# Pre-Demolition Audit
# 9-12 New College Parade

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## Document information

**Document prepared for**
New College Ltd

**Date of issue**
August 2024

**Issue no.**
3

**Our reference**
7063-9-12 New College Parade-PDA-2408-08yp.docx

**Document prepared by**
Katherine Adams

**Quality assured by**
Daniel Doran

**Disclaimer**
This report is made on behalf of Eight Versa Ltd. By receiving the report and acting on it, the client - or any third party relying on it - accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

**Contents:**

# Pre-Demolition Audit
# 9-12 New College Parade

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## Executive Summary

The pre-demolition audit was undertaken on 16th August 2022 by Katherine Adams and of Reusefully Ltd. A visual survey of the building, combined with analysis of the plans provided, was used to calculate the Key Demolition Products (KDP). The audit has investigated the key materials which are likely to rise from the proposed scheme to aid with the decision making for the proposed development during RIBA Stage 2. The quantities are as follows:

| | Weight | Volume | EWC |
|---|---|---|---|
| Concrete | 467.36 | 225.11 | 17 01 01 |
| Brick | 181.16 | 106.56 | 17 01 02 |
| Metals | 34.34 | 4.63 | 17 04 05 |
| Timber | 27.43 | 52.45 | 17 02 01 |
| Gypsum | 24.13 | 32.05 | 17 08 02 |
| Stone | 15.20 | 6.05 | 01 04 08 |
| Ceramic | 5.81 | 2.20 | 17 01 03 |
| Insulation | 3.51 | 17.06 | 17 06 04 |
| Glass | 1.23 | 0.50 | 17 02 02 |
| Carpet | 0.98 | 1.23 | 20 01 11 |
| Plastics | 0.53 | 0.73 | 17 02 03 |
| **Bitumen** | 0.39 | 0.64 | 17 03 03 |
| **Total** | **762.07** | **449.22** | |

The estimated Key Demolition Products (KDP) by weight are Concrete (62%), Brick (24%), Metals (4%), Timber (4%) and Gypsum (3%) with smaller amounts of Stone, Ceramic, Insulation, Glass, Carpet, Plastics and Bitumen.

## The Requirement

Eight Versa have engaged Reusefully Ltd to carry out a pre-demolition audit of 9-12 New College Parade, Finchley Road, London. The aim of the audit is:

- To provide an understanding of the types and amounts of products and materials arising during refurbishment
- Provide key parameters for products and elements to identify opportunities for reuse.
- To optimise the management of products and materials from the refurbishment/demolition and provide recommendations to the design team and refurbishment/demolition contractor in line with the waste hierarchy i.e. maximise reuse and upcycling opportunities and minimise waste to landfill
- To provide technical advice on the reuse of products and recycling of material on site
- To provide data to help with populating the Resource Management Plan and in support of any environmental assessment e.g. BREEAM
- To advise on targets for reuse and recycling for products and materials arising during the refurbishment

## Site Details

9-12 New College Parade is located on Finchley Road in London. The existing building on the site is a two-storey 1916 building with retail units at ground floor and basement level, and office at first floor. The retail units form part of the shopping parade running along Finchley Road. The buildings on the site originally formed part of a longer Edwardian shopping parade of moderate quality, most of which has been demolished and replaced with an incongruous three storey development. There is in part an Edwardian Baroque façade at the ground and first floor, which may be retained.

# Pre-Demolition Audit
# 9-12 New College Parade

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## The Pre-Demolition Audit

The pre-demolition audit was undertaken on 16th August 2022, consisting of a non-invasive visual survey of the buildings. Certain areas were inaccessible, such as a first floor office and some rooms were occupied. Hence, construction details and materials have been inferred based on typical practice. Survey notes and photographs were taken, and plans of the buildings were supplied with measured drawings and elevations.

On the basis of information gathered and provided, an analysis of materials arising from the demolition with results reported in both weight and volume. The weight has been calculated using standard density figures for the materials identified.

The following assumptions have been applied:

- Concrete floor slab on ground
- A mix of timber stud walls and block/brick work internally (for cores)
- Iron joists with clinker fill and timber floorboards
- Flat roof with asphalt covering and timber, with insulation
- Some insulation assumed for the internal walls.

## Demolition Results

Overall, the estimated Key Demolition Products (KDP) by weight are Concrete (62%), Brick (24%), Metals (4%), Timber (4%), Gypsum (3%) with smaller amounts of other materials as shown by Figure 1 and Table 1. The largest KDPs by volume are Concrete (51%), Brick (24%), Timber Products (12%), Gypsum (7%), and Insulation (4%) with smaller amounts of other materials.
Each of these KDP's has its own section later in the report detailing their arising and management options.

