# Air Quality Impact Assessment

## Redevelopment of West Central Street

AQIA/AMV/130920
Revision 2

Grontmij

| Issue | Date | Reason for Issue | Prepared | | Checked | | Approved | |
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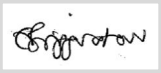
| 2 | 24-09-2013 | Final | SF | pp  | AMV |  | AMV |  |
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Air Quality Impact Assessment
AQIA/AMV/130920
Revision 2

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# Contents



# Appendices

# 1. EXECUTIVE SUMMARY

1) City & General New Oxford Street LLP propose to refurbish part of the city block bounded by New Oxford Street, West Central Street and Museum Street in the London Borough of Camden (LBC). The proposal site comprises Nos. 35–37 and 39-41 New Oxford Street; Nos. 16a, 16b and 18 West Central Street; and Nos. 10, 11 and 12 Museum Street. The scheme will involve the partial demolition of some buildings, construction work and refurbishment.

2) The London Borough of Camden has declared a borough-wide local air quality management plan due to concerns that $NO_2$ and $PM_{10}$ currently exceed EC Limit Values. In order to meet the requirements of the air quality management plan, the planning authority has advised that an air quality impact assessment (AQIA) must be conducted as part of the application for planning permission.

3) Grontmij, with specialist technical support provided by The Airshed, were appointed to conduct an AQIA on behalf of the applicant. This assessment considers the potential impacts during the construction phase and the risk to future residents once the scheme is occupied.

4) At this stage, there is very limited information about the phasing and exact methods to be used during the demolition and construction project. Accordingly this assessment outlines the potential air quality impacts that may be reasonably anticipated and typical mitigation methods available to minimise and control them. The report also provides a framework through which the construction impacts may be successfully managed. The construction impacts have been assessed in accordance with the risk assessment method published in recent draft supplementary planning guidance.

5) The proposed scheme is relatively small in scale. However there are potentially >100 sensitive receptors occupying properties within 20m of the proposed demolition and construction operations. Although the scale of the operations represent a low risk, the scheme has been judged to represent a medium scale risk overall due to the proximity of sensitive receptors.

6) The mitigation measures to be adopted during the construction phase are outlined and further details will be provided as part of a more detailed construction management plan which will be submitted to the planning authority in writing prior to the commencement of any operations on site. The construction management plan will include details on all relevant measures to be adopted to prevent or minimise the release of dust to the atmosphere.

7) Operational impacts have been assessed through reference to published measurements of air pollution within the Borough. The results of monitoring by LBC indicate that local air quality has the potential to exceed the annual mean EC Limit Values for $PM_{10}$ and $NO_2$. In order to prevent impairment of the internal air quality within the proposed development, all habitable rooms shall be fitted with low flow 'whole house' mechanical ventilation[1]. The air intake for this system shall be drawn in from the building façade.

[1] http://www.vent-axia.com/files/pdf-downloads/370712.pdf

# 2. INTRODUCTION

Grontmij were instructed to conduct an air quality impact assessment on behalf of the applicant for the proposed development. Grontmij appointed specialist air quality consultants The Airshed to assist.

## 2.1 Scope and Objectives

This AQIA considers the effects of the proposed development during the construction phase and once the scheme is occupied.

Relevant air quality standards and Guidance are discussed in Section 2. Baseline conditions are described in Section 3. The mitigation measures are discussed in Section 4. The overall significance of the air quality impacts is considered in Section 5.

## 2.2 Description of Proposed Scheme

City & General New Oxford Street LLP propose to refurbish part of the city block bounded by New Oxford Street, West Central Street and Museum Street in the London Borough of Camden (LBC). The proposal site comprises Nos. 35–37 and 39-41 New Oxford Street; Nos. 16a, 16b and 18 West Central Street; and Nos. 10, 11 and 12 Museum Street. The scheme will involve the partial demolition of some buildings, construction work and refurbishment.

The scheme will involve the partial demolition of some buildings, construction work and refurbishment. The local authority has advised that an air quality impact assessment (AQIA) must be conducted as part of the application for planning permission.

The proposed development area occupies ~750m$^2$. There is insufficient information at present to determine the duration of the project.

