The Terrace Upcycle:
A sustainable solution to the housing crisis

A PROPOSAL BY

ADAMS+COLLINGWOOD ARCHITECTS

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Executive summary
The Terrace Upcycle - a sustainable solution to the housing crisis

Adams+Collingwood Architects' Terrace Upcycle concept takes one of our most valuable assets - the terraced house - and with a simple set of design rules, upcycles it to create two homes in place of one.

On the surface this may not appear to be a particularly revolutionary concept, but our proposal is far more radical than a simple house extension. When rolled out across a street it becomes a cost-effective, highly sustainable solution to London and the UK's current housing crisis, whilst also protecting and reviving a traditional London housing typology.

There are many tangible benefits to our smart cities concept; low carbon footprint; regeneration of existing properties and local infrastructure; low cost to government, local authorities and homeowners; doubling up green garden space and creating a new supply of affordable ground floor garden flats – the most in demand demographic for new affordable housing, according to a 2018 House of Commons paper. (1)

To prove the concept we recently completed our first prototype at Temperley Road in London SW12. This mid-terrace house fitted the typical criteria for our concept, but in this case we worked on maximising the potential of one plot rather than the full row. We have increased the size by 50%, whilst retaining the façade and look and feel of the Victorian terrace.

Adams+Collingwood Architects' Terrace Upcycle concept has been well received since it was launched in 2017 in answer to a call from New London Architecture to find new ways of finding 250,000 new homes in London. Since then we have had exploratory discussions with London Mayor's office and our concept has been highlighted in various forums. Most recently Rob Adams was invited to speak at a Future Cites Forum round table on housing.

Our design proposal

Our flexible model creates modern and sustainable homes with an elongated lifecycle.

Modelled on a typical two-up-two-down terraced house, we are adding a single storey with roof terrace and a full height extension to the back. This generates flexible living accommodation for the different generations of a growing family, additional outside space, plus a new single ground floor dwelling unit. Our design proposal incorporates:

- The addition of a single storey in place of the typical pitched roof, including a planted roof garden accessed by stairs
- The conversion of the existing ground floor into a fully accessible garden flat suitable for a single person or couple, either a starter home or a place to retire.
- A full height, glazed extension to the rear of the property
- The zero carbon upgrade of all existing elements

We propose altering Permitted Development Rights to allow changes to terraced houses if they are made within the specific design parameters we outline above.

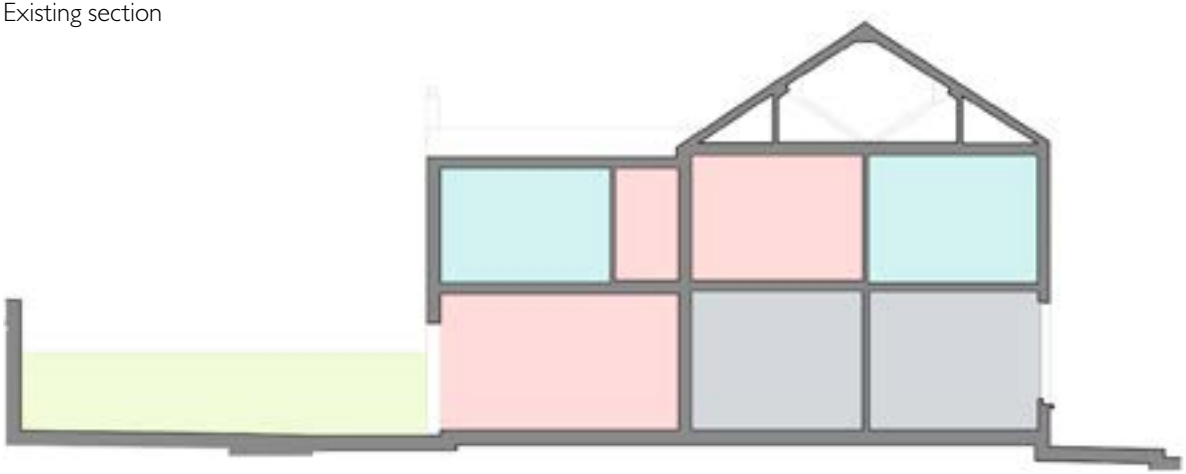
Our design proposal works well because, although terraces vary in style and period of construction, there are common, unifying elements:

- The layout of houses in streets and squares, small rear yards, private gardens, consistent boundary treatments.
- The architectural composition of terrace façades, in which the single houses form a unit in a large entity, but are subordinate to it.
- The detailed architectural treatment and proportion of elevations, and character of materials used.
- The plan form and general treatment of the interiors – a consistent hierarchy between front and back rooms.

Our design proposal
Sections

KEY:	Existing	Proposed
External space	28 sqm	73.4 sqm
Services	11.9 sqm	15.5 sqm
Circulation	18.1 sqm	20.1 sqm
Kitchen / living	35.4 sqm	72.4 sqm
Bedroom	26.5 sqm	44 sqm
Total	**119.9 sqm**	**225.2 sqm**

Existing section



Proposed section

Our design proposal
Floor plans

KEY:

- External space
- Services
- Circulation
- Kitchen / living
- Bedroom

GROUND FLOOR

Existing

Proposed

Our design proposal
Floor plans

KEY:

- External space
- Services
- Circulation
- Kitchen / living
- Bedroom

FIRST FLOOR

Existing

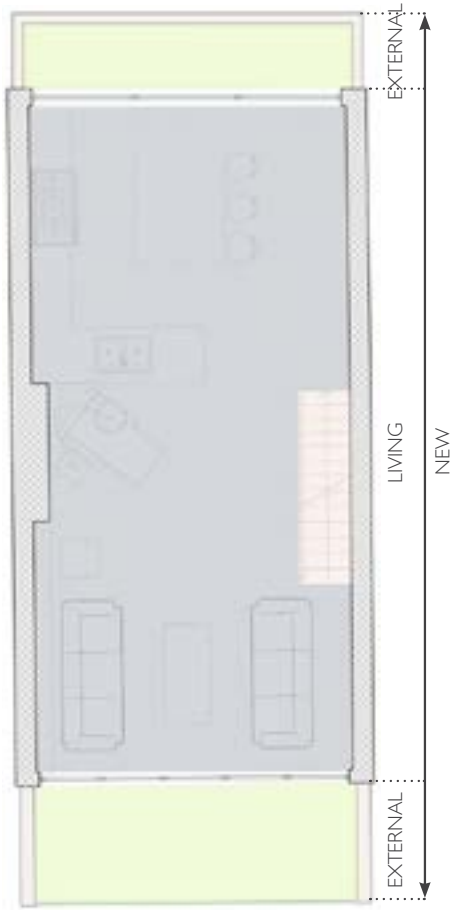
Proposed

Our design proposal
Floor plans

KEY:

