



Feasibility Report for HOMES FOR HARINGEY

Noel Park Conservation Area – Decent Homes &
POD replacements

By

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Summary

The Noel Park Estate is a designated conservation area consisting of a series of different house types. During the 1970s, pre-fabricated bathrooms “PODS” were added to the rear of 217 dwellings. The PODS have survived far in excess of their intended design life, and are now showing a large number of significant defects; notably movement of the foundations, damp and a latent asbestos issue.

Most of the estate properties do not meet the government’s “Decent Homes” standards. Homes for Haringey (HfH) require a delivery plan to carry out the necessary decent homes work on the estate and concurrently overcome the issues relating to the PODS. It is proposed that a pilot scheme will be carried out, based upon the recommendations of this report. It is the intention to then roll out a full programme of decent homes and POD works to the remainder of the estate, capturing any learning from the initial pilot project.

HfH have instructed John Rowan & Partners (JRP) to prepare this feasibility report, in respect of the pilot properties, identifying the available courses of action and the relative benefits, or drawbacks, of each POD remedial option. For each alternative, the following key factors have been considered and compared: Initial Capital Cost; Life Expectancy; Life Cycle Cost; Duration of work; Disruption to Residents; Remaining Health Hazards post completion; Access to the rear gardens; Implications for arranging resident decants; Space Utilisation; Build quality and finish of the end product.

Within the estate there are 28 tenanted houses with POD bathrooms, designated “P4 archetypes”. We recommend demolition and removal of these pods and reconfiguring the internal ground floor layout to dispense the need of replacing the POD (Option E). This work can be phased without the need to decant residents and will potentially save HfH over 500k in comparison to replacing the structure.

Our recommendation is to replace all of the PODS (except P4 archetypes) with Pre-fabricated PODS, secured on an alloy helical pile foundation system (Option D). The capital costs of this method are comparable to those for replacing the POD with out buildings constructed using traditional methods. Crucially, Option D requires no decanting of the residents and would shorten the duration of the estate wide improvement works by approximately 18 months. Both options will deliver consequential savings to HfH in terms of management resource, legal costs and the need to provide alternative accommodation.

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1 Existing Housing Stock

1.1 Designated Pilot Properties

HfH produced a report in November 2004 categorising the Noel Park POD properties into 4 generic archetypes. It has been proposed that the pilot projects will select the following stock.

Unit	Address	Property Type	POD Archetype
1	183 Gladstone Avenue, N22 6LB	Ground Floor Maisonette Flat	P1
2	183a Gladstone Avenue, N22 6LB	First Floor Maisonette Flat	P1
3	t.b.c.	3 bedroom house	P4

JRP carried out a full measured survey and condition report of units 1 & 2 in October 2009. The findings of those investigations are utilised within this report. Since the address of unit 3 is still to be confirmed, we are unable to comment upon the condition of the property.

1.2 General Defects

We have been advised that the PODS were built in several batches over a period of approximately 5 years. Although the construction details may vary between batches, the typical defects can be summarised as follows:

- The raft foundations are generally insufficient for purpose; with many now demonstrating failures due to settlement and/or subsidence
- The PODS are freestanding on the rafts, with little or no tie-back restraints to the original building. The PODS are frequently seen to be ‘falling away’ from the main building with gaps of over 150mm between the original buildings and POD structures being observed
- Concern is highlighted that further movement could rupture or sever services between the main building and the POD
- The construction materials and make-up of the PODS are not thermally efficient and do not comply with current building regulations
- Internal condensation to walls and ceilings due to insufficient ventilation is common
- Rotting timbers to window and door components
- Damp and rotting floor joists; frequently deflecting due to loss of structural bearing strength
- Internal damp due to roof leaks
- Fixings of internal fittings failing due to consequential degradation from damp and corrosion

- De-laminating of plywood cladding panels and failure of fixings; panels coming loose
- Peeling of external painting and textured coatings
- Ponding of water on flat roofs; consequential leaking
- Gutter and down pipe connections becoming loose due to movement etc.

