**Chelmer Site Investigations**

Unit 15, East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
**Telephone:** 01245 400 930 **Fax:** 01245 400 933
**Email**: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

# Factual Report

| | |
|---|---|
| **Client:** | Dig for Victory Ltd |
| **Site:** | 21 Aberdare Gardens<br>London NW6 |
| **CSI Ref:** | FACT/5139A |
| **Dated:** | 12th Oct 2014 |

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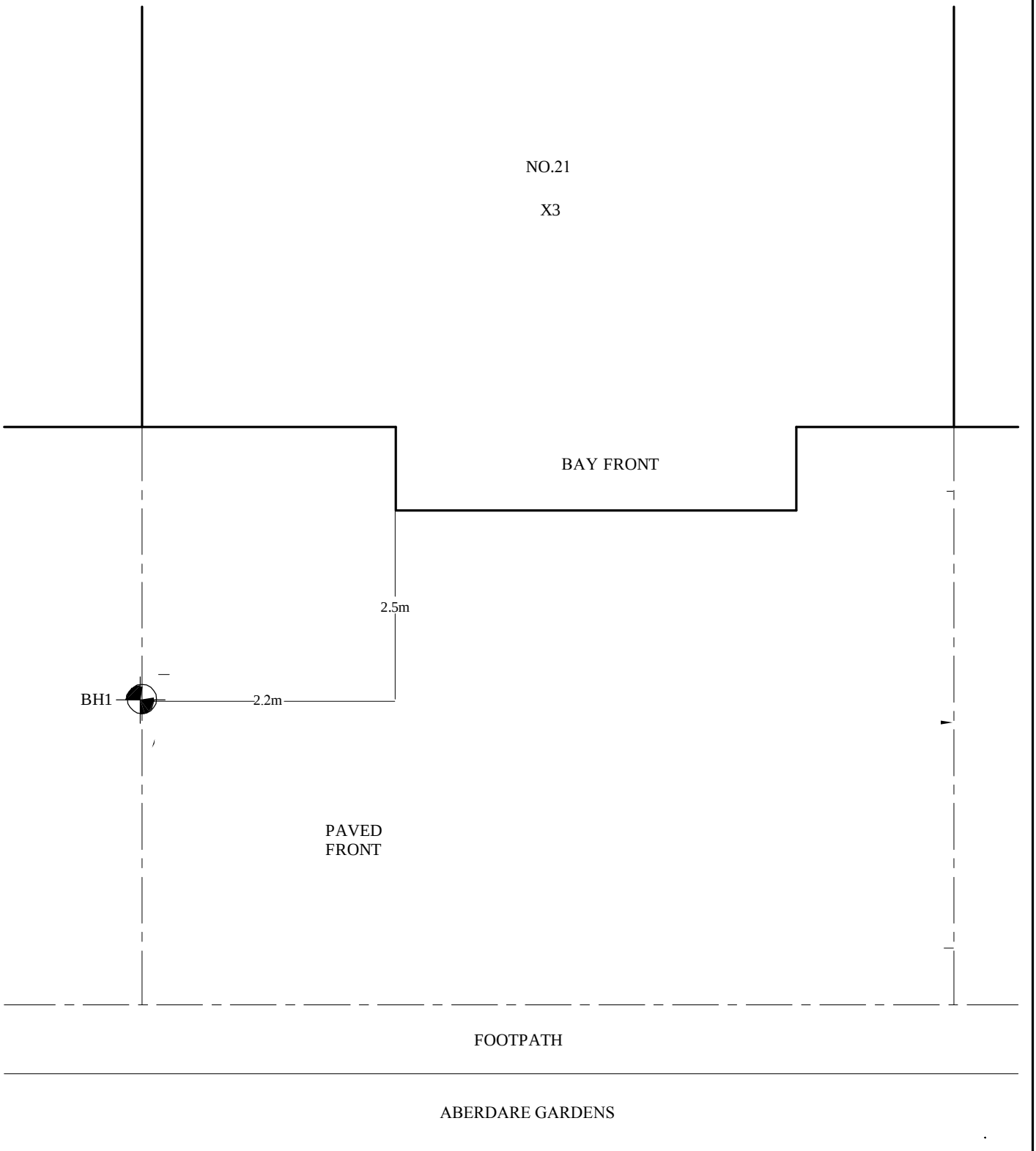
Chelmer Site Investigations

| | | | | |
|---|---|---|---|---|
| **Client:** Dig for Victory Ltd | **Scale:** N.T.S. | **Sheet:** 1 of 1 | **Date:** 12.10.14 | |
| **Location:** 21 Aberdare Gardens, London NW6 | **Job No:** 5139A | **Weather:** Overcast | **Drawn by: JG** | **Checked by: ME** |




**Notes:**

*On site tree identification for guidance only. Not authenticated.*

**Key:**

Tree/Shrub | Borehole | Trial Pit | G Gully | Tree Stump | Rain Water/ Soil Pipe | MH Manhole

