DO NOT SCALE

1a) ANTICIPATED FOUNDATION TYPES

Tf MASS CONCRETE TRENCHFILL FOUNDATION

-Bearing Strata medium dense SAND.
-Minimum depth 1250mm below proposed ground level.
-Maximum safe bearing pressure limited to 125kN/m².
-Refer to specific house type footing drawings by the structural engineer.

Rn NOMINALLY REINFORCED STRIP FOUNDATION

-Bearing Strata medium dense SAND.
-Minimum depth below proposed ground level; 600mm in SAND.
-Maximum safe bearing pressure limited to 125kN/m².
-Refer to specific house type footing drawings by the structural engineer.

DRn DEEP NOMINALLY REINFORCED STRIP FOUNDATION

-Bearing Strata medium dense SAND.
-Minimum depth below proposed ground level; 600mm in SAND
-Maximum safe bearing pressure limited to 125kN/m²
-To be used where the depth from existing ground level to formation level is less than 1.2m but from slab level, due to land raising, is greater than 1.2m but less than 3.0m.
-Refer to specific house type footing drawings by the structural engineer.

P PILED FOUNDATIONS WITH ASSOCIATED REINFORCED CONCRETE GROUND BEAMS

-Where the maximum foundation depth exceeds 3.00m a piled foundation option rather than trenchfill/short reinforced strips or raft foundations are to be adopted especially if site levels are raised prior to construction work commencing on the plots in question.
-H designates where heave precautions are required to ground beams due to the presence of trees and cohesive strata.
-Column or line loads supported by ground beams.
-Piles anticipated to be friction bearing within the sand strata at lengths in excess of 10.0 metres, subject to confirmation by a specialist contractor.
-Discussions should be held with the Local Authority to confirm that there are no noise and vibration issues due to the presence of residential properties.
-The working platform for the rig installing the piles will need to be assessed and if required designed in accordance with BR470.

***** FOUNDATION ANOMALIES

Indicates foundations and slabs which may be affected by trial pits, trees / hedges or former features. The foundation and slab type indicated may have to be amended and appropriate foundations and slabs adopted to suit local ground conditions exposed at the time of construction and agreed with NHBC/Local Authority Inspectors.

V DOUBLY REINFORCED STRIP FOUNDATIONS ON VIBRO STONE COLUMNS

-Founded on vibro stone columns within areas of land raising or deeper madeground.
-The upper 0.6m of the vibro stone column are typically sacrificial.
-Bearing capacity limited to 125kN/m².
-The suitability of the site for vibro stone columns must be determined by the specialist contractor undertaking the vibro stone columns, and it is advisable to invite the contractors to witness the ground conditions prior to commencing construction.
-Further cable percussive boreholes may be required by the specialist contractors to determine the deeper lying ground conditions.
-Remnant substructures should be broken out to prevent obstructions to vibro stone column installation.
-Technique not to be used in areas with cohesive strata influenced by trees unless such strata are removed and replaced with approved material.
-Technique not suitable where peat strata and soft clays with shear strength less than 30kN/m² are present unless such strata are removed and replaced with approved material.
-Any reprofiling of the areas of proposed treatment must be undertaken with approved strata to E3P specifications and subject to the specialist contractors approval.
-Confirmation should be sought with the local authority regarding any vibration issues associated with vibro stone column foundations.
-Confirmation of the suitability of the site for treatment should be provided to the NHBC for approval, with information supplied in accordance with NHBC Standards Chapter 4.5(4)
-The working platform for the rig installing the vibro stone columns will need to be assessed and if required designed in accordance with BR470.
-The stone column layout should be designed by the specialist contractor and submitted to the NHBC for approval.
-The installed stone columns will require verification testing in accordance with NHBC Standards, Chapter 4.5 (12) which are likely to comprise of 600mm diameter plate tests and dummy footing test/mini zone tests. The testing methods and frequency should be agreed with the NHBC in advance of commencing construction.
-A typical design of doubly reinforced strip footings assumes the stone columns diameter are between 450mm to 600mm, maximum centre misalignment of isolated columns of 150mm, with a maximum spacing between columns of 1800mm to span between stone columns in accordance with NHBC Standards. The NHBC also specifies the columns should be spaced at a maximum of 2000mm, and misaligned by less than 150mm.
-In the event of unforeseen circumstances which influence the efficiency of the treatment and require remedial measures these should be immediately reported to the NHBC.
-The installation contractor will be required to record and provide all works, including information concerning the treatment, the depth of fill, volume of stone used, on-site changes, and any other relevant information relating to the works.
-Upon completion of the treatment the designers should provide confirmation of the suitability of the installation, including review of the test results.
-Refer to specific house type footing drawings by the structural engineer.

