

NOT TO 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/m<sup>2</sup>.
- 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/m<sup>2</sup>.
- 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/m<sup>2</sup>.
- 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 3.0m a piled foundation option rather than trenchfill/deep 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 the 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 BS470.

### \* 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 NHC/Local Authority Inspectors.

## V DOUBLY REINFORCED STRIP FOUNDATIONS ON VIBRO STONE COLUMNS

- Founded on vibro stone columns within areas of land raising or deeper made ground.
- The upper 0.6m of the vibro stone column are typically sacrificial.
- Bearing capacity limited to 125kN/m<sup>2</sup>.
- 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/m<sup>2</sup> are present unless such strata are removed and replaced with approved material.
- Any repelling 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 NHC for approval, with information supplied in accordance with NHC 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 BS470.

- The stone column layout should be designed by the specialist contractor and submitted to the NHC for approval.
- The installed stone columns will require verification testing in accordance with NHC Standards, Chapter 4.5 (12) which are likely to comprise of 600mm diameter plate tests and dummy footing test/mine zone tests. The testing methods and frequency should be agreed with the NHC 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 NHC Standards. The NHC 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 NHC.
- 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

- This drawing is to be read in conjunction with the following:-
  - Groundsure Environmental/Geotechnical/Historical Ordnance Survey Maps, Don Street, Middleton, North Manchester ref. CHAPS-AB-205545-13877-0502-13EDR/GEO/HIS, dated 05 February 2013.
  - British Geological Survey, 1:10,560 Geological Map Sheet Manchester S15.
  - REFA Consulting Engineers, Proposed Industrial Development, Rex Mill, Don Street, Middleton, Manchester, report ref. 05122, dated September 2006.
  - Survey Systems Ltd, Topographical Survey, Don Street, Middleton, drawn on 15/03/2011, dated 15/03/2011, dated March 2012.
  - Obtained from records held by Vitaform, unreferenced.
  - Coopers Site Investigation Report, reference 5639a.
  - British Geological Survey, onshore borehole records.
  - Kellen Homes, Site Planning Layout, Don Street, Middleton, ref. KHDSPL01, rev. AQ, dated 26 May 2022.
  - Urban Green, Land off Don Street, Arboricultural Impact Assessment, ref. UG095, dated May 2021.
  - RSK, External works, Don Street, Middleton, ref. 882333/40-22-01, rev. P6, dated 31 May 2022.
  - ESP, Phase 1 & II Geoenvironmental Site Assessment, Land off Don Street, Middleton, ref. 14-554-L1-2, dated 8 June 2022.
  - ESP, Supplementary Site Assessment Letter Don Street, Middleton, ref. 14-554-L1-2, dated 8 June 2022.
  - Email from Kellen Homes Limited dated 16 February 2022 containing E3P trial pit logs and location plan.
- 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.
- The tree contours show the minimum depth required for foundations below ground level in clay soils within influencing distance of trees/hedges, i.e. trees to be retained and trees to be removed. The 'ground level' shall be determined in accordance with the NHC Standards Chapter 4.2 'Building Near Trees'.
- Trees or hedges 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 hedges will be sited to avoid affecting any proposed dwelling foundation.
- The shrinkability of the cohesive soil strata on this site has been determined as LOW in accordance with NHC Standards Chapter 4.2.
- Where necessary foundations should be stepped in accordance with current NHC recommendations.

## BASIS OF ASSESSMENT AND GUIDANCE ON FOUNDATION CONSTRUCTION

- General**
  - The foundations are based upon inferred ground conditions from exploratory holes by third parties. In areas where variable ground conditions occur the precise locations of the exploratory holes will 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 provided to indicate 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 contractors Coopers to confirm or recommend procedures for reassessment 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 underdrains.
  - Where retaining walls are proposed in close proximity to plots, the foundations may need to be constructed at the same time as the plot/retaining foundations, and specific discussions with Coopers structural engineers are recommended should potential conflicts be considered.
  - The assessments make no account of proposed utility excavations and should deep excavations be proposed the formation depths should be appraised to determine if these need to be set at a lower level.
  - This site will require cutting and filling to achieve the necessary development platform. In areas where piles 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 grade 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 1) was current at the time of the original revision of this drawing. The developer should be aware that trees which are <1 mature height may be subject to substantial changes in growth over time and therefore reassessments of tree heights and foundation depths at the time of construction/filling may be required.
  - This site is comprised of granular made ground 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

- ESP are to undertake the above investigations to determine the influence of potential abnormal ground conditions 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.

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

**coopers**  
chartered consulting engineers  
Tel 01244 684910  
Email: info@coopers.co.uk  
Web: http://coopers.co.uk

Park House  
Sandpiper Court  
Chester Business Park  
Chester  
CH4 9QU

**KELLEN HOMES**

Project **Don Street, Middleton.**

Title **FOUNDATION PLAN SHEET 1 OF 4**

| DRAWING NUMBER | DATE     | SCALE | REVISION |
|----------------|----------|-------|----------|
| 5639 / Fd / 01 | 03.03.22 | 1:500 | B        |
|                | DRAWN    | AM/OS |          |
|                | CHECKED  | PRS   |          |

## 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 lirk 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)

- Environment Agency Historic Landfill site (taken from ref. a)
- Former buildings/structures (taken from ref. a)
- Former River lirk route (taken from ref. a)
- Former pond extents (taken from ref. a)
- Former footpath positions (taken from ref. a)
- Former hedgerow (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)

## 2a) SITE PLAN

(Scale 1:500)

The original of this drawing contains coloured symbols and/or features. Any black and white reproduction must not be used.

