

GENERAL HOUSING SPECIFICATION

SECTIONS C to X - MATERIALS AND WORKMANSHIP

To be used in the Framework for

Single Operator Framework for;
RESPONSE Maintenance to Occupied Dwellings and Associated Minor Works

for

South Dublin County Council (5 Lots)

Prepared By:

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GENERAL HOUSING SPECIFICATION

SECTIONS C to X - MATERIALS AND WORKMANSHIP

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C.0 Compliance with Materials and workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (EU) 2024/3110, as amended, together with any applicable national implementing legislation in Ireland, the Contractor shall provide proof (a Declaration of Performance (DoP)) and, where applicable, CE Marking documentation, European Technical Assessments (ETA), and any other documentation required under the Construction Products Regulation for all construction products to be incorporated into the Works.

The Contractor shall ensure that every product incorporated into the Works is fit for the use for which it is intended and complies with the requirements of Part D of the Building Regulations. The Contractor may be required to demonstrate such compliance and suitability by means of manufacturers' certification, NSAI Agrément Certification, independent third-party certification, accredited test reports, or other evidence acceptable to the Employer's Representative.

DEMOLITIONS (If Applicable)**C.1 General**

Demolition work shall be carried out in accordance with BS 6187:2011, Code of Practice for Full and Partial Demolition, and in accordance with the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended), and all statutory and Local Authority requirements.

No demolition work shall be undertaken until a thorough investigation of the sections of the buildings (if any) to be demolished has been carried out, including the identification of structural, environmental and health and safety hazards, and before the Architect and Quantity Surveyor have been informed in writing of the commencement date of demolition.

The Contractor shall ensure that he has adequate insurance cover for demolition work

All taking down shall be carried out in a careful, controlled and efficient manner and any taking down in excess of that shown on the drawings shall be made good together with any consequential work at the Contractor's own expense.

Attention is drawn to "Safe System of Work Plan (SSWP) Demolition (HSA)"

C.2 Plant

The Contractor is to provide all requisite plant, scaffolding, drawing-in ways, gangways, planks, gantries, tarpaulins etc., for the proper protection and execution of the works.

C.3 Surplus Materials

Unless described as refixed, set aside for re-use, taken to store, stacked on site or similar expressions, all materials arising from the work shall become the property of the Contractor and allowance should be made by him in the "Value of Credits" column for their value. The Architect reserves the right to retain any or all of such materials not at present described as refixed, set aside for re-use, etc., and in such cases the Contractor will be reimbursed at the rates he has inserted in the "Value of Credits" column.

C.4 Re-Use of Old Materials

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The Contractor shall be responsible for the care and protection of all materials described as for re-use, taken to store, etc., from the time of his taking possession of the site.

Materials arising from the work which are not described as being for re-use may be used in the works only if the Architect's agreement is first obtained.

C.5 Removal of Surplus Materials and Debris

All items included under Demolitions and Taking Down shall include for the removal from site and lawful disposal of all surplus materials, debris and arisings generated by the Works. All timber and associated materials affected by fungal decay, rot or insect infestation shall be removed from the Works and disposed of without delay.

Removal of all waste from the site shall be carried out in accordance with all current statutory requirements and Waste Management legislation. All demolition arisings shall be separated, handled and disposed of in a responsible manner. Demolition waste shall be segregated on site and reused or recycled wherever practicable

C.6 Use of Explosives for demolition

See Clause A34/310. Not permitted.

C.7 Workforce

Demolition work is to be executed only by competent workers experienced in this type of work and all safety precautions necessary must be taken to avoid accidents and to safeguard persons.

Only workers fully trained and certified as such to use specialist plant and equipment.

C.8 Stripping and Disposal of Asbestos Based Materials

Where asbestos-containing materials (ACMs) or asbestos products are to be taken down and removed, the Contractor shall comply with the requirements of the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2025, including S.I. No. 386 of 2006, S.I. No. 589 of 2010, S.I. No. 632 of 2025, and all associated Codes of Practice and guidance issued by the Health and Safety Authority (HSA).

Attention is drawn to the Health and Safety Authority publication “Asbestos-containing Materials (ACMs) in Workplaces - Practical Guidelines on ACM Management and Abatement” and the current Code of Practice for the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations.

Removal of asbestos shall be carried out by a competent Specialist Contractor authorised and suitably qualified to undertake asbestos works and who shall maintain insurance appropriate to the risks associated with asbestos removal activities. All waste shall be placed in sealed bags for **licensed disposal**.

If, during the execution of the Works, the Contractor uncovers asbestos-containing materials or products not otherwise indicated in the Contract Documents, he shall immediately cease work in the affected area, secure the area as necessary, inform the Architect without delay, and no further work shall be carried out in that area until written instructions are received from the Architect.

C.9 Shoring and Strutting

The Contractor shall provide and maintain during the execution of the works all shoring, strutting, needling and other supports, and shall take all other precautions or adopt such other expedients as may be necessary to preserve the stability of the buildings, whether new or existing, the subject of this Contract, and of all other property including that of adjoining owners that may in any way be endangered or affected by the works required to be executed under this Contract.

The Contractor shall also protect all the same against damage and/or settlement, and no part of these protective measures shall be taken down or removed until all risk of damage and/or settlement is past.

All work involving risk of damage and/or settlement to the buildings is to be executed by the Contractor in such portions as will minimise risk as far as possible.

Appendix A: List of References and Standards.

Item	Clause No.	Reference	Comment
1	C.1	BS 6187: 2011	Code of practice for full and partial demolition.
2	C.1	Safe System of Work Plan (SSWP) Demolition (HSA)	An easy-to-follow guide to the safe management of demolition works.

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3	C.8	S.I. No. 386 of 2006, S.I. No. 589 of 2010, S.I. No. 632 of 2025, and all associated Codes of Practice and guidance issued by the Health and Safety Authority (HSA) S.I. No. 589 of 2010: Safety, Health and Welfare at Work (exposure to Asbestos) (Amendment) Regulations 2010.	S.I. No. 632 of 2025 does not supersede or replace S.I. No. 386 of 2006 or S.I. No. 589 of 2010. It is an amending regulation that modifies and updates the earlier regulations. The 2025 instrument explicitly defines the 2006 regulations as the "Principal Regulations" and the 2010 regulations as the "Regulations of 2010", and states that all three are to be cited together as the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2025.
4	C.8	Health and Safety Authority (HSA) publication "Asbestos-containing Materials (ACMs) in Workplaces – Practical Guidelines on ACM Management and Abatement" and the current Code of Practice for the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2025.	Supersedes "Guidelines on Working with Materials Containing Asbestos Cement." (HSA) And the "Safety with Asbestos information sheet" (HSA).

Section D – EXCAVATIONS AND EARTHWORKS

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Section D – EXCAVATIONS AND EARTHWORKS

D.0 Compliance with Materials and Workmanship with the Building Regulations

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The Contractor shall ensure that every product incorporated into the Works is fit for the use for which it is intended and complies with the requirements of Part D of the Building Regulations. The Contractor may be required to demonstrate such compliance and suitability by means of manufacturers' certification, NSAI Agrément Certification, independent third-party certification, accredited test reports, or other evidence acceptable to the Employer's Representative.

GENERALLY

D.1 Setting out and Levels

The Contractor shall be responsible for setting up and maintaining an accurate site datum level reference point.

The Contractor, at the commencement of the works and in consultation with the Clerk of Works shall carry out and record a check grid of existing ground levels. The positions of all buildings and roads together with floor levels and road centre level shall also be set out. No excavations, site stripping or changes in levels shall be made until the above setting out and levels have been agreed with the Architect.

D.2 Nil

D.3 Soil Conditions

It will be deemed that the Contractor has inspected the drawings and site and has consulted available information concerning sub-soil conditions before submitting his tender.

The information in the contract documents giving details and levels of the sub-soil and water levels is supplied as an indication only and gives no assurance that there may not be considerable variation of sub-soil conditions over the site as a whole.

D.4 Unauthorised Excavations

The Contractor is prohibited from making excavations other than those approved by the Architect as necessary for the works. In the event of the Contractor making unauthorized excavations he will be required to backfill such excavations with material as directed, at his own expense.

D.5 Use of Explosives for removal of obstructions

Not Permitted.

D.6 Excavation through rock

When rock is met within the course of excavation it must be removed by mechanical

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means.

The Contractor shall be responsible for informing all other interested parties of his intention and shall take all precautions to prevent damage to any services of statutory undertakings or local authorities or to adjacent property.

D.7 Disposal of water

Allow for keeping the surface of the site and the excavations free of surface water and groundwater at all times. Temporary drainage, sump pumping, well-point dewatering, cut-off drains and other necessary measures shall be provided to maintain stable excavation conditions and to facilitate construction in accordance with the requirements of BS 6031 *Code of Practice for Earthworks*, EN 1610 *Construction and Testing of Drains and Sewers*, and EN 752 *Drain and Sewer Systems Outside Buildings*.

The Contractor shall notify the Architect immediately upon the occurrence of groundwater ingress, water percolation, flooding, artesian conditions, or waterlogging becoming apparent within any excavation. No continuous dewatering or pumping operation shall be commenced without the prior written approval of the Architect, except where required to safeguard personnel, property, completed works, or adjacent infrastructure.

The Contractor shall ensure that no nuisance, erosion, flooding, contamination, silting, pollution, settlement, or damage is caused by the collection, conveyance, treatment, or discharge of pumped water. All dewatering operations shall comply with the requirements of the Local Authority, Water Services Authority, Environmental Protection Agency (EPA), Inland Fisheries Ireland, and other statutory authorities having jurisdiction.

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D.8 Depths of Excavations

All excavations shown on the drawings are to be taken down until, in the Architects judgement, a good bearing level is reached.

D.9 Re-use of Excavated Materials

Only excavated topsoil that is suitable for re-use and free from contamination, deleterious matter, excessive stones, roots, vegetation, construction debris, and other unsuitable materials shall be re-used within the Works.

Excavated material shall not be used for backfilling around foundations, structures, services, or beneath paved, trafficked, or hard landscaped areas. Material used for backfilling in such locations shall comprise approved engineered fill suitable for the intended application and shall be placed and compacted in accordance with the Contract requirements.

Excavated material used for making up levels to cultivated areas, landscape grading, and mounding shall be clean, stable, and free from contaminants, rubble, oversized stones, and other deleterious materials. Such material shall be suitable for supporting the proposed landscaping and vegetation and shall be placed in a manner that avoids undue compaction and promotes satisfactory drainage.

D.10 Planking and Strutting

Provide and perform all planking, strutting, casing and timbering as may be required to uphold sides of excavations including drain trenches and manholes during construction.

D.11 Existing Trees and Shrubs

All existing trees, shrubs and hedgerows designated for retention shall be protected throughout the duration of the Works in accordance with BS 5837:2012, Trees in Relation to Design, Demolition and Construction – Recommendations, unless otherwise instructed by the Architect.

Temporary protective fencing shall be erected before commencement of the Works and shall extend sufficiently to protect the full canopy spread and root protection areas of retained trees and shrubs. The fencing shall be robust, clearly visible and maintained in an effective condition throughout the Contract.

The Contractor shall maintain such temporary fencing until completion of the Works or until commencement of final landscaping operations, unless otherwise directed by the Architect. Trees and shrubs identified for removal shall be felled, grubbed up and removed without damage to retained vegetation, structures, services or adjoining property. Roots, stumps, trunks, branches and arisings resulting from clearance operations shall be removed from the Site and disposed of in accordance with applicable waste management and environmental regulations. Burning of vegetation, timber, stumps, roots or other materials on Site shall not be permitted.

No excavation, storage of materials, plant operation, vehicle movement, mixing of concrete, discharge of washings, dumping of spoil, stockpiling, parking or other construction activity shall take place within protected areas. The Contractor shall take all necessary precautions to prevent contamination, flooding, compaction, erosion or the ingress of water-borne materials into such areas.

Where earthworks or excavation operations are required in the vicinity of retained trees and shrubs, all practicable measures shall be taken to avoid damage to roots, stems, trunks, branches and surrounding soil structure. Particular care shall be taken to prevent root severance, soil compaction by construction traffic, lowering of existing ground levels within root protection areas or the placement of fill over existing ground levels. Any roots exposed during excavation shall be protected from drying out, kept moist and covered as soon as practicable.

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D.12 Cultivated Areas

Planting to cultivated areas will be carried out by the Employer. Grassing, turfing and seeding shall be carried out by the Contractor, who shall complete all associated ground preparation, cultivation, grading, topsoiling and soil improvement works as specified. The Contractor shall subsequently provide the Employer and their appointed personnel with safe and unrestricted access to those areas of the Site designated for planting operations. Access shall be arranged and coordinated so that planting and any additional landscaping works may proceed efficiently and without interruption, delay or interference from the Contractor's activities.

D.13 Removal of Surplus Material

Notwithstanding any other provision of the Contract, all surplus excavated material, demolition debris, tree roots, stumps, vegetation, redundant drains, foundations, concrete, hardstanding and other unsuitable or unwanted materials arising from the Works shall be removed from the Site by the Contractor and disposed of at a suitably authorised and licensed waste facility. All transportation, handling and disposal costs shall be deemed to be included in the Contract.

Where the Contractor, for reasons of programming or construction methodology, elects to remove from the Site any excavated material that would otherwise be suitable for re-use within the Works, the Contractor shall, at his own expense, provide and import equivalent approved material to make good any resulting deficit. Such replacement material shall be suitable for its intended purpose and shall comply with the requirements of the Contract.

D.14 Destruction of Noxious Weeds

Provide for the identification, control and eradication of all noxious, invasive and injurious weeds occurring on the Site. All treatment and disposal operations shall be carried out in accordance with current Irish legislation, applicable environmental regulations and best horticultural practice.

The Contractor shall take all necessary measures to prevent the spread of weeds by seed dispersal, root fragmentation, transport of contaminated soil or movement of plant and equipment. Any arisings resulting from weed control operations shall be removed from the Site and disposed of in accordance with statutory requirements.

Particular attention shall be given to the control of species subject to legal restrictions or recognised as invasive, and all works shall be undertaken in a manner that prevents re-establishment or spread within or beyond the Site boundaries.

D.15

to Nil

D.20

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MATERIALS

D.21 Blinding for polythene membranes

Blinding for polythene membranes shall be clean soft sand free from stones and other foreign matter.

D.22 Hardcore

Unless otherwise specified, all hardcore and granular fill shall consist of approved well-graded crushed rock, gravel or recycled aggregate suitable for the intended application and complying with the requirements of the Transport Infrastructure Ireland (TII) Specification for Road Works, Series 800, for sub-base and capping materials.

Where hardcore is used beneath pavements, footpaths, roads, parking areas or other trafficked surfaces, the material shall be of a grading and classification appropriate to the loading conditions and shall be placed, compacted and tested in accordance with the Contract requirements and the relevant provisions of the Specification for Road Works.

Samples of all proposed hardcore and granular fill materials shall be submitted to the Architect for approval before use. The Contractor shall provide material test results, certificates of compliance and representative samples when requested. Independent testing by an approved laboratory may be required where directed by the Architect, and all associated costs shall be borne by the Contractor.

Hardcore and granular material beneath concrete paths, hardstanding's, floor slabs and foundations shall comply with I.S. EN 13242, Aggregates for Unbound and Hydraulically Bound Materials for Use in Civil Engineering Work and Road Construction, together with all relevant Irish National Annexes, guidance documents and current standards applicable at the date of Tender. Materials shall be tested and certified as compliant by an approved testing authority. Certificates of conformity and test results shall be retained on Site and made available for inspection upon request.

D.23 Material for filling under Paved Areas and around Foundations

Material for filling to make up levels under paved areas and for backfilling around foundations shall be as specified in the "Engineering Specification" appended and/or as indicated on the drawings.

D.24

to Nil

D.25

D.26 Filling to make up levels of Cultivated Areas

Filling to make up levels of cultivated areas and mounding shall be basically sub-soil, but may contain an admixture of coarse sand, gravel and other small hard materials up to approximately 25% of the total bulk. Sub-soil shall be free from excessive proportion of lime, any lumps of clay, rubbish, ash, clinker, concrete, weeds (eg. couch grass), roots and the like.

If filling needs to be imported the Contractor is to supply a sample for approval by the Architect.

D.27 Top Soil Generally:

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All Topsoil shall conform to BS 3882:2007 and shall be good quality medium top spit loam, easily moulded when moist but not very sticky and not leaving a smooth surface when smeared. It shall be free from sub- soil, chemical or other pollution, noxious weeds, roots, turf, couch grass, rubbish, or an excessive proportion of clay, sand, gravel, chalk or lime. It shall not contain stones or flints in quantities exceeding 10% of the total bulk and those present shall not exceed 30mm in any dimension.

Before any top soil is laid the Architect shall inspect and agree the existing levels of made up areas, the height and shaping mounds where these occur and the degree of compaction of the ground. All stones with any dimension greater than 30mm in size, weeds, roots, debris etc. shall be raked off.

The suitability of the topsoil has to be confirmed by the Architect before commencing work.

Top soil stripped from site:

Any suitable top soil stripped off the site shall be stored in areas agreed with the Architect, in suitably sized spoil heaps of not more than 2m high, and in an approved manner. The Contractor is to allow the Architect or his authorised agent, access to the topsoil heaps.

Undisturbed topsoil to be prepared as necessary by the Contractor so that it is in a suitable state for the cultivation operation i.e. seeding and planting using sand and compost.

Break up any compacted soil before spreading topsoil.

Topsoil filling for making up levels in gardens and planted areas shall, unless otherwise stated, to be flush with adjoining paving after settlement, to allow for draining into planted and grassed areas.

Top-soil, which is to be spread as Clause D 27, shall be 300mm in depth and not less than 200mm in planted areas, 150mm in grassed areas and 100mm depth for areas to be turfed as Clause D 29.

Imported topsoil:

Provide imported topsoil as necessary to make up deficiencies in existing topsoil on site, and to complete the works. Where top soil is to be imported the Contractor shall submit a sample load for approval and shall ensure that all subsequent deliveries are similar to the approved sample load.

Requirements of imported topsoil are as follows:

- Source to be approved by the Architect
- Texture shall be friable, well-aerated, with good crumb structure to BS 3882:2007
- Topsoil shall fall between pH 5.5 and 6.0 to BS 1377-3:1990.
- Nutrient content shall be nitrogen, phosphorus, potassium and magnesium with minimum index value for general purpose grade BS 3882:2007.
- Maximum size of stones in any dimension: 30mm
- Maximum stone content by dry weight : 5%
- Shall be free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, large lumps of clay or vegetation or foreign matter.

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- Shall not be stripped from under canopy of tree nor closer than 4 metres to a hedge.
- Organic material from sewage works shall not be used as a soil substitute.

D.28 Grass Seed Mixture

Grass seed shall be Department of Agriculture certified as to source, purity and germination, shall be delivered to site in sealed bags and certificates shall be handed to the Architect. The seed mixture shall, unless otherwise specified, be of a utility grade amenity (lawn) grass mixture comprised of the following species

60% Perennial Rye Grass 20% Chewings Fescue

20% Slender Creeping Red Fescue

D.29 Supply of grass turf

Turf shall be approved good quality meadow or downland turf, fibrous well rooted, mown, free from matter or dead grass and pernicious weeds, following treatment by selective weedkiller not less than three months previously and shall be cut 900mm x 300mm of regular size and shall be not less than 50mm of regular size even thickness throughout, and generally in accordance with BS 3969:1998 (+A1:2013).

The Contractor shall supply a sample for approval and all subsequent deliveries shall be equal to the approved sample.

Any turf brought onto the site, or laid prior to such approval, will be deemed to have been brought on or laid at the Contractor's risk, and he will be instructed to lift and/or cart away such turf off the site and replace and/or relay at his own expense unless instruction in writing to the contrary to be given by the Architect.

D.30 Nil.

WORKMANSHIP

D.31 Site Clearance and Preparation

Before commencing excavations, clear site of rubbish, shrubs and general vegetation, unless otherwise instructed, and remove from site in accordance with Clause D.13.

Reduce levels down to the specified formation level and store top-soil and sub-soil in separate heaps. Top- soil shall not be heaped more than 2 metres high and shall be stripped, moved and stockpiled under favourable weather conditions, to avoid compaction and loss of soil structure. Site-stripping shall only be carried out in areas where building work is to be immediately carried out.

All tree stumps and offensive matter is to be dug up and removed from site and any deep excavation so made is to be backfilled with filling in accordance with Clauses D22 and D26 as directed on site by the Architect.

In cultivated areas where new ground level is lower than existing, reduce level to a minimum of 150mm below new level for topping with top soil.

D.32 Existing Live Services

Report any live services or drains, not otherwise indicated, as soon as encountered and protect pending instructions and notify all authorities concerned.

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D.33 Disused Drains

Plug any disused drain pipes etc. cut off at the perimeter of excavations with Class F-20 concrete rammed into refusal but not less than 300mm.

D.34 Sides of Excavations

Sides of excavations shall be vertical unless otherwise directed. In the event of the Contractor taking out excavation with other than vertical sides without permission he will be required to backfill such excavation with material as directed at his own expense.

D.35 Bottoms of Excavations to be approved

The Contractor shall give the Architect at least 48 hours' notice when the excavations will be ready for inspection. The bottom of every excavation will be inspected by the Architect and the level thereof agreed between the Architect and the Contractor. If a good bearing bottom is obtained at a lesser depth than that shown on the drawings, or is not obtained at the level so shown, the Architect is to be informed. No concrete is to be laid until the bottom has been approved and the level thereof taken.

Notwithstanding such approval, any bottom which becomes waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed to the Architects satisfaction before any concrete is placed.

Notwithstanding approval as aforesaid, concrete, hardcore, etc. shall not be laid on frozen ground. Protection shall be provided to prevent the penetration of frost into the ground adjacent to or under concrete which has been placed.

D.36 Filling

Filling around foundations or to make up levels under pavings shall be executed in layers not exceeding 150mm in compacted thickness and consolidated to ensure proper compaction.

Filling to make up levels of cultivated areas and mounding shall be completed sufficiently in advance of subsequent treatment to allow for natural settlement to take place. Any settlement below the required levels shall be made up with soil and any areas panned hard by subsequent traffic shall be loosened.

Backfill shall not be placed against concrete masonry walls within 10 days of completion of wall. Building debris and standing water shall be removed from the excavation prior to backfilling. Both sides of walls shall be filled and compacted in alternate layers.

Backfilling unless, otherwise specified, under floor slabs, concrete hardstandings and pavings shall be Hardcore as Clause D.22.

Backfilling to foundation trenches under cultivated areas shall be, unless otherwise specified, shall be excavated sub-soil in accordance with Clause D.23.

Where trenches for drains or services are adjacent to and greater in depth than foundation trenches, such trenches for drains or mains shall be backfilled to the level of the underside of adjacent foundations in lean mix concrete Class F-7.5.

D.37 Consolidation of Hardcore and Granular Filling

Hardcore and granular filling material unless otherwise described, shall be consolidated to the required levels and contours in accordance with Clause 802 of "Specification for Road Works" NRA.

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Care shall be taken to ensure that no damage is done to the foundations, walls or adjoining works.

D.38 Consolidation of Formation for Paths and Pavings

After completion of excavation and consolidation of filling, the whole of the formations for paths and pavings for pedestrian traffic shall be consolidated to the required levels and contours with a roller, vibrating roller or mechanical punner to a compaction equivalent to that obtained with a 2.5 to 3 tonnes roller, care being taken that no damage is done to adjoining work.

Formations for pavings subject to vehicular traffic shall be consolidated in accordance with the "Engineering Specification" appended and/or as indicated on the drawings.

D.39 De-compaction of Sub-soil

The sub soil to landscaped and cultivated areas shall be maintained free of compaction during construction. Where heavy machinery is to be used the contractor shall ensure that these areas are properly de-compacted to a depth of 500mm.

If the subsoil becomes heavily de-compacted during building works and the de-compaction of the sub-soil does not allow for drainage, the contractor shall construct soak-pits to ensure drainage on his own cost.

Where possible all de-compaction operations shall take place in dry weather conditions when the soil profile is dry enough to fracture.

Where soil has not been de-compacted prior to hand-over, the contractor shall present alternative solutions for de-compaction to the architect. The design and timing of the above will be the responsibility of the contractor.

Any soil filling shall be deposited in 225mm layers and shall be suitably compacted in such a way that allows water to drain freely through.

D.40 Nil

D.41 Preparation of Cultivated Areas

Cultivation shall be carried out to the depths indicated with a mechanical cultivator with fixed tines or other means. All weeds and roots shall be removed and destroyed and all rubble, large stones and rubbish shall be removed and replaced with filling as Clause D.26.

Cultivation shall be completed sufficiently in advance of subsequent treatment to allow for natural settlement to take place. Any settlement below the required levels shall be made up with soil as Clause

D.26 and any areas panned hard by subsequent traffic shall be ripped and re-cultivated. Any areas ponding shall be ripped, drained and reinstated, or as otherwise instructed, to remedy problem.

D.42 Level of Cultivated Areas

Areas to be grassed over shall be graded to a uniform level depending on the contours. "Flat" grassed areas shall be graded to a general "domed" grade such that a continuous run off shall occur leaving no puddles after heavy rain.

Planted beds adjoining hard surfaces, manholes etc., shall be finished flush with such areas and grassed areas finished 25mm higher.

Section D – EXCAVATIONS AND EARTHWORKS

Where applicable finished levels shall be minimum 150mm below the D.P.C. level of the adjacent building. Surfaces shall be graded to give surface drainage away from buildings and so as to avoid ponding.

D.43 Nil

D.44 Grass Seeding Generally

Where areas are to be grass seeded it shall be carried out before handover. Where grass seeding is not appropriate due to time of year/weather, the contractor shall ensure that the areas are covered with a suitable alternative such as grass turf as Clause D 46.

The contractor will be required to mow established grassed areas twice before hand over. Grass areas shall be sufficiently established to recover fully from mowing.

All grassed areas to be treated with a weed killer and then ploughed and harrowed to a minimum depth of 150 mm and all stones larger than 30 mm, perennial weeds and rubbish shall be removed.

D.45 Sowing of Grass Seed

Before sowing a base dressing of approved fertiliser (N.P.K., 50:50:50) shall be lightly raked or harrowed into seed bed at a rate of 40g/m².

Certified seed, as Clause D28, shall be cross-sown in two directions at right angles to each other, half the seed being used in each direction, and the ground lightly raked over on a still dry day when the top 25mm of soil is dry. Seed shall be sown at a rate of 150kg/ha in open spaces and 30grams/m in gardens.

Where grass has failed, the contractor must rectify by raking over the appropriate area and re-sowing within one month from date of sowing.

D.46 Laying of Grass Turf (as Clause D29)

This clause applies where areas are shown to be turfed or required under Clause D.28.

No turf is to be brought on site, or laid, until the top soiling has been approved by the Architect.

Prior to the laying of turf, top soil shall be brought to an even tilth and necessary firmness, and thoroughly watered if dry. A base dressing of approved fertiliser (N.P.K. 50.50.50) shall be worked into the top 50mm of topsoil, at a rate of 40g/m², as the final tilth is reached.

Turfs shall be unloaded on an area clear of that to be turfed. Turf shall be laid in rows, commencing at the rear end of the area, and laid progressively by placing planks over the last row of turf laid and laying subsequent turf there from. The planks shall be moved forward as each line of turf is laid and so on to the end of the area.

Turfs shall be laid with half lapped joints, well butted up and evenly beaten, twice over the whole area with wooden turf beaters. No rollers shall be used. Any inequalities in finished levels owing to variation in turf thickness or unequal consolidation of soil shall be adjusted by raking and/or packing fine soil beneath the turfs. The finished level of turf abutting paving must be 25mm above the paving surface after laying and beating operations are completed. The Contractor shall allow for pegging on steep slopes .Turf shall not be laid in exceptionally dry or frosty weather.

D.47 Maintenance of Grassed Areas

Section D – EXCAVATIONS AND EARTHWORKS

The Contractor shall carry out at least two cuts of grass to all seeded areas and in any event maintain grassed areas until handover.

Maintain the condition of grassed areas by:

- Grass cutting as Clause D48.
- Re-form edges abutting paths, borders, manhole covers and the like with a suitable edging tool, to form clean straight lines or smooth flowing curves. Form a clean edge, sloping slightly back from vertical.
- Draw back soil from edges to permit the use of edging shears and remove debris.
- Make good worn or damaged areas by re-seeding to BS 7370-3:1991, Clause 12.6, using seed to match the existing in appearance and quality.
- Provide suitable protection and watering to promote successful germination and/or establishment. Turfed areas to be watered, as necessary, to avoid shrinkage.
- The prompt removal of litter, fallen leaves and other rubbish.

D.48 Grass Cutting First cut:

When grass is 60 mm high remove debris, litter and all stones and earth clods larger than 25 mm in any dimension. When grass is reasonably dry, cut at the second cut to approximately 30 mm high, Removed all cuttings and debris from site.

Generally:

Remove litter, rubbish and debris from grassed areas before mowing. The height of growth must not exceed 50 mm at any time. Cut as and when necessary to a height of 25 mm, using a cylinder mower.

Cut to a neat even finish, without rutting or compaction of the surface, especially when ground conditions are soft.

Leave edges neat and well defined.

At the time of each cut, neatly trim all grass edges round the base of trees, manholes, the base of lighting columns and the like and remove all cuttings. Sweep all adjoining hard areas clear of cuttings and remove.

Do not cut during periods of drought, or when ground conditions or grass are wet, without the prior agreement of the Architect.

Do not allow nylon filament rotary cutters or other mechanical tools closer than 100 mm to the stem of any tree or plant. Complete operations close to stems using hand tools.

When seeded areas are well established, form edges to planting beds and around newly planted trees with a suitable edging tool, to form clean straight lines or smooth curves. Draw back soil from edges to permit use of edging shears and remove all cuttings

D.49 Repair of Damaged Areas

Any shrinkage, to cultivated areas, below the finished levels shall be rectified at the Contractors own expense at the end of the Defects Liability Period.

The Contractor shall also rectify and overseed any bare patches caused to grassed areas, in accordance with Clause D.47 up to the end of the Defects Liability Period excepting any grass destroyed or damaged by vandalism or similar cause through no fault of the Contractor.

Section D – EXCAVATIONS AND EARTHWORKS**Appendix A: List of References and Specifications.**

Item No.	Clause	Reference	Comment
1.	D.11	BS 5837:2012	Trees in relation to design, demolition and construction – Recommendations.
2.	D.22	“Specification for Road Works” by NRA (www.nre.ie)	Clauses 803 and 804.
3.	D.22	IS EN 13242:2013	Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction.
4.	D.22	Annex E of SR:2004 (+A1:2007)	Guidance on the use of IS EN 13242:2013 (at the time of most recent revision of Section D - Excavations and Earthworks, document SR 21:2004 was still current but under review for amendment at time of this spec revision in October 2013)
5.	D.27	BS 3882:2007	Specification for topsoil and requirements for use. (to replace BS 3882:1994)
6.	D.27	BS 1377-3:1990	Methods of test for soils for civil engineering purposes – Chemical and Electro-chemical tests, (added date)
7.	D.29	BS 3969:1998 (+A1:2013)	Recommendations for turf for general purposes. (to replace 3969:1993)
8.	D.47	BS 7370-3:1991	Grounds maintenance – Recommendations for maintenance of amenity and functional turf (other than sports turf) (added date)

LIST OF CLAUSES E

BUILDING CONTROL

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APPENDIX A: LIST OF REFERENCES AND STANDARDS

Section E – ENERGY PERFORMANCE

E.0 Compliance with Materials & Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. no.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with the CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERAL (New build + Retrofit)

E.1 Energy Performance generally

New dwellings and refurbishment of existing dwellings shall achieve a set standard of energy performance set out by the latest building regulations. The Job Architect shall use the Building Energy Rating benchmark system to set a target for the proposed dwelling's final use energy performance.

The Job Architect shall insert the BER target of the dwellings as: **A BER rating of no worse than (Insert rating here) for each dwelling.**

E.2 BER (Building Energy Rating) Testing

A Building Energy Rating test shall be conducted by an accredited SEAI BER Assessor and shall carry out the BER test in a competent and professional manner.

INSULATION

E.3 Insulation Generally

All insulation to be provided in all locations specified and/or shown on drawings so designed as to meet current U-Values stated in the current Technical Guidance Document, Part L: Conservation of Fuel and Energy for Dwellings.

E.4 Glass Fibre Mats

Glass Fibre mats for thermal insulation (Thickness as shown on drawings) shall comply with IS EN 13162:2012, while having a thermal conductivity of no more than 0.045W/mK. Manufacturer's or suppliers certificates of compliance with the standard shall be provided when requested by the Architect.

E.5 Rock Fibre Mats

Rock fibre mats (Rockwool) for fire stopping and thermal insulation (Thickness as shown on drawings) shall comply with IS EN 13162:2012, while having a thermal conductivity of no more than 0.045W/mK. Manufacturer or suppliers certificates of compliance with the standard shall be provided when requested by the Architect.

E.6 Insulation for Concrete Ground Floors

Insulation for concrete ground floors shall be of High performance rigid Polyisocyanurate (PIR) insulation board (Thickness as shown on drawings) and shall comprise of a CFC-free rigid urethane core with low emissivity composite foil facings on both sides,

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(‘Kingspan ThermaFloor TF70’ or equivalent), while having a thermal conductivity no more than 0.022 W/mK), unless otherwise shown in drawings. The insulation shall extend under the entire floor with perimeter insulation provided at the vertical edges as shown on the drawings. All Polyisocyanurate insulation shall comply to IS EN 13165:2012

E.7 Insulation for Suspended Timber Floors

Insulation for suspended timber floors shall be High performance rigid Polyisocyanurate (PIR) insulation board (thickness as shown on drawings) and shall comprise of a CFC-free rigid urethane core with low emissivity composite foil facings on both sides, (‘Kingspan ThermaFloor TF70’ or equivalent), while having a thermal conductivity no more than 0.022 W/mK), unless otherwise shown in drawings. All Polyisocyanurate insulation shall comply with IS EN 13165:2012.

E.8 Cavity Wall Insulation

Cavity wall insulation shall be high performance rigid phenolic insulation board (thickness as shown on drawings) comprising of a CFC-free rigid insulation core with low emissivity composite foil facings on both sides and having a thermal conductivity of no more than 0.020 W/mK, (Kingspan Kooltherm K8 Cavity Board’ or ‘Xtratherm Safe-R partial fill cavity board’ or equivalent), unless otherwise shown in drawings.

Or (Job Architect shall delete where appropriate)

High performance rigid polyisocyanurate (PIR) insulation board (thickness as shown on drawings), comprising of a CFC-free rigid insulation core with low emissivity foil facings and having a thermal conductivity of no more than 0.021 W/mK, (XtroLiner XO/CW Partial fill cavity board’ or equivalent), unless otherwise shown in drawings.

E.9 External Wall Insulation

External wall insulation shall be high performance rigid phenolic external insulation board (thickness as shown on drawings) comprising of a CFC-free rigid insulation core with low emissivity composite foil facings on both sides, (Kingspan Kooltherm K5 External Wall Board’ or equivalent), while having a thermal conductivity of no more than 0.020 W/mK, unless otherwise shown in drawings. All Phenolic foam insulation to comply with IS EN 13166:2012.

All ETICS (External Thermal Insulation Composite Systems) shall comply to IS EN 13499:2003.

E.10 Insulation to Timber Roof Spaces (Warm and Cold roof Design)

Roof insulation material (including its thickness and method of laying may vary from contract to contract. The Contractor must check the tender drawings and confirm the requirements with the Architect before work commences. Generally roof insulation shall be: -

Cold Roof Design

Insulating mat for thermal insulation to timber pitched roof spaces shall be mineral wool mat as Clauses E.5 and E.6 with a total thickness of 300mm and have a thermal conductivity of no more than 0.044W/mK., unless otherwise described. The mat shall be laid between joists (or trusses if specified) for full extent of roof-space, (excluding under the water tank), and tucked tightly to the joists and carried over the wallplate ensuring that the insulation does not obstruct the ventilation path from the roof eaves. Installation shall be by a specialist firm approved by the Architect.

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In addition to the mineral wool mat insulation to timber pitched roof spaces the ceiling board shall be a composite laminate comprising of 12.5mm plasterboard bonded to 30mm thick high performance CFC- free rigid urethane insulation board during manufacture, (Kingspan Thermawall TW56, with an overall thickness of 42.5mm, or equivalent). Unless otherwise shown on the drawings, Installation, workmanship, and storage shall be in accordance with the manufacturer's recommendations. The boards must be placed with the long edge running perpendicular to the joists or battens and all edges must be supported with a minimum of 20mm support. Provide noggins between joists longitudinally and at right angles to support board edges.

Note: Use of Polystyrene board and bead insulation is prohibited for use as insulation in an attic space, unless requested by the Architect.

Or (Job Architect shall delete where appropriate)

Warm Roof Design

Insulating board for thermal insulation to timber pitched roof spaces shall be high performance rigid insulation, (Kingspan Kooltherm K7, or equivalent), while having a thermal conductivity of 0.020 W/mk), and shall be placed between the roof rafters supported by battens giving a minimum of 20mm support for the long board edges.

The insulation must not obstruct the 50mm minimum space provided for the passage of air to remove condensation from the roof space. In addition to the rigid board insulation shall be a composite laminate comprising of 12.5mm plasterboard bonded to 30mm thick high performance CFC-free rigid urethane insulation board during manufacture (Kingspan Thermawall TW56, with an overall thickness of 42.5mm, or equivalent). Unless otherwise shown on the drawings, Installation, workmanship, and storage shall be in accordance with the manufacturer's recommendations. The boards must be placed with the long edge running perpendicular to the rafters or battens and all edges must be supported with a minimum of 20mm support. Insulation must not obstruct the ventilation path at the roof eaves to the roof space, and a minimum air space shall be provided between the insulation layer and the underside of the roof weatherproof membrane/sarking felt.

E.11 Loft Hatch Insulation

Insulate trap door with high performance rigid urethane insulation board as clause E.8.

For new dwellings loft hatches servicing a cold roof design must be properly sealed with around the edges of the door to ensure there is no passage for draughts by installing EPDM draught excluder strips along the doors edge. Trap door build as Clause N.59. See drawings for appropriate detailing.

E.12 Cold Bridging

Provide Expanded Polystyrene insulation board (Thickness as shown on drawings) to prevent "cold bridging" as shown at details indicated on the drawings. Expanded Polystyrene board for thermal insulation shall comply with IS EN 13163:2012 and unless other wise specified shall be Grade SD Type A of the thickness shown on the drawings.

Note: Expanded Polystyrene must not come into contact with P.V.C, insulated electric cabling.

E.13 Fire Stopping to Ducts

Provide and fit fire stopping plasterboard around all ducts that penetrate compartment spaces. Minimum of 2 hour fire integrity rating is required for the plasterboard material, ('Gyproc Fireline plasterboard' or equivalent), and shall consist of 2 layered boards with staggered jointing to prevent passage of smoke.

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Final construction shall meet the specifications set out in the Fire Safety Certificate in order to satisfy compliance with TGD, Part B.

Unless otherwise described fire stopping at pipe penetrations at compartment floors and walls shall consist of that stated in Clause R.9.

E.14 Insulation of Plumbing and Heating Services

Insulation of hot and cold plumbed services shall be as set out in Section R Plumbing Installation, Clause R/W/17.

Insulation for central heating services shall be as set out in South Dublin County Council Standard Specifications for Gas, Oil, or Solid Fuel Central heating systems in New and Existing houses.

E.15 Alternative Materials

Where it is proposed to use an alternative insulating products they shall be certified to have the same performance, or better, and be of the same thickness than those specified above.

In any event all insulating materials shall be approved by the Architect before delivery to site.

AIRTIGHTNESS

E.16 Airtightness Generally

All homes must reach Airtightness requirement listed in the Technical Guidance Document, Part L: Conservation of Fuel and Energy in Dwellings. The Contractor shall be responsible for achieving the airtightness levels set by the latest requirements of TGD part L: Conservation of Fuel and Energy in Dwellings, and shall co-ordinate between subcontractors to establish the extent of their responsibilities

The Contractor shall highlight any elements of work within the identified airtight envelope, which may present a risk of the final air test failing and make them known to the Architect.

New builds shall be sealed at areas shown on general drawings to ensure and continuous and effective Airtightness envelope is created.

E.17 Air permeability test method

All air permeability tests shall be carried out by an individual that has been accredited and approved by a third party, (e.g.: National Standards Authority of Ireland), to carry out the test. All air permeability tests must comply with the procedures of I.S. EN 13829:2000.

For one off houses a single test is required, however in the case of a large development of housing units the number of tests required is dependent on the Table 4, 'Number of Pressure tests per dwelling type' in Technical Guidance Document, Part L: Conservation of Fuel and Energy in Dwellings.

New builds must pass an air permeability test to ensure that the building is achieving a rate of less than $7\text{m}^3/(\text{h.m}^2)$ @ 50 Pascals. If the building air leakage is greater than the required value then the Contractor shall arrange for appropriate remedial action to be taken.