Figure 1: Demolition Results - KDP's by weight (tonnes)

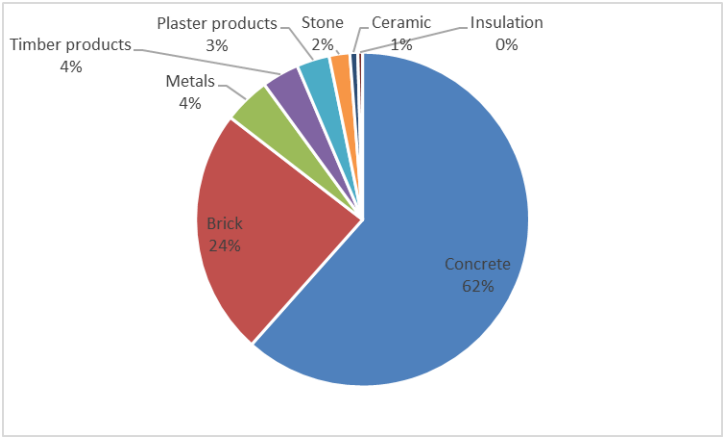
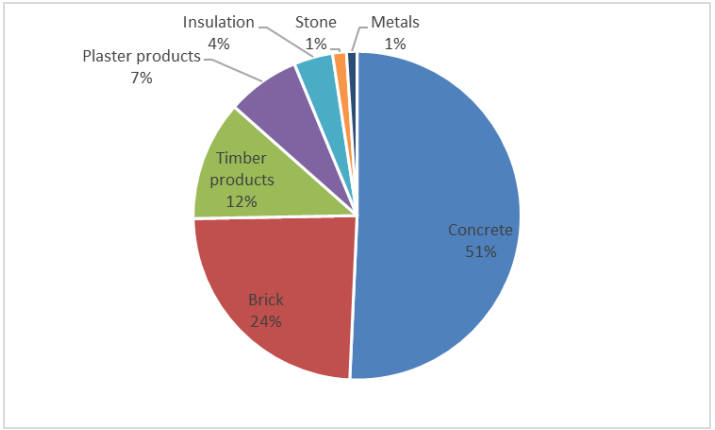



Figure 2: Demolition Results - KDP's by volume ($m^3$)



# Pre-Demolition Audit
## 9-12 New College Parade

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

Table 1 provides the weight (tonnes), volume ($m^3$) and European Waste Codes for each KDP.

| | Weight | Volume | EWC |
|---|---|---|---|
| Concrete | 467.36 | 225.11 | 17 01 01 |
| Brick | 181.16 | 106.56 | 17 01 02 |
| Metals | 34.34 | 4.63 | 17 04 05 |
| Timber | 27.43 | 52.45 | 17 02 01 |
| Gypsum | 24.13 | 32.05 | 17 08 02 |
| Stone | 15.20 | 6.05 | 01 04 08 |
| Ceramic | 5.81 | 2.20 | 17 01 03 |
| Insulation | 3.51 | 17.06 | 17 06 04 |
| Glass | 1.23 | 0.50 | 17 02 02 |
| Carpet | 0.98 | 1.23 | 20 01 11 |
| Plastics | 0.53 | 0.73 | 17 02 03 |
| Bitumen | 0.39 | 0.64 | 17 03 03 |
| **Total** | **762.07** | **449.22** | |

## Concrete

Concrete is the largest KDP identified, estimated to be approximate 467 tonnes as shown by Table 1. This is from a number of sources, the most from the clinker used as infill in the floors (288 tonnes), block walls (assumed to be in the cores and the walls between the bouses (81 tonnes) and the floor slab (36 tonnes). The concrete columns and beams are from the support structure for the external staircase. Most of the concrete is unsuitable for reuse, as it is not in precast sections. The concrete paving on the roof is suitable for reuse.

Concrete is in theory 100% recyclable. It can be segregated and crushed for reuse as hard core, fill or in landscaping or used as recycled aggregate in new concrete. Although recycled and secondary aggregates can be used in some concrete applications, other lower grade end uses (e.g. in unbound materials as fill and hardcore) may sometimes be more resource efficient due to reduced processing demands and transportation. Often such waste does not even leave the demolition site, being used for the site's redevelopment, as shown by the NFDC figures with nearly half of inert waste (over 9 million tonnes) treated this way. Otherwise it is used on other sites as fill to offset the need for primary raw materials. Very little concrete waste therefore tends to go to landfill.

It is recommended that the concrete should be segregated either onsite (space is limited on site) or at a waste facility and crushed to produce recycled concrete aggregate (RCA)1 in accordance with the WRAP Quality Protocol for aggregates2 from inert waste. Ideally, this should be used back in concrete. It can also be used for lower value applications such as for piling mats and temporary/ permanent fill (infilling). If reprocessed, stored and/or used onsite then appropriate permits3 or exemptions will be required for these operations. RCA is of a higher quality than recycled aggregate (RA) due to the limit of masonry in the aggregate (maximum of 5%). The performance characteristics of RCA are better than RA and therefore there are fewer restrictions on the use of RCA in concrete. The use of RCA in concrete is given in BS 8500-24.

Various options are available to utilise RCA as listed below. Recycled concrete aggregates can be used in:

- Bitumen bound materials – Recycled concrete aggregate can be used may be used in a variety of base course and binder course mixtures.

[1] Recycled concrete aggregate is aggregate resulting from the processing of inorganic material previously used in construction and principally comprising crushed concrete [BS 8500-1: 2002].