In addition to the above the HfH report highlights that the construction of the POD walls are timber frame, containing rockwool insulation, sandwiched between asbestos boards (chrysotile and amosite fibres). The external asbestos insulation board is overlaid. The report also highlights the likelihood of asbestos fibres within the vinyl flooring. Consequently, any remedial solution should make full consideration of the management of this health hazard. In some instances, the separation of the POD structures has exposed asbestos materials; increasing the risk of release of harmful fibres.

The Haringey Council Design & Engineering Services Group advised in their report of October 2004 that underpinning the raft foundations was an unreasonable consideration bearing in mind the remaining life expectancy of the POD structures. The memo recommended the demolition of these structures and replacing the existing foundations with new ones suitable for the ground conditions and purpose.

2 POD Remedial Works – Available Options

The following POD solutions have been investigated:

OPTION

- A.** Repair and refurbish the existing bathroom pod, including underpinning the existing foundations
- B.** Demolish and remove the existing pre-fabricated POD. Construct new bathroom extension using traditional in-situ construction methods.
- C.** Demolish and remove existing pre-fabricated POD. Install new in-situ concrete strip foundations. Install new pre-fabricated bathroom POD extension.
- D.** Demolish and remove existing pre-fabricated POD. Install alloy metal helical pile foundations. Install new pre-fabricated bathroom POD extension.
- E.** In respect of P4 archetype – demolish and remove existing bathroom POD. Re-configure original internal space to negate the need to occupy the outgoing POD footprint.

2.1 OPTION A - Refurbishment

The internal condition of the PODS is generally poor and the bathrooms largely fail to meet the minimum requirements for 'Decent Homes'. The asbestos panelling is integral to the external envelope structure. No guarantee could be made as to the remaining structural integrity of the POD if the asbestos was to be first removed. It is very likely that removing the asbestos panelling would weaken the structure to such an extent that removal of the hazard is not practical. Consequently, practical solutions for increasing the thermal efficiency of the PODS are largely limited to over-cladding of the unit.

Over cladding could also assist in improving water-tightness of the unit, but is unlikely to improve the structural stability of the units. Generally, the condition of windows and doors are poor and replacement is necessary. We estimate a cost of approximately £17k per unit to carry out the necessary essential repairs to the PODS. HfH estimated that repair works could

potentially prolong the life of the PODS by another 15 years. At that point it would be wise to assume that demolition and replacement would be the only viable course of action.

As there is only one bathroom in each dwelling, residents would have to be de-canted while the internal bathroom replacements take place.

2.2 OPTION B - POD Replacement with Traditional Construction

Demolish and remove existing structure, safely remove asbestos, traditional strip concrete foundations. Flat roof extension to existing footprint of POD, insulated cavity walls, double skin blockwork with rendered finish similar to existing PODS, uPVC windows.

A number of properties have nearby trees; affecting foundation design. In some cases, new foundations will have to exceed 3m depth in order to comply with building control. The in-situ foundations may subsequently require temporary shoring works to provide earth support during the excavations. Deep excavations can increase the level of precautionary measures required to comply with health and safety and increase risk of party wall matters.

Due to access restrictions, the demolition (including asbestos) materials shall be removed off-site through the building. Alternatively, rear gardens can be converted into temporary access routes, however this comes with cost and legal rights of access implications. New materials shall be delivered by the same means. This will dictate a slow and labour intensive construction process. The necessary working at height will require scaffold erection, the delivery of which could be complicated by access restrictions.

The new construction would be compliant with current building regulations and insulated, as a minimum, to achieve the current U-value standards. Greater thermal efficiencies can be designed into the proposal.

Again, existing bathroom provisions dictate residents de-canting while works progress, the relatively long on-site phase leading to longer decant periods for residents.

As with any form of on-site construction, the working environment is inconsistent. This can lead to issues in the quality of workmanship. Life expectancy for the new-build extension is 60 years.

2.3 OPTION C - Off-Site Manufactured POD Replacement (Traditional Foundations)

Demolish and remove existing structure, safely remove asbestos, traditional strip concrete foundations. Supply and install new pre-fabricated bathroom POD.