GENERAL NOTES

1. This drawing is to be read in conjunction with the following:-
 a) GroundSure EnviroInsight/GeoInsight/Historical Ordnance Survey Maps, Don Street, Middleton, North Manchester ref. CMAPS-AAB-205545-13877-050213EDR/GEO/HIS, dated 05 February 2013.
 b) British Geological Survey, 1:10,560 Geological Map Sheet Lancashire 90NE.
 c) REFA Consulting Engineers, Proposed Industrial Development, Rex Mill, Don Street, Middleton, Manchester, report ref. 05122, dated September 2006.
 d) Survey Systems Ltd, Topographical Survey, Don Street, Middleton, drawing ref. SSL-13989A-250-1-8-8, dated March 2012.
 e) Obtained from records held by Vitafoam, unreferenced.
 f) Coopers Site Investigation Report, reference 5639si.
 g) British Geological Survey, onshore borehole records.
 h) Kellen Homes, Site Planning Layout, Don Street, Middleton, ref. KH/DS/PSL/01, rev. AQ, dated 26 May 2022.
 i) Urban Green, Land off Don Street, Arboricultural Impact Assessment, ref. UG956, dated May 2021.
 j) RSK, External works, Don Street, Middleton, ref. 882333/40-22-01, rev. P6, dated 31 May 2022.
 k) E3P, Phase I & II Geoenvironmental Site Assessment, Land off Don Street, Middleton, ref. 14-554-R1-1, dated May 2021.
 l) E3P, Supplementary Site Assessment Letter Don Street, Middleton, ref. 14-554-L1-2, dated 8 June 2022.
 m) Email from Kellen Homes Limited dated 16 February 2022 containing E3P trial pit logs and location plan.
2. The foundation types indicated are based upon the facts established from observations and field tests during the trial pit investigations. It should be recognised that natural strata may vary considerably from point to point and the groundwater regime may be influenced by seasonal or other factors. The foundation types indicated are therefore for 'GUIDANCE PURPOSES ONLY' and should be constantly reviewed in the light of the actual conditions exposed on site during the construction work.
3. The tree contours show the minimum depth required for foundations below ground level in clay soils within influencing distance of trees/hedgerow - i.e. trees to be retained and trees to be removed. The 'ground level' shall be determined in accordance with the NHBC Standards Chapter 4.2 'Building Near Trees'.
4. Trees or hedgerows which are to be planted must be considered. No allowance has been made for them on this drawing as it is assumed that any proposed trees and or hedgerows will be sited to avoid affecting any proposed dwelling foundation.
5. The shrinkability of the cohesive soil strata on this site has been determined as LOW in accordance with NHBC Standards Chapter 4.2.
6. Where necessary foundations should be stepped in accordance with current NHBC recommendations.

BASIS OF ASSESSMENT AND GUIDANCE ON FOUNDATION CONSTRUCTION:

General
-The foundations are based upon inferring ground conditions from exploratory holes by third parties. In areas where variable ground conditions occur the precise locations of the exploratory holes would be required to allow accurate assessments of the ground conditions for plot specific assessments.
-No information has been provided to indicate the location of the exploratory holes have been surveyed.
-The foundation types have been proposed based upon the developer's commercial preferences for foundation types with depths
-It is acknowledged that trench stability can influence the suitability of foundation construction and we would advocate trial excavations with the developer and contractors to appraise the influence, limitations and changes/measures that can be adopted.

Investigation Areas
-Specific features from the historical Ordnance Survey maps have been accurately overlaid to disclose potential abnormal ground conditions. Specific targeting and delineation of these features are required to enable an accurate assessment.
-The remarks section of the foundation schedule details plot specific features likely to be encountered and may include recommendations for further investigation prior to construction.
-Where the ground conditions differ from those indicated in this drawing we would advocate the developer contacts Coopers to confirm or recommend procedures for reappraisals prior to casting the foundations, and may require further ground investigation.

