Site address

Former Nestlé Factory

Nestles Avenue, Hayes UB3 4RF

Carbon Reduction Measures

Pre-commencement of super structure – Block B

Condition 37

Prepared by

BBS Environmental

For

Barratt London

Date

June 2021

EST54738 Issue 1

Contents

Report prepared by: Ben Talbutt

22th June 2021

Assessment type: Discharge of Planning Condition & S106 clauses

1. Introduction

This report has been prepared for Barratt London Ltd, by BBS Environmental, a construction consultancy specialising in sustainability, energy conservation and the application of renewable energy technologies. It has been prepared to discharge Condition 37 of the planning approval which states:

Prior to the commencement of any superstructure works for each residential phase of development, full details of the carbon reduction measures that conform to the energy strategy (Energy Statements, Sep 2017, ESC54738 Issue 4) shall be submitted and approved in writing by the Local Planning Authority. These shall include:

1 - Full details of the baseline energy and carbon performance of each phase of the development
2 - Full details of the passive energy savings measures (Be Lean - London Plan)
3 - Full details of the combined heat and power systems including:
a - full plans and specifications of the technology
b - the phasing of the installation of the network which includes the delivery of main necessary energy centre in phase one
c - the input and output (annual KgCO2 and KWhr) of the CHP system
d - the onsite network connection
e - the future proofing for offsite connections
f - monitoring, reporting and maintenance regimes.
4 - Full details and specifications, including relevant plans and elevations of any additional low or zero carbon technology to be utilised in the site.

The development must proceed in accordance with the approved details unless otherwise agreed in writing with the Local Planning Authority.

The report will also address Schedule 8: Part 2 – Carbon Offset Fund, of the S106 agreement which states:

Schedule 8: Part 2 – Carbon Offset Fund

3. The Residential Owner shall within three (3) months of Commencement of each Residential Phase of the Development submit an Energy Strategy to the Council for that Residential Phase.

4. In the event that the Energy Strategy demonstrates that a 100% reduction (zero carbon) in C02 emissions cannot be achieved for a relevant Residential Phase the Residential Owner shall pay to the Council the Zero Carbon Contribution for that Residential Phase prior to Occupation of the relevant Residential Phase PROVIDED ALWAYS that the Zero Carbon Contributions shall not exceed (in total across all Residential Phases) the sum of £1,494,594.00 (ONE MILLION FOUR HUNDRED AND NINETY FOUR THOUSAND GIVE HUNDRED AND NINETY FOUR POUNDS).

This report relates specifically to Block B.

The results take into account a change to the external wall U-value which was necessitated by the ban on combustible materials in buildings above 18m[1]. To counteract the increased emissions, detailed thermal modelling has been carried out on the most significant thermal junctions and the design of these elements has been optimised to minimise linear thermal bridging. In addition, highly efficient gas boilers and combined heat and power systems will contribute further to the overall CO_2 reductions.

[1] Unlike the original energy statement, every unit within phase four has been assessed in the calculation of these results.

2. Baseline energy and carbon performance

2.1 Introduction

This summary sets out the key measures and carbon dioxide emissions targets proposed for the development in the three stages of the London Plan 2016 energy hierarchy in order to address Part 1 of Condition 37 which requires:

1 - Full details of the baseline energy and carbon performance of each phase of the development

The London Plan 2016 sets targets for and requires evaluations of regulated energy use – i.e. energy related to building services such as heating and lighting. Other energy use is classed as unregulated and covers energy used by the building occupants, for, in the case of dwellings, cooking and appliances. This energy cannot be influenced by the applicant as it solely dependent on the occupant's behaviour. Unregulated emissions have been calculated according to the Building Research Establishment's Domestic Energy Model (BREDEM 2012)

2.2 Key results

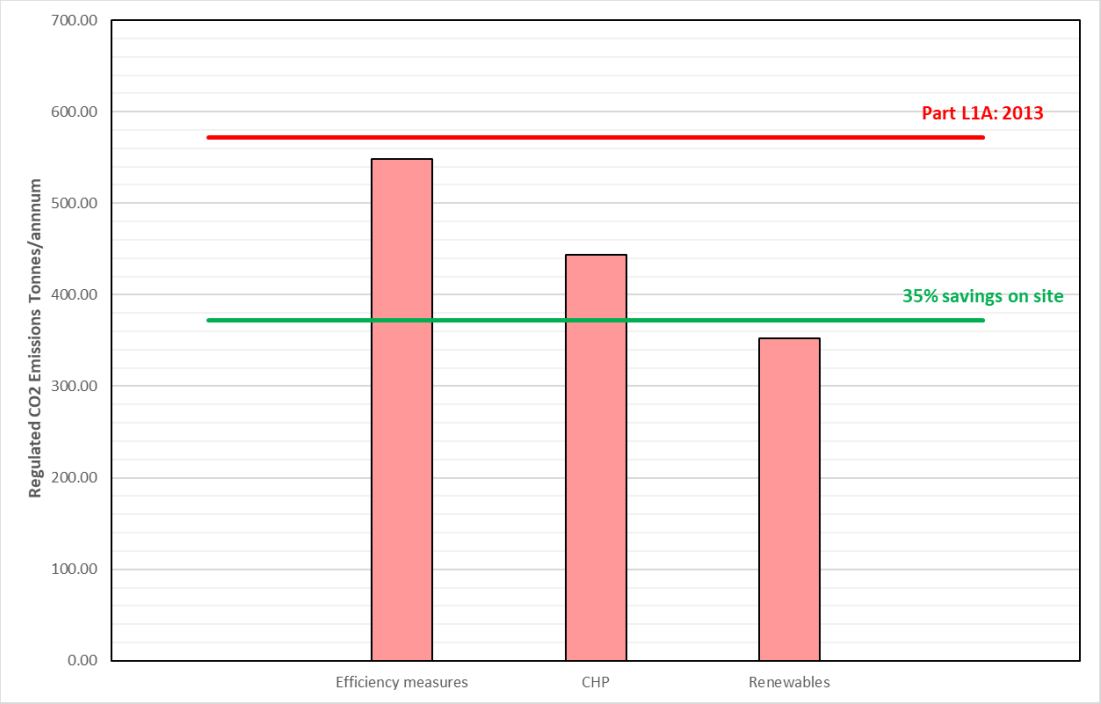
Table 1: Carbon dioxide emissions (domestic) at each stage of the energy hierarchy