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| | | | | | |
|---|---|---|---|---|---|
| **Client:** Dig for Victory Ltd | **Scale:** N.T.S. | **Sheet No:** 1 of 1 | **Weather:** Overcast | **Date:** 12.10.14 | |
| **Site:** 21 Aberdare Gardens, London NW6 | **Job No:** 5139A | **Borehole No:** 1 | **Boring method:** Hand auger | | |

| Depth Mtrs. | Description of Strata | Thick-ness | Legend | Sample | Test Type | Test Result | Root Information | Depth to Water | Depth Mtrs |
|---|---|---|---|---|---|---|---|---|---|
| G.L. | BRICK PAVING | 0.15 | | | | | | | |
| 0.15 | MADE GROUND: medium compact, dark brown, very silty clay, with gravel and brick fragments. | 0.75 | | D | | | Hair and fibrous roots to 0.9m. | | 0.5 |
| 0.9 | Firm, orange-brown, grey veined, silty CLAY, with partings of orange and brown, silt and fine sand, claystone nodules and selenite crystals. | 1.4 | | D | V | 62<br>66 | No roots observed below 0.9m. | | 1.0 |
| | .....becoming stiff from 1.4m. | | | D | V | 78<br>82 | | | 1.5 |
| | | | | D | V | 94<br>100 | | | 2.0 |
| 2.3 | Very stiff, orange-brown, grey veined, silty CLAY, with partings of orange and brown, silt and fine sand, frequent claystone nodules and selenite crystals. | 2.7 | | D | V | 140+<br>140+ | | | 2.5 |
| | | | | D | V | 140+<br>140+ | | | 3.0 |
| | | | | D | V | 140+<br>140+ | | | 3.5 |
| | | | | D | V | 140+<br>140+ | | | 4.0 |
| | | | | D | V | 140+<br>140+ | | | 4.5 |
| 5.0 | Borehole ends at 5.0m | | | D | V | 140+<br>140+ | | | 5.0 |

**Drawn by**: JG **Approved by:** ME

**Remarks:** Borehole dry and open on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

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# REPORT NOTES

## Equipment Used

Hand tools, Mechanical Concrete Breaker and Spade, Hand Augers, 100mm/150mm diameter Mechanical Flight Auger Rig, GEO205 Flight Auger Rig, Window Sampling Rig, and Large or Limited Access Shell & Auger Rig upon request and/or access permitting.

## On Site Tests

By Pilcon Shear-Vane Tester ($Kn/m^2$) in clay soils, and/or Mackintosh Probe in granular soils or made ground and/or upon request Continuous Dynamic Probe Testing and Standard Penetration Testing.

## Note:

Details reported in trial-pits and boreholes relate to positions investigated only as instructed by the client or engineer on the date shown.

We are therefore unable to accept any responsibility for changes in soil conditions not investigated i.e. variations due to climate, season, vegetation and varying ground water levels.

Full terms and conditions are available upon request.

# delta dual V3 sump installation instructions and technical details

## application

The Delta Dual V3 Sump is designed to evacuate water collected from the Delta cavity membrane system installed in basement applications.

The Dual V3 Sump can also be used for collecting wastewater from small light wells, baths, showers, wash hand basins, sinks, dishwashers and washing machines. It is not possible to collect wastewater from a W.C.

Ground water in basement applications is collected via the cavity membrane system through the clear opening at the top of the chamber or can enter the chamber through one of the three 110mm inlets on the side of the chamber. It is important to note that ground water is collected at slab level to prevent dewatering below this level.

## method of operation

The Delta Dual V3 sump chamber is manufactured from high-density polyethylene and is designed to resist ground water pressure.

Two powerful Delta V3 pumps are fitted, one to operate as the main duty pump the other to act as a back up. During regular maintenance the operation of the two pumps are reversed.

The sump chamber is fitted with two brass nonreturn valves to prevent water travelling back into the chamber once the pumps have stopped and a gate valve for isolation or maintenance purposes.

## maintenance

The Delta Dual V3 sump chamber is manufactured using high quality components designed to give a long a trouble free life. With any piece of mechanical equipment regular preventative maintenance is important to keep this product working efficiently on a day-to-day basis. We recommend the sump is serviced twice a year by specialist pump engineers.

## electrical connections

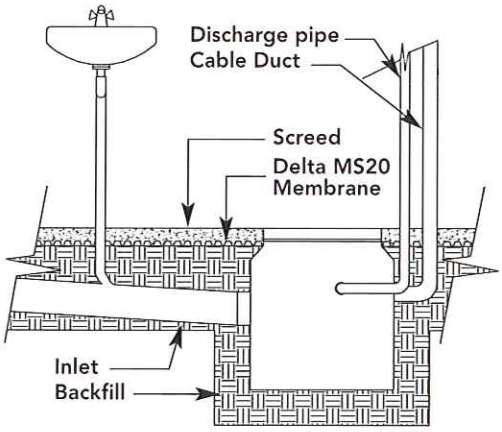
Each pump and high level alarm are to be electrically connected to a non switched fused spur (total of three). This spur should have it's own dedicated supply from the main fuse board.

It is advisable to leave 500mm of the pump electrical cable in the sump to allow for servicing of the pump(s) outside the sump.

Pumps must not be wired to a 'RCD' or similar protective device.

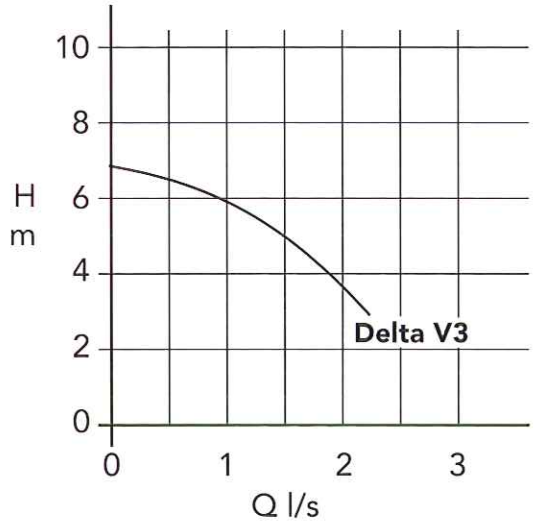
## float(s)

Ensure float(s) does not foul chamber sides. It may be necessary to rotate pipe work on pump to achieve this as there may have been some movement during transit.

