

Engineering Specifications

for

Proposed Alterations to Potting Shed Shared Island

at

**Tyrone Guthrie Centre, Mullaghmore,
Newbliss, Co Monaghan**

for

Board of Trustees at Tyrone Guthrie

July 2026



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Specifications

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DESCRIPTION OF MATERIALS AND WORKMANSHIP
EXCAVATION AND EARTHWORKS

DEFINITION OF EXCAVATED MATERIALS

Rock: Solid material encountered in excavations which because of its size or position can be removed only by means of wedges, compressed air, other special plant.

Topsoil: Soil capable of supporting vegetable growth.

NATURE OF EXCAVATION

The contractor shall visit the site, inspect the location of the proposed works and decide for himself the nature of the ground and sub soil to be excavated.

REMOVAL OF VEGETATION

The contractor shall visit the site, inspect the location of the proposed works and include for the removal of all trees, hedgerows and all other growth and vegetation over the area of the proposed works. Include for the grubbing up of all roots and backfilling to engineers specification.

OVERSITE EXCAVATION

Excavate over the areas of the new buildings, paths and driveways and all other works to a depth of min. depth of 300mm approx. or as indicated on the drawings and run topsoil to separate spoil heaps adjacent to the works as directed. All top soil must be saved for spreading over areas to be decided by the Engineer/Client unless directed otherwise. The surface excavation shall be taken down to the level necessary to ensure that the all vegetable matter is removed.

GENERAL EXCAVATION

All excavation shall be made to the depths and dimensions shown on the drawings or as the engineer may direct. The contractor shall include for reasonable care while excavating for foundations, in particular, at those points adjacent to neighbouring structures. The contractor shall not be allowed any variation in respect to excavations to be carried out by hand. Should the dimensions of any excavation exceed those shown on the drawings or ordered by the engineer, the contractor shall at his own expense fill such extra space with foundation concrete as hereafter described. The engineer on site must confirm the level of all excavations.

BLASTING

Blasting will not be allowed without written permission from the engineer, who must be fully informed by the contractor as to steps taken to safeguard the surrounding property and the contractor, must take all responsibility.

PLANKING AND STRUTTING

The contractor shall take all necessary precautions to ensure the stability of the sides of the excavations. The contractor shall take all risks of collapse and shall pay for any extra excavations beyond the net sizes necessary and for subsequent returning, filling and ramming in concrete to a foundation mix if the engineer so decides.

EXCAVATIONS FREE FROM WATER

The excavations shall be kept free from general water at all times and all mud and slurry shall be removed to present a fully undisturbed dry surface to base concrete. The position of sumps and manner of pumping shall be subject to the approval of the engineer.

INSPECTION OF TRENCHES

The contractor shall notify the engineer as soon as the trenches are excavated and no concrete is to be poured until he has examined the trenches and approved same.

CART AWAY

All surplus spoil shall be carted off site to a tip provided by the contractor who shall pay all charges in connection therewith. Disposal of surplus materials and waste must comply with the Waste Management Act 1996 and current regulations and collection shall be carried out by those with a valid waste collection permit and waste shall be disposed off to a permitted facility.

OBSTRUCTION

Any obstruction at or below formation level shall be reported to the engineer and shall be dealt with as directed by him.

FORMATION TO STRIP FOUNDATIONS ETC.

To minimise moisture softening the formation shall be exposed for as short a time as possible. The last 50mm of excavation shall not be taken out until concreting is almost ready to start.

The formation shall be lightly rammed. Before any concrete is placed, the contractor shall call on the engineer or his representatives to inspect the formation.

PUMPING

The contractor shall provide all equipment and other works necessary to keep the excavation free of water and to prevent the direct access of water to the formation.

Excavation shall be so arranged that any water entering the cut is immediately drained away to a sump or other point from which it can be pumped or otherwise disposed off. Before any pumping takes place, the approval of the engineer shall be sought, but this approval will not absolve the contractor from his responsibilities for the safety of the works. If the contractor pumps or otherwise puts water into a drain, stream, sewer or the like, he shall be responsible for seeking all permission and from removing from the system all deposits caused thereby.

HARDCORE

A min 300mm layer (or as indicated on the drawings) of granular material of broken stone to pass a 75mm ring consolidated to the satisfaction of the engineer shall be placed below all ground floor slabs, on top of which a layer of an approved fine sand blinding shall be placed and consolidated to his satisfaction. A radon barrier shall be placed and sealed below the ground floor slab and floor insulations as shown on the drawings.

The attention of the contractor is drawn in particular to the requirement to ensure conformity of hardcore with I.S.EN 13242:2002 and meet the specification as outlined in Annex E of the accompanying guidance document to this standard, SR21: 2004+A1: 2007. The layer of hardcore should be well compacted, clean and free from matter liable to cause damage to the concrete. Specific guidance is given in 3.4.2 of SR21: 2004+A1: 2007 on limiting the presence of a reactive form of pyrite which may give rise to swelling or sulfate attack on concrete. A blinding layer should be provided in accordance with the specification given in Annex E of SR21: 2004+A1: 2007, for fines material. The blinding layer should be of adequate depth to fill surface voids thus creating an even surface and avoiding sharp projections, which may damage radon or damp-proof membranes.

FILLING

Where additional bulk filling is to be provided below ground floor slabs of building, all vegetable soil shall be removed. Filling is to be applied only when the formation level is free of mud and slurry, the formation level shall be left exposed for a short a time as possible after removing the vegetable soil. The formation level shall be lightly rammed and generally levelled before filling commences. Filling shall consist of hard dry material as above. The filling shall be deposited in layers not exceeding 150mm when compacted and shall be at a moisture content of not exceeding 5%. Each layer shall be compacted to the satisfaction of the engineer with approved mechanical equipment. Loose rock or broken solid rock of suitable size may be used for filling under floors with the engineer's approval.

TESTING

Every facility shall be provided to enable the engineer to obtain samples and carry out tests on the materials of construction. If these tests show that any of the materials of construction do not apply with the requirements of this specification, the contractor will be responsible for the costs of the tests and the replacement of the defective materials and/or construction.

RADON SUMPS

Radon sumps where provided shall have an Irish agreement certificate or equivalent. They shall be located as shown on the drawings. Excavate locally to allow for 100mm hardcore fill beneath and above the sump. Lay the sump level. Connect a 110mm uPVC pipe to the box with a patent collar and run continuous through all rising walls to the outside of the external wall and turn up to terminate at footpath level with a marked cap. The stand pipe shall be 75mm out from the block face. Finish in the footpath with a PVC cap with agreement approval marked to indicate that it is a radon extraction point.

All works in connection with the installation of the Radon sump and Radon Barrier shall be carried out by a specialist contractor engaged by the main contractor and approved by the Engineer. A certificate shall be furnished to the client on completion of the works confirming that the Radon Barrier, sump and associated item have been installed in accordance with Building Regulations and manufacturer's details and specification.

IN-SITU CONCRETE WORK

STANDARDS

References herein to Irish, British or other National Standards of Practice do not give the year of issue or dates of amendment. The latest relevant published version including any relevant amendments at date of invitation to tender shall apply. Where a Standard or Code of Practice has been superseded the latest edition of the superseding publication shall apply.