The constraints in respect of demolition, asbestos removal and groundworks will be the same as those in OPTION B. It would be envisaged that the pre-fabricated POD would be craned into position over the property. JRP and HfH have been discussing the viability of pre-fabricated PODS with Target Fixings. Target do not envisage any issues in being able to site mobile cranes to install PODS to any of the Noel Park POD properties. If required, PODS could be delivered as flat packs with the final assembly carried out on site; although this is not envisaged necessary.

Again, existing bathroom provisions dictate residents de-canting while works progress. The consistent production environment conditions associated with factory assembly provide greater probability of delivering good quality workmanship.

The Pre-fabricated POD would be compliant with current building regulations and insulated, as a minimum, to achieve the current U-value standards. As with Option B, the thermal efficiency can be increased prior to manufacture. The life expectancy of the POD is 60 years; the same as that for the traditional construction.

2.4 OPTION D – Off-Site Manufactured POD Replacement (Helical Pile Foundations)

Target fixings have offered their patented 'Helipile' system. This aluminium alloy piling system requires no curing time prior to follow on works being commenced.

Using Target's helipile system and their pre-fabricated PODS, the entire demolition, removal of the existing structure, asbestos removal, and installation of the new POD could be carried out in approximately 4 hours.

Targets propose to encapsulate the existing PODS and lift them off-site, intact. The existing foundations can then be punctured to facilitate the installation of the helipiles. Once in place, the new POD can be crane lifted into position. As previously noted, Target do not envisage any issues in being able to site mobile cranes to install PODS to any of the Noel Park POD properties.

Due to the bathroom POD being replaced within a day, there is no need to decant residents. The consistent production environment conditions associated with factory assembly provide greater probability of delivering good quality workmanship. The method of this POD option causes the least disruption to residents of any replacement alternatives.

The Pre-fabricated POD would be compliant with current building regulations and insulated, as a minimum, to achieve the current U-value standards. The life expectancy of the POD is 60 years; the same as that for the traditional construction. In respect of this option and Option C, the residents may require extensive consultation so that they fully appreciate that the new PODS, whilst pre-fabricated, are of a much higher build quality than the existing units and that their life expectancy and quality are on a par (if not better) with that of Option B.

Copies of technical information from Target fixings are included in Appendix C

2.5 OPTION E – Internal Reconfiguration (P4 Archetype only)

Archetype P4s are small 3 bedroom houses with a single storey POD extension. Concerns have been raised by HfH as to the suitability of the existing kitchen spaces for installing a 'Decent Homes' kitchen. Volumetric storage requirements for kitchens are defined under the CLG guidelines as those appropriate to the size and type of property. In these P4 type properties, the bedrooms are all on the first floor. JRP propose that the ground floor space is re-designated such that the current rear dining rooms are converted in use to kitchen diners. This will enable a decent homes kitchen of suitable storage volume to be installed. The space previously occupied by the small kitchen can now host a new bathroom, hence removing the need to replace the bathroom POD. The existing POD can therefore be removed off-site providing greater garden space for the resident and lower future maintenance costs for HFH.

The new layout will be smaller in floor area than the existing plan, but we believe that the additional storage will facilitate a greater amount of usable space for the resident. The new bathroom will remain directly off the kitchen as is currently the situation. The layout allows for the provision of a washing machine, fridge/freezer and cooker. The layout does not require demolition of any load bearing structures.

Removal of the external building results in a life expectancy which matches (or effectively exceeds) that of a replacement bathroom shell.

A plan of the proposed kitchen layout is enclosed in Appendix A.

