Our ref: 16-136.03L

Mr Neil Buddin
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2nd October 2017

Dear Neil,

Re: Proposed Crane Base & Watching Brief - McCarthy & Stone Retirement Apartments, Roundel Kitchens, Harton Centre, 52 Harton Lane, South Shields, Tyne & Wear

Following completion of the site investigation works carried out at the above site, please find attached the following:

- Foundation Plan

1.0 Introduction:

Arc Environmental Limited were commissioned by Anwen Construction on behalf of McCarthy & Stone Retirement Lifestyles Limited to undertake a site visit at Roundel Kitchens, Harton Centre, 52 Harton Lane, South Shields, Tyne & Wear and inspect ground conditions at formation level below a proposed tower crane base. A Foundation Plan (see attached) was provided which shows the Crane Base location.

2.0 Ground Conditions:

The open excavation c.5.2m x c.5.20m x 2.00m deep revealed c.1.10m of made ground (typically disturbed clay with bricks and drainage fragments) over greenish grey and brown sandy gravelly clay to c.1.50m then stiff brown mottled grey sandy gravelly clay. Plates 1 and 2 below show the open excavation and formation level c.2.00m below current ground levels.



Plate 1 – View looking North Over Open Completed Excavation

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2.0 Ground Conditions (Cont'd):



Plate 2 – View looking South Over Open Partially Completed Excavation

3.0 Insitu Testing:

3.1 Insitu Hand Shear Vane Tests: -

Insitu hand shear vane tests were carried out using a portable insitu hand vane tester (upper limit 120kN/m^2) at several locations across the base of the excavation on the natural clay deposits encountered at formation level i.e. c.2.00m below current ground levels.

The insitu hand vane tester takes direct readings of shear strength. Three vane sizes allow for the direct determination of undrained shear strength of extremely low to high strength clays. The peak vane value is determined by a calibrated scale ring built into the head assembly (dial). The dial is used both to push the vane to the desired test depth and apply the shearing torque. The results are summarised in Table 1 below.

Table 1

Type of Strata	Shear Strength Values	Result Details
Sandy gravelly CLAY (Glacial Till)	All tests recorded values >120kN/m^2	high strength

4.0 Crane Base Foundation:

When considering the ground conditions identified the proposed crane base (square pad foundation) based within the natural stiff (high strength) clays at c.2.00m depth below current ground levels can be designed to a maximum allowable bearing pressure of 200kN/m^2.

5.0 Site Observations:

Most of the buildings had been demolished and several new foundations constructed. Following part demolition and removal of floor slabs there was no obvious evidence of significant ground contamination. Plates 3 to 5 below illustrate the amount of demolition works completed to date.



Plate 3 – View looking Northwest Over New Strip Footings



Plate 4 – View of USTS and Partially Exposed Brickwork Cradle

5.0 Site Observations (Cont'd):



Plate 5 – View looking West of Remaining Structure & Demolition Plant

6.0 Outstanding Remedial Requirements: -

From the results of the previous contamination screening, there was evidence of some minor ground contamination being present on this site and, as previous, there will be a requirement for remediation and subsequent validation works as discussed in the main Phase 2: Ground Investigation Report. The outstanding remediation works are briefly listed as follows: -

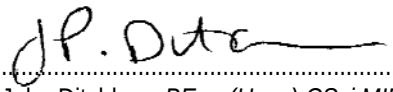
- Demolition of the remaining commercial buildings on the western portion of the site.
- Removal of the floor slabs with a 'watching brief' across the western portion of the site.
- If the UST's are to remain insitu, confirmation is needed that these have been 'made safe' / decommissioned.
- Excavation and removal of obvious contamination 'hot spots' (if present).
- Implementation of ground vapour protection measures, incorporating a hydrocarbon and volatile vapour resistant membrane.
- A DQRA may be required to confirm that the provision of a vapour resistant membrane will negate the risks associated with the presence of elevated volatiles. Reference should be made to BS8485:2015: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings and BRE 414: 2001 – Protective Measures for Housing on Gas Contaminated Land, for design details and specifications.
- Provision of a minimum 0.60m of clean cover in areas of soft landscaping and communal garden areas including a no-dig marker layer (i.e. 0.30m of basal compact stone or high visibility geotextile).

All remediation works should be validated by a suitably qualified and experienced Geo-Environmental Engineer to ensure all works are being completed in strict accordance with an agreed remediation strategy/statement, and once all the remediation works have been completed, the final Validation Report can be issued.

Re: Proposed Crane Base & Watching Brief - McCarthy & Stone Retirement Apartments, Roundel Kitchens, Harton Centre, 52 Harton Lane, South Shields, Tyne & Wear (Cont'd)

We trust the information we have provided to you is to your satisfaction and if you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely,
for and on behalf of Arc Environmental Limited



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John Ditchburn *BEng (Hons) CSci MIEnvSc FGS*
Associate Director

C.c. Donald Ives & William Bird - McCarthy & Stone Retirement Lifestyles Limited

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Foundation Plan

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Do Not Scale

Note: Trees to rear gardens of adjacent properties are advised as previously removed

READ WITH DRAWING 0461 FOR COLUMN SETTING OUT

Note: No new trees adjacent to the building perimeter

5.2m x 5.2m x 1.5m deep RC base for crane, JASO J190N crane (24m height, 40m jib) with ARA20 cast in anchors. Top of concrete level to be 14.000 max. Site ground level to be maintained at top of base level minimum during the works. Allow mass concrete if required under base to suit bearing strata.