Stage	*Domestic Buildings Carbon dioxide emissions (Tonnes CO2/yr)*	
	Regulated	*Unregulated*
Building regulations compliant	***571.99***	***654.36***
After efficiency measures	***548.50***	***654.36***
After CHP	***443.21***	***654.36***
After renewable energy systems	***352.26***	***654.36***

Table 2: Regulated emissions savings (domestic) at each stage of the energy hierarchy

Stage	*Domestic Buildings Carbon dioxide emissions (Tonnes CO2/yr)*	
	(T CO2/yr)	*Percentage*
Savings from efficiency measures	***23.49***	***4.11%***
Savings from CHP	***105.29***	***18.25%***
Savings from renewables	***90.95***	***16.06%***
Cumulative on-site savings	***219.73***	***38.42%***

Graph 1: Domestic energy hierarchy targets



3. Passive energy savings measures

The development proposals include the provision of the following energy efficiency measures:

- Optimally sized windows that achieve good daylight levels but avoid excessive solar gain in summer and heat loss in winter;
- Insulation in walls, floors and roofs that meet or exceed the performance levels listed for the reference case in SAP2012 Table R1. These are as follows:

Element	Part-L Limiting value	Proposed U-value	% improvement
Heat loss floors	0.25 W/m^{2}K	0.15 W/m^{2}K	40%
External walls	0.30 W/m^{2}K	0.19 W/m^{2}K	36%
Main roofs	0.20 W/m^{2}K	0.12 W/m^{2}K	40%
Windows	2.00 W/m^{2}K	1.40 W/m^{2}K	30%
Air leakage rate	10 m^3/hm^2	4.5 m^3/hm^2	55%

- Careful design to reduce the effect of non-repeating thermal bridges including the use of high-performance thermal breaks where appropriate;
- All lighting, both in individual apartments and in the communal areas will use lamps with a luminous efficacy of at least 45 lamp-lumens/watt (equivalent to an “A” rating);
- All common area lighting will have automatic controls with occupancy and daylight sensors;
- Any white goods that are supplied (fridges, freezers, washer dryers and dishwashers) will be models that are “best practice” for energy consumption; and
- Mechanical ventilation systems which will be installed in every apartment and the systems used will exceed Energy Savings Trust “best practice” guidelines.

These measures will enable the dwellings to achieve compliance with the current Building Regulations, Part L1A: 2013 prior to the addition of low and zero carbon technologies.

The most significant change in the passive energy saving measures from the Energy Statement (ESC54738 Issue 4) is the increase in the external wall U-value from 0.15 W/m^{2}K to 0.19 W/m^{2}K. This is due to a change in the insulation that is to be used as a result of the ban on combustible materials in buildings over 18m high. To mitigate the increased emissions resulting from the higher U-value detailed thermal modelling has been carried out on the most significant thermal junctions and the design of these

elements has been optimised to minimise linear thermal bridging. In addition, highly efficient gas boilers and combined heat and power systems will contribute further to the overall CO_2 reductions.

4. Combined Heat and Power systems

4.1 Plans and specifications

In line with the energy strategy, a low NOx E230 CHP unit is proposed. Full plans and specifications of the CHP system are included in Appendix 1

4.2 Phasing of the installation

The MEP Performance specification (FNF-SITE-SP-200-0001) details the following phasing for the installation:

Phase 1 – Installation of 2No. Boilers, all primary & Secondary Pipework with Blanked off connections left for future connection of the rest of the boilers & CHP, flushing bypasses shall be installed, and the contractor shall ensure that all pipework has circulation through it for water quality purposes.

Phase 2 – Boilers 3-4 commissioned and brought online.

Phase 3 – When the development reaches 60%, the remaining boilers and CHP units shall be installed.

All flues & pipework shall be installed during the first phase of the works, with blanked off sections left for future connection to the Plant. Due to the complex nature of installing Thermal Stores, these shall also be installed under Phase 1.

The phasing plan of the development can be found in Appendix 1

4.3 Input and output of the CHP system

For technical details of the CHP, please see Appendix 1

4.4 Onsite network connection

A layout for the site heat mains is included in Appendix 1.

All the apartments and all the non-residential spaces will be connected to the network. The network will serve only the main residential part of the site as covered by this report. It will not be extended to serve the Class B and Data Centre buildings as the heat demand in these buildings will be low, and a separate heating and cooling system, using air source heat pumps in the variable refrigerant flow (VRF) format, is proposed.

A further material consideration on a large and extensive site such as this is the need to demonstrate that the planned construction phasing has taken account of the need to ensure that the site heat mains are installed and the Energy Centre is built and commissioned before the first occupations will take place. This has been taken fully into account and the Phasing Plan and the Heat Mains Layout Plan, both included in Appendix 1, show how this will work.

The Energy Centre, attached to the western flank of Block D1, is part of Phase 1. This means that the Energy Centre can be constructed and the plant and flues installed and commissioned to coincide with the initial completions in Phase 1. The site heat mains, routed through Sandow Square, will be installed at an early stage as part of the permanent landscaping construction works and connected to the Phase 1 substations or temporarily capped as necessary.