TOLERANCE FOR FINISHED WORK

PAD FOUNDATIONS STRIP FOOTINGS

The permissible deviation in setting out of general concrete foundations shall be +40mm/-20mm in plan dimension and +/-10mm in vertical dimension. The permissible deviation in respect of formed concrete foundations and pad foundations cast with holding down bolts or pockets for steel or precast concrete structures shall be +/-5mm in both plan and vertical dimensions unless otherwise approved in writing by the engineer.

ELEMENTS ABOVE FOUNDATIONS

The permissible dimensional deviation of structural concrete elements above foundation work level shall be +/-3mm in cross section, and +/-5mm in location.

FLOOR SLABS

The level of any point on the floor slab shall be within ± 5 mm of the floor datum level. In addition the maximum variation in level of points on a 3m grid shall be 5mm. Relevant standards shall apply in the particular case of floor slabs in warehouse and or storage areas where the flatness criteria as set out in the Concrete Society Technical Report TR34 shall apply. The floor flatness category to be achieved shall be as specified on the drawings and the Concrete Ground Floors Specification included in this specification document shall apply.

PLUMB

The permissible deviation from plumb of the upper and lower edges of any nominally vertical surface shall be +/-4mm per 2m of surface subject to an overall limit of +/-12mm in any structural unit. A similar tolerance shall apply to the planarity of sloping surfaces.

DEVIATIONS AT JUNCTIONS

The maximum permissible deviation from the specified linear inter-relationship of any two surfaces at a junction shall be 6mm.

BOW

The permissible deviation arising from bow in the surfaces of columns, walls, and beams shall be +2mm per 2m of surface subject to an overall limit of +8mm in any structural unit.

BULGING AND LOCAL IRREGULARITIES

The permissible deviation for bulging and local irregularities in any surface of concrete elements shall be +/-3mm.

MATERIALS

The materials, labour and workmanship in and connected with the execution of the concrete work shall be the best of their kinds without regard to any trade terms. The contractor shall employ a duly qualified person experienced in reinforced concrete construction to supervise the work. The quality of materials and the standard of workmanship for the reinforced concrete shall comply with the relevant Clause of BS 8110, I.S. EN 206-1 and BS 8007 in regard to all requirements not otherwise described in the preamble. The engineer shall be afforded all reasonable opportunity and facility to inspect the materials and the manufacture of concrete and to take any samples or to make any tests.

CEMENT

The cement shall be Normal Portland Cement (CEM1) complying in all respects with the current European Standard I.S. EN 197-1. Cement shall be certified as complying with I.S. EN 197 and shall bear the CE Standard Mark certified by the National Standards Authority of Ireland in accordance with I.S. EN 192 - 'Cement-Conformity Evaluation'.

Cement delivered in standard bags shall be properly stored in a weatherproof shed with the floor raised above ground level and having a clear space of at least 225mm between the underside of the floor beams and the ground surface. Cement delivered in bulk in a tanker shall be properly stored in a silo of BS or IS approved design. Each consignment shall be kept separate, identified and used in order of delivery. Cement damaged in storage or handling shall not be used in the manufacture of white concrete.

AGGREGATE

The aggregates for concrete shall consist of naturally occurring material complying in all respects with IS5 (Note: the use of "all-in" aggregates or marine aggregates shall not be permitted). All aggregates shall be free from laminated, and/or flaky particles, dust, silt, clay and other impurities. The fine aggregates shall be washed natural pit or river sand, passing a 6mm sieve and shall be graded from the largest to the smallest particle sizes to the engineer's satisfaction. The coarse aggregate shall be retained on a 6mm sieve and shall be composed of clean washed gravel or clean crushed hard stone. It shall be in two sizes up to 19mm when maximum aggregate size of 19mm is used, and three sizes up to 38mm when maximum aggregate size of 38mm is used.

WATER

Water shall be clean and free from harmful matter and shall be of potable quality.

ADMIXTURES

Admixtures other than those herein specified shall not be used without the written consent of the engineer. Concrete admixtures shall comply with BS 5075 and I.S. EN 934-2 and shall be used in accordance with the manufacturer's instructions. Admixtures shall be as noted on the drawings and shall be confirmed by the engineer in writing.

MIXING

The quantity of cement, the quantity of fine aggregates and the quantities of the various sizes of coarse aggregate shall be measured by weight only. A separate weighing device shall be provided for weighing the cement. The amount of water shall be measured by volume or weight. Any solid admixture to be added shall be measured by weight only, but liquid or paste admixtures shall be measured by volume or weight.

The batch weight of aggregates shall be adjusted for the moisture content of the aggregate being used. The quantity of water contained in the aggregates shall be determined by the concrete supplier in accordance with a method approved by the engineer, and the quantity of water to be added to the mix shall be reduced by the quantity of water contained in the aggregates being used.

CONCRETE MIXES

The concrete strength shall be as specified on the drawings in accordance with IS EN 206-1. The responsibility for producing concrete to the required strength is entirely that of the contractor and his supplier and the cement content shall be adjusted to achieve this strength. The maximum w/c ratios and minimum cement contents for the various strength classes given in Table F.1 (IRL) are to provide a durable concrete for the various mixes. Table F.1 is appended to this concrete specification.

READY MIXED

Ready-mixed concrete may be used on the basis of a designed mix, subject to the engineer's approval to the manufacturer and supplier. Deliveries shall be accompanied by delivery dockets for each batch of concrete and they shall contain the following information; -

- Name/Reference of the Ready-Mix Plant
- Serial number of the delivery docket
- Date and time of loading i.e. time when all materials enter the mixer/truck
- Delivery truck number
- Name of purchaser
- Name and location of site

In addition the delivery docket shall give details of the following:

- a) for designed concrete
 - strength class
 - exposure class
 - chloride content class
 - consistence class or target value
 - limiting values of concrete composition, if specified

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- type and strength class of cement, if specified
 - type of admixture and addition, if specified
 - special properties, if specified
 - maximum nominal upper aggregate size
 - in case of light-weight or heavy-weight concrete: density class or target density
- b) for prescribed concrete
- details of the composition, e.g. cement content, and, if required, type of admixture
 - either w/c ratio, or consistence in terms of class or target value, as specified
 - maximum nominal upper aggregate size

CONFORMITY CONTROL AND CONFORMITY CRITERIA

Conformity of the concrete from the production plant shall be checked and controlled in accordance with Clause 8 of IS EN 206-1. The responsibility of providing concrete, which attains the specified strength, is entirely that of the contractor, and no adjustment of rates shall be permitted if additional cement is required to provide compliant concrete.

TESTING OF CONCRETE

The quality of the concrete delivered to site shall be tested and verified by 7 day and 28 day cube tests carried out in accordance with BS 1881. Tests shall be taken at the minimum rate of 2 cubes per 7.0m³ of concrete poured. Each cube shall be made from a single sample taken from a batch of concrete. Compliance with the specified strength may be assumed if: -

- The average strength determined from any group of four consecutive cubes exceeds the specified strength by not less than 3.0N per sq.mm.
- Each individual test is greater than 85 per cent of the specified characteristic strength (grade in Table F.1).

ACTION TO BE TAKEN IN THE EVENT OF FAILURE OF TEST CUBES

In the event of cube failures the cost of additional test and/or the replacement of any portions of concrete deemed to be defective by the engineer shall be borne by the contractor. All costs associated with remedial and/or replacement work including any consequent effects on progress/programme shall be borne by the contractor.

