 600-750mm.

3.27.4. Plants to be set out evenly with consideration given for an even spread of species where a hedgerow mix is specified.

3.27.5. All shrubs specified as part of the native hedgerow mix are to be protected from rabbit damage

by using Tubex 'Shelterguards' 75cm or similar approved, secured using stakes and ties.

3.28. **Planting Trees:**

3.28.1. If planting is not carried out immediately after delivery, root balled trees should be placed close together and the ball or container should be covered with sand or moist peat to prevent drying out and freezing in accordance with BS 4428.

3.28.2. Tree pit excavations should be at least twice the diameter of the root spread and 1.5 times the depth of the roots to be planted.

3.28.3. Break up subsoil to the sides of the pit and replace excavated subsoil with topsoil.

3.28.4. Ensure trees are planted at the original root collar soil depth by observing the soil mark on the stem.

3.28.5. Backfill soil around the tree and lightly firm to ensure close contact with the roots.

3.28.6. Underground guying: refer to approved drawings for details.

3.28.7. Root barriers: refer to approved drawings for details. As a minimum, a 600mm deep barrier should be installed where the rootball is within 2 m of a building foundation or within 3 m of an existing underground service route.

3.29. **Tree Stakes:**

3.29.1. Stakes to be minimum 50mm diameter, 1800mm length and softwood, peeled chestnut, larch or oak, straight, free from projections and large or edge knots and with pointed lower end.

3.29.2. Extra heavy standards trees to be secured in position using two stakes, a cross bar and adjustable tree ties made of PVC or rubber in accordance with figure 8 in BS 4428.

3.29.3. Prior to planting stakes to be driven into position on the prevailing windward side of the tree as close to the tree as possible but ensuring clearance of the root ball to a minimum depth of 300mm below the bottom of the pit. Following planting pin stakes with cross bar and attach ties where centre of cross bar and tree meet.

3.30. **Trees in hard surfacing:**

3.30.1. Tree guards to be installed to protect stem from external damage. Products should be agreed with the client and indicated on tree pit details. As a minimum the tree guard should be 1.8 m high x 600 mm diameter in steel and fixed to tree grille as per manufacturers specification.

3.30.2. Ensure that protection methods do not impede natural movement of trees or restrict growth.

3.30.3. A suitable steel tree grille should be installed to the size and specification agreed, and fixed to tree grille as per manufacturers specification.

3.31. **Mulching:**

3.31.1. Clear all weeds and water soil thoroughly prior to mulching.

3.31.2. Spread medium grade bark of 100% recycled content to BS EN ISO 14021, free of pests, disease, fungus and weeds.

3.31.3. The minimum depth should be 50 mm over all planted areas.

3.31.4. Finished level of mulch should be 30 mm below adjacent grassed or paved areas.

3.32. **Watering:**

3.32.1. During establishment of grass areas ensure that sufficient water is applied using a fine rose sprinkler to maintain healthy growth.

3.32.2. Thoroughly water completed turf immediately after laying. Check that water has penetrated into the soil below.

3.32.3. Thoroughly water areas of shrub and tree planting following planting.

3.33. **Failures of planting:**

3.33.1. Defects due to materials or workmanship not in accordance with the Contract: Plants/ trees/ shrubs that have failed to thrive.

- Exclusions: Theft or malicious damage after completion.
- Rectification: Replace with equivalent plants/ trees/ shrubs.

3.33.2. Replacements: To match size of adjacent or nearby plants of same species or match original specification, whichever is the greater.

3.33.3. Timing of making good: During the next suitable planting season.

4.0 MANAGEMENT OBJECTIVES

4.1. The overall objective of this plan is to maintain a high quality and appropriate landscape setting to the development, enhance ecological value, and ensure elements within it are managed to complement the development and its general appearance, and the end users of the site.

4.2. The landscape areas will be sympathetically managed to create a variety of habitats as part of the proposed landscape scheme and its ongoing maintenance, will increase the value of the site generally, and will provide suitable green infrastructure throughout the site in the long term to provide positive links with the surrounding area.