- External space
- Services
- Circulation
- Kitchen / living
- Bedroom

SECOND FLOOR AND ROOF LEVEL



Proposed second floor

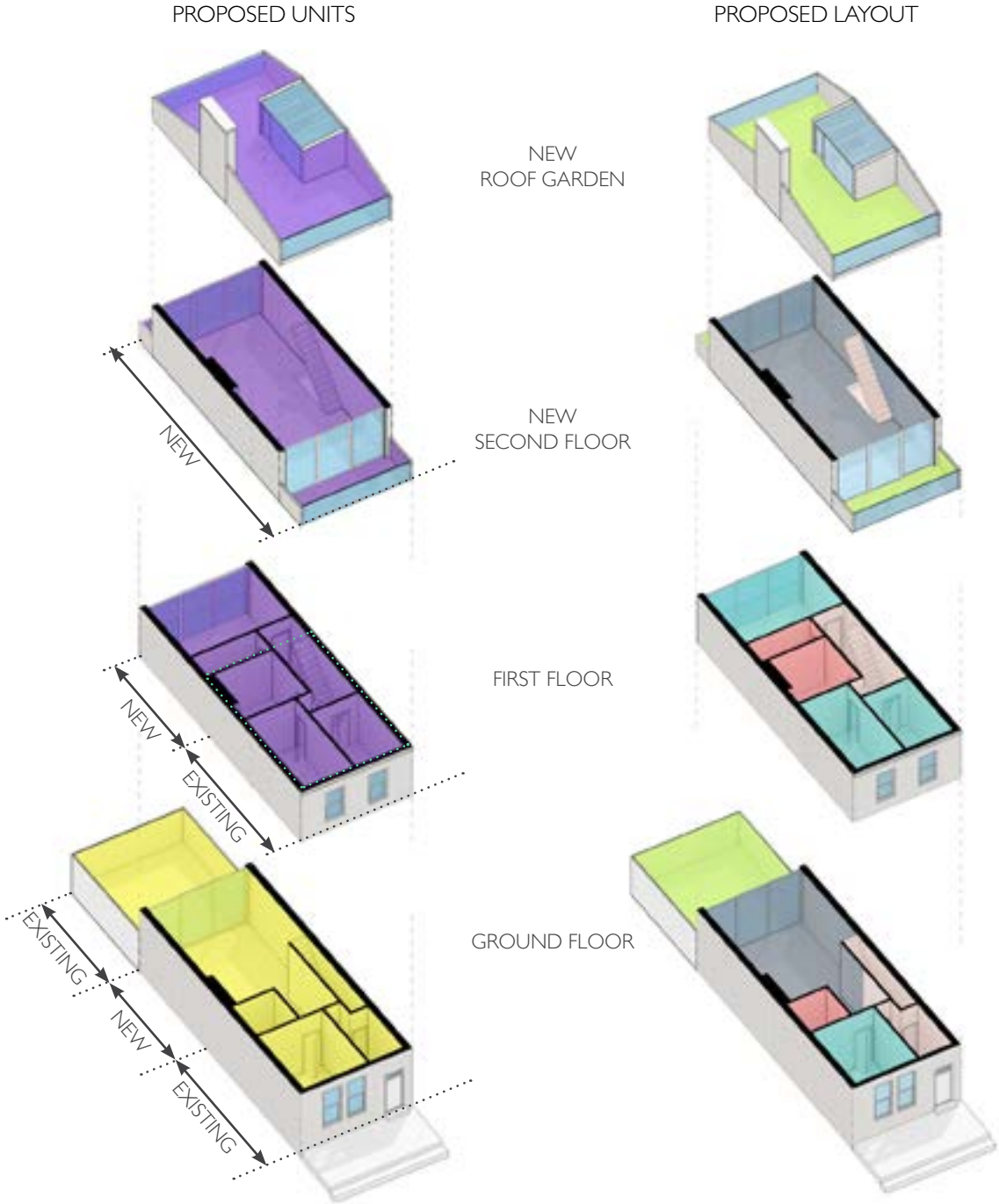
Proposed roof garden

Our design proposal
Axonometrics

KEY:

Proposed unit 1	69.6 sqm
External space	20.4 sqm
Services	3.5 sqm
Circulation	4.3 sqm
Kitchen / living	31 sqm
Bedroom	10.4 sqm

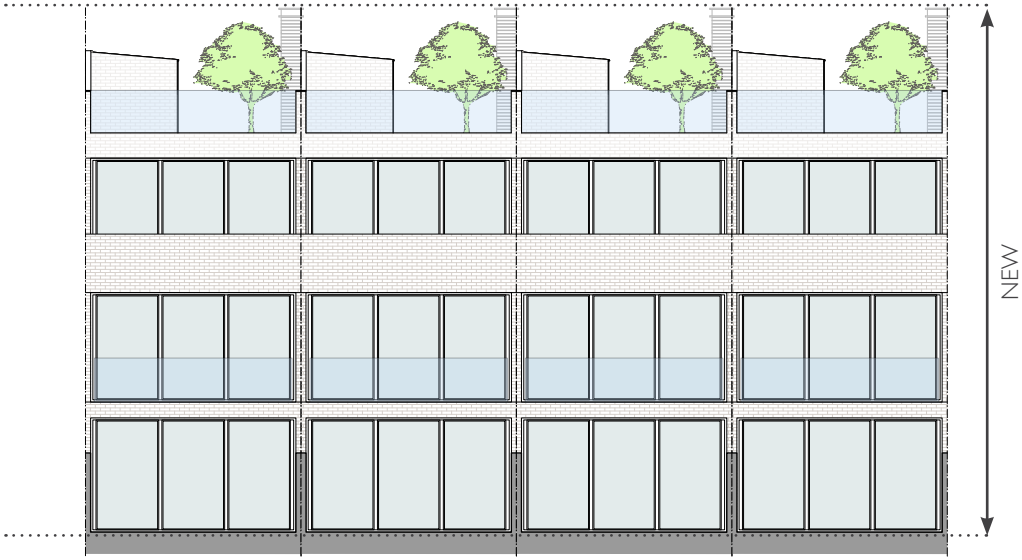
Proposed unit 2	155.6 sqm
External space	53 sqm
Services	12 sqm
Circulation	15.8 sqm
Kitchen / living	41.4 sqm
Bedroom	33.6 sqm



Our design proposal
Elevations

PROPOSED FRONT ELEVATION

PROPOSED REAR ELEVATION



A different approach to smart cities

Rather than investing in new construction, or demolishing and rebuilding, our proposal simply upgrades existing housing stock within our cities.

