

Fast Calc Ltd

Structural Calculation and Details - FAST

Issued to
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GUY GOULD.
STEEL SUPPLIERS 92 267614

25 Park Road

Job Number 21174

Issue
04/03/2011



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FCL

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Scheme: Alterations at 25 Park Rd
Purbeck

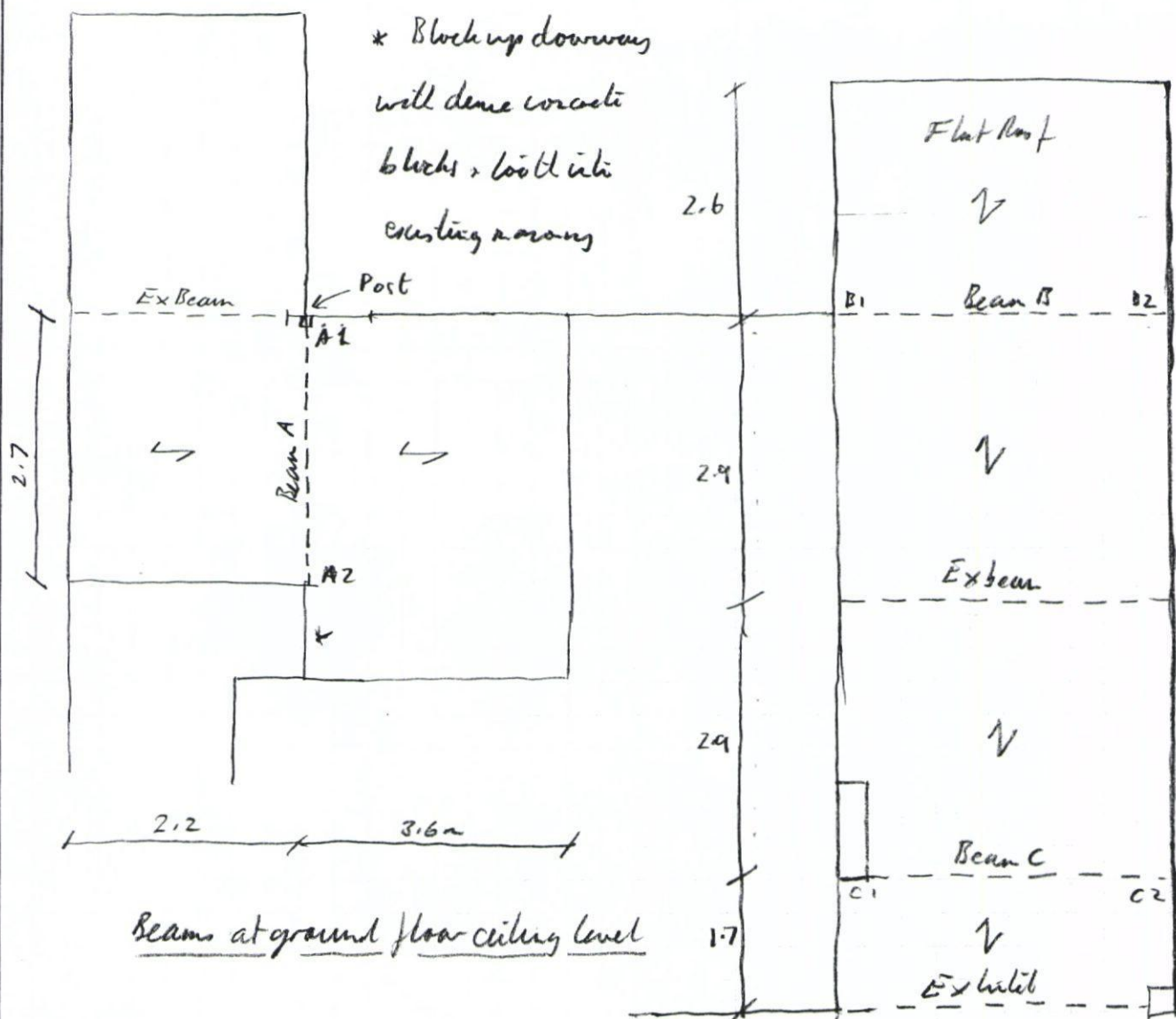
Title: Steel & Loading

Sheet: 1 Issue: 1

Job No: 21174

Date: 2/03/11

By: JM Ck:



Beams at ground floor ceiling level

Loads kN/m²

	DL	IL
Pitched Roof	1.0	0.6
Flat Roof	0.7	0.6
Floor	0.4	1.5
Masonry	2.7	



Where there is significant additional load on existing structural elements, including footings and existing lintels and beams, they should be exposed, inspected and assessed for adequacy of condition and load bearing capacity.

all Structural steelwork to be hot finish, minimum S275 unless otherwise stated.