CONCRETE BLINDING

The surface of the ground under foundations, and other concrete in contact with the ground or with hardcore, shall be sealed with a layer of concrete Grade 15 average 50mm thick.

JOINTING NEW CONCRETE

Treat the surface of the existing concrete at the joint before placing new concrete as follows:-

- When the concrete is between 2 and 4 hours old, wet the surface with a fine spray (not a jet) and at the time brush the mortar from the face of the joint without disturbing the coarse aggregate.
- When the concrete is between 4 and 24 hours old and (a) has not been carried out remove the mortar from the face of the joint with a wire brush or water jet without disturbing the coarse aggregate.
- When the concrete is between 1 and 3 days old and (a) or (b) has not been carried out, remove the mortar from the face of the joint by grit blasting or with a needle gun without disturbing the coarse aggregate and wash off any dust from the surface. Do not hack or hammer the surface.

CONSTRUCTION JOINTS

All vertical construction joints shall be formed with well braced timber stop ends holed or slotted where necessary to allow the reinforcement to pass through the joints. The concrete shall be compacted against the stop end for the full height of the lift.

All construction joints shall be located in such positions as shall be approved by the engineer. The vertical joints shall be stepped and staggered in approved positions and such joints shall not be located at or adjacent to quoins. Except where otherwise directed, the joints in ribbed floors shall be formed in the slab, parallel to the ribs. The joints in floors shall be located in such positions as will minimise the number of joints required.

In beams and suspended slabs an approved splayed joints shall be provided. In all other cases a tongued and grooved key shall be formed at horizontal and vertical joints. The width of the groove shall be about one third the thickness of the concrete and shall be formed with prepared timber battens having slightly splayed edges.

In structures subject to water pressure, the joints shall be provided with a rebate at the water face, together with a water bar of approved pattern and girth as described on the drawings.

SHRINKAGE GAPS

The work shall be carried out in such a manner as the engineer shall direct to minimise the shrinkage of the concrete and shrinkage gaps shall be left at the discretion of the engineer.

FROST

Concreting work shall be suspended when the air temperature falls below 2 deg. Celsius or if less than 5 deg. Celsius on a falling thermometer or when frost is expected. Frozen aggregate shall be thawed out before use by the aid of approved equipment. Concrete placed in cold weather shall be protected from damage by frost or other weather conditions shall be cut out and replaced by fresh concrete at the contractor's expense. The contractor shall provide a minimum and maximum thermometer of approved design for the purpose of measuring the shade temperature of the outside air. The temperature of concrete at the time of placing shall be at least 5 deg. Celsius and precautions shall be taken to ensure that the concrete temperature after placing does not fall below 5 deg. Celsius until it is thoroughly hardened.

CURING

Horizontal and vertical slabs and other large areas of concrete shall be prevented from drying out for at least 7 days after the concrete has been placed. Precautions shall be taken during the initial period of at least 7 days, to protect all reinforced work from exposure to sun, wind and rain.

PLASTER SURFACES

Where a rendered or plastered finish is specified, the concrete surfaces shall be treated to provide an adequate key. Alternatively, the formwork may be coated with an approved retarding compound which shall be removed with water and wire brush as soon as possible after concreting. Precautions shall be taken to ensure that the retarding compound does not come in contact with the reinforcement.

TRAFFIC OVER CONCRETE

No traffic or temporary load of any kind will be allowed over any concrete until the following minimum time after casting unless approved protective methods are adopted to the engineer's satisfaction.

- | | |
|---|---------|
| • Foundations, ground floor slabs and other concrete in contact with the ground | 28 days |
| • Columns | 10 days |
| • Suspended Slabs | 10 days |
| • Suspended Beams | 14 days |

These times are given for guidance only and do not relieve the contractor of any responsibility for protecting the concrete work against damage from any cause whatsoever.

FORMWORK

The contractor shall submit dimensioned drawings of the systems of falsework which he proposes to adopt for the various sections of the work. This falsework shall be suitably proportioned and braced to withstand the weight of the freshly placed concrete, together with the weight of the workmen and materials.

Where supported on the ground the sole piece carrying the vertical supports shall be bedded on a solid base and shall have an area sufficiently large to ensure that there shall be no settlement under full load. Adjustable screws or hardwood folding wedges shall be used for adjusting and striking the vertical supports. All shuttering shall be removed without shock or vibration. Before the shuttering is stripped, the concrete shall be exposed in order to ascertain that the concrete has sufficiently hardened.

Shuttering to vertical surfaces may be removed whenever the concrete will not be damaged by so doing. Shuttering and supports under slabs, beams, girders, arches and structures or parts of structures carrying the loads shall not be removed without the engineer's approval. The striking of the horsing shall be carried out in an approved sequence of operations so that no undue shock or other damage is caused to the permanent work.

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The contractor shall be responsible for any injury to work and any consequential damage caused or arising from the removal of striking of formwork, centering and supports, and any advice, permission or approval given relative to their removal shall not relieve the contractor from the responsibility here defined.

LOCATION	MINIMUM PERIOD (Days)	
	Surface Temperature of Concrete	
	Cold Weather 2 deg - 5 deg C	Normal Weather 16 deg C
Sides of beams walls and columns	2	1
Slab soffit forms (props left under)	10	4
Beam soffit forms (props left under)	14	7
Props to slabs	21	7
Props to beams	28	16

The formwork should be designed taking into account the surface finish required for the concrete. The formwork should be rigid and tight to prevent loss of grout. All joints between sheets shall be fitted with loose hardwood tongues and all joints between sides and soffit shall be either tongued or sealed with foam strip or other approved material to prevent loss of grout.

The formwork and supports shall be sufficiently rigid to resist without distortion all dead loads and incidental loads resulting from placing, vibration etc.

REMOVAL OF FORMWORK

The contractor shall give the engineer not less than 24 hours notice of his attention to strike any formwork. The time at which formwork is struck shall be the contractor's responsibility but the minimum periods between concreting and the removal of forms unless otherwise approved shall be as stated in Table B. Days during which the average temperature is below 2 deg. C. shall be disregarded in calculating the minimum time which shall elapse before forms are removed.

MOULD OIL AND GREASE

All formwork shall be treated with approved mould oil or grease before use and shall be carefully cleaned down and further oiled or greased before re-use. The type of mould oil or grease and its methods of application to be used for shuttering for exposed surfaces shall be as recommended by the manufacturer for this kind of work and shall be subject to the engineers approval. The use of specially faced boards of plywood shall not be permitted except with the approval of the engineer.

HOLES AND CHASES IN CONCRETE

Holes, chases and other openings required for the passage of pipes, conduits, etc., shall be formed by inserting suitable sleeves, cores and sinkings before placing the concrete. The sub-contractors shall be required to furnish full information in regard to the position of such opes and chases, and the position of bolts, clips, holes or other openings in the finished work shall not be permitted without the sanction of the engineer. Such holes and chases shall be made only in approved locations and shall be cut with approved tools.

COMPACTION

Thoroughly compact all concrete using a method appropriate to the workability of the concrete and nature of the work.