The Terrace Upcycle concept avoids the need to consider building on the green belt or green / brown city space, by intensifying the density of existing buildings. Our proposal doubles the number of households in a street and creates a variety of much needed housing types. (2)

When carried out at across a terraced row, our concept could be expanded to consider the future adaptability for upcycled terraces through upgrading local infrastructure and amenities as part of the same project. For example, works could include a service trench the length of the street that would future proof installing cabling for home data, mains upgrade, drainage upgrade, and the issues of infrastucture that smart cities need to address. We could also incorporate charging points for electric vehicles, safe and sustainable street furniture, and flexible local amenities that can adapt to future requirements of the local community.

Terrace Upcycle artists' impression

A cost-effective solution

The upcycle offers a significant financial saving when compared to new build, whilst creating a considerably lower carbon footprint.

When carried out for a private homeowner or developer, these additions would very quickly pay for themselves through the extra income generated by the lease or sale of the new second property.

Alternatively, we would be happy to take our proposal to local authorities on the premise that the government could support this initiative by offering loans or finance for Terrace Upcycle projects on the understanding that the new property would be let or sold as affordable housing to key workers, first time buyers, pensioners or similar.

Regenerating a valuable resource

Terraced houses are of outstanding importance to the historical development of the UK's towns and cities.

Taking London as an example, their construction in planned streets and squares on the housing estates of central and inner London from the mid-seventeenth century onwards has bequeathed a remarkable legacy which dictated the character and form of large areas of the capital.

The conservation of our terraced houses makes good economic and practical sense, however currently terraced streets all over the UK are peppered with poor rear extensions and badly-detailed loft conversions. Homeowners are already squeezing all available space under Permitted Developments Rights in a piecemeal fashion. Our Terrace Upcycle proposal would deliver streetscapes with a renewed sense of purpose and a unified façade.

A typical terrace

Sustainability credentials

The terraced house is well known for its sustainable credentials.

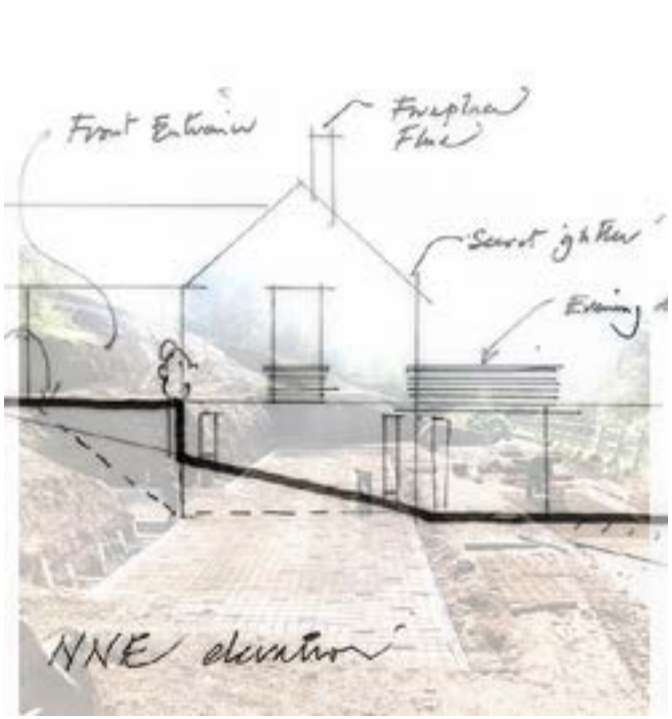
Principally this is because of the huge advantage gained by having a party wall. Party walls do not require the same degree thermal insulation as external walls because the neighbouring houses maintain the same temperature and there is no loss of heat.

With careful consideration of construction methods, materials and utilities systems and installation, there is no reason why the Terrace Upcycle could not produce zero carbon buildings, and even put energy back into the grid. The terrace upcycle proposal includes a super insulated fabric, draught sealed and ventilated using MVHR systems. Rainwater that is not absorbed by the green roof will be collected and re used to clean and irrigate the garden. Additional energy needs will be met using solar panels and ground source heat pumps.

Hampshire Homestead
Sustainability formed an integral part of our brief for these two new build multi-generational homes in the Hampshire countryside. Both homes are low maintenance, well insulated and with solar panels, ground source heat pump and rainwater harvesting they effectively pay for themselves, as well as minimise impact on the local environment.

Sustainability credentials

Campden Hill Square
We stripped this London Georgian property back to its bare bones to reinstate a sustainable and technologically innovative home. Our architects designed a grey water harvesting system; WC's are flushed using run-off water from sis and baths; and the external facades were heavily insulated on the internal face. On completion, the house is very cosy.



The Boathouse
This new build affordable home for a local key worker has been constructed with a sustainable timber frame and ground source heat pumps to reduce carbon emissions and ensure the home remains affordable to maintain.

Abingdon Road
We refurbished this Victorian house to create a 'forever home' for the family. Our client was very keen for their home to be an exemplar of sustainability and efficiency and we achieved this through passive improvements in services, acoustic and thermal linings to external walls, insulation and glazing, and solar power generation in a discreet rooftop location. Monitoring equipment ensures they only use what is necessary and sell excess back to the national grid.

Multi-generational living

The current housing crisis across the UK is a result of very little investment from successive governments. There has been minimal, piecemeal public grant funding, minimal tax intervention or constraint on non-domestic purchasers.

Left to its own devices, the UK housing market does not meet the needs of a growing and ageing UK population. Comprehensive government intervention is required to address this crisis.