4.5 Future proofing for offsite connections

While it is not feasible to connect to an existing district heating network, the communal heating system will be designed to permit a future connection to such a network should one extend into the locality in the future, and appropriate provision is being made within the Energy Centre. In order to facilitate this, the energy centre has been positioned at the edge of the site. A plan of the Energy Centre is included in Appendix 1

4.6 Monitoring, reporting and maintenance regimes

The Energy Centre MEP Services Particular Performance Specification (FNF-SITE-SP-200-001) gives full details of the monitoring, and reporting regimes but are summarised below.

Each apartment on the site shall have a heat unit incorporating a heat flow meter on secondary LTHW circuits. These shall be used alongside the primary heat meter located in each building for billing purposes, energy sub-metering and the control of the circuit flow rate.

The Energy Centre gas and heat consumption shall be measured via BMS connections to new pulse meters. In addition, electricity consumption for all major loads shall be monitored from pulse output meters installed on sub main supplies to each mechanical plant motor control panel.

The BMS shall contain an energy monitoring graphical display, which shall indicate the following information:-

- Heat consumption at each heat unit in kWhr (week to date, month to date, year to date).
- Energy Centre electrical energy consumption in kWhr (week to date, month to date, year to date).
- Gas energy consumption in kWhr (week to date, month to date, year to date).
- Energy Centre water consumption in litres (week to date, month to date, year to date).
- LTHW flow rate per circuit (max / min / average flow rate in week to date, month to date and year to date)
- Heat Demand in kW at any given time.

The BMS shall include all controls required to provide the full control and correct operation of the heating strategy described below. The main panel shall be capable of reading information relayed from all of the individual block panels.

Facilities shall be provided within the BMS controls installation for the future compilation of monitoring trends and historical information. A graphical front end shall be used to provide the primary control interface for the BMS, with graphics created for each system and control element. A security password system shall be incorporated to automatically prohibit commands from unauthorised people, with access levels hierarchically arranged such that a minimum level can be set to “read only” and at the highest level to access all information. 25% spare points capacity shall be provided for future extension to control / monitor any future installations.

The Applicant proposes to develop the detailed design of the communal plant, and then subsequently operate the systems in conjunction with an ESCo partner: they have a proven track record in this regard and already have some 6,000 apartments that are part of existing completed residential and mixed-use schemes ranging in size from 200 to over 700 apartments that are serviced in this way. All equipment will be maintained in line with the manufacturer’s guidance and best practices.

5. Low or zero carbon technology

This phase has an allowance for a substantial array of photovoltaic panels in line with the energy strategy. A total of 120kWp is proposed for this phase which is equivalent to roughly 857m^2 of roof area. This figure is based on good industry practice regarding the ratio of roof area to active panel area, and consequently we are confident that it can be delivered.

6. Carbon Offset Payment

After the energy hierarchy has been applied, there are still 352.26 tonnes of CO2/year to be offset through a payment to the local authority's carbon offset fund. This is to be offset at a cost of £60 per tonne for 30 years giving a total of £634,061.59 for this block. Table 3 below details the carbon dioxide emissions at each stage of the hierarchy and the offset payment.

Table 3: Carbon dioxide emissions (domestic) at each stage of the energy hierarchy and offset payment

Stage	*Domestic Buildings Carbon dioxide emissions (Tonnes CO2/yr)*	
	Regulated	*Unregulated*
Building regulations compliant	***571.99***	***654.36***
After efficiency measures	***548.50***	***654.36***
After CHP	***443.21***	***654.36***
After renewable energy systems	***352.26***	***654.36***
Offset Payment	**£634,061.59**	***$0***