Loose hardwood tongues shall be used between all plywood sheets and foam sealing strips fully compressed between formwork and concrete shall be used at all construction joints.

Formwork shall be effectively watertight. Formwork ties shall be arranged in a uniform pattern as directed by the engineer and shall be provided with rubber cones against the formwork so that a neat recess about 50mm dia. x 40mm deep is left at the tie after stripping. The recess shall be treated as a minor surface blemish. The concrete surface shall be smooth, free from honeycombing, lipping and grout loss, shall have true clean arises and shall be of uniform colour and texture. Only very minor surface blemishes shall be permitted.

While the concrete is still green all surface blemishes shall be filled with a fresh, specially prepared paste of cement and fine aggregate to match the colour of the concrete. After curing the blemished and surface where necessary shall be rubbed down with a fine carborundum stone to produce a smooth even surface as required by the surface finish to be achieved.

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For ribbed or waffled slabs exposed to view an approved G.R.P. or polypropylene mould shall be temporarily supported by an approved system compatible with the mould. Joints between adjacent moulds shall be featured in the manner indicated on the engineer's drawings and the contractor shall prepare a detailed scheme, for approval, by which this feature may be achieved. Removal of moulds shall be achieved by the use of compressed air carried out strictly in accordance with the manufacturer's recommendations.

CONCRETE FINISHES

All concrete surfaces which are to be covered up, non-exposed or are to receive further finishing shall be formed to achieve a Type A finish. All exposed concrete shall be finished to achieve a Type B finish as defined in BS8110, § 6.2.7.3. In areas where a higher quality finish is required, a Type C shall be obtained. Such areas will be as specified on the drawings.

Where type B or C finishes are required, the contractor shall produce sample panels, min 1m x 1m in size and include a joint in the formwork, for approval by the architect and engineer prior to commencement of works. The quality of finish as achieved in the approved sample panel will be that adopted for the finish of the various elements.

REINFORCEMENT

Rolled mild steel bars, cold twisted bars and high tensile fabric reinforcement shall comply with the requirements of BS 4449 and BS 4483 respectively. The contractor shall deliver free of charge, samples of the various reinforcements for testing if required by the engineer. Any consignment of reinforcement failing to comply with the tests shall be removed from site. Certificates of origin for all reinforcement shall be provided.

In the measurement of the weight, the net lengths as shown on the drawings and schedules shall be taken in conjunction with the net weight per metre on the nominal diameter or size of the reinforcement.

The sizes and other dimensions of the reinforcement shall be checked against the drawings and site dimensions before the material is ordered from the schedules. The reinforcement shall be cut, cold bent and hooked to the dimensions shown on the drawings and schedules or to such other dimensions as may be directed.

ALTERNATIVE BAR SIZES

No alteration or substitution shall be made in the lengths, sizes or arrangement of the reinforcement, without the prior written approval of the engineer.

FIXING REINFORCEMENT

Reinforcement shall be provided as indicated on the drawings and maintained in its correct position by means of suitable clips, soft tying wire or welding, supplied by the contractor at his own expense. The correct cover shall be maintained by means of suitable plastic spacers or small stools wired to reinforcement. Such spacers and stools shall be supplied at the contractor's expense. The contractor shall not commence concreting on any section of the work until the formwork and reinforcement have been approved by the engineer. Reinforcement in slabs shall be supported at points sufficiently close to ensure that the correct cover is accurately maintained. Each corner bar in beam and column reinforcement shall be similarly supported, at such intervals as will ensure that the correct cover is accurately maintained.

All reinforced concrete elements shall be checked by the engineer prior to pouring of concrete for which adequate notification shall be provided.

SCREED

Screed materials and properties shall be in accordance with IS EN 13813. The proportion of cement and the quality and grading of the aggregate for screeds shall be approved by the engineer.

The screeds shall be laid not more than four hours after the casting of the concrete base except by the permission of the engineer or in the case of screeds placed on precast concrete units. All joints in screeds shall be set out to the engineer's approval. Where screeds are constructed more than four hours after the casting of the base concrete, or on precast units, the base concrete shall be thoroughly cleaned and an approved bonding agent applied as directed by the engineer. The satisfactory adhesion of all screeds to the base concrete shall be the contractors sole responsibility and no approval or advice of the engineer regarding the method of construction shall relieve him of his responsibility.

Table F.1 (IRL) Recommended Limiting values for Composition and Properties of Concrete

	Exposure Classes																				
	No risk of corrosion attack	Carbonation induced corrosion				Chloride-induced corrosion						Freeze/thaw attack				Aggressive chemical environments					
						Sea water			Chloride other than sea water												
	XO	XC1	XC2	XC3	XC4	XS1	XS2	XS3	XD1	XD2	XD3	XF1	XF2	XF3	XF4	XA1	XA2		XA3		
Maximum w/c ratio	---	0.65	0.60	0.55	0.55	0.55	0.50	0.45	0.55	0.50	0.45	0.60	0.55	0.55	0.45	0.55	0.50		0.45		
Minimum strength class	C12/15	C25/30	C28/35	C30/37	C30/37	C30/37	C35/45	C40/50	C30/37	C35/45	C40/50	C28/35	C30/37	C30/37	C40/50	C30/37	C35/45		C40/50		
Minimum cement content (kg/m³)	---	280	300	320	320	320	360	400	320	360	400	300	320	320	400	320 (1)	280 (2)	360 (1) (3)	320 (2)	400 (1) (3)	360 (2)
Minimum air content (%)													If less than C40/50 use 5.5% (10 agg.) 4.5% (14 agg.) 3.5% (20 agg.) 3.0% (40 agg.)			(1) CEM 1 (2) Sulfate resisting cement (3) Use sulphate resisting cement if SO ₄ ²⁻ >1400mg/l					
Other requirements																					
Note 1: These recommendations are for a CEM 1 cement except where otherwise noted Note 2: The values in this table are based on the assumption of an intended working life of at least 50 years.																					

BLOCKWORK

MATERIALS

Materials shall comply with the following specifications:-

Solid concrete blocks and bricks	=	IS EN 771
Hollow concrete blocks	=	IS EN 771
Cement	=	IS EN 197-1
Mortar	=	IS EN 998
Aggregates for Mortar	=	IS EN 13139 & SR 18:2006
Wall Ties and Ancillary Components	=	IS EN 845

CONCRETE BLOCKS

Concrete blocks shall be steam cured factory made blocks of uniform texture and shall be obtained from an approved manufacturer. The average compressive strength of the solid concrete blocks shall be 7.5N/mm² for blocks tested on edge, or as specified on the drawings. The average compressive strength for hollow blocks shall be 7.5N/mm² for blocks in vertical orientation.

MORTARS

Cement mortar for blockwork shall be composed of one part cement to three parts sand.

Cement mortar for brickwork shall be composed of one part cement to four parts sand with the minimum amount of mortar plasticiser.

Gauged mortar for brickwork and blockwork shall consist of four parts sand mixed in bulk with 0.5 part of hydrated lime with one part of cement by volume added later to the sand lime mixed in small quantities as required for immediate use.

Coloured mortar shall be obtained by the addition of an approved colouring agent used in strict accordance with the manufacturer's instructions.

Ready mixed mortars, if different from those described above shall not be used without the engineer's approval.