External Works
-The foundation schedule includes specific designs to account for the proposed slab levels and underbuild.
-Where retaining walls are proposed in close proximity to plots, the foundations may need to be constructed at the same time as the plot/garage foundations, and specific discussions with Coopers structural engineers are recommended should potential conflicts be considered.
-The assessments make no account of proposed utilities excavations and should deep excavations be proposed the formation depths should be appraised to determine if these need to be set a lower level.
-This site will require cutting and filling to achieve the necessary development platform. In areas where plots have significant underbuild brickwork and/or adjacent retaining walls, the relationship between plot foundation and retaining wall will need to be considered by a structural engineer. Where necessary the foundation option presented here may need to be amended or adapted. The final regrade levels of the earthworks contract will also need to be considered in these areas.

Tree Influence and Formation Depths
-The tree survey (as referenced in General Note 1i) was current at the time of the original revision of this drawing. The developer should be aware that trees which are +|- mature height may be subject to substantial changes in growth over time and therefore reappraisals of tree heights and foundation depths at the time of construction/felling may be required.
-This site is comprised of granular madeground over sand strata over the majority of the site. Therefore trees do not influence foundation depths, the tree contour depths have been included on the plan for information only.

8a) DRILL & GROUT INVESTIGATION

E3P are to undertake the above investigations to determine the influence of potential shallow mine works across the site. Should shallow coal seams or mine workings be encountered these may have an impact on the foundation recommendations provided on this plan and table.

NOTE: This site will be extensively regraded. The final cut and fill levels have not been produced. Therefore for preliminary assessment it has been assumed that these levels will be sat at 0.45m below FFL. All foundation assessments on the accompanying table are relevant to this datum reference level. This note excludes working platform levels for piling or vibro replacement techniques which will be set relevant to ground beam and vibro footing designs.

3a) SUB STRUCTURE READY MIX CONCRETE DESIGNATIONS BY END USE

Use as substructure and ground floors	Ready-mixed concrete (designated mix)
General Use:	
· Rough blinding (non-structural)	- GEN1
· Infill	- GEN1
· Unreinforced oversite concrete below timber floors	- GEN1
· Structural blinding and overbreak	- GEN1
· In situ external concrete for drives and paths	- PAV1
· In situ external concrete foundations for precast concrete paving slabs	- GEN1
· Fill to wall cavity	- GEN1
· Solid filling under steps	- GEN1
Floor Slabs	
· House or garage with reinforced concrete floor slab, either suspended or precast.	- RC35
· House with non-reinforced slab (ground bearing) with either:	
a) Permanent finish to be added, e.g. screed or floating floor.	- GEN1
b) No permanent finish to be added, e.g. carpet.	- GEN2
· Garage with non-reinforced slab (ground bearing)	- GEN3
Foundations:	
· Strip foundations	- GEN1
· Trench fill	- GEN1
· Other mass concrete foundations	- GEN1
· Reinforced concrete footing	- RC35

Notes:
1) Worst case sulphate conditions over the entire site are Design Sulphate Class DS-1, ACEC Class AC-1, and Design Chemical Class DC-1.
2) Classification and designation in accordance with NHBC guidance, Section 3.1- Table 6, and BS8500 -1, 2006.
3) The above conditions represent the worst case conditions identified within the testing of soils on the site.
4) Any fill material to be imported onto the site should be tested and should not exceed the classifications given above.

FOR TENDER PURPOSES ONLY

4a) SUB-STRUCTURE BRICKWORK / BLOCKWORK AND MORTAR REQUIREMENTS

Brickwork or blockwork below DPC to be in accordance with BS5628 (Part3), Table 13 (Section A), assuming **Design Sulfate Class, DS-1,** sulfate and acid conditions and **Aggressive Chemical Environment for Concrete, AC-1,** in accordance with BRE Special Digest 1.