2.6 Summary of Options

Item	Criteria	OPTION A Refurbishment	OPTION B POD Replacement with Traditional Construction	OPTION C Off-Site Manufactured POD (Traditional Foundations)	OPTION D Off-Site Manufactured POD (Helical Pile Foundations)	OPTION E Internal Reconfiguration (P4 Archetype only)
1	Life expectancy of external envelope	15yrs	60yrs	60yrs	60yrs	n/a
2	Access requirement through neighbours' gardens or through dwelling	Yes	Yes	Yes	No	Yes
3	Decant of resident for works	Yes	Yes	Yes	No	No - Possible to sequence works without decanting resident
4	Duration of works (1 shortest, 5 longest)	4	5	3	1	2
5	Risk of Planning Constraints (1 lowest, 3 highest)	1	3=	3=	3=	2
6	Advantages	No HfH obligation to refit leaseholders bathrooms	New construction	Quality Assurance of Final Product due to factory conditions	Quality Assurance of Final Product due to factory conditions Zero Decant – minimal resident disruption	Reduced Initial Capital Cost Reduction in future maintenance regime for external envelope
7	Disadvantages	Underpinning will not resolve alignment/settlement issues Only a short term interim solution	Increased risk of leaseholder challenges due to highest cost and disruption levels	Slow foundation construction method negates potential time savings, reduced preliminary costs and zero decant	Potential resident resistance to replacing an existing 'pre-fab' with another pre-assembled product.	Managing resident expectation due to reduced floor area
8	Scaffolding Requirement	Yes	Yes	No	No	No

Item	Criteria	OPTION A Refurbishment	OPTION B POD Replacement with Traditional Construction	OPTION C Off-Site Manufactured POD (Traditional Foundations)	OPTION D Off-Site Manufactured POD (Helical Pile Foundations)	OPTION E Internal Reconfiguration (P4 Archetype only)
9	Environmental Impact of new construction element (5 lowest, 1 highest)	4	1	2	3 – no need to remove existing foundations	5
10	Extent of required resident liaison and decant management resource	High	High	High	Low	Medium
11	Asbestos presence following works	Yes – POD intact	None (PODS)	None (PODS)	None (PODS)	None – POD removed

3 Pod Option Costs

3.1 Pilot Scheme Construction Costs

The following table summarises the comparative construction costs for the various POD options for the pilot scheme properties together with an allowance for the necessary decent homes works:

	OPTION A Refurbishment	OPTION B POD Replacement with Traditional Construction	OPTION C Off-Site Manufactured POD (Traditional Foundations)	OPTION D Off-Site Manufactured POD (Helical Pile Foundations)	OPTION E Internal Reconfiguration (P4 Archetype only)
Bathroom Pod Cost	16,938	32,916	36,060	31,336	13,017
Kitchen Cost	7,752	7,752	7,752	7,752	7,752
Central Heating & HCWS	4,780	4,780	4,780	4,780	4,780
Ext doors, windows and repairs	6,202	5,584	5,584	5,584	6,202
Renew rainwater goods and repairs (UPVC)	3,454	3,454	3,454	3,454	3,454
Scaffolding	667	667	667	667	667
Total	39,793	55,153	58,297	53,573	35,872

The above costs are the cost per dwelling and exclude professional fees and VAT.

3.2 Life Cycle Costs

Below is a summary table of relative life cycle costs (over a 60 year period) for each of the alternative bathroom POD options including a single bathroom and kitchen, window and external door replacement for the front and rear etc. A more detailed breakdown of the calculations is included in Appendix B of this report.

	Lifecycle Cost Summary	Assumed 60 Years Life Cost Per Dwelling
1	Option A: Repair and refurbish the existing bathroom pod, including underpinning the existing foundations	£206,000
2	Option B: Demolition and construction of new bathroom extension in traditional construction	£208,000
3	Option C : Demolish POD, concrete strip foundations and pre-fabricated POD	£211,000
4	Option D: Demolish POD, helical pile foundation and pre-fabricated POD (i.e as per Target Fixing's Proposal)	£206,000
5	Option E: Demolish and remove existing bathroom POD. Re-configure original internal space to negate the need to occupy the outgoing POD footprint.	£189,000

The costs in respect of the pre-fabricated bathroom PODS (options C & D) have been based upon the indicative costs supplied by Target fixings and referred to in Appendix C. They have indicated that their costs would be likely to reduce by approximately 20% if they were successful in securing the entire POD replacement programme.

In respect of our proposed Option E, we anticipate that the potential initial capital cost saving of approx £500,000 for the P4 archetypes.

4 Retrofit

This report aims to provide recommendations as to the most suitable remedy to the current solutions surrounding the selection of the most beneficial POD improvement/replacement alternative.

Generally, most of the Noel Park properties do not comply with the decent homes requirements for thermal efficiency etc. There are a number of strategies which can be implemented to reduce the energy consumption of the dwellings within the estate. The extent to which energy efficiencies can be incorporated, or retrofitted, into the estate properties would be greatly under the optimum if consideration was only given to the PODS themselves.