If building fails to pass a test then remedial work is to be carried out before another test commences on the same test house until the building has achieved a satisfactory level of compliance. Any additional buildings built after the most recent test of its type should

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be given the same remedial work as given the complaint test building.

E.18 Vapour Control Barrier

The vapour control barrier shall be of polyethylene ('Pro Clima Intelligent airtight system 'INTELLO PLUS' from www.ecologicalbuildingsystems.ie, or equivalent) and shall comply with IS EN 13984:2013. The vapour control barrier must be continuous in its surrounding of the building's envelope and must be tape to appropriately to other building elements such as doors and windows as to the manufacturer's recommendation with the Architects approval. All vapour control barriers and accessories shall at the time of installation have a valid NSAI Agrément Certificate.

OR (Job Architect shall delete where appropriate)

A well-built inner concrete wall leaf with a coat of wet-finish plaster can if properly applied alongside proper detailing can provide an airtight layer.

E.19 Sealing of Vapour barrier

All horizontal and vertical overlaps of the vapour control barrier must be a minimum of 150mm overlap with double back jointing tape between the two laps and then sealed using a sealing tape recommended by the manufacturer.

E.20 Areas of General Air Leakage

The Contractor is required to take into account the possible air leakage points that can appear in an airtight envelope. The Contractor shall also highlight any elements of work within the indentified airtight envelope, which may present a risk of the final air test failing and make them known to the Architect.

The Contractor's attention is drawn to the following list of areas where air leakage can occur in the building's airtight envelope. NOTE: This list does not include all areas of air leakage from the building and is NOT a minimum benchmark that should be aimed for.

Section E – ENERGY PERFORMANCE

Common Areas of Air Leakage	Method of Airtightening
Window and door openings.	All window and door surrounds shall be appropriately weather sealed and taped to prevent air leakage.
Pipe penetrations through the exterior walls or ground floor.	Seal around pipes that penetrate the exterior wall and ground floor creating a draught-proof seal at the pipe's penetration of the envelope.
Pipe Penetrations to the Roof Space.	All pipe penetrations into the roof space shall be sealed and taped to create a draught-proof seal.
Ground Floor meeting Exterior wall	Seal between the floor, wall and air barrier layer shall be appropriate sealed
Intermediate Timber Joist Floor and Exterior Wall junction.	Where the airtightness barrier meets an upper floor connecting the building's exterior wall the barrier shall be sealed and taped to the underside and topside of the floor's substructure (E.g. plasterboard, plywood, MDF), unless shown on drawings.
Intermediate Concrete Floor and Exterior Wall junction.	Where the airtightness barrier meets an upper floor connecting the building's exterior wall the barrier shall be sealed and taped to the underside and topside of the floor's concrete structure, unless shown on drawings.
Existing timber joists built into external wall.	Existing timber joists built into the exterior walls shall have applied mortar to close any gaps between the concrete wall and the timber. Then sealed and taped to prevent air leakage. This shall be repeated at all instances where joists penetrate the exterior wall.
Underside of ceiling joists to the exterior wall.	As above the airtightness barrier shall be sealed and taped the underside of the ceiling joists substructure (E.g. Insulation board or plasterboard), unless show on drawings.
Loft Hatch to Attic space	The surround of the Loft hatch shall be appropriately sealed and the loft hatch to be fitted with EPDM draught strips to prevent air leakage between the hatch board and the hatch frame.

Further information on acceptable airtightness details can be found in the 'Acceptable Construction Details' by the Department of Environment, Community, and Local Government. www.environ.ie

VENTILATION**E.21 Room Ventilation**

Provision requirements providing adequate air exchange for room ventilation can be found in TGD Part F; Ventilation.

E.22 Mechanical Ventilation with heat recovery

Mechanical ventilation units with fitted heat recovery system shall conform to the room ventilation requirements listed in section 1.2.3.1 of the TGD Part F; Ventilation. The unit's location, ventilation inlets/outlets, and ducts runs shall be in accordance to the

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manufacturer's instructions.

Contractor's attention is drawn to the calculation table and requirements for the MVHR system can be found in the TGD Part F; ventilation.

E.23 Passive Stack Ventilation

Passive stack ventilation system for use in room ventilation ('Intelligent Passive Stack Ventilation from Passivent or equivalent) with a mechanical assisted fan shall be installed in according to BRE IP 13/94.

Appendix A: List of References and Standards

Item No.	Claus e no.	Reference	Comment
1.	E.1	Technical Guidance Document, Part L:2011	Part L 'Conservation of Fuel and Energy' 2011 edition. by Department of Environment, www.environ.ie
2.	E.5	IS EN 13162:2012	Thermal insulation products for buildings – factory made mineral wool (MW) products – Specification.
3.	E.8	IS EN 13165:2012	Thermal insulation products for buildings – Factory made rigid polyurethane foam (PU) products – Specification.
4.	E.13	IS EN 13163:2012	Thermal insulation products for buildings – factory made expanded polystyrene (EPS) products – Specification.
5.	E.18	IS EN 13829:2000	Thermal performance of buildings – determination of air permeability of buildings – Fan pressurization method.
6.	E.19	IS EN 13984:2013	Flexible sheets for waterproofing – Plastic and rubber vapour control layers – Definitions and characteristics.

LIST OF CLAUSES F

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F.2 Dimensions F.3

To Nil

F.4

MATERIALS

F.5 Portland Cement

F.6 Aggregates

F.7 Mixing Water

F.8 Admixtures

F.9 Curing Compounds F.10

To Nil

F.11

F.12 Readymixed Concrete Generally

F.13 Concrete Mixes F.14

To Nil

F.15

F.16 Reinforcement

F.17 Expansion Joint Filler

F.18 Nil

F.19 Precast Concrete Window Sills

F.20 Prestressed concrete Lintels

F.21 Precast concrete door Sills

F.22 Precast concrete chimney cappings F.23

To Nil

F.25

TESTING

F.26 Testing Generally

F.27 Slump Tests to Concrete

F.28 Cube Tests to Concrete F.29

To Nil

F.30

WORKMANSHIP

F.31 Plant and Method

F.32 Reinforcement

F.33 Formwork

F.34 Nil

F.35 Tolerances

F.36 Concrete in Cold Weather

F.37 Placing and compaction

F.38 Construction Joints

F.39 Nil

F.40 Striking times and loading of foundations etc.

F.41 Curing

F.42 Damage from Disturbance etc.

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F.43	Holes and Chases and Casting	In F.44
To	Nil	
F.45		
F.46	Surface Finishes	
F.47	Damp Proof Membranes	
F.48	Radon barriers	F.49
To	Nil	
F.50		

CONCRETE PAVING AND HARDSTANDINGS

F.51	Generally	
F.52	Services	
F.53	Levels and Alignment	
F.54	Concrete Bays	
F.55	Surface Finishes to Pavings	
F.56	Nil	
F.57	Expansion Joints in Concrete	Hardstandings
F.58	Movement Joints in Kerbs and	Pavings
F.59	Curing of in-site Concrete Pavings and	Hardstandings
F.60	Damage	

APPENDIX A: LIST OF REFERENCES AND STANDARDS Compliance with Materials and**Workmanship with the Building Regulations**

In order to demonstrate conformity with the Building Regulations (Part D; Materials and workmanship), and with the Construction Products regulation (regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. No.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) A CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is required to demonstrate this means of manufacturer's confirmation, or independent testing certificate.

GENERALLY**F.0 Concrete Generally**

All concrete shall be ready mixed concrete unless otherwise approved, in which case a supplementary specification will be issued. The Contractor shall ensure that the ready mixed concrete supplier is provided with copies of Clauses F1 to F13 and F26 to F28.

F.1 Dimensions

Figured dimensions on detailed drawings of reinforced concrete indicate measurements to actual concrete faces and do not include for any plaster or other finish which will be additional to such dimensions.

F.2	
to	Nil
F.3	

Section F – CONCRETE WORK**MATERIALS****F.4 Portland Cement**

All Portland Cement used in the construction of the works shall comply with the requirements of IS EN 197-1:2011 and IS EN 197-2:2014. Manufacturers of the cement shall be licensed under the Irish Standard Mark Licensing Scheme of the N.S.A.I.

Suppliers of cement, concrete, concrete products and other cement-based products shall certify that the cement used in these products complies in all respects with the above provisions. Copies of this certificate shall be submitted to the Architect with the first delivery and thereafter on request.

Both the Standard Mark and information prescribed under the licensing scheme shall be inscribed on each bag of cement or in the case of bulk cement accompanying the delivery documentation of each delivery.

F.5 Aggregates

All fine aggregate (sand) and coarse aggregate shall be well washed and graded and shall conform to IS EN 12620:2013.

Pit run material will not be permitted to be used for reinforced concrete work. Marine aggregates shall not be permitted.

Aggregates for exposed concrete shall be free from all impurities likely to cause discoloration.

F.6 Mixing Water

Mixing water shall be from the municipal supply only and comply with IS EN 1008:2002. No water shall be added after mixing.

F.7 Admixtures

No admixtures or cement replacement materials shall be used unless approved or instructed by the Architect in writing. Any admixture shall comply with IS EN 934-2:2009 (+A1: 2012).

Permission will not be given for the use of admixtures containing calcium chloride.

F.8 Curing Compounds

Curing compounds shall be a spray applied liquid membrane complying with Clause 1027 of "Specification for Road Works: " NRA. (Sika Antisol 90, or equivalent).

F.9
to
F.10

Nil

F.11 Readymixed Concrete generally

Readymixed concrete, in all respects, including mixing, transporting and delivery, shall comply with the requirements of IS EN 1996-1-1: 2005 (+A1:2012) and IS EN 206-1:2002 as Designed mixes.

Section F – CONCRETE WORK

Composition of the mixes shall conform to Clause F.13 except when otherwise approved or instructed by the Architect in writing.

Concrete shall be obtained from a depot approved by the Architect who may visit it at any time to assure himself that the provisions of this Specification are complied with. The Contractor shall make written application to the Architect stating the name of the supplier and the address of the particular depot.

Written approval must be obtained prior to the commencement of concreting. Such approval will be in respect of one depot only and supplies shall not be obtained from any depot other than that approved without the written consent of the Architect.

Concrete for exposed work shall be of uniform colour and texture consistent with the appropriate approved sample and the Contractor shall inform the supplier whenever any batch is required for such work. The appropriate Mix Designation, as shown in Clause F.13 shall, without exception, be quoted in all documentation relating to the concrete specified in this Contract. Delivery tickets in accordance with IS EN 206-1: 2002 shall be provided by the supplier for each batch. In addition to the requirements of IS EN 206-1: 2002, each ticket shall state the actual cement content of the batch. The Contractor shall retain all delivery tickets until the end of the Defects Liability Period.

F.12 Concrete mixes

Unless otherwise specified the concrete mixes in the various sections of the works shall be designed mixes in accordance with IS EN 1996-1-1:2005 (+A1:2012) and IS EN 206-1:2002 as set out in Table A below. General locations of the mixes are indicated in Table B.

The characteristic strengths shown in the Tables are to be regarded as absolute minimal. In the event of any portion of the structures giving characteristic strength tests less than the stated minima, the Architect may require the Contractor to carry out a loading test in the manner outlined in BS EN 1992-1-1:2005 and should such a test prove unsatisfactory the Contractor will be required to take down the defective structure and replace it at his own expense. Whether or not the loading test is satisfactory the cost of such test is to be borne by the Contractor.

TABLE A - DESIGNED MIXES				
Mix Designation	F-40	F-30	F-20	F-7.5 Lean Mix
Cement Type	OPC	OPC	OPC	OPC 7.5
Characteristic Strength (N/mm ²)	40	30	20	20mm
Aggregate Size (mm)	20mm	20mm	20mm	100
Minimum Cement Content (kg/m)	350	300	220	
Slump (± 25mm)	5mm	50mm	50mm	50mm

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TABLE B - LOCATION OF CONCRETE MIXES	
Mix Designation	Location
F-40	Slabs to Caravan Bays (Halting Sites Only) Retaining Walls Kerbs and Channel Blocks
F-30	Foundations to walls. Floor slabs. R.C. Ring Beams and Columns Concrete Padstones.
F-20	Paving to perimeter of dwellings. Driveways, Public Footpaths, Bases to fence posts, railings, bollards, barriers etc, Benching, haunching and surrounds to drains, pipes, ducts, and covers to manholes.
F-7.5	Lean mix for filling and making up formation levels. Cavity wall fill

F.13
to
F.14**Nil****F.15 Reinforcement**

Reinforcement shall comply with the following standards:-

- i. Mild Steel - BS 4449:2005 +A2:2009
- ii. Cold Worked deformed bars - BS 4449:2005 +A2:2009
- iii. Steel fabric - BS 4483:2005

All reinforcement shall be stored by type, size and length either off the ground on properly constructed racks or on clean surfaced areas. All reinforcement is to be certified by an independent third party as complying with BS 4449:2005+A2: 2009, i.e. CARES or equivalent third party certification body for reinforcing steel.

F.16 Expansion Joint Filler

Expansion joint filler shall be bitumen impregnated fibre board ("Flexcell" or equivalent) 13mm thick unless otherwise shown on drawings.

Section F – CONCRETE WORK**F.17 Nil****F.18 Precast concrete window cills**

Precast concrete window cills shall be of approved manufacture to the dimensions shown on the drawings and complying with IS 89-1:1981 in respect of materials and workmanship.

Aggregates used shall be free from pyrite or other impurity. Contractors may be required to obtain and provide proof of testing of aggregates for pyrite content.

F.19 Prestressed concrete lintols

Precast prestressed concrete lintols shall comply with IS EN 845-2:2013 (+NA:2013).

Aggregates used shall be free from pyrite or other impurity. Contractors may be required to obtain and provide proof of testing of aggregates for pyrite content.

F.20 Precast concrete door cills

Precast concrete door cills shall be of approved manufacture to the dimensions shown on the drawings. Reinforcement shall be 4 No. 6mm dia. M.S. Bars and materials and workmanship shall generally be in accordance with I.S. 89-1:1981.

F.21 Precast concrete chimney cappings

Precast concrete chimney cappings shall be to the sizes shown on the drawings. Reinforcement shall be a minimum of 2 No. 8mm M.S. bars all round.

F.22
to
F.25

Nil

TESTING**F.26 Testing Generally**

Testing shall be carried out in accordance with IS EN 206-1:2002 and the provisions of Clause B33, B34 and B35.

Sampling and testing of concrete shall be in as set out in Clauses F.27 and F.28 or as otherwise specified by the Architect. Where there is no appropriate provision in the relevant "Standards" the methods to be used shall be agreed prior to carrying out the work.

The Contractor shall supply all necessary apparatus for testing of concrete in the field.

F.27 Slump Tests to Concrete

A slump test shall be taken on each delivery of concrete and results recorded. The slump tests shall be carried out in accordance with IS EN 12350-1:2009,

IS EN 12350-2:2009 and IS EN 12350-4:2009. A load from which the result of a slump test exceeds the appropriate permitted tolerance shall be adjudged not to be in accordance with this Specification.

F.28 Cube Tests to Concrete

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The Contractor shall make a set of three 150mm test cubes, from a sample taken from a single batch from each 21 cubic metres of concrete, of each designed mix, or from each days supply if less than this, or at a greater frequency if directed by the Architect.

All tests shall be conducted in the presence of the Job's Architect or Clerk of Works.

The cubes shall comply with IS EN 12390-1:2012 and shall be made, stored and cured in a curing tank in accordance with IS EN 12390-2:2009. Cubes shall be properly identified and delivered to an approved test laboratory, as Clause B.34, for testing in accordance with IS EN 12390-3:2009(+COR:2011), IS EN 12390- 6:2009 and IS EN 12390-7:2009.

For every sample and test a record shall be kept on site including the part or parts of the structure represented.

Single cubes from each set, as described above, shall be tested for compressive strength at 7 days, and the remaining two at 28 days, unless otherwise instructed by the Architect.

In the absence of more accurate data, the values obtained from 7-day cubes may be compared with the required values by conversion into equivalent 28-day values by incrementing by one third (or such other factor as decided by the Architect).

Each result shall be judged for compliance against the characteristic strength given in Tables A & B.

As a consequence of non-compliance, the Contractor shall bear the costs of any further testing required to establish the acceptability of the concrete in the works. The result obtained from a 7 day cube shall not of itself constitute a proof of non-compliance, or of compliance.

F.29
to
F.30

Nil

WORKMANSHIP**F.31 Plant and Method**

Before the commencement of any work, the Contractor shall submit the following for the Architect's written approval:

- (i) The concreting method including the methods of transporting, placing and compacting.
- (ii) Details of formwork proposals and the methods of achieving surface finishes including fixing of linings together with position of joints.
- (iii) The proposed position and type of every construction joint not already shown on the Architect's drawings.

Such approvals by the Architect shall not be deemed to relieve the Contractor or his obligations to comply with any of the provisions herein.

F.32 Reinforcement

Reinforcement shall be free from all loose mill scale, loose rust, oil, grease or similar defects, immediately before placing the concrete. It shall be bent cold exactly to detail

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using an approved bending machine.

Hooks, bobs, bends, etc., where not specifically detailed are to be in accordance with BS 8666:2005 (+A1:2008). Each bundle of bent bars shall be clearly tagged with the bar list number. Reinforcement shall be placed in the exact position shown on drawings with all intersections securely tied with 1.6mm dia. soft iron tying wire, or tack welded in accordance with BS EN ISO 17660-1:2006 and BS EN ISO 17660-2:2006.

The designated cover (25mm minimum) generally in accordance with BS EN 1992-1-1:2005 (+COR:2010), shall be maintained by approved purpose made spacers or concrete pads fixed to the reinforcement, the use of pieces of brick, block tile or timber will not be permitted.

No laps or splices in bars shall be made except those detailed on the drawings, without prior approval of the Architect. The size and position of the reinforcing bars or mesh shall be approved by the Architect before concreting commences. The insertion of reinforcement into concrete already placed, the lengthening of bars by welding and the re-bending of incorrectly bent bars will not be permitted. For concrete having exposed surfaces, reinforcement shall be assembled and placed in such a manner as to avoid any damage to formwork faces.

Where reinforced concrete slabs or walls are constructed against tanking care shall be taken in positioning reinforcement to avoid damage to tanking.

F.33 Formwork

Formwork shall be true to line, level, face and profile and be of robust construction adequately framed, braced, struttred, cramped, tied and propped to restrict deformation due to constructional loads to not more than 5mm and to entirely eliminate deformation of the form faces by warping or buckling.

Wire ties will not be permitted. Formwork shall be grout-tight under all conditions including vibration when specified or used. Formwork shall be designed to allow prefabrication of conveniently sized elements to facilitate ease of handling and assembly, to permit striking without force, shock or any damage whatever to the concrete member or formwork face and to permit the removal of sides without disturbing soffits and without disturbing necessary props.

Propping shall be carried down to an approved bearing, shall not be supported by timber floors and shall be so arranged that formwork may be lowered smoothly.

Re-propping will not be permitted. Provision shall be made for cleaning out and draining. Formwork shall be constructed of material or lined with material as may be necessary to produce a satisfactory surface to receive applied finishes as indicated or to achieve the finishes specified in Clause F.46 and in such a manner as to eliminate screw or nail head imperfections. Before each use, form faces shall be treated with the minimum amount of an approved mould oil necessary to obtain a clean release. The use of cement retarders will not be permitted. Immediately prior to concreting, formwork shall be thoroughly cleaned out and re-checked.

No placing shall commence until the Clerk of Works has inspected the formwork and given his consent for concreting to proceed, but such consent shall not relieve the Contractor of his responsibility for its sufficiency. After striking, formwork shall be cleaned, stacked and protected and, before re-use, shall be serviced, made good or replaced with new as may be necessary to maintain the finish and standard specified.

Section F – CONCRETE WORK**F.34 Nil****F.35 Tolerances**

The maximum tolerances within which concrete work shall be constructed are as follows:-

1. All setting out dimensions + 6mm
2. Sections of concrete members + 3mm
3. Surface level of floor slabs + 6mm
4. Plumb of columns and walls in storey height + 6mm
5. Plumb of columns and walls in full building height + 20mm

Any rectification of work not constructed within the tolerance set out above, shall be entirely at the responsibility and expense of the Contractor.

F.36 Concreting in Cold Weather

Concrete shall not be placed on or against frozen ground or frost covered formwork. Placing of concrete at air temperature below 3° will not be permitted unless the Contractor first obtains the Architect's written approval of detailed proposals for sufficient heating and shielding to ensure a minimum temperature of 4° in the concrete when placed and thereafter to maintain a temperature in the concrete of not less than 3° until thoroughly hardened.

Guidance on suitable precautions may be found on the Concrete Society website www.concrete.org.uk.

All concrete damaged by frost shall be removed and replaced by the Contractor at his own expense. A continuous daily record of the maximum and minimum air temperature shall be maintained in an approved manner on site.

F.37 Placing and compaction

The concrete shall be placed and compacted in its final position within 2 hours of mixing. The time of mixing shall be recorded on the delivery note for each load.

When the concrete is delivered, the complete batch shall be discharged in one operation and the concrete so discharged shall not be modified by the addition of further water or in any other manner.

No traffic whatsoever, wheeled or foot, shall take place over reinforcement or placed concrete and the Contractor shall provide all necessary stools, walkways, platforms and barrow runs.

Concrete shall be placed in this final position as rapidly as practicable by methods which preclude segregation or loss of ingredients; compaction shall be completed before initial set commences. Partially set concrete shall not be re-worked or used. "Flowing" in formwork shall be avoided by placing and compacting in shallow layers in quick succession. All concrete shall be deposited as near to its final position as practicable to

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avoid rehandling. No concrete shall be dropped a distance of more than 2 metres.

Concrete shall be thoroughly compacted and carefully worked, with suitable tools, into formwork and round reinforcement and fixtures so as to avoid displacement. A competent steel fixer shall attend throughout to correct any unavoidable displacement.

Where compaction is by means of vibrators, these shall be of an approved pattern of the immersion type. Accidental contact with reinforcement shall be avoided. Vibration shall be executed by a competent operative and shall not be carried out to the detriment of adjacent partly hardened concrete.

No surplus water shall be visible on the surface of concrete on completion of compaction.

Foundations shall be placed in their full depth in one operation and the top surface carefully levelled. The greatest care shall be taken when depositing concrete in foundations to ensure that it is rammed closely against the face of the trenches in order that there is no subsequent settlement or disturbance to the ground.

Concrete placed in timbered excavations shall be well rammed close against the excavation face as the timber is withdrawn. Where this cannot be done, the runners or poling boards must be left in and not subsequently removed.

All concreting shall be continuous to completion or to an approved construction joint.

All defective concrete caused by bad placement, compaction or defective formwork shall be removed and replaced, as directed by the Architect, at the Contractors expense.

F.38 Construction Joints

All construction joints shall be straight, truly vertical or level as the case may be, of the profile shown and formed in the exact positions shown on drawings or previously approved. Vertical joints shall be formed against adequately secured rigid stop boards, designed to pass the continuous steel reinforcement without temporary binding or displacement. An adequate and acceptable key for succeeding work shall be formed.

As early as possible on the day after casting, stop boards shall be removed and the joint faces vigorously wire brushed and washed to remove laitance and expose the coarse aggregate. Similar exposure of horizontal joint faces shall be effected an hour after placing carefully using a soft brush and water.

Immediately before placing adjacent concrete, the joint face shall be dry brushed or pressure blown thoroughly clean, wetted and treated with a thin layer of freshly mixed mortar similar in all respects to that present in the concrete to be placed. For exposed finishes, care shall be exercised to preserve an unbroken line at the exposed edge of the joint. Any necessary construction joints in mass concrete strip foundations shall be halved and lapped with a projection equivalent to half the depth.

Construction joints shall also be arranged to minimise the effect of shrinkage.

F.39 Nil**F.40 Striking times and loading of foundations etc.**

Section F – CONCRETE WORK

It shall be the Contractor's responsibility that no distortion, damage, overloading or undue deflection is caused to the structure by the striking of formwork by the Architect reserves the right to delay the time of striking in the interest of the work. Formwork shall not be struck until the concrete has sufficiently hardened. The following striking times given in days (24 hours) are the absolute minimum that will be permitted for the following average air temperatures:-

Type of Formwork	Minimum Period Before Striking		
	Temperature		
	3°C	7°C	16°C
Walls, columns, Beams and Slab Sides	4	2	1
Slab Soffits	8	6	4
Beams Soffits	18	14	9
Slab Props	19	15	10
Beam Props	28	21	16
The number of days during which the temperature is at freezing point or below shall be added to the times given			
Times for intermediate air temperatures may be interpolated, pro rata.			

Notwithstanding the provisions made for striking times and curing of concrete no construction work or loading of foundations and other concrete elements (i.e. slabs, beams etc.) shall take place less than 48 hours after placing of the concrete or as may otherwise be determined by the Architect.

F.41 Curing

Both before and after striking formwork all concrete shall be prevented from drying out for seven days by, unless otherwise directed by the Architect, application of a liquid membrane curing compound as Clause

F.9 used in accordance with the manufacturers instructions.

Curing compounds shall not be used where the concrete is to receive a screed or other finish.

Where formwork does not allow for the use of curing compounds or when directed by the Architect not to use them one of the following methods shall be used:

- (i) Covering with a layer of sacking canvas, hessian or similar absorbent material and kept constantly wet.
- (ii) Covering with polythene sheeting, the concrete first being thoroughly wetted. Any other method approved by the Architect.

The Contractor shall employ workmen in addition to watchmen during weekends and holidays to ensure that the above conditions are complied with.

Section F – CONCRETE WORK**F.42 Damage from Disturbance etc**

The Contractor shall be responsible for preventing damage to all in-situ and precast concrete work from disturbance, shock vibration, premature loading or overloading.

F.43 Holes, Chases and Casting In

No holes or chases shall be cut in concrete work without the prior written approval of the Architect. The Contractor shall ensure that all necessary holes and chases, including fixing holes for railings and balustrades, etc., are carefully formed in the correct positions by requisite measures prior to the placing of concrete. Conduits, pipes and special fixings shall be concreted in where required and the exact positions demanded. It shall be the Contractor's responsibility to ensure full co-ordination with sub-contractors in the setting out for this purpose.

F.44
to
F.45

Nil

F.46 Surface Finishes

Samples - Before the execution of any specified finish, the Contractor shall prepare 1.25 m square samples for the Architect's approval, using the methods agreed by the Architect for the actual work. No concreting in any finish shall be attempted until the approval of a sample. Approved samples shall be retained till the completion of all such work and closely adhered to throughout the work. Any subsequent change of mix for work where a sample panel has been prepared shall ensure that colour and texture is consistent with the approved sample. Rejected samples shall be demolished and removed. Any deviations from the approved sample shall be reported for inspection by the Architect, who will direct as to whether the work in question shall be rectified or entirely renewed. Such directions shall be executed forthwith.

Fair-faced surfaces shall be free from honeycombing, stains, fins, lippings, nail holes or excessive air holes and shall be of uniform colour and texture. Form markings, if evident, shall be controlled and regular.

Smooth-faced surfaces shall be obtained with suitable, smooth impervious form linings, free from all surface defects. The resulting surface shall be entirely free from honeycombing, stains, fins, lippings, lining joint marks, nail and screw marks, raised grain marks, air holes or any other imperfections and shall be of uniform colour, tone and surface texture.

External rendered surfaces. All external surfaces to receive rendering, cement backings or plasterwork shall be keyed by lining the formwork with grooved rubber mats to produce an adequate mechanical key.

Trowel finish - After compaction to finished levels the concrete shall be wood floated and lightly steel trowelled to a smooth even face free from honeycombing, air holes or other imperfections.

Power Float Finish After compaction and at initial set power float the concrete to a smooth even face free from honeycombing, air holes or other imperfections. Then polish to a glazed surface free of blade marks.

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SCHEDULE OF CONCRETE	FINISHES
FINISH	LOCATION
Fair Faced	i Risers to external steps. . Kerbs. ii .
Smooth-faced	NIL
Trowel Finish	i Treads of external steps (edges to be bull nosed). .
Power Float	i Floors to houses. .

F.47 Damp Proof Membranes

Lay polythene sheet D.P.M's under ground floor slabs where shown on drawings and in accordance with Clause G52.

F.48 Radon Barriers

Supply and lay radon barriers or combined DPM/ radon barriers where shown on the drawings and in accordance with Clauses G/ R/ 1 to G/ R/15.

F.49
to
F.50

Nil

CONCRETE PAVINGS AND HARDSTANDINGS**F.51 Generally**

The foregoing clauses where applicable shall apply also to this sub-section except as varied hereunder. For construction of roadways see separate specification.

F.52 Services

Before any foundation work to the footpaths and other external paving drains, sewers, cable ducts or other special formation work shall be completed.

Public Authorities such as gas, electricity, telephone, water etc. will be informed by the Council of their intention to construct the works and will be supplied with drawings of proposed works. This will not in any way relieve the Contractors of their responsibility for giving due notice to the aforementioned Authorities and for ensuring that all the cable ducts, pipe crossings etc. are completed.

If, through neglect on the part of the Contractor, additional work of any kind is necessary in the provision of works below formation level, the cost of this additional work will be borne by the Contractor.

The Contractor shall take every precaution and bear every expense necessary to preserve from damage and leave in working condition all surface fittings of waterworks, drainage, or

Section F – CONCRETE WORK

other undertaking. All such fittings shall be left in clean, usable condition.

F.53 Levels and Alignment

All levels and alignments of paths and paving shall be carefully set out and frequently checked. All care shall be taken to ensure that the correct cross sections are maintained. The finished face of footpaths shall be formed so as to provide adequate fall to, satisfactory run off to surface water outlets, gullies etc.

The horizontal alignment of kerbs shall be smooth and unbroken. Curved sections shall accurately represent the curves shown on drawings and shall be so constructed that width of channel is constant.

F.54 Concrete Bays

Where concrete pavings are laid in bays, the bays shall be laid "hit and miss" fashion and the adjoining bays shall not be laid until the previous work is sufficiently mature.

Where construction joints are now shown in the contract the Contractor shall submit for approval proposals for the layout of construction joints before concreting is started

F.55 Surface Finishes to Pavings

The concrete shall be fully compacted and brought to finished levels and a dense surface with a tamping beam having a 75mm wide steel shod foot and weighing not less than 10 kg per m.sq. Where shown as being reinforced the concrete shall first be placed, compacted and levelled 50mm below finished levels, the reinforcement mesh placed with 150mm laps and the remaining concrete placed, compacted and levelled as before.

Tamped finish - After compaction to finished levels, concrete so shown shall be lightly tamped with a light beam having a 19mm wide foot to give regular, parallel and equally spaced shallow markings.

Brushed finish - After compaction to finished levels, concrete so shown shall be wood floated and lightly steel trowelled to a smooth face and lightly dragged with a soft broom in parallel strokes at right angles to the length of the work.

Trowel finish - After compaction to finished levels, concrete so shown shall be wood floated and lightly steel trowelled to a smooth even surface.

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SCHEDULE OF CONCRETE FINISHES TO PAVINGS	
FINISH	LOCATION
Tamped	i. Hardstandings to caravans
	ii Skip Areas
	.
Brushed	i. Footpaths
	ii Aprons to meter rooms etc.
	. Paths and Driveways to
	ii Houses
Trowel	i.
	Tops of Kerbs (with bull nosed edge)

All edges to concrete including either side of joints are to be finished smooth with a bullnose trowel.

F.56 Nil**F.57 Expansion Joints in Concrete Hardstandings**

Expansion joints between bays of hardstandings and between perimeter of hardstandings and walls shall be 13mm wide and shall be formed with impregnated sheet as Clause F.17 extending for the full depth and 10mm above the top of the slab. When directed the joint shall be raked out to a depth of 20mm to remove the fibrous sheet and all dust, stones, etc., and shall be sealed while dry with a hot applied joint sealing compound complying with IS EN 14188-1:2004 used in accordance with the manufacturer's instructions.

F.58 Movement Joints in Kerbs and Pavings

Movement joints in kerbs and pavings shall be formed at centres not exceeding 3600mm in either direction.

The joints shall comprise a double thickness of bituminous roofing felt. The jointing material shall be laid straight, set truly vertical at right angles to the kerbing and shall extend the full depth of the concrete. It shall be neatly cut off at surface level and the surface of the concrete shall be carefully finished to the same level on each side of the joints.

F.59 Curing of in-site Concrete Pavings and Hardstandings

Protection from adverse weather conditions or other damage, and subsequent curing of concrete pavings shall be commenced as soon as practicable after laying and shall be continued for at least 5 days.

The initial protection shall be provided by a liquid curing compound in accordance with Clause F9 and used in accordance with the manufacturer's instructions.

F.60 Damage

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Any surface damaged by the elements, protective covering, footmarks etc. shall be taken up and replaced by new surfacing at the Contractor's expense.

Appendix A: List of References and Standards. (Part 1)

Item	Clause No.	Reference	Comment
1.	F.5	IS EN 197-1:2011	Cement – Part 1: Composition, specifications and conformity criteria for common cements. (to replace IS EN 197-1:2004)
2.	F.5	IS EN 197-2:2014	Cement – Part 2: Conformity evaluation. (to replace IS EN 197-2:2001)
3.	F.6	IS EN 12620:2013	Aggregates for concrete.
4.	F.7	IS EN 1008:2002	Mixing water for concrete – Specification for assessing the suitability of water, including water recovered from processes in the concrete industry, As mixing water for concrete.
5.	F.8	IS EN 934-2:2009	Admixtures for concrete, mortar and grout – Part 2: concrete admixtures – Definitions, Requirements, Conformity, Marking and labeling.
6.	F.9	‘Specification for Road Works; road pavements – concrete materials’ www.nra.ie	Clause 1027: Curing (to replace clause 1022 of the same document.)
7.	F.12	IS EN 1996-1-1:2005(+A1:2012)	Eurocode 6: Design of Masonry structures – Part 1-1: General rules for reinforced and unreinforced masonry structures (to replace IS 326:2004)
8.	F.12	IS EN 206-1:2002	Concrete – Part 1: Specification, Performance, Production and Conformity (including Irish National Annex)
9.	F.13	IS EN 1992-1-1:2005(+COR 2010)	Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings (including Irish National Annex)
10.	F.16	BS 4449:2005(+A2:2009)	Steel for the reinforcement of concrete. Weldable reinforcing steel. Bar, coil and decoiled products. Specification.
11.	F.16	BS 4483:2005	Steel fabric for the reinforcement of concrete. Specification.
12.	F.19	IS 89-:1981	Window cills.
13.	F.20	IS EN 845-2:2013(+NA:2013)	Specification for ancillary components for masonry – Part 2: Lintels (including Irish National Annex)

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Appendix A: List of References and Standards, continued... (Part 2)

Item	Clause No.	Reference	Comment
14.	F.27	IS EN 12350-1:2009 IS EN 12350-2:2009 IS EN 12350-4:2009	Testing Fresh Concrete – Part 1: Sampling. Testing Fresh Concrete – Part 2: Slump test. Testing Fresh Concrete – Part 4: Degree of compactability.
15.	F.28	IS EN 12390-1:2012 IS EN 12390-2:2009 IS EN 12390-3:2009 (+COR 2011) IS EN 12390-6:2009 IS EN 12390-7:2009	Testing Hardened Concrete – Part 1: Shape, Dimension and other requirements for specimens and moulds. (to replace IS EN 12390-1:2000) Testing Hardened Concrete – Part 2: Making and curing specimens for strength tests. Testing Hardened Concrete – Part 3: Compressive strength of test specimens. Testing Hardened Concrete – Part 6: tensile strength of test specimens. Testing Hardened Concrete – Part 7: Density of hardened concrete. (to replace IS EN 12390-7:2009)
16.	F.32	BS 8666:2005	Scheduling, Dimensioning, Bending and cutting of steel reinforcement for concrete – Specification (incorporating Amendment No.1)
17.	F32.	BS EN ISO 17660-1:2006 BS EN ISO 17660-2:2006	Welding – Welding of reinforcing steel – Part 1: load-bearing welded joints. Welding – Welding of reinforcing steel – Part 2: Non Load-bearing welded joints.
18.	F32	IS EN 1992-1-1:2005(+COR:2010)	Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings (including Irish National Annex)
19.	F.36	www.concrete.org.uk	Guidance on concrete work in cold weather. Replaces references to “Winter concreting” (Cement and Concrete Association) and “Winter Building” (HMSO) – no longer easily available.
20.	F.57	IS EN 14188-1:2004	Joint fillers and sealants – Part 1: Specification for hot applied sealants.

LIST OF CLAUSES G

BUILDING CONTROL

G.0 Compliance with the Building Regulations

BRICKWORK AND BLOCKWORK

G.1 Samples
 G.2 Testing
 G.3 Nil
 G.4 Nil
 G.5 Bricks and Blocks Generally
 G.6 Nil
 G.7 Clay Bricks
 G.8 Concrete Bricks
 G.9 Nil
 G.10 Concrete Blocks
 G.11 Cement
 G.12 Colouring Agents
 G.13 Water
 G.14 Limes
 G.15 Sand
 G.16 Mortar Plasticisers
 G.17 Ready-mixed lime: Sand for Mortar
 G.18 Trowel Ready mortar
 G.19 Damp-Proof Courses
 G.20 Damp-Proof Membranes
 G.21 Cold Applied Bitumen Damp-Proofing Compound
 G.22 Nil
 G.23 Wall Ties
 G.24 Nil
 G.25 Sealant for Movement Control Joints
 G.26 Joint Sealant for Pointing
 G.27 Bedding Mastic
 G.28 Backing to Movement Joints and Pointing Sealants
 G.29 Sealants Generally
 G.30 Proprietary Fire Barrier Systems to Party Walls (if applicable)
 G.31 to Nil
 G.33
 G.34 Storage of Material
 G.35 Finished Facework to be kept clean
 G.36 Work in Cold Weather
 G.37 Sample Panel of Finished Facework
 G.38 Nil
 G.39 Mortar mixing and Batching
 G.40 Mortar Mixes
 G.41 Coloured Mortar (Factory Mixed) for Bedding/Joining
 G.42 Mortar for Pointing
 G.43 Raking out, jointing and painting
 G.44 Chases, Ducts, Opening Etc.
 G.45 Blockwork below Ground
 G.46 Cavity Walls
 G.47 Building-in of cavity wall insulation
 G.48 Forming openings, blocking up, making good and building in
 G.49 Nil
 G.50 Nil
 G.51 Laying of Damp-Proof Courses
 G.52 Cavity Trays
 G.53 Nil
 G.54 Storing and Handling of Sealants

G.55	Preparation of Joints for Sealants
G.56	Application of Gun-Applied Sealants
G.57	Nil
G.58	Nil
G.59	Building-in fire stopping in cavity walls at party walls (where applicable)
G.60	Building-in fire stopping over party wall at roof (where applicable)
G.61	Proprietary Insulated Cavity Closers/Barrier
G.62	Installation of Proprietary Fire Barrier Systems over Party walls at roof (where applicable)

RADON PROTECTION MEASURES

G.63	Generally
G.64	Specialist Installer
G.65	Certification
G.66	Storage and Handling
G.67	Radon Resisting Membrane
G.68	Radon Sumps
G.69	External Vent Cap
G.70	Sub Floor Network Pipes
G.71	Nil
G.72	Nil
G.73	Membranes
G.74	Jointing
G.75	Sumps
G.76	External Vent Cap
G.77	Sub Floor Network Pipes

FIREPLACES AND FLUES FOR SOLID FUEL

G.78	Nil
G.79	Nil
G.80	Nil
G.81	Tiled Hearths to Solid Fuel Cookers
G.82	Firebacks to Fireplace
G.83	Tiled Surround and hearth to Fireplace
G.84	Firebacks and Frets
G.85	Nil
G.86	Nil
G.87	Flue gathering units, lintels and chimney cappings
G.88	Flue linings and flue terminals
G.89	Metal Damp Proof Course to Chimneys
G.90	Fibre Lagging Rope
G.91	Register Plate and soot door to cookers G.93
To	Nil
G.96	
G.97	Installation of solid fuel cookers
G.98	Storage Firebacks
G.99	Installation of Firebacks
G.100	Installation of hearths
G.101	Installation of tiled surround G.102
To	Nil
G.108	
G.109	Chimney breasts and stacks generally
G.110	Installation of flue lining
G.111	Chimney cappings and terminals
G.112	Damp Proof Course G.113
To	Nil
G.118	
G.119	Testing of flues

Section F – CONCRETE WORK

APPENDIX A: LIST OF REFERENCES AND STANDARDS Compliance with Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. no.225 of 2013), the contractor shall provide proof (a Declaration of Performance (DoPO) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended, the Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERALLY**G.0 Samples**

Samples (up to 6 No. of each type) of facing bricks and concrete blocks, including specials, shall be submitted to the Architect for his approval before any of these materials are delivered to the site.

G.1 Testing

The Contractor shall as and when required by the Architect submit and deliver materials for testing by the Employer as Clauses A33/220 and A33/560.

G.2
to
G.3

Nil

G.4 Bricks and Blocks Generally

Bricks and blocks shall be as described. Bricks and blocks shall be clean, hard and sound with well defined arrises.

The use of chipped bricks or blocks will not be permitted in facework.

Unless otherwise described shapes and dimensions of special bricks shall comply with BS 4729:2005.