All site mixed mortar shall be well mixed and tempered in a suitable clean mixing drum, mixed only in quantities sufficient for immediate use. Any mortar, which has, partly set is not to be re-used and shall be discharged.

MORTAR TESTS

The 1:0.5:4 cement:lime:sand mortar shall be tested as follows:-

Preliminary tests shall be made of six 100mm mortar cubes, made, cured and tested and the results recorded in accordance with the recommendations of BS 1881.

The cubes shall be made in steel moulds of approved design. Three cubes shall be tested at seven days and the remaining three at twenty eight days. The cubes shall comply with the strengths previously specified.

The engineers representatives may, at any time, direct the 100mm test cubes be taken in his presence from typical batches of mortar.

WORKMANSHIP

Workmanship shall be in accordance with IS EN 1996.

WALLING

Walling shall be carried out in a uniform manner, no one portion being raised more than 900mm above another, with bed and vertical joints average 10mm thick. Vertical joints shall be fully flushed up as the work proceeds and all walling shall be carried up in a uniform manner with true and vertical quoins and shall be properly bonded.

CAVITY WALL TIES

The leaves of a cavity wall should be tied together by Type 1 or Type 2 stainless steel wall ties in accordance with IS EN 845 & PD 6697 embedded in the horizontal mortar joints at the time the course is laid, to a minimum depth of 50mm. The length of the wall tie should be chosen to suit the width between the two leaves. The ties should be placed at a frequency of 750mm horizontally and 450mm vertically for cavity widths up to 100mm (minimum 3.0 ties per sq.m) and 450mm horizontally and 450mm vertically for cavity widths up to 150mm (minimum 4.9 ties per sq.m) and they should be provided within 225mm of all openings and control joints so that there is one for each 225mm of height of the opening. Ties used should be Staifix RT2 225mm long for 100mm cavity widths and Ancon ST1 Heavy Duty for 150mm cavity widths (or similar approved).

COLLAR TIED WALLS

Collar tied walls shall be formed from two number 100mm walls with a 15mm space between, filled solidly with mortar. Fairfaced blocks shall be used for all exposed masonry. The two wall leaves shall be tied with brickforce reinforcement as noted on the drawings.

DAMP PROOF COURSES

Damp proof course shall be polymeric damp proof course weighing not less than 1.5kg/m² or other equal and approved complying with the requirements of BS 6515. Damp proof courses shall be laid in accordance with the requirements of BS 8215.

TESTING OF BLOCKS

For the purpose of testing conformity of the block with this specification, ten blocks shall be selected at random from every batch of 1000 blocks and tested at the Institute for Industrial Research and Standards in accordance with IS EN 772, if requested by the engineer.

CERTIFICATES

A Manufacturer's Declaration of Performance for the properties of the blocks shall be produced for all batches of blocks delivered to site.

TOLERANCES

The permissible deviation for blockwork shall be as follows:-

Level:

For any nominally horizontal surface when measured from the nearest reference level : +/-10mm.

Position on Plan:

For the position of any nominally vertical surface at the lower edge when measured horizontally from the nearest reference line : +/-10mm.

Plumbness:

The permissible deviation from plumb of the upper and lower edges of any nominally vertical surface shall be 3mm in any 1m but not more than 10mm.

The permissible deviation from straightness, measured horizontally shall be +/-10mm.

The permissible deviation for abrupt change in a nominally continuous surface shall be +/-3mm.

The permissible deviation from the specified relationship of any two surfaces at a junction shall be +/-3mm.

The permissible deviation in joint thickness shall be as follows: -

Horizontal joints : joint thickness +/-3mm combined thickness in any 1m height +/-10mm.

Vertical joints : joint thickness +/-3mm combined thickness in any 3m length +/-10mm.

The permissible deviation for bed joints from the nearest horizontal reference shall be +/-10mm.

STRUCTURAL STEELWORK

GENERAL

The works covered by this specification comprise of the supply, fabrication, delivery and erection of steelwork. In general all work shall be carried out in accordance with the National Structural Steelwork Specification (NSSS) for Building Construction 5th Edition CE Marking (published by BCSA) as amended by the following clauses. All fabricated structural steelwork and relevant ancillary elements shall be CE Marked and only steel fabricators approved by a notified body shall supply structural steel and associated components to the project. The fabricator must be able to provide a Factory Production Certificate and Welding Certificate issued by the notified body and a Declaration of Performance for the project.

DRAWINGS

Tender and construction drawings are to be read in conjunction with this specification.

CODES OF PRACTICE

All steelwork is to comply with BS 4-1, BS 7668, IS EN 10025, IS EN 10029, IS EN 10034, IS EN 10056, IS EN 10210 and I.S. E.N. 1993.

MATERIALS

All steelwork shall be grade S275 J0 or S355 J0 unless noted otherwise.

All structural hollow sections shall be hot finished unless noted otherwise.

All bolts to be grade 8.8 to BS 3692 unless noted otherwise.

TESTING/QUALITY CONTROL

Provide test certs to demonstrate that the steel grades used comply with the requirements of this specification.

Provide test certificates for bolts to demonstrate that the bolts used comply with the requirements of this specification

All test certificates are to be verified by an approved Independent Inspection Authority.

WORKSHOP AND ERECTION DRAWINGS

The tender drawings indicate the general layout of the steelwork and the size of main structural members only. All of the connections have not been detailed. The structural steelwork contractor shall prepare the necessary calculations for connections, and all detailed workshop drawings and shall submit for approval all such details in duplicate to the engineers for checking. The contractor shall allow for the additional quantity of steel required for end plates, bolts, etc. in all the connections. One copy of each drawing will be returned to the structural steelwork contractor. The structural steelwork contractor shall, before commencing fabrication, provide two sets of the approved drawings for the engineers.

The structural steelwork contractor shall not commence the fabrication of any part of the work until the engineers have given their approval to the structural steelwork contractor's workshop drawings.

PROGRAMME OF SUPPLY

The structural steelwork contractor shall arrange his programme of fabrication, delivery and erection in consultation and agreement with the general contractor and shall be prepared to amend this programme if required to do so by the general contractor.

SITE CONNECTIONS

All site connections shall be bolted unless noted otherwise on the drawings. The structural steelwork contractor shall arrange to have an adequate supply of electric power where site welding is necessary.

WELDING

Welding shall be a metal arc process and shall conform to the standards of B.S. EN 1011 B.S. 5135 and B.S. 4570 as appropriate.

WELDING CONSUMABLES

Consumables for use in metal arc welding shall comply to the standards of BS EN ISO 2560, BS EN 12072, BS EN 440, BS EN 756, BS EN 758, BS EN 760 and BS EN 1668 as appropriate.

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WELDING SPECIFICATION

The structural steelwork contractor shall provide for the engineer's approval a written specification of the type of consumables and welding procedure he proposes to adopt.

TESTING OF WELDERS

Every welding operator, before he carries out any welding in this contract, shall pass or have passed such qualifying tests, which in the opinion of the engineer's will prove his competence in carrying out the welding. The tests shall be carried out to BS 4871 : Part 3 and BS EN 287.

TESTING AND EXAMINATION OF WELDS

Testing of welds shall be carried out in accordance with Clause 5.5 of the National Structural Steelwork Specification and all results shall be made available to the engineer.