Appendix 1

Indicative drawings

Energy Centre – Schedule of mechanical plant – CHP 01 + 02

Energy Centre general arrangement

Energy Centre Schematic

Site Heat Mains Layout – Sheet 1

Site Heat Mains Layout – Sheet 2

Site Heat Mains Layout – Sheet 2

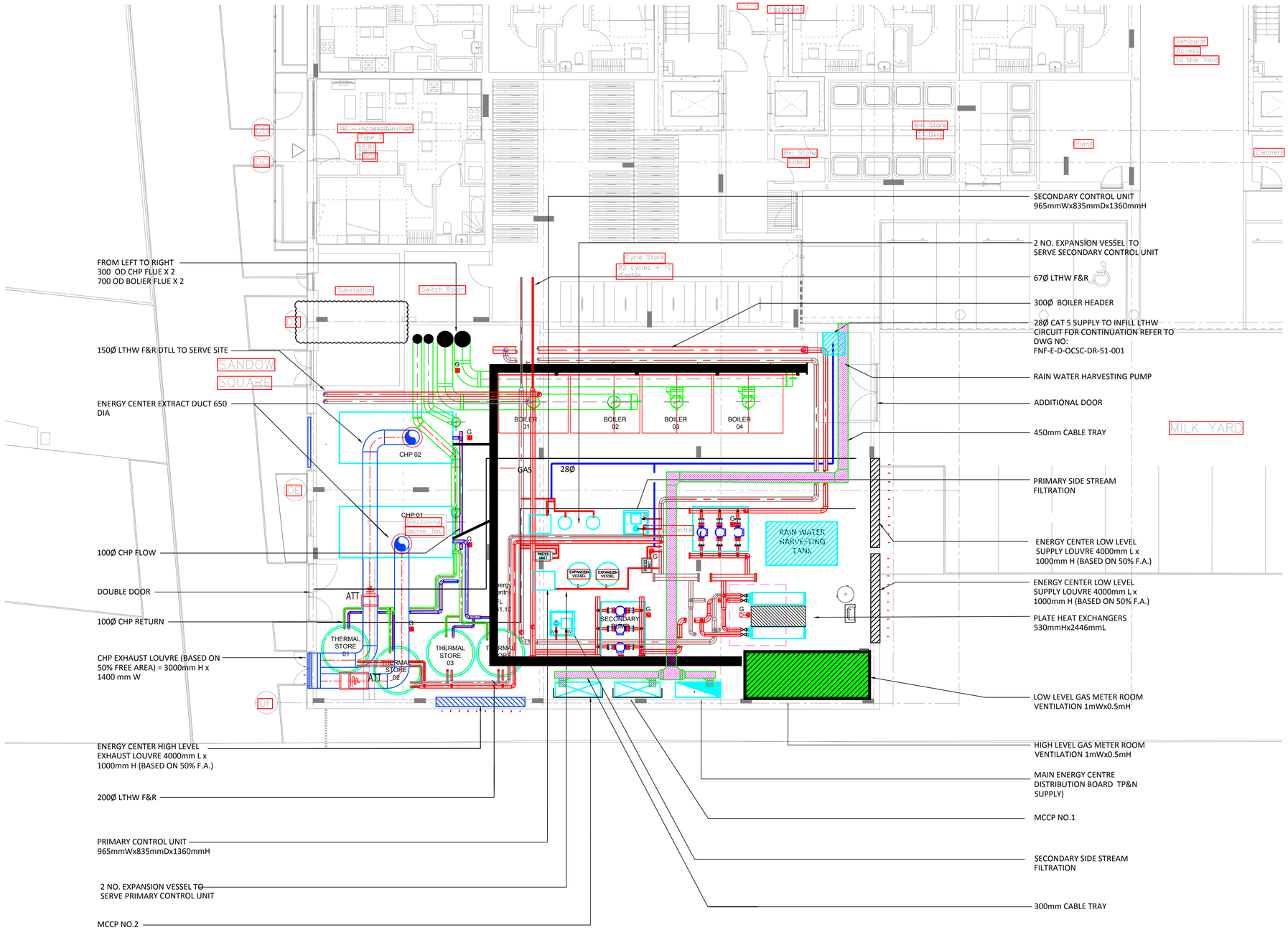
Phasing Plan

Schedule FNF-M-D-OCSC-SCH-50-0002 Combined Heat and Power (CHP) plant

Reference No	Components	Technical Details	Comments
CHP. 01 & CHP.02	Model	E230	
	Size (length x width x height)	4100mm x 1950mm x 2295mm	
	Weight	5500kg	
	Weight w/Enclosure	7000kg	
	Fuel Type:	Natural Gas	
	Electrical Output:	228 kW	
	Thermal Output:	357 kW	
	Max Water In/Out Temperatures	80°C/90°C	
	Max Water Flow Rate	8.79 l/s	Assuming Cp = 4.2kJkg.K and ρ = 968.55kg/m3
	Max Test Pressure	9.75 bar	
	Exhaust Outlet Temperature	120°C	
	Exhaust Connection Size	200mm	
	Exhaust Max Allowable Backpressure	3710 Pa	
	Exhaust Flange Type	PN10	
	Min/Max Gas Pressure mbar:	20 /55	
	Gas connection	50 N.S. PN16 flanged	
	Engine Details		
	Fuel Type	Natural Gas	
	Min. Methane Number	70	
	Cylinders	12	
	Speed	1500 rpm	
	Aftercooler	No	
	Ventilation Details		
	Connection Size	500mm	
	Ventilation Rate	2.39m3/s	
	Maximum Air Inlet Temperature	30°C	
	Maximum Air Outlet Temperature	45°C	
	Alternator		
	Rating	350kVA	
	Voltage	400V	
	Phase	3	
	Frequency	50Hz	
	Generator		
	Manufacturer	Stamford	
	Model	HCI444E-311	
	Type	Synchronous	
	Power Factor	PF 0.8	
	Current Per Phase @ 0.8PF	407	
	CHP Protection Device	400A/Ph	
	Efficiency:	94.3%	
	Noise Data		
	Enclosure SPL @ 1m SN/LN	70dBA/65dBA	

Notes:

1. The CHP unit shall be manufactured by ENER-G (telephone +44 161 745 7450) or equal and approved.
2. The engine coolant system shall be hydraulically separate from the building heating.
3 The unit shall be complete with integral controls including BMS and boiler module cascade interfaces, mechanical, electrical, thermal and motor generator protection, synchroniing, modulation and performance monitoring of the CHP system.



NOTES:

1. ALL LEVELS & PLANT CONFIGURATION/CORDINATION TO BE UNDERTAKEN BY THE MECHANICAL, ELECTRICAL & PUBLIC HEALTH CONTRACTORS TO PRODUCE A FINAL WORKING INSTALLATION MODEL.
2. THE INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE WITH ACCORDANCE WITH SPECIFICATION & SCHEDULES OF PLANT & EQUIPMENT TO PROVIDE A COMPLETE WORKING SYSTEM IN ACCORDANCE WITH THE DESIGN.
3. THE DOMESTIC WATER SERVICES SHALL BE WRAS APPROVED & COMPLIANT WITH THE WATER BYE LAWS.
4. RISER LTHW PIPEWORK SIZES AS HEAVY GRADE STEEL
5. THE CONTRACTOR SHALL INCLUDE FOR ALL NECESSARY OFFSETS TO AVOID OTHER SERVICES.
6. VENTS TO BE FITTED AT ALL HIGH POINTS
7. ALL PIPEWORK TO BE INSULATED IN ACCORDANCE WITH SPECIFICATION.
8. CS, DVR,CV & METER SIZES SHALL BE SIZED TO SUIT FLOW AND MEASURING SIGNAL REQUIREMENTS
9. INTUMESCENT FIRE BARRIER PUTTY TO BE FITTED BETWEEN PIPE INSULATION & PIPE SLEEVES ON ALL PIPEWORK PASSING THROUGH WALLS & FLOORS
10. FOR SCHEDULES OF EQUIPMENT SEE SPECIFICATION.
11. THE COMPLETE INSTALLATION TO BE CO-ORDINATED WITH ALL OTHER SERVICES.
12. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE CURRENT ARCHITECTS LAYOUT.
13. THE CONTRACTOR SHALL INCLUDE FOR ALL FINAL CONNECTIONS TO EXISTING DRAINAGE.
14. ALL PENETRATIONS OF FIRE COMPARTMENT TO BE SLEEVED TO MAINTAIN THE FIRE COMPARTMENT INTEGRITY.
15. ALL CONCEALED PIPEWORK TO BE INSULATED IN ACCORDANCE WITH THE MECHANICAL SERVICE SPECIFICATION & DRAWING.
16. ALL ENERGY CENTER LOUVRES ARE TO BE FIRE SMOKE RESISTANT DAMPER/INTUMESCENT AIR TRANSFER GRILLES.
17. FINAL FLUE DESIGN TO BE COMPLETED BY SPECIALIST

