

**Construction of single storey extension  
Unit 16 Cligga Industrial Estate  
Perranporth**

For

**Perranzabuloe Parish Council**

Building Regulations compliance, construction notes & general specification.  
To be read in conjunction with drawings 772 / 2,4 & 5 Engineer's calculation sheets and  
details.

Project: **Construction of single storey extension**

Clients: **Perranzabuloe Parish Council**

Technicians and Engineers: **M&A Associates & JSJ Design**

Contact: **07482 220235**

Architect: **M&A Associates**

### **Overview of the project**

The project is a single storey extension constructed in concrete blockwork built off a concrete strip foundation with concrete slab floor and timber roof structure.

The works have been approved by Cornwall Council planning department.

### **Drawings**

772 / 2, 4 & 5

### **Specification**

ATL/772

### **Structural calculations**

General structure by JSJ Design to follow

### **SAP, Airtightness test, EPC**

By ATT Southwest – to follow

### **Water usage calculation**

Not required

## 1. Roof construction.

Roof to be fibre cement slate on treated softwood battens on breather membrane on timber trusses supported by wall plates matched into existing roof structure all to Specialist Truss manufacturer's design. All trusses to be fixed down to wall plates. Strap wall plates down at 1500 crs over at least 2 courses of masonry. Install lateral restraint at verges at 1500 crs max over at least 2 fully blocked out trusses  
Insulate as indicated on drawings, fit vapour barrier and 12.5mm plasterboard under. Provide eaves ventilation ensuring ventilated space throughout roof. Gutters and downpipes to be PVCu, fascias to be PVCu, soffits to be PVCu.

## 2. Wall construction.

External walls generally:

Build off 600 x 225 deep concrete GEN3 strip foundations – depth agreed with Building Control on site inspection. Lay 300 trench block to underside slab level.

Walls to be 95 dense concrete block outer and inner leaf all in 7N/mm<sup>2</sup> strength with 110mm cavity. Install stainless steel wall ties at 450V and 600H crs and at every course around openings. Insulate as indicated on drawings. Interior finish 12.5mm plasterboard on adhesive dabs with skim finish for office areas and fair faced blockwork for workshop. Render externally with 2 coats waterproof sand/cement render. Ensure vertical dpc's and isolation cuts are made together with remedial wall ties as indicated on drawing.  
 $U=0.25W/m^2K$

Internal walls:

38 x 89 CLS studwork at 400 crs on double sole and head plates with mid height noggins securely fixed to structure. Fit double studs at external wall abutments and fix with resin anchors. Fit double studs at all doorways. Install Rockwool acoustic insulation and line with 10kg/m<sup>2</sup> (min) plasterboard with skim finish.

## 3. Floor construction

Ground floor – office area

22mm particle board on 120 thick RR insulation on 150 thick concrete slab designed by Structural Engineer. Install DPM/radon barrier. Vent radon sumps to external atmosphere.  
 $U=0.14W/m^2K$

Ground floor - workshop

150 thick concrete slab designed by Structural Engineer on 50mm nominal insulation (unheated space). Install DPM/radon barrier.

## 4. Windows & doors generally.

All glazed units to be 25mm "Low E" argon filled soft coated double glazing with minimum opening sections in accordance with "Ventilation". Internal doors to have a minimum clear opening of 750mm. All glazing below 800mm above floor level to be safety glazing in accordance with BS6206. Any full height glazing to display manifestation in accordance with K5 of the Building Regulations. All frames to be factory fitted with trickle ventilation.

All door and side panel glazing below 1500mm above floor level to be safety glazing in accordance with BS6206. All frames to be PVCu. All fittings and operating mechanisms to be stainless steel. All bedroom windows to be escape type. All doors, windows, locks and mechanisms to be designed in accordance with "Secure by Design" criteria to accord with Part Q of the Building Regulations.

## 5. Protection against Radon.

Radon barrier to be installed as indicated on drawing.

## 6. Ventilation generally.

Kitchens / utility / bathrooms – in addition to any openable windows, Kitchen to be provided with a fan capable of extracting 30l/s, bathroom 15l/sec. All new window frames to have trickle vents fitted to allow background ventilation. Aggregate office area window openings to be 10% of floor space.

## 7. Smoke alarms / fire.

Mains operated heat detector to be installed as shown on drawings. Fire alarm and emergency lighting system, exit signs etc to be installed in accordance with BS 5839-1. Surface linings to all internal areas to achieve Class "O" surface spread of flame.

## 8. Switches and socket outlets.

To enable disabled people to operate them, all electrical switches, sockets, doorbells, tv sockets, telephone jack points, heating controls etc. to be positioned at between 450 and 1200mm above floor level.

