MARCH 17, 2025

DEVELOPMENT AT LAND OFF HINCHLEY ROAD, BLACKLEY

Energy Statement
REV D 22/05/2026

MATTHEW HURD

ON BEHALF OF MILLER HOMES

Email: requests@energyanddesign.co.uk Tel: 01543 547771

Energy&Design

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1.0 INTRODUCTION

1.1 CONTEXT

This Statement was prepared by Energy & Design Ltd. on behalf of Miller Homes Limited to support a planning application for the proposed 106-dwelling development at Land off Hinchley Road, Blackley.

This energy and sustainability statement shows that the requirement will be met to comply with the following Documents:

Building Regulations L12021

National Planning Policy Framework (NPPF)

Policy JP-S2 Carbon and Energy

1.2. DESCRIPTION OF DEVELOPMENT

The development at Land off Hinchley Road, Blackley, proposes 106 plots. These plots comprise a range of detached, semi-detached and terraced dwellings.

The current site is shown below.



1.3. PROJECT BRIEF

The development is being designed according to the council policy JP-S2 Carbon and Energy, to reduce carbon (kg CO2/year) over L12021 targets.

2.0 METHODOLOGY

2.1 ASSESSMENT METHODOLOGY

Energy & Design Ltd. has modelled sample types using the L12021 methodologies to calculate the dwellings' CO2 emissions (kgCO2/year), total energy demand, and end design usage.

This will allow us to show compliance in two steps.

1) Baseline CO_2 emissions – this will be calculated and given in Total CO_2 emissions ($kgCO_2$/year). SAP uses the Target Emission Rate (TER = Target CO_2 kilograms per M2 of total useful floor area per year) to create the baseline for compliance with the approved document Part L12021. This is then multiplied by the total useful floor area to calculate the Target CO_2 emissions.
2) Then, we calculate the design CO2 emissions by multiplying the Design Emission Rate (DER = Design CO2 kilograms per M2 of total useful floor area per year) by the total useful floor area.
3) We then calculate the reduction of CO_2 kilograms per year as a percentage

3.0 BASELINE ENERGY DEMAND

3.1 THE DEVELOPMENT BASELINE

To evaluate the proposed energy strategy, it is essential to determine the baseline first. In this case, it is the Target Emission Rate for CO_2 emissions per year and the total energy demand.

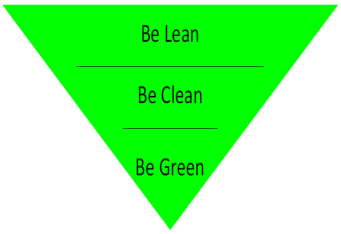
The proposed dwellings have been modelled in L12021 software, and the maximum CO_2 emissions permitted for the site to comply with L12021 are as per the baseline.

The baseline CO_2 emissions are shown below:

Target Emission Rate: Compliant with AD L12021	
Total CO_2 emissions – $kgCO_2$/year	108,354.14

4.0 CO_2 REDUCTION STRATEGY – FABRIC, LOW CARBON, AND RENEWABLE APPROACH

4.1 ENERGY HIERARCHY



Reduce energy through fabric and passive design

Use energy efficiently

Produce on site renewable energy

The proposed dwellings have been designed by the 'energy hierarchy', which aims to reduce energy demand through passive design measures and a fabric-first approach before utilising low-carbon energy and the production of on-site renewable energy.

4.2 ENERGY EFFICIENCY MEASURES

The proposed design will reduce thermal energy demand by targeting improved insulation levels, air leakage, and fabric u-values that align with current building regulations' requirements.