Rev No.	Date	Revision Note	Drn by	Chkd by
P01	22.01.18	FOR INFORMATION	J.C.	S.T.
P02	08.06.18	TENDER ISSUE	J.C.	J.C.
P03	23.07.18	TENDER ISSUE	J.D.	J.C.
T01	14.01.19	TENDER ISSUE	J.D.	J.S.

Rev No.	Date	Revision Note	Drn by	Chkd by

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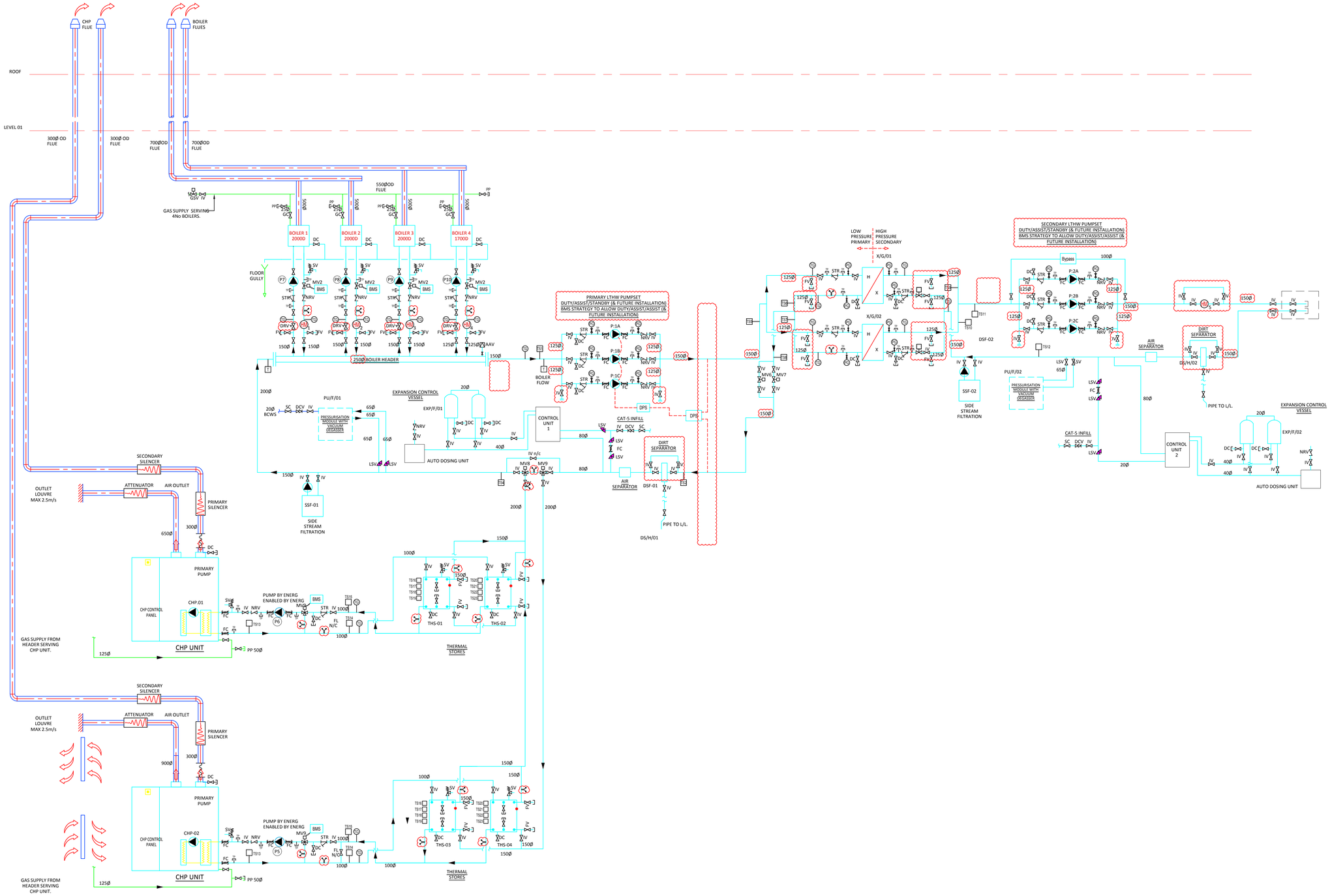
Client: BARRATT LONDON
Project: FORMER NESTLE FACTORY

Title: BLOCK D
ENERGY CENTRE

PROJECT	DISCIPLINE	ZONE	COMPANY	TYPE	NUMBER	REVISION
FNF	M	D	OCSC	DR	50-001	T01

Date: 22.02.17 Scale: 1:100 @ A1 Drn by: J.C. Chkd by: S.T. Aprvd by: J.F.