G.5 Nil**G.6 Clay Bricks**

Clay bricks shall be of first quality to selected colours and shall comply with IS EN 771-1:2011.

G.7 Concrete Bricks

Concrete bricks shall be of first quality to selected colours and shall comply with IS EN 771-3: 2011.

G.8 Nil

Section F – CONCRETE WORK

G.9 Concrete Blocks

Concrete blocks shall be made with natural aggregates and shall comply with IS EN 771-3: 2011.

Aggregates shall be free from pyrite or other impurity. Contractors may be required to obtain and provide proof of testing of aggregates for pyrite content.

Unless otherwise specified solid and hollow blocks shall be category I or II with a declared compressive strength of 10 N/mm².

The blocks shall be in a dry and properly cured state when delivered to site.

G.10 Cement

Cement for mortar shall be in accordance with Clause F.5 or Section F: Concrete Work.

G.11 Colouring Agents

Colouring agents for coloured mortar shall comply with IS EN 12878:2005 used in accordance with the manufacturer's instructions.

G.12 Water

Water shall be from the mains in accordance with Clause F7 and kept free from any impurities.

G.13 Limes

Hydrated limes for cement/lime mortars shall comply with IS EN 459-1:2010. The lime is to be mixed in strict accordance with the manufacturer's written instructions.

Lime to be delivered onto the site in suitable containers with the weight and manufacturer's name or brand name clearly marked thereon. A certificate indicating compliance with the Irish Standard Specification must be supplied by the manufacturer with each consignment.

The hydrated lime shall be stored in a suitable weather tight building and in such a manner as to permit access for the proper sampling and identification of each consignment.

G.14 Sand

Sand for mortar shall comply with the requirements of IS EN 998-2:2010 (+NA:2010).

G.15 Mortar Plasticisers

Mortar plasticizers shall not be used without prior written approval of the Architect.

G.16 Ready-mixed lime: sand for Mortar

Ready-mixed lime: sand for mortar shall be generally in accordance with IS EN 998-2:2010 (+NA:2010), and shall be obtained from an approved manufacturer.

G.17 Trowel Ready Mortar

Trowel ready mortar may be used with the prior written permission of the Architect.

The mortar shall be of approved manufacture and shall be used in accordance with the manufacturer's recommendations and comply with IS EN 998-2:2010 (+NA:2010).

Section F – CONCRETE WORK

The Contractor when ordering shall ensure that the manufacture is given details of the mortar mixes required in accordance with Clause G.40.

G.18 Damp-Proof Courses

Bitumen damp-proof courses shall comply with IS 57-1:1987. Polyethylene damp-proof courses shall comply with IS 57-2:1987.

Damp-proof courses at ground floor level shall be hessian based bitumen; grooved polythene may be used in all other locations both horizontally and vertically.

G.19 Damp-Proof Membranes

Polythene for damp-proof membranes to ground floor slabs shall be 300 microns (1200 gauge) thick blue tinted polythene sheet of approved manufacture.

All Damp-proof membranes shall comply with IS EN 13967:2012.

G.20 Cold Applied Bitumen Damp-Proofing Compound

Cold applied bitumen damp-proofing compound shall be approved bitumen compound or bitumen solution used in accordance with the manufacturer's instructions.

G.21 Nil**G.22 Wall Ties**

Wall ties shall be manufactured from austenitic stainless steel and comply with IS EN 845-1:2013 (+NA:2013). The use of galvanized steel or plastics will not be permitted. All ties shall be of sufficient length and design to allow for a minimum 55mm embedment into each leaf of brick or blockwork.

Where used in conjunction with cavity insulation the ties shall be fabricated with an integral stainless steel retaining pin or similar device which shall meet the requirements of the insulation manufacturer. Samples of all types of ties and retaining clips shall be submitted to the Architect for his approval before commencement of brick and blockwork.

G.23 Nil**G.24 Sealant for Movement Control Joints**

Sealant for movement control joints shall be gun applied polysulphide or polyurethane based low modulus sealants complying with IS EN ISO 11600:2003(+A1:2011) Type F and Clause G.29.

Colour to be to Architects choice and approval.

G.25 Joint Sealant for Pointing

Joint sealant for pointing around frames shall be a one part gun applied silicone sealant complying with IS EN ISO 11600:2003(+A1:2011) Type F and Clause G29.

Colour to be to Architect's choice and approval and the sealant shall be suitable for over-painting.

Section F – CONCRETE WORK**G.26 Bedding Mastic**

Mastic for bedding of frames shall be gun applied synthetic rubber mastic with gap filling properties of approved manufacture and shall be compatible with the pointing sealant (Clause G.26).

G.27 Backing to Movement Joints and Pointing Sealants

Joint fillers, performed back-up slips and bond breaker tapes or strips shall be as recommended by the sealant manufacturer complying with the requirements of BS 6093:2006 (+A1:2013) and approved by the Architect.

G.28 Sealants Generally

All sealants shall be suitable for the purpose and location and shall be compatible with adjoining substrates and surface finishes shall be in accordance with BS 6213:2000 (+A1:2010) and be in compliance with BS 6093:2006 (+A1:2013).

Where necessary provide sealant manufacturers recommended primer.

The Contractor shall, before using any joint sealant or mastic, provide samples of all types to be used together with the manufacturer's written documentation stating compliance with the standards and requirements of this specification.

G.29 Proprietary Fire Barrier Systems to Party Walls (If applicable)

Proprietary fire barrier systems to party walls at roofs shall be of approved design and manufacture and shall carry an appropriate Agrément Certificate or a Certificate issued by the Fire Research Establishment (U.K.).

The system shall include for all junctions with chimneys gutters, parapets etc. and shall be suitable for use in all locations shown on the drawings.

G.30
to
G.33

Nil.

WORKMANSHIP**G.34 Storage of Material**

- (i) Bricks shall be properly stacked on level and hard standing and be adequately protected from inclement weather.
- (ii) Cements and limes shall be stored separately, kept dry and used in rotation of deliveries.
- (iii) Sands shall be stored in separate pens according to type and uses, on clean, hard, dry standings and protected from contamination.
- (iv) Sands for pointing shall be stored separately, away from all other sands and shall be obtained in sufficient quantity at one time to enable material of the approved colour to be used for the whole of the work.
- (v) Concrete blocks shall be stacked on a firm, dry level surface and protected from rain, snow and rising damp.

Section F – CONCRETE WORK**G.35 Finished Facework to be kept clean**

Faced work shall be kept perfectly clean at all times. Scaffold boards next to the facework must be turned back at nights or during heavy rain and inclement weather. Rubbing to remove stains will not be permitted. Protect freshly laid work during interruption through rain and at completion of each day's work.

G.36 Work in Cold Weather

No brickwork or blockwork shall be carried out when the temperature is at or below 3 °C unless the permission of the Architect has been obtained that the work should be continued with agreed precautions being taken. Using an on-site thermometer, Investigation on whether the air temperature is below 4 °C or Prior knowledge of forecast indicates a drop in temperature during the works and for a time after the works, the following measures should be taken a listed below.

- Notification to the Architect must be given and current work must stop immediately with no additional brickwork or blockwork to commence until the air temperature as risen and maintains and above 4 °C.
- Setting brickwork and block shall be protected appropriately from cold weather damage in order to allow mortar to set.
- The use in the mortar of anti-freeze compounds or any admixture containing calcium chloride will not be permitted.
- Any work damaged by frost shall be taken down and made good at the Contractors expense.

G.37 Sample Panel of Finished Facework

Sample panels of finished facework in brickwork and/or blockwork, 1200 x 1200 mm, shall be constructed to the satisfaction of the Architect, in an agreed location until the completion of this work on site when it shall be removed. This shall become the "approved" sample for all finished facework on site and is to be completed at least 7 working days before this work is programmed to commence on site.

All work shall be carried out in accordance with IS EN 1996-1-1:2005(+A1:2012) and IS EN 1996-2:2006 (+COR:2009).

Brickwork and blockwork shall be built uniform, plumb, true and level, with perpends vertical and in line, and unless otherwise specified vertical and horizontal joints shall be 10 mm.

The brickwork and blockwork shall be built to the bond indicated on the drawings. Where no bond is indicated, the units shall be laid in stretcher bond. Where possible the coursing shall be arranged to allow a full block to be positioned directly beneath a lintel bearing. Leave toothing to provide for the bonding of future work. Where shown on the drawings, form toothing in existing work to provide adequate bond for new work. When bonding brickwork or blockwork to existing the work shall be thoroughly wetted.

Bricks and blocks shall be laid on even beds of mortar and all joints shall be well filled. The maximum height of brickwork or blockwork built in any one day shall not exceed 1.5 m and where it is raked back no part shall rise more than 1.2 m above ground level.

Section F – CONCRETE WORK

Bricks and blocks shall be wetted as necessary during hot or dry weather.

No bats shall be used except where required for bonding and no cut blocks shall be less than half blocks. Cutting of brickwork and blockwork against concrete soffits and timber joists shall include for cutting to give normal joint and complete filling thereof with mortar.

Bricks shall be taken and mixed from at least three bales during laying to avoid contrast between adjoining lifts, in accordance with manufacturers instructions.

G.38 Nil**G.39 Mortar Mixing and Batching**

All materials shall be accurately gauged by gauge boxes and mechanically mixed. Under no circumstances shall the materials be proportioned by shovel.

Re-tempering of mortar will not be permitted. Gauge boxes and mixers shall be kept clean. Water shall be from the mains and kept free of any impurities.

The mortar shall be mixed in small quantities and used within 2 hours of mixing of the cement and water.

G.40 Mortar Mixes

Mortars shall comply with IS EN 998-2:2010 (+NA:2010) and unless otherwise specified (see Clause G18) mortar mixes shall be as follows:-

Cement/Sand = one part Portland cement to three parts clean sharp sand (1:3)

Cement/Lime/Sand = one part Portland cement to one part hydrated lime to six parts clean sharp sand (1:1:6).

G.41 Coloured Mortar (Factory Mixed) for Bedding/Joining

Coloured mortar for bedding and jointing brick walls with joints finished as the work proceeds shall be factory mixed lime and sand, as Clause G17, and shall be of selected tint, gauged on site with Portland cement in accordance with the manufacturer's recommendations to obtain the required proportions in accordance with Clause G.40.

G.42 Mortar for Pointing

Ordinary mortar for pointing shall be cement/lime/sand (1:1:6).

Coloured mortar for pointing shall be as above but gauged with colouring agent of selected tint as Clause G.12.

White pointing mortar shall be composed of 1 part white Portland cement, 3 parts fine silver sand.

G.43 Raking out, jointing and painting

Internal brickwork and blockwork built fair face shall be flush jointed as the work proceeds. Facework generally shall be jointed as the work proceeds and unless to match existing or otherwise specified joints shall be finished with a bucket handle (keyed) joint, formed with a curved edge jointing tool to form a semi-circular groove the same width as the joint, flush with the brick face.

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All damaged bricks shall be cut out and replaced and all putlog holes filled.

G.44 Chases, Ducts, Opening Etc.

Form or leave all chases or grooves for flashings or conduits etc. Chases shall be first formed along each edge, and to be the correct depth of the chase, with a saw cut before removing the excess material with an approved chasing tool. Vertical chases shall not exceed 1/3 the thickness of the wall and shall not be placed back to back. Where permitted horizontal or diagonal chases shall not exceed 1/6 the thickness of the wall unless otherwise directed. Chases shall not be placed back-to-back and shall not be formed in party walls. Form all ducts, openings etc. as the work proceeds and make good.

G.45 Blockwork below Ground

All blockwork below ground/dpc level shall be laid in (1:3) cement/sand mortar. Cavities to cavity walls below ground level shall be filled up to finished ground level with (1:10) cement/sand mortar.

G.46 Cavity Walls

External cavity walls to be constructed with two skins having a 150mm cavity between unless otherwise specified.

The inner and outer skins shall be bonded together with approved stainless steel wall ties as Clause G23. Spacing of ties shall be as the following table and staggered in each both directions.

Size of Concrete Block (mm)	Spacing of Ties (mm)		Vertical Spacing at Openings (mm)
	Horizontally	Vertically	
450 x 225 x 100	900	450	225

Ties at openings and at movement joints to be spaced vertically as 225mm centres and within 225mm of jambs.

The inner and outer skins of cavity walls shall be built up together and no portion of the wall shall rise more than 1200 above the other.

Unless otherwise detailed the cavity at eaves shall be closed with a course of slates lapped and bedded in (1:3) cement/sand mortar.

Cavities shall be kept clear of mortar droppings and all rubbish, by moveable boards or other means, and shall be cleaned daily; leave cleaning openings at the base of cavities for this purpose. At completion, the openings to be built up uniform with surrounding work

G.47 Building-in of cavity wall insulation

External cavity walls to have cavity wall insulation slab as specified in Clause E.8, as shown on drawings or elsewhere, fixed against inner skin of blockwork with special stainless steel wall ties as Clause G.23. The insulation slabs shall be laid broken joint with a minimum of 4 No. wall ties per slab.

Provide for forming insulation slabs around heads, jambs and cills of openings in external

Section F – CONCRETE WORK

wall and other locations shown on the drawings. All insulation shall be fixed true and vertical.

Cavity wall slabs shall be installed in accordance with the Architects details and manufacturers printed instructions. Where forming part of the insulation slab horizontal grooves shall face downwards and all tongue and grooves shall be fully engaged.

G.48 Forming openings, blocking up, making good and building in

Bricks/blocks shall be as described. Mortar shall be cement/lime/sand (1:1:6) for work above dpc and cement/sand (1:3) for work below dpc unless otherwise stated.

Work shall be neatly toothed in or blockbonded and tightly pinned up below existing work, plumb, level and to same plane and coursing as existing.

Reveals, jambs and corners shall be neatly raised and quoined up. Jambs of openings formed in cavity walls shall be returned to close the cavity where appropriate with closer blocks as Clause G46, and with dpc at interfaces of inner and outer leaves, and insulation as required.

Items built into facings shall have bricks neatly cut around and pointed.

Arches shall be accurately formed with cleanly shaped bricks and include provision of all necessary centering.

Jointing and pointing shall be as described. Mortar for making good chases in non-faced work shall be cement/lime/sharp sand (1:1:6).

Lintols to have a minimum 150 mm bedding at each end.

G.49
to
G.50

Nil

G.51 Laying of Damp-Proof Courses

Damp proof courses shall be laid in mortar, with 150mm laps at junctions and in length. Unless otherwise specified the dpc shall be the full width of the wall or in the case of cavity walls the width of each leaf.

Vertical d.p.c.'s shall be continuous for their whole length.

Damp proof courses to jambs of all door and window openings shall be tacked or stapled to frames prior to building-in and unless otherwise specified shall be minimum 150mm wide.

Damp proof courses under cills shall be turned up the back and around the ends of the cill for its full height.

Damp proof courses to concrete and steel lintols, in external cavity walls, are to be placed as detailed on drawings. Ensure that they extend at least 150mm beyond each side of lintol and that they are fully supported across width.

G.52 Laying of Damp Proof Membranes

Bitumen rubber compound membrane shall be spread on clean and dust free surfaces in accordance with the manufacturer's recommendations.

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Polythene sheet membrane shall be laid over hardcore well blinded with soft sand. Joints shall be double welted or lapped and bonded as recommended by the manufacturer to suit the site conditions. Double welted joints shall be formed with a 300 mm upstand, double folded and temporarily weighted to maintain the fold in position prior to concreting. Lapped and bonded joints shall have a minimum 150 mm overlap, bonded between the laps with a continuous 25 mm x 1 mm double-sided mastic tape and the upper sheet edge sealed with 75 mm wide polythene self-adhesive jointing tape. Where possible the damp proof membrane shall be of the appropriate width for each location so as to avoid joints. In all cases the damp proof membrane shall be turned up to floor level and lap over dpcs to external walls and extend over internal partition or party walls.

All damp proof membranes are to be inspected and passed by the Clerk of Works before covering up.

G.53 Cavity Trays

Build in all cavity trays and flashings as specified under Q.21 or Section Q: Metalwork.

G.54 Nil**G.55 Storing and Handling of Sealants**

- (i) Sealants to be stored in accordance with the manufacturer's recommendations.
- (ii) Where sealant materials contain toxic compounds comply with the manufacturer's recommendations regarding handling precautions.
- (iii) The Contractor shall arrange for adequate ventilation when working in confined spaces with sealants.

Collect and dispose of used containers and cartridges in a manner which does not allow them to become a health hazard on or off the site.

Provide material datasheets to the Clerk of work for use in the PSDP Safety File.

G.56 Preparation of Joints for Sealants

Ensure that dimensions and shape of joint are accurate and that joint surfaces are dry, clean and free from dust, dirt and loose material. Where required prime joint surfaces in accordance with the sealant manufacturer's recommendations. Install all joint fillers, back up strips and bond breakers as required.

G.57 Application of Gun-Applied Sealants

All sealants shall be applied in accordance with the manufacturer's instructions. Application shall be by cartridge or sachet loaded guns, trigger-operated by hand or air-pressure, fitted with a nozzle appropriate to the joint to be sealed.

The sealant shall be extended firmly and evenly into the joint ensuring proper adhesion with components to be jointed, and tooled with a concave finish.

Sealants shall not be applied when the temperature is below 5°C unless otherwise recommended by the manufacturer.

G.58

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to Nil
G.59

G.60 Building-in fire stopping in cavity walls at party walls (Where applicable)

For fire-stopping to external cavity walls 225mm rock fibre insulation batts/slabs as Clause E.5 shall be built into the cavity as the work proceeds, one above the other without gaps or voids, to the extent shown on the drawings and commencing at the bottom of the cavity. Before batts/slabs are placed in position against the built leaf, mortar joints shall be trimmed off flush. All edges of batts/slabs shall be kept free from mortar droppings.

G.61 Building-in Fire-Stopping over Party Wall at Roof (Where applicable)

The top of party walls to be shuttered up and filled with (1:3) cement/sand mortar to finish smooth 25 mm below top line of roof truss rafter member. Lay first layer of 300 x 50 mm rock fibre insulation (as clause E.5) compressed to 25 mm, for entire length of wall and carried down over eaves.

Lay felt and battens as specified under "Roofing" (Section M) and carefully saw cut halfway through tiling battens on either side of party wall.

Lay 300 wide x 100 mm rock fibre batts, compressed to profile roof tiles, over sarking felt and trimmed neatly between battens. Battens to be stapled to battens or otherwise mechanically fixed in position until roof tiles are laid.

Ensure all insulation is correctly centered over party wall. Form fire-stopping at eaves as detailed on drawings.

G.62 Propriety Insulated Cavity Closers/Barriers

Propriety insulated cavity closers shall be constructed from fire resisting materials and comply with BS 476- 20:1987 and must achieve a minimum of 1 hour fire resistance before failure.

All Insulated cavity closers/barriers shall allow for the complete closing of cavity wall voids at areas shown on the general detail drawings, leaving no passage for fire and smoke to travel past.

Cutting and storage of all insulated cavity closers/barriers shall be to the manufacturer's recommendations.

G.63 Installation of Proprietary Fire Barrier Systems over Party Walls at roof (Where applicable)

Proprietary fire barrier systems as Clause G.30 shall be installed strictly in accordance with the manufacturer's drawings and instructions.

Installation shall include for all works, including leveling of walls, as may be required by the manufacturer for correct functioning of the system.

RADON PROTECTION MEASURES**G.64 Generally**

The radon protection measures shall be provided in accordance with the current Building Regulations.

Section F – CONCRETE WORK**G.65 Specialist Installer**

Installation of all radon protection measures shall be carried out by a competent specialist installer. The Contractor shall furnish the Architect with proof of the installer's competence before work is commenced.

MATERIALS**G.66 Certification**

All materials used for Radon protection measures shall have a European or Irish Agrément Certificate and comply with the current Building Regulations. All L.D.P.E barriers should be tested to comply with table 3 of TGD Part C (Site preparation and resistance to moisture) and test certificates shall be provided to the Architect.

Where indicated radon resisting membranes shall be a continuous membrane designed to resist the passage of radon soil gas into a building ('Monarflex RMB 400' or equivalent).

G.67 Storage and Handling

Radon Barriers should be stored rolled up in a dry area until they are to be used. Keep away from sharp objects and chemical solvents that may damage the barrier.

Do not place heavy items on top of Radon Sumps and other fittings.

G.68 Radon resisting membranes

Radon membranes (FILL-IN-INFORMATION)

G.69 Radon Sumps

Radon Sumps shall be a proprietary rigid polythene unit complete with blank spigots for connection to the sub floor network ('Radon Control Systems Easi-Sump' or equivalent).

G.70 External Vent Cap

External vent caps to sub floor networks shall be u-PVC units designed to finish flush with the external ground level and suitable for future connection to a future vent stack (Radon Control Systems Easi-Sump Cap Link or equivalent).

G.71 Sub Floor Network Pipes

Sub floor network pipes shall be 110mm u-PVC as Clause W.9.

G.72
to
G.73

Nil

INSTALLATION**G.74 Membranes**

Blind the hardcore with a layer of sand to provide an even bed for the Radon Barrier. Lay the Radon Barrier neatly, tuck well into angles to prevent bridging and creasing.

Install membrane with folds to all upstands to provide for potential future settlement.

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Ensure the barrier is not punctured as building work continues. Any damage must be repaired using jointing tape and membrane material before laying the floor slab in accordance with the manufacturers instructions.

Radon resisting membrane must bridge cavities in walls forming a cavity tray. All designed cavities must be properly closed to interior spaces.

Cover the barrier with the permanent overlying construction as soon as possible.

The entire installation to be in accordance with the Agrément certificate and manufacturers recommendations.

G.75 Jointing

Form gas tight joints using jointing material as supplied by the radon membrane's manufacturer and in accordance with their recommendations.

Ensure the areas to be joined are clean and dry and provide an overlap of at least 150mm.

Seal around all service pipes and cable penetrations in accordance with the manufacturer's recommendations.

G.76 Sumps

Prepare a suitable sized hole in the hardcore and set the sump onto a firm level base, connect the outer pipes and backfill and surround with hardcore all in accordance with the Agrément certificate and manufacturer's recommendations.

G.77 External Vent Cap

External vent caps to sub floor networks shall installed so as to finish flush with the external ground level. It shall be located to facilitate the use of standard pipe clips with any future vent stack. All in accordance with the Agrément certificate and manufacturer's recommendations.

G.78 Sub Floor Network Pipes

Sub floor network pipes shall be laid to 1:100 fall to open-ended sump to avoid water accumulating in pipework.

FIREPLACES AND FLUES FOR SOLID FUEL**MATERIALS**

G.79
to
G.81

Nil

G.82 Tiled Hearths to Solid Fuel Cookers

Tiled hearths solid fuel cookers shall be constructed from 150 mm x 150 mm glazed, buff clay fireplace tiles, of selected colour, having round edge tiles to external edges.

G.83 Firebacks to Fireplace

Firebacks shall be either Refractory Concrete with a temperature rating of 1520°C having a

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crack inducer and marked with the manufacturer's Trade Name to the face or manufactured from Fireclay and complying with BS 1251:1987.

The firebacks to be finished with corrugated paper on the back to ensure an expansion gap between the fireback and the filling.

G.84 Tiled Surround and hearth to Fireplace

Provide glazed tiled surround and hearth, to fireplaces, of approved design to the sizes indicated on the drawings. The surround and hearth to be manufactured and installed by an approved firm.

G.85 Firebaskets and Frets

All firebacks to be supplied complete with appropriate cast iron basket and black vitreous enamelled fret and to be suitable for use with smokeless fuels.

G.86
to
G.87

Nil

G.88 Flue gathering units, lintols and chimney cappings

Precast flue gathering units, lintols to fire openings and chimney capping shall be as specified under Section F "Concrete Work" and as shown on the drawings or as otherwise detailed.

G.89 Flue linings and flue terminals

Clay flue linings shall comply with IS EN 1457-1:2012 and IS EN 1457-2:2012, Class A1 N1 and shall be spigot and socket type have an internal diameter of 200mm minimum.

Chimney terminals/pots shall comply with IS EN 13502:2002 and have an internal diameter of 200mm minimum. Terminals shall be 300mm long with a beaded rim and pots shall be of the type and length shown.

G.90 Metal Damp Proof Course to Chimneys

Damp proof course to chimneys at roof intersection shall consist of a metal tray complete with integrated apron flashing as shown on the detailed drawings. The metal tray shall be fabricated from lead, stainless steel or zinc alloy all as specified under Section M "Roofing" (Section M). Where manufactured from stainless steel trays shall have expanded stainless steel mesh welded to all surfaces in contact with masonry.

G.91 Fibre Lagging Rope

Fibre lagging rope for packing shall be woven continuous filament glass yarn rope. Asbestos shall not be used.

G.92 Register Plate and soot door to cookers

Provide a purpose made stainless steel register plate complete with soot door and cast iron sealing ring, as shown on detailed drawings, to cookers as Clause G.97, where cast iron flue connects to masonry flue.

G.93

Section F – CONCRETE WORK

to
G.96

Nil

WORKMANSHIP**G.97 Installation of solid fuel cookers**

Solid fuel cookers shall be installed in accordance with the manufacturers instructions, BS 8303-1:1994, BS 8303-2:1994, BS 8303-3:1994 and the detailed drawings.

G.98 Storage of Firebacks

All firebacks and flue sets shall be kept dry at all times by storing them under cover on dry ground.

G.99 Installation of Firebacks

Firebacks shall be installed in accordance with BS 8303-1:1994, BS 8303-2:1994, BS 8303-3:1994 and the detailed drawings and as follows:

Place fireback in opening and line up flush with face of blockwork, keeping it at hearth height level. Backfill with damp vermiculite and cement mix (8:1) and tamp down well.

Cap off with sand and cement mix (3:1).

Seal between lips of fireback and fire surround with fibre lagging rope and point with fire cement.

G.100 Installation of hearths

Tiled hearths shall be bedded evenly over the entire area in Cement/Lime/Sand (1:1:8) mortar or as otherwise indicated on the manufacturers instructions.

The back hearth in fire openings are to consist of cement/sand (1:3) with steel troweled finish, level with front hearth.

G.101 Installation of tiled surround

Tiled surrounds shall be evenly bedded at base and edges with Cement/Lime/Sand (1:1:8) mortar then plugged and screwed to wall at fixing clips with 4 No. 14 gauge x 38 mm zinc plated mild steel wood screws. Pack any voids between surround and chimney breast with rock fibre wool before pointing between mantle shelf and chimney breast with 1:1:8 mortar.

G.102
to
G.108

Nil

G.109 Chimney breasts and stacks generally

Workmanship generally shall be as for Section G "Brickwork and Blockwork" and flues shall be constructed in accordance with IS EN 15287-1:2007(+A1:2010).

Chimney breasts and stacks below roof line (D.P.C.) shall be built in solid concrete blocks bedded in (1:1:6) Cement/Lime/Sand mortar. Chimney stacks above roof line (D.P.C.) shall be built in solid concrete blocks or 225mm brickwork "English" bond both bedded in (1:3) Cement/Sand mortar.

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Build-in flue gathering units and lintols to fire openings as work proceeds ensuring that all joints are fully filled and pointed.

The all surfaces of chimney breasts and stacks, including areas within floor and ceiling zones and in the roof space shall be rendered in (1:1:6) Cement/Lime/Sand mortar plaster.

G.110 Installation of flue linings

Flue linings shall be placed in true alignment centrally within the flue and shall be built in with the female ends facing upwards as the work proceeds. The linings shall be jointed in (1:½:6) Cement/Lime/ Sand mortar and the flues shall be coved, at intermediate stages with a coving sack drawn up from the base as the work proceeds.

Purpose made bends must be used for changes in direction and mitreing will not be allowed.

Parging, which shall be carried out as the work proceeds, around the flue linings to consist of 1 part cement/6 parts 3mm crushed LECA/ 1 part water. On no account shall the cement/water ratio be exceeded.

G.111 Chimney cappings and terminals

Chimney stacks shall be capped with a precast concrete capping, as Clause G.88, bedded in (1:1:6) Cement/Lime/Sand mortar or capped in corbelled brick or special bricks as indicated on detailed drawings.

Flues shall be finished with a purpose made terminal or chimney pot as Clause G.89 haunched in (1:3) cement/sand mortar.

G.112 Damp Proof Course

Provide damp proof course as Clause G.19, neatly holed for passage of flue liners, under precast chimney cappings and to brick cappings in position shown on drawings.

Build-in metal tray as specified. Clause G.90 to form damp proof course where chimney stack first cuts roof all as shown on detailed drawings. Flashings are to be as specified under Section M "Roofing".

G.113
to
G.118

Nil

G.119 Testing of flues

The Contractor shall be held responsible for all flues drawing smoke satisfactorily and he shall be required to establish that every flue is free from obstruction.

Flues shall be tested by both coring ball and smoke before handover of dwellings in the following manner and sequence and in accordance with IS EN 15287-1:2007(+A1:2010).

- (a) A 185mm metal alloy coring ball shall be lowered gently by rope from the top of chimney pot at roof level to the hearth opening and withdrawn again. Providing no obstruction is encountered once should be sufficient.
- (b) Two smoke pellets designed for the purpose shall be placed in the fire basket and ignited. When smoke starts to form in the heating chamber the door of the heating appliance shall be closed and the smoke allowed to drift upwards towards the top of the flue. If there is no sealed heating appliance but an open type fire then a piece of

Section F – CONCRETE WORK

board should be placed over the fire surround opening and sealed around edges.

When smoke is observed rising above top of chimney pots a polythene bag should be placed over the pot and sealed around the edges to form an airtight seal. The bag **should not** be squeezed as this would induce additional air pressure which is not required for the test.

The smoke test shall continue for five minutes.

The chimney breast and surrounding walls would be observed at ground floor, first floor and at roof space to check for smoke leakage. Where a flue abuts a party wall simultaneous observations shall also be made in adjoining dwellings at ground floor, first floor and roof space to check for smoke leakage. Particular attention should be taken to barge overhangs to end of terrace dwellings and at eaves for leakage from cavities.

Before commencing the smoke test the chimney flue should be preheated by gas blow lamp or other similar means to induce the smoke to rise easily.

- (c) On completion of the above tests a Certificate of Satisfaction, as provided shall be signed by the Contractor and endorsed by the Clerk-of-Works. Dwellings will not be accepted for handover unless the Architect is in possession of the Certificate of Satisfaction.
- (d) The above tests will also be made by the Contractor, six months after the handover of dwellings and a second Certificate of Satisfaction completed and endorsed.

Section F – CONCRETE WORK

SOUTH COUNTY COUNCIL - ARCHITECTS DEPARTMENT DUBLIN	
FLUE TEST CERTIFICATE	
CONTRACT:.....	
CONTRACTOR:..... .	
ADDRESS:	
LOCATION: KITCHEN HEN	LIVING ROOM
☐	☐
SMOKE TEST:	DATE.....
CORE TEST:	DATE.....
I hereby certify that the tests as set out in the South Dublin County Council Standard Housing Specification have been completed and that the above flue is in compliance with these tests. 	
Signed: Contractor	Endorsed: Clerk of Works.
RE-TESTING DUE	

APPENDIX A: LIST OF REFERENCES AND STANDARDS. (Part 1)

Item No.	Clause	Reference	Comment
1.	G.5	BS 4729:2005	Clay and calcium silicate bricks of special shapes and sizes, recommendations.
2.	G.7	IS EN 771-1:2011	Specification for masonry units – Part 1: Clay masonry units.
3.	G.8	IS EN 771-3:2011	Specification for masonry units – Part 3: Aggregate concrete masonry units (Dense and lightweight aggregates)
4.	G.12	IS EN 12878:2005	Pigments for the colouring of building materials based on cement and/or lime – Specifications and methods of test.
5.	G.14	IS EN 459-1:2010	Building lime – Part 1: Definitions, Specifications and conformity criteria.
6.	G.15	IS EN 998-2:2010 (+NA:2010)	Specification for mortar for masonry – Part 2: Masonry mortars. (including Irish National Annex)
7.	G.19	IS 57-1:1987 IS 57-2:1987	Damp-proof courses – Part 1: Bitumen damp proof courses. Damp-proof courses – Part 2: Polyethylene damp-proof courses.
8.	G.20	IS EN 13967:2012	Flexible sheets for waterproofing – Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet – Definitions and characteristics.
9.	G.23	IS EN 845-1:2013 (+NA:2013)	Specification for ancillary components for masonry – Part 1: Wall ties, tension straps, hangers and brackets (including Irish National Annex)
10.	G.25	IS EN 11600 ISO :2003 (+A1:2011)	Building construction– Jointing products – classification and requirements for sealants.
11.	G.28	BS 6093:2006 (+A1:2013)	Design of joints and jointing in building construction – Guide.
12.	G.29	BS 6213:2000 (+A1:2010)	Selection of construction sealants – Guide.

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APPENDIX A: LIST OF REFERENCES AND STANDARDS. (Part 2)

Item No.	Clause	Reference	Comment
13	G.37	IS EN 1996-1-1:2005 (+A1:2012) IS EN 1996-2:2006 (+COR:2009)	Eurocode 6 – Design of masonry structures – Part 1- 1: General rules for reinforced and unreinforced masonry structures. (to replace IS 325-1:1996 and IS 325-2:1995) Eurocode 6 – Design of masonry structures – Part 2: Design, considerations, selection of materials and execution of masonry (including Irish National Annex) (to replace BS 5628-2:2005 and BS 5628-3:2005)
14.	G.62	BS 476-20:1987	Proprietary Insulated Cavity Closers/Barrier.
15.	G.83	BS 1251:1987	Specification for open-Fireplace components.
16.	G.89	IS EN 1457-1:2012 IS EN 1457-2:2012	Chimneys – Clay/Ceramic – Part 1: Flue liners operating under dry conditions – requirements and test methods. (to replace IS EN 1457-1:2006) Chimneys – Clay/Ceramic flue liners – Part 2: Flue operating under wet conditions – requirements and test methods. (New Standard to be added)
17.	G.89	IS EN 13502:2002	Chimneys – Requirements and test methods for clay/ceramic flue terminals.
18.	G.97	BS 8303-1:1994 BS 8303-2:1994 BS 8303-3:1994	Installation of domestic heating and cooking appliance burning solid mineral fuels – Part 1: Specification for the design of installations. Installation of domestic heating and cooking appliances burning solid fuels – Part 2: Specification for installing and commissioning onsite. Installation of domestic heating and cooking appliances burning solid mineral fuels – Part 3: Recommendations for design and on site installation.
19.	G.109	IS EN 15287-1:2007 (+A1:2010)	Chimneys – Design, installation and commissioning of chimneys – Part 1: Chimneys for non-roomsealed heating appliances.

LIST OF CLAUSES J

BUILDING CONTROL

J.0 Compliance with the Building Regulations

GENERALLY

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J.2 Labour

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J.4 Type of Stone and Source

J.5 Re-use of Stone

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J.7 Nil

J.8 Materials for Mortar

J.9 Wall ties and fixings J.10

To Nil J.14

WORKMANSHIP

J.15 Storage of Stone

J.16 Sample Panel of Finished Facework

J.17 Mortar Mixes

J.18 Uncoursed Random Rubble

J.19 Course Random Rubble

J.20 Jointing and Pointing Random Rubble

J.21 Quoins and Jambs

J.22 Site Cutting and Attendance

APPENDIX A: LIST OF REFERENCES AND STANDARDS

Section J – STONework

J.0 Compliance Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship) and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. no.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERALLY

J.1 Requirements

Stonework shall generally comply with the requirements of IS EN 1996-2:2006 (+COR:2009) and the relevant clauses of Section G – Brickwork and Blockwork of this specification in respect of materials and workmanship.

J.2 Labour

All stone work shall be carried out by a qualified stonemason of proven ability.

MATERIALS

J.3 Stone Generally

The stone, shall unless otherwise specified, be obtained from a single approved source.

The stone shall be free from any defects which could adversely affect the integrity of the stone and shall also be free of any defects on the visible faces, which could mar the appearance of the completed work.

J.4 Type of Stone and Source

The type of stone and source shall be to the Architect's Selection and samples shall be submitted for approval before any stone is delivered to site.

J.5 Re-use of stone

Where existing stone walling is being taken down for re-use of the stone, the stone is to be properly cleaned of all mortar, vegetable matter, fungi etc. and stored awaiting re-use in accordance with Clause J.15.

J.6
to
J.7

Nil

J.8 Materials for Mortar

Materials for mortar shall be as specified in Section G – Brickwork and Blockwork.

Section J – STONEMWORK**J.9 Wall ties and fixings**

All wall ties and fixings shall be stainless steel as a specified in Sections G and Q.

J.10
to
J.14

Nil

WORKMANSHIP**J.15 Storage of Stone**

All stone ready for use shall be stacked on a clean, dry, free-standing surface, avoiding contact with the soil. The stone shall be protected at all times from freezing.

J.16 Sample Panel of Finished Facework

A sample panel of finished stonework, 1200 X 1200mm, or as directed shall be constructed to the satisfaction of the Architect in an agreed location, until the completion of this work on site, when it shall be removed. This shall become the “approved” sample for all finished facework on site and is to be completed at least 7 working days before this works is programmed to commence on site.

J.17 Mortar Mixes

Mortars shall comply with IS EN 998-2:2010 (+NA:2010) and unless otherwise specified mortar mixes shall be as follows: -

MORTAR TYPE	STONE	
	Limestone	Granite
Cement/Sand	1 : 6 ½ - 7	1 : 3
Cement/Lime/Sand	1 : 3 : 12	1 : 1 : 6

Mixing shall be as Section G – Brickwork and Blockwork.

J.18 Uncoursed Random Rubble

Stones shall be selected to keep cutting to a minimum. Where facing a concrete block wall ties shall be provided 900mm horizontally and 450mm vertically; the ties shall be embedded a minimum of 55mm into the blockwork and 100mm into the stonework.

Where the wall is a free standing, without backing, bonding shall be provided by means of longitudinal bonders on both faces with at least one transverse bonder every meter squared extending two-thirds into the wall thickness.

J.19 Course Random Rubble

Build as for uncoursed work, Clause J.18, but roughly level the work to courses every 450mm of height.

J.20 Jointing and Pointing Random Rubble

From slightly recessed joints as the work proceeds and stipple the surface of the mortar with a stiff bristle brush in order to show up the grit in the mix. No joint to exceed 25mm in width.

Section J – STONEMWORK**J.21 Quoins and Jambs**

Select stones of larger size and more regular shape for quoins and jambs.

J.22 Site Cutting and Attendance

Keep site cutting to a minimum. Unavoidable cutting, corrective work and attendance on other trades shall be undertaken by a stone mason.

Appendix A: List of References and Standards.

Item No.	Clause	Reference	Comment
1.	J.1	IS EN 1996-2:2006 (+COR:2009)	Eurocode 6 – Design of masonry structures – Part 2: Design considerations, selection of materials and execution of masonry (including Irish National Annex) (to replace BS 5628-3:2005)
2.	J.17	IS EN 998-2:2010 (+NA:2010)	Specification for mortar for masonry – Part 2: masonry mortar. (to replace IS EN 998-2:2003)

LIST OF CLAUSES M**BUILDING CONTROL**

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M.3 Nil
M.4 Nil
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M.6 Plain Concrete Tiles and Fittings
M.7 Nil
M.8 Fibre Reinforced Cement Slates (f.r.c.) M.9
To Nil
M.12
M.13 Testing of Roof Tiles
M.14 Ridge Terminal Units
M.15 Nil
M.16 Vent Pipe and Ventilation Terminal Units
M.17 Nails
M.18 Rivets for F.R.C. Slates
M.19 Battens
M.20 Underlay
M.21 Eaves Ventilation
M.22 Rafter Ventilation
M.23 Nil
M.24 Laying of Tiles Generally
M.25 Stacking
M.26 Fixing Underlay
M.27 Fixing Battens
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M.29 Eaves
M.30 Verges
M.31 Ridges & Hips

SHEET METAL FLASHINGS

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M.35
M.36 Fixing Accessories
M.37 Nil
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M.40 Flashings Generally
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M.49	Installation
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M.52	Roof Ridge Terminals
M.53	Roof Tile Terminals
M.54	Humidity Sensitive Wall Inlet
M.55	Ducting
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M.64	Ducting
M.65	Tile Terminals
M.66	Fire Dampers

APPENDIX A: LIST OF REFERENCES AND STANDARDS

Compliance with Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. No.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate

TILES AND SLATES GENERALLY

M.0 Approvals of Samples

Samples of tiles and slates must be submitted and the Architects written approval obtained before work is commenced.

M.1
to
M.4

Nil

MATERIALS

M.5 Interlocking Concrete Tiles and Fittings

Interlocking concrete tiles shall be 420 x 330 mm complying with IS EN 490:2011 and IS EN 491:2011. The tiles shall be of approved manufacture and to the profile shown on the detailed drawings. Colour to be selected by the Architect from the manufacturer's standard range.

M.6 Plain Concrete Tiles and Fittings

Plain concrete tiles shall comply with IS EN 490:2011.

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The tiles shall be of approved manufacture with the colour selected by the Architect from the manufacturer's standard range.