## 2.3 Initial Consultation with the Local Authority

Preliminary consultation (See Consultation Documentation in Appendix C) with the local authority has confirmed that the AQIA must consider the following aspects:

- *"the impact of the excavation/demolition/construction of the site on nearby receptors and the mitigation measures that will be put in place; and*
- *the steps taken to mitigate exposure to air quality for the proposed residential units as this is an area with really high levels of air pollution. The development will not itself contribute to these levels (other than its initial construction) so a basic analysis based on the existing particulate levels in the area is all that is required. The Council's Sustainability Officer (copied into this email) would be happy to advise in terms of information held by the Council that could be used in this respect."*

There are a number of sensitive receptors located around the proposed development. All properties within the development shall be vacant for the duration of any demolition and construction phases. The nearest sensitive receptors are located at 33–37 New Oxford Street and 43–45 New Oxford Street and are <10m from the nearest phase of the demolition and construction operations. Details of the location of sensitive receptors are summarised in Table 2.1 below.

Table 2.1 - Receptors

| No | Location | Floors | Distance to demolition (m) | Distance to construction (m) | Uses |
|---|---|---|---|---|---|
| 1 | 33 New Oxford Street | 5 | <10 | <10 | mixed uses |
| 2 | 35 New Oxford Street | 4 | <10 | <10 | mixed uses |
| 3 | 37 New Oxford Street | 4 | <10 | <10 | mixed uses |
| 4 | 43 New Oxford Street | 4 | <10 | <10 | mixed uses |

| | | | | | |
|---|---|---|---|---|---|
| 5 | 45 New Oxford Street | 4 | <10 | <10 | mixed uses |
| 6 | 21 - 31 New Oxford Street use | 8 | >25 | <10 | office |
| 7 | 14 West Central Street | 3 | 10 | 10 | office use |
| 8 | 236 Shaftesbury Avenue | 4 - 5 | 20 | 20 | mixed uses |
| 9 | 44 - 50 New Oxford Street | 5 | 60 | 40 | mixed uses |
| 10 | 36 - 42 New Oxford Street | 5 | 40 | 20 | mixed uses |
| 11 | 2 - 28 New Oxford Street | 8 | 50 | 30 | mixed uses |
| 12 | 11 West Central Street | 3 | <10 | <10 | car park |
| 13 | Travel Lodge | 13 | <10 | <10 | hotel |

## 2.4 Potential Adverse Impacts

The proposed demolition and construction operations will involve the generation of dust and particulate with the potential to cause nuisance and annoyance, by soiling of surfaces (e.g. pavements, roadways, vehicles, windows, and clothing) and irritation of the eyes and upper airways (nose and throat). The smaller fraction of these particles also has the potential to contribute to poor air quality and thus affect human health. The development may also generate road traffic during the construction phase.

Air pollution within central London is relatively high so that future residents within the proposed development may be exposed to high levels of ambient air pollution through the inhalation of toxic gases and particles such as $NO_2$ , $PM_{10}$ and $PM_{2.5}$. The main pollutants of concern in the study area are likely to be long-term exposure to $NO_2$ and airborne particles e.g. $PM_{10}$ and $PM_{2.5}$.

# 3. STANDARDS AND METHODS

## 3.1 Air Quality Standards

European Directive 2008/50/EC consolidates previous European air quality legislation, provides a new regulatory framework for $PM_{2.5}$ and allows extended compliance deadlines for $NO_2$ and $PM_{10}$. The limits within the EC Directive are implemented by the Air Quality (England) Regulations as amended.[2]. These Regulations set air quality standards for a range of air pollutants typically associated with road traffic emissions, including $PM_{10}$ and $NO_2$, which require that the annual mean concentration for both these pollutants should not exceed 40ug/$m^3$. Directive 2008/50/EC set an annual mean for $PM_{2.5}$ of 25ug/$m^3$ to be achieved by 2015.

Air Quality Objectives have been published in the UK Air Quality Strategy which sets out the measures intended to improve and protect ambient air quality and how the UK government proposes to fulfil the UK's obligations under the European Directives.[3]

The Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland sets out the policy, targets and objectives for air pollutants. The Technical Guidance to local authorities for the review and assessment of air quality was last revised in February 2009.[4] This Guidance TG(09) sets out the methods to be used to determine if the Air Quality Objectives are likely to be achieved.