The following measures to reduce energy use and carbon emissions have been included in the design of the new dwellings:

- Design new homes to optimise natural daylight in all the habitable spaces with suitable window sizes relative to living rooms and bedrooms.
- Design and layout to promote passive solar gains and maximise natural daylight, sunlight and ventilation, with most homes orientated to the South or West.
- Development which balances minimising the direct adverse impact of shading from other buildings and landscape features and improving access to passive solar gains.
- High-performance glazing with appropriate window u-values and g-values to reduce heat loss and optimise positive solar gain while reducing the potential for overheating.
- 100% low energy lighting.
- Bespoke individual PSI values - these have been calculated and used; this assists in Fabric Energy Efficiency by designing out the cold bridges, which may occur if using the Approved details.
- TMP – the TMP (Thermal Mass Perimeter) has been calculated rather than using default figures as required by L12021; this now reflects the actual as-built dwelling more accurately, closing the gap between design and as-built performance.

4.3 PROPOSED FABRIC FIRST SPECIFICATION

The following are the U-values of the proposed fabric.

Element	Limiting Average Values - Part L12021	Proposed Average Values
Ground Floor U-Value (W/m^2K)	0.18	0.14
External Wall U-Value (W/m^2K)	0.26	0.21
Party Wall U-Value (W/m^2K)	0.20	0.00 (fully filled & sealed)
Roof - Insulated at ceiling U-Value (W/m^2K)	0.16	0.07
Window U-Value (W/m^2K)	1.60	1.30
Door U-Value (W/m^2K)	1.60	1.50
Design Air Permeability $m^3/h.m^2$ at 50 Pa	8.00	4.50

5.0 LOW AND ZERO CARBON (LZC) TECHNOLOGIES

5.1 TECHNOLOGIES

The following technologies will be assessed for appropriateness in the development.

- Air Source Heat Pumps (ASHP)
- Ground Source Heat Pumps (GSHP)
- Biomass Technology
- Solar Hot Water (SHW) Technology
- Photovoltaic (PV) Technology
- Flue Gas Heat Recovery (FGHRS) Technology
- Waste Water Heat Recovery (WWHRS) Technology

5.2 AIR SOURCE HEAT PUMP (ASHP)

ASHP technology extracts heat from the external air and condenses this energy to heat a smaller space within a dwelling or non-domestic building. A pump circulates a refrigerant through a coil to absorb energy from the air. This refrigerant is then compressed to raise its temperature, which can be used for space heating and domestic hot water.

Advantages

- Mature technology
- Can assist in cooling.
- Approx. 250% efficient using electricity.

Disadvantages

- Hot water cylinder required.
- Either oversized radiators or underfloor heating is required
- Currently, the running costs are high compared to a gas system.
- Can be noisy.

Conclusion

ASHP has been deemed **suitable for this development.**

5.3 GROUND SOURCE HEAT PUMP (GSHP)

GSHP technology exploits seasonal temperature differences between the ground and air. Fluid is pumped through pipes laid in the ground, taking up heat extracted by the heat pump and released at a higher temperature to drive a space heating system. The pipework is placed either horizontally or vertically in the ground.

Advantages

- More efficient than ASHP
- Mature technology
- Can assist in cooling.
- Approx. 320% efficient using electricity.

Disadvantages

- Costly to install.
- Hot water cylinder required.
- Either oversized radiators or underfloor heating is required
- Currently, the running costs are high compared to a gas system.
- Can be noisy.

Conclusion

Due to the cost, GSHP has been deemed **unsuitable for this development.**

5.4 BIOMASS TECHNOLOGY

Biomass boilers work on the principle that the combustion of wood chips or pellets can create heat for space heating and hot water.

Advantages

- Considerable reduction in CO_2 emissions

Disadvantages

- Can be costly to run compared to a gas boiler.
- Space for a plant room to store fuel and plant.
- Regular maintenance may be required.
- A local source of fuel (reduce transport emissions)

Conclusion

Due to the cost and the requirement of space for plant and fuel storage, Biomass has been deemed **unsuitable for this development.**

5.5 SOLAR HOT WATER (SHW) TECHNOLOGY

Solar thermal technology harnesses solar energy to generate heated water.

Advantages

- Mature Technology
- Approx. 50% of hot water demand can be met.
- Low maintenance

Disadvantages

- Not always aesthetically pleasing.
- The benefit of installation is limited to the water heating demand.
- A Large hot water cylinder is required.
- If the system is oversized can contribute to overheating
- Access for maintenance
- Not as many installers as previously
- Benefits not as good as similar technologies.