4.3. The site currently is former military facility that is currently under-going phased residential development, located to the south of Gloucester City. The development's main access is off Rudloe Drive. The site contains limited number of existing trees, the most valuable of which are retained as part of the development.

4.4. An important aim of this management plan is to prescribe works which will maintain or enhance habitats and features of benefit to wildlife known to be present within the local area, as well as providing general enhancements for the wider benefit of local flora and fauna. The ecological assessment submitted with the outline application did not identify the need for any further specific species surveys but proposed a series of enhancement measures to the benefit of local wildlife and result in an overall gain in biodiversity.

Management Objectives

4.5. The general objectives for landscape areas are to:

- apply best practice to all horticultural and ecological operations;
- ensure the establishment and future sustained growth of all plants, trees, hedges, grass, and wildflower areas;
- create new habitat areas as part of the benefits of the proposal to enhance wildlife value and species diversity through careful management;
- introduce structural diversity within the existing woodland areas;
- ensure good horticultural practice in the long-term health and vitality of all trees, shrubs and hedges to promote healthy and vigorous growth;
- manage the range of grasslands proposed to the benefit of potential amphibian and invertebrate populations;
- ensure the consistent control of weeds and invasive species;
- provide protection against pests and diseases as appropriate;
- ensure the replacement of defective plant material;

- review opportunities for enhancing planted areas and replacing worn-out areas of planting where appropriate, in line with the original design aspirations.

5.0 MANAGEMENT RESPONSIBILITIES

5.1. For the purpose of this document the following terms and responsibilities are defined as follows;

a) *The Developer* – Vistry Group who are responsible for the development of the site.

b) *The Landscape Contractor* – A sub-contractor who is responsible for implementing the landscape scheme to the approved drawings and will be instructed directly by the Developer. The Landscape Contractor will be liable for any failures to the planting and for the replacement planting during the rectification period.

c) *The Management Company* – The company who will be responsible for the upkeep and ongoing maintenance of the landscape areas following completion and handover from the Landscape Contractor. The Management Company will be responsible for any replacement planting required after the rectification period.

5.2. The respective open space and landscaped/ecological areas will be transferred a new Limited company (the Management Company) formed and incorporated to own and manage the relevant areas. Initially the Directors of the company will be Vistry Group. At the point of each plot sale, every household becomes a shareholder of the company and covenant to abide by various obligations and restrictions in relation to the Management Company areas and importantly covenant to pay the annual Management Company service charge to cover the annual maintenance costs. At the end of the development, Vistry Group resigns and the Directorship of the company is transferred to the residents. Once the relevant areas have been laid out, Vistry Group will initially maintain the areas but will within a short period hand the maintenance responsibility over to the managing agents acting on behalf of the Management Company.

6.0 LANDSCAPE MANAGEMENT CLAUSES

GENERAL

6.1. These clauses should be read in conjunction with the proposed landscape scheme to enable the appropriate ongoing management and maintenance of planted areas.

6.2. All landscape maintenance operations, where they do not conflict with ecology operations, should be in accordance with BS 4428:1989 *'Code of practice for general landscape operations'* (excluding hard surfaces). Ongoing landscape maintenance operations are to be in accordance with sound ecological principles, and where relevant to be in accordance with BS 7370-4:1993 *'Grounds Maintenance Recommendations for maintenance of soft landscape'* (other than amenity turf).

6.3. It is intended that the landscape scheme will be implemented by a Landscape Contractor appointed by Vistry Group, and upon completion will hand over the ongoing maintenance responsibilities of each landscaped area to the Management Company.

6.4. The Management Company will be responsible for the maintenance of all landscaped areas during the life of the development. The rectification period shall be for 12 months, after which the Management Company is liable for any failures and necessary replanting.

6.5. Generally, the management company is responsible for the following:

- **Watering:** Ensure water supply is available for necessary application to wet to field capacity, as necessary for the continued thriving of all planting.
- **Litter and debris:** Collect and remove from site all extraneous litter or debris found in those planted areas included within the maintenance responsibilities.
- **Leaving the site in a good condition:** Removing any soil or arisings from hard surfaces. Ensure protection of existing grassed areas during maintenance operations. Do not place excavated or imported materials directly on grass.
- **Dead plants**: During the rectification period replacement planting is the responsibility of the landscape contractor. In the subsequent years this will be the responsibility of the management company.
- **Weather damage**: Plants which have been subject to frost heave or wind rock and are therefore struggling to establish.