Any welding considered by the engineers to be unsatisfactory shall be rejected and the cost of replacing any such rejected material will be borne by the contractor.

SPLICES

No splices of any description shall be used in any member without the written approval of the engineers. All butt welding in tubes must include a suitable backing member.

INSPECTION OF FABRICATED STEELWORK

The engineers or their representatives shall have access at all times to the structural steelwork contractor's workshop for the purpose of inspecting the steelwork. Any steelwork found to be unsatisfactory at workshop inspection or subsequent inspection shall be rejected and replaced at the structural steelwork contractor's expense.

SURFACE PREPARATION OF STEELWORK

All steelwork shall be shot-blasted to Swedish Standard Sa 2.5 (SIS 055900).

After shot blasting, remove all traces of loose rust, grit, etc. by compressed air hose or careful clean dry brushing. Remove all laminations by careful grinding leaving the surface smooth. All external steelwork shall be hot dip galvanised.

BLAST PRIMING

Priming of the clean blast steel should be carried out within 2 hours of shop-blast. The blast primer shall be a 2-pack epoxy zinc phosphate primer (grey) applied by airless spray to give a minimum dry film thickness of 20 microns.

SITE HOLDING PRIMER

After fabrication, carefully remove all weld spatters, rough edges etc. by grinding, chipping and scraping, and grind to a smooth surface. Remove any unsound primer around weld areas.

The site holding primer shall be a 2-pack epoxy zinc phosphate primer (grey) applied by airless spray to give a dry film thickness of 60 microns.

All primers shall be suitable for the later application of intumescent paint and all relevant information regarding the constituents of the primer shall be forwarded to the main contractor for the purposes of sourcing a suitable and compatible intumescent paint.

PATCH PRIMING AFTER ERECTION

After erecting all site contaminants shall be removed and the steelwork shall be patch primed if required with the specified primer.

EXTERNAL STEELWORK NUTS & BOLTS

All exterior steelwork, nuts and bolts shall be hot-dip galvanised to BS EN ISO 1461 to a minimum thickness of 85 microns.

HOLDING DOWN BOLTS

The structural steelwork contractor shall provide all the necessary holding down bolts as shown on the drawings and his quotation shall include for the supply and delivery of these bolts in advance of the delivery of the steelwork.

ERECTION OF STEELWORK

The structural steelwork contractor shall check the position, setting-out and levels of all holding down bolts before erection has commenced and any difference in level or levels from those shown on the contract drawings shall be brought to the immediate notice of the engineer.

The structural steelwork contractor shall provide all the plant necessary for the erection of the steelwork.

BOLTING

Unless specified otherwise all bolts and nuts shall be Grade 8.8 high tensile and shall be in accordance with BS 3692 and BS 4190.

All threads shall comply with BS 84 - "Screw Threads of Whitworth Form". Washers shall be tapered whenever necessary to give the head and nut a true bearing.

All bolts shall be provided with steel washers under the nut and sufficient washer shall always be used to have the threaded portion of the bolt clear of the parent metal. All bolt shanks shall project at least one thread beyond the nut.

All bolts shall be zinc plated in accordance with BS 3382-2, unless they are in an exterior situation where they shall be hot-dip galvanised to BS EN ISO 1461 (85 microns minimum thickness).

TEMPORARY BRACING

The structural steelwork contractor shall provide all necessary temporary bracing and strutting to resist erection forces and wind forces and any other temporary bracing or strutting as required by the engineer until the roof decking has been completely erected.

ADDITIONAL HOLES

Any additional holes required shall be drilled on site. Burning holes in steelwork is not permitted. No holes will be drilled until approval for such holes has been given by the engineer.

GROUTING BASES

After the steelwork has been finally approved the holding down bolt sleeves shall be filled solid with an approved non-shrink grout with a minimum strength of 35N/mm².

The space between the underside of the base-plate and the concrete column shall then be filled with the same quality non-shrink grout.

STACKING OF STEELWORK

When stacking the fabricated steelwork before delivery, the structural steelwork contractor shall ensure that sufficient timber shims are placed between members to avoid undue bowing of the chords. He shall also ensure that the steelwork is carefully unloaded and stored on site prior to erection.

TOLERANCES

The permissible dimensional deviations for structural steel elements above foundations shall be as outlined in the National Structural Steelwork Specification.

STRUCTURAL TIMBER

CODES OF PRACTICE

Unless otherwise specified where reference is made to standards and codes of practice the current version as published on the date of this specification, including any amendments, shall apply. Structural timber shall comply with B.S. 5268 and I.S. 444 and trussed rafters shall in addition comply with I.S. 193.

SPECIALIST SUPPLIERS

The contractor shall nominate specialist suppliers for laminated timbers or trussed rafters as applicable. The appointment of these suppliers shall be subject to the engineer's approval.

TYPE AND GRADE OF TIMBER TO BE USED

Trussed rafters and general structural timber shall fall within group species SC.3 (BS 5268) in accordance with "Timber Grades for Structural Use" irrespective of any other grading carried out at source. Timber supplied to I.S. 444 shall be C16 grade.

MARKING OF TIMBER

The species group and stress grade shall be marked on all timber. All timber re-sawn from stress graded stock shall be regraded before use.

DIMENSIONS

Timber dimensions in general, which are shown on the drawings or referred to elsewhere, are target sizes as defined in IS 444 at 20% moisture content unless otherwise indicated or where the details dictate otherwise. Permissible cross-section deviations from the target size are as defined in BS EN 336. Any deviations from the target sizes indicated shall be advised to the engineer prior to installation of timber. In particular member sizes shown for all laminated beams are finished sizes.

TOLERANCE

The permissible dimensional deviations for timber work generally shall be as specified in B.S. 5268-2. In the case of trussed rafters the maximum difference in thickness of abutting pieces shall be not greater than 1mm.

FINISH TO TIMBER

All timber exposed to view shall be planed and sanded on four sides prior to fabrication. In the case of laminated beams all machining is to be done after gluing. No cutter or sanding marks are permissible. In exposed surfaces voids shall be filled, glued inserts shall be selected with care to match grain and colour. Outside laminations shall be free from loose knots and open knot holes. The timber for outside laminations shall be selected with reasonable care to match colour and grain at edge points.

LOADING

The roof loading to be assumed shall be as follows:-

General Roof Areas	kN/m²
Trussed Rafters, Battens and Tiles	0.75 (on slope)
Metal Deck, Insulation and PVC Roof	0.25 (on plan)
Ceiling and Fittings	0.25 (on plan)
Imposed – Roof Level	0.60 (on plan)
Imposed – Ceiling Level	0.25 (on plan)

Wind

In accordance with BS6399:Part 2:1995 assuming:

$V_b = 24 \text{ m/s}$

LIMITS TO DEFECTS FOR CONSTRUCTIONAL PURPOSES

In the process of assembly and construction the appropriate stress graded softwood shall be selected so that no defect permitted by such grading prejudices the strength of the completed structure at bearing joints and other assemblies.

LIMITS TO DISTORTION

Any piece which is bowed, sprung twisted or cupped in excess of the limits set out in I.S. 193, Clause 4.4.1, shall be rejected.