M.7 Nil**M.8 Fibre Reinforced Cement Slates (f.r.c.)**

Slates for under cloaks shall be asbestos free fibre reinforced cement (f.r.c.) slates of approved manufacture. All slates must comply with IS EN 492:2012.

M.9
to
M.12

Nil

M.13 Testing of Roof Tiles

A representative selection of tiles from each consignment delivered on site shall be made in the presence of the Clerk of Works. As a guide the number of tiles to be sent for test shall be at least 25 from every five thousand tiles in the consignment and so chosen as to be reasonably representative. The samples for testing are to be sent by the Contractor on the instructions of the Clerk of Works to an approved testing authority in accordance with Clauses A33/220 and A33/560. The sample is to be clearly labeled and will be given an identification number by the Clerk of Works.

M.14 Ridge Terminal Units

Ridge ventilation terminals to match remainder of the ridge tile to be as supplied by tile manufacturer. Provide minimum of two per house or as otherwise indicated. Nil

M.15 Vent Pipe and Ventilation Terminal Units

Vent pipe and ventilation terminal units shall be plastic profiled tile or slate units to match remainder of roof.

Type and pattern to be as shown on the drawings and a sample shall be approved by the Architect before installation. Terminal units shall be supplied complete with flexible connector, which shall be properly fixed and adequately supported.

M.16 Nails

Nails for tiles shall comply with BS 1202-3:1974 for aluminium alloy nails, of the length and diameter as recommended by Slate manufacturer.

Nails for underlay shall comply with BS 1202-1:2002 for steel nails, galvanised finish, Table 4 extra large head felt nails, 20 mm long x 3 mm diameter.

Nails for battens shall comply with BS 1202-1:2002 for steel nails, galvanised finish, Table 1, round plain head nails, 75 mm long x 2.65 mm diameter.

Clips for fixing interlocking tiles without provision for nail fixing shall be of the requisite types supplied by the tile manufacturer. Nails for fixing the clips shall be aluminium alloy to comply with BS 1202-3:1974 and of the length and gauge recommended by the tile manufacturer.

M.17 Rivets for F.R.C. Slates

Rivets shall be disc headed copper rivets, with a 19 mm head and a 19 mm long x 2 mm diameter shank.

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M.18 Battens

Shall be as described under "Woodwork". (Section N: Woodwork)

M.19 Underlay

Underlay (sarking) felt shall be either

- Bitumen reinforced as Class 1F of IS EN 13707:2004 (+A2:2009) and comply with BS 8747:2007.
- Polyester based class 5U in compliance with BS 5534:2003(+A1:2010).

Note: Class 5U underlay offers a higher resistance to tearing and should be used as an eaves starting strip, or where stresses on the felt are predicted. See BS 5534:2003 (+A1:2010) Annex A, page 77 for more information.

M.20 Eaves Ventilation

Eaves ventilators shall be continuous over fascia ventilators giving 10,000mm²/m, for pitched roofs, ventilation ('Glidevale FV100' or equivalent or as otherwise indicated on drawings).

M.21 Rafter Ventilation

Rafter ventilators shall provide 10,000mm²/m continuous ventilation ('Glidevale RV200 Continuous Rafter Roll' or equivalent or as otherwise indicated on drawings).

M.22 Nil

WORKMANSHIP

M.23 Laying of Tiles Generally

Concrete tiles shall be laid and fixed in accordance with IS ICP 2:2002, and with the manufacturers recommendations.

M.24 Stacking

Concrete tiles shall be stacked on wood strips or pallets on level ground.

M.25 Fixing Underlay

The underlay should allow drainage of water into the eaves gutter. It shall extend over the tilting fillet and fascia board and lap into the gutter and be laid so that no troughs are formed in which water may be trapped.

Vertical laps should be not less than 150 mm and each end should be securely nailed over the rafters. The edge distance to the fixings should be not less than 50 mm.

Horizontal laps should be not less than 150 mm and where they are not fully supported they should occur under a batten with at least 25 mm of underlay projecting. (Provide

Section M - ROOFING

additional intermediate battens if required).

M.26 Fixing Battens

Battens shall be nailed through the felt to each rafter. Battens shall be laid level across rafters throughout the whole length of the roof. Prices shall be deemed to have included for any timber packings required to maintain the level of the battens. Joints shall be square ended with not more than one batten in four jointed on any one rafter.

M.27 Tiling and Slating

Tiling and slating shall be close jointed with the horizontal and vertical joints ranging perfectly straight. Each course shall be laid flat on the previous course and properly fixed.

Unless otherwise specified tiles and slates shall be fixed as follows:-

The top and bottom courses and every second course of interlocking tiles shall be fixed with nails or clips. Verges shall be clipped. Minimum headlap shall be 100 mm.

Every second course of plain tiles shall be fixed with two nails to each tile. In addition to which the two bottom and two top courses shall be similarly nailed and at verges, hips, valleys and abutments the two end tiles of every course shall be twice nailed. Minimum headlap shall be 65 mm.

M.28 Eaves

Interlocking tiles at eaves shall be laid in accordance with the manufacturer's written instructions. Profiled tiles shall be fitted with an approved eaves filler unit as provided by the tile manufacturer. Fit eaves ventilation as Clauses M21 and M22 in accordance with the drawings and manufacturer's recommendations.

M.29 Verges

Verges to interlocking tile roofs shall have special end interlocking tiles where such are made.

All verges shall have F.R.C. slate/tile undercloak bedded and jointed in cement/sand (1:3) mortar.

M.30 Ridges and Hips

Bed and joint ridge and hip tiles in cement/sand (1:3) mortar.

The tiles shall be bedded continuously along edges with solid bedding at butt joints. No ridge or hip tiles shall be solidly bedded except at butt joints and ridge ends.

End ridge tiles shall be both mechanically fixed, in accordance with the detailed drawings, and bedded as above.

SHEET METAL FLASHINGS MATERIALS**M.31 Lead**

Lead shall be milled sheet or strip complying with IS EN 12588:2006 and the requirements of BS 6915:2001 (+A1:2014). Lead sheeting shall be 2.24mm Colour Code 'Red' for flashings, valley gutters and slates and 1.8mm Colour Code 'Blue' for soakers.

Section M - ROOFING**M.32 Stainless Steel**

Sheet and expanded metal mesh shall be stainless steel grade 1.4301 in accordance with IS EN 10088- 1:2005. Unless otherwise specified sheet shall be 0.7mm thick and mesh 0.3mm thick.

Shop welding shall be TIG to IS EN 1011-3:2000 (+A1:2004).

M.33
to
M.34

Nil

M.35 Fixing Accessories

Nails shall comply with BS 1202-2:1974, Table 2 jagged shank copper clout nails for lead sheet, of 3.35mm diameter and not less than 25mm long. Stainless steel nails shall be used for stainless steel sheet. Screws shall comply with BS 1210:1963, brass for lead sheet and for stainless steel sheet, 10 gauge and not less than 25mm long.

Fixing clips and wedges shall be cut from the same material as the sheet being fixed.

M.36 Nil**M.37 Underlay**

Underlay shall be sheathing felt complying with IS EN 13707:2004 (+A2:2009) Type 4A and comply with BS 8747:2007.

M.38 Nil**WORKMANSHIP****M.39 Flashings Generally**

Sheet metal flashings and soakers shall be as described, neatly cut, formed and dressed.

Flashings turned into brickwork or concrete shall be turned 25mm into joint or groove, and wedged at each step and at 500mm maximum centres unless otherwise shown. Free edges of flashings shall be clipped at 500mm maximum centres unless otherwise shown.

Unless otherwise shown, sheet metal flashings shall be formed from pieces not exceeding 1800 mm length and lapped not less than 100mm at joints.

Stepped flashings shall lap upstands by not less than 65mm, other cover flashings shall lap upstands by not less than 75mm.

M.40 Nil**M.41 Substrates and Underlay**

Surfaces to receive underlay or sheet metal linings and flashings shall be even, free from protrusions and clean and dry.

Felt underlay shall be laid with butt joints, fixed sufficiently to prevent movement during the

Section M - ROOFING

fixing of the sheet and kept dry.

M.42 Cavity Trays

Cavity trays to walls and metal trays to chimneys shall as described under "Metalwork" (Section Q).

PASSIVE STACK VENTILATION SYSTEM GENERALLY**M.43 Location**

A fan-assisted, passive stack ventilation system in accordance with the Technical Guidance Document, Part F: Ventilation, 2009 shall be provided to all wet areas ie. all Bathrooms and Kitchens and Internal WC's in locations and to details shown on the Drawings.

M.44 Compliance

The design and installation of the system, which shall be entire, shall be in accordance with BRE Information Paper IP 13/94 - 'Passive stack extract ventilation systems.' and the system shall carry an Agreement Certificate. Fan-assisted PSV devices shall comply with IS EN 13141-4:2011.

M.45 Background Ventilation

Background ventilation shall be provided in all habitable rooms, including areas serviced with PSV systems as clause M.44.

General background ventilation rates to be achieved in accordance to table 1: 'Basic ventilation provision using background ventilators and specific provision for extract and purge ventilation' in technical Guidance Document, Part F, 2009'.

M.46 Nil**M.47 Installation**

The installation to be carried out in accordance with the system manufacturers recommendations.

M.48 Nil MATERIALS**M.49 Ceiling Extracts**

Ceiling extracts to be humidity sensitive operating between 40% and 70% relative humidity ('Passivent System Ref. A161' or equivalent)

M.50 Roof Ridge Terminals

Ridge terminals to provide an air flow resistance not exceeding 10Pa at an air movement of 100m³/h ('Passivent System Ref. PRT' or equivalent)

M.51 Roof Tile Terminals

Roof tile terminals to provide an air flow resistance not exceeding 5Pa at an air movement of 100m³/h ('Passivent System Ref. TT9' or equivalent)

Section M - ROOFING

M.52 Humidity Sensitive Wall Inlet

Humidity sensitive wall inlets to provide background ventilation ('Passivent System Ref. 99H' or equivalent) to habitable rooms including wet areas.

M.53 Ducting

Provide ducting as supplied by system Manufacturer. Ducting to be capable of fitting within 75mm zone of timber stud walls.

Ducting in roof space to be fully insulated.

M.54 Fittings

Provide for all fixtures, fittings and couplings that may be required.

M.55
to
M.62

Nil

WORKMANSHIP

M.63 Kitchen Extracts

Kitchen extracts should be positioned where possible within 1 metre of the cooker hob but not directly over it. This should not be mistaken for as the cooker extract hood.

M.64 Ducting

Ducting to be kept as vertical as possible and insulated ductwork in roof space should drop no less than 45°.

All flexible duct connections to be clamped, taped, with rigid connections to be taped and properly supported.

M.65 Tile Terminals

Tile terminals should be fixed within three courses of the ridge.

M.66 Fire Dampers (3 storey houses only)

In 3 storey houses provide for fire dampers to system in accordance with the manufacturers details to comply Technical Guidance Document, Part B: Fire Safety.

Section M - ROOFING

Appendix A: List of References and Specifications

Item No.	Clause	Reference	Comment
1.	M.5	IS EN 490:2011	Concrete roofing tiles and fittings or roof covering and wall cladding – Product specification. (to replace IS EN 490:2005)
2.	M.5	IS EN 491:2011	Concrete roofing tiles and fittings for roof covering and wall cladding – Test methods. (to replace Bs 473;500)
3.	M.8	IS EN 492:2012	Fibre-cement slates and fittings – Product specification and test methods.
4.	M.17	BS 1202-3:1974	Specification for nails – Aluminum nails.
5.	M.17	BS 1202-1:2002	Specification for nails – Steel nails.
6.	M.20	IS EN 13707:2004 (+A2:2009)	Flexible sheets for waterproofing – Reinforced bitumen sheets for roof water proofing – Definitions and characteristics (to replace BS 747:2000)
7.	M.20	BS 8747:2007	Reinforced bitumen membranes (RBMs) for roofing. Guide to selection and specification. (newly added standard)
8.	M.24	IS ICP 2:2002	Irish Code of Practice – Slating and tiling.
9.	M.32	IS EN 12588:2006	Lead and lead alloys – Rolled lead sheet for building purposes.
10.	M.32	BS 6915:2001 (+A1:2014)	Design and construction of fully supported lead sheet roof and wall coverings – Code of Practice.
11.	M.33	IS EN 10088-1:2005	Stainless steels – Part 1: List of stainless steels.
12.	M.33	IS EN 2011-3:2000 (+A1:2004)	Welding – Recommendations for welding of metallic materials – Part 3: Arc welding of stainless steels.
13.	M.36	BS 1202-2:1974	Specification for nails – Copper nails.
14.	M.36	BS 1210:1963	Specification for wood screws.
15.	M.45	BRE Information Paper IR 13/94	Passive stack ventilation, extract ventilation systems.

LIST OF CLAUSES N

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N.2 Native Timbers
N.3 Quality Control
N.4 Moisture Content

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- N.5 Preservation of Joinery
N.6 Preservation of Structural and Carpentry Timbers
N.7 Preservatives
N.8 Method of Treatment for New Timbers
N.9 Double Vacuum Impregnation
N.10 Moisture Content
N.11 Drying Time following Preservation Treatment
N.12 Handling of Treated Timber
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CARPENTRY

- N.14 Timber for Carpentry
N.15 Workmanship
N.16 Metalwork
N.17 Screws, nails bolts etc.
N.18 Truss Clips
N.19 Joist Hangers
N.20 Trimmer Connections
N.21 Nil
N.22 Trussed Rafters
N.23 Storage of Trussed Rafters
N.24 Bracing of Trussed Rafters
N.25 Erection of Trussed Rafters
N.26 Lateral Restraint to Roofs
N.27 Wall Plates
N.28 Fixing of Wall Plates
N.29 Chimney Breasts and Flues
N.30 Tank Trays
N.31 Cut Pitched and Flat Roofs
N.32 Longitudinal Joints
N.33 Screwed or Bolted Joints and Connections
N.34 Traditional Pitched Roofs
N.35 Fascia, Soffit and Barge
N.36 Formwork to eaves bands, concrete barges etc
N.37 Timber Floors
N.38 Sundries
N.39 Additional Support for Plasterboard Ceiling Slabs
N.40 Nil

JOINERY

- N.41 Timber for Joinery
N.42 Workmanship
N.43 Plywood

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N.44	Medium Density Fibre Board (MDF)
N.45	Blockboard and Chipboard
N.46	Nil
N.47	Skirtings and Pipe Casings
N.48	Architrave's
N.49	Internal Doors
N.50	Door Saddles
N.51	External Doors Revised March 2005
N.52	Doors to External Stores
N.53	Gates to Gardens
N.54	External Door Frames
N.55	Roof Windows
N.56	Windows
N.57	Staircases
N.58	Bulkheads
N.59	Trap Doors
N.60	Hotpress
N.61	Ducting for Pipework
N.62	Bath Panels
N.63	Stud Partition
N.64	Nil
N.65	Eaves Ventilation
N.66	Shelf to Fire Surrounds
N.67	Arrises
N.68	Kitchen fitments
N.69	Sink Base Unit N.70
To	Nil
N.100	

IRONMONGERY

N.201	Ironmongery Generally
N.202	Sundries
N.203	Lubrication and Adjustment of Ironmongery
N.204	Windows Generally
N.205	Drainage Outlets
N.206	Window Ventilators N.207
to	NIL
N.209	
N.210	Door Generally
N.211	Door Stops
N.212	Butt Hinges (Timber Doors)
N.213	Locks to External Timber Doors
N.214	Letter Plate
N.215	Numerals
N.216	Weatherseals to External Timber Doors
N.217	Pull Handles to Timber Doors
N.218	Barrel Bolts (Internal)
N.219	Nil
N.220	Mortise Sash Lock (2 Lever)
N.221	Lever lock furniture
N.222	Privacy mortise lock (bathrooms only)
N.223	Lever lock furniture for privacy lock (as N222 above)
N.224	Mortise Latch
N.225	Lever Handle for Mortise Latch
N.226	"T" Hinges
N.227	Padlock Bolt
N.228	Butt Hinges (Steel Doors)
N.229	Mortice Sash Locks to Steel Doors (Service Blocks)
N.230	Pull Handles to Steel Doors
N.231	Locks to Gallows Gates N.232

To	Nil
N.234	
N.235	Shower Rails
N.236	Coat Hooks

SCHEDULES

N1	Schedule of Ironmongery – External Doors and Gates to Houses	N2	Schedule of Ironmongery – Internal Doors to Houses
N3	Schedule of Ironmongery – Service Blocks		
N4	Schedule of Ironmongery – Caretakers Facilities		

APPENDIX A: LIST OF REFERENCES AND STANDARDS**N.0 Compliance with Materials and Workmanship with the Building Regulations**

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in National rules for Ireland (S.I. No.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERALLY**N.1 Timber Generally**

All timber used throughout the work shall be well seasoned and dry, free from sap, shakes, large or loose knot, waney edges or other imperfections. It shall be hardwood and softwood as defined in IS EN 942:2007 respectively. Timber which is in the opinion of the Architect inferior in character and condition or is not suitable for the requirements of the work because of the blemishes it contains shall not be used. All timbers found defective in these respects shall be removed from the site.

- White deal shall be spruce, straight, well-seasoned and free from sapwood.
- Red deal for joinery, etc. shall be Scots Pine (Pinus Sylvestris).
- Flooring shall be best white deal.
- Pitch pine and Parana pine shall be first quality and free from knots.
- Oak shall be first quality, sound, close-grained and well-seasoned Japanese Oak.
- Teak shall be first quality.
- Mahogany shall be prime east African Mahogany.
- Oregon Pine (Douglas Fir) shall be first quality Oregon "Clear".

The size of both unwrought carpentry timber and joinery timber, described in this specification and shown on the drawings, in all cases are the finished sizes.

Section N – WOODWORK**N.2 Native Timbers**

It should be noted that the Specification for white and red deal permits the use of suitable native timber. When pricing the Bills of Quantities the Contractor should satisfy himself that adequate supplies of the required is available, as claims will not be entertained for subsequently using imported in lieu of native timber.

N.3 Quality Control

All timber, timber components, joinery, preservatives and treatments will be subject to the NSAI Timber Quality Control Scheme.

The Contractor shall at all times allow access, provide facilities for sampling of materials and supply such information as may be requested in connection with the scheme to the NSAI Timber Certification Services, 1 Swift Square, Northwood, Santry, Dublin 9.

N.4 Moisture Content

The moisture content of all timber shall not exceed the permitted maxima set out in IS EN 942:2007. Tests will be carried out on delivery and during the progress of the work in accordance with the recommendations of the foregoing standard specification: -

The specification requires at the time of fabrication or erection the moisture content shall not exceed the values set out below: -

(	Structural Timbers (including Roof	20%
1	Trusses)	
)		
(	External Joinery Timbers	17
2		+/-
)		2%
(	Internal Joinery Timbers	15
3		+/-
)		2%

or as set out in the appropriate British or Irish Standards.

All timber shall be free from surface moisture at time of treatment with preservative. All timber on site shall be subject to inspection for moisture content by the Architect, Clerk of works or staff of the NSAI.

PRESERVATION OF TIMBER**N.5 Preservation of Joinery**

All softwood species for joinery, including fascias and soffits shall be preserved in accordance with the preservative manufacturer's instructions and unless otherwise stated, with the recommendations of BS 8417:2011.

N.6 Preservation of Structural and Carpentry Timbers

All structural and carpentry timbers shall be pre-treated in accordance with the preservative manufacturer's instructions and unless otherwise stated, with the recommendations of IS EN 15228:2009.

N.7 Preservatives

All organic solvent preservative solutions must comply with Class F/N (fungicidal/insecticidal) of BS 5707:1997. All preservative formulations shall be registered and approved by the Pesticide Control Unit of the Department of Agriculture.

Section N – WOODWORK**N.8 Method of Treatment for new Timbers**

All new timber used on site, including all structural, joinery and flooring timbers, shall receive a double vacuum impregnation treatment in accordance with BS 5707:1997, Clause 5 using an organic solvent preservative as Clause N7 above unless otherwise approved by the Architect in writing. Substitute methods of treatment involving brushing, spraying, immersion or pressure impregnation using C.C.A. (Chromated Copper Arsenate) will not be allowed.

N.9 Double Vacuum Impregnation

All double vacuum impregnation treatments shall be carried out in specialist treatment plants approved by the relevant preservative manufacturer and shall be in comply with the requirements of BS 8417:2011 and shall be maintained so that they can carry out treatment schedules in accordance with the relevant Irish and European Standards.

All deliveries of treated timber to the site shall be accompanied by a treatment charge sheet showing date regarding the type of treatment, etc. (Certificates will not be accepted). The charge sheets shall be given to the Clerk of Works on the same day the material is delivered.

N.10 Moisture Content

All timbers which are pre-treated, whether on the site or in specialist treatment plants, shall comply with Clause N.4 before treatment. All timbers shall be free from surface moisture at time of treatment.

After treatment, pressure impregnated timber shall be dried back to a moisture content as Clause N.4 (20% to 15%).

N.11 Drying Time Following Preservation Treatment

Following preservation treatment by double vacuum treatment all timber will undergo a drying of forty-eight hours, in open storage under cover with free air circulation. Following preservation by other methods the timber will undergo a drying time in accordance with the treatment manufactures recommendations.

N.12 Handling of Treated Timber

Treated external joinery shall not be machined, drilled etc., under any circumstance, in all joinery shall be treated with preservative after cutting and machining and before assembly.

Treated timbers shall not be reduced in size.

Where treated timbers are machined or cut, e.g. Bird's mouthing, notches, boring etc., the exposed areas shall receive two liberal brush coats of a organic solvent preservative "complying with Clause N7 and applied in accordance with BS 5707:1997. The colour of this preservative shall be markedly different from that of the original preservative. If this different colour is not readily seen, it will be assumed that no supplementary treatment took place and that timbers shall be re-treated.

N.13 Testing

Samples of timber for all tests shall be regularly and randomly selected for analysis. Samples of any wood preservative used on site shall also be taken for testing.

Section N – WOODWORK**CARPENTRY****N.14 Timber for Carpentry**

All structural timbers shall in accordance with IS EN 1995-1-1:2005+A1:2008 and shall be strength graded and marked in accordance with IS 127:2002. Each individual timber length shall bear the stamp indicating NSAI Approval showing the grade and strength class of the timber.

White deal wrot timber boarding shall be free from excess cupping, unsound or loose knots, wane or excess fissures.

N.15 Workmanship

Rafters, purlins, sole plates, ridges, collars etc. shall be in one length if possible. Where joints are unavoidable, the timbers shall be properly scarfed and spiked and bolted, as required. Scarfs, unless otherwise directed, shall be 0.5m long

N.16 Metalwork

Metal straps, bolts, joist hangers etc. and metallic coating shall comply with relevant sections of Section Q – Metalwork.

N.17 Screws, Nails, Bolts, etc

Screws shall comply with either BS 1210:1963, IS 97:1986 or IS 97-2:1988, as appropriate and steel nails with BS 1202-1:2002. Nails for fixing external joinery shall be aluminium in accordance with BS 1202-3:1974.

N.18 Truss Clips

Truss clips for connections to wall plates to be 1.00mm thick (20 SWG) galvanised mild steel or stainless steel of approved manufacture at all party walls. Mild steel to be hot-dipped galvanized using double-dipped process to BS EN ISO 1461:2009.

N.19 Joist Hangers

Joist hangers are to be of galvanised steel or stainless steel and are to comply with IS EN 845-1:2012 (+NA:2013). Joists shall not be built into party walls. Mild steel to be hot-dipped galvanized using double-dipped process to BS EN ISO 1461:2009.

N.20 Trimmer Connections

All trimmers to be fixed with joist hangers as clause N 19.

N.21 Nil**N.22 Trussed Rafters**

Trussed rafters shall comply with IS EN 1995-1-1:2005+A1:2008 and shall be manufactured under the NSAI Roof Truss Quality Control Scheme and tagged with the “NSAI APPROVED” tag.

Details and calculations shall be submitted to the Architects for approval.

Where details or truss layouts shown on the general arrangement drawings differ from the requirements of the Design System Owners the Architect shall be informed before fabrication of the trusses.

The trusses shall be to the pitch and spans shown on the detailed drawings and fixed at centres not greater than 600mm unless otherwise shown. At chimney stacks and trap door where centres exceed 600mm, unless otherwise specified, provide a double truss

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on either side and intermediate mono trusses are required complete with all purlins, binders and trimmers all as shown on the drawings and in accordance with the fabricators Design System Owners details.

Water tanks shall be supported over four trusses in accordance with IS EN 1995-1-1:2005+A1:2008 and as shown on the detailed drawings. Where water tanks exceed 270 litres capacity the Contractor shall inform the fabricator who shall make allowance for this in the design.

Trusses shall not be cut, modified or repaired on site in any way.

N.23 Storage of Trussed Rafters

Trussed rafters shall be stored upright and supported at the design bearing points (wall plate positions). The supports shall be level and at such a height as to ensure that any rafter overhangs are free from ground contact.

All supports shall be firm and safe and the storage shall be on firm level ground free of vegetation. All trusses shall be protected against exposure to rain and in such a way as to allow for the free circulation of air.

N.24 Bracing to Trussed Rafters

Permanent horizontal and diagonal bracing members shall be fixed to ceiling ties and rafters as shown in IS EN 1995-1-1:2005+A1:2008 and on the detailed drawings.

Bracing shall start at each gable and at each separating wall and repeat without interruption in the length of every roof. No bracing shall cross a party wall.

The ends of all longitudinal bracing members shall directly connect with the gable or separating walls. The lower ends of diagonal rafter bracing members shall abut the end walls as closely as possible to the intersection between the end wall and the wallplate.

Where shown or otherwise specified provide additional bracing to ceiling ties and internal truss members in accordance with the Design System requirements, details of such additional bracing shall be submitted by the fabricator to the Architect before fabrication of the trusses.

All bracing shall consist of 100 X 25 (minimum) softwood fixed to each truss with two number 2.65mm X 75mm long round wire nails.

N.25 Erection of Trussed Rafters

Temporary battens shall be nailed to each side of the ridge to maintain position and the trussed rafters secured to the wall plate at each end with truss clips as clause N30 and fixed with minimum 30mm long X 3.75mm (9SWG) sherardised square twisted shank nails. Clips shall be nailed in accordance with the manufacturer's recommendations and all nail holes provided shall be used. Sherardising to accordance with IS EN 13811:2003.

N.26 Lateral restraints to roofs

Where shown on the drawings or otherwise specified provide mild steel lateral restraint straps, at 2 metre maximum centres to roofs at gable walls.

Ensure that "turn-downs" on straps are in tight contact with the wall. Straps to rafters must engage in a block not less than $\frac{3}{4}$ full size. All straps are to be fixed with at least 4 no. 8 gauge X 50mm counter-sunk plated wood screws.

Straps shall be of sufficient length to engage in at least two rafters or ceiling ties. Provide

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100 X 44mm softwood noggins between rafters/ceiling ties at every strap. Securely fix 44mm softwood wedges between wall and adjacent rafter/ceiling tie. Rafters and ceiling ties shall not be notched.

N.27 Wall Plates

Wall plates unless otherwise shown shall be 100 x 75mm white deal, square sawn and free from any distortion. Wall plates shall be halved at joints and cut up to each side of party walls.

All wall plates shall comply with the requirements in IS EN 1995-1-1:2005 (+A1:2008).

All wall plates shall be positioned and aligned to given both correct span and level and fixed so as to provide the full bearing area to the ceilings joists.

N.28 Fixing of Wall Plates

Wall plates unless otherwise specified shall be fixed down at 1200 mm maximum centres and within 300mm of their ends and joints.

Fixings direct to masonry walls shall be with 100mm x 1200mm long vertical mild steel restraint straps as clause 26. The straps shall be screwed to the wall plate with 2 No. 12 gauge x 50mm counter-sunk plated wood screws and fixed to masonry with 6 No. 8 swg x 75mm masonry nails evenly spaced along the length of the strap.

N.29 Chimney Breasts and Flues

All structural timber shall be kept a minimum of 40mm clear of all chimney breasts and flues.

N.30 Tank Trays

Tank to be set on 19 X 119mm T & G boarding spiked to 2 No. 36 X 100mm primary bearers, spiked to 2 No. 75 X 150mm secondary bearers, spiked to 2 No. 44 X 100mm spreader beams which in turn shall be supported as close as possible to the node points of the last four trusses – all to comply with the requirements of IS EN 1995-1-1:2005+A1:2008.

N.31 Cut Pitched and Flat Roofs (Clauses 29-32)

Timber for pitched roofs for other than trussed rafter construction shall be white or red deal complying with IS EN 1995-1-1:2005+A1:2008. Section sizes and spacing shall be as shown on the detailed drawings.

Ceiling joists, rafters, collars and wall plates, unless otherwise specified shall be nailed at all joints. Purlins shall be supported by ends and by struts from cross and longitudinal walls. Struts shall be nailed and notched to purlins and runners. All joints shall be at least twice nailed and size and spacing of nails shall be in accordance with IS EN 1995-1-1:2005+A1:2008.

N.32 Longitudinal Joints

Ceiling joists and rafters shall be in one length between spans.

Purlins, ridges and collars etc. Shall be in one length unless otherwise agreed with the Architect. Where joints are unavoidable the timbers shall be properly scarfed or half jointed and spiked and /or bolted as required.

N.33 Screwed or Bolted Joints and Connections

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Correctly sized pre-drilled holes shall be formed for all screwed or bolted joints and connections. The size, spacing and tolerance for bolts, screws and their accessories shall be in accordance with IS EN 1995-1-1:2005+A1:2008.

N.34 Traditional Pitched Roofs

Construct roofs as shown on drawings and on detailed drawings to be supplied as the work proceeds, all framed up in the best manner possible, well spiked together and to the following scantlings unless otherwise noted or instructed in timber as Clause 31: -

Rafters 125mm X 36mm at 400 centres maximum. **Ceilings joists** 150mm X 44mm at 400 centres maximum. **Collars** 150mm X 44mm at every fourth rafter.

Hangers and runners 75mm X 50mm hangers at every fourth rafter.

Ridge 200mm X 25mm step-jointed and plated.

Wall plates 100mm X 75mm step jointed.

Struts 100mm X 75mm.

Purlins 150mm X 75mm stepped jointed.

Notch rafters over wall plates, trim for chimney with 100mm X 75mm trimming rafters and trimmers, properly scarfed and bolted. Wall plates shall be as Clause 27 and fixed down as Clause 28.

Trim for trap doors, one to each house in positions to be decided on site or as indicated on drawings with 75mm thick trimmers, and for ceiling lights, if shown. Provide 19mm tongued and grooved boarding as may be necessary to take flashings around chimney stacks.

Purlins shall be supported by end and party walls and by struts from cross and longitudinal walls birdsmounted to take purlins. Purlins shall be supported every 2134mm minimum.

N.35 Fascia, Soffit and Barge

In order to reduce long-term maintenance exposed timber at roof level has been reduced to a minimum by use of concrete barges, hip roofs and flush brick eaves. Where unavoidable sizing will be as follows;

Fascia: 27 X 169mm

Soffit: 19mm T.G./V sheeting.

Barges: 27 X 169mm on 115 X 44mm gable ladder at 450 centres.

N.36 Formwork to Eaves Bands, Concrete Barges etc.

All casings, centring and moulds for concrete work shall be spruce or other approved timber of sufficient thickness, wrought where necessary and coated with approved mould oil. Watertight construction shall be used. They shall be substantially and accurately constructed true to level surface line for the centre length of any block of houses, and watered before concrete is laid or placed. They shall remain in position for such a period after the concrete is placed, as the Architect may direct. The Contractor shall inform the Architect or their representative when he intends to strike any shuttering

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and shall obtain their consent. Responsibility for the safety of the concrete shall rest with the Contractor, who shall make good at his own expense any damage or defect. The formwork shall be so arranged as to permit of easing and removal without jarring the concrete.

N.37 Timber Floors

Timber floor joists to be in accordance with Clause 14 and as shown on drawings. Joists to be 175 X 44mm. Trimming joists to be 175 X 75mm. Fix 175 X 44mm solid bridging to joisted first floors as shown on drawings.

Flooring throughout to be 119 X 19mm (fin) spruce tongued and grooved with splayed headings, securely spiked and cleaned off. Boards for access to electrical wiring to be screwed as indicated on drawings, the tongues having been first removed. Flooring boards are to be delivered on the site as soon as possible after the order to commence work is given and stacked under cover so that the air will circulate freely around them. The boards are to be placed loosely into the house as soon as the roofing is complete and left until ready for fixing.

N.38 Sundries

Provide and fix scaffolding, rough boarding, shuttering, strutting, centering etc., with all necessary nails, bolts and straps etc.

N.39 Additional Support for Plasterboard Ceiling Slabs

Where ceiling ties to roofs are more than 50mm clear of party or gable walls provide additional 75 x 35mm ceilings joists to support edge of plasterboard ceiling slabs. Fixings shall be 60mm long masonry nails at 300mm max centres; no fixing to be more than 200mm from end of joist and no fixing shall be made into a mortar joint.

Also provide 50 x 44mm softwood noggins to all unsupported edges of plasterboard ceiling slabs in accordance with the manufacturer's requirements.

N.40 Nil**JOINERY****N.41 Timber for Joinery**

Softwood shall comply with IS EN 942:2007.

Hardwoods shall be provided to IS EN 942:2007. Samples of each type of hardwood of representative sections for use in the work shall be previously submitted by the Contractor for the Architect's approval.

The quality of timber for exposed surfaces in finished joinery shall comply with IS EN 942:2007.

N.42 Workmanship

Workmanship shall generally be in accordance with BS 1186-2:1988 and BS 1186-3:1990; tolerances to be generally in accordance with BS 4787-1:1980.

Any timber splitting or opening to the extent of one millimeter within the Contract Maintenance Period shall be replaced. All joinery work is to be properly wrought and framed together and finished in a workmanlike manner. All framing to have mortise and tenon joints. Tonguing to be cross-grained. Work is to be prepared and framed up as soon as possible after the order to commence work is given and stored dry under cover, so

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that the air will circulate freely around it. No work is to be glued or wedged up until required for use, unless otherwise specified or directed.

All joinery is to be finished die square, and when in work is to hold the full dimensions shown on drawings. No piecing, lengthening or unnecessary joining will be permitted.

Work exposed to view is to be wrought and that exposed to weather is to be put together with an approved silicone sealant.

N.43 Plywood

Plywood for internal and external use shall comply with IS EN 636:2012 plywood for use in exterior conditions. Plywood to have a bonded quality according to the requirements in IS 314-2:1993.

N.44 Medium Density Fibre Board (MDF)

Medium Density Fibre Board (MDF) shall comply with IS EN 622-1:2003 and IS EN 622-5:2009. Moisture resistant (MDF.H) shall be used internally as defined in IS EN 622-5:2009.

For external use Exterior MDF shall be used where all surfaces shall be painted.

N.45 Blockboard and Chipboard

Blockboard and Chipboard shall not be used except in kitchen units as specified in Clause N68.

N.46 Nil**N.47 Skirtings and Pipe Casings**

Red deal, single bullnosed 119 X 19mm

N.48 Architrave's

Red deal, single bullnosed 69 X 19mm.

N.49 Internal Doors

Internal doors to be 44mm flush type **half hour fire doors** certified as complying with requirements of BS 476-22:1987. The doors to be slipped on all edges and be supplied with 1½ pairs of butt hinges. Frame and architrave's are to be in red deal to the design and dimensions shown on detail drawings.

All first floor frames and in other locations where indicated, to extend to ceiling level with glazed panel over door. Frames to be to the sizes shown on the detailed drawings and fixed with 150mm long propriety frame fixings to blockwork and 100mm x 4 crosshead countersunk screws to timber partitions. Fixings shall be located 200mm from top and bottom of frame and not more than 600mm centres.

A sample of the each different type of door set shall be submitted to the Architect for approval prior to any being delivered to the site.

Door Saddles

N.50 Provide and fit 144 X 19mm red deal door saddles to all internal doors unless otherwise

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directed. Saddles shall be twice levelled on top checked to frames and rounded, bedded in pitch and tar at concrete on tiled floors. Saddles shall be secured with brass countersunk screws to floors and finished with three coats polyurethane varnish.

N.51 External Doors

Front and rear external doors, frames and screens complying with IS 196-1:1983 and IS 196-4:1982 shall be manufactured in red deal (*pinus sylvestris*) or, **subject to the approval of the Architect**, in hardwood all as detailed on the drawings. The door leaf shall be a minimum thickness of 44mm and all suitable for double-glazing. Weatherseals and threshold as Clause N216.

A performance test certificate report or Agrément Certificate shall be supplied for the glazing of doors detailing the results for air infiltration, water penetration and wind resistance against the required criteria of 300 Pa, 200 Pa and 2000 Pa respectively for compliance with BS 6375-1:2009, IS EN 12211:2000, IS EN 1026:2000 AND IS EN 1027:2000.

Unless otherwise specified, external doors should have a maximum U-value of 1.6 W/m²K averaged across glazed and solid elements.

External door-sets shall be factory finished as clause N56.

Ironmongery to external doors shall be as clauses N210 to N218 inclusive. The Contractor shall also submit proposals from the manufacturer concerning the continuing availability of spare and replacement ironmongery items for the purposes of maintenance.

A sample of the each different type of door set shall be submitted to the Architect for approval prior to any being delivered to the site.

N.52 Doors and Frames to External Stores

To be red deal ledged, braced and sheeted doors complying with IS.196-6:1986 and as shown on detailed drawing. Frames to be red deal (*pinus sylvestris*) to the sizes shown on the detailed drawings and fixed with 150mm long propriety frame fixings to blockwork. Fixings shall be located 200mm from top and bottom of frame and not more than 600mm centres. Bottom of frame to be secured with iron spud and rings to concrete spud blocks.

Outer face of door frame at store to be lined with bellcast.

N.53 Gates to Gardens

Timber garden gates to ledged and braced boarded gates. Ledges and braces to be 27 X 144mm and boarding 19 X 69mm sections. Frames to be 44 X 94mm with 19 X 38 planted stops. All as detailed drawings.

N.54 Nil**N.55 Roof Windows**

Roof windows shall consist of an aluminium faced, softwood timber frame roof window fitted with double glazing (to be specified by the Architect) and shall be either top hung or central pivoted opening as to the drawings. The window shall come with prefabricated aluminium flashing incorporated into the roof window design.

Unless otherwise specified, roof windows should have a maximum U-value of 1.6 W/m²K averaged across frame and glazing.

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A performance test certificate report or Agrément Certificate shall be supplied for the windows detailing the results for air infiltration, water penetration and wind resistance against the required criteria of 300 Pa, 200 Pa and 2000 Pa respectively for compliance with BS 6375-1:2009, IS EN 12211:2000, IS EN 1026:2000 AND IS EN 1027:2000.

Prior to the commencement of bulk manufacture the Contractor shall submit a sample window and shop drawings showing detail of sections, assembly and fixings for approval by the Architect. The sample shall in all respects, including finish, be representative of all deliveries and shall be fitted with all required ironmongery. The Contractor shall also submit proposals from the manufacturer concerning the continuing availability of spare and replacement ironmongery items for the purposes of maintenance.

N.56 Windows

Windows shall be fully-finished, factory assembled windows in accordance with BS 644: 2012, manufactured in red deal (pinus sylvestris) with hardwood cill or, **subject to the approval of the Architect**, in hardwood all as indicated on the drawings and shall be suitable for double-glazing. Timber shall comply with IS EN 942: 2007.

A performance test certificate report or Agrément Certificate shall be supplied for the windows detailing the results for air infiltration, water penetration and wind resistance against the required criteria of 300 Pa, 200 Pa and 2000 Pa respectively for compliance with BS 6375-1:2009, IS EN 12211:2000, IS EN 1026:2000 AND IS EN 1027:2000.

Prior to the commencement of bulk manufacture the Contractor shall submit a sample window and shop drawings showing detail of sections, assembly and fixings for approval by the Architect. The sample shall in all respects, including finish, be representative of all deliveries and shall be fitted with all required ironmongery.

Windows shall be factory-finished (opaque or clear, with the approval of the Architect) using a coating system complying with IS EN 927-1:2013 and IS EN 927-2:2006.

Unless otherwise specified, windows should have a maximum U-value of 1.6 W/m²K averaged across frame and glazing.

Frames shall be fixed with stainless steel straps 150 x 25 x 1 mm stainless steel, type 304 to IS EN 10088-2:2005. fixed to frame and wall with 3 No. 8 gauge x 38mm stainless steel screws. Minimum 4 straps per frame. Fixings to be located 200mm maximum from bottom and top of frame and at not more than 600mm centres. Cills to be bedded in mastic to concrete cill.

Ironmongery for windows shall comply with clauses N201 to N204 inclusive. The Contractor shall also submit proposals from the manufacturer concerning the continuing availability of spare and replacement ironmongery items for the purposes of maintenance.

Unless otherwise specified windows shall not have permanent ventilation as generally passive ventilation systems will be installed. Where permanent ventilation windows is specified ventilators to be as Clause N206.

N.57 Staircases

Form stairs in the sizes and sections shown on the detailed drawings.

Timber quality to comply with Class J30 of IS EN 942:2007. Sizes and tolerances shall comply with BS 585-1:1989 and workmanship with BS 1186-2:1988.