Conclusion

Due to the number of disadvantages, SHW has been deemed **unsuitable for this development.**

5.6 PHOTOVOLTAIC (PV) TECHNOLOGY

Photovoltaic (PV) technology involves converting the sun's energy into electricity.

Advantages

- Mature Technology
- Low maintenance
- Easily integrated.

Disadvantages

- Not always aesthetically pleasing.
- Poor design can lead to lower-than-expected yields.
- Access for maintenance

Conclusion

Due to the benefits of this technology, PV has been deemed **suitable for this development.**

5.7 FLUE GAS HEAT RECOVERY (FGHRS) TECHNOLOGY

Flue Gas Heat Recovery (FGHRS) technology helps improve the efficiency of your heating system by recovering heat from flue gases.

Advantages

- Helps improve the efficiency of your heating system by recovering heat from flue gases.
- Use less gas for the same temperature.
- Fit and forget technology, very little maintenance required.

Disadvantages

- Not always aesthetically pleasing.
- Access for maintenance

Conclusion

Due to the benefits gained from this technology, FGHRS has been **deemed suitable** for appropriate plots **for this development.**

5.8 WASTEWATER HEAT RECOVERY (WWHRS) TECHNOLOGY

Wastewater Heat Recovery System (WWHRS) technology uses the residual heat from the waste shower water to preheat the incoming cold feed that refills the system. Therefore, less energy is used to heat that water to the required temperature.

Advantages

- It helps improve the efficiency of your heating system by using technology that uses the residual heat from the waste shower water to preheat the incoming cold feed that refills the system.
- Use less gas for the same temperature.
- Fit and forget technology; very little maintenance required.

Disadvantages

- Access for maintenance

Conclusion

Due to the benefits gained from this technology, WWHRS has been **deemed suitable** for appropriate plots **for this development.**

5.9 CONCLUSION

The following technologies have been deemed suitable for this development.

- Air Source Heat Pump (ASHP)
- Photovoltaic (PV) Technology
- Flue Gas Heat Recovery System (FGHRS) – If Using Gas
- Waste Water Heat Recovery System (WWHRS)

ASHP and PV have been chosen for this development.

For this site, it is currently proposed that all plots will use ASHP and PV

5.10 PROPOSED FABRIC & LZC RESULTS

ASHP has been chosen as the preferred technology for this development to reduce emissions over L12021 regulations.

Target & Design Emission Rate L12021: Compliant		
Target Total CO_2 emissions – $kgCO_2$/year L12021	108,354.14	
Design Total CO_2 emissions – $kgCO_2$/year L12021	14,031.13	
Total achieved reduction $kgCO_2$/year	**94,323.01**	**87.05%**

6.0 WATER CONSERVATION

6.1 WATER CALCULATOR

All new developments must be designed to use water efficiently.

Using low-water-use fixtures and water restrictors, water consumption will be under 110 litres per person per day, compared to the Part G building regulations, which are 125 litres per person per day. An example of how this can be done is below.

breglobal

Job no:	
Date:	24/08/2023
Assessor name:	Matthew Hurd
Registration no:	BREAM-900
Development name:	Miller Homes Ltd

Clear

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PRINTING: before printing please make sure that in "Page Setup" you have selected the page to be as "Landscape" and that the Scale has been set up to 70% (maximum)

WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)