TREE WORK

6.6. General

6.6.1. A pre-commencement site meeting shall be held prior to any works commencing on site, to agree all approved processes with: the Arboricultural Consultant, the tree works contractor, and the main contractor. This meeting could be used to formally agree the methods of work, position of site offices, material storage, compounds, parking and tree protection measures prior to commencement of the development and the associated clearance work.

6.6.2. All permitted or approved tree works shall be carried out to the highest standards, based on British Standard 3998:2010 'Recommendations for Tree Work' and current best practice. To ensure standards are met it is recommended that a contractor from the Approved List of the Arboricultural Association be used (01242 522152, www.trees.org.uk). Under no circumstances shall site personnel undertake any tree pruning operations.

6.6.3. All tree surgery works should be carried out prior to the erection of protective fencing and before site preparation works are started.

6.6.4. Before any tree works commence, a schedule should be submitted to the main contractor to agree any tree works that become apparent during the construction process. Refer to Arboricultural Implications Assessment and Tree Protection Method Statement for full details of tree works. Works should ideally be carried out during the tree's dormant period.

6.6.5. Notice should be given of any defective, diseased, unsafe or weak parts of trees in addition to those scheduled for attention.

6.7. Supervision

6.7.1. On-going arboricultural site monitoring for the duration of the proposed development will be carried out by the Arboricultural Consultant at pre-determined and agreed time intervals, and governed by the type, timing, location and intensity of site works.

6.7.2. A site visit report will be provided listing the efficiency of the tree protection measures, any defects requiring rectification or other relevant comments relating to the management of the tree stock. The report will be provided to the client, and the main contractor/site manager.

6.8. **Removing trees, shrubs and hedges**

6.8.1. The Arboricultural Method Statement & Tree Protection Plan by Hayden's (approved under Condition 13) should be referred to for details of the agreed tree removals and works to retained trees. All works should be carried out to standards BS 3998, Soft Landscape Proposal drawings 101-103 and Health & Safety Executive (HSE)/ Arboricultural and Forestry Advisory Group Safety Leaflets.

6.8.2. The contractor should check for below and above ground services and give notice if they may be affected.

6.8.3. Arboricultural work shall not be carried out during the bird nesting season, i.e., 1st March to 31st August.

AMENITY GRASS AREAS

6.9. **General**

6.9.1. Grassed areas should be maintained for a healthy vigorous sward, free from disease, fungal growth, discolouration, scorch or wilt.

6.9.2. Ornamental lawns should be maintained reasonably free from moss, excessive thatch, weeds, frost heave, worm casts and mole hills.

6.10. **Grass Cutting**

6.10.1. Before mowing, remove litter, rubbish and debris and deposit off-site.

6.10.2. The height of the first cut should be 40 mm once the initial growth has reached 75 mm. Maintain general grass areas between 50 and 75 mm. All arisings should be removed from the surface.

6.10.3. Ensure a neat and even finish, without surface rutting, compaction or damage to grass. Leave neat and well-defined edges. Neatly trim around obstructions, especially trees where damage to bark etc. should be prevented.

6.10.4. Adjoining hard areas should be swept clear and arisings removed.

6.10.5. Apply liquid fertilizer approved by the Authorised Officer in mid- June prior to forecasted rainfall in line with manufacturers recommendations. Hand watering prior to application required where no rainfall is forecast.

6.11. **Bulbs and corms in grassed areas**

6.11.1. Do not cut the grass areas containing bulbs before flowering.

6.11.2. Delay mowing bulbs in the lawn up to six to eight weeks after flowering has finished. Cut to the height of adjoining lawn areas and remove all arisings.

MEADOWGRASS AREAS

6.12. **General**

6.12.1. The peripheral grassland habitats proposed to the site boundaries will be maintained to promote a healthy sward and create variety of heights and flowers through a phased mowing approach.