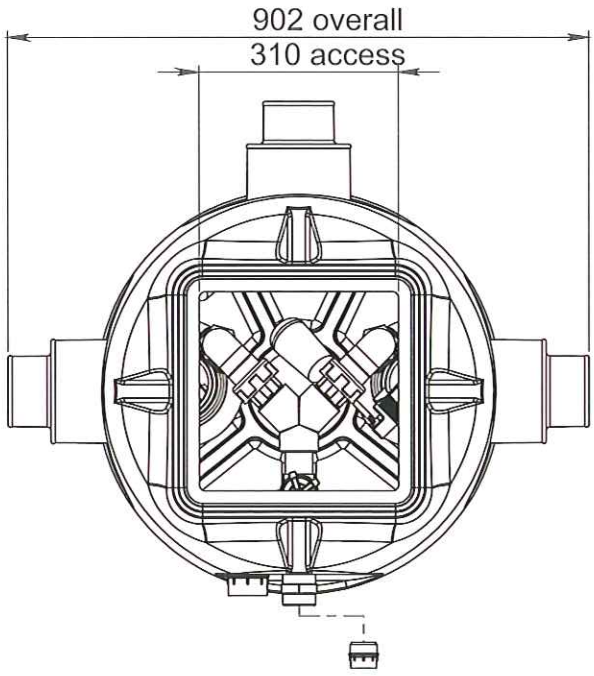


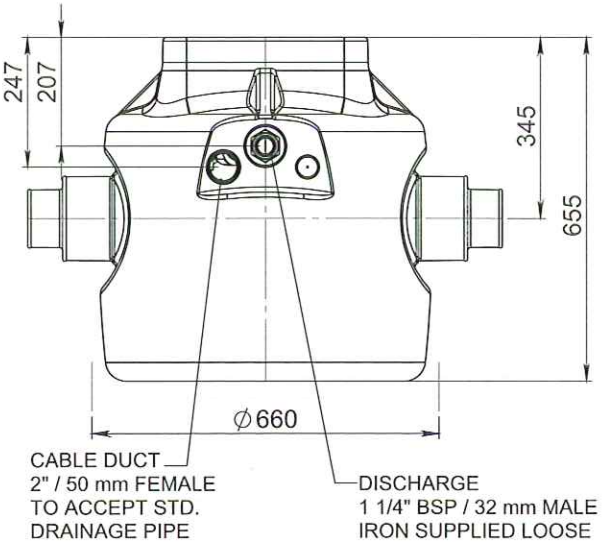

**Cutaway of Delta Dual V3 Sump**

## delta dual V3 sump - Delta V3 technical details




Performance tolerance to ISO 2548,
Class C (water under normal conditions)




## high level alarm

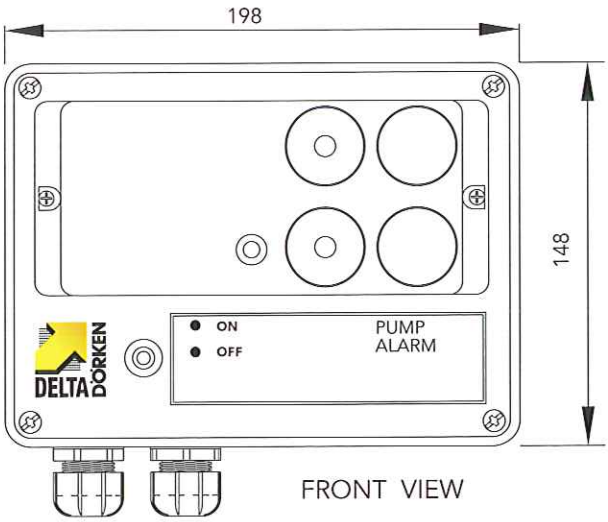
The Delta Dual V3 sump chamber can be fitted with a mains dependent / mains independent high-level alarm. An audible signal will be heard in case of pump failure. This alarm is normally operational from the mains power supply (240/1/50) however in case of a power cut the alarm is power by a built in back up battery.

Overall Size of Alarm Box:

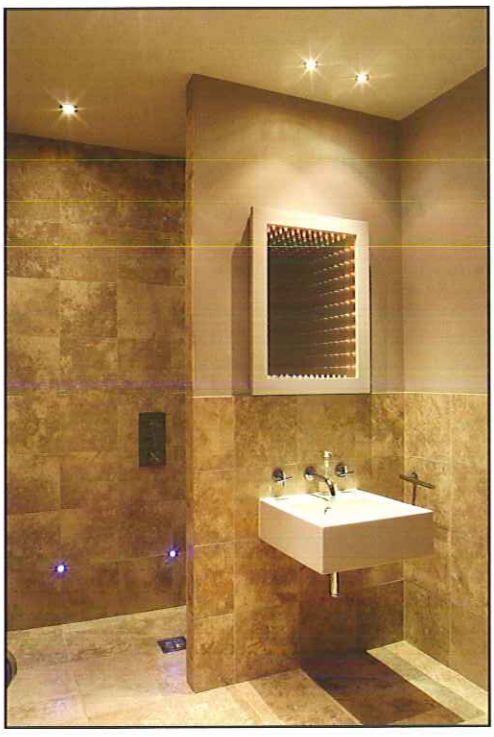
L = 198mm

W = 148mm

D = 106mm




FRONT VIEW



# delta foul V3 sump installation instructions and technical details

## application

The Delta Foul V3 Sump is designed to collect foul water from kitchens, bathrooms and utility rooms installed in basements.

The Foul V3 Sump can be used for collecting waste water from baths, showers, wash hand basins, sinks, dishwashers and washing machines.

It is not possible to collect ground water from the Delta cavity membrane system due to the possibilities of odour problems. It is important that the membrane system is completely sealed from the pump chamber.

Foul water will enter the chamber through one of the three 110mm inlets on the side of the chamber. If only using one inlet the other two can be blocked using the plugs supplied.

## method of operation

The Delta Foul V3 sump chamber is manufactured from high density polyethylene and is designed to resist ground water pressure. A single Delta 612SE pump is fitted in the chamber and designed to handle solid waste.

