

Reinforced Concrete Beams - designed in accordance with BS8110

Beam size: 750 x 450 deep
 Concrete: $f_{cu} = 35$ N/mm² at 28 days
 Steel: $f_y = 500$ N/mm²
 Cover: 50 mm

Main bar size: 16 mm
 Link size: 10 mm

d: 382 mm

Design Beams for maximum span = 1.9 m
 Uniformly distributed load on beam, w = 41.0 kN/m

200095

Bending

Ultimate design moment of resistance of concrete section

$$M_u = 0.156 f_{cu} b d^2$$

$$M_u = 597.6 \text{ kNm}$$

$$M_u = \frac{w l^2}{8} \times 1.45$$

$$= \frac{41.0 \times 1.9^2 \times 1.45}{8}$$

$$M_u = 26.8 \text{ kNm}$$

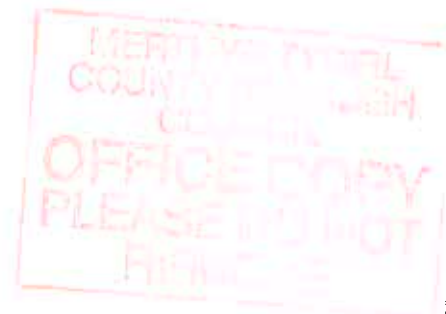
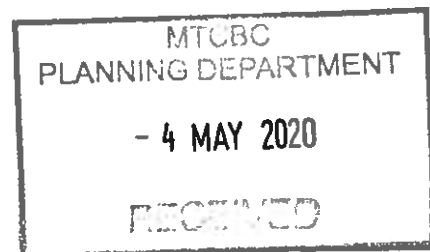
$$K = \frac{M}{b d^2 f_{cu}} \quad (K \leq 0.156)$$

$$= \frac{26.83 \times 10^6}{750 \times 382^2 \times 35}$$

$$= 0.007$$

$$z = d (0.5 + (0.25 - K/0.9)^{1/2})$$

$$= 379$$



TITLE 10 - 13 Hampton Street

$$A_s = \frac{M}{0.95 f_y z}$$

$$A_s = \frac{26.8 \times 10^6}{0.95 \times 500 \times 379}$$

$$A_s = 149.02 \text{ mm}^2$$

Therefore use 3 T 16 $A_s = 603.19$

Check minimum % reinforcement, $0.13\%bh = 439 \text{ mm}^2$

Check maximum % reinforcement, $4\%bh = 13500 \text{ mm}^2$

Shear

$$\text{Shear stress, } v = \frac{V}{bd} = \frac{41.0}{2} \times \frac{1.9 \times 10^3 \times 1.45}{750 \times 382}$$

$$v = 0.20 \text{ N/mm}^2$$

$$\text{Shear strength, } v_c = \frac{100A_s}{b_v d} = \frac{100 \times 603}{750 \times 382} = 0.21$$

Refer to table 3.9, using formula provided in Note 2 $0.79 (100A_s / (b_v d))^{1/3} (400/d)^{1/4} / \chi_m$
where $100A_s / bvd < 3$; $400/d > 1$

$$v_c = 0.38 \text{ N/mm}^2$$

For concrete greater than 25 N/mm^2 values of v_c can be multiplied by $(f_{cu}/25)^{1/3}$. F_{cu} should not be greater than 40

$$0.38 \times (35 / 25)^{1/3} = 0.43 \text{ N/mm}^2$$

From Table 3.8, if $0.5 v_c < v < (v_c + 0.4)$ Use minimum links, or
 $(v_c + 0.4) < v < 0.8 \text{ square root } f_{cu}$ Use designed links
or 5 N/mm^2