We see clear evidence that it is not enough to simply 'supply more homes' when the market environment does not constrain their use or ownership – prices have not gone down as a result of more supply and those in most desperate need are still priced out of the market.

Developers in London and across the UK are responding to this crisis with proposals for soaring towers and large-scale redevelopments that stretch further and further into the suburbs around our cities and towns. People clearly enjoy living in our historic terraces, but this is not currently a sustainable model.

Typically our UK cities are relatively low-density and, by way of simple space planning and permitted development rights for homeowners, we could retain the beautiful simplicity of our city streetscapes.
As an example, Greater London has approximately 3.4m dwellings of which 50% are houses. By implementing our proposal a total of approximately 1.7million ground floor dwellings could be
achieved for the relatively small price of a rear extension and an additional storey.

This solution also relieves demands from the increasing population, when a terrace house could become a home for three generations rather than one.

Multi-generational living

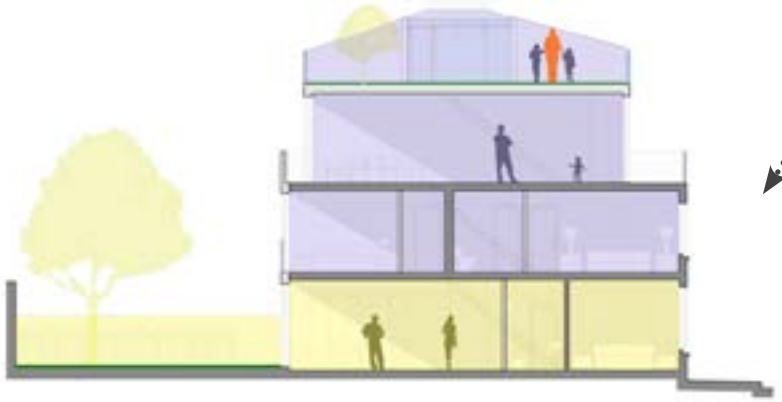
KEY:

- Proposed unit 1 69.6 sqm
- Proposed unit 2 155.6 sqm

1. CHILD

2. INDEPENDENT

4. GRANDPARENTS



3. FAMILY

Key

The value of green spaces to our wellbeing

It is now widely accepted that access to green spaces plays a crucial role in our wellbeing.(3)

A recent report by environmentalist David Lindo recommends ensuring every person in London should be no further than 1km from green space and the London Mayor recently revealed he is considering a major overhaul of planning rules to ensure this happens.(4)

Our Terrace Upcycle concept doubles the number of gardens in a terraced row by creating a ground floor garden flat and a roof garden for the larger home.

This would not only improve the wellbeing of all residents in the terrace, but roof gardens have proven practical sustainability benefits as well:

- Roof gardens can regulate temperatures by working as heat insulators to keep houses cool in the summer and warm in the winter
- They improve air quality in cities soaking up pollutants, which translates into fewer respiratory diseases and can cause a reduction in the derived health expenditure
- They absorb up to 80% of rainfall and avoid potential floods (5)

We could also consider teaming up with local environmental groups to encourage residents to grown their own urban vegetable gardens to promote healthier living and reduced expenses.

Proof of concept

We recently completed our first prototype at Temperley Road in London SW12. Following discussion with the homeowner they agreed to test our Terrace Upcycle proposal.

We have transformed a typical London Victorian terrace house to create a highly energy efficient and spacious family home that retains the familiar features of the traditional terraces we all treasure.

Our client bought their two-up two-down terrace before starting a family and were left with the choice to sell and buy somewhere bigger, extend where they were, or rebuild. Our specialist residential team have worked on a number of similar terraced houses and recommended the most practical cost saving initiative to save them money and create their ideal family home. To help the family take advantage of VAT savings, instead of refurbishing and extending the existing property, we chose to demolish and rebuild, saving them over £100k. Crucially for our Terrace Upcycle concept to work, the local council were supportive of this plan.

Externally we recreated a replica façade exactly as it would have been 120 years ago when the terrace was originally built and kept the traditional architectural typology of the 'water closet wing' to the rear. Internally we designed a simple contemporary split-level plan that doubles the size of the original house on the same footprint. Four bedrooms, three bathrooms, a formal sitting room, a utility room, plenty of storage space and an open plan kitchen dining room opens onto the family garden. The kitchen floor is 450mm below the garden ground level a wall is introduced that acts as a spare seat for an additional outside room.

The works completed in March 2019 and since moving back in, the client tells us their new home feels strong, robust and draughtproof. Previously the family had issues typical of many terraced houses - internal doors that couldn't close during winter, springy floorboards and mysterious draughts that pushed up energy bills. Pre-construction the house energy consumption was 6,000 kWh electricity and 7,500 kWh gas per annum. Post-construction it is anticipated we have reduced this to 4,000 kWh electricity and 6,000 kWh gas per annum, for a building that is twice the size.

The end result is a 50% bigger, energy efficient contemporary new home, with the same Victorian front door in the same community. A terraced house upcycled.

Conclusion

London's terraced houses are a valuable resource; their conservation makes economic and practical sense.

The conservation of terraced street patterns and the scale and character of their urban design are seen as worth preserving, but a sea change in planning policy is required to accept new ideas for the design of the rear of these houses and roof top gardens.

With the experience gained from our Temperley Road prototype project and the data we collected, we are now looking into ways to improve on the sustainable statistics and the cost of the construction under current planning constraints. If and when planning policy changes, we would be ready to implement on a grand scale.

So far we have had constructive initial discussions with the London Mayor's office and Future Cities Forum. As a next step we are looking for an owner of a full terrace or back to back terraces to test the proposal at a larger scale. A collective planning application would avoid the constraints applied to individual properties and allow our team to fully explore the potential of the Terrace Upcycle concept.

We have based our concept on the presumption that in the UK very soon, we will all shortly have to address the demise of 100-200 year old terrace properties which left undealt with will further exacerbate the housing crisis we face. 14% of our carbon emissions are generated by heating, ventilation and hot water to our homes (6) and these old terraces are a large contributor towards this. Adams+Collingwood Architects' Terrace Upcycle concept satisfies the practical need for additional urban housing whilst also reducing our carbon footprint. We also address the emotional need that we have for terraced houses and the sense of community and neighbourliness they create. Our grand vision is to keep the best of the old but upgrade to new.