FCL

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Scheme: *Alterations at 25 Park Rd
Purbebrook*

Title: *Details / Padstone*

Sheet: *3* Issue: *1*

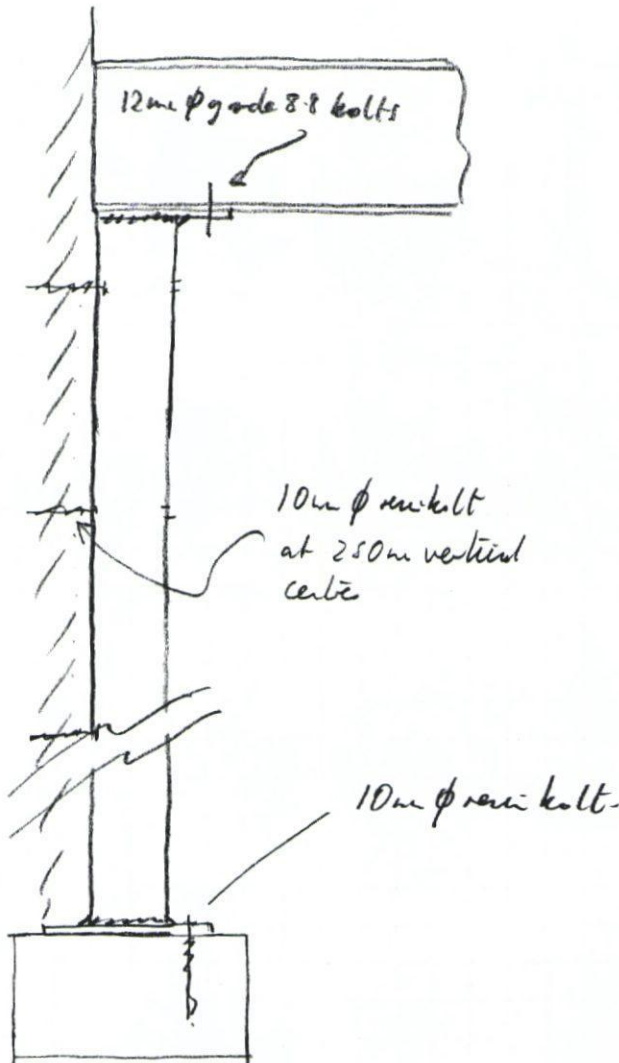
Job No: *21174*

Date:

By:

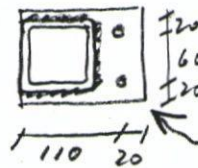
Ck:

Post A - Details - the 6m jettied wall.

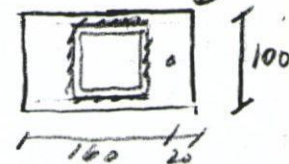


*80 x 80mm
x 3.6m*

Top Plate.



Base Plate.



6m m/s plate



Padstone.

A1 (Base of post) / A2 / B1 / B2 / C1 / C2

the 300 x 100 x 140 deep dense concrete padstone

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Scheme: Alteration at 25 Park Rd
Portsmouth

Title: Beam A / Beam B / Beam C

Sheet: 2 Issue: 1

Job No: 21174

Date:

By:

Ck:

Beam A span 2.7m

BEAMS TO BE BIT
LONGER!

Approx total load on beam

$$= 2.7 \left(5.8 \frac{1}{2} (0.4 + 1.5) + 2.5 \times 2.7 \times 0.2 \right) = \underline{33.6 \text{ kN}}$$

$$\text{Max BM} = 33.6 \times 2.7 / 8 = \underline{11.3 \text{ kNm}}$$

Use 178, 102 UB for Beam A span

UB UNI. BEAM.

$$S = \frac{5 \times 33.6 \times 10^3 \times 2700^3}{384 \times 2.05 \times 10^8 \times 1540 \times 10^8} = \underline{3.1 \text{ mm}}$$

$$M_s = 178 \times 171 / 103 = \underline{23.4 \text{ kNm}} \quad (> 11.3 \text{ kNm})$$

$$L_c = 1.2L + 2D = 324, \quad \lambda = 324 / 2.39 = 136, \quad u = 22.6, \quad P_b = \underline{137 \text{ N/mm}^2}$$