6.12.2. Future management prescriptions pertaining to retained and created grassland habitats will be carefully devised to promote animal and plant diversity, and carefully managed and enhanced for invertebrates/amphibians if found.

6.12.3. The areas of proposed meadow grassland are shown on the planting plans LA4305-100F, 101F, 102F and 103F.

6.13. **General Cutting**

6.13.1. The Management Company shall be responsible for following the cutting regime that varies the number of cuts in different parts of the grassland and/or the varying the height of cutting across the area. The developing wildflower turf meadow and wetland grassland should be cut once in the first year, and then through specific cutting regimes as outlined below.

6.13.2. Cutting regimes should leave random areas unmown and allowed to develop to a tall sward height to provide foraging and places of shelter for wildlife and ecology purposes. It is possible to leave field margins unmown for 1 year to further aid wildlife.

6.13.3. The application of fertiliser or herbicide on these areas should be avoided, and all cuttings within the area left in-situ up to 7 days. Elsewhere the cuttings shall be removed directly following a cut.

6.14. **Cutting regime (Grass and Wildflower Mix EM10: Tussock Mix)**

6.14.1. Newly laid meadow turf to be mown twice a year to a height of 25-50mm, cuttings to be left for 1 to 2 days after mowing or strimming, then raked and removed. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers.

6.14.2. Once established tussock grassland requires minimal maintenance. Unwanted perennial weeds (docks, thistles) may need control by selective scything before seeding. To control scrub and bramble development, tussock areas may need cutting every 2-3 years between October and February. For wildlife this cutting is best done on a rotational basis so that no more than half the

area is cut in any one year leaving part as an undisturbed refuge.

6.15. **Cutting regime (Emorsgate EP1 Pond Edge Mixture)**

6.15.1. Newly sown meadows to be mown regularly throughout the first year of establishment to a height of 40-60mm, removing cuttings if dense. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers.

6.15.2. In subsequent years, to achieve a variation in structure, cut back and remove short sections of vegetation every 2-3 years in rotation. Remove vegetation in wedge shaped sections. Vegetation removal to be carried out in September to November to minimise disruption to wildlife.

6.15.3. To ensure that their seed will germinate, it may be necessary to over-seed with an appropriate seed mix to increase the floral diversity, especially where there are bare patches.

SHRUBS/TREES/HEDGES

6.16. **General**

6.16.1. Maintain a weed free area around each tree and shrub, minimum diameter the larger of 1m or the surface of the original planting pit.

6.16.2. Remove dead flower heads, fallen leaves, litter and debris and deposit off-site in order to maintain a tidy and clean appearance to the shrub areas.

6.16.3. Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.

6.16.4. Where grass edges meet planting beds, trim grass edges and remove arisings.

6.16.5. Refirm plants/trees around the base until firmly bedded following strong winds and other disturbances.

6.16.6. Check and adjust/refix tree guards, stakes and ties or replace defective elements, allowing for growth and to prevent chafing.

6.17. **Pruning generally**

6.17.1. Pruning should be carried out in accordance with good horticultural and arboricultural practice.

6.17.2. When pruning, make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area.

6.17.3. Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well-balanced natural appearance.

6.17.4. Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines and road lighting luminaires annually.

6.17.5. Prune ornamental shrubs to encourage healthy and bushy growth and desirable ornamental features e.g. flowers, fruit, autumn colour, stem colour.

6.17.6. Remove suckers by cutting back level with the source stem or root.

6.18. **Pruning flowering species of shrubs and roses**

6.18.1. Time of year:

- Winter flowering shrubs: Spring
- Shrubs flowering between March and July: Immediately after the flowering period
- Shrubs flowering between July and October: Back to old wood in winter
- Rose bushes: Early spring to encourage basal growths and a balanced, compact habit

6.19. **Pruning new hedges**

6.19.1. Allow rapidly establishing hedges to reach planned height as quickly as possible.

6.19.2. Trim back lateral branches moderately.

6.19.3. Cut back slowly establishing hedges hard in June and September to encourage bushy growth down to ground level.

6.19.4. Allow the hedge to reach planned dimensions only by gradual degrees, depending on growth rate and habit.

6.20. **Formative pruning of young trees**

6.20.1. Ensure that the type and timing of pruning operations suit the plant species.

6.20.2. Do not prune during the late winter/ early spring sap flow period.

6.20.3. Crown prune by removing dead branches and reducing selected side branches by one third to preserve a well-balanced head and ensure the development of a single strong leader. Whips or feathered trees should not be pruned until established.