References

1. House of Commons Briefing Paper 07671, published December 2018
2. Tackling London's Housing Crisis, published Mayor of London, May 2018: https://www.london.gov.uk/what-we-do/housing-and-land/tackling-londons-housing-crisis
3. New Ideas for Housing London, background competition essay by Claire Bennie, published by NLA, June 2015: https://newlondonarchitecture.org/docs/nla_housing_essay.pdf
4. Capital Gains: A Global City in a Changing World, published by Fabian Society and City of London, August 2019: https://fabians.org.uk/publication/capital-gains/
5. Green Roofs or How to Save With Rooftop Gardens, published online by Sustainability for All: https://www.activesustainability.com/construction-and-urban-development/green-roofs-or-how-to-save-with-rooftop-gardens/
6. UK Housing: Fit for the Future? Published by Committee on Climate Change, February 2019: https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/

APPENDICES

The Terrace Upcycle:
Temperley Road Case Study

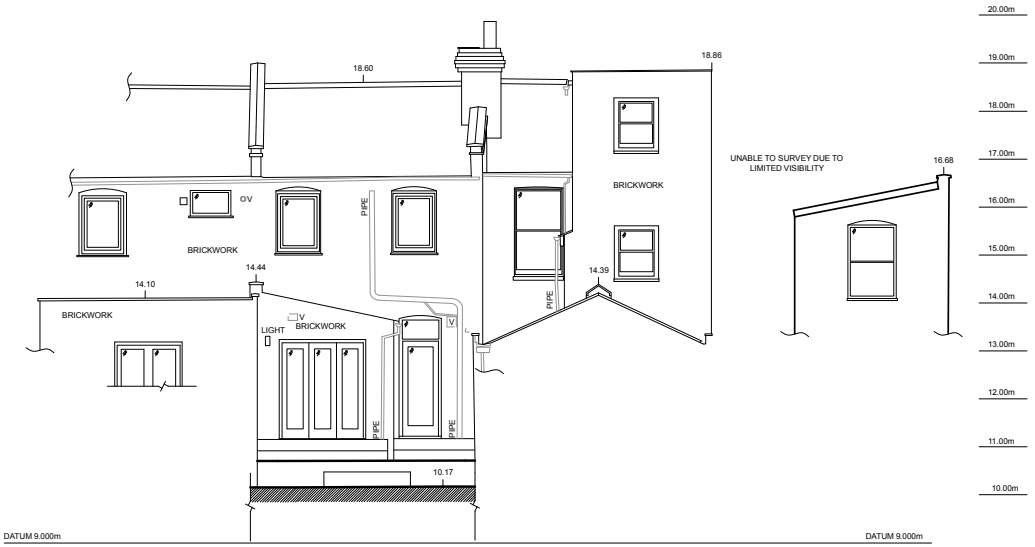
Temperley Road is a perfect example of a terraced house in need of modernisation.

Similarly all of the neighbours have altered their properties, acting within the London plan either as permitted development or planning consent.

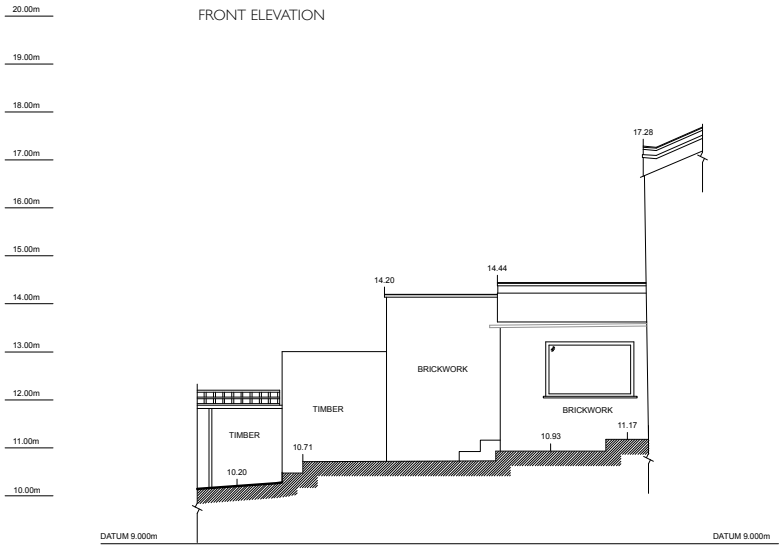
Under current planning legislation the terrace street as we know it can be gradually altered into a complete miss-match of interpretations of the law.

These all fall short of realising the maximum potential of our terraced housing stock and result in poor quality building stock and unsightly rear elevations.