Beam B span 3.7m

Approx total load on beam

$$= 3.7 \left(2.6 \frac{1}{2} (0.7 + 0.6) + 2.9 \frac{1}{2} (0.4 + 1.5) + 2.9 \frac{1}{2} (1.0 + 0.6) + 0.3 \right) = \underline{26.1 \text{ kN}}$$

$$\text{Max BM} = 26.1 \times 3.7 / 8 = \underline{12.1 \text{ kNm}}$$

Use 152, 152, 300 C (300 L)

152 x 152 x 30 kg/m Rnd. (6 x 6)

$$S = \frac{5 \times 26.1 \times 10^3 \times 3700^3}{384 \times 2.05 \times 10^8 \times 1790 \times 10^8} = \underline{4.8 \text{ mm}}$$

$$M_b = 152 \times 287 / 103 = \underline{40.7 \text{ kNm}} \quad (> 12.1 \text{ kNm})$$

$$L_c = 1.2L + 2D = 474, \quad \lambda = 474 / 3.83 = 123, \quad u = 16.0, \quad P_b = \underline{165 \text{ N/mm}^2}$$

Beam C span 3.7m

$$\text{Approx total load on beam} = 3.7 \left(4.6 \frac{1}{2} (0.4 + 1.5) \times 0.2 \right) = \underline{16.9 \text{ kN}}$$

$$\text{Max BM} = 16.9 \times 3.7 / 8 = \underline{7.8 \text{ kNm}}$$

Use 152, 152, 23 UC for Beam C (230 L)

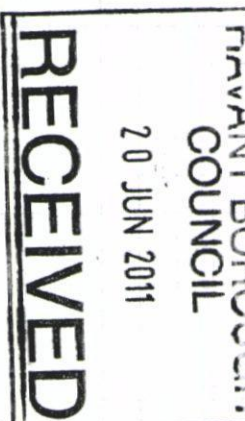
$$S = \frac{5 \times 16.9 \times 10^3 \times 3700^3}{384 \times 2.05 \times 10^8 \times 1260 \times 10^8} = \underline{4.3 \text{ mm}}$$

$$M_s = 147 \times 184 / 103 = \underline{27 \text{ kNm}} \quad (> 7.8 \text{ kNm})$$

$$L_c = 1.2L + 2D = 324, \quad \lambda = 324 / 3.18 = 129, \quad u = 20.9, \quad P_b = \underline{147 \text{ N/mm}^2}$$

Where there is significant additional load on existing structural elements, including footings and existing lintels and beams, they should be exposed, inspected and assessed for adequacy of condition and load bearing capacity.

all Structural steelwork to be hot finish, minimum S275 unless otherwise stated.



Health & Safety Guidance

Existing Services

All existing services to be located where appropriate using CAT and generator for all live services, and other equipment as necessary for all other services. This must be carried out prior to any works being commenced and certificates for "clean air" and survey completion documents must be issued by the authority/competent person carrying out the service. These documents must be kept in a file on site and available for inspection by the workforce or HSE should they wish to do so, copies of these documents should also be provided for any sub-contractor who will be working on the site and should be made aware of any potential hazard or risk involved in the task.

Overhead Services will be marked as required by GS6

The guidance on work near overhead cables can be found in the guidance note GS6

The main points are:

1. Plant or equipment should not approach within 15m of power lines measured in a horizontal distance from the line.
2. All overhead lines should be considered to be live unless testing proves otherwise.
3. Precautions (goal Posts) must be taken when access routes cross overhead cables.
4. Consideration must be given to the storage of materials under or near overhead lines that the material does not exceed the 15m exclusion distances.

Excavations & Confined Spaces

There is no minimum depth required for excavation support, the HSE have advised: Any excavation that has ground which could be unstable must be supported by an appropriate ground support system *i.e. trench or drag boxes and preparatory water systems* and installed in accordance with the manufacturers instructions. Deep excavations should be supported by temporary works systems which should be designed by a competent person from the appropriate equipment provider, the method statements and risk assessments must be provided by the designer in accordance with the Construction (design & management) regulations 1994. Installation of the equipment must be carried out or supervised by a competent person. Deep excavations can be considered as confined spaces and operatives working in these areas must be trained in confined spaces; safe access and egress and how to use BA escape sets and gas monitoring equipment.

Working at Height

Contractors are to ensure that Scaffolding is erected and maintained by recognised Scaffolding Company using trained scaffolders, toe boards, hand/guardrails etc must be provided. All lifting and access platforms must be operated by a suitably qualified person (MEWPS). Fall arrest systems *i.e. harness* must be provided and worn by persons working at height.