		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
	House Type:	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
	Description:	Sample																			
Installation Type	Unit of measure	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day
Is a dual or single flush WC specified?		Dual		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Click to Select		Click to Select		Click to Select	
WC	Full flush volume	4	5.84		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Part flush volume	2.6	7.70		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Taps (excluding kitchen and external taps)	Flow rate (litres / minute)	5	9.48		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Are both a Bath & Shower Present?		Bath & Shower		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Bath	Capacity to overflow	181	19.91		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Shower	Flow rate (litres / minute)	8	34.96		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Kitchen sink taps	Flow rate (litres / minute)	6	13.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a washing machine been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Washing Machine	Litres / kg		17.16		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a dishwasher been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Dishwasher	Litres / place setting		4.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a waste disposal unit been specified?		No	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00
Water Softener	Litres / person / day		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Calculated Use			112.5		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Normalisation factor			0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91
Code for Sustainable Homes	Total Consumption		102.4		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
	Mandatory level		Level 3/4		-		-		-		-		-		-		-		-		-
Building Regulations 17.K	External use		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0
	Total Consumption		107.4		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
	17.K Compliance?		Yes		-		-		-		-		-		-		-		-		-

7.0 SUMMARY

7.1 TECHNOLOGIES

All plots will use ASHP and PV.

7.2 CARBON REDUCTION

Using fabric and ASHP, an **average reduction of 87.05% in carbon emissions (kg CO2/year) is expected against L12021 targets across the site.**

This complies with Policy JP-S2 Carbon and Energy.

APPENDIX A – SITE LAYOUT



1:500 0 5 10 15 25m

DRAWING LEGEND: -

- Denotes Development Boundary
- Denotes 1.8m High Close Board Fence refer to boundary treatments plan
- Denotes 1.8m High Screen Wall refer to boundary treatments plan
- Denotes 450mm High Low Level Wall & with 600mm Railings above & 1100mm brick piers refer to boundary treatments plan
- Denotes 600mm high Railings with upstand refer to boundary treatments plan
- Denotes Indicative Hedge Planting/Soft Landscaping. Refer to landscaping plans
- Denotes Indicative Hedge Planting/Soft Landscaping within managed areas. Refer to landscaping layout.
- Denotes Affordable Shared Ownership
- Denotes Social Rented
- Denotes Indicative Block Paving Finishes. refer to hard surfacing plan.
- Denotes Indicative trees. Refer to landscaping layout.
- Denotes Timber Cycle Shed
- Denotes Refuse Bin Locations

miller homes	Project : Hinchley Road, Charlestown			Rev C 15.07.25	
Open Market					
Housetype	Description	Sqft.	Number	Total Sq ft	% of Mix
Harper Mid	3 Bed Mid Mews	947	2	1894	1.9
Harper Semi	3 Bed Semi	947	17	16099	16.0
Lever Semi	3 Bed Semi	993	9	8937	8.5
Langton Semi	3 Bed Semi	1,177	16	18832	15.1
Barton Detached	3 Bed Detached	1,171	12	14052	11.3
Barton Semi Detached	3 Bed Semi	1,171	14	16394	13.2
Worthington	4 Bed Detached	1,175	6	7050	5.7
Kimpton	4 Bed Detached	1,291	8	10328	7.5
			84	**93586**	**79.2**
AFFORDABLE					
Housetype	Description	Sqft.	Number	Total Sq ft	% of Mix
Social Rented					
Latchford Mid	2 Bed Mid Mews	1118	2	2236	1.9
Latchford Semi	2 Bed Semi	1118	6	6708	5.7
Crawford Mid	2 Bed Semi	764	1	764	0.9
Crawford Semi	2 Bed Semi	764	2	1528	1.9
			11		**10.4**
Shared Ownership					
Crawford Semi	2 Bed Semi	764	2	1528	1.9
Harper Mid	3 Bed Mid Mews	947	1	947	0.9
Harper Semi	3 Bed Semi	947	5	4735	4.7
Lever Semi	3 Bed Semi	993	1	993	0.9
Latchford Semi	2 Bed Semi	1118	2	2236	1.9
			11		**10.4**
			22	**21675**	**20.8**
	Total		**106**	**115261**	**100**

Rev.	Description	Drawn	Date
C	Layout amended to reflect planner comments.	AD	22.07.25
B	Frontage railing locations amended & set back to create proposed managed landscape buffer.	AD	25.03.25
A	Cycle stores & Refuse points added.	AD	18.03.25

miller homes
Miller Homes Limited - North West Region
103 Dalton Avenue
Birchwood Park
Warrington
WA3 6YF