6.20.4. Remove duplicated branches and potentially weak or tight forks. In each case cut back to live wood.

6.21. **Pruning of existing / established new trees**

6.21.1. Ensure that the type and timing of pruning operations suit the plant species.

6.21.2. Pruning of mature and/or well-established trees should be avoided unless absolutely necessary from a structural or health and safety concern.

6.21.3. Crown lifting can be carried out by shortening or removing lower branches. Living branches must be retained on at least two thirds of the total tree height after crown lifting.

6.21.4. If crown reduction is required, reduce the crown by pruning out entire branches at their points of origin from the trunk or another branch at least three times the diameter of the branch to be removed. Make the cuts outside the branch collar to ensure the wound will heal. *Do not 'top' mature or established trees.*

6.21.5. Do not prune during the late winter/ early spring sap flow period.

6.21.6. Arboricultural work shall not be carried out during the bird nesting season, ie. 1st March – 31st August.

6.22. **Climbing plants**

6.22.1. When pruning, remove excess growth, to ensure that signs, light fittings, doors and windows are kept clear at all times.

6.22.2. Insecure growth: Attach to supporting wires or structures using 1 mm diameter black plastics coated steel wire.

6.22.3. Supporting structures: Check and repair as necessary.

6.23. **Dead and diseased plants/trees**

6.23.1. Remove within one week of notification.

6.23.2. Replace plants/trees in the next scheduled round of replacement planting.

6.24. **Removal of dead plant material**

6.24.1. At the end of the growing season, check all shrubs/trees/hedges and remove all dead foliage, dead wood, and broken or damaged branches and stems.

6.25. **Reinstatement of shrub/ herbaceous areas**

6.25.1. In the presence of mulch/ matting materials, carefully move to one side and dig over the soil, leaving it fit for replanting.

6.25.2. Use pit and plants to original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.

6.25.3. Apply slow-release fertilizer at rate shown by manufacturer's recommendations.

6.26. **Weed control generally**

6.26.1. Ensure weed cover is less than 5% at all times, and no weed to exceed 100 mm high.

6.26.2. Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.

6.26.3. Rake the area to a neat, clean condition and reinstate mulch to original depth.

6.26.4. Use suitable foliar acting herbicide to kill regrowth. Allow recommended period for herbicide to take effect before clearing dead weeds.

6.27. **Soil aeration**

6.27.1. Where compacted soil surfaces arise, prick up with fork to aerate the soil of root areas and break the surface crust.

6.27.2. Do not damage plants and their roots.

6.28. **Maintenance of mulch**

6.28.1. Thickness of mulch to be a minimum of 50 mm in general shrub areas, 75mm at the base of hedges, 100mm at the base of trees.

6.28.2. Areas of mulch to be topped up twice per year.

6.28.3. Mulch spill on adjacent areas should be cleared of debris and returned to the planted area.

6.28.4. Remove weeds growing on or in mulch by hand weeding.

6.29. **Fertilizer for Shrubs/Hedges/Trees**

6.29.1. Slow-release organic granular fertilizers applied during February or March, spreading evenly at a rate as recommended by the manufacturer.

6.30. **Planting**

6.30.1. New trees, hedgerow and shrub planting will include native species, especially berry bearing and/or nectar producing to benefit foraging birds and bats.

6.30.2. Hedgerows and garden hedgerow boundaries will provide nesting habitat.

6.30.3. Garden gates will be raised to allow hedgehog and other small mammals access into gardens for foraging opportunities.

6.30.4. Open space grassland will be managed for the benefit of biodiversity, with low intensity seasonal timing for maintenance cuts that allow plants to flower and set seed which in turn will benefit wildlife including invertebrates, a prey source for bats and birds and offer places of shelter for wildlife ecology purposes.