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Treads, Strings, Handrails and Newel Posts to be red deal. Risers to be either white deal or, **with prior approval of the Architect**, MDF.H complying with Clause 44.

Unless dry-lined walls shall be fully plastered before the staircases are fixed against them. Newel posts as required shall be properly secured to floors and notched to trimmers etc.

Prior to the commencement of bulk manufacture the Contractor shall submit a sample staircase for approval by the Architect.

N.58 Bulkheads

If bulkheads are shown over stairways, frame up as shown on detail drawings. Trim around over stair walls as previously specified with 75mm wide trimmer. Bulkhead bearers on splay shall be 75mm X 35mm checked and birdsmouthed as necessary and so arranged to give a vertical clearance of 2000mm minimum measured over stair tread nosing unless otherwise shown or instructed.

N.59 Trap Doors

From trap doors for access to roof space in position shown on drawings with 750mm X 600mm MDF.H doors 22mm thick. Linings to be 112mm X 75mm red deal mitred at angles and rebated to receive plaster with 19 X 69mm stop to receive trap door. Insulate trap door as Clause N107.

N.60 Hot Press

Doors to hot press shall be flush panel doors as clause N49 to size shown on detailed drawings.

Include for forming three tiers of 19 X 44mm spar shelving, 25mm apart, Form base for cylinder with t & g boarding screwed to 75mm X 150 rough deal bearers.

NOTE: Where hot press is on ground floor the cylinder is to be supported 1 metre off floor level on 119mm X 19mm t & g base supported by 69mm X 44mm wrot red deal framing fixed to floor wall.

N.61 Ducting for Pipework

Ducting to vertical and horizontal pipework to consist of 35mm X 44mm white deal framing faced in 9mm removable plywood panels, as clause N43, fixed with screws and cups at 450mm centres. Provide door in panel for access to gate valves. All primed and painted two finish coats oil paint to selected shade,

N.62 Bath Panels

Enclosures to bath to be formed with 35mm X 44mm rough deal studding sheeted on outside with approved 9mm Plywood, as clause N43, primed and painted two finish coats oil paint to selected shade, fixed to framing with raised headed C.P. screws and cups

Form 100 X 35mm recessed skirting to enclosures. Provide waterproof silicone sealant around baths. Provide two rows white ceramic tiles around bath.

N.63 Stud Partition

Where shown on drawings provide timber stud partitions with 75 X 44 studs at 400mm centres with 75 X 44 noggins at 900mm vertical centres staggered. Wall posts, sills, heads, sole pieces, trimming pieces etc. to 75 X 44. Faced with 9.5mm dry lining as

Section N – WOODWORK

specified elsewhere.

Where first floor partitions run parallel to floor joists provide 175 X 44 solid bridging at 400 centres. Where line of partition and joists correspond exactly joist to be increased to 175 X 75.

Where roof is of traditional cut construction provide 44 X 44 noggins at 600 crs. where partitions run parallel to roof trusses.

Where the roof is of a prefabricated truss construction, the plasterboard ceiling lining shall be continuous for entire roof, ie installed before partitions. **On no account should partitions be fixed to trusses.**

N.64 Nil**N.65 Eaves Ventilation**

Provide continuous eaves ventilation as shown on drawings.

N.66 Shelf to Fire Surrounds

Provide Mahogany shelf 125 X 38 mm rounded on edge to brick fire surrounds.

N.67 Arrises

All arrises exposed in finished work shall be rounded and rubbed down with abrasive paper before priming or staining, to minimum 1.5mm radius generally and minimum 3mm radius to upper arrises of horizontal members exposed to the weather, unless otherwise shown to be of greater radius.

N.68 Kitchen fitments

Provide kitchen fitments, both floor and wall units, as shown on drawings and schedules. For sink base units (see Clause N69), The units shall meet the performance requirements of BS 6222-2:2009 test level 'H'.

Carcase construction shall be from high density fine surface 15mm moisture resisting chipboard coreboard complying with IS EN 312:2010 Type P3, with an approved factory applied 80g/m² melamine finish complying with IS EN 14322:2004. All exposed edges to be sealed with PVC edging. Structural rails and uprights shall be as Clause N41; rear uprights of double base units to be inset by 65 mm to accommodate services running along walls.

Carcases to be supported on adjustable feet which shall allow for a toe recess of not less than 50mm deep at the base of the unit.

The Carcass shall have predrilled corrosion resisting corner plates at each corner for wall fixing.

Where panels are cut to allow access to valves or for any other reason the exposed edge shall be sealed using oil-based paint

Doors shall be not less than 15mm thick and shall be capable of opening through 180°. Hinges to be a metal sprung concealed system with integral catches.

Drawers shall be flat-bottomed and be constructed from proprietary high impact polystyrene sections with hardboard base or proprietary metalbox system. Side runners shall have roller system and stop.

Handles shall be to the Architects selection.

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Shelves shall be adjustable for height and be retained in position using self-retaining bearers. Shelves in double base and wall units to be supported in 6 positions (centrally front and back as well as both ends) to prevent deflection under heavy loads.

Half-length shelves to be provided in all sink base units for easy access to sink traps.

Worktops shall be postforming grade laminate to IS EN 438-1:2005 bonded to 30mm minimum thickness moisture resisting chipboard coreboard complying with IS EN 312:2010 Type P3. The worktop shall be suitably balanced on the reverse surface with a moisture resistant compensating veneer. Worktops shall be in continuous lengths unless otherwise shown and shall be supplied to length with both ends lipped in matching laminate. All necessary battens and supports for worktop shall be included.

Samples of base and wall units shall be provided for the Architects approval.

N.69 Sink Base Units

Sink base units, with 1 No. drawer and shelf, shall be built to receive a single drainer stainless steel inset sink top in a continuous worktop as shown on the drawings. The units shall generally be in accordance with Clause N68.

The carcass shall be designed to ensure that no on site modifications are required when installing the sink top and waste pipe and trap.

A sample base unit complete with sink tap, taps and waste shall be provided for the Architects approval.

N.70

To **Nil**

N.100

IRONMONGERY**N.101 Ironmongery Generally**

The contractor shall submit samples of all ironmongery, which shall include, where possible, alternative surface finishes, for the Architect's approval before ordering; and shall obtain and deposit with the Architect an undertaking from the suppliers that the goods will be delivered in such consignments and qualities as will ensure due progress and completion of the work in accordance with the Contract. The approved samples shall be retained on the site as the standard for subsequent deliveries and shall ultimately be used in the works. Screws and fixings shall be of a suitable gauge and material for the purpose and shall match the article to be fixed. The Contractor shall also submit proposals from the manufacturer concerning the continuing availability of spare and replacement ironmongery items for the purposes of maintenance.

N.102 Sundries

All ironmongery shall include for all screws, fixings, keys, keyhole plates, receivers and other incidentals as that may be required for the correct installation and operation of the item.

N.103 Lubrication and adjustment of Ironmongery

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All wearing surfaces of lift-off hinges including rising butts shall be lubricated during fixing using a suitable grease as recommended by the manufacturer and the wearing surfaces of other metal hinges shall be lubricated whilst laid flat using light machine oil. Any other ironmongery requiring lubrication for correct functioning shall be lubricated in accordance with the manufacturer's recommendations.

N.104 Windows Generally

Each opening sash to have the following ironmongery: -

- (A) 1 No. pair one-piece easy clean sliding friction hinges, as 'Egress Easy Clean Stays' supplied by Basta Parsons Ltd or similar and approved. The stay length shall not be less than half the sash height and installation shall fully comply with the manufacturer's instructions. The stays shall incorporate an opening restricting device.
- (B) 2 No. approved casement fasteners with push type lock. On no account shall key type locks be used on bedroom windows.

A sample hinge and casement fastener is to be supplied and approval of the Architect obtained prior to any installation.

N.105 Drainage Outlets – Where Applicable

6mm minimum dia. tubular copper drainage outlets to be provided to all condensation channels as follows: -

- (A) 3 No. where channel is over 1350mm long.
- (B) 2 No. where channel is less than 1350mm long but over 300mm long
- (C) 1 No. where channel is less than 300mm.

N.106 Window Ventilators

Provide closeable slot ventilator morticed into frame. The ventilator or ventilators, of approved design, must provide a minimum free area of 6500mm².

N.107

to NIL

N.109

N.110 Doors Generally

Ironmongery to doors to be as listed on Schedules N1 to N4 (at the end of this section) or of similar performance and to a specification approved by the Architect. The Specification of all items in Schedules N1 to N4 to be as listed below. The Contractor shall also submit proposals from the manufacturer concerning the continuing availability of spare and replacement ironmongery items for the purposes of maintenance.

N.111 Door Stops

Provide in all locations where doors open against walls etc, 1 screw for fixing, to prevent handles etc. from damaging adjoining wall surfaces.

N.112 Butt Hinges (Timber Doors)

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100mm double pressed steel butt hinge, self colour steel finish, fixed with 32mm X 12mm gauge countersunk steel wood screws.

N.113 Locks to External Timber Doors

External doors to have approved three point locking system complete with lever lock furniture and latch. The latch is to have an internal deadlocking facility and cylinder to have a minimum of five tumbler pins giving a minimum of 10,000 differs. 2 keys (minimum) to be provided.

N.114 Letter Plate

Combination letter plate and knocker to have inward opening sprung flap with a minimum aperture of 195mm X 40mm. Fixings to be from inside face of door.

N.115 Numerals

Provide for up to 3 No. 50mm high Chromium or Brass plated numerals and fixings to front doors only.

N.116 Weatherseals to External Timber Doors

Provide approved weatherseal system, including weatherbar to all external doors. Details of the system to be approved by the Architect and be supplied with the sample door as Clause N51.

Any weatherbar at the foot of the door must be compatible the level access threshold as detailed on the drawings. This detail is also to be incorporated in the sample door as above.

All external doors shall be fitted with gaskets and weather-stripping complying to IS EN 12365-1:2003.

N.117 Pull Handles to Timber Doors

150mm cranked pull handle, zinc alloy or other approved, with front fix “D” type old persons and disabled dwellings only. Pull handle shall meet compliance with BS 8424:2004.

N.118 Barrel Bolts (Internal)

250mm Long Chromium Plated brass heavy duty pattern barrel bolt and receiver with enclosed shoot. When positioned at the top of doors bolts to be mounted vertically.

N.119 Nil**N.120 Mortise Sash Lock (2 Lever)**

65mm 2 lever Mortise sash lock with C.P. for end and striking plate and reversible brass latch. With a minimum 16 Differs and 2 keys (minimum). Keys to differ in all locations within each dwelling.

N.121 Lever lock Furniture

Provide with all mortise sash locks one set of sprung lever action handles and lock plates for front fixings complete with spindle. Lever locks to be in accordance with the requirements of IS EN 1906:2012.

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N.122 Privacy mortise lock (bathrooms only)

75mm Mortise sash lock with C.P. fore-end and striking plate and reversible brass latch. Lock to have emergency release facility.

N.123 Lever Lock furniture for Privacy Lock (As N222 above)

One set of sprung lever action handles and lock plates for front fixing complete with spindle.

Lock plates to include locking nib to internal face of door and emergency release mechanism to outside face of door.

N.124 Mortise Latch

63mm tubular mortise latch with zinc-plated fore-end and striking plate and reversible latch. To be in accordance with IS EN 12209:2004 (+COR:2005)

N.125 Lever handle for Mortise Latch

One half set of sprung action lever handle and latch plate for front fixing complete with spindle.

N.126 “T” Hinges”

254mm long medium black japanned steel “T” hinge with steel pin and galvanised screws. Hinges shall meet the requirements of IS 1935:2002 (+COR: 2005).

N.127 Padlock Bolt

250mm galvanised steel padlock bolt and receiver with galvanised screws to timber gates and welded to steel doors. All padlock bolts and fittings shall be in compliance with IS EN 12320:2012.

N.128 Butt Hinges (Steel Doors)

180mm steel pin butt hinges with independent bearings and grease nipples and welded to steel doors.

N.129 Mortice Sash Locks to Steel Doors (Service Blocks)

Mortice sash locks to steel doors to be ‘Multi-T-Lock’ European Profile dead locks with 75mm lock case and ‘Multi-T-Lock’ “Interactive” key security.

The locks and key security to be to South Dublin County Council (Travellers Section) system and supplied by Crothers Security Ltd, Solution House, 139 St. Peters Road, Dublin 12.

N.130 Pull Handles to Steel Doors

150mm x10mm dia steel pull handles welded to face of door. Pull handles shall meet requirements in BS 8424:2004.

N.131 Locks to Gallows Gates

Provide shrouded locking system to gallows gates to details shown on drawings complete with ‘Multi- T-Lock’ “Interactive” key security as Clause N229.

N.132

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to Nil

N.134

N.135 Shower Rails

Provide shower rails, of approved manufacture, to baths and showers consisting of minimum 1800mm long 25mm diameter C.P. tube complete with 2 No. wall flanges or plugged and screwed to walls in accordance with manufacturer's instructions.

Where corner configuration is required provide matching C.P. right angle bend or single piece preformed tube.

N.136 Coat Hooks

Die-cast hat and coat hook with black polyester powder coating (as Basta Type 1190 or similar and approved) plugged and screwed to walls 19mm R.S.D Pozidrive screws.

SCHEDULE NO: N1				JOB:	
TITLE: Schedule of Ironmongery – External Doors and Gates to Houses					
LOCATIO N	CLAUSE REF OF ITEM			DESCRIPTION	NO REQUIRED
Front Doors	N112 N115 N117	N113 N116	N114 N118	P.S. Butt Hinge 3 Point Locking System Combined Letter Plate Numerals Weatherseals Barrel Bolts Pull Handle (Single bed type and disabled dwellings only)	3 per door 1 set per door 1 per door 1 to 3 per door 1 set per door 2 per door 1 per door
Back Doors	N112 N116 N118	N113	N111	P.S. Butt Hinge 3 Point Locking System Lever lock furniture Weatherseals Barrel Bolts	3 per door 1 set per door 1 set per door 1 set per door 2 per door
External Stores	N126 N127			Steel “T” Hinge Padlock Bolt	2 per door 1 per door
Rear Entrance Gates	N126 N127			Steel “T” Hinge Padlock Bolt	2 per door 1 per door

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SCHEDULE NO: N2		JOB:	
TITLE: Schedule of Ironmongery – Internal Doors to Houses			
LOCATION	CLAUSE REF OF ITEM	DESCRIPTION	NO. REQUIRED
Living Rooms Kitchens Bedrooms	N112 N120 N121	P.S. Butt Hinge Mortise Sash Lock (2 lever) Lever Lock Furniture	3 per door 1 per door 1 set per door
Bathrooms and WC's	N112 N122	P.S. Butt Hinge Privacy Mortise Lock	3 per door 1 per door
	N123 N135	Lever Lock Furniture (for Privacy Lock) Shower Rail	1 set per door 1 set per unit
Hot Press And Stores	N112 N124	P.S. Butt Hinge Mortise Latch Lever Latch Furniture	3 per door 1 per door 1 half set per door

SCHEDULE NO: N3		JOB:	
TITLE: Schedule of Ironmongery – Service Blocks			
LOCATION	CLAUSE REF OF ITEM	DESCRIPTION	NO REQUIRED
External Timber Doors to Kitchen and Bathroom	N112 N113 N116 N118 N115 N114	P.S. Butt Hinge 3 Point Locking System Weatherseals Barrel Bolts Numerals Combined Letter Plate	3 per door 1 set per door 1 set per door 1 per door 1 to 2 per unit 1 per unit
External Steel Doors to Kitchen and Bathroom	N112 N113 N127 N118 N130 N115	Butt Hinge with Bearing Mortice Sash Lock Padlock Bolt Barrel Bolts Pull Handles Numerals	2 per door 1 set per door 1 per door 1 per door 2 per door 1 to 2 per unit

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Door to External Store	N112 N113 N127 N130	Butt Hinge with Bearing Mortice Sash Lock Padlock Bolt Pull Handles	2 per door 1 set per door 1 per door 2 per door
Door to Service Duct	N112 N113 N130	Butt Hinge with Bearing Mortice Sash Lock Pull Handles	2 per door 1 set per door 2 per door
Bathroom	N134 N135	Hat & Coat Hook Shower Rail	2 per unit 1 set per unit

SCHEDULE NO: N4

JOB:

TITLE: Schedule of Ironmongery – Caretakers Facilities

LOCATION	CLAUSE REF OF ITEM	DESCRIPTION	NO REQUIRED
External Steel Doors to	N112 N113 N130	Butt Hinge with Bearing Mortice Sash Lock Pull Handles	2 per door 1 set per door 2 per door
Stores, Elec Switch rooms and Pump Room			
Gallows Gate	N131	Shrouded Locking System	1 per gate

Section N – WOODWORK

Appendix A: List of References and Standards. (Part 1)

Item No.	Clause no.	Reference	Comment
1.	N.1	IS EN 942:2007	Timber in joinery – General requirements. (replaces IS EN 942:1996)
2.	N.4	IS 96:1976	Moisture content of timber for building. (added to clause N4)
3.	N.5	BS 8417:2011	Preservation of wood. Code of practice. (replaces BS 5589:1989)
4.	N.6	IS EN 15228:2009	Structural timber – Structural timber preservative treated against biological attack. (replaces 5268-5:1989)
5.	N.7	BS 5707:1997	Specification for preservatives in organic solvents.
6.	N.14	IS EN 1995-1-1:2005 + A1 2008, (includes Irish national annex 2010)	Eurocode 5: Design of timber structures – Part 1-1: General – common rules and rules for buildings (including Irish National Annex), (replaces IS 444:1998)
7.	N.14	IS 127:2002	Structural timber – Visual strength grading – sawn softwoods with rectangular cross-section.
8.	N.17	BS 1210:1963	Specification for wood screws (Still current but obsolescent.
9.	N.17	IS 97:1986	Wood screws.
10.	N.17	IS 97-2:1988	Wood screws – Part 2: screws with rolled threads. (typo date change)
11.	N.17	BS 1202-1:2002	Specification for nails – Steel nails.
12.	N.17	BS 1202-3:1974	Specification for nails – Aluminium nails.
13.	N.18	BS EN ISO 1461:2009	Hot dip galvanised coatings on fabricated iron and steel articles. Specifications and test methods. (to replace BS EN ISO 1461:1999)
14.	N.19	IS EN 845-1:2012 (+NA:2013)	Specification for ancillary components for masonry – Part 1: Wall ties, Tension straps, Hangers, and Brackets. (including Irish National Annex)
15.	N.25	IS EN 13811:2003	Sherardising – Zinc diffusion coatings on ferrous products – Specification.
16.	N.41	IS EN 942:2007	Timber in joinery – General requirements (to replace IS EN 942:1996)
17.	N.42	BS 1186-2:1988	Timber for and workmanship in joinery. Specification for workmanship.
		BS 1186-3:1990	Timber for and workmanship in joinery. Specification for wood trim and its fixing.

Section N – WOODWORK

Appendix A: list of specifications and References... (Part 2)

Item No.	Clause no.	Reference	Comment
18.	N.42	BS 4787-1:1980	Internal and external wood doorsets, door leaves and frames. Specification for dimensional requirements.
19.	N.43	IS EN 636:2012	Plywood – Specifications.
20.	N.43	IS EN 314-2:1993	Plywood – Bonding Quality – Requirements.
21.	N.44	I EN 622-1:2003 S EN 622-5:2009 I S	Fiberboards – Specifications – Part 1: General requirements. Fibreboard – Specifications – Part 5: Requirements for dry process boards (MDF) (to replace IS EN 622-5 2006)
22.	N.49	B 476-22:1987 S	Fire tests on building and structures. Methods of determination of the fire resistance of non-load bearing elements of construction.
23.	N.51	IS 196-1:1983 IS 196-4:1982	Wood Doorsets – Dimensions. Paneled timber doors.
24.	N.51	BS 6375-1:2009	Performance of windows and doors. Classification for weather tightness and guidance on selection and specification.
25.	N.51	IS EN 12211:2000	Windows and doors. Resistance to wind load. Test method.
26.	N.51	IS EN 1026:2000	Windows and doors. Air permeability. Test method.
27.	N.51	IS EN 1027:2000	Windows and doors. Water tightness. Test method.
28.	N.52	IS 196-6:1986	Framed and sheeted timber doors (external)
29.	N.56	BS 644:2012	Timber windows and doorsets. Fully finished factory- assembled windows and doorsets of various types. Specification. (to replace BS 644:2009)
30.	N.56	IS 927-1:2013 IS 927-2:2006	Paints and Varnishes – coating materials and coating systems for exterior wood – Part 1: Classification and selection. Paints and Varnishes – Coating materials and coating systems for exterior wood Part 2: Performance specification.
31.	N.56	IS EN 10088-2:2005	Stainless Steels-Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes.

Section N – WOODWORK

Appendix A: List of Standards and References... (Part 3)

Item No.	Clause no.	Reference	Comment
32.	N.57	BS 585-1:1989	Wood Stairs. Specification for stairs with closed risers for domestic use, including straight and winder flights and quarter or half landings.
33.	N.57	BS 1186-2:1988	Timber for and Workmanship in joinery. Specification for Workmanship.
34.	N.68	BS 6222-2:2009	Domestic kitchen equipment. Fitted kitchen units, peninsular units, island units and breakfast bars.
35.	N.68	IS EN 312:2010	Particleboards – Specifications. (to replace IS EN 312:2003)
36.	N.68	IS EN 14322:2004	Wood-based panels – Melamine faced boards for interior uses – Definition, requirements and classification. (to replace BS 7331:1990)
37.	N.68	IS EN 438-1:2005	High pressure decorative laminates (HPL). Sheets based on thermosetting resin (usually called laminates) Introduction and general information.
40.	N.101	‘Standards for Ironmongers’ by the Guild of Architectural Ironmongery, 2004.	List of industry standards involving door and window ironmongery www.gai.org.uk
41.	N.112	IS EN 1935:2002 (COR:2004)	Building Hardware – Single-axis hinges – Requirements and test methods.
42.	N.114	IS EN 13724:2013	Postal services – Apertures of private letter boxes and letter plates – Requirements and test methods.
43.	N.116	IS EN 12365-1:2003	Building Hardware – Gasket and weather-stripping for doors for doors, windows, shutters and curtain walling – Part 1: Performance requirements and classification.
44.	N.121	IS EN 1906:2012	Building Hardware – Lever handles and knob furniture – Requirements and test methods.
45.	N.124	IS EN 12209:2004 (+COR:2005)	Building Hardware – Locks and Latches – Mechanically operated locks, latches and locking plates – Requirements and test methods.

LIST OF CLAUSES Q

BUILDING CONTROL

Q.0 Compliance with the Building Regulations

GENERALLY

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Q.3 Nil
Q.4 Materials
Q.5 Pre Galvanised steel
Q.6 Cast Iron
Q.7 Stainless Steel
Q.8 Aluminium
Q.9 Nil
Q.10 Galvanised Pressed Steel Lintols
Q.11 Galvanised Steel Hangers and Straps
Q.12 Bed joint reinforcement
Q.13 Nil
Q.14 Nil
Q.15 Conditions of Surfaces
Q.16 Metallic Coatings
Q.17 Paint Q.18
To Nil
Q.20
Q.21 Cavity Trays
Q.22 Chimney tray damp proof course
Q.23 Nil
Q.24 Gallows Gates
Q.25 Steel Doors
Q.26 Frames to Steel Doors Q.27
To Nil
Q.30

WORKMANSHIP

Q.31 Welding
Q.32 Smithing etc.
Q.33 Forging
Q.34 Painting at Works
Q.35 Erecting and Positioning of Galvanised Pressed Steel Lintols

APPENDIX A: LIST OF REFERENCES AND STANDARDS

Section Q – METALWORK

Q.0 Compliance with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. no.225 of 2013), the contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent certificate.

GENERALLY

Q.1 Shop Drawings

The Contractor shall submit detail drawings when required by the Architect for his inspection.

Q.2
to
Q.3

Nil

Q.4 Materials

Mild steel shall comply with IS EN 10025-1:2004, IS EN 10025-2:2004 and IS EN 10029:2010.

Tubes shall comply with IS EN 10296-1:2003 and IS EN 10297-1:2003 shall be of the type of steel and method of manufacture described.

Bolts, nuts and fixing accessories shall comply with BS 4190:2001 and BS 4933:2010.

Structural sections shall comply with IS EN 10056-1:1999, IS EN 1993-1-1:2005 and IS EN 1993-1-1 National Annex:2007.

Q.5 Pre Galvanised Steel

Pre galvanized steel sheet and strip shall comply with IS EN 10346:2009 edges to be zinc coated.

Q.6 Cast Iron

Cast iron shall comply with IS EN 1561:2011.

Q.7 Stainless Steel

Stainless steel shall be in accordance with IS EN 10088-1:2005. Surface finishes shall be as described. Stainless steel plate and strip shall comply with IS EN 10088-2:2005.

Stainless steel bars, rods, wire, sections and bright products shall comply with IS EN 10088-3:2005. Stainless steel tube shall comply with IS EN 10296-2:2005 and IS EN 10297-2:2005.

Section Q – METALWORK**Q.8 Aluminium**

Wrought aluminium shall be of the alloys described and shall comply with IS EN 485-1:2008 (+A1:2009) for sheet, strip and plate, IS EN 754-1:2008 for cold drawn rod/bar and tube and IS EN 755-1:2008 extruded drawn rod/bar and tube and profiles.

Q.9 Nil**Q.10 Galvanised Pressed Steel Lintols**

Where shown on drawings provide galvanised mild steel lintols. The supplier and type of lintols are to be approved by the Architect before ordering. The lintols are to be suitable for the span and loading above and shall be of a profile suitable for the location specified. See clause Q.35 for fore erection and positing of steel lintols.

All lintols shall be manufactured in accordance with IS EN 845-2:2013 and shall not require any additional onsite protective coatings to comply with this standard.

All cavity lintols are to be insulated to prevent cold bridging.

Where the underside of lintols are to be plastered internally or externally they shall be provided with a keyed surface.

Q.11 Galvanised Steel Hangers and Straps

All ancillary components for masonry i.e. restraint straps, cleats, angle brackets, joist hangers and, unless otherwise specified, structural timber connections shall comply with IS EN 845-1:2013. They shall be fabricated from pre-galvanised mild steel as Clause Q.5 or stainless steel as clause Q.7 and be of approved manufacture and to the dimensions shown on the drawings.

Q.12 Bed Joint Reinforcement

Bed joint reinforcement shall be stainless steel complying with IS EN 845-3:2013.

Q.13
to
Q.14

Nil

Q.15 Conditions of Surfaces

All surfaces of metalwork shall be clean, free from loose millscale and loose rust.

Q.16 Metallic Coatings

Unless otherwise described galvanised coatings for iron and steel shall be hot dip galvanising complying with IS EN ISO 1461:2009 and carried out after fabrication by complete immersion in a zinc bath in one operation and with excess zinc carefully removed.

Q.17 Paint

Ferrous metalwork not protected by a metallic coating and which is to be protected at works shall be painted as Clause V25.

Bituminous paint shall be a black bituminous paint as Clause V22. Paint for Galvanised steel shall be as Clause V25.

Q.18
to

Nil

Section Q – METALWORK

Q.20

Q.21 Cavity Trays

Cavity trays and stopped cavity gutters shall be supplied complete with integrated apron flashings attached by means of a compressed double welt, stapling will not be allowed.

The units shall be fabricated from stainless steel with lead flashings as specified in Section M: Roofing.

Q.22 Chimney tray damp proof course

Damp proof course to chimneys at roof intersection shall consist of a metal tray complete with integrated apron flashing, factory welted, as shown on the detailed drawings. Trays shall have 50mm upstands to edges not intersecting roof and flue apertures.

The metal tray shall be fabricated from lead (Code 5) or stainless steel as specified under Section M: Roofing. Where manufactured from stainless steel trays shall have expanded steel mesh welded to all surfaces in contact with masonry. Lead trays shall be coated both sides in bitumen paint.

Q.23 Nil**Q.24 Gallows Gates**

The gallows gates shall be fabricated from structural hollow sections to the details shown on the drawings. The gates shall be inspected by the Architect before weld dressing and galvanizing. The Contractor shall inform the Architect when they gates are ready for inspection.

The gates shall be provided with an approved locking device using as Clause N.131 shall also be supplied. The Contractor shall be responsible for the correct operation of the gates at completion of the contract.

Q.25 Steel Doors

Steel doors as the detailed drawings shall be fabricated with the front plate welded to all frame members. The back plate or plates shall be welded to the perimeter frame and to at least two horizontal members at lock height.

Q.26 Frames to Steel Doors

Galvanized steel frames to doors shall be built into wall as work proceeds by means of integral 100 x 25 x 2.5mm dovetail cramps. The fixings shall be located 200mm from top and bottom of frame and at not more than 600mm centres.

Q.27
to
Q.30**Nil****WORKMANSHIP****Q.31 Welding**

Welding generally shall be carried out in accordance with IS EN 1011-1:2009

Section Q – METALWORK

Welding of ferritic steels shall comply with IS EN 1011-2:2001 unless otherwise stated.

Welding of stainless steels shall comply with IS EN 1011-3:2000 unless otherwise stated.

Welding of aluminium and aluminium alloys shall comply with IS EN 1011-4:2000 unless otherwise stated.

Welders shall have satisfactorily completed approval testing in accordance with BS 4871-3:1985 or BS 4872-1:1982 or BS 4872-2:1976.

Where hollow sections are used all welds shall continue completely around the sections to be joined unless otherwise stated.

All gates exceeding 1.5m in any dimension shall be inspected by the Architect before weld dressing and surface coating. The Contractor shall inform the Architect when products are ready for inspection.

Those involved in any hot works must hold a certified permit to work in all hot works on site and shall comply with site health and safety rules.

Q.32 Smithing etc.

All smithing and bending shall be soundly and neatly executed, care being taken not to overheat.

Q.33 Forging

All straps, bolts and similar work shall be forged neat and clean from the anvil.

Q.31 Painting at Works

Where described as primed at works, ferrous metalwork shall be freed of rust, millscale, welding slag and flux residue and shall be dry immediately prior to painting with primer as Clause Q.17. Galvanized surfaces to receive bituminous paint shall be clean, dry and free from grease and salts.

The primer shall be touched up with similar primer if damaged by subsequent handling.

Q.32 Erecting and Positioning of Galvanised Pressed Steel Lintols

Lintols shall have a minimum bearing on the supporting structure of 150mm at each end. Bearing surfaces shall be flat and level.

Lintols shall be positioned so that the subsequent brickwork maintains regular horizontally continuous courses and true plane of the face of the surrounding wall.

Lintols shall not be erected until the supporting structure has achieved adequate working strength.

Appendix A: List of References and Standards. (Part 1)

Item	Clause no.	Reference	Comment
1.	Q.4	IS EN 10025-1:2004 IS EN 10025-2:2004	Hot rolled products of structural steels – Part 1: General technical delivery conditions.

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			Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels.
2.	Q.4	BS EN 10029:2010	Hot rolled steel plates 3mm thick or above. Tolerances on dimensions and shape. (replaces BS EN 10029:1991)
3.	Q.4	IS EN 10296-1:2003	Welded circular steel tubes for mechanical and general engineering purposes. Technical delivery conditions. Non-alloy and alloy steel tubes. (replaces typo IS EN 10296-1:2003)
4.	Q.4	IS EN 10297-1:2003	Seamless circular steel tubes for mechanical and general engineering purpose. Technical delivery conditions. Non-alloy and alloy steel tubes. (replaces typo IS EN 10297-1:2003)
5.	Q.4	BS 4190:2001	ISO metric black hexagon bolts, screws and nuts – Specification.
6.	Q.4	BS 4933:2010	Specification for ISO metric black cup and countersunk head bolts and screws with hexagon nuts. (replaces BS 4933:1973)
7.	Q.4	IS EN 10056-1:1999	Specification for structural steel equal and unequal angles and dimensions.
8.	Q.4	IS EN 1993-1-1:2005	Eurocode 3: Design of steel structures – Part 1 – 1: General rules and rules for buildings.
9.	Q.4	IS EN 1993-1-1 National Annex: 2007	Eurocode 3: Design of steel structures. General rules and rules for buildings (including Irish National Annex 2007) (corrigendum 2009), 2005.
10.	Q.5	IS EN 10346:2009	Continuously hot-dip coated steel flat products – technical delivery conditions, 2009. (replaces IS EN 10327:2004)
11.	Q.6	BS EN 1561:2011	Founding: Grey cast irons. (replaces IS EN 1561:1997)
12.a	Q.7	IS EN 10088-1:2005 IS EN 10088-2:2005	Stainless steels – Part 1: list of stainless steels. Stainless steels – Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes.

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Item	Clause no.	Reference	Comment
1 2. b	Q.7	IS EN 10088-3:2005	Stainless steel; s – Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes.
1 3.	Q.7	IS EN 10296-2:2005	Welded circular steel tubes for mechanical and general engineering purposes. Technical delivery conditions stainless steel. (replaces typo 2006 date)
1 4.	Q.7	IS EN 10297-2:2005	Seamless circular steel tubes for mechanical and general engineering purposes. Technical delivery conditions stainless steel. (replaces typo 2006 date)
1 5.	Q.8	BS EN 485-1:2008 + A1 2009	Aluminium and aluminium alloys. Sheet, strip and plate. Technical conditions for inspection and delivery. (replaces IS EN 485-1:1994)
1 6.	Q.8	BS EN 754-1:2008	Aluminium and aluminium alloys. Cold drawn rod/bar and tube. Technical conditions for inspection and delivery. (replaces 754-1:1997)
1 7.	Q.8	BS EN 755-1:2008	Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Technical conditions for inspection and delivery.
1 8.	Q.10	IS EN 845-2:2013	Specification for ancillary components for masonry lintels. (replaces IS EN 845-2:2003)
1 9.	Q.11	IS EN 845-1:2013	Specification for ancillary components for masonry – wall ties, tension straps, hangers and brackets (including Irish National Annex), 2013. (replaces IS EN 845-1:2003)
2 0.	Q.12	IS EN 845-3:2013	Specification for ancillary components for masonry – bed joint reinforcement of steel meshwork (Including Irish National Annex), 2013. (replaces IS EN 845-3:2003)
2 1.	Q.16	IS EN ISO 1461:2009	Hot dip galvanized coatings on fabricated iron and steel articles – specifications and test methods.

Section Q – METALWORK

Appendix A: List of References and Standards, continued... (Part 3)

Item	Clause no.	Reference	Comment
22.	Q.31	IS EN 1011-1:2009	Welding – recommendations for welding of metallic materials. General guidance for arc welding.
		IS EN 1011-2:2001	Welding – recommendations for welding of metallic materials. Arc welding of ferritic steels (Amd 1).
		IS EN 1011-3:2000	Welding – recommendations for welding of metallic materials. Arc welding of stainless steels (Amd 1).
		IS EN 1011-4:2000	Welding – recommendations for welding of metallic materials. Arc welding of aluminum and aluminium alloys (Amd1).
23.	Q.31	BS 4871-3:1995	Specification for approval testing of welders working to approved welding procedures. Arc welding of tube to tube-plate joints in metallic materials.
24.	Q31.	BS 4872-1:1982	Specification for approval testing of welders where welding procedure approval is not required. Fusion welding of steel.
		BS 4872-2:1976	Specification for approval testing of welders when welding procedure approval is not required. TIG or MIG welding of aluminium and its alloys.

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APPENDIX A: LIST OF REFERENCES AND STANDARDS

R.0 Compliance with Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) and set out in national rules for Ireland (S.I.225 of 2013), the Contractor shall provide proof (a Declaration of performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERALLY**R.1 Regulations**

All plumbing and sanitary installations shall comply with Irish Water and FCC Water Regulations and any other regulations that are in force at the time of construction.

R.2 Qualified Tradesmen

All plumbing and sanitary installations shall be carried out by qualified and competent tradesmen.

R.3 Setting Out

The position of all pipe runs including joints and connections shall be agreed with the Architect before any installation is commenced.

R.4 Pipework Generally

Pipework shall include for all necessary bends, fittings, expansion joints, etc., as appropriate and shall be firmly supported by clips or brackets all in accordance with good practice and the manufacturer's recommendations.

The Contractor shall provide all washers, jointing materials etc., necessary to obtain a watertight installation.

R.5 Copper Tubes

Copper tubes shall comply with the requirements of I.S EN 1057:2006 (+A1:2010) and bear the Irish Standard Mark. Manufacturers of the Copper tubes shall be licensed under the Irish Standard Mark Licensing Scheme of the N.S.A.I.

Manufacturers or suppliers shall certify that each delivery complies in all respects with the provisions of IS EN 1057:2006 (A1:2010) and copies of this certificate shall be submitted to the Architect on request.

R.6 Compression Tube Fittings

Compression tube fittings of copper and copper alloy, including stopcocks, gate valves, M.T. fittings and flanged tank connectors, shall comply with IS EN 1254-2:1998 and bear the Irish Standard Mark (Particular Regulations applicable to compression Tube Fittings of Copper Alloy Ref. 239/3).

Manufacturers or suppliers shall certify that each delivery complies in all respects with the provisions of IS EN 1254-2:1998 and copies of this certificate shall be submitted to the Architect on request.

R.7 Testing of Materials

The Contractor shall allow for the pressure testing of Hot Water cylinders and for the testing of all other items in this section which the Architect may deem necessary, see Clauses A33/220 and A33/560.

Pressure testing shall be carried out in the presence of the Clerk of Works.

R.8 Thermal Envelope

In this section the expression “thermal envelope” shall mean the area of the building within the warm side of the insulation and Airtightness layer perimeter. E.g a cold attic space is deemed outside of the thermal envelope.

R.9 Pipe Fire Collars (Multi-Storey Housing)

All piping penetrations through fire compartment walls and floors must be fitted with an appropriate pipe fire collar that will prevent smoke and fire movement by closing off the aperture in the event of a fire. The fire collar must be constructed of corrosion resistant steel with a water resistant polymer intumescent material (Pipe collar B150 by fireseal.ie or equivalent and approved by FCC and local Fire Chief), and comply with IS EN 13501-3:2006 + (A1:2009) and BS 476-20:1987.

The collar should be sealed around to prevent the passage of smoke and fire through the walls and floors. Sealing should be Acrylic based (M701 Acrylic sealant by fireseal.ie or equivalent and approved by FCC and Local Fire Officer) and comply with IS EN 1366-3:2009.

RAINWATER INSTALLATION**R.10 Plastic Gutters**

Plastic gutters shall be as indicated on the drawings and shall be black in colour, complying with IS EN 12200-1:2000 and shall include all fittings and accessories required. Sizing and profile shape of the gutters shall be to the Architect's decision.

The Contractor's attention is drawn to tables 16 and 17 of Technical guidance document, Part H for calculations of drainage requirements.

R.11 Plastic Rainwater Pipes

Plastic rainwater pipes shall be 70mm square UPVC rainwater pipes ('Wavin Osma Amazon' or equivalent) and black in colour, complying with IS EN 12200-1:2000 and shall include all fittings and accessories required.

The Contractor's attention is drawn to tables 16 and 17 of Technical guidance document, Part H for calculations of drainage requirements.

R.12 Fixing of Plastic Gutters

Gutters are to be laid accurately to a continuous even fall of 1 in 600 minimum.

The gutters shall be supported at not more than 1 metre centres and strictly in

accordance with the manufacturer's instructions. All fixings, seals and supports shall be as supplied or recommended by the manufacturer.

R.13 Fixing of Plastic Rainwater Pipes

Rainwater pipes shall be fixed and jointed in accordance with the manufacturer's instructions except that brackets shall be spaced at not more than 1 metre centres. Brackets shall be secured to the wall with 10 gauge screws and plastic plugs.

R.14
to
R.19

Nil

R.20 Aluminium Gutters

Aluminium Gutters and fittings ('Alumasc Aqualine' or equivalent) to comply with to IS EN 755-1:2008, complete with all fittings and seals required. The gutters to be plain finish 100mm half round to houses and 120mm half round to apartments.

The Contractor's attention is drawn to tables 16 and 17 of Technical guidance document, Part H for calculations of drainage requirements.

R.21 Aluminium Rainwater Pipes

Aluminium rainwater pipes shall ('Alumasc Flushjoint' or equivalent) comply to IS EN 755-1:2008, including all fittings and accessories required.

Rainwater pipes to be round pipes of 76mm dia, 1.22mm min wall thickness, to houses and 102mm dia, 1.5mm min wall thickness, to apartments.

R.22 Fixing of Aluminium Gutters

Gutters are to be laid accurately to a continuous even fall of 1 in 600 minimum.

The gutters shall be supported with brackets at not more than 900 mm centres apart and strictly in accordance with the manufacturer's instructions. All fixings, seals and supports shall be as supplied or recommended by the manufacturer.

R.23 Fixing of Aluminium Rainwater Pipes

Rainwater pipes shall be fixed and jointed in accordance with the manufacturer's instructions with brackets spaced at not more than 2 meter centers apart and located near joints.

R.24 Balcony Outlets

Rain water outlets from balconies to be ('Harmer Balcony Outlets' or equivalent) 102mm rainwater pipes as Clause R.20.