FRONT ELEVATION



REAR ELEVATION



SIDE ELEVATION

EXISTING FRONT ELEVATION

scale 1:100

0m 1m 2m 3m 4m 5m

Revisions

Client
AMANDA AND OLIVER ADAMS

Job Title
66 TEMPERLEY ROAD
LONDON
SW12 8QD

Drawing name
ELEVATIONS AS EXISTING

Scale	Date drawn
1:100@A3	AUGUST 2016
Drawn by	Drawing size
DW	A3

Job number	Drawing number	Revision
757	P003	

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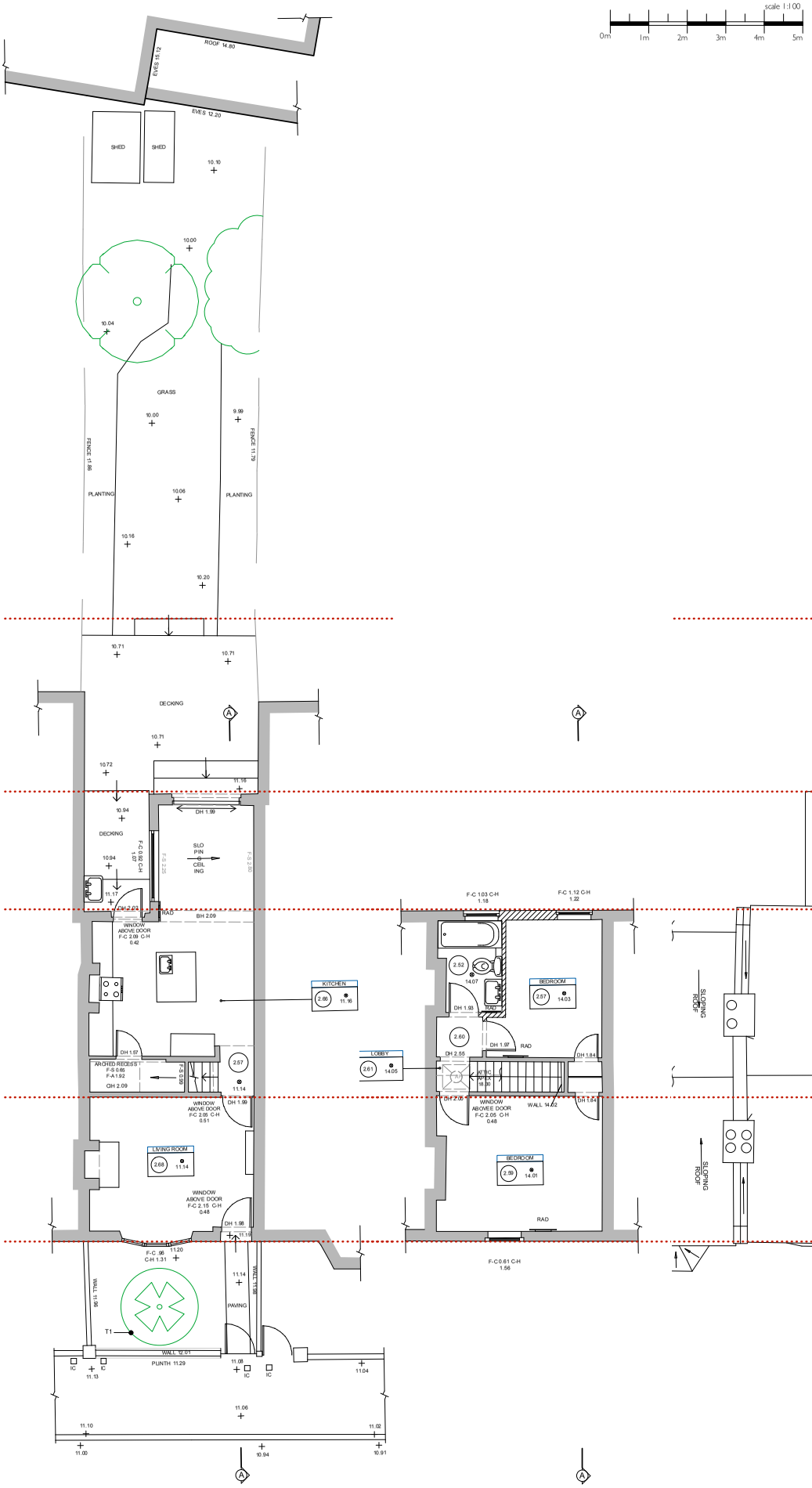

GROUND FLOOR PLAN FIRST FLOOR PLAN ROOF PLAN

Revisions

Client
AMANDA AND OLIVER ADAMS

Job Title
66 TEMPERLEY ROAD
LONDON
SW12 8QD

Drawing name
PLANS AS EXISTING

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Drawn by: DW	Drawing size: A3

Job number	Drawing number	Revision
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ADAMS + COLLINGWOOD ARCHITECTS
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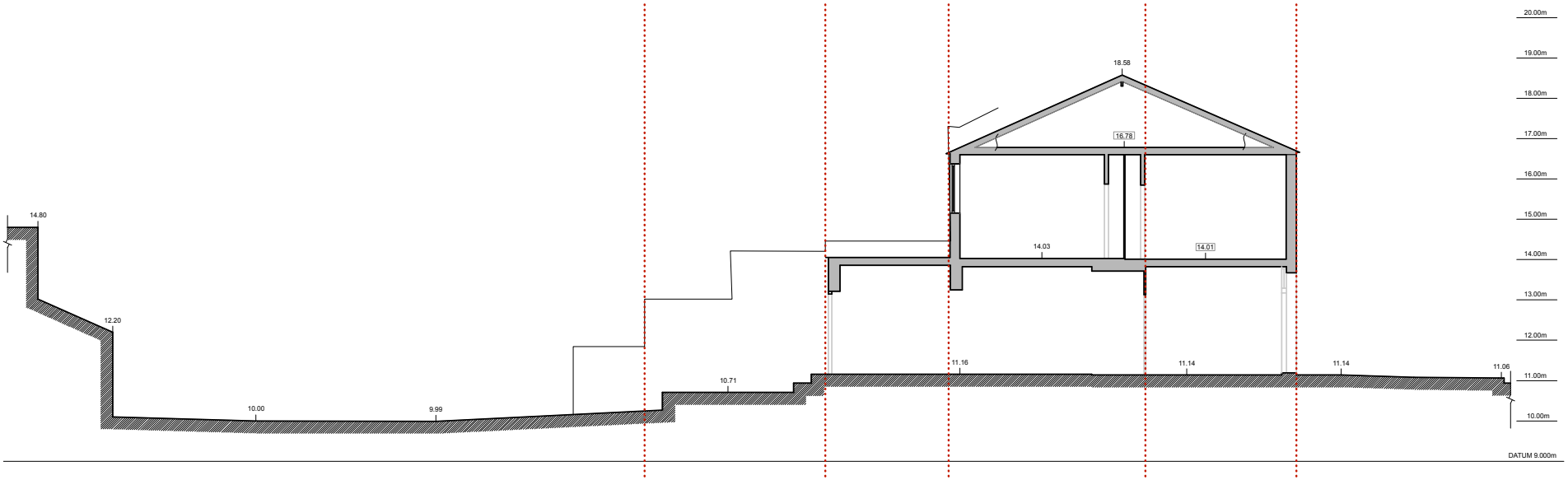