6.30.5. The SuDS attenuation basin within the POS of the site will be dry for most of the year. The design of the basin will provide grassland habitat of varying topography that is of value to bats, birds reptiles and invertebrates.

HARD LANDSCAPE AREAS/FENCING

6.31. **Hard surfaces and gravel areas**

6.31.1. Apply a suitable foliar acting or residual herbicide to manage weed growth. Allow recommended period for herbicide to take effect before clearing arisings.

6.31.2. Remove litter, leaves and other debris from all hard surfaces.

6.31.3. Remove mud, silt and debris from surface gutters and channels.

6.31.4. Empty traps and flush clean drainage gullies.

6.31.5. Rake over any gravel areas and remove weeds, litter, leaves and debris, and level off.

6.31.6. Repair paving areas in accordance with the original paving specification or BS 7370-2, clause 4.12.

6.31.7. Stain removal in accordance with BS 7370-2, table 4.

6.32. **Timings**

6.32.1. Layout of the POS to be completed and transferred to the Parish Council prior to 80% occupation (65th dwelling).

6.32.2. Installation of furniture to be completed and transferred to the Parish Council prior to 80% occupation (65th dwelling).

PLAY AREAS AND EQUIPMENT

6.33. **Timings**

6.33.1. Layout of the POS to be completed and transferred to the Parish Council prior to 80% occupation.

6.33.2. Installation of play equipment to be completed and transferred to the Parish Council prior to 80% occupation.

6.34. **Play surfaces**

6.34.1. Regular checking of rubber safety matting to ensure that it is fixed securely with no humps or trip hazards. Provide extra pegs if necessary.

6.34.2. Where required, replace any displaced matting and top up with new soil and seed to match existing as necessary.

6.34.3. Remove leaves, litter, debris and other objects from the play area.

6.35. **Play equipment**

6.35.1. Regular visual checking of all specialised play equipment and non-prescriptive play elements (including natural features such as boulders and logs etc).

6.35.2. If required, ROSPA should provide inspections to ensure approved safety of play equipment and spaces in line with recommended guidance for the prevention of accidents.

6.36. **Defects**

6.36.1. Where defects occur, areas are to be cordoned off immediately to ensure safety, with repairs / replacement undertaken at the earliest opportunity using materials to match those originally specified. Manufacturer's guidance should be followed for specific equipment.

7.0 MAINTENANCE AND MANAGEMENT ONGOING

7.1.1. The following table indicates the ongoing maintenance operations to be carried out in year 1 in the period between practical completion and the end of the rectification period.

Maintenance Operations Year 1	Timing of operations (January to December)											
	J	F	M	A	M	J	J	A	S	O	N	D
General Operations												
Fertiliser: Apply as deemed necessary to top 50mm of soil in accordance with manufacturer's instructions. Replace dislodged mulch materials.			x	x								
Watering: At regular intervals during spring and summer months following planting. Additional watering during dry spells as required.	As required and approved.											
Dead and diseased plants: Remove within one week of notification. Replace plants in the next scheduled round of replacement planting. Replacement plants to original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater. Apply slow release fertilizer at rate shown to manufacturer's recommendations.	As required and approved.											
Weed control generally: Ensure weed cover is less than 5% at all times, and no weed to exceed 100 mm high. Where manual weed control using hand tools has proved unsuccessful use suitable residual herbicide to manufacturer's instructions.	As required and approved											
Mulch: To all areas of shrub, tree and hedgerow planting to the required depths, twice per year. Remove weeds growing within the mulch by hand.				x						x		
Clearance of fallen leaves: Leaf litter to be composted offsite. Twice a month or as required.										x	x	x
Litter picking: Emptying and cleaning of litter bins. Contents disposed of off-site.	Weekly or as necessary											
Snow/ice removal: Excessive snow to be removed from plants to avoid damage. Gritting to hard surfaces to be non-toxic, biodegradable and eco-friendly.	As required and approved											
Amenity Grass												
Initial cut: Prior to mowing remove litter, stones and debris and deposit off-site. Cut to 40mm once the initial growth has reached 75mm. Bare areas and those that have failed to thrive are to be reseeded/re-turfed as required. Generally weekly mow during growing season.			x	x	x	x	x	x	x	x		
Wildflower/ Meadow Grass (EM10)												
Cutting regime: Mow meadow area to height of 25-50mm twice a year.						x			x			
Weed control: Control of pernicious weeds by spot application of herbicide as advised by manufacturer.							x	x	x	x		
Watering: Initial watering after completion of turf laying and for the first two weeks of establishment.	As required and approved.											
Wetland Meadow (Emorsgate EP1 Pond Edge mixture)												