[2] https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-from-inert-waste

[3] https://www.gov.uk/guidance/waste-environmental-permits

[4] https://shop.bsigroup.com/products/concrete-complementary-british-standard-to-bs-en-206-specification-for-constituent-materials-and-concrete/standard

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

- Concrete – Recycled concrete aggregate is permitted for use in certain grades of concrete. It is generally acknowledged that RCA can potentially be used to replace 20% of the coarse aggregate in concrete up to Grade 50.
- Pipe bedding – suitably graded recycled concrete aggregate is used in pipe bedding.
- Hydraulically bound mixtures (HBM) for subbase and base – recycled concrete aggregate can be suitable for use in HBMs. These can be used in the construction of car parks, estate/minor roads and hard standing.
- Unbound mixtures for subbase – suitably graded recycled concrete aggregate is used as subbase.
- Capping – Recycled concrete aggregate is suitable for capping applications.

Examples of structural concrete that have been used as RCA include the London Olympics 2012 http://www.klhsustainability.com/assets/Uploads/a0e1e6c7e1/Case-Study-201110-The-Procurement-and-Use-of-Sustainable-Concrete.pdf and Building B16 at BRE; https://www.icevirtuallibrary.com/doi/abs/10.1680/icetra.64638.447

Ideally, concrete waste could be sent to a local concrete producer, to be used as RCA for the new development, following the inert waste Quality Protocol (https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-from-inert-waste). RCA could be specified in the new concrete.

Local waste management companies that could manage the concrete waste include:

- Powerday, https://www.powerday.co.uk/ T: 020 3858 0504
- Norris Skips, https://norriskips.co.uk/skip-hire/ T: 020 8698 8000
- RTS Waste, www.rtswaste.co.uk T: 020 7232 1711
- Days Group, http://www.daygroup.co.uk/. T: 0845 065 4655

Alternatively, licensed waste management contractors or demolition contractors should be able to reprocess concrete waste into aggregates.

### Higher value opportunities

- Used for making bricks e.g. the K-Briq (in Scotland) https://kenoteq.com/ and StoneCycle https://www.stonecycling.com/ .
- Concrete waste can also be used for blocks and paving. For example, Blocks (Aircrete) can be up to 70%; other blocks average 24% https://www.cba-blocks.org.uk/wp-content/uploads/2018/03/CBA-2pp-Aggregate-Block-datasheet-rnd2.pdf but can vary considerably e.g. 74% https://sheehancontractors.co.uk/eco-friendly-construction-solutions-concrete-blocks/

Table 2: Estimated concrete arisings from demolition.

| Item | Tonnes | Volume ($m^3$) |
|---|---|---|
| Clinker | 288.0 | 120.0 |
| Block wall - double | 81.20 | 58.00 |
| Concrete floor slab | 38.4 | 16.00 |
| Brick wall - double 9" (mortar) | 35.84 | 18.86 |
| Block wall - double (mortar) | 19.75 | 10.40 |
| Concrete column | 1.8 | 0.8 |
| Concrete beams | 1.7 | 0.7 |
| Brick wall - single 4" (mortar) | 0.41 | 0.24 |
| Render | 0.2 | 0.12 |
| Concrete paving | 0.1 | 0.04 |
| **Total** | **467.36** | **225.11** |

## Brick

Brick is estimated at 181 tonnes ($106m^3$) from the external walls and some internal walls with the assumption of a double layer at 9" thick. They are thought to be a mix of brick types. However due to the age of the buildings it is likely that lime mortar has been use in part, making it easier to use the bricks (especially the external layer at the back). There is also some brick work at the roof level, which may be suitable for reuse.
Bricks can potentially be recovered and reused, but most often they are crushed and recycled into fill materials or recycled aggregate. Although there is a market for recovered clay bricks, it is not always done, commonly due to the inability to remove mortar from the bricks. Traditional lime-based mortars are generally weaker than cement-based mortars and hence easier to remove. The more recent use of strong mortars with a high cement content can increase the time and effort required to remove the mortar and/ or lead to subsequent damage to the bricks. These mortars may be chosen to improve longevity in use and reduce maintenance requirements from repointing for instance. Reclaimed bricks are often more expensive than new bricks as a result of the additional recovery effort. In addition, there needs to be confidence that reused bricks will be suitable for their intended purpose. It may be necessary to test the bricks for strength and frost resistance. It is recommended that some mortar tests are undertaken to establish the type of bond and the strength of it and provide an estimation of how much time they would take to clean and the value in doing so.

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com


For bricks that are unable to  be reused are segregated either onsite or at a waste facility and crushed to produce recycled aggregate (RA). Considering the size of the site, it is likely that this will be offsite. This RA can be used as fill materials.  Finished recycled aggregates should not contain more than 1% (by weight of clay, soil, metals, wood, plastic, rubber and gypsum plaster, in line with the limits set within the aggregates standards. It is recommended that they are processed where possible into recycled aggregates (RA).

The Quality Protocol for inert materials (https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-from-inert-waste)  should be followed.

Local waste management companies that could manage the brick waste include:

- Brewsters Waste, https://brewsterswaste.co.uk/, T: 020 7474 3535
- Ohara Bros,  http://oharabros.co.uk/services/aggregates-recycling, 020 8424 2220
- RTS Waste, www.rtswaste.co.uk T: 020 7232 1711
- Days Group, http://www.daygroup.co.uk/. T: 0845 065 4655

Alternatively, licensed waste management contractors/demolition contractors should be able to reprocess the brick waste into aggregates.