LEGEND:

- ISOLATION VALVE
- ISOLATION VALVE WITH CURRENT SWITCH
- GLOBE VALVE
- 2 PORT MOTORISED VALVE
- 3 PORT MOTORISED VALVE
- 3 PORT GATE VALVE
- 4 PORT GATE VALVE
- DEAD WEIGHT FIRE VALVE
- SLAM SHUT VALVE
- DOUBLE REGULATOR VALVE
- FIXED ORIFICE DOUBLE REGULATING VALVE
- BUTTERFLY VALVE
- PRESSURE RELIEF VALVE
- PRESSURE REDUCING VALVE
- DRAIN COCK
- NON RETURN VALVE/CHECK VALVE
- AIR VALVE & VENT
- THERMOSTATIC RADIATOR VALVE
- LOCK SHIELD VALVE
- GATE ANGLE - 2 PORT
- CONTROL ANGLE - 2 PORT
- STRAINER
- AIR ADMITTANCE VALVE
- PRESSURE INDEPENDANT CONTROL VALVE
- HEAT METER
- TEMP SENSOR (BMS)
- COMMISSIONING STATION

NOTES:

1. THE CONTRACTOR SHALL INCLUDE FOR ALL NECESSARY OFFSETS TO AVOID OTHER SERVICES.
2. ALL PIPEWORK TO BE INSULATED IN ACCORDANCE WITH SPECIFICATION.
3. INTUMESCENT FIRE BARRIER PUTTY TO BE FITTED BETWEEN PIPE INSULATION & PIPE SLEEVES ON ALL PIPEWORK PASSING THROUGH WALLS & FLOORS
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9. ALL CONCEALED PIPEWORK TO BE INSULATED IN ACCORDANCE WITH THE MECHANICAL SERVICE SPECIFICATION & DRAWING.
10. FLUSHING BYPASS ON BOILERS ACHIEVED BY INTERCONNECTING FLEXIBLE HOSES ON BOILER PIPEWORK
11. FLUE TO EXTEND 3m ABOVE THE HIGHEST POINT ON BLOCK D ROOF.
12. ALL ENERGY CENTER LOUVRES ARE TO BE FIRE SMOKE RESISTANT DAMPER/INTUMESCENT AIR TRANSFER GRILLES
13. PUMPS FOR SIDE STREAM FILTRATION TO BE SUPPLIED BY MANUFACTURER

Rev No.	Date	Revision Note	Drn by	Chkd by
P01	22.01.18	FOR INFORMATION	J.C.	S.T.
P02	08.06.18	ADDED PUMP REFERENCES & MINOR MODS	L.C.B.	S.T.
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P04	03.12.18	TENDER ISSUE	C.W.	S.T.

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Client: BARRATT LONDON
Project: FORMER NESTLE FACTORY

Title: BLOCDK D
ENERGY CENTRE SCHEMATIC

PROJECT	DISCIPLINE	ZONE	COMPANY	TYPE	NUMBER	REVISION
FNF	M	D	OCSC	SC	50-001	P04

Date: 22.02.17 Scale: 1:100 @ A1 Drn by: J.C. Chkd by: S.T. Aprvd by: J.F.

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7. MAINS COLD WATER PIPEWORK SHALL BE LAID BY THE WATER CONTRACTOR
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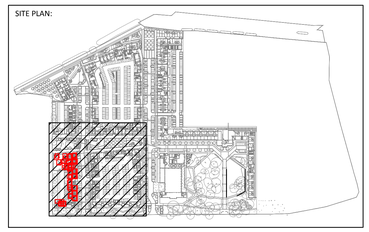
10. THE CONTRACTOR SHALL ENSURE THAT THE INSTALLATION IS IN ACCORDANCE WITH THE NJUG REQUIREMENTS.
11. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ARCHITECTS DRAWING
12. ALL DIMENSIONS SHOWN ARE THE INTERNAL DIMENSIONS OF THE PRE INSULATED PIPEWORK

SITE PLAN:



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P01	08.06.18	ISSUED FOR COMMENT	J.D.	S.B.
T01	10.07.18	FOR INFORMATION	J.D	J.C.
T02	01.08.18	TENDER ISSUE	J.D.	J.C.
T03	16.11.18	UPDATED TO SUIT VE OPTION	J.D.	J.S.
T04	20.12.18	TENDER ISSUE - UPDATED DRAWING TITEL	J.R.	J.S.