Maintenance Operations Year 1	Timing of operations (January to December)											
	J	F	M	A	M	J	J	A	S	O	N	D
Cutting regime: Once established mow grass to height of 50mm once a month in the growing season and remove arisings							x	x	x	x		
Weed control: Control of pernicious weeds by spot application of herbicide as advised by manufacturer.							x	x	x	x		
Shrubs/ Herbaceous												
Litter and debris: Remove dead flower heads, fallen leaves and debris.	As required and approved											
Weed control: Maintain weed free area with a minimum diameter of 1m around each plant.	As required and approved											
Native Hedgerows												
Stakes and Ties: Adjusted each year to allow for growth.	As required											
Existing hedgerows: Cut back to encourage bushy growth.	x	x	x							x	x	x
Existing and proposed trees												
Stakes and Ties: Adjusted each year to allow for growth. Removed when tree has sufficiently established to support itself, usually after 2 years.	As required											
Existing Trees: All trees to be checked to ensure healthy growth and safety. Pruning as required in accordance with BS 3998.	As required											
Crown lifting/thinning: Ensure a clearance of 2.5m above footpaths/roadways to maintain sightlines. Ensure footpaths and routes are clear from obstructions. In subsequent years thinning may be required in accordance with BS3998.	As required and approved											
Monitoring: Remove dead, diseased or dying trees, fungal growths, fruiting bodies, climbing plants and any other foreign objects.	Monthly											
Play Areas												
Safety: Following completion a RoSPA inspection will be carried out to ensure safety of the scheme in accordance with recommended guidance for the prevention of accidents.	End of defects liability period											
Monitoring: Regular visual checking of all play equipment and tightening/adjustments to fixings and fittings in accordance with manufacturer's instructions. Where defects occur, areas are to be immediately fenced off and repairs are to be made at the earliest opportunity.	Monthly											
Hard surfaces and gravel areas												
Weed control to hard surfaces: Apply herbicide to hard surfaces at the start of the growing season or as required.			x	x								
Clean hard surfaces: Remove litter, leaves and other debris from all hard surfaces. Where necessary repair paving areas in accordance with the original paving specification. Remove any stains in accordance with BS 7370-2, table 4.	As required and approved											
Clean drains: Remove mud, silt and debris from surface gutters and channels. Empty traps and flush clean drainage gullies.	As required and approved											
Maintain gravel areas: Rake over any gravel areas and remove weeds, litter, leaves and debris, and level off.	As required and approved											

7.2. The following table indicates the ongoing maintenance operations to be carried out following the end of the rectification period.