We appreciate the aspirations of HfH to use Noel Park as a trial project to research how environmental retrofit solutions can reduce the carbon footprint and provide sustainable alternatives within the borough. We would therefore recommend that the review of the Noel Park Estate's retrofit potential is looked at on a wider basis than that of the POD extensions. A study of the available products and approaches within this estate could be developed into a design standard for the entire housing stock of the ALMO.

5 Conclusion and Recommendations

The general condition of the housing stock within the Noel Park Estate is below the Government's Decent Homes Minimum standard. The lack of capital investment within the estate over recent years has increased the need for improvement works to be carried out.

The internal condition of the bathrooms is being affected and compromised by the defects and undesirable factors displayed by the physical fabric of the POD building envelopes. Fundamentally, major works need to be implemented to resolve these problems. The costs of the POD corrective works, irrespective of the option, are significant and it must be ensured that the recommended solutions deliver value for money over their lifetime. Hence the option with the lowest initial capital cost may not be the best value solution over the 60 year period. Our results in section 3, confirm that this is true. Any solution should also take consideration of the disruption which will be caused to residents and seek to minimise it.

The consequential problems resulting from the inadequate foundations (ie. the leaning of the of the PODS) will not be rectified by underpinning the existing foundations. Similarly the existing POD wall constructions are not thermally efficient and are a contributory cause to the cold and damp internal spaces which exist. In 2004, HfH's own design team recommended that the PODS were replaced with new structures because they had already exceeded their design life and they were exhibiting the aforementioned problems. On the basis of the current data, we fully support that view.

On balance, there is minimal cost difference between traditional construction (Option B) and pre-fabricated POD with helical piles (Option D), however, the time and resource savings, lack of decant requirement and reduced disruption of Option D will generate additional cost savings to HfH's organisation. In respect to Option E (Remove POD and reconfigure internal layout), we envisage an initial cost savings to amount of £17,000 per unit over option B. This would equate to over £500,000 gross savings if applied to all P4 properties within Estate.

We therefore recommend that HfH progress the pilot schemes using Option D (Pre-fabricated PODS with Helical Pile system) for the double storey pilot maisonettes in Gladstone Avenue. Option D will provide the least disruptive replacement solution for the resident whilst providing an end product of at least equal quality to Option B. Over the course of a programme of estate wide improvements, the project POD replacements could be potentially reduced from the anticipated 2.5 years (If Option B was chosen) to 1 year

(Option D) by dispensing the need to decant the residents. The lack of the decanting requirement is likely to be appreciated by the affected residents.

Option E (Only applicable to P4 House archetypes) provides significant cost savings over Option D and through careful planning of the sequencing of the works, the need to decant residents can be avoided. We therefore recommend that the pilot P4 archetype (address t.b.c.) property is improved using Option E (Internal configuration).

Both our recommended solutions for the pilot properties will reduce the levels of disruption and inconvenience to the residents.

Appendix A

Pod Archetype 4 – Proposed Alternative Internal configuration

Appendix B

Life Cycle Costs – Comparative Options

Appendix B

	Lifecycle Cost Summary	60 Years Life Cost Per Unit
1	Option A: Repair and refurbish the existing bathroom pod, including underpinning the existing foundations	£206,000
2	Option B: Demolition and construction of new bathroom extension in traditional construction	£208,000
3	Option C : Demolish pod, concrete strip foundations and pre-fabricated pod Type P1	£211,000
4	Option D: Demolish pod, helical pile foundation and pre-fabricated pod Type P1 (i.e as per Target Fixing's Proposal)	£206,000
5	Option E: Demolish and remove existing bathroom POD. Re-configure original internal space to negate the need to occupy the outgoing POD footprint.	£189,000

	Pilot Properties Cost	Option A	Option B	Option C	Option D	Option E
	183 Gladstone Avenue, N226LB Ground Flr	£39,793.08	£55,152.67	£58,296.59	£53,572.78	N/A
	183a Gladstone Avenue, N226LB 1st flr	£39,793.08	£55,152.67	£58,296.59	£53,572.78	N/A
	TBC, 3 Bedroom House	£39,793.08	£55,152.67	£58,296.59	£53,572.78	£35,871.78