E 437,026.224 m
N 564,822.298 m

E 437,029.822 m
N 564,818.543 m

E 437,022.470 m
N 564,818.700 m

E 437,026.067 m
N 564,814.946 m

Proposed planting

Outline of previous buildings on the site

BH01 1.4m of made ground

BH02 1.6m of made ground

BH03 0.8m of made ground

BH04 1.1m of made ground

BH05 1.2m of made ground

BH06

BH08 2.2m of made ground

BH09

BH10

BH12

BH-G

BH-H

BH-I

RBHA

RBHB

1700 deep pad base

Minimum 1700x 1700x 800 dp pad bases to columns (depth to suit founding strata level)

3000x3000x600 thk RC lift pit base TOC = 13.420

215 thk blockwork sleeper wall

Claymaster heave protection board

Tree influence zone, see drawing 150

Indicative site boundary

Approx outline of conjectured location of underground storage tanks. Made ground approx 1.7m below extg ground levels. Depths of adjacent foundations to step down to suit 45° line as noted for reservoir.

Approx outline of infilled reservoir on the site. Foundations to be taken down to suit level of natural stiff clay, varies approx 1.8 - 3.2m below existing ground levels. Refer to ARC Report dated 15-03-2017 for details.
Note: The depths of adjacent foundations to the infilled reservoir within influencing distance should be such that if a line was drawn at 45° downwards from the base of the foundation this should not intersect the adjacent made ground or pass below.
See Detail 4 on Drawing 0209

Top of concrete = 13.750
Except at Lift Pit

All columns to be bolted to top of foundations.

Legend - Pad Foundations

Type Mark	Type	Length	Width	Thickness	Count
A	1200x1200x500 deep	1200	1200	500	2
B	1400x1100x500 deep	1100	1400	500	1
C	1500x1500x700 deep	1500	1500	700	2
D	1700x1700x800 deep	1700	1700	800	2
E	1100x1100x500 deep	1100	1100	500	2
F	900x900x600 deep	900	900	600	1
G	1000x1000x1700 deep	1000	1000	1700	2
H	1000x1000x600 deep	1000	1000	600	5

Lintel Schedule - Drainage
External Walls - Lintels

Span (mm)	Manufacturer	Model
300	Naylor	P100 (100x70)
600	Naylor	S4 (100x100)
900	Naylor	S4 (100x100)

Lintel Schedule - Drainage
Load Bearing Walls - Lintels

Span (mm)	Manufacturer	Model
300	Naylor	S4 (100x100)
600	Naylor	R6 (100x150)
900	Naylor	R9 (100x215)

Legend - Foundations

All foundations to be 600mm wide unless noted otherwise, with base level 900mm minimum below existing ground levels.

All foundations to be minimum 350mm concrete depth unless noted otherwise. Foundations 1200mm wide and over to have 2 sheets A252 mesh reinforcement bottom.

All pad bases to be 900x900 square x 600 deep unless noted otherwise.

- Indicates foundation base level min 1300mm below GL
- Indicates foundation base level min 1700mm below GL
- Indicates foundation base level min 2100mm below GL
- Indicates 500 deep concrete pad bases
- Indicates 600 deep concrete pad bases & foundations
- Indicates 700 deep concrete pad base
- Indicates 800 deep concrete pad base

0 1 2 3 4 5 m
Scale 1:100

1 Foundation Plan GA
1 : 100

DESIGN REVIEW

Design review by:		Checked by:	

Residual hazards:

DRAWING NOTES

1. Read with General Notes on drawing 0002.
2. Borehole locations BH01 - BH12 inclusive and RBHA-RBHC are taken from ARC Environmental Ground Investigation Report Ref 16-136 dated 19-07-2016. Borehole locations BH-A to BH-J inclusive are taken from ARC Environmental supplementary ground investigation report by letter dated 15-03-2017 (read with Drawing 0210).
3. Foundations have been designed for a safe G.B.P. of **200** kN/m² onto natural stiff high strength clays found at depths ranging from approx 0.9m to 2.2m below existing ground level. Foundation base levels to be lower where noted due to tree influence. Foundation base levels also to be lower in areas of made ground to former reservoir and UST's, and to be taken down to suit level of the natural stiff high strength clay, up to 3.2m below existing ground level.
4. Site Investigation has shown soils to have low and moderate volume change potential.
5. For details of foundation material and concrete class refer to General Notes on drawing 002.

Date	Revision	By	Chkd	Rev
11.09.17	Posts and pad foundations omitted at grid F14. Crane base size shown	JDH	PW	E
14.06.17	Foundations repositioned at Grid 26 C' & D' to match arch'ts, notes added; Issued for Stage 05 / Construction	JDH	PW	D
02.05.17	Foundations updated to show influence of proposed planting, pads added & scheduled. Note re existing trees removed	JDH/ WRH	DD	C
24.03.17	Updated to architects plan for Stage 04 Issue	WRH	PW	B
09.02.17	Stage 03 - Preliminary	WRH	PW	A

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Project
Harton Lane, South Shields

Title
Foundation Plan GA

Client
McCarthy & Stone
Later Life. Greater Life

Scale @ A1	Drawn	Checked
As indicated	WRH	PW
Date	Status	Ref.
Feb 2017	Construction	06.16007

Drg. No. NE-2339-05-SE-0200 Rev. E