The main focus of interest in terms of human health is now particles below about 2.5um in diameter. In the UK, the Department of Health sponsored Committee on the Medical Effects of Air Pollution (COMEAP) has advised that *"in defining a coefficient linking $PM_{2.5}$ and mortality and advising on its use for quantification .... $PM_{2.5}$ is our chosen index of pollution."*[5]. $PM_{2.5}$ does not fall within the local air quality management regime and is the responsibility of central government.

## 3.2 Sensitive Receptors

Air Quality Objectives should apply to all locations where members of the public may be reasonably likely to be exposed to air pollution for the duration of the relevant objective. Thus short-term standards such as the 1 hour objective for $NO_2$ should apply to footpaths at site boundaries and other areas which may be frequented by the public even for a short period of time.

Longer term objectives such as the 24 hour or annual mean for $NO_2$ or $PM_{10}$ should apply at houses and other locations which the public can be expected to occupy on a continuous basis. The long-term and short-term objectives do not apply to exposure at the workplace.

## 3.3 Ecological Receptors

This assessment assumes that the ecological limit values for pollutants do not apply to the study area. This is based on paragraph 10 of 2008/50/EC[6], which states that compliance with critical levels for the protection of vegetation should focus on places away from built-up areas.

## 3.4 Review and Assessment

The London Borough of Camden (LBC) has conducted reviews of air quality within its area.[7] The Council declared a borough-wide air quality management area in 2001 due to concerns that levels of $PM_{10}$ and $NO_2$currently exceed EC Limit Values in many parts of the Borough. LBC has also published progress reports which require that all new development should have construction management plans which include measures to reduce air pollution emissions.[8]

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[2] S.I. 2000 No. 928. Environmental Protection, England. The Air Quality (England) Regulations 2000.
[3] DEFRA July 2007. The Air Quality Strategy for England Scotland Wales and Northern Ireland (Volume 1).
[4] DEFRA 2009. Review and Assessment Technical Guidance TG(09).
[5] Committee on the Medical Effects of Air Pollutants. Quantification of the Effects of Air Pollutants on Health in the UK. Interim Statement. 18th January 2006. http://www.advisorybodies.doh.gov.uk/comeap/pdfs/interimlongtermeffects2006.pdf
[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0050:EN:NOT
[7] London Borough of Camden April 2013. Air Quality Updating and Screening Assessment – 2012.
[8] London Borough of Camden September 2011. Air Quality Progress report.

LBC operates four automatic continuous real-time air quality monitors within the borough, including a TEOM particulate $PM_{10}$ monitor in Shaftesbury Avenue, <200m from the proposed development site. The Council has also conducted extensive monitoring of local air quality for $NO_2$ using diffusion tubes. There are six diffusion tube sites within 1km of the proposed development site. All sites report levels of $NO_2$ that are consistently >40ug/$m^3$ (the EC annual mean Limit Value) for the most recent four years for which data is published. These data are summarised in Table 2.1 below.[9]

The measurements over the last six years indicate that there is a gradual trend of reduced ambient NO2 concentrations within the borough. Air quality in Camden continues to fail to meet the long and short-term air quality objectives for NO2. The annual mean levels of NO2 continue to be exceeded at all four automatic monitoring sites and the majority of LBC's nitrogen dioxide diffusion tube sites. The short-term NO2 objective has been exceeded at 2 of the 4 automatic monitoring stations in 2012.