## 9. Access.

All walkways and access ways around building to be no steeper than 1:12 over 2.0 metres or 1:20 over 10.0 metres with a maximum rise of 500mm unless stepped in accordance with the Ambulant Disabled access criteria of the Building Regulations (part K).

## 10. Water and space heating.

Heating and domestic hot water by means of extension to existing system. System to be thermostatically controlled.

## 11. Drainage – generally.

Surface water :

Gutters and downpipes to be PVC

Downpipes from gutters to gullies to new soakaway via 100 dia pvc pipework.

Foul water :

Above ground :

All above ground pipework to be upvc. Wash hand basins to be fitted with 32mm min. dia. waste pipes and kitchen sinks, baths, showers etc. to be fitted with 40mm min. dia. waste pipes, all with 75mm deep seal traps and all discharging to internal 110 dia. stacks. Where distance from appliance to stack exceeds 1.7m for 32mm dia. pipe and 3 metres for 40mm dia. pipes, anti siphon devices must be employed. All traps to be accessible for cleaning purposes and all pipes to be fitted with rodding eyes at changes of direction. Vent pipes to terminate at least 900mm above any opening into the building within a horizontal distance of 3 metres of the vent. Stub stacks to discharge into ventilated stack positioned in accordance with part H of the Building Regulations, see also drainage on drawing.

Below ground :

Connecting to existing foul drain.

All new underground pipework to be 110 dia. flexibly jointed uPVC. Pipes to be bedded and surrounded in 150mm granular material conforming to BS882 table 4. Where pipes in areas accessible to vehicles have less than 1200mm cover they are to be protected by a reinforced concrete slab laid above the 150mm granular material and designed to span the trench. Where pipes pass through or under walls, relieving pre-stressed concrete lintels are to be provided over and positioned so as to allow a 150mm bed and surround to the pipes.

Inspection chambers: All new inspection chambers to be of the following type.

Type 1: Purpose made polypropylene or similar approved chamber placed on pipe bedding material and surrounded at head with 200mm min GEN3 concrete plinth for frame constructed in accordance with the manufacturer's instructions where necessary. Fit heavy duty covers.

## 12. Thermal compliance.

1. SAP rating / Energy Performance Certificate and airtightness test required.
2. Builder to certify insulation continuity, accredited detail conformity and commissioning of any hot water and heating system.

## 13. Electrical.

All external electrical fittings to be IP56 minimum standard. Electrical installation, alarms etc. to be tested and certified by a suitably qualified electrician in accordance with part P of the Building Regulations. All light fittings to be low energy type.

## 14. Communications.

n/a

## 15. Materials and workmanship

### CONTENTS

1. EXCAVATION
2. CONCRETE, IN-SITU AND PRE-CAST
3. MASONRY
4. STRUCTURAL TIMBER
5. DRAINAGE

### 1. EXCAVATION.

#### E1 Excavation of foundation pits and trenches.

E1.1 The side of all pits, trenches and other vertical faces shall be adequately supported at all times

E1.2 Trenches and pits shall be kept free of water in accordance with clause E3

E1.3 The bottom of all excavations shall be levelled or graded carefully as shown on the drawings.

E1.4 All excavated materials from such excavations not required for refilling shall be disposed of off site or as directed by the Client.

E1.5 The contractor shall, at his own expense, make good with GEN3 concrete :-

(i) Any excavation work greater than the net volume required for the works as described in the drawings.

(ii) Any additional excavation at or below the bottom of foundations to remove material which the contractor allows to become unsuitable.

#### E2 Backfilling of foundations, pits and trenches and removal of supports

Unless otherwise shown on the drawings or directed by the Engineer, all filling for this purpose shall consist of suitable graded granular material to Department of Transport Specification Clause 803 and compacted by approved plant in layers not exceeding 100mm. Timber sheeting and other excavation supports shall be removed as the filling proceeds. The removal of such supports will not relieve the Contractor of his responsibilities for the stability of the works during construction.

#### E3 Earthworks to be kept free of water.

- E3.1 The Contractor shall arrange for rapid dispersal of water shed on the area of the works during construction, or which enters the works from any source
- E3.2 The Contractor shall provide where necessary temporary watercourses, ditches, drains, pumping or other means of maintaining the works and foundations free from water.

## 2. CONCRETE, IN-SITU AND PRE-CAST

### C1. General

- C1.1 All concrete work, including preparation and storage of materials, shall be in accordance with BS 8110. Concrete shall be produced, transported and assessed for compliance with the specification in accordance with the relevant provisions of BS5328 parts 3&4.
- C1.2 Concrete shall not be mixed when the air temperature in the shade is below 3 degrees C. No frozen materials or materials containing ice shall be used.

### C2 . Concrete Mix Design

Concrete mix design shall be in accordance with BS5328 Parts 1 & 2, 1991. All mixes shall be DESIGNATED mixes, the mix allocated by the Engineer depending on location within the works. The following mixes are applicable :- RC35, GEN3, 1:2:2 site batched.