Due to the tank capacity and non macerating action, the pump will operate infrequently and is very quite in operation.

The sump chamber is fitted with a brass non return valve to prevent waste water travelling back into the chamber once the pump has stopped.

## maintenance

The Delta Foul V3 sump chamber is manufactured using high quality components designed to give a long a trouble free life. With any piece of mechanical equipment regular preventative maintenance is important to keep this product working efficiently on a day to day basis.We recommend the sump is serviced twice a year by specialist pump engineers.

## electrical connections

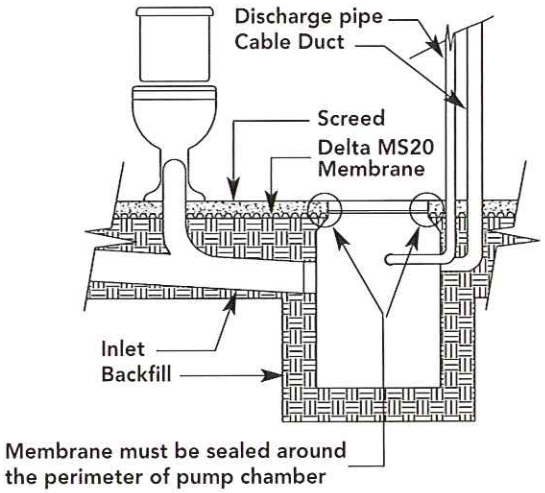
The 612SE pump and high level alarm are to be electrically connected to non switched fused spurs (total of two). These spurs should have their own dedicated supply from the main fuse board.

It is advisable to leave 500mm of the pump electrical cable in the sump to allow for servicing of the pump(s) outside the sump.

The pump must not be wired to a 'RCD' or similar protective device.

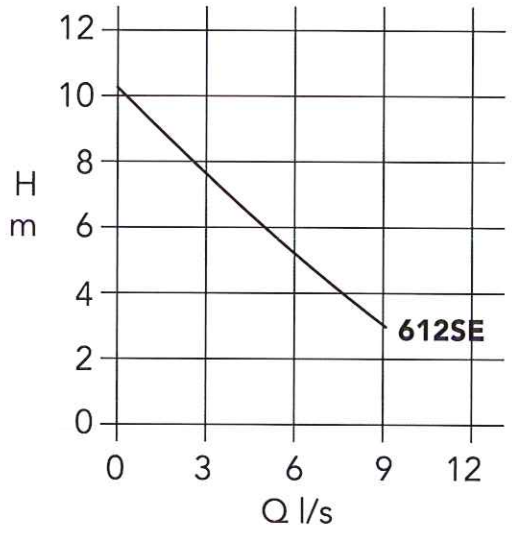
## float

Ensure float switch does not foul chamber sides. It may be necessary to rotate pipe work on pump to achieve this as there may have been some movement during transit.




**Cutaway of Delta Foul V3 Sump**

## delta foul V3 sump - 612SE technical details




Performance tolerance to ISO 2548,
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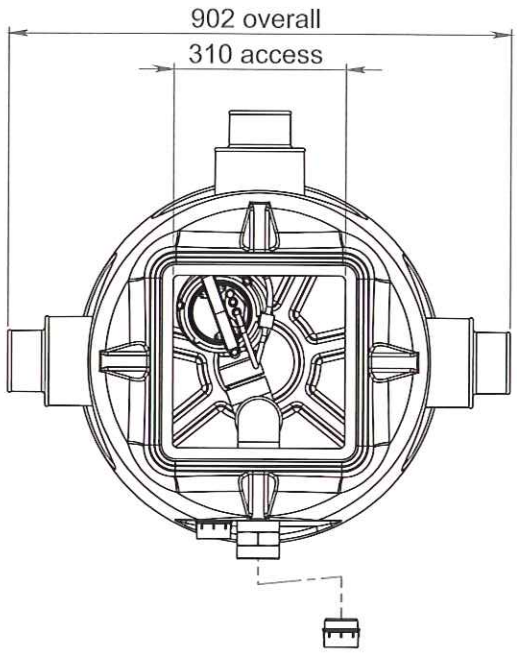


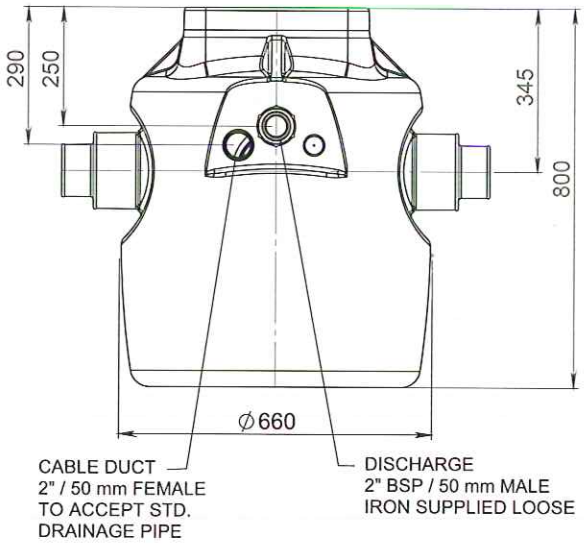


## high level alarm

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Overall Size of Alarm Box:

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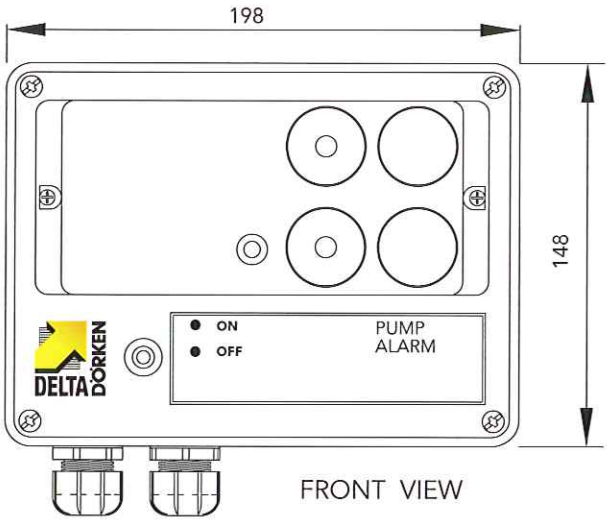
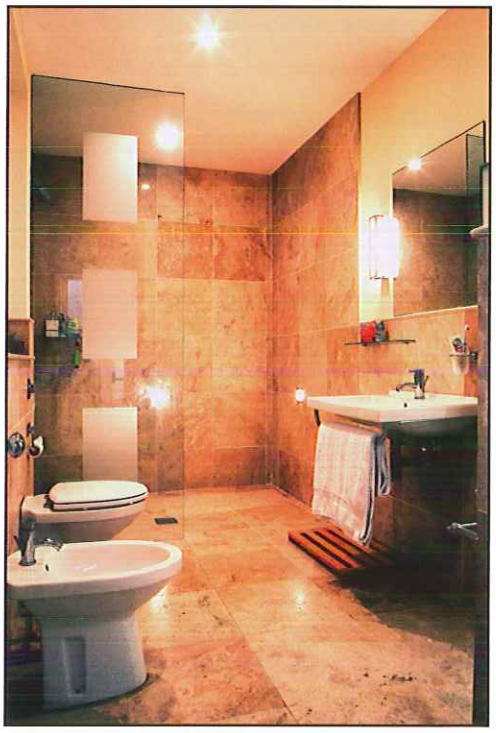
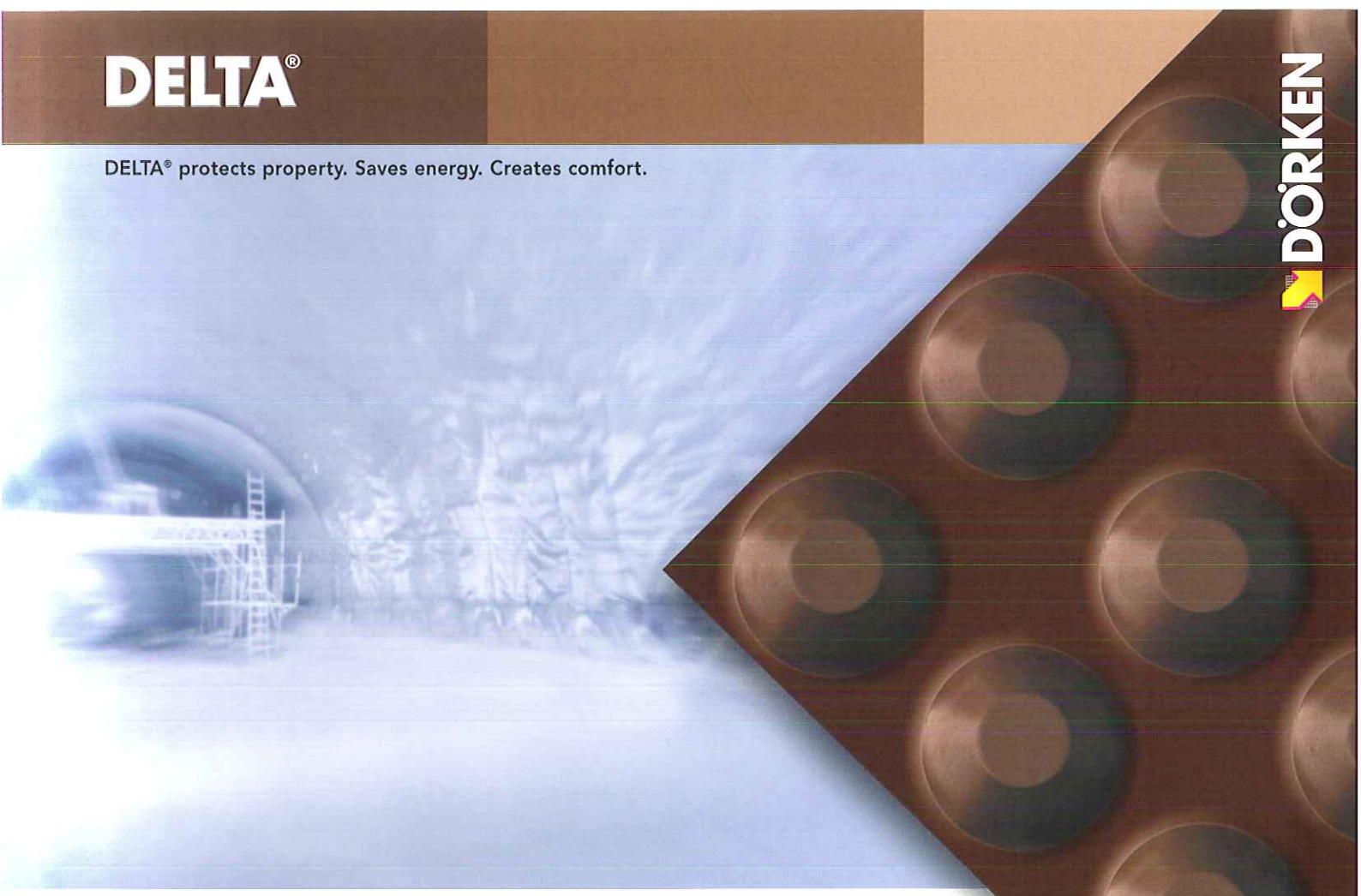


DELTA®

DELTA® protects property. Saves energy. Creates comfort.