Table 2.1 – Summary of $NO_2$ Diffusion Tube Data

| Site Code | Site Name | Site Type | *Distance (m) | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|
| CA21 | Bloomsbury Street | Roadside | 280 | 81 | 41 | 77 | 43.7 |
| CA14 | Russell Square | Background | 597 | 45 | 44 | - | - |
| CA11 | Tottenham Court Rd | Kerbside | 674 | 108 | 92 | 92 | 83.3 |
| CA9 | 63 Gower Street | Roadside | 733 | 83 | 74 | - | - |
| CA22 | Goodge Street | Roadside | 743 | 61 | 50 | - | - |
| CA10 | Tavistock Gardens | Background | 942 | 50 | 52 | 47 | 40.1 |

Units = annual mean $NO_2$ ug/$m^3$ *Distance from development site to monitoring site

## 3.5 Best Practice Guidance for Construction

London Councils and the Mayor's Office have published best practice Guidance on mitigation measures that should be adopted to prevent or minimise adverse air quality impacts from construction operations.[10] This provides a simple framework for assessing potential risk, based on the development footprint, number of properties involved and a checklist for prevention, suppression and control of air pollutants.

There is currently a draft for consultation which revises and updates the Guidance.[11]

The draft method includes a slightly more detailed framework for risk assessment. This draft Guidance has been taken into account in developing the mitigation measures to be adopted for the application.

## 3.6 Assessment Criteria

The assessment criteria used in this study are set out in Table 2.2 below. The significance of changes brought about in ambient air pollution has not been assessed in accordance with EPUK Air Quality Guidelines[12] as this is only relevant when considering a proposed change in local air quality due to change in road traffic or other source of air pollution.

Table 2.2 – Assessment Criteria

| Pollutant | Time Period | Justification |
|---|---|---|
| $NO_2$ | Annual mean | EC Limit Value |
| $PM_{10}$ | Annual mean | EC Limit Value |

[9] London Borough of Camden, 10 th July 2013. Air Quality Progress report.
[10] London Councils & Mayor of London. November 2006. The Control of Dust and emissions from construction and demolition.
[11] Mayor of London September 2013. The Control of Dust and Emissions During Construction and Demolition. Draft Supplementary Planning Guidance Published for Public Consultation.
[12] EPUK 2010. Development Control Planning for Air Quality

# 4. BASELINE CONDITIONS

Estimates of background pollution particles (PM 10 ) and oxides of nitrogen ($NO_x$ and $NO_2$) have been obtained from the DEFRA sponsored air quality archive.[13] The data in Table 3.1 presents the estimated background concentrations for the year 2012 within the study area where OSx1 ,y1 = 528000,180000 and OSx2 ,y2 = 532000,183000.

Table 3.1 – Annual Mean Estimates of Background Air Quality 2012

| OSx | OSy | $NO_x$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|
| 529500 | 182500 | 102.3 | 51.0 | 23.9 | 17.0 |
| 530500 | 182500 | 94.7 | 48.6 | 23.3 | 16.5 |
| 530500 | 181500 | 116.4 | 56.4 | 24.1 | 17.3 |

Units = ug/$m^3$, annual mean

The assessment assumes that background air pollution levels within the study area will not reduce after 2012 and that there will be no reduction in vehicle emissions arising from improvements in vehicle engine technology due to replacement of ageing vehicles with Euro 5 compliant vehicles. This is intended to be pessimistic, to take account of uncertainties in predictions of background air pollution and vehicle exhaust emissions for future years.

[13] http://laqm.defra.gov.uk/maps/maps2010.html#2010BackgroundMaps

# 5. MITIGATION

The aim of this section is to identify potential adverse air quality impacts likely to arise during the construction phase, including demolition works, together with those during the operational phase (i.e. post development).

## 5.1 Construction Phase

At this stage of the project there is very limited information about the phasing and exact methods to be used. Accordingly this assessment outlines the potential impacts and mitigation methods and provides a framework through which these impacts may be successfully managed.

The impacts from the proposed operations have been assessed using the simple risk assessment framework suggested in the supplementary planning guidance for London[11].

The dust risk from the various phased of the proposed operations are summarised in Table 5.1 below.

Table 5.1 – Overview of Dust Risk Assessment

| Phase | Scale | Risk Threshold | Dust Risk |
|---|---|---|---|
| Demolition | Volume Building demolished | <20,000m 3 | Small |
| Earthworks | Total Site Area | <2,500m 2 | Small |
| Construction | Building Volume | <25,000m 3 | Small |
| Trackout | No of HDV/day >3.5t | <25/day | Small |

The proposed scheme is relatively small scale. However there are potentially >100 sensitive receptors occupying properties within 20m of the proposed demolition and construction operations. Accordingly although the scale of the proposed operations represent a low risk, overall the scheme represents a medium scale risk, due to the proximity of sensitive receptors.