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PRESERVATIVE TREATMENT

Timber for use in roofs in domestic house building shall be treated at critical locations as indicated in the House Building Manual published by Homebond including rafter ends, wallplates, all slating/tiling battens, barge timbers, gable framing, joist ends at supports/bearings etc

COMPATIBILITY OF PRESERVATIVE

The contractor shall ensure the compatibility of the preservative and any other required coatings/finishes and he shall also ensure that no corrosive effects to metal plates, connectors, or bolts shall result from their use.

MOISTURE CONTENT

The moisture content of the timber at the time of construction shall not exceed 18% with no value exceeding 20% during transportation, storage or erection.

PROTECTION AND STORAGE OF TIMBER

Timber members shall, at all times, be protected from damage, staining, decay, insect attack and avoidable exposure to the weather.

The contractor shall prepare a level clean site for the storage of the timber members. The members shall be stacked on timber shims such that no bowing or damage takes place and they shall be protected against exposure to rain and extremes of temperature.

TOOTHED PLATE

If toothed plate connectors are to be used they shall comply with the recommendations of B.S. 1579 "Connectors for Timber". The construction of the joints where these connectors are specified shall be carried out in accordance with B.S. 5268 : Part 2 "The Structural Use of Timber".

PREPARATION OF PLATES & BOLTS

All steel plates required in the roof construction shall be hot dip galvanised to BS EN ISO 1461. All steel bolts shall be zinc plated to B.S. 3382 unless specified otherwise.

INSPECTION OF TIMBER MEMBERS

The contractor shall afford the engineer or his representative every assistance in the inspection of timber members during all stages of fabrication and erection. Any member found to be, or suspected of being, defective shall be replaced or test loaded to the engineer's satisfaction at the contractor's own expense.

The contractor shall keep an approved type of moisture meter in his works for the control of the moisture content and for the use of the engineer at the time of inspection.

TESTING OF SAMPLE MEMBERS

The engineer may require sample members to be test loaded to confirm the adequacy and compliance with specification. Such testing where required shall be carried out by the contractor, or approved testing authority, in accordance with the relevant code of practice and to the engineer's satisfaction.

HANDLING OF MEMBERS

Care shall be taken at all times to ensure that the members suffer no damage or overstressing while they are being loaded, unloaded or lifted into position. Special care shall be taken to avoid damage to the sides and arises of members by lifting slings. In all cases the supplier's recommendations shall be sought and complied with as a minimum precaution.

ERECTION OF MEMBERS

The contractor shall at all times have a competent foreman in charge of the erection of the timber members who shall ensure that the work is carried out in accordance with the drawings, the aforementioned specifications and the suppliers recommendations. Any irregularities or inconsistencies shall be brought to the engineer's attention.

TEMPORARY BRACING

The contractor shall be responsible for the stability of the partially completed structure. He shall provide and fix, in addition to the permanent bracing, any temporary bracing necessary for the stability of the partially completed structure. He shall arrange his programme of erection so that no part of the structure is unduly exposed to possible loading in an unpropped or partially propped state.

PREFABRICATED TIMBER COMPONENTS

DRAWINGS

This specification shall be read in conjunction with the drawings.

SUPERIMPOSED LOADING

The superimposed loading for the trusses shall be as indicated on the drawings.

TRUSS SPACING

The spacing of the roof trusses shall be 400mm unless indicated otherwise on the drawings.

ROOF PITCH

The roof pitches shall be as indicated on the drawings.

WIND LOADING

The wind loading to be used in the design of the trusses shall be calculated in accordance with IS EN 1991-1-4.

PREFABRICATED TIMBER TRUSS ELEMENTS

All design, workmanship and materials shall comply in every respect with the requirements of IS EN 1995 and S.R.70.

Each truss or structural member shall be marked in accordance with the requirements of I.S. EN 14250.

STRUCTURAL CALCULATIONS

The fabricator shall design and provide detailed calculations showing the stress in each truss member (including all girder trusses) for all combinations of loading, and also the deflections of each unit under loading.

SHOP DRAWINGS

The fabricator shall submit in duplicate for approval all shop drawings and calculations and no manufacture shall commence until he has received back from the engineer one copy of the relevant drawings marked "approved".

STORAGE HANDLING

The fabricator shall prepare for approval a detailed scheme for the erection of the units, and shall give all necessary details for the handling and erection of the trusses in writing to the General Contractor. The storage, handling and erection of the roof trusses shall be as described in IS 193.

SPECIES OF TIMBER

The species of timber to be used for fabrication shall conform to the species given in IE EN 338.

GRADE OF TIMBER

All timber to be used for fabrication shall be mechanically stress graded in accordance with IS EN 14081. The timber shall comply with the additional grading requirements relating to wane, spring, bow, twist and cupping as set out in I.S. EN 14250.

METAL PLATE

The material used for metal plate connectors shall be hot dipped galvanised plain steel sheet or coil to I.S. EN 10346 and I.S. EN 10143.

Nails used for fixing metal plates shall be treated such that they are compatible with the plate and the preservative have a service life of at least that of the metal plate.

DEFLECTION

Deflection and differential deflection limits shall be those stated in I.S. EN 1995-1-1 but continuous elements should not exceed limits stated for simply supported elements. Trusses may be cambered to counteract deflections due to permanent loads as a means of satisfying these deflection limits.

TIMBER TREATMENT

All timber to be used for fabrication shall be double vacuum pressure treated with an approved type preservative in accordance with the recommendations of I.S. EN 15228 and B.S. 8417 "Preservation of Wood". The fabricator shall supply to the engineers all details of the method of application and type of preservative, which he proposes to use. The treatment employed shall have no corrosive effects on the metal plate connectors, nor cause a reduction in timber strength.

Where water soluble preservatives are used the moisture content of the timber shall be reduced to 22% before fabrication.

MOISTURE CONTENT

The moisture content of the timber at fabrication shall not exceed 22%.

TIMBER DIMENSIONS AND LIMITING DISTORTIONS

The permissible deviations of timber dimensions for trussed rafters shall be as per IS EN 336 and section 10 of IS EN 1995-1-1.

BRACING

Permanent bracing shall be fixed to ceiling ties and rafters to allow for wind and other horizontal loadings. Longitudinal, nodal and rafter diagonal bracing shall be fixed to the rafters and ceiling joists in accordance with IS EN 1995-1-1 in addition to any further bracing required by the truss design. Bracing members shall be provided and fixed in accordance with the requirements of S.R. 70 except as noted. The manufacturer shall provide the contractor with a detailed bracing plan indicating all bracing members which are to be installed in the roof structure. All bracing members shall have a minimum cross-sectional area of 2500mm² and have a minimum thickness of 25mm.

Temporary bracing shall be provided and installed as required to stabilise the trusses during the erection phase. Temporary bracing should be maintained until the permanent bracing has been fully installed. The truss designer/fabricator must provide erection instructions to the contractor including details of all necessary temporary bracing.

BATTENS AND COUNTERBATTENS

All battens are to be supplied, strength graded and stamped in accordance with the requirements of S.R.82. Minimum battens size to be 47mm x 35mm for rafters or trusses at maximum 400mm centres. If trusses are to be placed at greater than 400mm centres, the truss supplier must provide calculations to verify the proposed batten size based on the design roof loads and provide certification for this design in the form of an ancillary design certificate.