Telephone 0870 336 4700
www.millerhomes.co.uk

Project Title: HINCHLEY ROAD, CHARLESTOWN

Drawing Title: SITE LAYOUT PLAN

Scale	Drawn By	Checked By	Authorised By
1:500	MG	-	-
	Date 21.02.25	Date -	Date -

Job No.	Drawing No.	Revision
809380	HR-SL-01	C

Original Sheet Size A1 Do Not Scale From This Drawing

APPENDIX B – CARBON REDUCTION RESULTS

	Target L12021				Design L12021				
Plot Reference			# Total CO2 / Year		Assumed Technology			##Total CO2 / Year	Percentage reduction
	TER	TFA	(TER X TFA)			DER	TFA	(DER X TFA)	CO2/Year
Plot 001	10.42	92.28	961.56		ASHP & PV	1.34	92.28	123.66	87.14
Plot 002	10.7	88.02	941.81		ASHP & PV	1.56	88.02	137.31	85.42
Plot 003	9.67	103.86	1,004.33		ASHP & PV	1.15	103.86	119.44	88.11
Plot 004	9.67	103.86	1,004.33		ASHP & PV	1.15	103.86	119.44	88.11
Plot 005	9.49	108.8	1,032.51		ASHP & PV	1.16	108.80	126.21	87.78
Plot 006	9.49	108.8	1,032.51		ASHP & PV	1.16	108.80	126.21	87.78
Plot 007	10.64	88.02	936.53		ASHP & PV	1.64	88.02	144.35	84.59
Plot 008	11.17	92.28	1,030.77		ASHP & PV	1.46	92.28	134.73	86.93
Plot 009	11.04	109.2	1,205.57		ASHP & PV	0.96	109.20	104.83	91.30
Plot 010	10.46	88.02	920.69		ASHP & PV	1.59	88.02	139.95	84.80
Plot 011	11.46	92.28	1,057.53		ASHP & PV	1.24	92.28	114.43	89.18
Plot 012	10.58	101.37	1,072.49		ASHP & PV	1.62	101.37	164.22	84.69
Plot 013	10.58	101.37	1,072.49		ASHP & PV	1.62	101.37	164.22	84.69
Plot 014	10.64	88.02	936.53		ASHP & PV	1.64	88.02	144.35	84.59
Plot 015	9.47	88.02	833.55		ASHP & PV	1.25	88.02	110.03	86.80
Plot 016	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 017	11.49	99.91	1,147.97		ASHP & PV	0.97	99.91	96.91	91.56
Plot 018	9.49	108.8	1,032.51		ASHP & PV	1.16	108.80	126.21	87.78
Plot 019	9.49	108.8	1,032.51		ASHP & PV	1.16	108.80	126.21	87.78
Plot 020	11.49	99.91	1,147.97		ASHP & PV	0.97	99.91	96.91	91.56
Plot 021	10.64	88.02	936.53		ASHP & PV	1.64	88.02	144.35	84.59
Plot 022	11.17	92.28	1,030.77		ASHP & PV	1.46	92.28	134.73	86.93
Plot 023	10.58	108.8	1,151.10		ASHP & PV	1.14	108.80	124.03	89.22
Plot 024	9.62	103.86	999.13		ASHP & PV	1.14	103.86	118.40	88.15
Plot 025	9.62	103.86	999.13		ASHP & PV	1.14	103.86	118.40	88.15
Plot 026	12.09	70.96	857.91		ASHP & PV	1.56	70.96	110.70	87.10
Plot 027	10.78	70.96	764.95		ASHP & PV	1.72	70.96	122.05	84.04
Plot 028	12.09	70.96	857.91		ASHP & PV	1.56	70.96	110.70	87.10
Plot 029	10.46	88.02	920.69		ASHP & PV	1.59	88.02	139.95	84.80
Plot 030	9.3	88.02	818.59		ASHP & PV	1.20	88.02	105.62	87.10
Plot 031	10.52	88.02	925.97		ASHP & PV	1.61	88.02	141.71	84.70