Ongoing Maintenance Operations Years 2-5	Timing of operations (January to December)											
	J	F	M	A	M	J	J	A	S	O	N	D
General operations												
Fertiliser: Apply as deemed necessary to top 50mm of soil in accordance with manufacturer's instructions. Replace dislodged mulch materials.			x	x								
Watering: At regular intervals during spring and summer months following planting. Additional watering during dry spells as required.	As required and approved.											
Dead and diseased plants: Remove within one week of notification. Replace plants in the next scheduled round of replacement planting. Replacement plants to original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater. Apply slow release fertilizer at rate shown to manufacturer's recommendations.	As required and approved.											
Weed control generally: Ensure weed cover is less than 5% at all times, and no weed to exceed 100 mm high. Where manual weed control using hand tools has proved unsuccessful use suitable residual herbicide to manufacturer's instructions.	As required and approved											
Mulch: To all areas of shrub, tree and hedgerow planting to the required depths, twice per year. Remove weeds growing within the mulch by hand.				x						x		
Clearance of fallen leaves: Leaf litter to be composted offsite. Twice a month or as required.										x	x	x
Litter picking: Emptying and cleaning of litter bins. Contents disposed of off-site.	Weekly or as necessary											
Snow/ice removal: Excessive snow to be removed from plants to avoid damage. Gritting to hard surfaces to be non-toxic, biodegradable and eco-friendly.	As required and approved											
Amenity Grass												
Routine cut: Prior to mowing remove litter, stones and debris and deposit off-site. Generally, a weekly mow during growing season, and monitor growth to ensure height doesn't exceed 75mm. Mow to a height of 25-30mm and remove arisings offsite. Reseeding and turfing to areas that have failed as necessary.			x	x	x	x	x	x	x	x		
Wildflower/ Meadow Grass (EM10)												
Cutting regime: Once established, cut no more than one half every 2/3 years between Oct-Feb on a rotational basis.	x	x								x	x	x
Weed control: Control of pernicious weeds by spot application of herbicide as advised by manufacturer.				x	x							
Wetland Meadow (Emorsgate EP1 Pond Edge mixture)												
Cutting regime: Cut short wedge shaped sections every 2/3 years between Sept-Feb on a rotational basis.									x	x	x	

Ongoing Maintenance Operations Years 2-5	Timing of operations (January to December)											
	J	F	M	A	M	J	J	A	S	O	N	D
Weed control: Control of pernicious weeds by spot application of herbicide as advised by manufacturer.				x	x							
Ornamental Grasses												
Depending upon the species grasses are to be cut back/ trimmed.			x	x	x							
Shrubs/ Herbaceous												
Litter and debris: Remove dead flower heads, fallen leaves and debris.	As required and approved											
Weed control: Maintain weed free area with a minimum diameter of 1m around each plant.				x								
Pruning:												
Winter flowering shrubs			x	x								
Shrubs flowering between March and July								x				
Shrubs flowering between July and October: Back to old wood in winter.											x	x
Removal of dead plant material: At the end of the growing season, check all shrubs and remove all dead foliage, dead wood, and broken or damaged branches and stems.										x		
Native Hedgerows												
Stakes and Ties: Adjusted each year to allow for growth.	As required											
Pruning: Cut back in winter to encourage bushy growth and achieve planning height and width.	x	x	x							x	x	x
Ornamental Hedgerows												
Pruning: Cut back in winter to encourage busy growth and achieve planning height and width.	x	x	x							x	x	x
Existing and proposed trees												
Existing Trees: All trees to be checked to ensure healthy growth and safety. Pruning as required in accordance with BS 3998.												
Crown lifting/thinning: Ensure a clearance of 2.5m above footpaths/roadways to maintain sightlines. Ensure footpaths and routes are clear from obstructions.	As required and approved											
Monitoring: Remove dead, diseased or dying trees, fungal growths, fruiting bodies, climbing plants and any other foreign objects.	Monthly											
Thinning: Where the density of cover has increased such that their growth is restricting that of other species. Where possible felled species should be left in situ to provide invertebrate habitat.	As required and approved											
Play Areas												

Ongoing Maintenance Operations Years 2-5	Timing of operations (January to December)											
	J	F	M	A	M	J	J	A	S	O	N	D
Monitoring: Regular visual checking of all play equipment and tightening/adjustments to fixings and fittings in accordance with manufacturer's instructions. Where defects occur areas are to be immediately fenced off and repairs are to be made at the earliest opportunity.	Monthly											
Hard surfaces and gravel areas												
Weed control to hard surfaces: Apply herbicide to hard surfaces at the start of the growing season or as required.			x	x								
Clean hard surfaces: Remove litter, leaves and other debris from all hard surfaces. Where necessary repair paving areas in accordance with the original paving specification. Remove any stains in accordance with BS 7370-2, table 4.	As required and approved											
Clean drains: Remove mud, silt and debris from surface gutters and channels. Empty traps and flush clean drainage gullies.	As required and approved											
Maintain gravel areas: Rake over any gravel areas and remove weeds, litter, leaves and debris, and level off.	As required and approved											

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