### Higher value opportunities

If bricks are suitable for reuse, then there are a number of reclamation dealers, that would buy the bricks:

- London Reclaimed Brick Merchants, www.lrbm.com, T: 020 8452 1111
- Premier Reclaimed Bricks, http://www.premierreclaimedbricks.co.uk/, T: 020 8684 3537
- Contact Salvo, https://www.salvoweb.com/

There could be possibility of using the recycled aggregate to make new bricks and blocks, for example the K- Brick is a new product made from construction and demolition waste (https://kenoteq.com/).

## Metals

Metal accounts for as shown by Table 3 of which there is 35 tonnes. There is likely to be limited opportunity to reuse some of the metal, items which maybe suitable include the radiators, sinks, stairs and railings on the roof.
For recycling, steel should be segregated on site. It is common practice for demolition contractors to reduce their contract value by allowing for the income from the recycling of metals during demolition. Standard skip hire companies are likely to charge for haulage costs only and may give back a small rebate on the metals. Once segregated it is usually sent to a metal scrap merchants (recyclers).
At these, the metals will be sorted, sheared (cutting large pieces), shredded, graded, and baled. The steel will be then sent to smelters to be re-melted as ingots (which are usually downcycles material), and then sent to steel furnaces. Much of this maybe abroad - depending on the price per tonnes the scrap merchant can obtain (currently it is around £265/tonne). The UK does not use all the scrap metal it produces with around 80% exported to countries such as China and Turkey.

### Higher value opportunities

- Best practice for steel is for it to be reused; recycling is the business as usual model._Companies such as Cleveland Steel and Tubes will buy steel for reuse https://cleveland-steel.com/
- Cesla Steel (https://www.celsagroup.com/en/sustainability/circular-economy-and-recycling/) are introducing a scheme where steel can be bought by them and recycled in their furnace and a voucher provided for new high recycled content steel - around 98% (mainly rebar). They are looking for companies to pilot this with.

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## Aluminium

Aluminium may be present in some of the door frames. Aluminium is usually treated in a similar manner to steel, in that it will be sent to a scrap merchant, where it will be sorted, sheared (cutting large pieces), shredded, graded, and baled. Aluminium has high recycling rates, which can be between 92% and 98% for architectural aluminium and there is a highly established aluminium recycling market. Around 75% of all aluminium ever produced is still in productive use. Recycling uses only 5% of the original energy used to produce primary Aluminium and water. Some aluminium can be up to 75% recycled content (postconsumer); about half of the aluminium produced in Europe originates from recycled materials.

### Higher value opportunities

The Council for Aluminium in Building has recently launched a closed loop recycling scheme for its members https://c-a-b.org.uk/closed-loop-recycling/ .

### Local waste management companies

Local waste management contractors include (as with steel):

- Capital Metal Recycling, http://capitalmetalrecycling.co.uk/ T: 0208 964 2120
- London Scrap Metal Recycling, http://www.londonscrapmetalrecycling.com T: 0208 809 1019
- EMR Group http://www.emrgroup.com/

## Lead

There is 0.4 tonnes of lead flashing on the roofs; this is a high value material – and can generate £1 per kg. Lead will be smelted and refined. There are likely to be limited opportunities for its reuse.

*Table 3: Estimated metal arisings from refurbishment*

| Item | Tonnes | Volume |
|---|---|---|
| Iron beams | 27.4 | 2.60 |
| Suspended ceiling grid - main runners | 2.6 | 0.60 |
| Ducting | 2.0 | 0.29 |
| Radiator - pressed steel | 1.2 | 0.00 |
| External stairs | 0.5 | 0.02 |
| Lead flashing | 0.4 | 0.05 |
| Metal railings | 0.3 | 0.04 |
| Metal door frame | 0.2 | 0.03 |
| Metal window frame | 0.2 | 0.02 |
| Cast iron pipework | 0.03 | 0.00 |
| Sinks | 0.0 | 0.0 |
| **Total** | **34.84** | **3.65** |

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com


## Gypsum

There is an estimated 24 tonnes (117m³) of plaster and plasterboard arising from the demolition as shown by Table 4. Plaster skim has been used on the some of the internal walls and ceilings. Plasterboard should if possible be segregated on site or if room does not permit then segregated at a waste transfer station. The plaster maybe difficult to remove from the brickwork/blockwork, and as such it can be treated with the bricks as RA, if it is in low quantities. There are a number of companies within the London area that offer recycling services, as long as the plasterboard is relatively free from contamination. Some of the recycling routes can include being used in the plasterboard manufacturing process (check with the waste/recycling company for their recycling routes). Note, a lot of plasterboard is sent for land treatment – it would be better if possible, to recycle back into plasterboard. If it is sent to disposal, then it should be landfilled in a monocell (i.e. landfilled separately from the other waste).