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## KEY TO PROPOSED FEATURES

(All positions are approximate unless otherwise stated)

- Proposed plot locations (taken from ref. h)
- Slab levels (taken from ref. j)
- Underbuild locations and depth (taken from ref. j)
- Gravel board and height (taken from ref. j)
- Flag on end and height (taken from ref. j)
- 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)

- Surveyed group of trees (taken from ref. i)
- Surveyed individual tree (taken from ref. i)
- Surveyed hedges (taken from ref. i)
- Indicates minimum depth of foundation required in areas affected by existing trees/hedges with a CLAY subsoil (TREES RETAINED). Not applicable to foundations in a granular subsoil. Dashed lines indicates trees proposed to be removed. (NHC Standards Chapter 4.2)
- Denotes 1.5m foundation depth contour of existing tree height - for heave precautions. Dashed lines indicates trees proposed to be removed. (NHC 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 - TP4 excavated by Coopers between 11 and 15 March 2013.
- Hand dug trial pit HTP1 dug by Coopers on 15 March 2013.
- Rotary open hole boreholes R1 - R15 drilled for Coopers between 12 and 15 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 lirk 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
- TP201 - TP202 between 11 - 24 March 2021
- TP401 - TP428 between 13 - 15 January 2021
- TP601 - TP602 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
- WS501 - WS506 on 15 May 2022 (taken from ref. k & l)
- Rotary boreholes drilled for E3P: RB101 - RB108 between October & November 2014
- RB201 - RB208 between 27 January - 04 February 2021
- RB301 - RB312 between 25 - 28 March 2021
- RB401 - RB409 on 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)
- Light cable boreholes BH1 - BH54 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 Holes 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)

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

(All positions are approximate unless otherwise stated)

- General Use:
  - Rough blinding (non-structural)
  - Infill
  - Unreinforced oversite concrete below timber floors
  - Structural blinding and overbreak
  - In situ external concrete for drives and paths
  - In situ external concrete foundations for precast concrete paving slabs
  - Fill to wall cavity
  - Solid filling under steps
- Floor Slabs:
  - House or garage with reinforced concrete floor slab, either suspended or precast.
  - House with non-reinforced slab (ground bearing) with either:
    - a) Permanent finish to be added, e.g. screed or floating floor.
    - b) No permanent finish to be added, e.g. carpet.
  - Garage with non-reinforced slab (ground bearing)
- Foundations:
  - Strip foundations
  - Trench fill
  - Other mass concrete foundations
  - Reinforced concrete footing
- Notes:
  - Worst case sulphate conditions over the entire site are Design Sulphate Class DS-1, ACEC Class AC-1, and Design Chemical Class DC-1.
  - Classification and designation in accordance with NHC guidance, Section 3.1, Table 6, and BS8500 - 1, 2006.
  - The above conditions represent the worst case conditions identified within the testing of soils on the site.
  - Any fill material to be imported onto the site should be tested and should not exceed the classifications given above.

- Ready-mixed concrete (Designated mix):
  - GEN1
  - GEN1
  - GEN1
  - GEN1
  - PAV1
  - GEN1
  - GEN1
  - GEN1
  - RC35
  - GEN1
  - GEN1
  - RC35

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

Brickwork or blockwork below DPC to be in accordance with BS5628 (Part 3), Table 13 (Section A), assuming Design Sulphate 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 |                            |                                 |                                                            |                                                                                                                                           |
|--------------------------------------------------------------|----------------------------|---------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Type / Strength                                              | Clay Fired Special quality | Calcium Silicate Classes 3 to 7 | Concrete Blocks Compressive strength >20 N/mm <sup>2</sup> | Concrete Blocks Compressive strength >7 N/mm <sup>2</sup> Density exceeding 1500 kg/m <sup>3</sup> Dense aggregate to BS882 or BS1047 (i) |
| Mortar Designation BS5628 (Part 1) & Table 1                 | (i) or (ii)                | (iii)                           | (i) or (ii)                                                | (i)                                                                                                                                       |

- Some autoclaved aerated concrete blocks of a lower compressive strength and density than that quoted above may be suitable for foundations of two storey dwellings where the height of blockwork is less than 1250mm below finished ground level. Subject to the prior approval of the NHC or submission of a valid Agreement Certificate from the manufacturer.
- The developer must obtain written approval from the NHC 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 | Agreement Certificate No. |
|------------------|--------------|---------------------------|
| Trenchblock      | Thermalite   | 003720                    |

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

## 5a) GROUND GAS

It is understood that ESP 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 ESP 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 walls) 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:

- Start foundation excavations in areas of potential anomaly to locate any features present.
- When likely foundation anomaly is identified halt the foundation excavation - DO NOT attempt to dig out areas where fills may be deep.
- 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.
- Do not continue foundation excavations for the plot until directly advised to do so by Kellen Homes Office or Coopers.

**FOR TENDER PURPOSES ONLY**

**THIS DRAWING SHOULD ONLY BE PRINTED IN COLOUR**

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