Plot 032	12.09	70.96	857.91		ASHP & PV	1.56	70.96	110.70	87.10
Plot 033	12.09	70.96	857.91		ASHP & PV	1.56	70.96	110.70	87.10
Plot 034	10.64	88.02	936.53		ASHP & PV	1.64	88.02	144.35	84.59
Plot 035	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 036	9.67	103.86	1,004.33		ASHP & PV	1.15	103.86	119.44	88.11
Plot 037	8.72	103.86	905.66		ASHP & PV	1.68	103.86	174.48	80.73
Plot 038	9.67	103.86	1,004.33		ASHP & PV	1.15	103.86	119.44	88.11
Plot 039	9.67	103.86	1,004.33		ASHP & PV	1.15	103.86	119.44	88.11
Plot 040	8.72	103.86	905.66		ASHP & PV	1.68	103.86	174.48	80.73
Plot 041	9.67	103.86	1,004.33		ASHP & PV	1.15	103.86	119.44	88.11
Plot 042	10.64	88.02	936.53		ASHP & PV	1.64	88.02	144.35	84.59
Plot 043	9.47	88.02	833.55		ASHP & PV	1.74	88.02	153.15	81.63
Plot 044	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 045	10.41	108.8	1,132.61		ASHP & PV	1.37	108.80	149.06	86.84
Plot 046	10.52	101.37	1,066.41		ASHP & PV	1.56	101.37	158.14	85.17
Plot 047	10.52	101.37	1,066.41		ASHP & PV	1.56	101.37	158.14	85.17
Plot 048	10.63	88.02	935.65		ASHP & PV	1.53	88.02	134.67	85.61
Plot 049	10.75	92.28	992.01		ASHP & PV	1.43	92.28	131.96	86.70
Plot 050	11.06	99.91	1,105.00		ASHP & PV	1.13	99.91	112.90	89.78
Plot 051	10.27	108.8	1,117.38		ASHP & PV	1.32	108.80	143.62	87.15
Plot 052	10.27	108.8	1,117.38		ASHP & PV	1.32	108.80	143.62	87.15
Plot 053	10.38	101.37	1,052.22		ASHP & PV	1.41	101.37	142.93	86.42
Plot 054	10.38	101.37	1,052.22		ASHP & PV	1.41	101.37	142.93	86.42
Plot 055	11.06	99.91	1,105.00		ASHP & PV	1.13	99.91	112.90	89.78
Plot 056	11.06	99.91	1,105.00		ASHP & PV	1.13	99.91	112.90	89.78
Plot 057	9.37	108.8	1,019.46		ASHP & PV	1.02	108.80	110.98	89.11
Plot 058	9.37	108.8	1,019.46		ASHP & PV	1.02	108.80	110.98	89.11
Plot 059	11.2	99.91	1,118.99		ASHP & PV	1.31	99.91	130.88	88.30
Plot 060	10.52	88.02	925.97		ASHP & PV	1.61	88.02	141.71	84.70
Plot 061	10.73	92.28	990.16		ASHP & PV	0.97	92.28	89.51	90.96
Plot 062	11.22	109.2	1,225.22		ASHP & PV	0.94	109.20	102.65	91.62
Plot 063	9.49	108.8	1,032.51		ASHP & PV	1.16	108.80	126.21	87.78
Plot 064	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 065	10.48	92.28	967.09		ASHP & PV	0.90	92.28	83.05	91.41
Plot 066	9.49	108.8	1,032.51		ASHP & PV	1.16	108.80	126.21	87.78
Plot 067	9.49	108.8	1,032.51		ASHP & PV	1.56	108.80	169.73	83.56
Plot 068	10.39	108.8	1,130.43		ASHP & PV	1.07	108.80	116.42	89.70
Plot 069	10.58	101.37	1,072.49		ASHP & PV	1.62	101.37	164.22	84.69
Plot 070	10.58	101.37	1,072.49		ASHP & PV	1.62	101.37	164.22	84.69
Plot 071	10.6	101.37	1,074.52		ASHP & PV	1.51	101.37	153.07	85.75