### C3 Transport and Placing

- C3.1 Concrete shall be so transported and placed that contamination, segregation or loss of the constituent materials does not occur.
- C3.2 All formwork and reinforcement contained in it shall be clean and free of standing water, snow or ice immediately before placing concrete.
- C3.3 Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against in situ concrete which has been in position for more than 30 minutes unless a construction joint is formed in accordance with the clause C5.
- C3.4 Concrete shall be compacted in its final position not later than 2 hours after the addition of cement to the mix (when contained in purpose built agitators operating continuously) and within 30 minutes of discharge from the agitator.
- C3.5 Except where otherwise agreed with the Engineer, concrete shall not be dropped into place from a height exceeding 2 metres. Where used, trunking and chutes shall be kept clean and used in such a way as to avoid segregation.

### C4. Compaction of Concrete

All concrete is to be fully compacted and worked well against the formwork and around all reinforcement and fittings until it forms a solid homogeneous mass free from voids. Compaction shall be attained using approved immersion type vibrators maintained to the efficiency of the manufacturer's recommendation.

## C5 Construction joints

C5.1 The position and detail of any construction joints not described in the specification and drawings shall be subject to the approval of the engineer, and shall be so arranged as to minimise the possibility of the occurrence of shrinkage cracks. Horizontal construction joints in slabs will not be permitted.

## C6 Curing of Concrete

Methods of curing concrete shall be agreed with the Engineer. Curing methods should be implemented immediately after compaction and for 7 days thereafter to protect the concrete against the harmful effects of the weather, including rain, rapid temperature changes, frost and from drying out.

## C7 Finishing concrete – upper surfaces

Screeded finish – the concrete shall be levelled and screeded to produce a uniform, plain surface as required.

Power float – workshop floor to be power floated to a flat smooth finish

## 3 MASONRY

### M1. General.

M1.1 The materials, components and workmanship used in the construction of all walls shall comply with the recommendations of BS 5390 & 5628 part 3. Concrete and hollow concrete blocks shall comply with the requirements of BS 6073 Parts 1 & 2. Care shall be taken to protect all blockwork units from saturation from rain or any other source, both before and after incorporation in the works, as this will have a significant effect upon shrinkage during the early life of the structure.

M1.2 Blocks shall be built up uniformly, with corners and other advanced work raked back and not raised above the general level more than 1 metre. Courses shall be kept horizontal and matching perpend shall be in vertical alignment.

M1.3 The maximum height of blockwork to be built in one day is 1.2 metres.

### M2. Cold weather working.

No masonry shall be laid when the air temperature in the shade is below 3 deg C

### M3. Protection of new work.

Immediately after laying and for three days thereafter masonry shall be protected against the harmful effects of the weather.

### M5. Wall ties and other metalwork



Unless otherwise described in the drawings wall ties shall comply with the requirements of BS 1243 and shall be of stainless steel loop type safety ties. Wall ties shall be fitted in every course at a max. distance of 200mm at all opening reveals.

Spacing and arrangement of ties to be as follows :-

(i) Generally at 600 centres horizontally and 450 centres vertically.

M6. Plasticisers

Plasticisers shall comply with requirements of BS 4887 and shall only be used with the permission of the Engineer. If plasticisers are used it is important to ensure that the manufacturer's instructions about quantity and mixing time are carefully followed.

M7. Mortar mixes.

M7.1 Mortar mixes are to be 1 : 4.5 (masonry cement : sand ) for bedding and pointing of blockwork and brickwork.

M7.2 Materials for mortar shall be as follows :

(i) The cement for mortar shall be to BS 12

(ii) Sand for mortar shall be to BS 1200

(iii) Water shall be obtained from normal mains supplies or other sources as approved by the Engineer.

(iv) Admixtures may be used subject to approval by the Engineer.

M7.3 Each batch of mortar is to be mixed using a suitable mechanical mixer and used within two hours of mixing. Mortars other than coloured mortars may be re-tempered during the two hour period. All constituent materials are to be measured to the specified mix proportions by weight or gauge boxes.

M8. Materials.

M8.1 Concrete blocks shall comply with the requirements of BS 6073 part 1. All solid blocks are to have a minimum compressive strength of 7.0 N/mm<sup>2</sup> and hollow blocks 10 N/mm<sup>2</sup>. (Unless otherwise noted).

M8.2 Engineering bricks shall comply with BS 3921 and shall be class B category solid type.

M9. Workmanship.

M9.1 All masonry shall be set out and built to the respective dimensions, thickness and height indicated on the drawings.