Use minimum links, T 10 then, $A_{sv} = 157 \text{ mm}^2$

$$\text{Link spacing, } s_v < \frac{0.95 f_y A_{sv}}{0.4 b_v}$$

$$\frac{0.95 \times 500 \times 157}{0.4 \times 750.00} < 248.7 \text{ mm}$$

Use T 10 links @ $250 \text{ } ^\circ l_c$

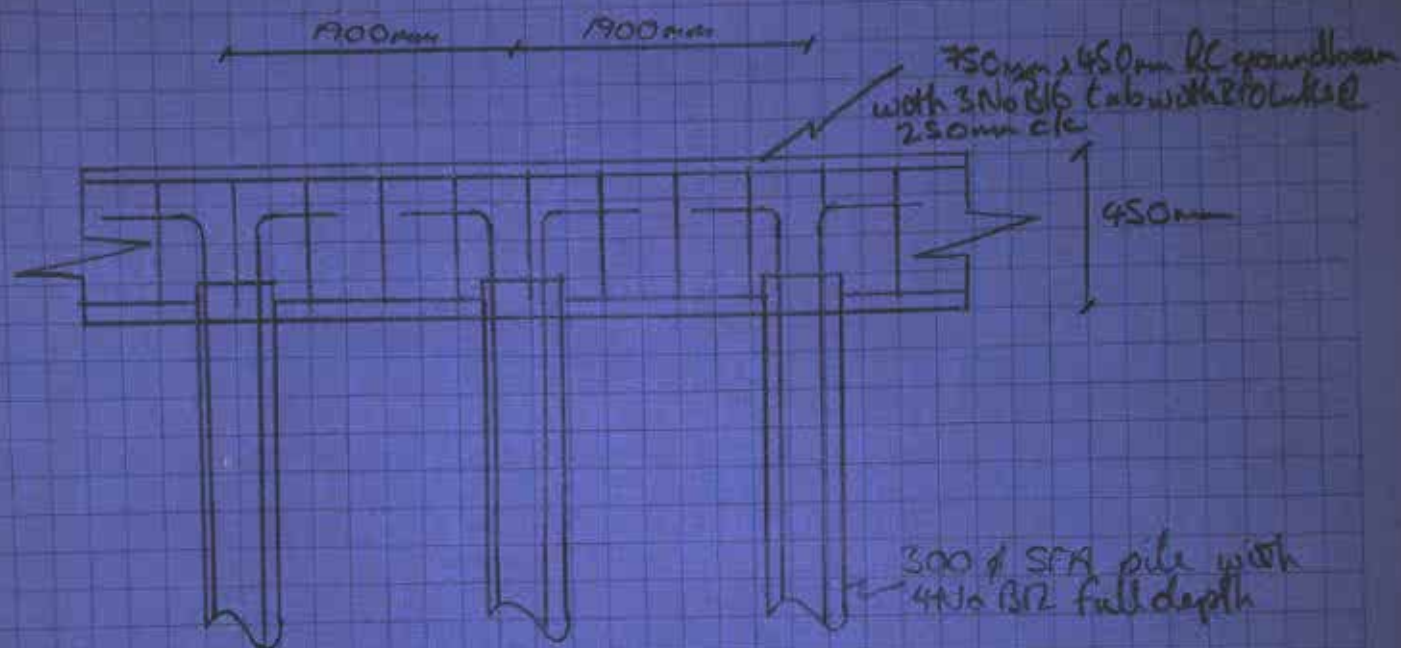
Check Max. Link spacing $< 0.75 d$

$$< 0.75 \times 382 = 287 \text{ mm} \quad \text{OK}$$

10-13 Hampton Street

SHEET 04

Section View



200095

PLANNING DEPARTMENT