Steel Erection & Lifting

Provide adequate crane age/lifting jacks for positioning all steelwork. No operatives to stand beneath members being lifted, particular care to be taken when supporting steel on recently built walls. All lifts carried out by crane or jacking systems, must be carried out under the instruction and supervision of a qualified "Slinger, Signaller"

Control of Substances Hazardous to Health Regulations 1999

It is every employers duty to provide assessments under COSHH regulations for their employees, warning them of any dangers involved with substances which could be hazardous to the employee during the course of their work.

Under the construction (design & management) Regulations 1994, it is the client's duty to ensure that any information regarding hazardous substances *ie* ground contamination is contained in the "Pre Tender health & Safety Plan". Failure to do so may result in prosecution by the health & Safety Executive of the Client as failing to carry out their duties under the CDM Regulations 1994.

The contractor or Sub-Contractor will provide COSHH assessments for any hazardous materials to be used or encountered during the course of their works, this assessment should be backed up with the *Safety Data Sheet* which should be supplied by the manufacturer of the goods. The assessments should be included with the Methodology and associated Risk Assessments and given to the Principal Contractor for approval prior to works commencing.

Should any substances or hazardous materials be suspected during the normal course of the work, the operative Should stop work immediately and report it to his supervisor who must take appropriate action.



Scaffolding

1. All scaffolding and working platforms must be properly constructed in accordance with BS 5973, Tubes and fittings must comply with BS 1139 and boards must comply with BS 2482. Under the Health & Safety at work Act 1974 and the Management of Health & Safety at Work Regulations 1999 require that a safe place and method of work is provided and maintained, the following points under the Health Safety and welfare Regulation 1996 with regards to the safe use of scaffolds apply.

Edge protection will be provided. Wherever anyone could fall more than 2m the first line of defence is to provide adequate edge protection. It needs to meet minimum legal standards of, or be equivalent to:

- A main guard rail at least 910mm above the edge
- A toe board at least 150mm high
- An intermediate guard rail or other barrier so that there is no gap more than 470mm
- Nets should be provided where there is a danger of dust or debris falling from height onto operatives or the public.

2. Scaffolding should be erected, altered and dismantled by qualified Scaffolders only.

3. On completion of the scaffold erection a "Certificate of Completion" should be issued and the structure inspected by a competent person or representative of the Company.

4. Incomplete scaffold or structures undergoing design modification must display appropriate warning notices and NOT be used until all works completed.

5. All scaffolding should be inspected at least weekly by a competent person or at any time where ground or adverse weather conditions may have affected the integrity of the structure. An inspection record sheet should be completed and a copy of this report should be kept in a file maintained on site. Any defects must be notified to the scaffold company immediately by telephone and followed up in writing within 24 hours.

6. Safe access and egress must be provided at all times to each platform level in the form of a ladder which must be suitably positioned and secured with the appropriate "up-stand" for access to and from the ladder. Materials and tools must not be carried by operatives whilst climbing ladders.

All materials must be lifted to each platform by mechanical hoist, crane or fork lift under the Lifting Operations and Lifting Equipment Regulations 1999 (LOLER).

Demolition/Temporary Work

1. Full surveys of any building to be demolished and surrounding properties must be carried out and a report in writing *Preferably to include photographs* must be prepared.

2. Under the Construction (Design & management) Regulation 1994, ALL demolition work must comply with CDM Regulations and the HSE should be notified on Form F10 (rev) prior to the commencement of any works. The local Authority and Environmental offices should be notified also.

3. All Contractors should prepare methodology and Risk Assessments together with any relevant COSHH assessments to the Principal Contractor for approval prior to the commencement of any works. Where the Demolition Company is the PC the methodology etc should be submitted to the Planning Supervisor for approval by the Client prior to commencement of works on site.

4. All temporary works should be designed by a suitably qualified competent person or the Design should be completed by the Manufacturer/company supplying the equipment for the temporary works systems. The designer has Legal responsibilities under the Construction (Design & Management) Regulations 1994 and must ensure that at the design stage every effort has been made to reduce, avoid or eliminate any hazard which could cause possible risk to Health, Safety and Welfare of the workers and the public. The Designer must provide a method statement for the installation of the equipment together with the associated risk assessments to the Contractor carrying out the works.

5. Suitably trained operatives, qualified and licensed demolition companies will be employed to carry out demolition works and copies of certificates must be provided and kept on site for inspection at any time.

6. Under the Lifting Operations and Lifting Equipment Regulations all certification of lifting equipment and appliances must be inspected by the PC prior to use of equipment and copies kept on site for inspection at any time.