Rev No.	Date	Revision Note	Drn by	Chkd by

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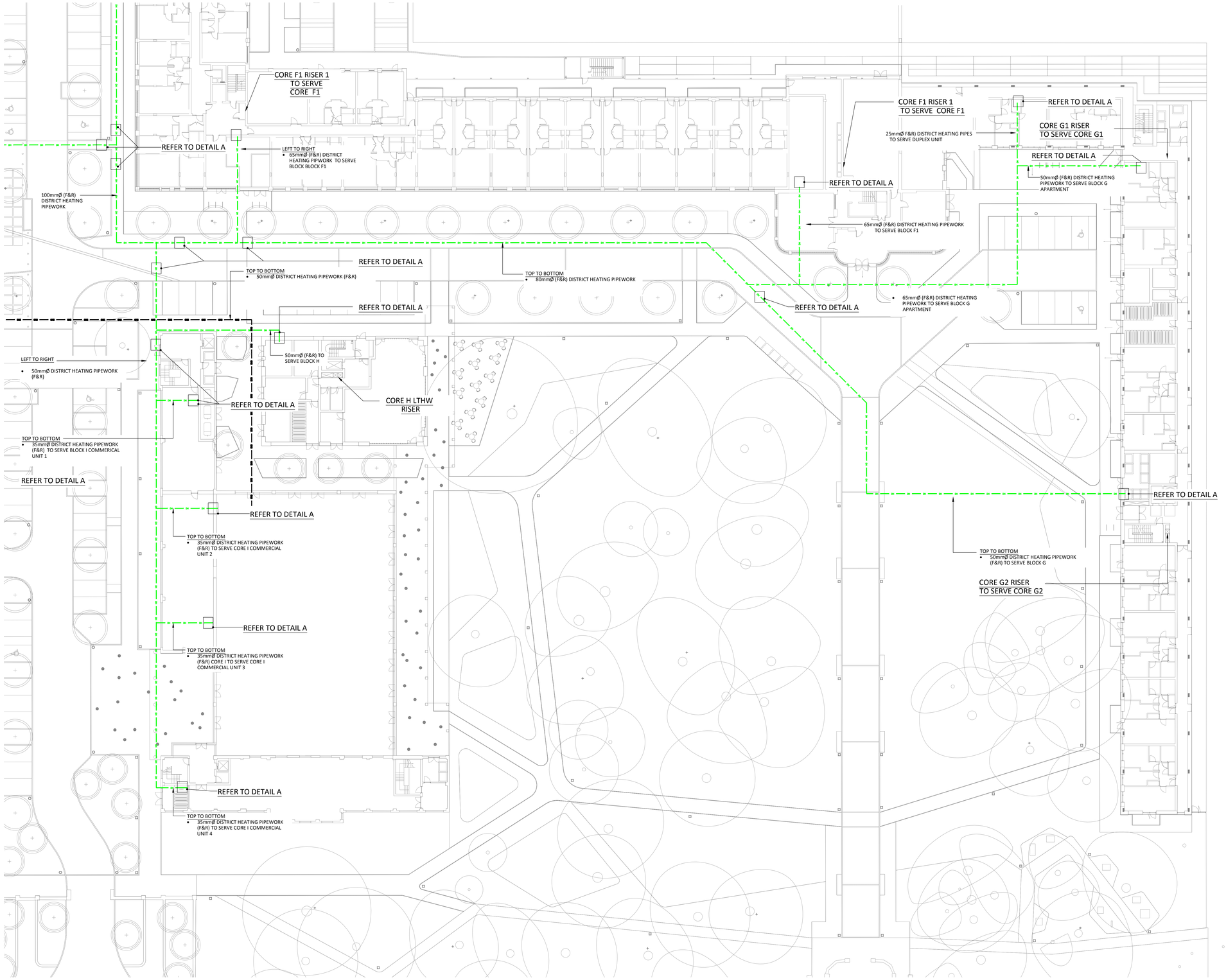
Client: BARRATT LONDON
Project: FORMER NESTLE FACTORY, HAYES

Title: PROPOSED SITE-WIDE
DISTRICT HEATING PIPWORK LAYOUT (1 OF 3)

PROJECT	DISCIPLINE	ZONE	ORIGINATOR	TYPE	NUMBER	REVISION
FNF	N	SITE	OCSC	GA	51-004	T04

Date: 31.01.18 Scale: 1:200 @ A0 Drn by: J.D. Chkd by: S.B. Aprvd by: J.S.



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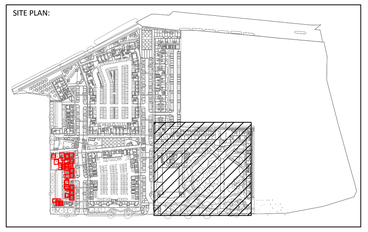
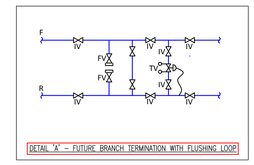
SITE PLAN:





- FOR SETTING OUT REFER TO ARCHITECT'S DRAWINGS.
- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER ARCHITECTURAL AND ENGINEERING DRAWINGS AND ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. USE FIGURED DIMENSIONS ONLY.
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Rev No.	Date	Revision Note	Drn by	Chkd by
P01	08.06.18	ISSUED FOR COMMENT	J.D.	S.B.
T01	12.07.18	FOR INFORMATION	J.D.	J.C.
T02	30.07.18	TENDER ISSUE	J.D.	J.C.
T03	19.11.18	PIPE SIZES UPDATED IN LINE WITH SWEDISH STANDARD DESIGN GUIDANCE	J.D.	J.S.
T04	20.12.18	TENDER ISSUE - UPDATED DRAWING TITEL	J.R.	J.S.

Rev No.	Date	Revision Note	Drn by	Chkd by

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O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

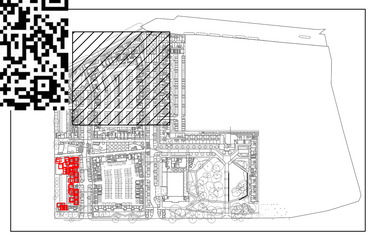
Dublin | London | Belfast | Galway | Cork

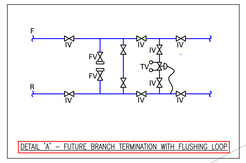
Client: BARRATT LONDON
Project: FORMER NESTLE FACTORY, HAYES

Title: PROPOSED SITE-WIDE
DISTRICT HEATING PIPWORK LAYOUT (2 OF 3)

PROJECT	DISCIPLINE	ZONE	ORIGINATOR	TYPE	NUMBER	REVISION
FNF	N	SITE	OCSC	GA	51-005	T04

Date: 31.01.18 Scale: 1:200 @ A0 Drn by: J.D. Chkd by: S.B. Aprvd by: J.S.