The outline scope of the air quality measures for the construction management plan are summarised in Table 5.2.

Table 5.2 - Framework for Construction Management Plan

| Item | Framework for Construction Management Plan |
|---|---|
| 1 | Summary of work to be carried out |
| 2 | Description of site layout and access – including proposed haul routes |
| 3 | Location of site equipment including supply of water for damping down, source of water (wherever possible from dewatering or extraction), drainage and enclosed areas |
| 4 | Inventory and timetable of all dust generating activities |
| 5 | List of all dust and emission control methods to be used |
| 6 | Details of any fuel stored on site |
| 7 | Summary of monitoring protocols and agreed procedure of notification to the local authority nominated person(s) |
| 8 | Site log book to record details and action taken in response to exceptional incidents or dust-causing episodes. It should also be used to record the results of routine site inspections including visual inspections of dusty operations |
| 9 | Hazardous materials survey (e.g. to determine if asbestos present in existing building fabric) |
| 10 | Reuse and recycling of materials generated by demolition |
| 11 | Risks associated with excavation of contaminated land |

The mitigation measures to be adopted during the construction phase are outlined in Table 5.3 below

Table 5.3 - Mitigation

| Phase | Control Technique | Method |
|---|---|---|
| All | Containment | barriers at ground level |
| All | Containment | fabric barriers above ground level to contain dust |
| Demolition | Prevention | road route for heavy goods demolition traffic to be agreed with Local Authority |
| All | Prevention | road vehicles used for project to be agreed with local authority |
| Demolition | Prevention | crushing of demolition material to be conducted off-site |
| Construction | Prevention | concrete batching to be conducted off-site |
| All | Prevention | no vehicle engines to idle at site |
| All | Prevention | all loads leaving and entering the site shall be covered |
| All | Prevention | no stockpiles of material shall be held on site overnight |
| All | Prevention | no bonfires shall be permitted |
| Excavation | Suppression | all surfaces shall be kept damp during dry weather |
| Demolition | Suppression | all roads shall be swept daily |
| Construction | Suppression | all roads shall be swept regularly |
| All | Suppression | dust control measures shall be adopted during cutting, grinding and sawing |
| All | Suppression | all skips shall be securely covered |

The dust control action plan is summarised in Table 5.4.

Table 5.4 - Dust Control Action Plan

| Item | Description | Status | Further Action |
|---|---|---|---|
| 1 | Undertaking Air Pollution Risk Assessments | To be conducted at same time as detailed construction planning. | Copy to be submitted in writing to London Borough of Camden for approval prior to commencement of any works on site. |
| 2 | Notification of works to local authorities | As part of Planning Application | Further, more detailed construction management plan to be completed post planning enforced through planning condition. |
| 3 | Emission standards for vehicles (both on road and off-road) | Requirement of Construction management plan | - |
| 4 | Air quality monitoring protocol | Requirement of Construction management plan | Proposed visual monitoring for dust emissions to be agreed with LBC |
| 5 | Requirement for no burning on any site | Requirement of Construction management plan | - |
| 6 | Demolition management | Requirement of Construction management plan | - |
| 7 | Waste and recycling management | Requirement of Construction management plan | - |
| 8 | Paving major haul routes used by HGVs | Not applicable | - |
| 9 | Training and identification of on-site staff responsible for pollution issues | Requirement of Construction management plan | - |
| 10 | Hazardous Materials Survey | Requirement of Construction management plan | - |
| 11 | Waste Management | Requirement of Construction management plan | - |

The applicant shall submit a construction management plan to the planning authority in writing prior to the commencement of any operations on site. The construction management plan shall include details on all relevant measures to be adopted to prevent or minimise the release of dust to the atmosphere.

## 5.2 Operational Phase (Once Development is Occupied)

The results of monitoring by LBC indicates local air quality has the potential to exceed the annual mean EC Limit Values for $PM_{10}$ and $NO_2$. The following measures are proposed to mitigate the effects of air pollution within the proposed scheme.