DÖRKEN



# DELTA®-MS 20

PREMIUM QUALITY

## General-purpose seepage layer for long-term safety.

Resistant to compression and degradation in soil.

DELTA®-branded quality products made by Dörken.

- Drainage system
- For building construction and civil engineering
- For vertical and horizontal application

**Delta Membrane Systems Ltd**
Unit 7
Bassett Business Centre
Hurricane Way
North Weald, Epping
Essex CM16 6AA
Tel: 01992 523811 Fax: 01992 524046
e-mail: info@deltamembranes.com
website: www.deltamembranes.com

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
**00/3742**
**Product Sheet 2**

# DELTA MEMBRANE SYSTEMS

# DELTA-MS20

## PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Delta-MS20, a moulded HDPE membrane for damp-proofing walls, floors and vaulted ceilings in new construction or existing buildings. It can be used above or below ground, over a contaminated or damp background, to support a dry lining and flooring.

## AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

## KEY FACTORS ASSESSED

**Resistance to water and water vapour** — the product is water resistant and has a high resistance to water vapour transmission (see section 5).

**Resistance to salt transfer** — the product provides an effective barrier to the transmission of salts or other contaminants from the substrate (see section 7).

**Resistance to puncture, impact and loading** — the membrane has a high resistance to puncture and will not be damaged by normal foot traffic during installation, or while laying concrete or screeding. It can support the long-term loadings likely to be experienced in service without undue deformation (see section 8).

**Durability** — under normal conditions of use the membrane will provide an effective barrier to the transmission of salts, liquid water and water vapour for the life of the structure in which it is incorporated (see section 11).

The BBA has awarded this Agrément Certificate to the company named above for the product described herein. The product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Third issue: 2 July 2010
Originally certificated on 24 November 2000

Simon Wroe
Head of Approvals — Materials

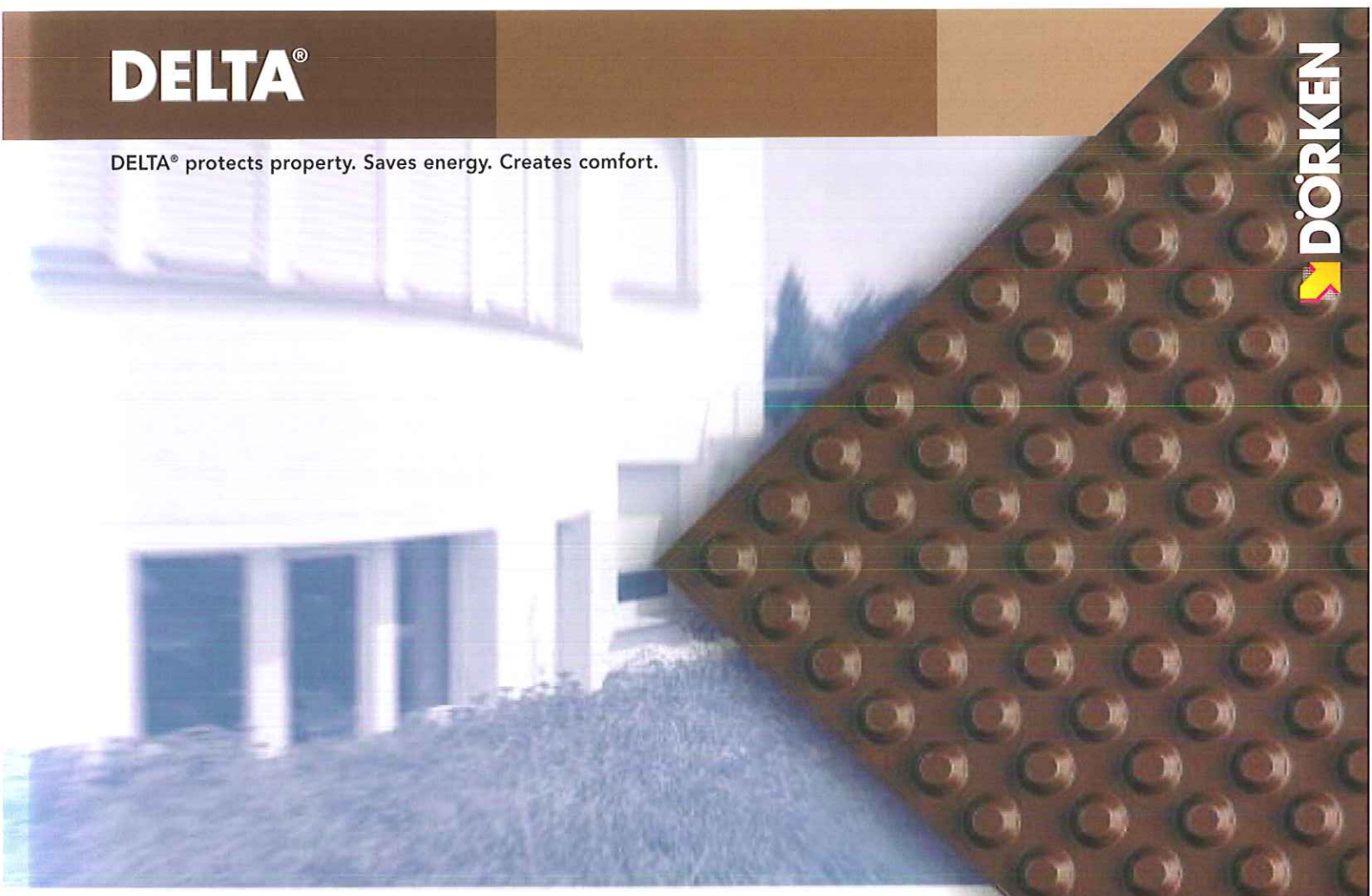
Greg Cooper
Chief Executive

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

# DELTA®

DELTA® protects property. Saves energy. Creates comfort.