Plot 072	10.6	101.37	1,074.52		ASHP & PV	1.51	101.37	153.07	85.75
Plot 073	10.6	101.37	1,074.52		ASHP & PV	1.51	101.37	153.07	85.75
Plot 074	10.6	101.37	1,074.52		ASHP & PV	1.51	101.37	153.07	85.75
Plot 075	10.39	108.8	1,130.43		ASHP & PV	1.07	108.80	116.42	89.70
Plot 076	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 077	10.47	92.28	966.17		ASHP & PV	1.35	92.28	124.58	87.11
Plot 078	10.36	108.8	1,127.17		ASHP & PV	1.08	108.80	117.50	89.58
Plot 079	10.39	108.8	1,130.43		ASHP & PV	1.07	108.80	116.42	89.70
Plot 080	9.49	108.8	1,032.51		ASHP & PV	1.56	108.80	169.73	83.56
Plot 081	9.49	108.8	1,032.51		ASHP & PV	1.56	108.80	169.73	83.56
Plot 082	11.49	99.91	1,147.97		ASHP & PV	1.39	99.91	138.87	87.90
Plot 083	10.58	101.37	1,072.49		ASHP & PV	1.62	101.37	164.22	84.69
Plot 084	10.58	101.37	1,072.49		ASHP & PV	1.62	101.37	164.22	84.69
Plot 085	10.39	108.8	1,130.43		ASHP & PV	1.07	108.80	116.42	89.70
Plot 086	11.22	109.2	1,225.22		ASHP & PV	1.22	109.20	133.22	89.13
Plot 087	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 088	10.64	88.02	936.53		ASHP & PV	1.64	88.02	144.35	84.59
Plot 089	11.55	99.91	1,153.96		ASHP & PV	1.41	99.91	140.87	87.79
Plot 090	10.7	88.02	941.81		ASHP & PV	1.66	88.02	146.11	84.49
Plot 091	10.47	92.28	966.17		ASHP & PV	1.35	92.28	124.58	87.11
Plot 092	11.01	109.2	1,202.29		ASHP & PV	0.96	109.20	104.83	91.28
Plot 093	9.46	108.8	1,029.25		ASHP & PV	1.16	108.80	126.21	87.74
Plot 094	9.48	108.8	1,031.42		ASHP & PV	1.16	108.80	126.21	87.76
Plot 095	9.46	108.8	1,029.25		ASHP & PV	1.16	108.80	126.21	87.74
Plot 096	9.46	108.8	1,029.25		ASHP & PV	1.16	108.80	126.21	87.74
Plot 097	11.03	109.2	1,204.48		ASHP & PV	0.95	109.20	103.74	91.39
Plot 098	10.48	101.37	1,062.36		ASHP & PV	1.52	101.37	154.08	85.50
Plot 099	10.48	101.37	1,062.36		ASHP & PV	1.52	101.37	154.08	85.50
Plot 100	11.03	109.2	1,204.48		ASHP & PV	0.95	109.20	103.74	91.39
Plot 101	10.36	108.8	1,127.17		ASHP & PV	1.07	108.80	116.42	89.67
Plot 102	10.46	88.02	920.69		ASHP & PV	1.59	88.02	139.95	84.80
Plot 103	10.52	88.02	925.97		ASHP & PV	1.61	88.02	141.71	84.70
Plot 104	10.36	108.8	1,127.17		ASHP & PV	1.07	108.80	116.42	89.67
Plot 105	10.46	88.02	920.69		ASHP & PV	1.59	88.02	139.95	84.80
Plot 106	11.46	92.28	1,057.53		ASHP & PV	1.24	92.28	114.43	89.18
Total			108,354.14					14,031.13	87.05

= data taken from the L12021 Target SAP worksheet section 12a box 272
= data taken from the L12021 design SAP worksheet section 12a box 272

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