Fixing nails for battens to be in accordance with the requirements of S.R. 70 and conform to I.S. EN 14592 and have a Declaration of Performance (DoP). The corrosion resistance of the nails should be suitable for a service class 3 environment as defined in I.S. EN 1995-1-1.

INSPECTION OF WORK IN FABRICATORS FACTORY

The fabricator shall permit and provide all assistance for the inspection of the work during fabrication, and for the testing of the timber and the metal plate connectors. Any trusses, which are rejected, shall be replaced at the fabricators own expense.

PROTECTION OF TRUSSES ON SITE

The general contractor shall allocate an area for the storage of the trusses. He shall level and hardcore this area and shall provide adequate raised bearers to prevent distortion in the plane of the truss.

Protection against exposure to rain shall be provided in such a way as to allow the free circulation of air, and protection against exposure to ground or surface water shall be provided at all times.

TIMBER TRUSS FABRICATORS

The truss manufacturer shall be an NSAI approved roof truss manufacturer. The main contractor shall submit the name of the manufacturer to the engineer for approval prior to placing any order.

UNDERPINNING SPECIFICATION

FOUNDATION UNDERPINNING

The underpinning of the existing walls/foundations to existing structures is to be carried out in such a manner as to cause the least possible disturbance to the existing foundation.

The existing foundations are to be exposed and then underpinned in approx. 1m long excavations. These excavations are to be carried out in an alternate manner, i.e. no two adjacent 1m long parts of the foundation are to be exposed and underpinned in succession. The excavations below the base of the existing walls/foundations will be carried down to a suitable bearing stratum as approved on site by the engineer. The minimum excavation depth below the base of the existing wall/foundation will be 500mm or 50mm below the base of any new adjacent foundations, whichever is deeper. Each section of work must be fully complete to the engineer's satisfaction before the next section is to be opened up.

Methods of shuttering and placing this concrete shall be agreed with the engineer prior to any work being carried out. Generally concrete underpinning shall be carried to within 50mm of the underside of the existing foundation, then left to set and shrink, then fine dry concrete shall be rammed in to make full contact with the old and new work. Reinforcement for each section shall protrude and be bent sideways so that it can then be bent back and extend into the next section.

The contractor must provide all the requisite shoring, needling and strutting and other supports to walls, roofs etc., to ensure the protection of existing buildings. He will be held solely responsible for the safety of the existing buildings and the sufficiency of all temporary work.

DEMOLITION AND GERNERAL SITE REQUIREMENTS

SCOPE OF WORK

The works comprise the demolition and removal of the relevant parts of the existing buildings and site structures on the site as indicated on the drawings. All foundations within the footprint of the proposed building shall be removed and the site shall be hardcored to a suitable level to facilitate the levels of the new building.

GENERAL

Carry out all demolition and taking down work generally in accordance with BS 6187:2011.

The extent of the buildings to be demolished in whole or in part is shown on the contract drawings. The contractor is required prior to the submission of his tender to visit the site and determine the nature and extent of the works to be undertaken. The contractor shall be deemed to have familiarised himself with the facilities of access to the works, including complying with all requirements of the Local Authority.

Prior to undertaking any work the contractor shall undertake a detailed survey of all the premises and any adjacent premises which might be effected by the proposed works. This survey shall include record drawings and photographs of the condition of the premises prior to the works being undertaken. Two copies of the survey report and photographs must be submitted to the architect/engineer prior to commencing any demolition works. Should the survey and examination so determine the contractor shall advise the Architect of any specialist precautions necessary to protect the works such as: -

- a) Structural surveys.
- b) Installation of tell tales.
- c) Specialist insurances.

HEALTH & SAFETY OF PERSON ON OR OFF SITE

The contractor should refer to the Health and Safety Plan Design Stage, prior to carry out there own risk assessment of the works. Ensure the safety of the works during demolition work. Carry out demolition work in such a manner as to cause the minimum inconvenience to persons in adjoining buildings.

Persons engaged to work on site must be in possession of a current registration card under the *Health and Safety at Work Construction Regulations 2001*. Person carrying out specialised tasks or operating machinery outlined in the ninth schedule must also have the appropriate skills card.

SUPERVISION

Carry out demolition work under the supervision of a responsible person experienced in demolition work who shall ensure that adequate safety precautions are taken.

EXPLOSIVES

The use of explosives for demolition shall not be permitted.

BURNING

Burn on-site materials arising from demolition is prohibited under *Air Pollution Act 1987* and Regulations S.I. No 271 of 2002 *Air Quality Standards Regulations 2002*.

NUISANCE

Take the necessary precautions to minimise nuisance arising from demolition work. The contractor is to take particular care to minimise any disruption of or damage to any adjoining properties. The contractor shall allow for carrying out a detailed survey (with photographs) of the adjacent properties internally and externally prior to commencement of the works.

DISCONNECTION OF SERVICES

Before starting demolition work, all affected services are to be diverted or disconnected.

PROTECTION

Take all reasonable precautions to protect adjoining work and provide temporary supports, screens and coverings as required.

TEMPORARY SUPPORT

Provide and maintain all necessary temporary support. Make good any damage. The contractor shall be responsible for the design of temporary support, which shall be subject to the approval of the engineers.

The contractor shall provide temporary support as necessary to the existing buildings as required prior to the completion of the new building. This shall be in the form of propping, shoring or similar. Any such supports shall be designed by the contractor/contractors temporary works design engineer and submitted for approval to the project engineer.

MATERIALS

Any materials and debris arising from demolition work shall become the property of the contractor unless specified otherwise, and shall be removed from site.

WASTES

Those concerned with controlled waste should comply with the Waste Management Act 1996 and current regulations and collection shall be carried out by those with a valid waste collection permit and waste shall be disposed off to a permitted facility.

The contractors attention is drawn particularly to Clause 4.2.8.2 of BS 6187 : 2000. All hazardous or toxic materials must be clearly identified at survey stage and all necessary precautions must be taken in their removal and disposal to comply with regulation S.I No. 163 of 1998 Hazardous Waste Regulations and other relevant regulations and statutory acts.

TEMPORARY WEATHERING

The contractor shall provide for temporary weathering to the exposed walls of remaining buildings in the form of appropriate weatherproof sheeting and battens, or similar approved, so that the adjacent properties are maintained fully waterproof during the works.

ROADS

The contractor should liaise with the Local Authority when partial or total road closure is required to be undertaken. The Local Authority should be contacted at an early stage to allow sufficient time to process permissions. Temporary Traffic management should be carried out with reference to the Traffic Management Guidelines and the Temporary Traffic Measures and Signs for Roadworks 2019. A traffic management plan shall be prepared for all site traffic in accordance with the Construction Site Traffic Management Plan (CSTMP) Guidance published by the Health and Safety Authority.

The local authorities requirements shall be complied with in relation to road maintenance and cleaning etc and allowance shall be made by the contractor for all necessary cleaning, maintenance and repair necessitated by the works.

ERECTION OF TEMPORARY HOARDING ON OR OVER STREET

The contractor should comply with statutory regulations and with Local Authority requirements regarding hoardings.

ADJACENT PROPERTY OWNERS

Property owners immediately adjacent to the property should be notified 2 weeks prior to the start of construction and/or demolition and of any key dates, when the risk of disruption is increased.

NOISE

The noise level shall comply with the normal statutory limits or as set out in the planning permission.