DÖRKEN

# DELTA®-MS

PREMIUM QUALITY

## High compressive strength for extra safety.


Low point loads.
Fast, tailored application straight from the roll for waterproofing of basements, foundations, and subterranean structures.

- Protection system
- For vertical and horizontal application
- For building, underground, and civil-engineering construction

**Delta Membrane Systems Ltd**
Unit 7
Bassett Business Centre
Hurricane Way
North Weald, Epping
Essex CM16 6AA
Tel: 01992 523811 Fax: 01992 524046
e-mail: info@deltamembranes.com
website: www.deltamembranes.com

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
**00/3742**
**Product Sheet 1**

# DELTA MEMBRANE SYSTEMS

# DELTA-MS500

## PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Delta-MS500, a moulded HDPE membrane for damp-proofing walls, floors and vaulted ceilings in new construction or existing buildings. It can be used above or below ground, over a contaminated or damp background, to support a dry lining and flooring.

## AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

## KEY FACTORS ASSESSED

**Resistance to water and water vapour** — the membrane is water resistant and has a high resistance to water vapour transmission (see section 5).

**Resistance to salt transfer** — the membrane provides an effective barrier to the transmission of salts or other contaminants from the substrate (see section 7).

**Resistance to puncture, impact and loading** — the membrane has a high resistance to puncture and will not be damaged by normal foot traffic during installation, or while laying concrete, or screeding. It can support the long-term loadings likely to be experienced in service without undue deformation (see section 8).

**Durability** — under normal conditions of use the system will provide an effective barrier to the transmission of salts, liquid water and water vapour for the life of the structure in which it is incorporated (see section 11).

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On behalf of the British Board of Agrément

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# SUSTAINABILITY STATEMENT

**PROPOSED BASEMENT**

**21 ABERDARE GARDENS, LONDON, NW6 3AJ**

## CONTENTS



## INTRODUCTION

This report sets out the sustainability issues and targets intended for the development at 21 Aberdare Gardens, London, NW6 3AJ. The development comprises the extension of an existing cellar into a full footprint basement; the new build basement measuring 159m² in total.

There is a requirement to submit a sustainability statement that will demonstrate how the project will aspire to the sustainability requirements of Camden Core Strategy Policy CS13 (Tackling climate change through promoting higher environmental standards) and LDF Policy DP22 (Promoting sustainable design and construction).

Further guidance is taken from Camden Planning Guidance 3 (Sustainability) which would be applicable to the proposed basement extension at 21 Aberdare Gardens: - "2.4 - All developments are expected to reduce their carbon dioxide emissions by following the steps in the energy hierarchy to reduce energy consumption" as well as seeking to adopt the principles behind the Code for Sustainable Home and/or Eco Homes 2006; where possible and feasible. The Developer of the site acknowledges the current issue with regard to concerns about climate change and the contribution that building stock makes in the form of emissions to the atmosphere, the use of water, waste generation and the use of polluting materials.

## 2.0 SUSTAINABILITY & THE ENERGY HIERARCHY

The London Plan 2011 lays down the methodology for the use of the energy hierarchy in 3 stages

Stage 1 - Be Lean

Use energy efficiently - reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services

Stage 2 - Be Clean

Use clean energy - proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP)

Stage 3 - Be Green

Reduce emissions via the use of renewable technologies - proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies

### 2.1 Baseline Energy Model

In order to consider the development against the energy hierarchy, a "baseline" energy model must be established – i.e. the minimum energy efficiency required to meet the Building Regulations Part L, which in the case of the proposed extension, would be Approved Document L1B
AD L1B requires existing thermal elements, if they are to be refurbished, to be refurbished to a minimum U-Value standard, and for new build element to meet a minimum U-Value standard as set out in the table below:

| Element | AD L1B U -Value Standard |
|---|---|
| Retained Walls | 0.30 |
| New Walls | 0.28 |
| Retained/New Roof - pitched | 0.16 |
| Retained/New Roof - flat | 0.18 |
| Replacement Windows | 1.6 |
| Replacement Doors | 1.8 |
| Air permeability | $15m^3/Hr/m^2$ |
| Low Energy Lighting | 75% |

AD L1B u value standards

While the replacement of controlled services is governed by the Domestic Heating Compliance Guide:

| Controlled Service | AD L1B Compliance Requirement |
|---|---|
| Mains Gas Boiler | 86% Efficient |
| DHW storage | 38mm Foam insulation |
| Controls | Programmer, Stat and TRVs |

Therefore, before apply the energy hierarchy to the subject development; it is assumed that the "baseline" efficient development will meet the above minimal standards

**2.2 Use Energy Efficiency**

The scheme will be designed to limit the emissions of carbon dioxide to the atmosphere from the operation of the building services via the use of good building fabric, i.e. be lean – use less energy; step 1 of the energy hierarchy. To achieve this, the development will adopt the principles of "best practice" u-values for the new build extension as noted in CPG 3:-

- New basement and external walls – u value=0.20
- New basement floor – u value=0.20
- New glazing – u=1.5

To further improve fabric efficiency in the ground floor element, the developer will undertake the following retrofitting works as identified in Appendix 1 of CPG 3:-

- Insulate internal walls to meet a minimum u value of 0.30; any further improvement on this would detrimentally affect the net internal space.
- Retrofitting of insulation to intermediate floors and internal walls to (un-heated) common areas.

In terms of the operation of building services, the following strategies will be adopted: -

- New high efficiency gas combination boilers (90% SEDBUK efficiency) will DHW in unvented highly insulated tanks to further enhance efficiency
- Controls will be upgraded via the use of TRVs, wall stats and timers to provide full interlock mechanism to ensure that boilers are only firing when required
- Under floor heating will be installed in the new build element to take advantage of the thermal mass of the building and to enable the heating system to run at lower temperatures and therefore more efficiently.
- Internal service pipework will be insulated to reduce transmissions losses.
- Where possible the use of LED low energy lighting will be adopted, where this is not possible, dedicated compact fluorescent lighting pendants will be installed.