### Local waste management companies

Local waste management options include:

- Powerday, https://www.powerday.co.uk/ T: 020 3858 0504
- Plasterboard Recycling Solutions http://www.plasterboardrecyclingsolutions.co.uk/ T: 0780 118 6380
- Hinton's Waste, https://www.hintonswaste.co.uk/recycling-facilities/plasterboard-recycling/ T:020 3322 3476
- Hippo Waste (collect in bags), https://www.hippowaste.co.uk/blog/plasterboard-recycling-removal/ T: 0333 9990 999
- RTS Waste Management, https://www.rtswaste.co.uk/plasterboard-mobile-compaction-service/ T: 020 7232 1711

*Table 4: Estimated plaster and plasterboard arisings*

| Location | Tonnes | Volume |
|---|---|---|
| Walls - internal | 13.5 | 18.00 |
| Ceilings | 9.86 | 13.14 |
| Plaster skim | 0.8 | 0.91 |
| **Total** | **24.13** | **32.05** |

## Timber

As shown by Table 5, there is an estimated 27 tonnes (52m3) of timber arising from the refurbishment. The largest source is from the timber floorboards (7.6 tonnes), laminate flooring (4.8 tonnes) and timber studwork (6.5 tonnes). Other sources include doors, timber joists in the roof, flooring, staircases, timber panelling, cabinets. Some of the doors, worktops, flooring and panelling maybe suitable for reuse.

Most of the solid timber can be recycled, usually into chipboard. Due to the age of the building, some of the timber maybe hazardous due to the coatings and preservatives used. Guidance has been issued for this5. Where reclamation is not possible the timber should be segregated on site if space permits, or offsite and sent to a licensed waste management contractor for recycling. Due to the age of the building it is unlikely that it is hazardous due to the coatings and preservatives used.

For chipboard, It is also difficult to recycle due to the length of the fibres and the glues, so the most appropriate route is likely to be energy from waste. There is a company, MDF Recovery that is starting to recycle MDF http://www.mdfrecovery.co.uk/ .

### Higher value opportunities

- It is recommended that a local wood recycling organization is contacted (Community Wood Recycling, www.communitywoodrecycling.org.uk) to see what timber items are suitable for reclamation and reuse.
- There are also examples of reuse of doors https://www.nweurope.eu/projects/project-search/fcrbe-facilitating-the-circulation-of-reclaimed-building-elements-in-northwestern-europe/news/reuse-toolkit-material-sheets/.

[5] https://condemwaste.org/wp-content/uploads/2021/07/CIWM-CD-Waste-Wood-Guide-v1.0.pdf

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com


*Table 5: Estimated timber arisings*

| Location | Tonnes | Volume |
|---|---|---|
| Timber floorboards | 7.680 | 15.36 |
| Laminate flooring | 4.810 | 8.02 |
| Timber studwork - joists | 3.313 | 6.63 |
| Timber studwork - sole+head plates | 2.225 | 4.45 |
| Timber battens | 2.200 | 4.40 |
| Timber roof joists | 1.650 | 3.30 |
| Timber solid door | 1.247 | 2.49 |
| Engineered wood flooring | 0.810 | 1.35 |
| Staircase | 0.800 | 1.60 |
| Timber panelling | 0.500 | 1.00 |
| MDF cupboards | 0.450 | 0.90 |
| Worktop | 0.432 | 0.60 |
| Timber door frame | 0.426 | 0.85 |
| Plywood sheets | 0.356 | 0.71 |
| Kitchen cabinets | 0.270 | 0.37 |
| MDF skirting board | 0.180 | 0.24 |
| Timber window frame | 0.038 | 0.08 |
| Bannister | 0.030 | 0.06 |
| Timber shelf | 0.015 | 0.03 |
| Hand rail | 0.004 | 0.01 |
| Hardboard sheets | 0.000 | 0.00 |
| **Total** | **27.43** | **52.45** |

## Stone

Around 15 tonnes of stone is present mainly occurring the façade (this is assumed to be stone, as shown by Table 6. There are smaller amounts of slate covering in No 9 on the walls, granite worktops and marble cladding on some of the lower level of the façade. The stone could be advertised on Salvo. They could be advertised on Salvo (www.salvoweb.com). Any material unsuitable for reuse or salvage can be disposed of alongside other inert waste.

*Table 6: Estimated stone arisings*

| Item | Tonnes | Volume |
|---|---|---|
| Façade | 14.40 | 5.76 |
| Slate covering | 0.50 | 0.18 |
| Worktop | 0.23 | 0.09 |
| Marble cladding | 0.07 | 0.03 |
| **Total** | **15.20** | **6.05** |

## Glass

Glass is estimated to be 1.23 tonnes as shown by Table 7. Some of the shop fronts (glass 10mm) could be reused. For glass to be reused it needs to be collected on specialist steel A frame stillages, handled and stored carefully. Some glass doors could also be reused. Glass can be collected in skips and containers for recycling. The quality of the glass in the skips will be dependent upon the awareness and training of those working on site and appropriate site management is required along with clear signage. They also need to be close to the workplace due health and safety risks from transporting glass.

A few glass manufacturers run their own cullet recycling scheme when they will collect cullet from processors or of older glass where they will be returned to the float line. The UK has three flat glass manufacturers, all operating float lines: Guardian Glass UK, Pilkington UK Ltd and Saint-Gobain Building Glass which are all based in the North of England. One of the limiting factors in the use of post-consumer flat glass as cullet back into the float glass manufacturing process is the availability of it in the right quality and chemical compatibility as the manufacturing process is sensitive to low levels of contamination. Most of post-consumer flat glass waste produced does not go back into glass and will be used as aggregate or landfilled. For demolition, common practice is more likely for it to be crushed into aggregate with other inert waste.