4 MAY 2020

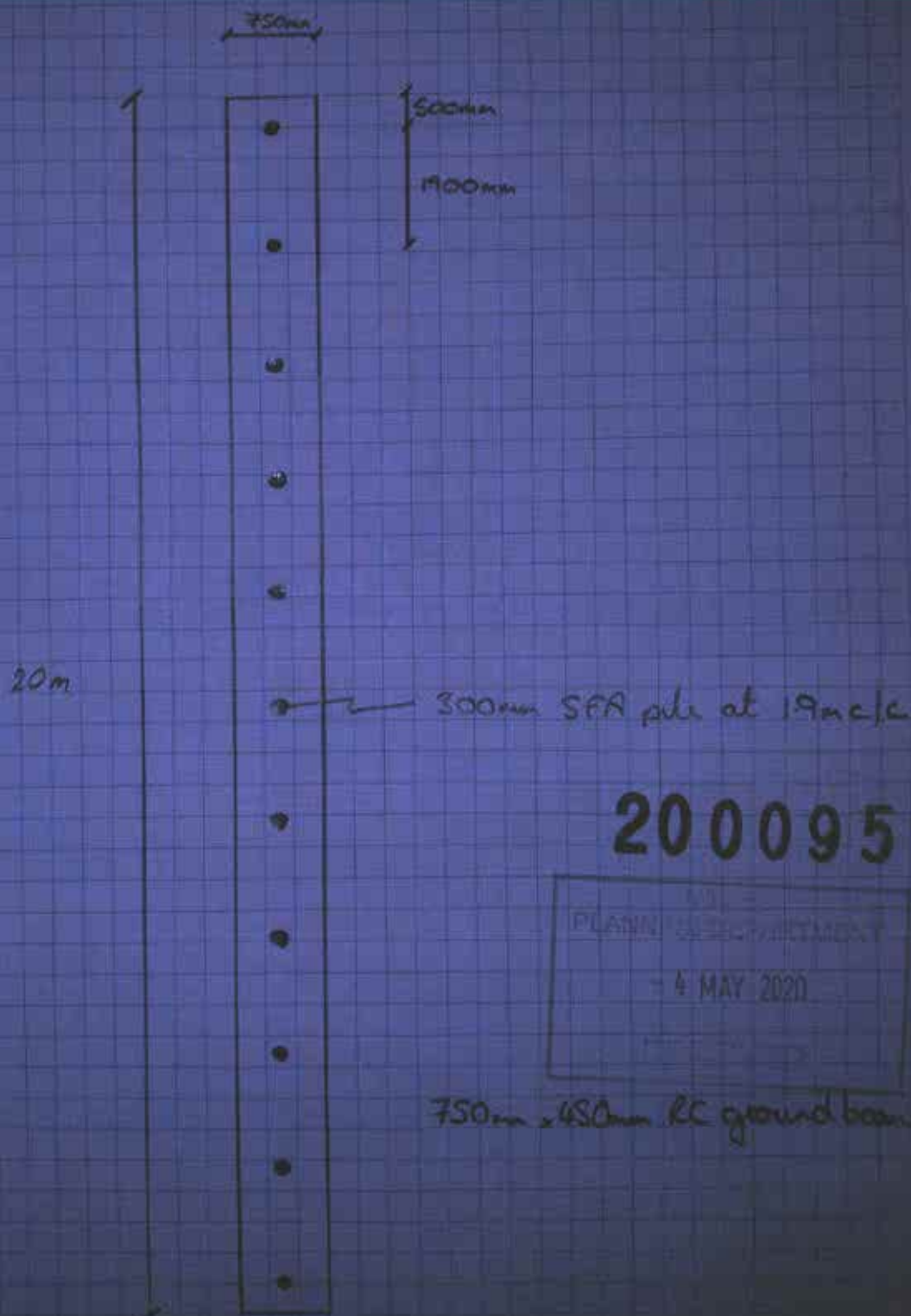
RECEIVED

10-13 Hampton Street

SHOTO3

Plan View

NTS



200095

10-13 Hampton Street, Muthy Tydfil

SH22302

Summary:

From the attached calculations provide the following:

- Piles to be 300mm diameter, installed to 5m depth with 4 No B12 bars full depth.
- Groundbeams to be 750mm wide x 450mm deep with 3 No B16 top & bottom and B10 links at 250mm centres.
- All concrete to be C35.