R.25 Testing

Gutters and rain water pipes shall be tested with water in the presence of the Architect to ensure that there are no leaks, gutters are to correct falls and pipes are unobstructed.

SANITARY INSTALLATION

R.26 Plastic Pipes, Fittings and Accessories

Plastic soil and ventilating pipes and fittings shall be uPVC and comply with B.S.

4514:2001.

Plastic waste pipes and fittings shall be either MUPVC (Modified Unplasticised Polyvinyl Chloride) to IS EN 1329-1:1999 or PP to IS EN 1451-1:1999 or ABS (Acrylonitrile Butadiene Styrene) to IS EN 1455-1:1999 and complying with to BS 5255:1989 as appropriate.

Plastic overflow pipes for flushing cisterns shall be 22mm uPVC and shall drain to the exterior of the building.

Unless otherwise agreed by the Architect, soil and vent pipes, waste pipes and traps shall be obtained from the same manufacturer.

R.27 Jointing of Pipes

All joints shall be perfectly smooth inside without excrescences.

Jointing of pipes and fittings above 50mm diameter shall be by sealing ring unless otherwise indicated in accordance with manufacturer's recommendations. All pipes of 50mm diameter or below shall be solvent welded in accordance with manufacturer's recommendations.

Pipework is to be assembled in a manner that does not entail making joints in restricted locations.

R.28 Cutting of Pipes

All pipes are to be accurately cut to the exact length required to penetrate fully into the fitting without causing bowing of the pipework or the displacement of adjoining pipework. Cuts are to be true and at right angles to the length of pipe. Cut ends are to be cleaned of all burrs and where ring connectors are being used the outside edge is to be filed to a taper.

R.29 Bends and Tees

All bends shall be sweep bends or easy right-angle bends. No elbows shall be used. All tees shall be swept tees. Provide cleaning eyes on elbows and tees to soil stack.

R.30 Nil

R.31 Support and Fixing of Pipework

Unless otherwise described, the fixing of brackets and supports and the frequency of their spacing shall be in accordance with the manufacturer's recommendations, plugged and screwed to the structure with galvanised screws. All steel brackets and support shall be plastics coated or galvanised.

R.32 Falls

All pipework to be laid to adequate falls sufficient to ensure complete drainage of pipes. The Contractor's attention is drawn to Technical Guidance Document, Part H: Drainage and Waste Water Disposal.

R.33 Soil Vent Pipes

Connect soil vent pipe at roof level with a flexible connector properly fixed and supported and not to exceed one metre in length, to a tile vent terminal ('Glidevale Type G6' or equivalent).

Where specified, Air admittance valve (AAV) soil pipes shall remain vertical and shall rise

above the level of the nearest sanitary appliance.

All AAVs are to comply with IS EN 12380:2002 and the requirements set out in Technical Guidance Document Part H; Drainage and Waste Water Disposal.

R.34 Waste Pipes

Waste pipes to sink shall be 40mm nominal and to wash hand basin shall be 32mm nominal both fitted with 76mm bottle traps to IS EN 274-1:2002.

Waste pipe to washing machine shall be a 32mm outlet stand-pipe finishing 600 minimum above finished floor level. Stand-pipe is to be trapped and connected by reducer to the 100mm bend and back inlet gully serving the kitchen sink.

Waste pipe to bath shall be 40mm nominal fitted with 76mm 'P' Trap to IS EN 274-1:2002 complete with 22mm flexible overflow connection.

R.35
to
R.40

Nil

R.41 Testing

The Contractor shall from time to time as required to suit the progress of the building work test the plumbing and internal drainage in sections, in the presence of the Architect, before any such work is covered. At the completion of the works all soil pipes and branches and waste pipes and other parts of the internal drainage works connected directly with any sewage drain or sewage drain ventilating pipe or soil pipe, shall be closed at each end and air shall be blown into the system until a pressure of 38mm is indicated on the water gauge. Without introducing further pressure the reading on the gauge shall remain constant for a period of 3minutes.

The Architect may also direct that a smoke or any other test be applied to any other parts of the drainage or ventilating system as he thinks desirable, and everything necessary for these tests shall be supplied by the Contractor.

R.42 Cleaning

On completion of the works, immediately before handing over, the Contractor shall thoroughly cleanse the whole of the system and ensure that it is functioning freely.

SANITARY FITTINGS

R.43 Supplies

Sanitary fittings shall be supplied by an approved firm from whom the Contractor shall obtain a guarantee that the fittings will be delivered to the site at such dates as the Contractor considers necessary for the completion of the works within the contract period.

Sanitary Fittings shall include all fittings and accessories and shall be to the Architects' approval.

The Contractors attention is drawn to the specialist nature of the fittings used and should allow for extended delivery times which may occur.

R.44 Quality

Ceramic fittings shall be of Vitreous China to BS 3402:1969 fired at such a temperature as

to produce a satisfactory permanent fused or vitrified glaze and shall be sound and of good workmanship without manufacturing faults.

The glaze shall be uniform, free from discolouration and possess an impervious surface.

Stainless steel fittings shall be formed from Stainless Steel complying with IS EN 10088-1:2005.

R.45 Nil

R.46 Stainless Steel W.C. Pan

Where specified, stainless steel W.C. pans shall be shrouded floor mounted pan with 'P' Trap suitable for fixing to 110 mm wall. The pan shall comply with IS EN 997:2012 with the particular compliance with Section 5 (Flushing requirements) ('Sissons 'Guardian' WC pan' or 'Associated Metal 'Rotterdam' WC pan or equivalent). Provide earthing lug with brass screw.

Suite to be supplied complete with standard thermoplastic seat and cover to BS 1254:1981.

R.47 Concealed Low Level Flushing Cistern

Where specified, concealed low level flushing cisterns shall be ('Armitage Shanks Conceala' or equivalent) a moulded thermoplastic dual flush cistern of 6 litre capacity for use with back to wall pan and be fitted with a flush valve as Clause R.49.

Flushing operation shall be by means of a C.P. palm push button and linkage ("Armitage Shanks Ref: 7633A9D.CP" or equivalent).

R.48 Vitreous China W.C. Suite

Low level WC's shall be a close coupled vitreous china W.C. suite, colour white, consisting of pan, and matching approved dual flush cistern of 6 litre capacity complying with IS EN 997:2012.

The cistern must have an indelible six litre water level mark. Internal overflows will only be allowed under certain circumstances with prior permission of the Architect. Flush valve to be as Clause R.49.

Suite to be supplied complete with standard thermoplastic seat and cover to BS 1254:1981.

R.49 Ball valves and floats for cisterns

All flushing valves shall be 13mm piston type ball valves with brass body to BS 1212-4:1991 with silencing pipe and 115 mm ball float.

R.50 Nil

R.51 Stainless Steel wash hand basin

Where specified, stainless steel wash hand basins to be fully skirted purpose made units, of approved manufacture, with 400 dia x 165mm deep minimum size bowls and 40mm upstands at wall. The unit to have cast concrete backing as shown on the detailed drawings and be complete with earthing lug with brass screw.

Basin to be supplied complete with 32mm waste, plug and chain.

R.52 Stainless Steel sink unit

Where specified stainless steel sink units shall be fully skirted purpose made units, of approved manufacture, fabricated from 0.83mm (minimum thickness) austenitic stainless steel complying with IS EN 10088-1:2005 with a minimum bowl size of 380 x 340 x 180 mm deep handed as appropriate and with 40mm upstands at wall. Where specified, the unit shall have cast concrete backing as shown on the detailed drawings and be complete with earthing lug with brass screw. two tap holes, 40mm chromium plated waste outlet, plug and chain.

R.53 Stainless Steel inset sink top for timber base units

Stainless steel sink tops for fitting to timber base units in houses shall be complying with IS EN 13310:2003 or an equivalent standard. They shall be manufactured from 0.83mm (minimum thickness) austenitic stainless steel complying with IS EN 10088-1:2005 with a minimum bowl size of 380 x 340 x 180 mm deep handed as appropriate, and be complete with earthing lug with brass screw, two tap holes, 40mm chromium plated waste outlet, plug and chain.

R.54 Vitreous china wash hand basin

Vitreous china wash hand basin shall be a white wash basin to BS 3402:1969 of approved manufacture supplied complete with 32mm waste, plug and chain.

Basins to Ground Floor WC's to be 365 x 255mm in size and basins to Bathrooms 560 x 405mm or as otherwise indicated.

R.55 Baths

Baths shall be either white porcelain-enamelled cast iron with slip-resistant base complying with I.S. 156:1984 or white vitreous enamelled steel sheet with slip resistant base of 1.6mm minimum thickness complying with IS EN 232:2012. The bath shall be 1700 x 700 in size and supplied with adjustable feet, 32mm chromium plated overflow outlet, and two end tap holes, earthing lug with brass screw, 40mm chromium plated waste outlet, plug and chain.

R.56 Glazed Fireclay 'Belfast' Sink

Where specified, glazed fireclay 'Belfast' sink, 610 x 455 x 255mm, complying with BS 1206:1974 of approved manufacture supplied complete with 40mm waste, plug and chain.

R.57 Level Access Showers

Level access shower tray to be sized as indicated on the drawings for one bedroom and specially adapted dwellings and as otherwise specified. ('Chiltern', 'Neatdek' or 'EASA' shower trays or equivalent). Shower set to include appropriately sized carer's screen, floor seal and skirting kit from the same manufacturer.

Provide a permanent watertight seal between the wall and the edges of the shower (see clause T.114). For flooring see clause T.126

R.58 Assembling and Installation of Sanitary Fittings

Sanitary fittings shall be assembled in accordance with the manufacturer's instructions and unless otherwise described installed in accordance with BS 6465-1:2006 (A1:2009) and BS 6465-3:2006.

Stainless Steel W.C. pans shall be fixed by bolting or clamped through the service duct wall in accordance with manufacturers recommendations.

Vitreous china W.C. pans shall be fixed to the floor with 12 gauge brass screws 53mm long plugged in concrete.

Baths shall be properly leveled when installed and bearing plates provided under bath feet to protect and spread load on timber floors. The rim of the bath shall be horizontal and care taken to provide a permanent watertight seal between the wall and the edges of the bath (see clause T.115).

Taps to sinks, basins and baths shall be fixed in accordance with the manufacturer's instructions and form a watertight seal with the fitting. Where fitted to stainless steel sinks and basins with concrete surround 100mm long parallel nipples are to be used to extend tap through concrete base.

Waste Fittings to sinks, basins, bowls and baths shall be bedded in a waterproof jointing compound recommended by the manufacturer and secured with a backnut, including polythene washers between the backnut and the sanitary fitting, to provide a watertight seal.

Flush Pipes shall be fixed to flushing cistern by union nut and to W.C. pan by rubber cone connector, all in accordance with the manufacturer's instructions, to provide a watertight seal.

Overflows, which shall be fitted to all cisterns, shall be suitable for coupling to the type of pipe described and permit easy dismantling of the flushing cistern, shall be connected to the fitting in accordance with the manufacturer's instructions including all washers, "P.T.F.E." tape necessary to provide a watertight seal.

Composite Stainless Steel/Concrete sink and basin units to service blocks shall be bedded in 1:3 cement/sand mortar to supporting walls and the joint between wall and unit sealed with a silicone sealant in accordance with Clause G.26.

R.59 Testing

On completion test the whole of the fittings to prove that they operate freely and leave in a clean and serviceable conditions.

COLD AND HOT WATER INSTALLATION

R.60 Copper Pipe and Fittings

See clauses R.5 and R.6.

R.61 Nil**R.62 Indirect hot water cylinders**

The domestic hot water cylinder shall have a capacity of 136 litres. It shall comply with BS 1566-1:2002 + (A1:2011) and be factory insulated with CFC and HCFC-free insulation. It shall have a threaded connection to allow for a top entry electric immersion heater in accordance with IS 60335-2-73:2003 + (A2:2009). The cylinder shall be fitted with a high efficiency, finned copper coil which shall give a reasonable recovery time. A strap on cylinder thermostat will be installed approximately $\frac{1}{4}$ the way up the cylinder to control the domestic hot water temperature (See also Electrical Specification for details of high limit thermostat).

The primary supply and return pipes at the coil shall have a minimum diameter of 22mm, the return primary shall be fitted with a lockshield balancing valve for adjustment when commissioning. Cylinders shall be fitted with a suitably located drain valve. The cylinder shall be tank fed from the cold water storage tank and shall vent back to that tank.

In situations where sufficient space cannot be provided for a cold water storage tank of adequate size i.e. apartments and duplexes, or, where otherwise directed by the Architect, a combination hot and cold water storage tank of an approved type and size (Coppercraft Ltd or equivalent and approved by FCC Mechanical Inspector). The combination tank shall be connected in accordance with the manufacturer's instructions and shall comply with all aspects of BS 1566-1:2002 + (A1:2011) and with Water Authority regulations. Tanks shall be fitted with a suitably located drain valve. The tank shall be fitted with a high efficiency, finned copper coil and shall be provided with a 1.5 bar, twin brass impellers, single phase, negative head pump. The cold water section shall have a threaded connection to allow for a dedicated cold water supply to the toilet system.

R.63 Water Storage Tank

Cold water storage tanks shall be black moulded polythene tanks complying with BS 4213:2004 complete with lid as Clause B110

All connections to tanks shall be made with brass locknut unions and ball valves shall be 13mm piston type with brass body complying with BS1212-1:1990.

Tanks to 3 bedroom houses shall have a minimum actual capacity of 273 litres (60 gal) ("ROM Plastics Ltd. ref. 80/60" or equivalent). Tanks to 4 bedroom houses shall have a minimum actual capacity of 363 litres (80 gal). Two no.182 litre tank connected in series would be acceptable. Note: connected by a pipe between the two tanks at a low level and must NOT have both ball valve and draw off pipe in the same tank.

Feed and expansion tanks for central heating to be of 18 litres (4 gal) actual capacity ("ROM Plastics Ltd. ref. 10/4" or equivalent).

All water storage tanks installed in attic spaces are to be properly insulated with purpose made jackets as Clause R.76. All water storage tanks shall have mounted lids.

Attic insulation must not be placed under storage tanks, unless the tank is raised beyond the top of the ceiling joists to give additional pressure head, in which case, the tank should be fully enclosed in insulation and the ceiling insulation carried through underneath. (See clause 1.9.2 and Diagram 3 of TGD, Part G: Hygiene)

R.64 Stop and Bib Cocks

All stop and bib cocks shall comply with IS EN 1213:2000 and be of approved manufacture. Number and type of valves shall be as indicated on the drawings. Under no circumstances will gate valves be permitted on the rising mains water supply.

R.65 Taps and Shower Fittings to Sanitary Fittings

Unless otherwise described draw-off taps shall be of chromium plated brass with chromium plated brass tapheads. Samples of all taps, shower fittings and equipment shall be provided on site by the Contractor for the Architects selection and approval and shall be approved before installation. Taps and shower fittings to bathrooms and WC's shall be of a matching suite. All to be installed in accordance with the manufacturers recommendations.

Draw-off taps, shower fittings etc. shall be provided as follows:-

1. Houses	
Hot and Cold Taps to Sink:	Dual flow deck mounted mixer taps with swivel spout complying with IS EN 200:2008 and WRC approved.
Hot and Cold Taps to Wash hand basins:	Pillar taps.
Hot and Cold Taps to Bath:	19mm mono deck mounted bath/shower mixer taps complying with IS EN 200: 2008 and WRC approved.
Shower fittings: (Over Bath only)	Bath/shower to be supplied complete with matching 1350mm shower hose, handset with removable spray head and wall mounted swivel holder. Provide shower rails as per Clause N.135.
Shower fittings: (Level Access only)	Provide electric shower unit as per clause Specification for Electrical Installation in Houses'. Provide shower rails as per Clause N.135.

2. Service Blocks	
Hot and Cold taps to basins:	12mm high neck cross head pillar taps complying with IS EN 200:2008 and WRC approved.
Hot tap to sink:	As above.
Cold taps to sinks:	12mm bib cock with hose union and mounted on 150mm high bib tap standard. All with C.P. finish and complying with IS EN 200:2008 and WRC approved.
Shower fittings:	See Clause R.67 below.

R.66 Combination Hot & Cold Water Tanks (Apartments and Duplexunits)

Combination hot and cold water storage tanks of an approved type and size, (manufactured by Coppercraft Ltd, or equivalent) are to be used in apartments and duplex units. Combination tanks shall have a minimum cold capacity of 226 litres and minimum hot capacity of 136 litres. The combination tank shall be connected in accordance with the manufacturer's instructions and shall comply with all aspects of IS 3198:1981 and with South Dublin County Council Water Bylaws 2004. Tanks shall be factory insulated and have a threaded connection to allow for an electric immersion heater. Tanks shall be fitted with a suitably located drain valve. The tank shall be fitted with a high efficiency, finned copper coil and shall be provided with a 1.5 bar, twin impeller, single phase, negative headpump.

The cold water section shall have a threaded connection to allow for a dedicated cold water supply to the toilet cistern.

R.67 Shower Fittings (where specified)

Shower equipment to be provided and installed:-

- (i) Thermostatic mixing valve ('MIRA Magni-Flo' or equivalent).
- (ii) Concealed time flow push button control ("MIRA No. T503" complete with "MIRA.AD31" extension spindle assembly or equivalent).
- (iii) Shower head shall be fixed, ('MIRA Nectar four spray showerhead' or equivalent), a minimum 2 metres above floor level.
- (iv) Fitted with brass impellers (Grundfos, Wilo or equivalent and approved by the FCC mechanical inspector).
- (v) Shower pump to be minimum 1.5 Bar twin automatic, heavy duty, brass bodied pump designed for a negative head of approved manufacture. Electrical connections to be as specified in Section S - Electrical Installation.
- (vi) Shower rail as Clause N.135.

All shower fittings and equipment to be approved before installation and to be installed in accordance with the manufacturers recommendations.

The pump shall be installed between the mixer and timeflow control button and the contractor shall ensure that the flow direction of the pump is correctly aligned.

R.68 Washing Machine

Make plumbing provisions for a standard washing machine to be installed at a later date by the occupants. Include separate 13mm cold feed (not rising main) and install stop-cocks

and blank ends on hot and cold feeds threaded for standard washing machine hose connections.

Where combination tank is used the washing machine shall be supplied by separate hot and cold feeds from cylinder and fitted with pressure reducing valves to each supply.

R.69 Pipework Generally

Pipework to fittings shall be neatly run in a manner approved by the Architect.

All connections and fittings shall as far as practicable be in such a position as will allow for removal and replacement.

Pipework shall not be laid perfectly horizontal but with a slight fall so as to be easily drained.

All pipes are to be accurately cut to the exact length required to penetrate fully into the fitting. Cuts are to be true and at right angles to the length of the pipe. Cut ends are to be cleaned of all burrs.

All stop cocks and gate valves must be positioned to allow immediate access to them.

R.70 Fixing of Pipework

Pipework shall be fixed with standard copper, brass or plastic clips or holderbats screwed to timber backgrounds. Where secured to concrete, brickwork or blockwork they shall be fixed with standard brass or plastic holderbats, in two pieces screwed together and held off the wall.

Fixings shall be spaced at not more than 1.2 metres centres horizontally or 1.8 metre centres vertically. All exposed pipework to be boxed-in unless otherwise specified.

R.71 Distribution piping in Service Blocks

Rising main: Carry up 13mm H.D. polythene as Clause R/WM/5, rising main to kitchen sink and then to cold water storage tank and connect to ball valve.

Cold feeds from CWT: C.W.T., to Carry 13mm copper cold feed, fitted with gate valve, near W.H.B. with branch to W.C.

Carry separate 19mm copper cold feed to shower mixer fitted with gate valve near C.W.T.

Carry 19mm copper feed to bottom of H.W. cylinder fitted with gate valve near C.W.T.

Hot feed from HW Cylinder: Carry 19mm copper feed and expansion pipe from highest point of

cylinder rising to a horizontal length of piping no less than 300mm min which shall then split into two pipes one proceeding into roof space and turning down to discharge below rim of C.W.T. and the other to act as the hot water distribution pipe.

Take separate 13mm branches to shower, sink and W.H.B.

Provide a draw-off cock at the lowest point of the hot water

system.

Ensure all draw-off points from the cold water tank are fitted at the opposite end of the tank from the rising main.

R.72 Distribution piping in Caretakers Office

Carry up 13mm copper cold feed to W.H.B., from stop cock, with branches to under sink water heater and W.C. cistern.

For details of under sink water heater see Section S: Electrical Services.

R.73 Distribution piping in Houses

Rising Main: Carry up 13mm H.D. polythene as Clause R/WM/5, rising main to kitchen sink and then to cold water storage tank and connect to ball valve.

Cold Feeds from C.W.T: Carry 19mm copper cold feed, fitted with gate valve at an accessible level (no greater than 1800mm above the finished floor level) in hot press, to bath with 13mm branches to W.H.B. and W.C.

Carry separate 19mm cold feed to bottom of H.W. Cylinder and fitted with gate valve at an accessible level (no greater than 1800mm above the finished floor level) in hot press.

Hot Feed from H.W. Cylinder: Carry 19mm copper feed and expansion pipe from highest point of

cylinder rising to highest point in roof space and turning down to discharge below rim of C.W.T.

Take separate 13mm branches to sink and W.H.B. and 19mm branch to bath.

Provide a draw-off cock at the lowest point of the hot water system.

Ensure all draw-off points from the cold water tank are fitted at the opposite end of the tank from the rising main.

R.74 Overflows to Service Blocks

Provide 19mm copper overflow pipes, with chromium plated dribbler fitting, to cold water storage tanks and W.C. cisterns all to discharge at low level into shower tray as drawn detail. All overflows to have sufficient fall to empty pipe, and shall be properly supported and clipped as Clause R.70.

R.75 Overflows to Houses

Provide 19mm uPVC black overflow pipes to cold water storage tanks and W.C. cisterns all to discharge to the outside. Overflow from C.W.T. to discharge 75mm below soffit. All overflows to have sufficient fall to empty pipe, and shall be properly supported and clipped as Clause R.70.

R.76 Insulation

Cold water storage tanks to be insulated ('Talsen' Universal Attic Tank Jacket or equivalent), Tank to be provided with rigid purpose made lid, 12mm plywood or equal and approved to support tank jacket. Sample to be approved by Architect.

All hot water cylinders and combination tanks to be factory insulated.

Pipework laid in floor screed or floor slab it shall be insulated with open cell pipe insulation of 13 mm wall thickness ('Aerotube' or equivalent). Ensure pipes are completely covered and insulation is cut to properly fit around brackets, fittings and valves. All joints on the insulation shall be tight and taped.

Where pipework is located in attic spaces it shall be insulated with closed cell pipe insulation of 22 mm wall thickness closed cell insulation. Ensure pipes are completely covered and insulation is cut to properly fit around brackets, fittings and valves. All joints on the insulation shall be tight and taped.

All pipes outside the thermal envelope of the building, including overflow pipes shall be insulated in accordance with Table 3 of BS 5422:2009 (reproduced in TGD Part G: Hygiene as Table1).

R.77 Testing

Provide for testing foregoing plumbing work to the satisfaction of the Architect. All leaking connections and defective pipes shall be taken out and replaced with new and then again tested to the satisfaction of the Architect.

R.78 Attendance

Provide for all attendance breaking or leaving holes, making chases, and making good all trades in connection with plumbing work.

WATERMAINS DISTRIBUTION MAIN**R.79 Generally**

Distribution mains shall generally be in accordance with the 'Specification for Housing Development Works' and as shown on the drawings, unless otherwise specified.

R.80 Distribution Pipework

Distribution pipework shall generally, unless otherwise indicated, be MOPVC pipes conforming to the UK Water Industry Specification No. 4-31-08 or equivalent EU Specification and manufacturers shall operate a quality system in compliance with IS EN ISO 3994:2011. Colour of pipework to be in accordance with IS 370:2007.

Where passing under roads distribution pipework shall be ductile iron pipes conforming to Class K9 of IS EN 545:2010. Ductile iron pipes and fittings shall be cement mortar lined with sulphate resistant cement and shall be sealed with an approved bitumen or epoxy resin sealcoat.

R.81
To
R.88

Nil

SERVICE MAINS (House Connections)**R.89 Trenches**

Trenches shall be excavated and backfilled as described in Section 'D' and shall be of sufficient depth and width for the watermain to be not less than 750mm below the finished surface of the ground and to allow the required backfilling.

R.90 Ducts

Provide 100mm diameter uP.V.C. ducts complying with IS 123:1964 Type 32 for water mains where passing through walls or under buildings when they shall be laid with concrete surround as described in Drainage, Section W. Where duct passes through floor slabs seal off around service pipe to prevent access by vermin.

Where the water main rises inside the external wall of the building, pipe within the duct shall be insulated with insulation impermeable to water vapour. The insulation shall be continuous from the outside face of the wall to the point where the rising main enters the thermal envelope of the building. Where the floor is a solid, ground-bearing slab, the pipe shall be insulated where it rises within 600mm of the outside face of the external wall. Where the floor is suspended the duct shall be insulated irrespective of the distance to the outside.

The DPM/vapour barrier shall be sealed around the duct. (See Diagrams 1 and 2 of TGD Part G: Hygiene)

R.91 Nil**R.92 Levels**

Underground pipes shall be not less than 750mm below finished ground level and shall enter the building at the level at which they are buried.

R.93 Polyethylene Pipes and Fittings

High Density polyethylene pipes shall comply with IS 134:1977. Fittings shall be compression fittings to IS EN 1254-3:1998.

Pipes shall be jointed and installed in accordance with the manufacturer's instructions.

R.94 Boundary Boxes (Stopcock chambers)

Boundary Boxes to be a sealed meter box system with telescopic body and circular plastic lid, ('Talbot Matrix' or equivalent), complete with shut-off valve, non- return valve and push fit outlets.

The unit shall have a minimum loadbearing capacity of a 5 ton wheel load and the minimum depth from base to lid shall be 500mm.

R.95 Nil**R.96 Connection to distribution main**

Provide for tappings to the distribution main in accordance with Clause B.27 and table R.I. below. Tappings shall include for patent brass ferrule with polythene pipe connection to stopcock, as Clause R.64, which shall be positioned in the footpath or concrete apron in front of each house, caravan bay, fire point etc.

TABLE R.I	
Location	Size of Tapping
Houses	1 No. 13mm per house
Service Blocks (Travellers sites only)	1 No. 13mm per Unit
Caretakers Unit/ Pump Room (Service blocks only)	1 No. 13mm
Community Centre	2 No. 13mm
Fire Hose Reel Points	1 No. 25mm per reel

R.97 Connection of service mains

Lay an independent water service to each house etc. with approved 13mm high density polythene tube, in a continuous length, as above and connect to stopcock. Cover for pipe shall not be less than 750mm unless specially protected and in any event shall be surrounded in 100mm sand. The supply shall be tested before filling in trenches. The service pipe shall enter the building at the levels at which it is buried in the ground and rise at a convenient place within the building away from external walls and without any joint occurring underneath the floor i.e. the rising main shall be continuous between the boundary box and internal stopcock.

Provide and fix 13mm gunmetal fullway screwdown stopcock to IS EN 1213:2000 fixed over floor level inside each unit in a position to be decided by the Architect on the job.

Service to fire points shall be in 25mm copper pipe insulated as Clause R.76 and surrounded in concrete above ground level and connected to hose reel in accordance with manufacturer's instructions. Pipe above ground to be insulated in accordance with Clause R.76.

R.98 Procedure for Water Connections

The following procedures must be followed in regard to all water connections.

1. After the water main has been laid the main shall be tested in the presence of an inspector, supervising inspector from the relevant Water Depot.
2. Then the test has been passed the main will be connected to the County Council main by the South Dublin County Council Water Services Division. It will also be swabbed and chlorinated at this stage. All excavation work shall be carried out by the Contractor. Adequate notice will be required before this work can be done.
3. The area water inspector will then make the individual house connections to the main. On no account must any tappings be made to the watermain by any other party than South Dublin County Council, Water Services Division.

For further procedures on water connections see Appendix 'C', Section B.

R.99 Nil**R.100 Testing**

All mains and service pipework shall be cleaned out prior to testing. The mains and service pipework installations shall be subjected to a hydraulic test pressure of 1½ times the

maximum working pressure. The pressure shall be maintained without measurable loss for 30 minutes. Installations or sections thereof which are to be either wrapped, embedded in the structure or concealed in permanently sealed ducts or trenches, shall in addition to the above specified test be similarly tested as they are laid and before being wrapped, embedded or concealed.

Appendix A: List of References and Standards. (Part 1)

Item No.	Claus e.	Reference	Comment
1.	R.5	IS EN 1057:2006 (+A1:2010)	Copper and copper alloys seamless, round copper tubes for water and gas in sanitary and heating applications.
2.	R.6	IS EN 1254-2:1998	Copper and copper alloys – Plumbing fittings – Part 2: Fittings with compression ends for use with copper tubes.
3.	R.9	13501-3:2006 (+A1:2009)	Fire classification of construction products and building elements – Part 3 Classification using data from fire resistance tests on products and elements used in building service installations: Fire resisting ducts and fire dampers.
4.	R.9	BS 476-20:1987	Fire tests on building materials and structures – Method for determination of the fire resistance of elements of construction (general principles)
5.	R.9	IS EN 1366-6:2009	Fire resistance test for services installations – Part 3: Penetration seals.
6.	R.10	IS EN 12200-1:2000	Plastics rainwater piping systems for above ground external use – Unplasticised Poly (Vinyl Chloride) (PVS-U) – Part 1: Specifications for pipes, fittings and the system.
7.	R.20	IS EN 755-1:2008	Aluminium and aluminium alloys – Extruded rod/bar, tube and profiles – Part 1: Technical conditions for inspection and delivery.
8.	R.26	BS 4514:2001	Unplasticised PVC soil and ventilating pipes of 82.4mm minimum mean outside diameter, and fittings and accessories of 82.4mm and of other sizes – Specification.
9.	R.26	IS EN 1329-1:1999	Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – Unplasticised Poly(Vinyl Chloride)(PVC-U) – Part 1 – Specification for pipes, fittings and the system.

10.	R.26	IS EN 1451-1:1999	Plastics piping systems for soil and waste drainage (low and high temperature) within the building structure – Polypropylene (PP) – Specifications for pipes, fittings and the system.
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Appendix A: List of References and Standards. (Part 2)

Item No.	Clause.	Reference	Comment
11.	R.26	IS EN 1455-1:1999	Plastics piping for soil and waste (low and high temperature) within the building structure. Part 1: Acrylonitrile-butadiene-styrene (ABS) – Specifications for pipes, fittings and the system. (partially replaces BS 5255:1989)
12.	R.26	BS 5255:1989	Specification for thermoplastics waste pipe and fittings (still current except in areas where standard is partially superseded)
13.	R.33	IS EN 12380:2002	Air admittance values for drainage systems – Requirements, test, methods and evaluation of conformity.
14.	R.33	Technical Guidance Document Part H:2010	'Drainage and Waste Water disposal' www.environ.ie
15.	R.34	IS EN 274-1:2002	Waste fittings for sanitary appliances – Part 1: Requirements.
16.	R.44	BS 3402:1969	Specification for quality of vitreous china sanitary appliances.
17.	R.44	IS EN 10088-1 :2005	Stainless steels – Part 1: List of stainless steels.
18.	R.46	IS EN 997:2012	WC pans and WC suites with integral traps. (to replace IS EN 997:2003)
19.	R.46	BS 1254:1981	Specification for WC seats (Plastics)
20.	R.49	BS 1212-4:1991	Float operated valves – Part 4: Specification for compact type float operated valves for WC flushing cisterns. (including floats)
21.	R.53	IS EN 13310:2003	Kitchen sink – Functional requirements and test methods.
22.	R.55	IS 156:1984	Cast iron baths.
23.	R.55	IS EN 232:2012	Baths – Connecting dimensions (to replace IS EN 232:2003)
24.	R.56	BS 1206:1974	Specification for fireclay sinks: Dimensions and workmanship.

Appendix A: List of References and Standards. (Part 3)

Item No.	Clause	Reference	Comment
25.	R.58	BS 6465-1:2006(+A1:2009) BS 6465-3:2006	Sanitary installations – Part 1: Code of Practice for the design of sanitary facilities and scales of provision of sanitary and associated appliances Sanitary installations – Part 3: Code of Practice for the selection, installation and maintenance of sanitary and associated appliances.
26.	R.62	BS 1566-1:2002+(A1:2011)	Copper indirect cylinders for domestic purposes – Open vented copper cylinders. Requirements and test methods. (to replace 161)
27.	R.62	IS EN 60335-2-73:2003 + (A2:2009)	Household and similar electrical appliances – Safety – Part 2-73: Particular requirements for fixed immersion heaters.
28.	R.63	BS 4213:2004	Cisterns for domestic use – Cold water storage and combined feed and expansion (thermoplastic) cisterns up to 500 litres – Specification.
29.	R.64	IS EN 1213:2000	Building valves – Copper alloy stop valves for potable water supply in buildings – tests and requirements. (to replace BS 1010-2:1973)
30.	R.65	IS EN 200:2008	Sanitary tapware – Single taps and combination taps for water supply systems of type 1 and type 2 – General technical specification.
31.	R.66	BS 3198:1981	Specification for copper hot water storage combination units for domestic purposes. (to replace IS 161:1975)
32.	R.76	BS 5422:2009	Method for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range -40 °C to +700 °C.
33.	R.80	IS EN 3994:2011	Plastics hoses – Helical – Thermoplastic – reinforced thermoplastics hoses for suction and discharge of aqueous materials – Specification.
34.	R.80	IS 370:2007	Colour code for buried plastics piping.
35.	R.80	IS EN 545:2010	Ductile iron pipes, fittings, accessories and their joints for water pipelines – Requirements and test methods. (to replace IS EN 545:2006)

Appendix A: List of References and Standards. (Part 4)

Item No.	Clause	Reference	Comment
36.	R.90	IS 123:1964	Unplasticised PVC pipe for cold water supply.
37.	R.93	IS 134:1977	Polyethylene pipe type 32.
38.	R.93	IS EN 1254-3:1998	Copper and copper alloys – plumbing fittings – Part 3: Fittings with compression end for use with plastic pipes.

LIST OF CLAUSES S – See Appendix 5

LIST OF CLAUSES T

BUILDING CONTROL

T.0 Compliance with the Building Regulations

WALL, FLOOR AND CEILING FINISHES

T.1 Gypsum plasterboard
 T.2 Moisture Resistant Gypsum Plasterboard
 T.3 Composite Laminate Insulating Plasterboard T.4
 To Nil
 T.6
 T.7 Pre-mixed gypsum undercoat plaster
 T.8 Pre-mixed gypsum finishing coat plaster
 T.9 Nil
 T.10 Pre-mixed gypsum board finish plaster
 T.11 Nil
 T.12 Nil
 T.13 Cement
 T.14 Lime
 T.15 Sand
 T.16 Coarse Aggregates
 T.17 Ready Mixed Lime: Sand for Mortar
 T.18 Plasticisers
 T.19 Colouring Agents
 T.20 Water
 T.21 Waterproofers
 T.22 Bonding Agents
 T.23 Nil
 T.24 Angle and Stop Beads
 T.25 Nil
 T.26 Fixings T.27
 To Nil
 T.28
 T.29 Plastering Generally
 T.30 Storage of Materials
 T.31 Testing
 T.32 Frosty Weather
 T.33 Sample Panel
 T.34 Preparation of Surface T35 Nil
 T.36 Scudding
 T.37 Dubbing out
 T.38 Nil
 T.39 Nil
 T.40 Fixing metal furring channels (to external walls)
 T.41 Fixing Plasterboard Generally
 T.42 Fixing Plasterboard to Timber Supports (to locations other than external walls)
 T.43 Nil
 T.44 Fixing Gypsum Wallboard
 T.45 Fixing gypsum wallboard to metal furring channels
 T.46 Fixing Composite Laminate
 T.47 Nil
 T.48 Jointing and Finishing Wallboard with Taped Joints
 T.49 Jointing wallboard to receive veneer finish
 T.50 Nil
 T.51 Mixing of Materials
 T.52 Re-Tempering Etc.
 T.53 Angles to gypsum plastered walls
 T.54 Application of gypsum plaster undercoats

T.55	Application of gypsum plaster finishing coats T.56
To	Nil
T.58	
T.59	Curing and Protection of Cement Based Plasters
T.60	Angle and Stop Beads to Cement Based Plasters
T.61	Application of Cement Based Plasterboard Undercoats
T.62	Application of Cement Based Plaster Final Coat to External Walls –Smooth
T.63	Application of Cement Based Plaster Final Coat to Internal Walls –Smooth
T.64	Application of Cement Based Plaster Final Coat – Roughcast Finish
T.65	Application of Cement Based Plaster Final Coat – Dry –Dash Finish T.66
To	Nil
T.68	
T.69	Use of Bonding Agents T.70
To	Nil
T.74	
T.75	Table of Plastering/ Rendering Systems T.76
To	Nil
T.100	

TILE, SLAB AND BLOCK FINSHES

T.101	Generally
T.102	Preparation
T.103	Nil
T.104	Samples
T.105	Nil
T.106	Bedding Systems- Wall tiling
T.107	Bedding Systems – Floor Finishings
T.108	Filling of Joints
T.109	Movements of Joints
T.110	Junction Strips
T.111	Nil
T.112	Nil
T.113	Glazed Ceramic Wall Tiles
T.114	Nil
T.115	Sealant Strips to Baths and Showers
T.116	Floor Tiles to Shower Areas T.117
To	Nil
T.124	
T.125	Plastic Floor Tiles
T.126	Plastic Sheet Floor Covering T.127
To	Nil
T.150	

BITUMEN MACADAM PAVING

T.151	Bitumen Macadam
T.152	Formation
T.153	Application
T.154	Tolerance

APPENDIX A: LIST OF REFERENCES AND STANDARDS

T.0 Compliance with Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. No.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

WALL, FLOOR AND CEILING FINISHES**T.1 Gypsum plasterboard**

Gypsum plasterboard shall be baseboard, lath or wallboard complying with IS EN 520:2005+A1:2009.

Baseboard and lath shall be round edged greyboard and wallboard shall be either tapered or square edged with one ivory face.

Where a vapour check or insulating grade is required the plasterboard shall be supplied with a veneer of Metalized Polyester film.

T.2 Moisture Resistant Gypsum Plasterboard

Moisture resistant gypsum plasterboard shall be either tapered or square edged wall board complying with IS EN 520:2005+A1:2009 - Type H.

T.3 Composite Laminate Insulating Plasterboard

Composite laminate insulating plasterboard, for use under ceilings to pitched roof spaces, shall be as Clause N106. The plasterboard to be in accordance with Clauses T1 or T2 above as required.

T.4

to **Nil**

T.6

T.7 Pre-mixed gypsum undercoat plaster

Pre-mixed gypsum undercoat plaster shall be a high impact resistant basecoat plaster manufactured from naturally occurring gypsum complying with IS EN 13279-1:2008, type B4/20/2 & C3/20.

T.8 Pre-mixed gypsum finishing coat plaster

Pre-mixed gypsum finishing coat plaster shall be manufactured from naturally occurring gypsum and shall comply with IS EN 13279-1:2008, type B1/20/2.

T.9 Nil**T.10 Pre-mixed gypsum board finish plaster**

Pre-mixed gypsum board finish plaster shall be manufactured from naturally occurring gypsum and shall comply with IS EN 13279-1:2008, type B1/20/2.

T.11
to
T.12

Nil

T.13 Cement

Normal Portland cement shall be in accordance with Clause F.5. White Portland cement shall comply with IS EN 197-1:2011.

T.14 Lime

Lime shall be in accordance with Clause G.14.

T.15 Sand

Sand for cement and lime mixes shall comply with the requirements of IS EN 998-1:2010.

Sand for use with white Portland cement shall be silver sand.

T.16 Coarse Aggregates

Coarse aggregates shall be in accordance with IS EN 12620:2013 unless otherwise described or to match existing aggregates for roughcast finish shall 10mm single-sized aggregate and for dry dash finish shall be 10mm graded aggregate of white spar or other selected aggregate to match approved sample.

T.17 Ready Mixed Lime: Sand for Mortar

Ready mixed lime : sand for mortar for plastering and rendering shall be in accordance with IS EN 998-1:2010.

T.18 Plasticisers

The use of mortar plasticisers in cement rendering is not permitted.

T.19 Colouring Agents

Colouring agents shall be in accordance with Clause G.12.

T.20 Water

Water shall be from the mains in accordance with Clause F.7 and kept free from any impurities.

T.21 Waterproofers

Waterproofers shall be integral waterproofers and shall have a current Agrèament certificate. Waterproofers shall be used strictly in accordance with the manufacturer's written instructions.

T.22 Bonding Agents

Bonding agents for internal use shall be P.V.A. (Polyvinyl Acetate) emulsion complying with BS 5270- 1:1989 and used in accordance with IS EN 13914-2:2005 and BS 8481:2006 and the manufacturer's instructions.

Unless otherwise specified bonding agents for external use shall be either waterproof E.V.A (Ethylene/Vinyl Acetate) or S.B.R. (Styrene butadiene rubber) or acrylic emulsions complying with the requirements of IS EN 13914-1:2005 and used in accordance with the manufacturers written instructions.