SECTION

ADAMS + COLLINGWOOD ARCHITECTS

Revisions

Client
AMANDA AND OLIVER ADAMS

Job Title
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LONDON
SW12 8QD

Drawing name
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Drawn by	Drawing size
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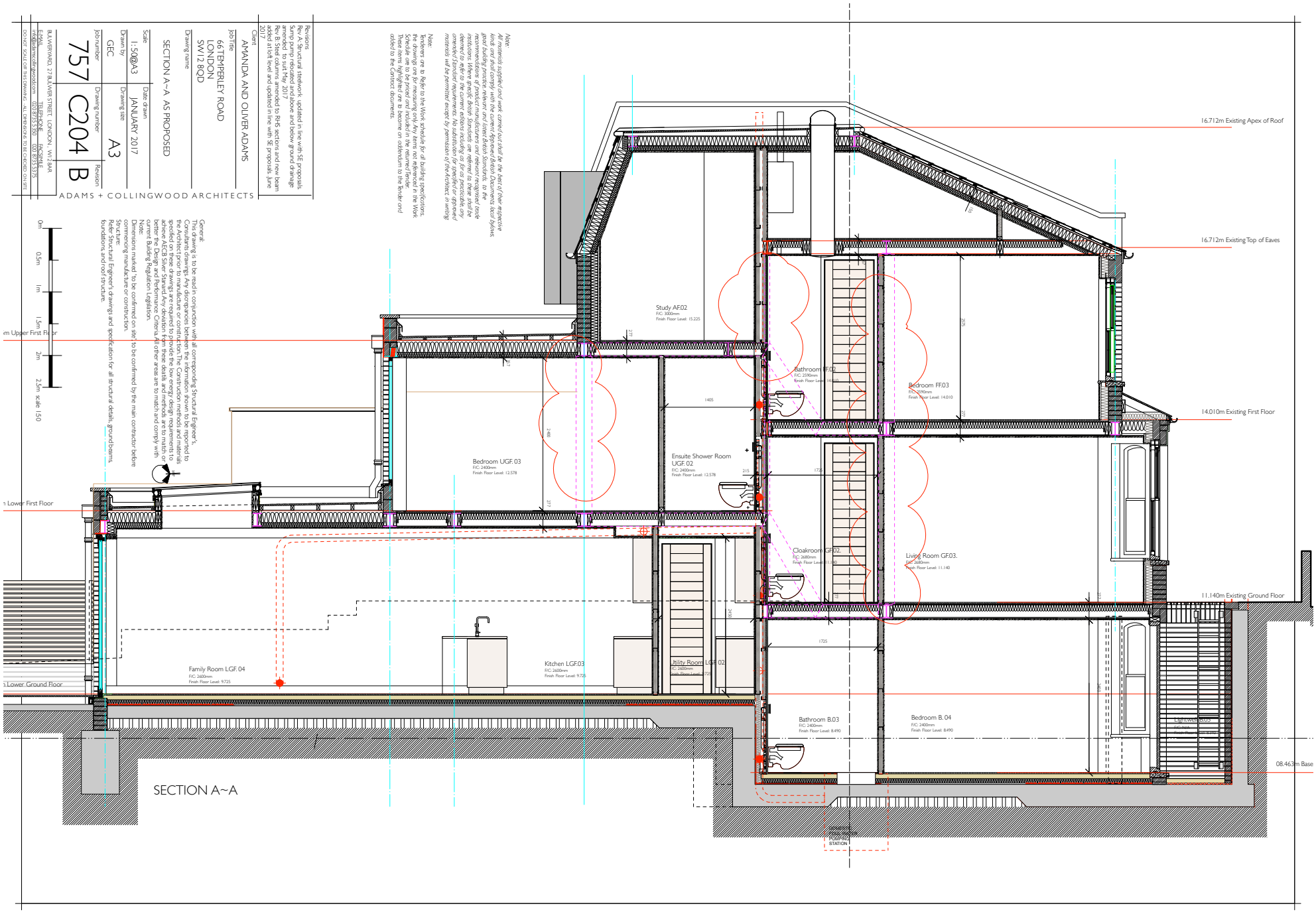
Revisions
Rev A: Structural steelwork updated in line with SE proposals
Sump pump relocated and above and below ground drainage amended to suit May 2017
Rev B: Internal room layouts amended to RIAS sections and new beam added at roof level and updated in line with SE proposals June 2017
Client
AMANDA AND OLIVER ADAMS
Job Title
66 TEMPERLEY ROAD
LONDON
SW12 8QD
Drawing name
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Date drawn
JANUARY 2017
Drawn by
GEC
Drawing size
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Job number
757
Drawing number
C204
Revision
B
ADAMS + COLLINGWOOD ARCHITECTS
BLAWERWARD, 27 BLAWERS STREET, LONDON - W12 8AR
E-MAIL info@adamscollingwood.com TELEPHONE 0207 8735 5300 FACSIMILE 0207 8735 5375
DO NOT SCALE OFF THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE
Note:
Tenderers are to Refer to the Work schedule for all building specifications, the drawings are for measuring only. Any items not referenced in the Work Schedule are to be priced by the Tenderer. These items highlighted are to become an addendum to the Tender and added to the Contract documents.
Note:
All materials supplied and used, carried out shall be the best of their respective kinds and shall comply with the current Japanese, British Documents, local bylaws, good building practice, relevant and latest British Standards, to the recommendations of product manufacturers and relevant recognised trade institutions. Where specific British Standards are referred to these shall be deemed to refer to the current edition including all or as practicable any amendments up to the date of the Contract. No substitution of any materials will be permitted except by permission of the Architect in writing
General:
The following is to be read in conjunction with all corresponding Structural Engineer's, Consultants drawings. Any discrepancies between the information shown to be reported to the Architect prior to manufacture or construction. The Construction methods and materials specified on these drawings are required to provide the low energy design requirements to achieve AECB Silver Standard. Any deviation from these details and methods are to match or better the Design and Performance Criteria. All other areas are to match and comply with current Building Regulation Legislation.
Note:
Dimensions marked 'to be confirmed on site' to be confirmed by the main contractor before commencing manufacture or construction.
Note:
Refer to Structural Engineer's drawings and specification for all structural details ground beams, foundations and roof structure.
0m
0.5m
1m
1.5m
2m
2.5m scale 1:50
16.712m Existing Apex of Roof
16.712m Existing Top of Eaves
14.010m Existing First Floor
11.140m Existing Ground Floor
08.463m Base
Upper First Floor
Lower First Floor
Lower Ground Floor
Study AF.02
F/C. 3000mm
Finish Floor Level: 15.225
Bathroom FF.02
F/C. 2590mm
Finish Floor Level: 14.xxx
Bedroom FF.03
F/C. 2590mm
Finish Floor Level: 14.010
Bedroom UGF. 03
F/C. 2400mm
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Ensuite Shower Room UGF. 02
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Kitchen LGF.03
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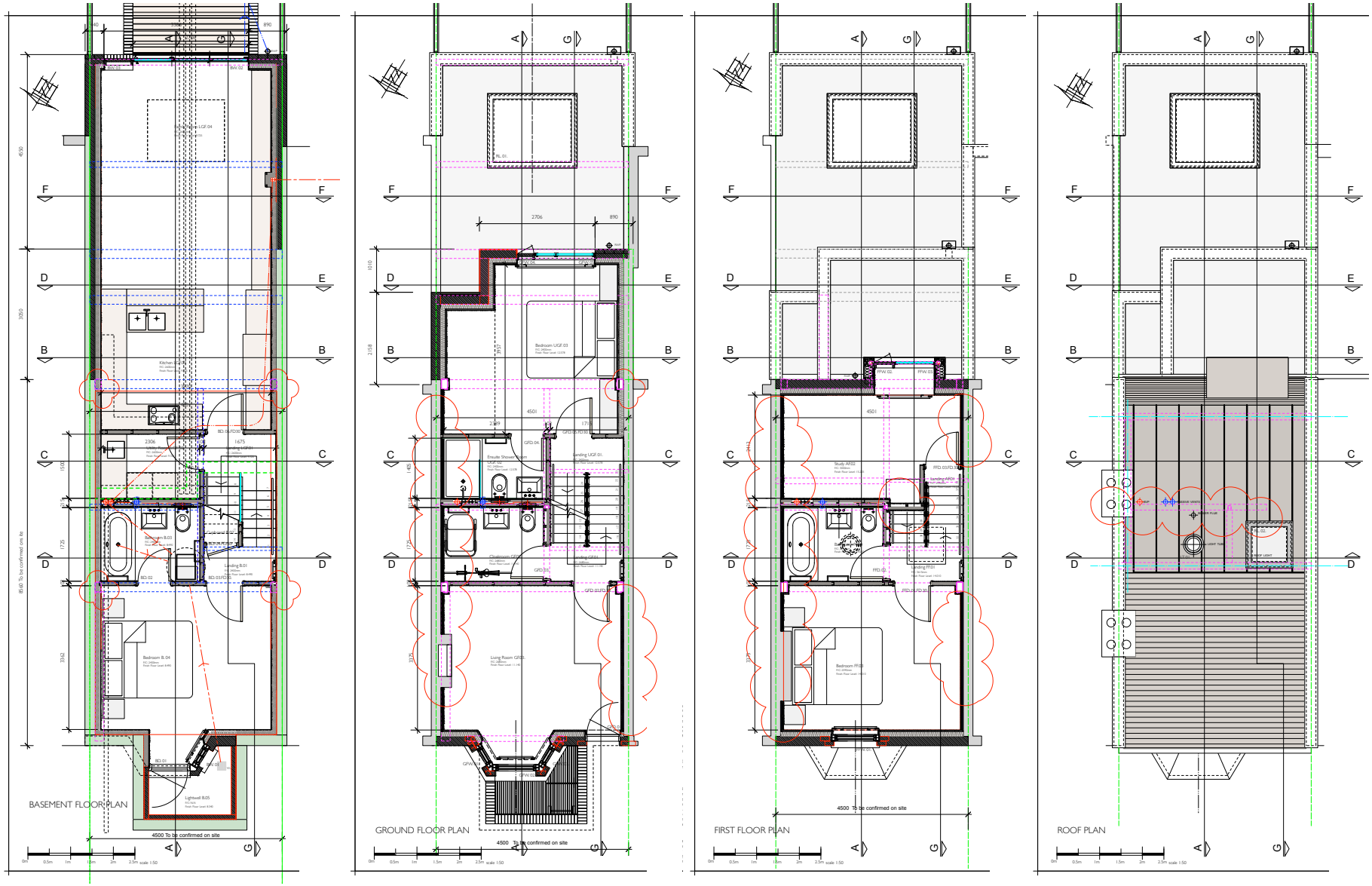
BASEMENT FLOOR PLAN
GROUND FLOOR PLAN
FIRST FLOOR PLAN
ROOF PLAN