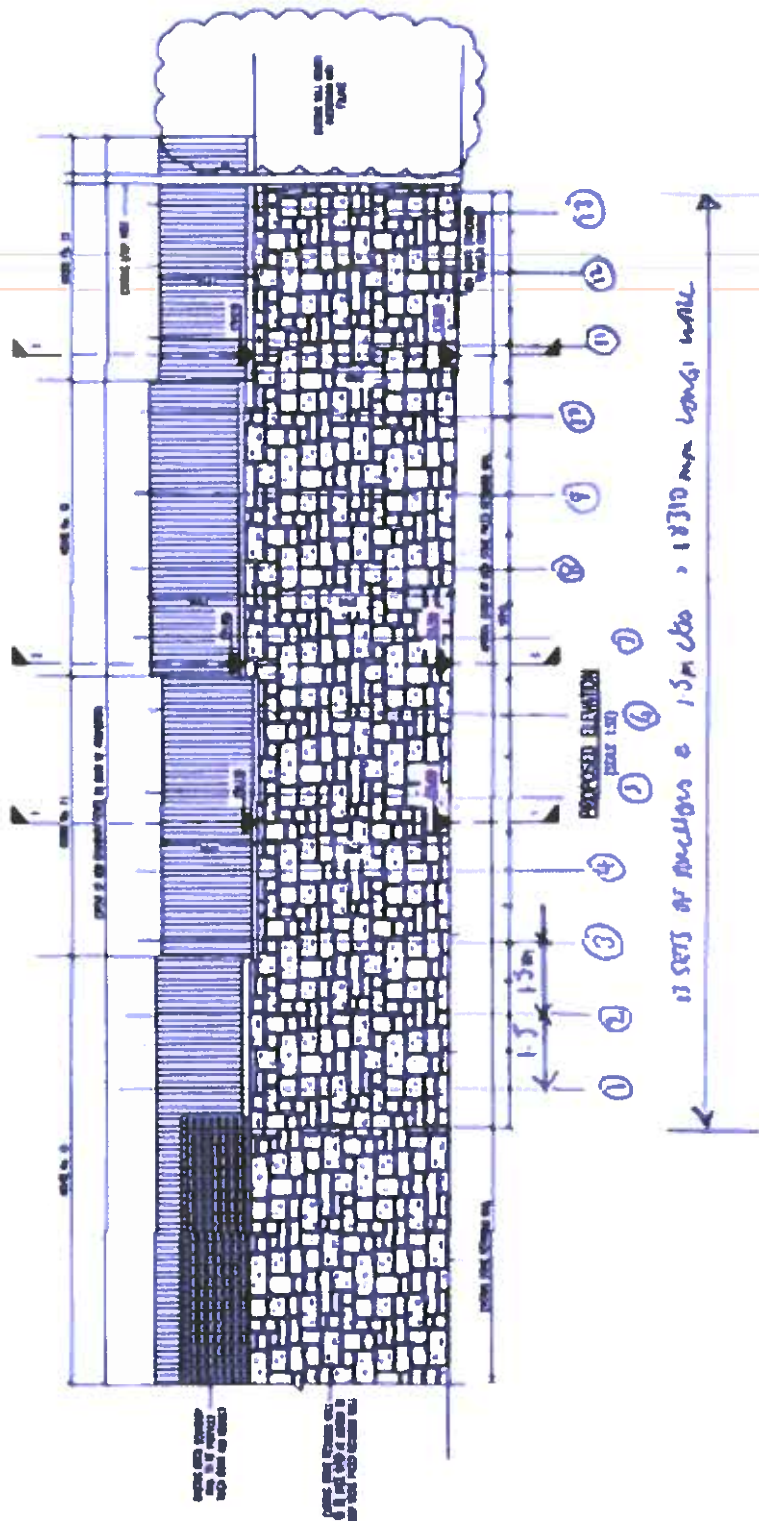
MERTHYR TYDFIL
COUNTY BOROUGH
COUNCIL
OFFICE COPY
PLEASE DO NOT
REMOVE

MT CBC
PLANNING DEPARTMENT
- 4 MAY 2020
RECEIVED

2009

- 4 MAY 2020

Figure 1. Schematic representation of the experimental design. The subjects were divided into two groups: the control group (n = 10) and the intervention group (n = 10). The control group received a standard diet and the intervention group received a diet supplemented with 100 mg of vitamin E per day. The subjects were followed up for 12 weeks. The primary outcome was the change in the concentration of C-reactive protein (CRP) in the blood. The secondary outcome was the change in the concentration of interleukin-6 (IL-6) in the blood.



- 4 MAY 2020

200095

10-13 Hampton Street, Merthyr Tydfil

SECRET

Introduction

Works are required to stabilise an existing slope and provide a replacement foundation for a garden wall at the above property.

Calculations

Pile Design

From the attached load sheet loading for the 3.5m high Hollowblock and stone faced wall is taken as 41 kN/m.

Piles to be spaced at 1.9m centres:-

$$Pile = (1.9/2 \times 41) + (1.9/2 \times 41) = 77.9 \text{ kN}$$

Therefore install pile for 78 kN (max)

Refer to attached static design sheet for pile length

From the attached static design sheet a pile length of 4m is required for 78 kN

NOTE: Due to presence of drain 25m B6c allow additional 1m to pile length for anchor into dense gravel.