Quality of Masonry Units and appropriate Mortar Designations

	Clay Fired	Calcium Silicate	Concrete Bricks	Concrete Blocks
Type / Strength	Special quality	Classes 3 to 7	Compressive strength >20 N/mm²	Compressive strength >7 N/mm² Density exceeding 1500 kg/m³ Dense aggregate to BS882 or BS1047
Mortar Designation BS5628 (Part 1) & Table 1	(i) or (ii)	(iii)	(ii) or (iii)	(ii)

Footnotes:
(1) Some autoclaved aerated concrete blocks of a lower compressive strength and density than that quoted above may be suitable for foundations for two storey dwellings where the height of blockwork is less than 1250mm below finished ground level. Subject to the prior approval of the NHBC or submission of a valid Agrément Certificate from the manufacturer.
(2) The developer must obtain written approval from the NHBC before using lower strength and lower density concrete blocks in foundations deeper than 1250mm below finished ground level.

The following autoclaved aerated blocks are suitable for use on this site: -

Proprietary Name	Manufacturer	Agrément Certificate No.
Trenchblock	Thermalite	00/3720
Or similar approved in accordance with notes (1) and (2) above		

Refer to structural engineers detailed drawings for required compressive strength of trenchblocks below slab for 2 storey and 3 storey structures.

Drainage Pipework Requirements

Drainage Pipework to be in accordance with BS5911, assuming Design Sulfate Class, DS-1, sulfate and acid conditions and Aggressive Chemical Environment for Concrete, AC-1, in accordance with BRE Special Digest. 1.

THIS DRAWING SHOULD ONLY BE PRINTED IN COLOUR

5a) GROUND GAS

It is understood that E3P will be undertaking ground gas monitoring post remediation and engineering regrade. Subject to the findings of this investigation, recommendations on the ground gas precaution measures to dwellings will be confirmed.

6a) CONTAMINATION

Refer to E3P reports on the requirements for remediation and build phase strategies for this site.

7a) FOUNDATION ANOMALIES

Backfilled trial pits, or historical features (such as recorded former wells) may be encountered during foundation excavations as noted on the plot specific remarks on the table. The following procedures should be adopted where such features are encountered:

1) Start foundation excavations in areas of potential anomaly to locate any features present.
2) When likely foundation anomaly is identified halt the foundation excavation - DO NOT attempt to dig out areas where fills may be deep.
3) Record the location of the feature relative to the proposed footprint and contact Coopers for engineering design. This may include a beam design to span the feature, therefore it is imperative that the deep fills are not excavated prior to confirmation of engineering designs.
4) Do not continue foundation excavations for the plot until directly advised to do so by Kellen Homes Office or Coopers.

CDM HIGH RISK ASSESSMENT
FOR ALL RISKS REFER TO KELLEN HOMES DESIGN RISK ASSESSMENT PACKAGE

LEGEND

(All positions are approximate unless otherwise stated)
(All references refer to those stated within General Notes)

KEY TO CURRENT SITE FEATURES

(All positions are approximate unless otherwise stated)

- Surveyed buildings (taken from ref. d)
- River Irk and associated water extents (taken from ref. d)
- Surveyed tank locations (taken from ref. d)
- Reservoir (taken from ref. d)
- E3P conjectured area of peat (taken from ref. k)

KEY TO FORMER FEATURES

(All positions are approximate unless otherwise stated)

- Enviroment Agency Historic Landfill site (taken from ref. a)
- Former buildings/structures (taken from ref. a)
- Former River Irk route (taken from ref. a)
- Former pond extents (taken from ref. a)
- Former footpath positions (taken from ref. a)
- Former hedgeline (taken from ref. a)
- Former tanks (taken from ref. a)
- Former Chimney (taken from ref. a)
- Former wells (taken from ref. a)
- Trench containing asbestos lagged steam pipes and associated fuel pumps (taken from ref. e)
- Conjectured positions of pumps
- Former suspected refuse heap (taken from ref. a)
- Extent of former brick / clay pit (taken from ref. a)
- Historical slopes (taken from ref. a)

KEY TO PROPOSED FEATURES

(All positions are approximate unless otherwise stated)

- Proposed plot locations (taken from ref. h)
- 85.70 Slab levels (taken from ref. j))
- 1.00UB Underbuild locations and depth (taken from ref. j))
- 1.00GB Gravel board and height (taken from ref. j))
- 1.00FL Flag on end and height (taken from ref. j))
- 1.00RW Retaining wall and height (taken from ref. j))
- Site boundary (taken from ref. h)