Further energy efficiency measures to assist the reduction of consumption of unregulated energy use is noted under 2.3

## 2.3 Use Clean Energy

The energy hierarchy goes on to consider how energy can be supplied more efficiently via connection to decentralised supplies such as community heating or CHP provisions.

Clearly, for a small refurbishment/extension project of <200sqm, the provision of community heating within the development is not practical and would offer no efficiency savings. However, the use of "traditional" gas boilers, with the flow and return temperatures similar to community schemes, does mean that, as and when such a network was available in the area – the property at 21 Aberdare Gardens would have the facility to connect to the network.

## 2.4 Use of Renewable Technologies

There is also a requirement to reduce CO2 emissions from the development using renewable or low carbon energy sources. Therefore this report will briefly considered the feasibility of the following technologies:

☐ Wind turbines
☐ Solar hot water
☐ Photovoltaic systems
☐ Biomass heating
☐ CHP (Combined heat and power)
☐ Ground source heating
☐ Air source heating

### Wind turbines

Wind turbines produce electricity from wind power – clearly they require an open aspect and thus are clearly more appropriate in rural areas

### Solar hot water

Solar thermal systems harness the suns energy to heat hot water via roof mounted panels. Without access to individual roof space in a Conservation area, this system cannot be considered for this basement extension project

### Photovoltaic systems

Solar "PV" systems are roof mounted panels with photocells that generate electricity from the Sun's light. Again without access to roof space in a Conservation area, they cannot be considered for this project

### Biomass heating

Biomass heating uses plant matter as a fuel source. It requires a special boiler and storage space for the fuel – usually in a pelleted format. The major drawback for biomass is the much increased level of nitrous oxide emissions – which would be a considerable problem in dense urban and suburban areas such as the London Boroughs. This reason, and the lack of available space, would preclude the consideration of the this system

## CHP (Combined heat and power)

Under the renewables section, CHP refers to domestic micro CHP systems. As yet an unproven technology and as such, cannot be recommended.

## Ground source heating

Ground source heat pumps extract the heat from the ground (or bodies of water) through collector loops prior to passing through a refrigeration "evaporation/compression heat exchange cycle which passes the heat into central heating systems
Although a highly efficient system, it requires considerable external space for the heat collector loops and as such is not practical for the development under consideration

## Air source heating

Delivering heat into the property via the same mechanism as the ground source heat pump, an air source heat pump uses the evaporator unit to extract heat directly from the air. The evaporator unit sits externally and is relatively compact

Given the small external area available – it *may* offer an opportunity to deliver renewable energy to the development at 21 Aberdare Gardens, but there may well be an issue of noise nuisance which would have to be investigated prior to further consideration.

In addition, air source heat pumps are very marginal when it comes to actually reducing emissions although up to 4 times more efficient than a condensing gas boiler, grid based electricity emits over 2.5 times the carbon emissions per KWh.

Once it is considered that the above noted efficiencies rely on low temperature flow rates (35o – 40o) to under floor heating in well insulated properties – the retro fitting of such systems in properties of townscape merit with single glazing etc, are results in the requirements for higher flow temperatures, reduced efficiencies and increased emissions.

With this in mind, it would be difficult to recommend the investment in an air source heat pump for this development.

## 2.5 Eco Homes & Code for Sustainable Homes Principles

Due to the small scale nature of the development, LDF Policy DP22's requirement for a formal Eco Homes assessment does not apply. However, the developer is committed to adopting many of the principles of Eco Homes and the Code for Sustainable Homes: -

## Energy

Unregulated energy use will be reduced via the provision of clothes drying facility in the rear garden, ensuring that all external lighting is energy efficient, providing a display energy device to enable occupants to monitor, and thereby manage their energy use and to supply information on the EU Energy Rating system to enable informed purchasing of white goods for the home.

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## Water

All newly installed sanitary ware will be selected to reduce wholesome water use – dual flush toilets, showers, basin and kitchen taps with flow restrictors and selecting baths with limited capacity. In addition, a water butt will be installed to the rear garden to enable the harvesting of rainwater for the upkeep of soft landscaping

## Materials

The re-use of much of the building structure is sustainable by definition as much material is retained in situ. In addition, the developer will ensure that the suppliers of building materials, where practical, can demonstrate a policy of responsible sourcing

## Waste

The main contractor will be required to put in place a site waste management plan to ensure minimal waste arising from site and to ensure that much of the construction waste is diverted from landfill. In addition, the main contractor will be required to join the Considerate Constructors Scheme and meet the minimum level of "Best Practice"

## Pollution

All insulants used within the development will have a rating of zero for ODP and have GWP of less than 5. New high efficiency boilers will be selected that have NO2 emissions at less than 40mg/Kwh

## Ecology

The nature of the development will have limited effect on the ecology of the site, indeed, the Code for Sustainable Homes would rate the effect as "neutral", however the developer is committed to a remodelling of the rear gardens with the use of indigenous planting to offer a minor enhancement of site ecology

## CONCLUSIONS/SUMMARY

It is the intention of the developer to deliver a sustainable development as defined within the policies of Camden Council; the same polices that have informed this report and the recommendations within. The policies require the developer to commit to the principles of the energy hierarchy and BREEAM sustainable development, and as can be seen above the developer has identified opportunities when they are able to do so, and will deliver these principles as part of the development, thereby meeting the minimum sustainability requirements of Camden Council and advancing the development beyond those requirements.

Prepared by **Dig For Victory Limited** – 20 Mortlake High Street, London, SW14 8JN

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For **Mr von Polach and Ms Macit**