∴ Pile length to be 5m.

- Allow pile cage of 4No B12 full depth for tying in purposes.

Beam Design

Refer to attached beam design sheet

MERTHYR TYDFIL
COUNTY BOROUGH
COUNCIL

OFFICE COPY
PLEASE RETURN



Optera Structural Solutions
The Barn, Oxburgh, Fosse Way
Stretton on Dunsmore
Warwickshire, CV23 9JF

Project:
10 - 13 Hampton Street

Calcs for:
Slope Stabilisation

Calcs by:
CT

Calcs date:
28/03/20

Checked by:
SW

Checked date:
29/03/20

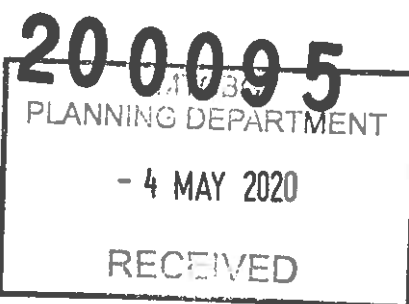
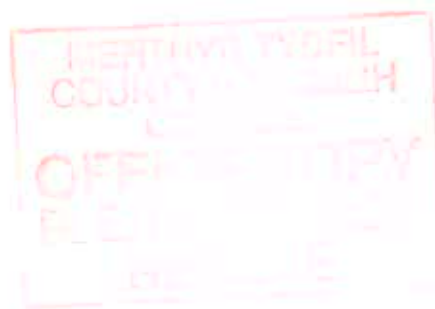
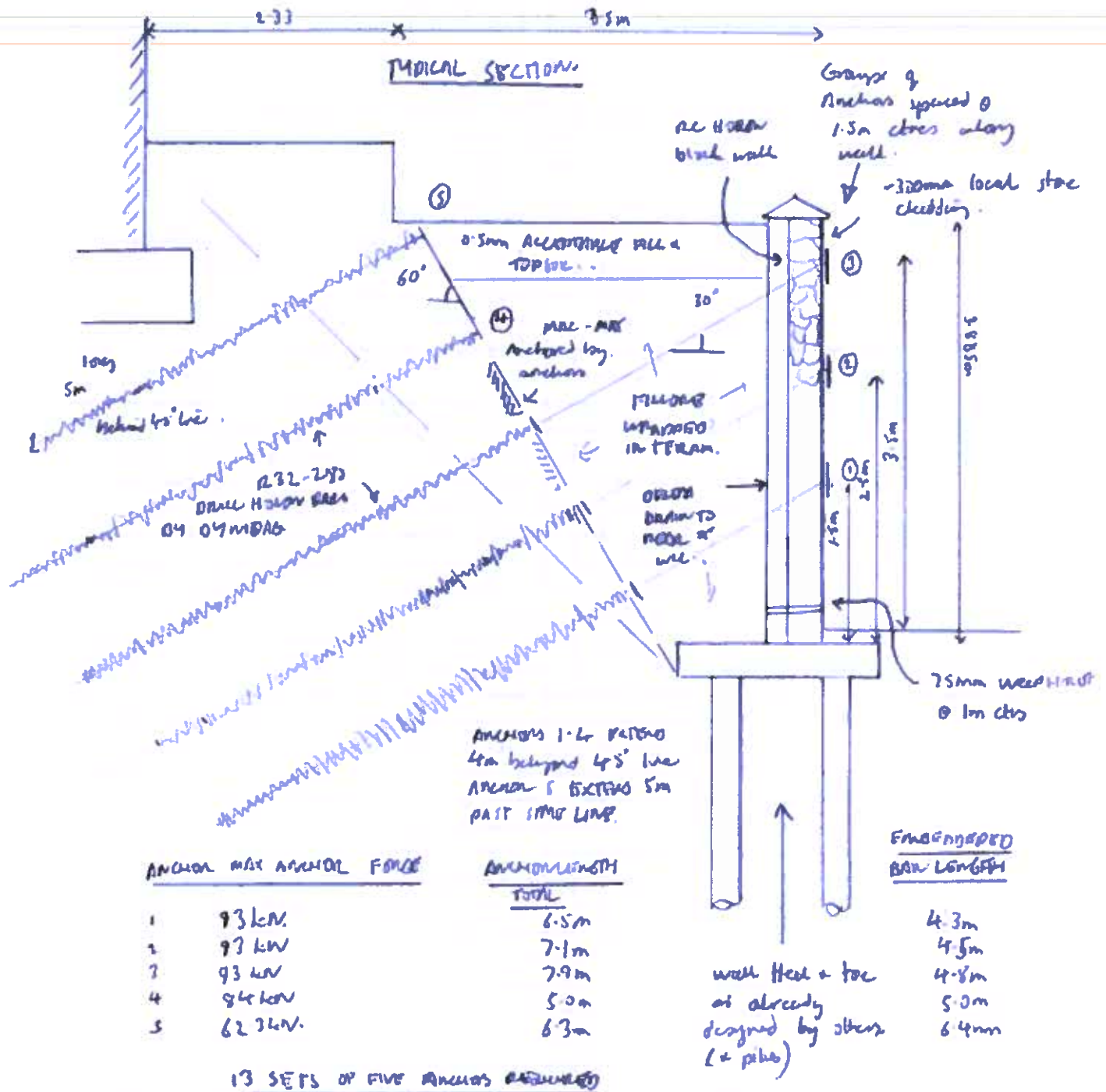
Job No:

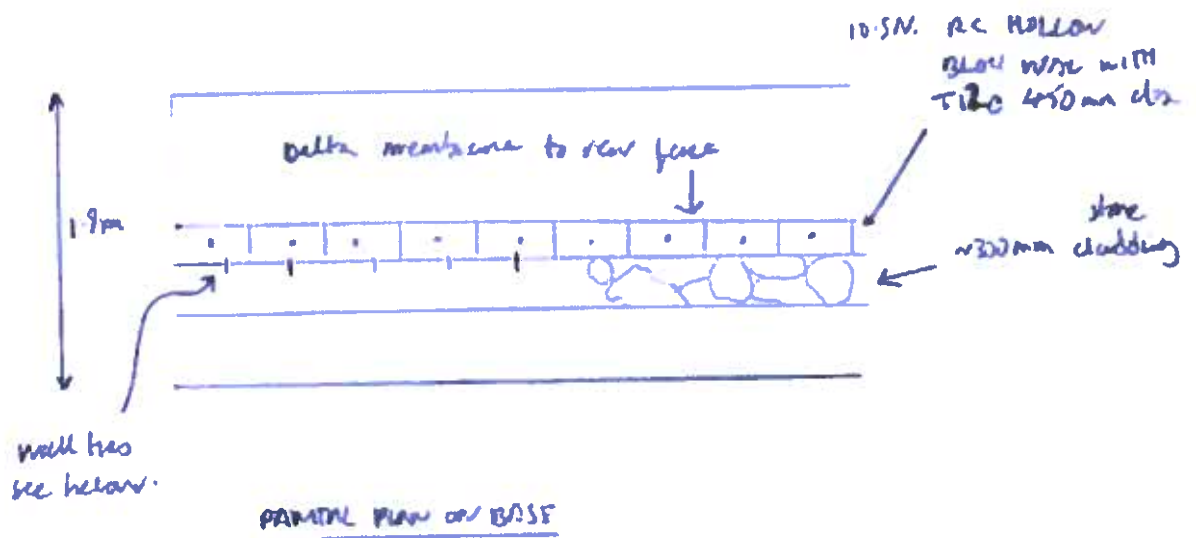
4322

Start page no./Revision
1

Approved by:
HH

Approved date:
01/04/20





Infill to blocks = 10mm AG x 30M in #12 @ 450mm

mortar to stone cladding & blocks - res (ii) mortar

- 1pt AC 42.5 (OPC)
- 1/2 pt lime
- 4 1/2 pt sand - type S

wall ties between wall & cladding : stainless wall ties 225mm long



200095

MERTON CYOHL
COUNTY ARCH
COUNCIL
OFFICE COPY
PLEASE DO NOT
REMOVE

PLANNING DEPARTMENT

- 4 MAY 2020

RECEIVED