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

There is a health and safety consideration for the workforce if it is to be segregated onsite. According to the NFDC, glass from facades may be available for recycling back into glass, as they are likely to be deconstructed and the glass less contaminated. As the cost of logistics is high, large volumes of waste are preferred when collecting. The quality of the glass waste is important with minimal contamination requiring the effective separation and segregation on site, which in turn requires education and training for those working on site. UKGBC have an example of glass being recycled into new glass (https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2018/09/05151714/VerdeSW1CaseStudy_FINALISSUE1.pdf). Other markets include the use of glass in glass wool insulation, container glass and ballotini products (glass beads).

The glass recycling industry has developed grades of glass cullet:

- Class C – which is contaminated and not suitable for re-melting back into glass. Contamination can include ceramic frit, putty, lead beading and space bars. This will be used as aggregate and road paint.
- Class B – this is called 'mixed cullet' and may have some contamination such as laminated glass, which is suitable for glass wool insulation and container glass.
- Class A – clean clear glass cullet with no contamination which can be used back in the floating by re-melting. This is currently mostly from pre-consumer glass. Demand for this outstrips supply.

Glass recyclers are:

- RTS Waste (www.rtswaste.co.u k T: 020 7232 1711). Note they may require the glass to be removed and stacked as panels.
- Berryman Glass Recycling (www.berrymanglassrecycling.com E: info@berryman-uk.co.uk
- May Glass Recycling (http://www.mayglassrecycling.co.uk/) may only take new glass
- Viridor https://www.viridor.co.uk/siteassets/document-repository/brochures/glass-recycling-ukviridor-low-res.pdf.

If glass waste is sent to landfill and not mixed with other types of non-inert waste, it will attract the lower rate of tax, currently at £3.10/tonne. There are economic opportunities with a market price of £50/tonne for recycled glass compared to €90/tonne for virgin material. For flat glass, one tonne of recycled material results in savings of 1200 kg of virgin material and 300kg of $CO_2$ emissions directly linked to the melting process[6].

### Higher value opportunities

The highest value opportunity would be to reuse the shop fronts as shop fronts- this unfortunately rarely happens due to the nature of demolition. For this to happen it would need to be dismantled, handled carefully and stored on A frame stillages for further reuse. It is better to keep it in its frame if possible, so as not to require any resealing.

*Table 7: Estimated glass arisings from demolition*

| Item | Tonnes | Volume |
|---|---|---|
| Glass - 10mm | 0.57 | 0.23 |
| Window glass - double | 0.33 | 0.14 |
| Glass door | 0.23 | 0.10 |
| Window glass - single | 0.1 | 0.0 |
| **Total** | **1.23** | **0.50** |

## Insulation

There is an estimated 0.5 tonnes (10m3) of insulation arisings from the demolition. Most of the insulation (0.4 tonnes) is assumed to be mineral wool and present in the internal stud walls that are to be removed. From a visual inspection it is difficult to ascertain the type of insulation used and the extent of it. There may be more present within the roof. There is a small amount as carpet undelay. Recovery of insulation material is unlikely to be possible if it is bonded to the substrate. Insulation is usually disposed of to landfill via a licensed waste management contractor or could be sent for energy recovery if foam-based insulants can be successfully disaggregated. There is a pilot project looking at the recycling of insulation including from Knauf: https://www.knaufinsulation.com/news/knauf-insulations-new-customer-waste-take-back-scheme-good-for-environment-and-business-0 and Rockwool offer a recycling scheme: https://www.rockwool.co.uk/about/sustainability/recycling/. Care should be taken to ensure that insulation that may contain ozone-depleting substances are removed and handled carefully.

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52014DC0445&from=EN

# Pre-Demolition Audit
# 9-12 New College Parade

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## Mineral ceiling tiles

Mineral ceiling tiles are used in the offices and some other areas at an estimated 3 tonnes. Some of these (around 70%) may be reusable; some are new with the offices in no 10-12 being newly fitted out.. There was a recycling programme for ceiling tiles, run by Zenith (Armstrong Ceiling Tiles), which requires the ceiling tiles to be stacked on pallets; however this is currently on hold. Rockfon have a recycling scheme but they will inly recycle their own tiles https://www.rockfon.co.uk/sustainability/our-sustainability-services/recycling-service/ They may have to be dated after January 2000 (it is assumed that these are due to their condition (the date should be stamped on the back of the tiles). Other routes include as fuel (e.g. cement kilns)

## Carpet

There is an estimated 0.9 tonnes of carpet arising from the office spaces covering 2,46m$^2$. The condition of this is good and as such it is estimated that around 70% is reusable. Indeed, 82m$^2$ is from newly laid carpet tiles. Carpet tiles can potentially be reused/recycled via:

- Carpet Tile Recycling; http://www.carpettilerecycling.co.uk; 01115 940 4454 (these need to be stacked on a pallet)
- Envirocycle; http://envirocyclelondon.com/recycle-office-carpet-tiles/; 07549448123 (these will also offer a removal service)
- Used Carpet Tiles, offer a pick up service; https://www.usedcarpettiles.com/; T: 0800 014 8591

Some manufacturers also offer a reuse/recycling service:

- Interface works with ReEntry Partners (social enterprise); https://www.interface.com/EU/en-GB/campaign/reentry/reentry-en_GB
- Millken; https://floors.milliken.com/floors/sustainability/end-of-life; t: 01942 612777

Potential recycling routes can also be searched at: https://carpetrecyclinguk.com/find-a-recycler/. If it is not suitable for recycling it can be sent for energy recovery via a waste transfer station.