KEY TO TREE CONTOURS

(All positions are approximate unless otherwise stated)

- G12# Surveyed group of trees (taken from ref. i)
- T1# Surveyed individual tree (taken from ref. i)
- H69 Surveyed hedges (taken from ref. i)
- 600 450 300 Indicates minimum depth of foundation required in areas affected by existing trees/hedgerows with a CLAY subsoil (TREES RETAINED). Not applicable to foundations in a granular subsoil. Dashed lines indicates tree proposed to be removed. (NHBC Standards Chapter 4.2)
- Denotes 1.5m foundation depth contour of existing tree height - for heave precautions. Dashed lines indicates tree proposed to be removed. (NHBC Standards Chapter 4.2)

Note: These tree contours and heave line will require amendment should LABC be utilised as Building Control.

KEY TO COOPERS EXPLORATORY HOLES

(All positions are approximate unless otherwise stated)

- Trial pits TP1 - TP54 excavated by Coopers between 11 and 15 March 2013.
- Hand dug trial pit HDTP1 dug by Coopers on 15 March 2013.
- Rotary open hole boreholes R1 - R15 drilled for Coopers between 12 and 16 March 2013.
- Window sample boreholes WS1 - WS19 drilled for Coopers between 11 and 15 March 2013.
- Cable percussive boreholes BH1 - BH6 drilled for Coopers between 11 and 15 March 2013.
- Water samples Water 1 - Water 3 obtained by Coopers from River Irk on 1 May 2013.

KEY TO EXPLORATORY HOLES BY OTHERS

(All positions are approximate unless otherwise stated)

- Trial pits excavated by E3P TP101 - TP123 between 08 & 09 February 2022 (taken from ref. m)
- TP201 - TP211 between 27 January - 30 March 2021
- TP301 - TP358 between 11 - 24 March 2021
- TP401 - TP428 between 13 - 15 January 2021
- TP501 - TP523 on 08 - 09 February 2022
- TP601 - TP612 on 08 March 2022
- TP701 - TP704 on 10 May 2022 (taken from ref. k & l)
- Window sample boreholes drilled for E3P: WS101 - WS122 between 01 October 2014 - 01 November 2014 WS201 - WS209 on 30 March 2021 WS301 - WS323 between 11 - 24 March 2021 WS401 - WS411 on 14 January 2021 WS506 05 May 2022 (taken from ref. k & l)
- Rotary boreholes drilled for E3P: RB101 - RB106 between October & November 2014 RB201 - RB208 between 27 January - 04 February 2021 RB301 - RB312 between 25 - 29 March 2021 RB401 - RB409 on between 21 - 26 January 2021 (taken from ref. k)
- Cable percussive boreholes drilled for E3P: CP301 - CP303 between 23 - 25 March 2021 CP401 - CP404 on 05 - 11 May 2022 (taken from ref. k & l)
- Trial pits TH1 - TH8 excavated by REFA Design Consultants on 10 May 2006 (taken from ref. c)
- Light cable boreholes BH1 - BH5A drilled by REFA Design Consultants between 13 and 20 June 2006 (taken from ref. c)
- Rotary boreholes R1 - R3 drilled by REFA Design Consultants on 13 June 2006 (taken from ref. c)
- Cable percussive boreholes BH21 - BH34 drilled by Norwest Holst Soil Engineers between 23 and 28 February 1983 (taken from ref. g)
- Borehole drilled for Soudan Mills between 27 November 1913 and 10 March 1914 (taken from ref. g)
- Borehole drilled for Soudan Mills between 28 March and 16 April 1984 (taken from ref. g)

SCALE BAR (m): 0 5 10 15 20 25 30 35 40 45 50

2a) SITE PLAN

(Scale 1:500)

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REVISION BOX				
Rev.	Date	Revision	By	Appd.
B	05.08.22	Plots 246 - 249 & 252 - 255 FFL and external works updated.	OS	PRS

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Project: Don Street, Middleton.

Title: FOUNDATION PLAN SHEET 1 OF 4

DRAWING NUMBER	SCALE at A0	1:500	REVISION
5639 / Fd / 01	DATE	03.03.22	B
	DRAWN	AH / OS	
	CHECKED	PRS	