M9.2 All work shall be plumb and levelled as work proceeds. Unless otherwise instructed all work shall be laid in stretcher bond, half lap and where possible the coursing shall be arranged to allow a full block to be positioned below a lintel. All cavities, hollow block cores and wall ties are to be kept clean and any extruding mortar struck off flush.

M9.3 All masonry units are to be laid on a full bed of mortar and all perpendicular joints are to be filled with mortar and properly flushed up. Joints to be nominally 10mm thick.

## 4. STRUCTURAL TIMBER

### ST1 General

All timber for structural purposes to comprise European whitewood or redwood (unless otherwise stated or as shown on drawings) stress graded and marked to BS4978 and dried to 22% moisture content or less.

All timber is to be C24 grade or better unless noted otherwise and is to be used strictly in accordance with BS 5268.

### ST2 Prefabricated Timber

Standard trusses shall be manufactured stored and erected in accordance with BS 5268, Part 3 and the manufacturer's recommendations.

### ST3 Setting Out and Dimensions

All dimensions and setting out of timber is the responsibility of the contractor who shall undertake all necessary site measurements and surveys for this purpose.

### ST4 Joints

ST4.1 Bolted joints shall have bolt holes drilled to diameters as close as possible to the nominal diameter of the bolt. Care shall be taken to avoid placing a bolt in any end with a split. A minimum of one complete thread should protrude from the nut. Wide flange washers shall be fitted under the head of each bolt and under each nut.

ST4.2 On completion of erection all joints shall be inspected and care taken to ensure that all bolted joints are tightened without crushing the wood.

ST4.3 Nailed joints shall be formed by driving into pre-bored holes of diameter not greater than 0.8 of the diameter of the nails. Care should be taken to avoid placing nails in any end split.  
Nails shall be as specified on the drawings or Detail sheets but for general use should not be less than 2.6mm diameter and of a length appropriate for the use intended. Nails should be spaced in accordance with BS 5268.

ST4.4 Patent joist hangers and steel straps should only be used where shown on the drawings. They are to be formed in galvanised mild steel of minimum 3mm thickness. All fixings should be used strictly in accordance with the manufacturer's instructions and nails are to be provided in all the available pre-drilled holes.

## 5. DRAINAGE

### P1 Pipes

#### P1.1 PVC Pipes

PVC pipes shall be 110 dia. by Hepworth or similar approved with flexible mechanical joints. Fittings shall be obtained from the same source as the straight pipes.

## P2. Granular Bed and Surround

All pipes will normally be laid on a 150mm thick full bed and surround of granular material.

## P3. Pipelaying.

Flexible jointed pipes.

P3.1 Following the laying, jointing and testing of the pipeline, the pipe shall normally be surrounded with granular pipe bedding material carefully compacted to a depth of 150mm over the crown of the pipe and the trench backfilled with selected material as specified.

P3.2 Where it is deemed necessary, a concrete arch protection to the pipeline will be provided. This shall be carried out in the following manner. The pipeline will be laid and tested on the prepared granular bed as before. The granular materials will then be taken up both sides of the pipe to half the pipe diameter and surmounted by GEN3 concrete taken the full width of the trench and to a depth of 150mm above the crown of the pipe. A gap shall be made in the concrete at each pipe joint, this being formed by the use of "Flexcell" or similar approved material, 12mm thick for pipes up to and including 375mm diameter and 18mm thick for pipes greater than 375mm diameter. Backfilling shall then be carried out as before, but not within 24 hours of the placing of the concrete.

P3.3 Trench widths for pipelaying shall be as detailed below, and shall be strictly adhered to:-

Internal Dia of Pipe (mm)	Width of Trench (mm)		
	Minimum	Nominal	Maximum
100	450	550	600

## P4 Pipe Bedding Materials.

Granular bedding and surround for flexible jointed pipes shall consist of free-draining, hard, clean, chemically stable gravel or crushed stone, be completely free of all vegetable matter, and meet the requirements of BS 882.

Bedding material shall have a Compaction Fraction value not exceeding 0.2.

## P5. Backfill Material.

Selected material for backfilling of trenches shall consist of uniform readily compactable material free from tree roots, vegetable matter, building rubbish and frozen soil, and excluding large stones and clay lumps retained on a 75mm sieve. Where pipes pass beneath floor slabs and foundations all backfill shall be MoT spec 803 compacted in accordance with clause E2.1

## P6. Unsuitable Material

Material excavated from trenches and not suitable for re-use as backfill material shall be removed from the site.

#### P7. Testing Of Drains.

Drains shall be tested after they are jointed and before any concreting or backfilling is commenced. A further test shall be carried out on the completion of the backfilling.

#### P8. Reinstatement.

Backfilling to pipe trenches above the level of the granular material or concrete as the case may be, shall be carried out with material previously specified, in layers not exceeding 150mm in thickness. The use of any mechanical means of compaction will not be permitted within 400mm of the crown of the pipe.