Notes

For comparison, the cost allows for a single bathroom and kitchen

Assumed rate of inflation at 2%

Kitchen to be refitted every 20 years

Bathroom to be refitted every 30 years

Rainwater goods to be renewed every 30years

Windows and doors to be renewed every 20 years

The capital cost also allows for the replacement of windows and doors, central heating, rainwater goods and repairs, full rewire etc, MC's ohp and prelims

It is assumed that HFH will procure and manage the supply & installation of the pods directly

Life cycle Costing for Pod Alternatives

Refurbish the existing pod and underpinning as necessary

Year	Re-fit Kitchen	Refit-bathroom	Rain water goods	Windows & Doors	Miscellaneous	Total £
0	Initial capital cost					£39,793
1						£0
5					£221	£221
10			£122		£244	£366
15	Pod replacement (As Option D)					£66,597
20						£0
25					£328	£328
30		£8,339			£362	£8,701
35	£20,827		£200	£9,702	£400	£31,129
40					£442	£442
45			£244		£488	£731
50					£538	£538
55	£30,948		£10,088	£14,417	£594	£56,047
60					£656	£656
						£205,550

Demolition and construction of new bathroom extension in traditional construction

Year	Re-fit Kitchen	Refit-bathroom	Rain water goods	Windows & Doors	Miscellaneous	Total £
0	Initial capital cost					£55,153
1						£0
5					£221	£221
10			£122		£244	£366
15					£269	£269
20	£15,475		£149	£7,209	£297	£23,129
25					£328	£328
30		£8,339	£6,149		£362	£14,850
35					£400	£400
40	£22,995		£221	£10,712	£442	£34,369
45					£488	£488
50			£269		£538	£807
55					£594	£594
60	£34,169	£15,105	£11,138	£15,918	£656	£76,986
						£207,960

Life cycle Costing for Pod Alternatives

Demolish pod, concrete strip foundations and pre-fabricated pod

Year	Re-fit Kitchen	Refit-bathroom	Rain water goods	Windows & Doors	Miscellaneous	Total £
0	Initial capital cost					£58,297
1						
5					£221	£221
10			£122		£244	£366
15					£269	£269
20	£15,475		£149	£7,209	£297	£23,129
25					£328	£328
30		£8,339	£6,149		£362	£14,850
35					£400	£400
40	£22,995		£221	£10,712	£442	£34,369
45					£488	£488
50			£269		£538	£807
55					£594	£594
60	£34,169	£15,105	£11,138	£15,918	£656	£76,986
						£211,104

Demolish pod, helical pile foundation and pre-fabricated pod (i.e as per Target Fixing's Proposal)

Year	Re-fit Kitchen	Refit-bathroom	Rain water goods	Windows & Doors	Miscellaneous	Total £
0	Initial capital cost					£53,573
1						
5					£221	£221
10			£122		£244	£366
15					£269	£269
20	£15,475		£149	£7,209	£297	£23,129
25					£328	£328
30		£8,339	£6,149		£362	£14,850
35					£400	£400
40	£22,995		£221	£10,712	£442	£34,369
45					£488	£488
50			£269		£538	£807
55					£594	£594
60	£34,169	£15,105	£11,138	£15,918	£656	£76,986
						£206,380

Life cycle Costing for Pod Alternatives

Demolish and remove existing bathroom POD. Re-configure original internal space to negate the need to occupy the outgoing POD footprint.

Year	Re-fit Kitchen	Refit-bathroom	Rain water goods	Windows & Doors	Miscellaneous	Total £
0	Initial capital cost					£35,872
1						
5					£221	£221
10			£122		£244	£366
15					£269	£269
20	£15,475		£149	£7,209	£297	£23,129
25					£328	£328
30		£8,339	£6,149		£362	£14,850
35					£400	£400
40	£22,995		£221	£10,712	£442	£34,369
45					£488	£488
50			£269		£538	£807
55					£594	£594
60	£34,169	£15,105	£11,138	£15,918	£656	£76,986
						£188,679