## Ceramics

There is an estimated 5.8 tonnes (2.2m$^3$) of ceramic materials arisings from the toilets, sinks, flooring and wall tiling. However, the most is from the ceramic tiles on the walls and the floors at 5 tonnes. It will be difficult to remove these tiles intact for reuse without damage and their monetary value is relatively low. There is a factsheet produced by the FCRBE project which discusses the requirements for reuse; see https://www.nweurope.eu/projects/project-search/fcrbe-facilitating-the-circulation-of-reclaimed-building-elements-in-northwestern-europe/news/reuse-toolkit-material-sheets/ . However for this project, it is recommended that these are either crushed with the inert waste on site or sent off site to produce recycled aggregate. Some of the sinks are relatively new and could have some reuse potential.

## Plastic

There is an estimated 0.5 tonnes (0.7m$^3$) of plastic arising, mostly from the vinyl flooring (at 0.3 tonnes) There is a small amount uPVC doors and window frames and signage and guttering. The condition is thought to be average (note, not all floors were observed). The best route for this vinyl is either recycling or energy recovery. Schemes exist to recycle old vinyl flooring, depending on the quality and amount of screed attached. This can either be dropped off at specific locations or collected. See https://www.recofloor.org/contractors-how-it-works/ and http://www.recofloor.org/about-us/#specifications for more details. Tarkett also has a program, called ReStart program, where old vinyl flooring can be reused in new flooring: https://professionals.tarkett.co.uk/en_GB/node/restart-10623. If the product does not meet the specification for recycling, then it is likely to be sent for energy recovery. Any uPVC may be collected through the Recovinyl scheme for recycling: https://axiongroup.co.uk/wp-content/uploads/2021/07/Recovinyl-Recyclers-2021.pdf . It should be noted that there is likely to be more plastic arising than estimated from hidden components such as cabling. 4

## Bitumen

Asphalt/bitumen account for an estimated 0.4 tonnes of KDP, arising from the flat roofs. As the age of this material is unknown, core sampling should be undertaken to determine any coal tar content, which might result in it being deemed hazardous waste.

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com


## Other materials

### WEEE

There are a number of Waste Electrical and Electronic Waste Equipment (WEEE) which were observed shown by Table 8. Note, these are assumed in terms of the type and number per building. Some of the lighting mat be suitable for reuse in another project or via the community. Any fluorescent lighting should be segregated onsite, collected and disposed by a licensed hazardous waste carrier. Alternatively, schemes such as Recolight, https://www.recolight.co.uk/ offer collection and drop off services. The metal fittings, if not suitable for reuse should be segregated with the other metal for recycling. For lighting, Recolight (www.recolight.co.uk) is as scheme which will send lights for recycling. There are also companies that will remanufacture lighting, including: Egg Lighting (www.egglighting.com/egg-circular) and Whitecroft Lighting – Vitality (www.whitecroftlighting.com/whitecroft-vitality) .

Any waste electrical and electronic equipment should be separated on site and sent to a specialist recycling facility, such as the following: www.wasteserviceslondon.co.uk/weee_recycling.htm ; www.pureplanetrecycling.co.uk/weee-recycling-london .

If items are in good condition, then they could be advertised for resale. Note, there are likely to be more items of WEEE that were not visible when undertaking the survey. There is considerable plant within the building.

*Table 8: Estimated WEEE arising*

| Item | Quantity | Reusable |
|---|---|---|
| Suspended ceiling lights - fluorescent | 50 | n |
| Recessed lights - twin CFL | 20 | n |
| Recessed lights – LED | 100 | y |
| Shower units | 1 | y |
| Fridges | 4 | y |
| Air conditioning/handling units | 9 | possibly |
| The reusability column is provided for indicative guidance only; these items should be suitable for reuse, provided all required performance characteristics can be verified and no insurance/warranty clauses are breached. | | |

### Hazardous materials

Some materials may be hazardous is nature. This could include materials contaminated with oil, treated timber, bitumen and asbestos. It is recommended that the demolition contractor undertakes appropriate testing to determine the hazardousness of materials and how they should be managed. This may affect some of the recycling opportunities presented. Some of the timber may be hazardous, see this guidance: https://condemwaste.org/wp-content/uploads/2021/07/CIWM-CD-Waste-Wood-Guide-v1.0.pdf

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com


## Maximising Reuse and Best Practice

It is advised that a long lead-in time as possible and maximum exposure are required to enable the reuse of products and components. The best chances for reuse, with the associated environmental and economic benefits, are as near to site as possible:

- Used by the same client locally
- Sold or given away locally

Table 9 shows the items that maybe suitable for reuse. The following recommendations may assist in maximising the reclamation potential of the items identified:

- Consult the client on the findings of this report and consider any options for closed-loop re-use in a similar project (or within the hospital)
- Consider setting aside storage on site for segregation of salvage items.