- All habitable rooms within the development shall be fitted with low flow 'whole house' mechanical ventilation.[14] The air intake for this system shall be drawn in from the building façade.
- All ventilation systems shall be located well away from any flue or chimney to prevent any products of combustion being drawn into the domestic ventilation system.

[14] http://www.vent-axia.com/files/pdf-downloads/370712.pdf

# 6. SIGNIFICANCE OF RESIDUAL IMPACTS

## 6.1 Demolition and Construction Impacts

The scale of the proposed demolition and construction operations is low risk in terms of local air quality, but overall the project represents a medium risk taking account of the number of sensitive receptors within 20m. A dust management plan is proposed as part of an overall construction management plan to prevent or minimise the release of dust and other pollutants to the atmosphere.

The scale of road traffic generated during the construction phase is unlikely to be significant in terms of local air quality.

## 6.2 Operational Impacts (affecting future residents)

Based on this assessment, exposure to particles and $NO_2$ is at risk of exceeding EC annual mean Limit Values at some receptors in the proposed new development where these windows face on to new Oxford Street.

Air quality is likely to be better away from New Oxford Street and at roof level. This has been taken into account when determining the requirement for mitigation to protect future residents of the proposed development. The proposed mitigation measures should reduce the risk that future residents may be exposed to levels of air pollution that exceed EC annual mean Limit Values for $NO_2$, $PM_{10}$ and $PM_{2.5}$.

# Appendices

## Appendix A - CONSULTATION

AQIA/AMV/130920 Issue 1

Steve Fraser

From: Humfrey, Nick <Nick.Humfrey@camden.gov.uk>

Sent: 13 September 2013 11:17

To: steve@theairshed.com

Subject: RE: AS 0392 West Central St. AQIA

Attachments: Camden PR_Report_2013 Final Draft.doc

Hi Steve,

I was literally looking at the letter you sent my colleague Poppy Lyle when this email arrived so sorry for not being in touch before and that you've had difficulty getting through. My number is 020 7974 4027 and I'm in all today if you want to call.

With regards to your questions, yes that's absolutely fine to set out basic principles for construction if you don't have the detail at the moment. You're right that we will put an S106 requiring a look at the completed construction management plan once the details are available.

With regards to exposure, I attach the most up to date Progress Report which I hope will help. Please feel free to contact me if you have any further questions.

Thanks

Nick Humfrey

Sustainability Officer

Telephone: 0207 974 4027

-----Original Message-----

From: Steve Fraser - The Airshed [mailto:steve@theairshed.com]

Sent: 13 September 2013 11:07

To: Humfrey, Nick

Cc: Steve Fraser; Tony Vine

Subject: AS 0392 West Central St. AQIA

Hi

I'm working on the air quality impact assessment for a proposed redevelopment at West Central Street and would be grateful for your advice. (I tried phoning first, without success).

The proposed development involves some demolition and the construction of a replacement new build. I understand that the Council has asked that the application should include an assessment of the impacts arising from demolition and construction. The information available on demolition and construction operations is very limited at this stage in the planning process. Our provisional assessment (based on the simple risk assessment framework in draft SPG planning Guidance on dust from construction) is that the project represents a low risk during demolition, site excavation, construction and transport. We are not in a position to develop a detailed dust management plan at this stage in the project, so I envisage that the draft dust mitigation plan within the AQIA will outline the general principles to prevent or minimise the release of dust and other pollutants to the atmosphere - in line with current best practice.

It will obviously be necessary to update and 'flesh-out' the dust management plan post planning at the same time as the detailed construction plannning (as suggested in the draft SPG). I therefore anticipate the AQIA accompanying the application will propose a general framework for management and control of construction impacts and that the planning authority will impose a planning condition requiring that the detailed dust management plan be sumbitted in writing for approval prior to the commencement of works on site.

I'd appreciate your views on this, to provide some reassurance to the project team that we are on the right track.

We have been advised that the AQIA should also include an assessment of the likely exposure to future residents based on published air quality data. I've obtained the DEFRA background estimates and the 2011 review and assessment off your website. I'd be grateful for a copy of the latest R&A and any other modelling report that we should take into account.

Kind regards

Steve Fraser - The Airshed

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