1. ALL ROUTES DETAILED ON THIS LAYOUT ARE INDICATIVE ONLY AND ALL DETAILED COORDINATION SHALL BE BY OTHERS.
2. ALL ROUTES AND SIZES ARE SUBJECT TO CHANGE FOLLOWING RECIEPT OF APPOINTED UTILITY COMPANY DESIGNS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL SERVICES ARE INSTALLED IN ACCORDANCE WITH THE UTILITY COMPANIES REQUIREMENTS.
4. ALL FINAL COORDINATION TO BE CARRIED OUT ON SITE.
5. NOTE THIS DRAWING SHALL NOT BE USED FOR SETTING OUT PURPOSES.
6. MAINS GAS WORKS SHALL BE CARRIED OUT BY THE GAS UTILITY CONTRACTOR
7. MAINS COLD WATER PIPEWORK SHALL BE LAID BY THE WATER CONTRACTOR
8. ALL EXCAVATIONS SHALL BE CARRIED OUT BY THE SUB-CONTRACTOR INCLUSIVE OF GAS, WATER, POWER AND TELECOMS
9. CONTRACTOR TO ENSURE THAT ALL BT OPENREACH DUCTS AND CHAMBERS ARE INSTALLED IN ACCORDANCE WITH THE OPENREACH DEVELOPERS GUIDE.
10. THE CONTRACTOR SHALL ENSURE THAT THE INSTALLATION IS IN ACCORDANCE WITH THE NJUG REQUIREMENTS.
11. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ARCHITECTS DRAWING
12. ALL DIMENSIONS SHOWN ARE THE INTERNAL DIMENSIONS OF THE PRE INSULATED PIPEWORK

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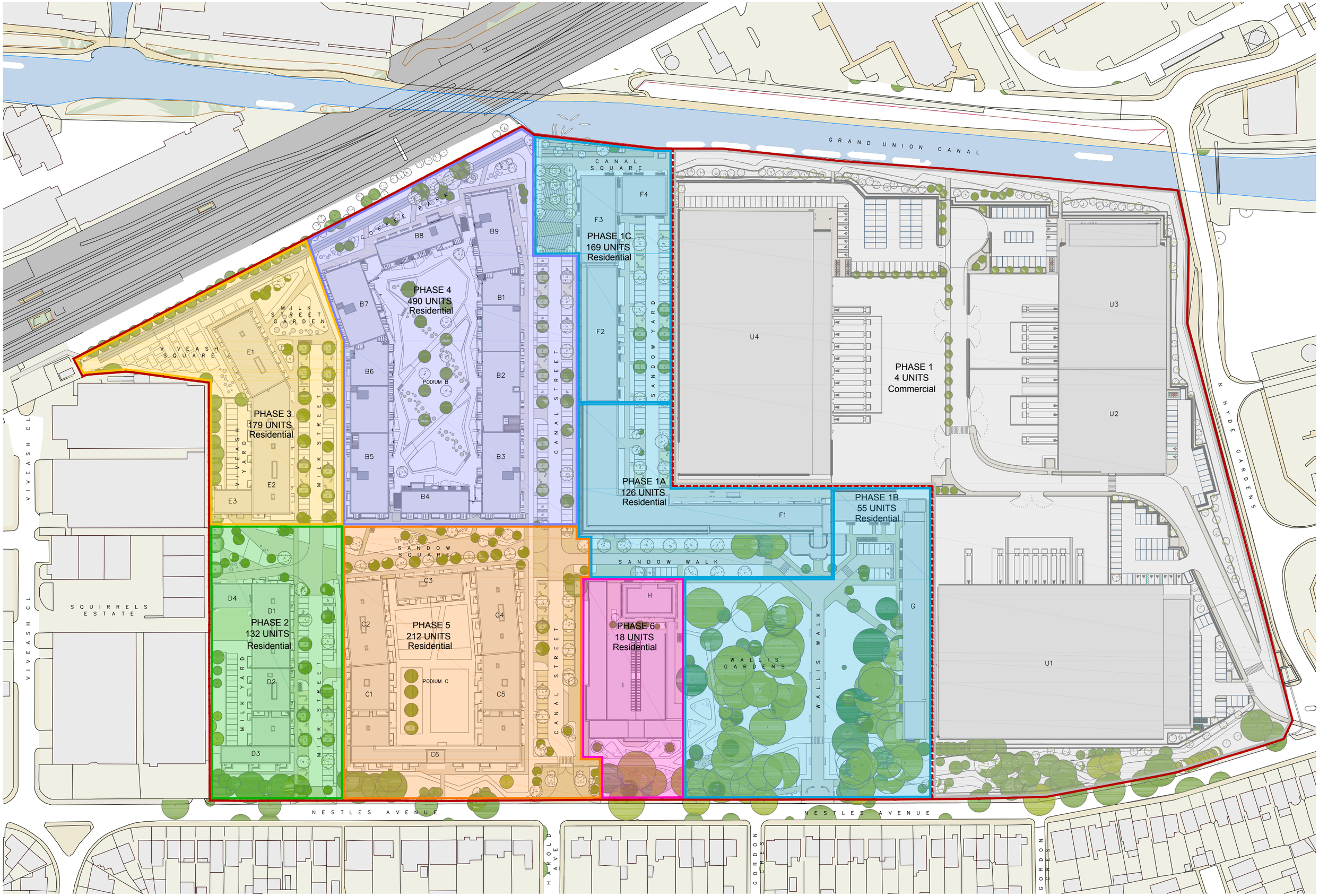

BARRATT LONDON

SEGRO

PHASE 1 COMMERCIAL AND RESIDENTIAL TO COMMENCE AT THE SAME TIME

PHASE 1 - COMMERCIAL - 4 UNITS

PHASE 1 (A, B, C) - RESIDENTIAL - 350 UNITS

PHASE 2 - RESIDENTIAL - 132UNITS

PHASE 3 - RESIDENTIAL - 179 UNITS

PHASE 4 - RESIDENTIAL - 490 UNITS

PHASE 5 - RESIDENTIAL - 212 UNITS

PHASE 6 - RESIDENTIAL - 18 UNITS

RED LINE - WHOLE SITE

RED LINE -LIMIT BETWEEN RESIDENTIAL AND COMMERCIAL AREA

DATE	REV	DESCRIPTION	CHK

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ISSUE D1

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