There are a few organisations that may be able to assist with the reuse of items, which are listed below in London:

- Reyooz http://www.reyooz.com/about/clients. Offer a service to collect surplus and distribute to charities, schools and small businesses.
- Globechain https://globechain.com/; a reuse marketplace that donates to charities, schools and small businesses
- Reuse Network: https://reuse-network.org.uk/donate-items/#/
- Collecteco: https://www.collecteco.co.uk/; donation of furniture and equipment to charities, schools and small businesses.
- Scrapstores: https://www.workandplayscrapstore.org.uk/ and Reusefully UK www.reusefully.co.uk

There is also an interactive map available from the Supply Chain Sustainability School, which shows geographically the different platforms available for material exchange.
https://www.supplychainschool.co.uk/school-launches-new-mep-mapping-tool/
For items that may have some architectural salvage value, specific salvage items can be advertised for free on www.salvo.co.uk or low value materials on www.salvomie.co.uk. Salvo also operate a demolition/refurbishment alert service on their website which serves to bring forthcoming demolition products to the attention of potential buyers or users. Local architectural salvage merchants about specific items can also be contacted. Salvo publishes a directory on their website. Ensure that salvaged items are removed and stored in such a way that all components remain together, e.g. doors in their frames.

Table 9 summarises the products that are likely to be more suitable for reuse. Note the images can be seen in Appendix A.

*Table 9: Materials and components recommended for reuse*

| | |
|---|---|
| External walls | • External brick work (back walls) – potentially some valuable yellow stock bricks<br>• Clay tile cladding on external walls<br>• Façade (stone)<br>• Concrete paving (on back external wall)<br>• Marble/granite cladding on the facade |
| Floors and ceilings | • Some quantities of carpet tile throughout the building, most in good condition. It is estimated around 70% may be suitable for reuse<br>• Some laminate may be recoverable depending on fixing method<br>• Mineral fibre ceiling tiles are in the offices (some of this is new); around 70% suitable for reuse |
| Doors and windows | • Timber doors, some with vision panels and a few fully glazed |
| Lighting | • Some lighting may be reusable although most fixtures are typically outdated. |
| M and E | • Radiators<br>• Cast iron pipework<br>• HVAC units |
| Internal fixtures and fittings | • Some kitchen cabinets are modern and suitable for reuse, and work tops<br>• Catering equipment<br>• Wooden panelling<br>• Some bathroom fixtures e.g. granite washstands<br>• Large timber cupboards and shelving |

eight versa

+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com


Table 10 summarises the standard and best practice opportunities for each of the KPDs identified on this project.

*Table 10: Standard and best practice opportunities for the KPDs*

| | Opportunities | |
|---|---|---|
| | Standard practice | Best practice |
| Concrete | Crushed as RA for fill on/offsite | Crushed for RCA back into concrete |
| Steel | Recycled as scrap on the global market | Reuse (structural); closed loop recycling as scrap |
| Brick | Recycled as RA for fill on/offsite | Reuse; recycle into higher value products |
| Glass | Crushed and used for RA for fill on/offsite | Reuse; closed loop recycling |
| Aluminium | Recycled as scrap on the global market | Reuse; closed loop recycling as scrap |
| Gypsum | Sent to cement kilns; or spread on land | Closed loop recycling |
| Softwood | Sent for energy recovery | Reuse; recycled into panelboard and animal bedding |
| Stone | Recycled as RA for fill on/offsite | Reuse; recycle into higher value products |
| Ceramic | Recycled as RA for fill on/offsite | Higher value recycling e.g. into tiles |
| Chipboard | Sent for energy recovery | Sent for energy recovery (opportunities limited) |
| Insulation | Sent for energy recovery/ landfill | Closed loop recycling |
| Vinyl | Sent for energy recovery/ landfill | Closed loop recycling |

# Pre-Demolition Audit
# 9-12 New College Parade

eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## Targets

It is highly recommended that to maximise the reuse and recycling of the KDP's that the following materials are segregated on site:

- concrete
- brick
- steel
- timber (softwood)
- plasterboard
- stone

Potential targets for materials are shown in Table 11. An estimated 98% of materials could be diverted from landfill. Around 64 tonnes, 8% is suitable for reuse.

*Table 11: Recommended targets per material*

| | Reuse | Recycling |
|---|---|---|
| Concrete | 0% | 98% |
| Steel | 10% | 90% |
| Brick | 30% | 68% |
| Glass | 10% | 85% |
| Gypsum | 0% | 50% |
| Softwood | 30% | 70% |
| Ceramic | 0% | 98% |
| Chipboard | 0% | 0% |
| Stone | 80% | 20% |
| Insulation | 0% | 25% |
| Vinyl | 0% | 50% |

During the demolition, details of the actual materials arisings and the waste management methods used should be recorded to compare actual with forecast and to assess performance against the targets set. Following completion of the project, any barriers to achieving the targets should be reviewed to ensure that in future projects these barriers can be overcome.

# Pre-Demolition Audit
## 9-12 New College Parade

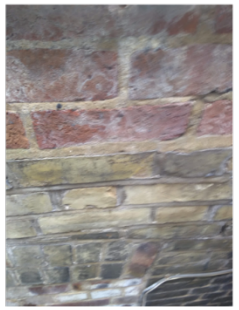
eight versa
+44 (0)20 7043 0418
www.eightversa.com
info@eightersa.com

## Appendix

### External items potential suitable for reuse






### Internal items