S.B.R. bonding agents shall only be used with the prior written approval of the Architect.

T.23 Nil

T.24 Angle and Stop Beads

Angle and stop beads for internal gypsum plastering and dry lining shall be of galvanised steel complying with IS EN 13658-1:2005

Angle and stop beads for external plastering and internal cement based plastering shall be manufactured from stainless steel complying with IS EN 13658-2:2005

Movement joint beads for external plastering shall be manufactured from stainless steel beads with a white P.V.C. extrusion cover strip complying with IS EN 13658-2:2005.

T.25 Nil

T.26 Fixings

Nails for fixing plasterboard shall be 2.65 mm diameter galvanized steel clout nails with a 7.5mm head diameter and complying with the requirements of BS 8212:1995. Nails shall be 30mm long for 9.5mm boards and 40mm long for 12.7 mm boards and shall be supplied by the plasterboard manufacturer.

Screws for fixing wallboard to metal firing shall be 25mm long self drilling and tapping bugle headed pozidriv screws supplied by the plasterboard manufacturer.

Fixings for composite laminate as Clause T.3 shall be in accordance with the manufacturer's recommendations.

T.27 to T.28 Nil

T.29 Plastering Generally

Internal plastering shall generally be carried out in accordance with IS EN 13914-2:2005 and BS 8481:2006.

Dry lining and partitioning using gypsum plasterboard shall generally be carried out in accordance with BS 8212:1995.

External plastering shall generally be carried out in accordance with IS EN 13914-1:2005

T.30 Storage of Materials

Plasters, plasterboards, lime and cement shall be kept dry. Plasters, lime and cement shall be stored separately and used in rotation of deliveries, and no plaster shall be used after three months from its date of manufacture unless tested and approved. All sands shall be stored separately, according to type, on clean hard, dry standings and shall be protected from contamination.

T.31 Testing

Samples of all materials, as directed shall be taken from time to time for testing as required by the architect. All defective materials shall be removed from the site forthwith at the Contractor's expense.

T.32 Frosty Weather

Plastering shall not be started or continued when the air temperature falls below 3° unless precautions are taken, with the Architect's agreement, to raise and maintain the temperature of the air, materials and structure at not less than the above temperature until completion of hydration.

Plastering shall be protected from the frost, extreme drying conditions and continued dampness.

T.33 Sample Panel

Where textured or wet or dry dash finishes are specified a sample panel 1 metre x 1 metre shall be executed by the Contractor for approval of the Architect before the work proceeds.

The sample panel shall not unless otherwise agreed with the Architect, form part of any finished work but shall be maintained until completion of the contract.

T.34 Preparation of Surface

Surfaces to receive plastering shall be dry brushed to remove all loose particles, dust, laitence, efflorescence, etc., and any projecting fins on concrete surfaces shall be hacked off. All traces of mould oil shall be removed from concrete surfaces by scrubbing with water containing detergent and rinsing with fresh water.

Organic growths (algae, fungi, etc.) shall be killed by treatment with a proprietary toxic wash and brushing off when dry.

Surfaces shall be wetted and re-wetted as required to equalize suction before first coat of plaster is applied. Where wetting is unsuitable or inappropriate to ensure adequate adhesion apply a bonding agent as Clause T.22 Do not wet plasterboards before plastering. Nil

T.35 Scudding

Scudding shall consist of a mixture of one volume of Portland cement and two volumes of clean, sharp, coarse sand prepared as a thick slurry and shall be hand thrown to a thickness of 3 to 6mm. It shall be left as thrown but wetted with a fine spray when necessary to ensure proper setting.

T.36 Dubbing Out

Dubbing out shall be in the same mix as the subsequent coat and shall not exceed 10mm in thickness in one application.

T.37
to
T.38

Nil

T.39 Fixing metal furring channels (To external walls)

Metal furring channel systems for drylining shall be supplied by the plasterboard manufacturer and shall be installed in accordance with his instructions.

The firrings shall be fixed to masonry walls at 600mm horizontal centres with the manufacturers approved bonding adhesive, all carefully plumbed and aligned and left ready for plasterboard.

Horizontal firrings at floor and ceilings shall be fixed continuously as should firrings around openings.

T.40 Fixing Plasterboard Generally

Store, cut and handle plasterboard in accordance with the manufacturers' written instructions.

Faces of supports (joists, firrings, studs etc) to receive plasterboard shall be accurately aligned, plumb and level and at the correct centres. Prices shall be included for any necessary packing.

To ensure support to the edge of plasterboard at the perimeter of wall or ceiling provide softwood noggins (44mm x 50mm minimum) fixed between the joists or studs and parallel to the joists and studs where these are more than 50mm from the perimeter.

Fix plasterboard to ceilings before fixing to walls or partitions. Before fixing dry lining ensure that all electrical wiring conduits are in place.

T.41 Fixing Plasterboard to Timber Supports (To locations other than external walls)

Ensure supports are spaced at centers not exceeding 450mm for 9.5mm board and 600mm for 12.7mm board.

Fix plasterboard to supports with nails, as Clause T.26, at 150mm maximum centres. The nails, which should be not less than 13mm from board edges, shall be inserted at right angles to face of board and driven home without fracturing the paper surface. Nails along the edges of adjacent boards shall be opposite one another and not staggered.

T.42 Nil

T.43 Fixing Gypsum Wallboard

Fix gypsum wallboard with joints centered over supports and with end joints staggered. Bound edges of boards shall be lightly butted together at joints and cut edges shall be tightly butted together.

Wallboard to ceilings shall be fixed with bound edges at right angles to joists.

Where required provide noggins at unsupported joints to ensure that the wallboard is fully supported on all four edges.

T.44 Fixing gypsum wallboard to metal firring channels

Fix 12.7mm gypsum wallboard to metal firring channels with screws, as Clause T.26, spaced at 300mm maximum centres and located not more than 10mm from board edges. Screws shall be driven home until heads are slightly below but without fracturing, the paper surface. Screws along edges of adjacent boards shall be opposite one another and not staggered.

T.45 Fixing Composite Laminate

Fixing composite laminate as Clause T.3 shall be in accordance with the manufacturer's recommendations.

T.46 Nil

T.47 Jointing and Finishing Wallboard with Taped Joints

Ivory faced tapered edge wallboard, unless otherwise specified (see clause T.49), shall be finished as follows and all in accordance with the manufacturer's instructions:

Bed jointing tape into tapered edge joints and finish with board surface with jointing compound. Fill cut edge joints, bed jointing tape tight to board surface and feather out to a level surface with jointing compound.

Fill nail or screw indentations not covered by jointing with joint filler and finish flush with surface.

Reinforce external angles with metal angle beads, as clause T.24, bedded in jointing compound with outer edges touching plasterboard. Apply two coats jointing compound finished flush with board surface.

Apply a slurry of jointing compound to entire surface of wallboard on completion of jointing.

T.48 Jointing wallboard to receive veneer finish

Jointing to ivory faced tapered edge gypsum wallboard, where gypsum plaster veneer finish as Clause

T.10 is specified, shall be as follows and all in accordance with the manufacturer's instructions:

Bed and finish, with jointing compound, all joints to tapered board including cut ends and internal angles.

Fill nail or screw indentations not covered by jointing with joint filler and finish flush with surface.

Reinforce external angles with metal angle beads, as Clause T.24, bedded in jointing compound with outer edges touching plasterboard.

T.49 Nil

T.50 Mixing of Materials

All materials shall be thoroughly mixed in the proportions described and in accordance with the manufacturer's instructions. No mixes of plasters other than those described shall be used without written approval of the Architect.

Bankers and gauge boxes shall be thoroughly cleaned after each mix and due care and attention shall be given at all times to their cleanliness.

T.51 Re-Tempering Etc.

Cement-lime-sand plasters shall be used within two hours of the gauging with cement.

Gypsum plasters shall be used within one hour of the addition of water.

Plasters shall not be re-tempered and the use of a water brush shall be kept to a minimum. All tools shall be kept clean and fresh plaster shall not be contaminated with set plaster.

T.52 Angles to gypsum plastered walls

Before plastering, fix metal angle beads, as Clause T.24, to all external angles with plaster dabs at 600mm centres. Ensure that nose of bead is plumb and square and set to give the correct thickness of plaster.

Avoid damage to galvanised coating due to excessive trowelling or scraping.

Scrim all internal angles to walls and ceilings with 100 mm jute scrim cloth bedded in the undercoat.

T.53 Application of gypsum plaster undercoats

Gypsum plaster undercoats shall be applied in accordance with the manufacturer's instructions. The plaster shall be built out to the required thickness, ruled to a true and level surface and properly scratched to form a key for subsequent coats.

T.54 Application of gypsum plaster finishing coats

Gypsum plaster finishing coats shall be applied in accordance with the manufacturer's instructions. The plaster shall be applied to the required thickness to a true and level plane. Unless otherwise specified, finish final coat to a smooth surface with a steel trowel.

In two or three coat work the finishing coat shall be applied as soon as the undercoat has set and has developed reasonable suction.

Where applying veneer finish, (as Clause T.10) do not apply an excessive thickness and avoid over trowelling.

T.55
to
T.58

Nil

T.59 Curing and Protection of Cement Based Plasters

All wall surfaces to be well wetted before each operation. Each coat, including scud coat, should be kept damp for three days and then allowed to dry out thoroughly to permit most of the initial shrinkage to take place before application of subsequent coat. Each coat shall also be protected from rain and frost for the first 48 hours after application. Any protection shall be kept clear of the final coat to avoid damage or discoloration.

T.60 Angle and Stop Beads to Cement Based Plasters

Before plastering fix metal angles and stop beads, as Clause T.24, to walls with stainless steel or galvanised nails. Ensure that the nose of the beads are plumb and square and are of the correct depth for the finish thickness of plaster.

T.61 Application of Cement Based Plaster Undercoats

Unless otherwise specified two undercoats of cement: lime: sand plaster shall be applied to external renderings.

The floating undercoat shall be nominally 10mm thick and in any event not less than 8mm, or more than 16mm in any part. When the undercoat has begun to stiffen it shall be combed or scratched to about 5mm deep to provide a key for the subsequent coat.

Before applying second undercoat brush down to remove dust and loose particles and damp down if necessary.

The second undercoat shall be 10mm thick and be applied and finished as the floating coat. Where the finishing coat is specified as machine applied the second undercoat shall be finished with a wood float and not combed or scratched.

T.62 Application of Cement Based Plaster Final Coat to External Walls - Smooth

Smooth (Nap) finishing coats of cement-lime-sand plaster to external walls shall be of a finished thickness of not less than 6mm, or more than 10mm. The final coat shall be applied with a laying trowel and finished with a wood or other suitably faced float. A steel trowel should not be used and

overworking should be avoided. If an area is too extensive to complete in one operation, finish to an approved line.

T.63 Application of Cement Based Plaster Final Coat to Internal Walls - Smooth

Smooth finishing coats of cement : lime : sand plaster to internal walls shall be as clause T.62 except finishing shall be with a steel trowel float.

T.64 Application of Cement Based Plaster Final Coat -Roughcast Finish

Roughcast finish to cement-lime-sand plaster shall contain aggregates in accordance with Clause T.16.

Apply the roughcast mix while wet by throwing on with a trowel or scoop to give a wide even spread to procure a consistent texture.

If an area is too extensive to complete in one operation, finish to an approved line.

T.65 Application of Cement Based Plaster Final Coat - Dry-Dash Finish

Dry-dash finish to cement-line-sand plaster shall be carried out with graded aggregates in accordance with Clause T.16.

The second undercoat (butter coat), as clause T.61, which is to receive the aggregate shall be prepared with white cement or mixed with coloured pigment as Clause T.19. The butter coat shall be drawn to a true and regular surface with a straight edge and while still plastic and soft, throw on washed wet aggregate with a wide and even spread to produce a consistent texture. Lightly press aggregate into surface with a wood float to ensure uniform adhesion over the whole surface.

If an area is too extensive to complete in one operation, finish to an approved line.

An approved waterproofer in accordance with Clause T.21 shall be added to the floating coat.

T.66
to
T.68

Nil

T.69 Use of Bonding Agents

On backgrounds where wetting is insufficient to ensure adequate adhesion or where recommended by the plaster manufacturer apply compatible bonding agent in accordance with Clause T.22.

Where an additional key to dense/strong or weak/permeable backgrounds is required apply a stipple coat comprising of a bonding agent, as Clause T.22, gauged with cement and sand, mixed and applied in accordance with the manufacturer's instructions.

T. 70
to
T. 74

Nil

T.75 Table of Plastering/Rendering Systems

The proportions stated in the following table shall be by volume. The thickness stated, unless otherwise indicated, is the overall finished thickness exclusive of any key, scudding, adhesive grout, pricking-up or dubbing out.

TABLE OF PLASTERING/RENDERING SYSTEMS			
Sys · Ref ·	System	Thickne ss	Background
A1	Veneer Finish Plaster as Clause T 10	2mm	Gypsum Wallboard or Composite Laminate (T3) (Internal Ceilings)
B1	Undercoat - Basecoat plaster as Clause T.7 Finishing - Lightweight Coat Finishing Plaster Type b.1 as Clause T.7	12.6mm	Brickwork and Blockwork (Internal)
C1	Scud - as Clause T.36 Floating - Cement/Lime/Sand 1:1:6 Or Cement/Readymix Lime - sand - 1:6 Finishing Coat - as floating coat Note - Ready mix lime-sand - 1:6	15mm	Brickwork and Blockwork (Internal)
C2	Scud - as Clause T.36 Floating - as C1 Finishing Coat - as C1	20mm	Brickwork and Blockwork (Internal)
	Scud - as Clause T.36 Floating - Cement/Lime/Sand 1:½:4½ OR Cement/lime-sand - 1:4½ Readymix 2 nd Undercoat - as floating coat Roughcast - Cement/Lime/Stone aggregate-	20mm for under-coat	Blockwork Walls (External)

	1:1½:3 Finish Coat Note - Readymix lime-sand - 1:9		
	Scud - as Clause T.36 Floating - as C3 but gauged with waterproofer added in accordance with manufacturers instructions Buttercoat- Cement/Lime/Sand - 1:1:5 OR Cement/Readymix lime-sand - 1:5 Dry dash Stone aggregate as Clause T.16, Finish thrown on Note: Readymix lime-sand - 1:6	20mm for under-coat	Blockwork Walls (External)

T.76
to
T.100

Nil

TILE, SLAB AND BLOCK FINISHINGS

T.101 Generally

All tiling shall generally comply with the following:-

- (i) Internal wall tiling to BS 5385-1:2009.
- (ii) Tile and slab flooring to BS 5385-3:2007.
- (iii) Wall and Floor tiling to Shower and Bath areas to BS 5385-4:2009.

T.102 Preparation

All screeds and backgrounds to receive finishings shall be dry throughout. A minimum period of 4 weeks shall elapse after the end of curing before finishings are fixed or laid on new concrete and a minimum of 2 weeks after the end of curing before finishings are fixed or laid on new cement and sand screeds or rendering. When glazed ceramic tiles are to be fixed to gypsum plaster backgrounds a minimum period of 4 weeks shall elapse between completion of plastering and commencement of tiling.

Gypsum plaster, and other backgrounds if necessary, shall be primed with a primer recommended by the adhesive manufacturer.

All surfaces to receive finishings shall be thoroughly cleaned and those to receive finishings directly bedded in cement and sand mortar shall be wetted sufficiently to prevent excessive absorption of water from the bedding.

T.103 Nil

T.104 Samples

The Contractor shall submit samples of all tile, slab and block finishings for the Architect's approval before ordering unless otherwise instructed. The approved samples shall be retained on site as the standard for subsequent deliveries.

T.105 Nil

T.106 Bedding systems – Wall tiling

Unless otherwise described tile finishings for walls shall be bedded in adhesive complying with IS EN 12004:2007 (+A1:2012) using the thin bed method in accordance with the manufacturer's instructions.

Bedding shall not exceed 3 mm total thickness for thin bed. The adhesive shall be applied to the background and ribbed with a notched trowel. Tiles shall be pressed firmly into position on the background and tapped back to achieve maximum contact and produce a flat, true surface with regular joints as described.

T.107 Bedding Systems - Floor Finishings

Unless otherwise described tile flooring shall be bedded in a cement based adhesive (thin bed method) bonded to the base.

Cement based adhesive shall comply with IS EN 12004:2007 (+A1:2012) and be used in accordance with the manufacturer's instructions. Thickness of the bed shall not exceed 5mm. The adhesive may be spread onto the dry base or buttered onto the backs of the tiles. Tiles shall be laid and firmly tamped down to ensure complete adhesion to the base with a level surface and joints as described.

T.108 Filling of Joints

Joints shall be in accordance with the appropriate clause. Unless otherwise described filling of joints shall be as follows:-

Sawdust shall not be used as protection to floors before joints are filled and set.

Filling of joints shall be carried out as soon as the finishings are properly set. Joints shall be clean and free from deleterious matter. Joints to finishings bedded in mortar and to be filled with a cement and sand mix may be dampened if necessary; All other joints shall be dry.

Filling materials shall be for joints not exceeding 3mm wide in wall tiling and 6mm wide in floor tiling a water resistant compressible cementitious grout as recommended by the manufacturer of the tile adhesive used and complying with relevant sections of BS 5385-1:2009, BS 5385-3:2007 and BS 5385- 4:2009 in respect to resistance to moulds and bacteria.

All filling materials shall be worked well into joints until filled flush with the surface. Proprietary materials shall be used in accordance with the manufacturer's instructions. Joints exceeding 3mm wide shall be well compacted and neatly finished with a trowel or

other approved tool. Dry mixed joint filling materials, where described, shall be carefully brushed in. Surplus material shall be removed and all surfaces left clean and free from stains.

T.109 Movement Joints

Movement joints shall be provided as follows and as otherwise may be specified or shown on the drawings:-

- (i) over structural movement joints.
- (ii) at internal wall to wall angles.
- (iii) at angles with structural walls and ceilings.
- (iv) at perimeter of floors and around bases of columns.
- (v) at junctions between different background materials.
- (vi) to give bays not greater than 3000 x 4500mm on brick and block walling.
- (vii) at intervals not exceeding 4500 mm across floors.

Joints shall be not less than 6mm wide in wall tiling and not less than 10mm in floor finishes and shall be to the full depth of tiles/finishes and beddings.

Sealants and backing strips shall be gun applied silicone sealant complying with IS EN ISO 11600:2003 (+A1:2011) Type F. The sealant shall be neatly finished flush with the tile surface.

T.110 Junction Strips

Junction strips at the abutment of differing floor finishes shall be of 3mm Brass Flat for the full depth of the bedding and screed.

T.111
To
T.112

Nil

T.113 Glazed Ceramic Wall Tiles

Glazed ceramic wall tiles shall be flat gloss 150mm x 150mm x 5.5mm tiles complying with IS EN 14411:2012 and shall be of the colours selected by the Architect.

Tiles shall be fixed with adhesive by the thin bed method and shall be wiped clean and fixed dry. The tiles shall be bedded with straight joints not exceeding 3 mm wide to approved finished sample and colour.

Use Proprietary PVC edge strips to match tile at external corners and installed in accordance with the manufacturer's instructions.

T.114 Nil

T.115 Sealant Strips to Baths and Showers

Shower trays and bathtubs to be sealed to adjacent walls with PVC profile, incorporating a polythene bond breaker, filled with silicone to allow joint movement ('Sealux Reg 25' or equivalent). The seal to be fitted in accordance with manufacturers instructions. Soft lipped seals are not acceptable.

Sealant shall be to be gun applied silicone sealant complying with IS EN ISO 11600:2003 (+A1:2011) Type F and must be as supplied by the profile manufacturer ('Sealux N' or

equivalent).

T.116 Floor Tiles to Shower Areas

Where shown on drawings Clay floor tiles to shower areas shall be 150mm x 150mm x 12mm dust- pressed ceramic tiles (Vitrified 3%) in accordance with IS EN 14411:2012, (Pilkingtons Dorset Stone Surefoot range or equivalent) to selected colour shall have a complementary range of coves and angles to form 100mm skirtings and upstands.

The tiles shall be clean and fixed dry with straight joints 3mm wide of approved finished sample and colour.

T.117
to
T.124

Nil

T.125 Plastic Floor Tiles

Vinyl floor tiles shall be 2mm thick through coloured homogenous vinyl marbleised floor covering complying with IS EN 649:2011 and classified 34/43 to IS EN 10874:2012 (“Tarkett Sommer Standard” or Polyflor Standard XL” or “Gerflex Architecton” or equivalent). The tiles shall be either 300mm x 300mm or 500mm x 500mm in size in colours to the Architects selection.

No flooring shall be laid until all other internal work is complete. The tiles shall be laid by a specialist firm in accordance with BS 8203:2001 (+A1:2009) and the manufacturer’s recommendations and with an adhesive approved by said manufacturer. Border cuts shall be 75mm minimum unless otherwise agreed by the Architect.

T.126 Plastic Sheet Floor Covering

Anti-slip vinyl sheet flooring shall to be provided in all shower rooms and bathrooms.

The anti-slip vinyl sheet flooring shall be 2mm thick through coloured homogenous vinyl (‘Altro T20’ or equivalent). It shall be extended 100mm vertically up walls to form skirting and all joints shall be welded.

Where laid on Suspended timber floors a sub base of 9mm plywood as Clause N.43 fixed to T&G flooring, as Clause N.37

No flooring shall be laid until all other internal work is complete. The sheet shall be laid by a specialist firm in accordance with BS 8203:2001 (+A1:2009) and the manufacturer’s recommendations and with an adhesive approved by said manufacturer. Border cuts shall be 75mm minimum unless otherwise agreed by the Architect.

T.127
to
T.150

Nil

BITUMEN MACADAM PAVING

T.151 Bitumen Macadam

Bitumen macadam for play areas and footpaths etc. shall be made in accordance with BS EN 13108- 1:2006 and should conform in respect of aggregate grading, binder content, grade of binder and mixing temperature with the appropriate tables of that standard.

T.152 Formation

Bitumen macadam shall be laid on an approved sub-base on a trimmed graded and compacted formation.

All topsoil over the pavement areas shall be removed.

Where the resulting subgrade levels are lower than those specified in the drawings, low areas shall be made up with approved granular material adequately compacted in 225mm layers. Where, after topsoil removal, the subgrade levels are higher than those specified, the subgrade shall be further excavated, trimmed, graded and compacted to the required levels.

The sub-base shall consist of 200mm (driveways) or 100mm (footpaths) depths of granular material in conformity with Clause 804 of the "Specification for Road Works" by the NRA(National Roads Authority). Compaction of the sub-base material shall be in accordance with Table 8/1, Clause 802 of the 'Specification for Highway Works' or until there is no further movement under the roller. Ensure that pyrite material is excluded.

T.153 Application

The bitumen macadam shall be transported, spread and compacted in accordance with BS 594987:2010.

All joints in the pavement and all concrete retaining structures shall be edge-coated with bitumen prior to laying. The bitumen macadam shall be machine laid where possible and hand laying shall only be permitted for laying regulating courses of irregular shape and varying thickness or in confined spaces where it is impracticable for a machine to operate.

The Contractor shall submit a paving schedule for approval before commencement which clearly indicated the extent of hand laid areas and whether cut back bitumen or slow set additives are necessary to facilitate the laying program.

Any material which has set (material outside the BS 594987:2010 laying temperatures ranges) before proper compaction must be removed. The bitumen macadam should be compacted with a 2.5 tonne (minimum) roller until a smooth even surface has been obtained and all wheel tracks have disappeared. Hand tamping shall only be permissible in areas inaccessible to rolling.

T.154 Tolerance

The bitumen macadam shall be laid to the levels and falls indicated on the drawings.

The finished thickness of the wearing course macadam shall not be less than 50mm (footpaths) or as otherwise indicated on the drawings for avenues, car-parks and playgrounds.

The surface level of the laid wearing course shall not deviate vertically by more than 10mm when measured under a 3m straight edge laid in any horizontal direction.

Appendix A: List of References and Standards. (Part 1)

Item No.	Clause	Reference	Comment
1.	T.1	IS EN 520:2005+A1:2009	Gypsum plasterboards - Definitions requirements and test methods. (Revised Amendment 2009)
2.	T.7	IS EN 13279-1:2008	Gypsum binders and gypsum plasters – Part 1: Definitions and requirements. (to replace IS EN 13279-1:2005)
3.	T.13	IS EN 197-1:2011	Cement – Composition, Specifications and conformity criteria, for common cements. (to replace IS EN 197-1:2004)
4.	T.15	IS EN 998-1:2010	Specification for mortar for masonry – Part 1: Rendering and plastering mortar. (to replace IS EN 998-1:2003)
5.	T.16	IS EN 12620:2013	Aggregates for concrete. (to replace IS EN 12620:2002)
6.	T.22	BS 5270-1:1989	Bonding agents for use with gypsum plasters and cement. Specification for Polyvinyl Acetate (PVAC) emulsion bonding agents for indoor use with gypsum building plasters.
7.	T.22	IS EN 13914-1:2005 IS EN 13914-2:2005	Design, Preparation and application of external rendering and internal plastering – Part 1: External rendering. Design, Preparation and application of external rendering and internal plastering – Part 2: Design considerations and essential principles for internal plastering.
8.	T.22	BS 8481:2006	Design, Preparation and application of internal gypsum, cement, cement and lime plastering systems - Specification.
9.	T.24	IS EN 13658-1:2005 IS EN 13658-2:2005	Metal lath and beads – definitions, requirements and test methods – Part 1: Internal plastering. Metal lath and beads – Definitions, requirements and test methods – Part 2: External rendering.
10.	T.26	BS 8212:1995	Code of practice for dry lining and partitioning using gypsum plasterboard.
11.	T.101	BS 5385-1:2009 BS 5385-3:2007 BS 5385-4:2009	Wall and floor tiling – Part 1: Design and installation of ceramic, natural stone and mosaic wall tiling in normal internal conditions – Code of practice. (to replace BS 5385-1:1995) Wall and floor tiling – Part 3: Design and installation of internal and external ceramic and mosaic floor tiling in normal conditions – Code of practice. (to replace BS 5385-3:1989)

			Wall and floor tiling – Part 4 Design and installation of ceramic and mosaic tiling in special conditions – Code of practice. (to replace BS 5385-4:1992)
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Appendix A: List of references and Standards, continued... (Part 2)

Item No.	Clause	Reference	Comment
12.	T.106	IS EN 12004: 2007 + A1: 2012	Adhesives for tiles – Requirements, evaluation of conformity, classification and designation. (to replace IS EN 12004: 2001)
13.	T.109	IS EN ISO 11600:2003 + A1: 2011	Building construction – Jointing products – classification and requirements for sealants. (to replace IS EN ISO 11600: 2004)
14.	T.113	IS EN 14411:2012	Ceramic tiles – Definitions, classification, characteristics, evaluation of conformity and marking. (to replace IS EN 14411:2006)
15.	T.125	IS EN 649:2011	Resilient floor covering – Homogeneous and heterogeneous polyvinyl chloride floor coverings – Specification. (to replace IS EN 649:1997)
16.	T.125	IS EN ISO 10874:2012	Resilient, textile and laminate, floor coverings – classification. (to replace IS EN 685:2005)
17.	T.125	BS 8203:2001+A1:2009	Code of practice for installation of resilient floor coverings. (to replace BS 8203:2001)
18.	T.151	BS EN 13108-1:2006	Bituminous mixtures – Material specification – Part1: Asphalt Concrete. (to replace BS 4987- 1:2005)
19.	T.152	‘Specification for Road Works’ by the NRA.	Series 800: ‘Road Pavements – Unbound and Cement Bound Mixtures’, Clause 804: Granular Material Type B. (Current version at time of revision; March 2013) (Fixed typo, to now read as the by the NRA, not DoEHLG)
20.	T.152	‘Manual of Contract Documents for Highway Works’ by the NRA.	Volume 1, Specification for Highway Works, Series 800: ‘Roads Pavements – Unbound, Cement and Other Hydraulically Bound Mixtures’, Clause 802, Table 8/1. (Current version at time of revision; November 2009)
21.	T.153	BS 594987:2010	Asphalt for roads and other paved areas – Specification for transport, laying, compaction and type testing protocols. (to replace BS 4987- 2:2003)

LIST OF CLAUSES U

BUILDING CONTROL

U.0 Compliance with the Building Regulations

GENERALLY

U.1 General Requirements
U.2 Installation
U.3 Safety
U.4 Glazing to external doors and windows
U.5 Samples U.6
To Nil
U.10

MATERIALS

U.11 Clear Float Glass
U.12 Obscure Patterned Glass
U.13 Georgian Wired Rough Cast Glass
U.14 Georgian Wired Polished Plate Glass
U.15 Safety Glass
U.16 Sealed Double Glazing Units U.17
To Nil
U.20
U.21 Plastic Sheet
U.22 Setting Blocks
U.23 Location Blocks and Distance Pieces
U.24 Linseed Oil Putty
U.25 Nil
U.26 Self Adhesive Glazing Tape
U.27 Non-setting Compound
U.28 Mastic Sealing U.29
To Nil
U.30

WORKMANSHIP

U.31 Glass to be kept free from Moisture
U.32 Nil
U.33 Rebates and Beads
U.34 Edges of Glass
U.35 Setting and Location Blocks
U.36 Use of Glazing Compounds
U.37 Glazing without Beads
U.38 Beading to Sealed Double Glazing Units
U.39 Bead Glazing to Plastic Sheet
U.40 Wired Glass
U.41 Protection and Cleaning of Glazing U.42
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U.45
U.46 Glass Location Schedule – Housing
U.47 Nil
U.48 Gaskets and weather stripping

Appendix A: LIST OF REFERENCES AND STANDARDS

U.0 Compliance with Materials and Workmanship with Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. No.225 of 2013), the Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERALLY**U.1 General Requirements**

All glazing shall be in accordance with the requirements of BS 6262:1982, BS 6262-1:2005, BS 6262- 2:2005, BS 6262-3:2005, BS 6262-4:2005, BS 6262-6:2005 and BS 6262-7:2005.

U.2 Installation

Installation of glazing shall be in accordance with Clause U.1 and workmanship shall be in accordance with BS 8000-7:1990.

All glazing to be completed before the commencement of the plastering as to the manufacturers recommendations. Where external rendering is carried out after glazing all glass or plastic sheet shall be protected from damage and any scratched or broken glass or plastic sheet shall be replaced at the Contractors expense.

U.3 Safety

All glazing must comply with the requirements of BS 6262-3:2005 and BS 6262-4:2005 in respect of safety.

Safety glass or plastic must comply with Class C of BS 6206:1981. In particular safety glass must be used in the following locations:

- (i) all glazing to external doors and side screens.
- (ii) all other glazing any part of which is less than 800 above finished floor level (e.g. low level windows)

Note: BS 6206 is partially superseded by IS EN 12600:2002. BS 6206 is still current and cited in the Technical Guidance Document, Part D, Materials and Workmanship, 2013.

U.4 Glazing to External Doors and Windows

Unless otherwise shown all glazing to external doors and windows shall be sealed double glazed units of approved manufacture as Clause U.16. or triple glaze where required.

U.5 Samples

Samples not less than 150mm square of special types of glass or plastic sheet are to be submitted for approval, if required by the Architect, before any glass or plastic sheet is cut.

U.6
To
U.10

Nil

MATERIALS

U.11 Clear float glass

Clear glass, including Low-E glass, shall be float glass complying with BS 952-1:1995.

The thickness of glass shall be 3mm glass for areas of less than 0.75 square meters and 4mm glass for areas greater than 0.75 square meters but not exceeding 1.50 square meters.

U.12 Obscure patterned glass

Obscure patterned glass shall comply with BS 952-1:1995 and unless otherwise specified shall be "Festival" Pattern.

The glass thickness shall be as clause U.11.

U.13 Georgian Wired Rough Cast Glass

Georgian wired rough cast glass shall comply with BS 952-1:1995, 6mm thick.

U.14 Georgian wired polished plate glass

Georgian wired polished plate glass shall comply with BS 952-1:1995. 6mm thick.

U.15 Safety glass

Toughened or laminated safety glass shall be in accordance with BS 952-1:1995.

U.16 Sealed Double Glazing Units

Sealed double glazing units to be manufactured using Low-E glass, as Clause U.11, in accordance with IS 330:1987.

The units shall achieve a U-value of 1.60 W/m²K or better, averaged across the frame and glazing, to comply with the Building Regulations. See reference to N.56: Windows.

to
U.20

Nil

U.21 Plastic Sheet

Clear and obscure unbreakable plastic glazing complying with Clause U.3 shall be polycarbonate sheet of approved manufacture. The thickness shall be as recommended by the manufacturer for the size of opening.

U.22 Setting Blocks

Setting blocks shall be of plasticised PVC, hammered lead, or sealed hardwood.

U.23 Location Blocks and Distance Pieces

Location blocks and distance pieces shall be of elasticised PVC, corresponding to softness number 35-45 of BS 2571:1990.

U.24 Linseed Oil Putty

Linseed oil putty shall comply with IS 28:1988.

U.25 Nil**U.26 Self-Adhesive Glazing Tape**

Self-adhesive glazing tape shall be as approved sample.

U.27 Non-setting Compound

Non-setting compound shall be as approved sample and colour.

U.28 Mastic Sealing Strip

Mastic sealing strip shall be as approved sample.

U.29
to
U.30

Nil**WORKMANSHIP****U.31 Glass to be kept free from Moisture**

All glass shall be kept dry during transit and storage. Glass becoming moist from condensation or other causes shall be thoroughly dried and aired.

U.32 Nil**U.33 Rebates and Beads**

All rebates and beads must be clean, dry and brushed free of dust before glazing commences.

U.34 Edges of Glass

All glass shall have clean cut edges, and edges shall be clean and dry before glazing commences.

U.35 Setting and Location Blocks

Setting and location blocks shall be used in panes of ordinary glazing exceeding 0.2m² and positions and sizes shall be as recommended in BS 6262:1982.

U.36 Use of Glazing Compounds

All glazing compounds including putties, non-setting compounds, two part rubberising compounds, mastic sealing strips and self-adhesive glazing tapes shall be used in accordance with the manufacturer's instructions.

U.37 Glazing without Beads

Glazing in linseed oil or metal casement putty as appropriate shall be executed with proper bed and back putties, sprigs, clips and splayed and mitred front putties. The back putties

Section U – GLAZING

shall be trimmed off flush with the tops of the rebates and the splayed front putties shall be finished 3mm back from sight line to allow for sealing between glass and putty with paint.

U.38 Beading to Sealed Double Glazing Units

Beading to sealed double glazing units to be in accordance with window manufacturer's recommendations.

U.39 Bead Glazing to Plastic Sheet

In bead Glazing to plastic sheet there shall be a minimum 2mm bed of silicone sealant on both side of the sheet. The sheet shall be solidly bedded without voids around the perimeter and with the sealant filleted to and above the bead.

U.40 Wired Glass

The wire in wired glass shall extend to the edges and be free from rust. The wires of Georgian wired glass shall be parallel to the framing.

U.41 Protection and Cleaning of Glazing

Protect all new and existing glass and frames from damage, including splashes from mortar, paint etc. at all times until completion of the contract.

Remove all smears and excess compound and sealant. On completion leave inside and outside clean and free from scratches and marks.

U.42

To

U.45

Nil**U.46 Glass Location Schedule – Housing**

LOCATION	TYPE OF GLAZING	CLAUSE
Windows to Bedroom, Kitchen/Dining, Living Room	Clear Float Glass	U11
Windows to Bathroom	Obscure Patterned Glass	U12
Front Entrance Door Screen	Obscure Patterned Glass Class C	U12
Rear Entrance Door	Clear Float Glass Class C	U11

U.47 Nil

U.48 Gaskets and weather stripping

All Gaskets and weather stripping shall comply with the requirements listed in IS EN 12365-1: 2003, IS EN 12365-2:2003, IS EN 12365-3:2003 and IS EN 12365-4:2003.

Appendix A: List of References and standards.

Item	Clause no.	Reference	Comment
1.	U.1	B 6262-1982 S	Code of practice for glazing for buildings.
2.	U.1	BS 6262-1:2005 BS 6262-2:2005 BS 6262-3 2005 BS 6262-4 2005 BS 6262-6 2005 BS 6262-7 2005	Glazing for buildings – Part 1, General methodology for the selection of glazing. Glazing for buildings – Part 2, Code of practice for energy, light and sound. Glazing for buildings – Part 3, Code of practice for fire, security and wind loading. Glazing for buildings – Part 4, Code of practice for safety related to human impact. Glazing for buildings – Part 6, Code of practice for special applications. Glazing for buildings – Part 7, Code of practice for the provision of information.
3.	U.2	BS 8000-7:1990	Workmanship on building sites. Code of practice for glazing.
4.	U.3	BS 6206:1981	Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings. BS6206 has been partially superseded by IS EN 12600:2002
5.	U.4	IS EN 12600:2002	Glass in building. Pendulum test. Impact test method and classification for flat glass.
6.	U.11	BS 952-1:1995	Glass for glazing. Classification.
7.	U.16	I.S. 330:1987	Hermetically sealed flat double glazing units.
8.	U.23	BS 2571:1990	Specification for general purpose flexible PVC compounds for moulding and extrusion.
9.	U.24	I.S. 28:1988	Linseed oil putty for use in wooden frames.

Appendix A: List of References and standards.

Item No.	Clause	Reference	Comment
10.	U.48	BS EN 12365-1:2003	Building Hardware – Gasket and weather stripping for doors, windows, shutters and curtain walling – Part 1: Performance requirements and classification.
		BS EN 12365-2:2003	Building Hardware – Gasket and weather stripping for doors, windows, shutters and curtain walling – Part 2: Linear compression force test.
		BS EN 12365-3:2003	Building Hardware – Gasket and weather stripping for doors, windows, shutters and curtain walling – Part 3: Deflection recovery test method.
		BS EN 12365-4:2003	Building Hardware – Gasket and weather stripping for doors, windows shutters and curtain walling – Part 4: Recovery after accelerated ageing test method.

LIST OF CLAUSES V

BUILDING CONTROL

V.0 Compliance with the Building Regulations

GENERALLY

V.1 Colour Range
V.2 Sample Finishes V.3
To Nil
V.4

MATERIALS

V.5 Approval of Brands and Paints Systems
V.6 Some Maker's Materials used for Coating
V.7 Delivery and Marking
V.8 Storage
V.9 Use of Materials
V.10 Malpractices
V.11 Quality Control and Testing
V.12 Nil
V.13 Remedying Defects Due to Defective Materials
V.14 Nil
V.15 Knotting
V.16 Stopping and/or Filler (see Clause V30)
V.17 White Spirits V.18
To Nil
V.19
V.20 Masonry Paint
V.21 Emulsion Paint
V.22 Undercoat paint
V.23 Black Bituminous Paint
V.24 Primer for Concrete and Alkaline Surfaces
V.25 Primer for Aluminium
V.26 Primer for non-ferrous metals
V.27 Exterior Stain Finish for Timber
V.28 Primer for Softwood to be painted
V.29 Nil
V.30 Oil Paint of interior use in houses
V.31 High Performance Gloss Paint System
V.32 Primer for Plastic Components
V.33 Paint Finish for Galvanised Steel
V.34 Primer for iron and steel
V.35 Undercoat for interior woodwork
V.36 Nil

PREPARATION OF SURFACES

V.37 Inspection
V.38 Stopping and/or Filler
V.39 Plaster, Rendering Concrete, & Blockwork
V.40 Iron & Steel
V.41 Galvanised Steel, Zinc Sprayed Steel, and Non-Ferrous Metals
V.42 Nil
V.43 Plywood
V.44 Woodwork to be painted
V.45 Woodwork to Receive a Clear or Exterior Stain Finish
V.46 Nil

Section V – PAINTING AND DECORATING

WORKMANSHIP

V.47	Workmanship Generally
V.48	Stirring of Material
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V.50	Brushwork
V.51	Priming of Joinery
V.52	Extent of Priming to Concealed Surfaces
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V.55	Coatings to be Dry
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V.58	Painting in unsuitable conditions
V.59	Protection of Wet Surfaces
V.60	Damage to Adjoining Surfaces
V.61	Cleanliness
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V.72	Tables of Painting and Decorating

APPENDIX A: LIST OF REFERENCES AND STANDARDS

Section V – PAINTING AND DECORATING

V.0 Compliance with Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products regulation (Regulation (EU) No.305/2011) as set out in national rules for Ireland (S.I. No.225 of 2013), The Contractor shall provide proof (a Declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be means of manufacturer's confirmation, or independent testing certificate.

GENERALLY

V.1 Colour Range

Painting and decorative schemes shall be carried out in colours selected by the Architect.

V.2 Sample Finishes

Prior to internal decorating, one complete wall for full height, designated by the Architect, shall be completely decorated. This decoration shall include samples of finishes to internal and external doors, frames, windows, ceilings and metalwork etc. After approval of the quality of finishes to these areas they shall be used as a standard for the work.

The Contractor shall also carry out sample finishes elsewhere if directed by the Architect.

Any extra cost in carrying out such decoration in advance of the general work shall be deemed to have been included in the Contract Sum. The painted surfaces of the above work shall be made good and touched up as directed prior to handover.