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Temperley Road Case Study

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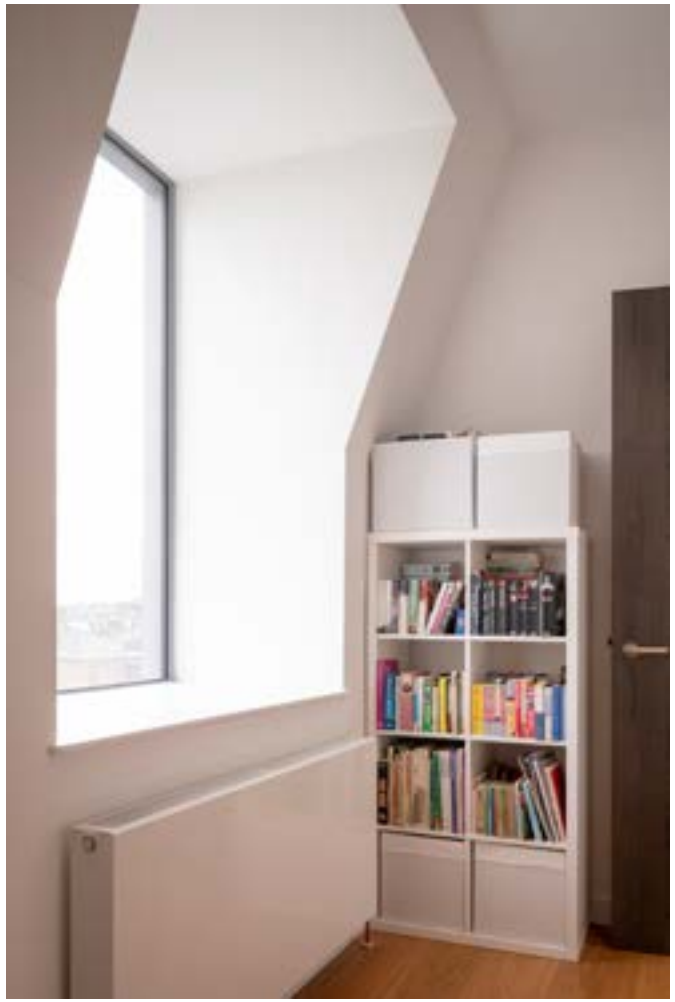

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