V.3
to
V.4

Nil

MATERIALS

V.5 Approval of Brands and Paint Systems

The Contractor shall seek, in writing, approval from the Architect for all brands and systems of paint he wishes to use. Only the approved brands and systems will be allowed to be used.

The Contractor should note that generally high performance paint systems are specified and he should, when tendering, take into account any specialist requirements or application needed or recommended by the manufacturer.

V.6 Some Maker's Materials used for Coating

While materials for the works may be obtained from several makers, paint systems for a particular surface must be obtained from the same maker. (i.e. one maker's finishing

Section V – PAINTING AND DECORATING

coat must not be applied over another maker's undercoat.)

V.7 Delivery and Marking

All paints, varnishes, stains and other surface coatings shall be delivered in sound and sealed containers, labelled clearly by the manufacturer, the printed label or decorated container stating:-

- (i) the type of product;
- (ii) the brand name, if any;
- (iii) the use for which it is intended i.e. undercoating or finishing;
- (iv) the appropriate European, Irish and British Standard reference.
- (v) the manufacturers batch number.
- (vi) Materials order sheets for all paints, primers, etc. shall be included in the safety file.

No paints other than water based paints and bituminous paint shall be delivered in containers exceeding 5 litres capacity.

V.8 Storage

All materials shall be kept in a dry, clean store, protected from frost.

V.9 Use of Materials

The materials are to be used exactly as received from the maker in accordance with the maker's instructions and the addition of thinners, driers or other materials will only be permitted when specially required by the maker and the procedure approved by the Architect.

V.10 Malpractices

Adequate supervision during painting work must be given by the Contractor to ensure that the paint is not adulterated in any way and is used in accordance with Clause V9.

V.11 Quality Control and Testing

All paint and surface finishes shall be subject to the NSAI Paint Quality Control Scheme.

The Contractor shall at all times allow access, provide facilities for sampling of materials and supply such information as may be requested in connection with the scheme to the NSAI. Where finished samples of paintwork are taken the Contractor shall be responsible for making good.

V.12 Nil

V.13 Remedying Defects Due to Defective Materials

All unsatisfactory materials shall be immediately removed from the site, and any work executed with such defective materials shall be made good by the Contractor at this own expense.

V.14 Nil

Section V – PAINTING AND DECORATING

V.15 Knotting

Knotting shall comply with IS 16:1958.

V.16 Stopping and/or Filler (see clause V30)

Stopping and/or filler, unless otherwise specified (See Clause V30) for:-

- i. Plasterwork shall be a cellulose/gypsum based filler, ("Polyfilla" or equivalent).
- ii. Concrete or rendering shall be of similar material to the background and finished with a similar texture.
- iii. For woodwork shall be an exterior quality flexible stopper forming part of the paint system or as otherwise recommended by the paint manufacturer and approved by the Architect.

Clear finished woodwork shall be filled with exterior quality flexible filler as recommended by the paint manufacturer.

Filling grain of plywood for internal use shall be cellulose/gypsum based filler.

V.17 White Spirit

White spirit shall comply with BS 245:1976.

V.18
to
V.19

Nil

V.20 Masonry Paint

Masonry paint for external walls and internal walls and ceilings to service blocks etc. shall be a synthetic resin solvent based paint having a drying time of 2 hours or less. It shall also be capable of withstanding rainfall 20 minutes after application and also be suitable for application to green concrete, ("Dulux All Seasons Weathershield" masonry coating or equivalent). The first coat shall be thinned in accordance with the manufacturer's instructions.

V.21 Emulsion Paint

Emulsion paint for interior use in houses shall be vinyl matt emulsion complying with IS 129:1964, (Dulux Vinyl Matt emulsion paint or equivalent), the first coat shall be thinned in accordance with the manufacturer's instructions.

V.22 Undercoat Paint

Black.

V.23 Black Bituminous Paint

Black bituminous paint shall comply with BS 3416:1991, type 1, ('Rito' or 'Everbuild' Black Bituminous paints or equivalent) for general use.

V.24 Primer for Concrete and Alkaline Surfaces

Primer for concrete and alkaline surfaces shall be an approved solvent based primer obtained from the maker of the undercoat and finishing coat.

Section V – PAINTING AND DECORATING

V.25 Primer for Aluminium

Primer for weathered or new aluminium shall be a approved water based acrylic zinc phosphate paint as supplied by the manufacturer of the finishing coats unless otherwise specified.

V.26 Primer for Non-ferrous metals

Primer coat for untreated non-ferrous metals such as copper, aluminium etc shall be, unless otherwise specified, a one coat Shellac-based primer ('Zinsser B.I.N.' or equivalent). To be applied according to the manufacturer's instructions.

V.27 Exterior Stain Finish for Timber

Exterior stain finish for hardwood/softwood shall be a high build two part system consisting of a preservative basecoat and 2 coats of solvent based acrylic woodstain ("Dulux Weathershield Added Durability Woodstain" or equivalent).

The system shall be approved by the Architect and the Contractor shall provide samples in the selected colours on the appropriate substrates.

V.28 Primer for Softwood to be Painted

Primer for exterior softwood to be painted shall be as Clause V30. Primer for interior woodwork to be painted shall be aluminium wood primer complying with BS 4756:1998.

V.29 Nil

V.30 Oil Paint for interior use in houses

Oil paints for interior use in houses shall be Hardgloss and undercoats complying with IS 32:1963.

V.31 High Performance Gloss Paint System

External woodwork and steelwork, where specified, shall be painted with a high performance gloss paint system giving a minimum 5 year life expectancy. The system shall be suitable for application to both woodwork and steelwork (Dulux Weathershield Exterior Gloss System or equivalent). Where used on steelwork the primer shall be as Clause V25 or as otherwise recommended by the manufacturer.

The system shall be applied as a complete system, including primer, and the manufacturer's recommendations shall be strictly adhered to in all cases.

The Contractor shall ensure that the appropriate primer is applied if necessary in the workshop or before installation of components.

V.32 Primer for Plastic Components

Primer for Plastic Components shall be a 2 part etching primer suitable for the type of substrate on which it is to be used and obtained from the manufacturer of the finishing and undercoats.

V.33 Primer for Galvanized Steel

Paint finish and primer for galvanized steel shall be a one coat finished paint system

Section V – PAINTING AND DECORATING

(COTEC 3 (Galvacoat) two-pack polyurethane anti-corrosion and adhesion coat or equivalent).

Preparation as Clause V40.

Application shall be 60-80 microns dry film thickness (100-130 wet), in one or two coats. Application may be by brush or spray.

V.34 Primer for Iron and steel

Primer for untreated iron and steel components shall be a 2 part etching primer suitable for the type of substrate on which it is to be used and obtained from the manufacturer of the finishing and undercoats.

V.35 Undercoat for interior woodwork

Untreated interior wood work shall be rubbed down with a fine abrasive paper, and remove all dust from the surface. Then apply 2 coats of wood primer undercoat (DULEX water-based 'Trade quick drying wood primer undercoat' or equivalent).

V.36 Nil

PREPARATION OF SURFACES

V.37 Inspection

The preparation of all surfaces must be inspected by the Architect before any coatings are applied.

V.38 Stopping and/or Filler

Unless otherwise described, stopping and/or filler referred to in the following clauses shall be the appropriate material described in Clause V.15.

V.39 Plaster, Rendering Concrete and Blockwork

All plaster or mortar splashes etc., shall be removed from plaster, rendering, concrete and blockwork by careful scraping, all holes, cracks etc., shall be stopped and the whole of the surfaces shall be brushed down to remove dust and loose material. In addition all traces of mould oil shall be removed from concrete surfaces by scrubbing with water and detergent and rinsing with clean water to remove all detergent. Surfaces must be clean, dry and free from rust or loose material prior to painting. When efflorescence has occurred or is suspected painting shall be deferred for a period as required by the Architect.

V.40 Iron and Steel

All rust, millscale, welding slag and flux residue, shall be removed from iron and steel surfaces by wire- brushing, scraping, hammering, flame cleaning etc.

All steel visual surface inspections will comply with IS EN ISO 8501-1:2007 and IS EN 8501-2:2007.

V.41 Galvanised Steel, Zinc Sprayed Steel, and Non-Ferrous Metals

Section V – PAINTING AND DECORATING

Surfaces of galvanised steel, zinc sprayed steel and non-ferrous metals shall be steam washed to remove all zinc salts, dirt dust and other surface contamination and allowed to dry.

After ensuring that any rust or dirt is removed, touch up any breaks in the galvanised film caused by welds etc. Apply a cold galvanising material with a zinc content of not less than 92% at a thickness 10% higher than the galvanised zinc.

Painting should be carried out within 48 hours of cleaning.

V.42 Nil

V.43 Plywood

Plywood shall be prepared in accordance with Clause V.43 as appropriate.

In addition internal surfaces to be finished with oil paint shall be filled with a cellulose/gypsum based filler to eliminate grain, rubbed down and dusted off and re-primed.

V.44 Woodwork to be Painted

Before fixing woodwork, all surfaces which will be visible after fixing shall be rubbed down and all knots and resin pockets shall be scorched back and coated with knotting. After priming and fixing, all nail holes and other imperfections shall be stopped and the whole surface shall be rubbed down and all dust brushed off.

V.45 Woodwork to Receive a Clear or Exterior Stain Finish

All holes and open joints shall be stopped and the whole surface shall be rubbed down with a fine abrasive paper, and all dust brushed off. Flush filling shall not be carried out.

V.46 Nil

WORKMANSHIP

V.47 Workmanship Generally

Workmanship generally shall be in accordance with the requirements of BS 6150:2006.

V.48 Stirring of Material

The contents of all cans and containers of all materials must be properly and thoroughly stirred before and during use and shall be suitably strained as and when necessary.

V.49 Manufacturer's Instructions

All materials shall be used strictly in accordance with the instructions issued by the manufacturers concerned.

V.50 Brushwork

Unless otherwise described all coatings shall be applied by brush. Written permission must be obtained from the Architect for the application of coatings by spray or roller where not so described and if permission is granted such application shall not result in extra cost to the Employer.

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V.51 Priming of Joinery

Joinery shall be delivered to the site unprimed unless otherwise provided for in Clause N.74, no primer shall be applied while the timber has a moisture content greater than 15% for internal joinery, and no greater than 17% for external joinery work (see clause N.4). The stores and drying room shall be of adequate size to allow for proper working space and for the proper coating and storage of primed work. Primers shall be applied as soon as possible after inspection and acceptance of the joinery by the Architect.

V.52 Extent of Priming to Concealed Surfaces

Backs of timber frames and linings shall be primed, see Clause V.26 or V.30, no other concealed surfaces of internal joinery are required to be primed.

V.53 Nil

V.54 Conditions of Priming

If, by the time that the work is to receive the succeeding coat, the priming coat has in any way deteriorated or has been damaged, the affected portions, or the whole, if necessary, shall be cleaned to remove all dirt, grease and loose matter, rubbed down and re-primed. Primer for re-priming items primed at works shall be similar to that used at works.

V.55 Coatings to be Dry

All coatings shall be allowed to dry thoroughly before succeeding coats are applied.

V.56 Rubbing Down

All undercoats for oil paints and clear finishes shall be rubbed down to smooth surface with abrasive paper and all dust removed before the succeeding coat is applied.

V.57 Differing Colours of Undercoats

Each succeeding coat of priming and undercoating paint shall be sufficiently different in colour as to be readily distinguishable.

V.58 Painting in unsuitable conditions

No coatings shall be applied to surfaces affected by wet, damp, foggy or frosty weather or other unsuitable conditions, or to any surface damp with moisture. If it is desired to proceed with painting when the temperature is below 5°C the permission of the Architect must be obtained.

V.59 Protection of Wet Surfaces

Adequate care must be taken to protect surfaces while still wet, by the use of screens and 'wet paint' signs where necessary.

V.60 Damage to Adjoining Surfaces

Care must be taken when storing materials, preparing surfaces or painting, etc., not to damage or stain other work. The Contractor shall remove all such stains, make good and touch up or replace as required by the Architect.

Section V – PAINTING AND DECORATING**V.61 Cleanliness**

All brushes, tools and equipment shall be kept in a clean condition and surfaces shall be clean and free from dust during painting. Painting shall not be carried out in the vicinity of other operations which might cause dust. The Contractor shall provide a suitable moveable receptacle, into which are to be placed all the liquids, slop washings, etc., which are on no account to be thrown down any of the gullies, manholes, sinks, lavatories, w.c.'s or any other sanitary fittings. All solid refuse or flammable residue must be removed from the site or burned.

V.62 Nil**V.63 Removal of Ironmongery Etc.**

All surface fixed ironmongery, fittings, etc., except hinges shall be removed before painting and refixed on completion.

V.64
to
V.71

Nil

V.72 Tables of Painting and Decorating

In the following tables, internal and external painting and decorating, including the preparation of surfaces, are described by reference to the foregoing clauses. The reference numbers on the left of the tables are used in the subsequent descriptions.

Abbreviations

U/C = Undercoat

Fin = Finishing Coat

TABLES OF PAINTING AND DECORATING**INTERNAL (Houses only)**

Ref.	Surface	Preparation	Primer	Undercoats	Finishing Coat
15.1	Plastered Wall and Ceilings	V.38	-	2 U/C (thinned) V.21	1 Fin Emulsion Paint Vinyl Matt (V.21)
15.2.	Aluminium in contact with mortar or concrete	-	-	1 U/C	Black Bituminous V.23
15.3.	Ends of iron, steel and galvanised work, built in	V.39 V.40	-	2 U/C	Black Bituminous V.23
15.4	Copper Pipes (Exposed)	V.40	V.25	2 U/C	1 Fin Oil Paint V.29
15.5	Iron and Steelwork (Internal)	V.39	V.25	2 U/C	1 Fin Oil Paint V.29

Section V – PAINTING AND DECORATING

15 6	Galvanised Steel	V.40	-	-	Cotec 3 V.32
15 7	Aluminium	V.40	V.24	2 U/C	1 Fin Oil Paint V.25
15 8	Back of frames (Excl. external door and window frames)	-	Aluminium Wood V.27	-	-
15 9	Woodwork (excl. external door and window frames)	V.43	Aluminium Wood V.27	2 U/C V.34	1 Fin Oil paint V.29
16 0	Plywood faced doors	V.42	Aluminium Wood V.27	2 U/C	1 Fin Oil paint V.29
16 1	Hardwood frames	V.44	Preservative Basecoat V.26	-	2 Fin Exterior Stain Finish V.26
16 2	External doors	V.43	Preservative Primer V.27	H.P. Exterior Gloss Paint system V.30	
16 3 To 20 0					

Section V – PAINTING AND DECORATING**TABLES OF PAINTING AND DECORATING****EXTERNAL**

Ref .	Surface	Preparation	Primer	Undercoats	Finishing Coat
201	Plastered Walls and Ceilings	V.38	-	2 U/C (thinned) V.21	1 Fin Emulsion Paint Vinyl Matt (V.21)
152.	Aluminium in contact with mortar or concrete	-	-	1 U/C	Black Bituminous V.23
153.	Ends of iron, steel and galvanised work, built in	V.39 V.40	-	2 U/C	Black Bituminous V.23
154	Copper Pipes (Exposed)	V.40	V.25	2 U/C	1 Fin Oil Paint V.29
155	Iron and Steelwork (Internal)	V.39	V.25	2 U/C	1 Fin

Section V – PAINTING AND DECORATING**Appendix A: List of References and Standards**

Item	Clause no.	Reference	Comment
1.	V15	IS 16:1958	Knotting.
2.	V17	BS 245:1976	Specification for mineral solvents (white spirit and related hydrocarbon solvents) for paints and other purposes.
3.	V21	IS 129:1964	Emulsion paints.
4.	V22	BS 3416:1991	Specification for bitumen-based coatings for cold application, suitable for use in contact with potable water.
5.	V27	BS 4756:1998	Specification for ready-mixed aluminium priming paints for wood work.
6.	V29	IS 32:1963	Hand gloss and enamel paint and appropriate undercoats.
7.	V39	IS EN ISO 8501-1:2007 IS EN ISO 8501-2:2007	Preparation of steel substrates before application of paints and related products – visual assessment of surface cleanliness. Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings. Preparation of steel substrates before application of paints and related products – visual assessment of surface cleanliness – Part 3: Preparation grades of welds, edges and other areas with surface imperfections.
7.	V46	BS 6150:2006	Painting of buildings. Code of practice.

LIST OF CLAUSES W

BUILDING CONTROL

W.0 Compliance with the Building Regulations

GENERALLY

W.1 Foul and Soil Sewers
 W.2 Installation generally
 W.3 Inspections
 W.4 Levels of Existing Drains
 W.5 Organisation of Work
 W.6 Surface Load
 W.7 Nil
 W.8 Nil

MATERIALS

W.9 uP.V.C. Pipes and Fittings
 W.10 Nil
 W.11 Nil
 W.12 Gullies
 W.13 Armstrong Junctions
 W.14 Manhole covers
 W.15 Manhole Step Irons
 W.16 Gulley Gratings
 W.17 Keys
 W.18 Galvanised Work
 W.19 Granular bedding material
 W.20 Granular and selected backfilling material W.21
 To Nil
 W.25

WORKMANSHIP

W.26 Setting out and Tolerances
 W.27 Testing W.28
 To Nil
 W.29
 W.30 Excavation
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Section W – DRAINAGE

APPENDIX A: LIST OF REFERENCES AND STANDARDS Compliance with Materials and workmanship with the Building regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as set in national rules for Ireland (S.I.No.225 of 2013), the Contractor shall provide proof (a declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR, is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

GENERALLY

W.0 Foul and Soil Sewers

This specification covers internal site drainage up to 150mm dia. Only, for details of larger drains and sewers are specified separately. Manhole covers and gully gratings shall be as this specification.

W.1 Installation generally

All drainage work shall generally be carried out in accordance with IS EN 752:2008.

All u.P.V.C. pipes and fittings shall be handled and installed in accordance with Manufacturer's instructions.

W.2 Inspections

The Contractor shall give written notice to the Architect for the purpose of inspection, testing where necessary and measurement, whenever sections of:-

- (i) Excavations are completed,
- (ii) Concrete and/or granular beds laid,
- (iii) Drains are completed,

and no further work shall be executed until each stage of the work has been inspected, tested where necessary and measured.

Contractor's attention is drawn to South Dublin County council 'Water services department; Specifications and standards for taking in charge and testing regime.

W.3 Levels of Existing Drains

The Contractor shall check the invert levels of existing drains, sewers and manholes before laying new drains and shall notify the Architect immediately if the declared invert levels shown on the drawings are found to be inaccurate.

W.4 Organisation of Work

The Contractor shall take care not to dig out or disturb pipes, mains, etc., already installed as part of the contract. He shall arrange his working in such a way that granular surround to pipes is not disturbed, and remains in place to fulfill its purpose of supporting the pipes.

Section W – DRAINAGE**W.5 Surface load**

The Contractor shall not permit the storage or stacking of equipment or materials, the passage of vehicles or the presence of any other load which may cause damage to pipes or settlement of the ground in the vicinity of sewers and drains.

No materials may be stacked higher than 0.5m within a horizontal distance from a pipeline equivalent to

1.5 times the depth to the top of the pipe without the prior written permission of the Architect following application stating the dimensions and loading of the proposed stack.

Any such permission shall not relieve the Contractor of his obligation to prevent settlement or remedy any damage caused by surface loads.

W.7

to Nil

W.8

MATERIALS**W.9 uP.V.C. Pipes and Fittings**

Unless otherwise directed all underground sewer and drainage pipes and fittings shall be manufactured from Unplasticised Polyvinyl Chloride (u.P.V.C.) complying with IS EN 1401-1:2009.

W.10

to Nil

W.11

W.12 Gullies

Waste and rainwater gullies to units shall be u.P.V.C. back inlet gullies, complying with Clause W.16, fitted with cast aluminium, hinged lockable covers.

Road and yard gullies shall be constructed in concrete blockwork (plastered on both sides) or approved precast concrete units and fitted with gratings and frames as Clause W.16.

W.13 Armstrong Junctions

Armstrong junctions (AJ'S) to be moulded uPVC and fitted with cast iron screw down or lockable cover.

The AJ shall come complete, where necessary with standard riser pieces to adjust for depth of drain. The cover frame shall also tilt and rotate to allow for alignment with buildings and ground level.

W.14 Manhole Covers

Manhole covers and frames shall be ductile iron complying with IS EN 124:1994, ('NOROC EUR En124 D400 DÉCOR' supplied Ejco.com or equivalent). Covers and frames shall have the following requirements:-

- i. The covers must meet the loading requirements of class D400 of IS EN 752:2008

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when tested with their frames.

- ii. Seatings shall be use neoprene seatings (unless stated otherwise).
- iii. Opening size shall be 600 x 600 min. and frame shall have a minimum depth of 100mm.
- iv. The cover shall be a single part and fitted tight in frame with opposed wedge seatings or other positive device and shall have 2 no. keyholes in accordance with IS 261:2013 (Large).

W.15 Manhole Step Irons

Manhole step irons shall comply with IS EN 13101:2002.

W.16 Gully Gratings

Gully gratings and frames for road and yard gullies shall be ductile iron complying with IS EN 124:1994 ('LION' 75 LKD (Locked) C250, ref.: 710118 by Ejco.com. or equivalent).

Gratings and frames shall meet the following requirements.

- i. The gratings must meet the loading requirements of Class C250 of IS EN 124:1994 when tested with their frames.
- ii. Opening size shall be 350 x 280 min and frame shall have a minimum depth of 100mm.
- iii. Hinges shall be a minimum 15mm dia. full length through grating welded or riveted at both ends.
- iv. The grating shall have a dished surface and be lockable by means of a socket head bolt or other approved device.

W.17 Keys

Three sets of each type of key for locking or lifting of covers shall be provided and handed over to the Architect at completion.

W.18 Galvanised Work

Unless otherwise described galvanized coatings for iron and steelwork shall be as Clause Q.16.

W.19 Granular bedding material

Granular material for bedding and surrounds to pipes shall comprise of broken stone or gravel to pass 10mm sieve and be retained on 5mm sieve.

W.20 Granular and selected backfilling material

Granular and selected material for backfilling shall comprise of uniform readily compatible material free from tree roots, vegetable matter, building rubbish and frozen soil, and excluding clay lumps retained on 75mm sieve and stones retained on 25mm sieve.

All granular fill for work under buildings, paths and roads shall comply with approved standard IS EN 13242:2002 (+A1:2007). (See also section D; Excavations and Earthworks, clause D.22).

W.21

to Nil

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W.25

WORKMANSHIP

W.26 Setting out and Tolerances

The Contractor shall set out the works to the correct positions, levels, dimensions, gradients and alignments and shall provide all necessary facilities and equipment for this purpose.

The invert levels shall be measured at the centre of the chambers and shall be constructed at the elevations shown on the drawings within a tolerance of + or - 20mm subject to the proviso that the fall between any two consecutive chambers shall be not less than 90% of that shown. Pipes shall be laid truly straight to the line and gradient between the chambers as set within the above level tolerances.

W.27 Testing

The Contractor is to test all drainage in the presence of the Architect or his representative. No drain is to be haunched or covered up until approved. The Contractor to provide all appliances and attendances for these tests.

All tests shall be carried out in accordance with SR 7:1981.

W.28

to Nil

W.29

W.30 Excavation

Excavate for all trenches for drains and sewers and consolidate and backfill in accordance with SR 7:1981.

Excavation for sewers and drains shall be in open cut unless otherwise instructed or unless previous permission has been given by the Architect who may lay down such conditions as he thinks fit without in anyway relieving the Contractor of his responsibilities.

Excess excavations below the required levels shall be filled up to the correct level with lean mix concrete, see Clause F.13, or as the Architect may require at the Contractor's expense.

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The bottoms of excavations, trenches and headings must be inspected and approved by the Architect before any further works are commenced. The Contractor shall support the sides of excavations by sheeting, timbering, strutting or other means and where so directed by the Architect such supports shall be left in. Details of supports left in shall be agreed with the Architect before the work is covered up, otherwise no claim in this respect will be entertained.

Only where directed or approved by the Architect may the Contractor lay adjacent foul and surface water sewers in one trench and the Contractor shall provide such extra support and protection of the sewers as the Architect may consider necessary.

W.31 Laying Pipelines - generally

Each pipe before being laid shall be carefully brushed out and inspected for soundness and straightness.

Pipelines shall be constructed in a single operation between manholes and chambers, unless otherwise authorised by the Architect. Except as herein specified temporary or permanent supports to pipelines such as bricks, timber blocks, concrete blocks, etc., shall not be permitted.

W.32 Concrete beds

Drains shall be laid on concrete beds Class F-20. The minimum depth of bed shall be equal to the diameter of the pipe and the minimum width of the bed shall be equal to three times the diameter of the pipe. Form flexible joints in the bed using 25 expanded polystyrene sheets or fibre board extending the full width of the bed, the joints should be placed at every joint in the pipe in accordance with SR 7:1981. Laid PVCu pipes shall be wrapped in polyethene sheeting to protect the pipe from the concrete bed.

After placing and leveling the pipes and fittings shall be fully grouted underneath and haunched for the whole length in Class F-20 concrete excepting at the joints so as to maintain the flexible joint.

W.33 Concrete surrounds

Where drains pass under buildings or walls or where drains not under concrete paving have less than 450mm cover they are to be surrounded in 150mm minimum Class F-20 concrete. Flexible joints shall be formed in the surround in a similar manner to Clause W.32 in accordance with SR 7:1981 and wrapped in polythene sheet or other approved material. Backfilling over the concrete surrounds shall proceed only after a period of 36 hours has elapsed from final placing of concrete.

No surrounds are to be formed until the drains affected are tested.

W.34 Relieving Lintols

Where drains pass through walls relieving lintols shall be placed over the drain to the satisfaction of the Architect.

W.35 Filling excavations

Backfilling material for trenches shall be granular backfill where the finished surface above the trench will be a road or other vehicular area, or any structure such as a bin store. In other positions, selected backfill material shall be used.

Backfilling shall be completed in a single operation between adjacent manholes and/or inspection chambers. The pipe surrounds shall first be carefully covered and compacted by hand to a level 300mm above the crown of the pipe. Backfill for the remaining depth of

Section W – DRAINAGE

the trench shall be placed in layers not exceeding 150mm deep and fully compacted by mechanical plant. Supports to trenches shall not be removed until sufficient filling has been placed and compacted to allow the gradual withdrawal of supports without endangering the pipes and supports or the stability of the sides of the excavation.

W.36 Manholes and Inspection Chambers - General Requirements

Manholes and inspection chambers shall be watertight. Pipes passing through the chambers shall terminate flush with the interior wall except in the case of circular chambers where a cement and sand (1:3) fillet shall be formed over the projecting crown.

The laying of sewers and drains shall be so organised that a flexible joint is located 150mm from the exterior wall followed by another flexible joint between 0.5m and 1m from the first joint.

Irrespective of their sizes, incoming and outgoing pipes on the main through runs shall be laid with their soffits at the same level unless specifically detailed on the drawing. The invert levels of lateral connections shall be coincident with the centre line level of the outgoing pipe, unless otherwise detailed.

Channels shall be formed with the appropriate half round channel sections. The channels shall be extended vertically on both sides in concrete Class F-30 with 25mm thick cement mortar rendering and turned into the benchings at soffit level with a 25mm arris. Benchings shall be formed in concrete finished as for concrete channels, the top surface of the benchings being laid to a fall of 1 in 6 towards the channels.

Two rows of step irons shall be provided at 300mm staggered vertical pitch and 300mm centres horizontally. They shall be so fixed as to provide a direct landing onto the widest part of the benching and shall lead vertically up to the side of the cover with the first step iron located at a distance not greater than 600mm below the top of the cover opening.

All manholes to be rendered internally with 3:1 sand and cement 20mm thick in 2 coats.

Backdrop chambers shall be constructed in accordance with the detailed drawings, either with vertical or 45° ramped drops depending upon the size of pipe and difference in level. Backdrop pipework shall be encased with concrete to give a minimum cover of 150mm to the pipework and shall be monolithic with the surround to the chamber.

Chambers and manholes shall be completed in a continuous operation and cover frames shall be fixed if necessary as a temporary measure direct onto the cover slab. It will not be permitted for chambers and manholes to stand partially completed and open. The Contractor shall take such steps as are necessary to prevent the ingress of soil or rubbish into the chambers or pipes.

W.37 Blockwork, Manholes and Inspection Chambers

Bases shall be formed from 150mm concrete Class F-30 with 200mm projecting offset all round.

Walls shall be 215mm solid blockwork constructed directly of the base and laid in 1:3 cement mortar with flush joints. Blockwork shall be plastered on both sides.

Step irons shall be built in as blockwork proceeds.

The cover slabs shall be formed of reinforced concrete Class F-30.

Unless otherwise shown sizes of manholes for foul and surface water drains for pipe sizes up to 150mm shall be:-

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For man holes and inspection chambers with maximum depth to invert level of 900mm.	785 x 785 (Internal)
For manholes greater than 900mm and less than 2700mm deep.	1200 x 785 (Internal)
Manholes greater than 2700mm deep shown on drawings.	Are specified separately and be as shown on drawings.

W.38 Nil

W.39 Work to Existing Manholes

Carefully cut away benching in existing manhole. Form holes in walls for and build in ends of new connections. Set in new channels and complete as Clause W.36.

W.40 Bedding and Fixing Manhole and Inspection Chamber Covers and Frames

One or two courses of concrete blockwork in cement mortar (1:3) shall be constructed below the frames, which shall be set to the profile of the ground surface. The frames shall be laid in cement mortar (1:3) beds carried over the edge of the frames and splayed back to the frame upstands. Surfaces between the frames and covers shall be greased.

W.41 Gullies and Gratings

Gully pots shall be laid on a 150mm concrete bed with a concrete surround 150mm thick.

Road gully gratings and frames shall be laid in cement mortar (1:3). Where surfacing is to be delayed, the gratings shall be set to finished levels and a ramp of fine textured bitumen macadam shall be placed and maintained around the gratings until the surfacing is carried out.

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W.42 Bedding of Armstrong Junctions

Armstrong junctions to be laid on 600 x 600 x 150 mm thick concrete Class F-20 bed and cradled up around same.

Ensure that covers are parallel to adjoining buildings.

W.43 Nil

W.44 Abandoned Chambers, Sewers and Drains - Fill and Disposal

Abandoned drains, sewers, inspection chambers and manholes less than 2m deep to invert shall be dug out and removed from the site.

Sewers and drains which due to their depth or size or for another reason are directed to be filled, shall be filled with lean mix concrete to the satisfaction of the Architect. Before filling commences pipelines shall be cleared by high pressure water jets and all branch connections between manholes and chambers located and plugged with concrete to a depth of 300mm. If the system is not connected to a live sewer system the Contractor shall make provision for removing any material contained within the pipeline.

The Contractor shall be responsible for the method of filling and shall pay due regard to grout entering the sub-soil and the effect of such grout on adjacent structures and underground services.

The pipelines shall be completely filled to the soffits. Manholes and chambers shall be filled to within 600mm of the existing ground surface. The remaining walls, covers and frames, cover slabs, etc., shall be removed from the site or recovered as directed.

W.45

to Nil

W.49

W.50 Clean and Flush all Sewers, Drainsetc.

Immediately prior to the issue of the certificate of practical completion, the Contractor shall clean out all debris from gullies, pipelines, manholes and chambers and flush by high pressure jetting.

W.51 FFC water department; water service specification

The contractor's attention is drawn to FCC water department; water service specification.

Section W – DRAINAGE**Appendix A: List of References and Standards.**

Item No.	Clause	Reference	Comment
1.	W.2	IS EN 752:2008	Drain and Sewer systems outside buildings. (to replace the following IS EN 752-1:1996, IS EN 752-2:1997, IS EN 752-3:1997, IS EN 752-4:1998)
2.	W.9	IS EN 1401-1:2009	Plastics piping systems for non-pressure underground drainage and sewerage – Unplasticised Poly (vinyl chloride) (PVC-U) – Part 1: Specifications for pipes, fittings and the system. (to replace IS EN 1401:1998)
3.	W.14	IS EN 124:1994	Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control.
4.	W.14	IS 261:2013	Water services road furniture – Requirements for cast iron covers and frames. (to replace IS 261:1994)
5.	W.15	IS EN 13101:2002	Steps for underground man entry chambers – Requirements, marking, testing and evaluation of conformity.
6.	W.20	IS EN 13242:2002 (+A1:2007)	Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction.
7.	W.27	SR 7:1981	Recommendations for the handling and installation of uPVC buried drains and sewers.

LIST OF CLAUSES X

BUILDING CONTROL

- X.0 Compliance with the Building Regulations

CHAIN LINK FENCING

- X.1 Chain Link
X.2 Concrete Posts
X.3 Line Wire Fixings X.4
To Nil
X.5
X.6 Fence Route
X.7 Fixing Posts

CONCRETE POST AND PANEL FENCING

- X.8 Standards
X.9 Concrete Posts
X.10 Concrete Panels
X.11 Timber Panels X.12
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X.17 Installation of Posts
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X.19 Finish to Timber Panels

STEEL PALISADE FENCING

- X.20 Standards
X.21 Pales
X.22 Posts
X.23 Rails
X.24 Fixing of Pales
X.25 Protective Treatment
X.26 Gates X.27
To Nil
X.29
X.30 Erection
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DECORATIVE MILD STEEL RAILING

- X.32 Materials
X.33 Workmanship
X.34 Shop Drawings
X.35 Changes in Level and Direction
X.36 Galvanising
X.37 Painting

APPENDIX A: LIST OF REFERENCES AND STANDARDS

X.0 Compliance with Materials and Workmanship with the Building Regulations

In order to demonstrate conformity with the Building Regulations (Part D; Materials and Workmanship), and with the Construction Products Regulation (Regulation (EU) No.305/2011) as setout in national rules for Ireland (S.I. No.225 of 2013), the Contractor shall provide proof (a declaration of Performance (DoP)) and (where applicable) a CE marking for all building products to be placed in the works.

The Contractor shall ensure that the product to be incorporated in the works, while complying with CPR is fit for the use for which it is intended. The Contractor may be required to demonstrate this by means of manufacturer's confirmation, or independent testing certificate.

CHAIN LINK FENCING**X.1 Chain Link**

Chain link mesh shall be 50mm x 3.0mm gauge galvanized mesh complying with IS 130:1980 and shall be in one width of roll to suit height of fence.

X.2 Concrete Posts

Intermediate posts, straining posts and struts shall be concrete complying with IS EN 12839:2012 and having the following minimum dimensions:-

FENCE HT	POST TYPE	LENGTH mm	SECTION at BASE mm	SECTION at TOP mm
1350	Intermediate	1990	125 x 115	95 x 60
	Strut	2140	100 x 100	--
	Straining	2270	130 x 125	100 x 100
1800	Intermediate	2400	140 x 135	80 x 70
	Strut	2600	100 x 100	--
	Straining	2780	160 x 140	110 x 100

X.3 Line Wire and Fixings

Line wire shall be 3.5mm gauge galvanised wire.

All other fittings and accessories shall be hot dip galvanised in accordance with Clause Q.16 after fabrication.

X.4
to
X.5

Nil

X.6 Fence route

Clear vegetation (only where necessary and as agreed with the Architect on site) and other obstructions along the route of fences. Remove any humps and fill any hollows with compacted soil.

X.7 Fixing Posts

Posts shall be set a minimum 600mm below ground level in holes 500 x 500 mm square; ensure holes have vertical sides.

The holes to be filled to within 150mm of ground level with concrete grade F20 well rammed in. The post shall be well supported in a vertical position until the concrete has set.

Posts shall be placed at maximum 3000mm centres, truly vertical with the tops following the contour of the ground.

Struts and straining posts shall be used every 70 metres and at ends, changes in direction and acute changes in level.

X/CL/8 Fixing chain link mesh

Strain 3 rows of line wire at max 600mm centres (vertically) between straining posts for 1350mm high fences and 4 rows of line wire for 1800mm high fences.

Fix chain link mesh to line wires with fully pinched galvanized hog rings.

CONCRETE POST AND PANEL FENCING

X.8 Standards

The materials, design, construction and erection of Concrete post and panel fencing and gates shall, unless otherwise specified or shown on the drawings, comply with the requirements of BS 1722- 11:2006 and IS EN 12839:2012.

X.9 Concrete Posts

Intermediate posts shall be reinforced concrete complying with IS EN 12839:2012 and having a minimum cross section of 130 x 105mm twice rebated, rebates to be minimum 25mm deep. Height of posts shall suit height of fence, but shall generally be 2400mm long for 1800mm high fences.

X.10 Concrete Panels

Concrete Panels shall be reinforced concrete complying with IS EN 12839:2012 and having a minimum cross section of 300 x 50mm. Length of panels to be maximum 1800mm.

X.11 Timber Panels

Timber infill panels shall be composed of square edged horizontal slats as specified in BS 1722- 11:2006. Preservation shall be as Section N - Woodwork. Length of panels to be maximum 1800mm and for 1800mm high fences be a minimum 1500mm high.

X.12
To **Nil**

X.16

X.17 Installation of Posts

Posts to be set in ground to a minimum depth of 600mm. The panel height to be measured at its highest distance above ground level.

Holes for posts shall be at least 400 x 400 mm square; ensure holes have vertical sides.

The holes to be filled to within 150mm of ground level with concrete grade F20 well rammed in. The post shall be well supported in a vertical position until the concrete has set.

The spacing of the posts to suit the length of the panels. Care shall be taken to ensure that each panel is fully recessed into the posts rebates at each end.

X.18 Installation of Panels

Panels shall be installed so that the top of the fence is level.

The bottom of timber panels to be kept clear of the ground contact by use of concrete panel (gravel board) as Clause X/CP/3 at the base.

X.19 Finish to Timber Panels

Timber panels to receive 2 Coats of ('Ronseal Fencilife' or equivalent) preservative decorative coating of colour to Architect's selection.

STEEL PALISADE FENCING**X.20 Standards**

The materials, design, construction and erection of steel palisade fencing and gates shall unless otherwise specified comply with the requirements of BS 1722-12:2006.

X.21 Pales

Pales shall be corrugated and the tops shall be "rounded and notched" and have a minimum thickness of 3mm and mass of 1.9 kg/m.

Heights shall be generally 1.8 metres where at ground level or 1.35 metres high where on top of dwarf walls unless otherwise shown on the drawings.

X.22 Posts

Posts shall be placed at not more than 2700mm centres and shall be as follows:-

- i. 1.8 metre high fencing in open ground - 102 x 44 x 7.44 kg/m R.S.J.'s
- ii. Other 1.8 metre high fences - 90 x 50 x 5mm R.H.S.
- iii. 1.35 metre high - 80 x 40 x 5mm R.H.S. fencing on dwarf with 150 x 150 x 6mm M.S walls plates, welded to bottom. The posts shall extend down to top of wall foundations and secured with 6mm dia. expanding bolts.

All hollow sections to have blank cap welded to top.

X.23 Rails

Horizontal rails shall be 50 x 50 x 6mm M.S. angles bolted to connector plates of minimum 8mm thick with 12mm bolts.

The connector plate shall be welded along all edges to the uprights.

X.24 Fixing of Pales

The pales shall be welded to the rails by neatly welding along the entire edge of the pale which is in contact with the rail.

X.25 Protective Treatment

All steel components shall be hot dipped galvanised in accordance with Clause Q.16 carried out after fabrication of the fence and after all welding has been completed.

X.26 Gates

Gates shall be provided with all required locking devices, drop bolts and sleeves. Locks shall be of an approved pattern and where required key alike to existing South Dublin County Council locks.

X.27

to Nil

X.29

X.30 Erection

Posts in open ground shall be set in grade HS3 concrete foundations formed in holes 300 x 300 x 900 mm deep. The hole shall unless otherwise specified shall be filled to ground level and there shall be at least 100mm of concrete below the bottom of the post.

Posts fixed to walls shall be secured with 3 No. 12mm dia. Stainless Steel expanding bolts per post or other approved fixing. Fixings shall be at 600mm centres and within 300mm of ends of posts.

Intermediate posts to panels between walls shall be fixed as (i) above.

Posts in dwarf walls shall be located on top of foundations then surrounded in 450 x 450 mm concrete grade HS3 base cast to finish 150mm below ground level. The blockwork wall shall then be built between posts to leave 215 x 215 pockets and on completion the pockets shall be filled with grade HS3 concrete. Expanded metal ties shall be placed in each horizontal joint of wall to tie wall to concrete pockets.

X.31 Painting

All palisade fencing shall be painted in accordance with Clause V.71, ref.: 204 and 207.

DECORATIVE MILD STEEL RAILINGS

X.32 Materials

Mild Steel railings consisting of decorative panels between support posts shall be to the height indicated on the drawing shall unless otherwise indicated be constructed as follows:

Decorative panels, shall consist of Verticals of 16mm round bar mild steel spaced at 115mm maximum centres and welded to 50mm x 12mm mild steel flat top and bottom rails.

Top of the panels to be finished as shown on the drawings ie. bowed, plain or pointed.

Support posts to be 50mm x 50mm x 3mm square mild steel hollow section capped at top and complete with decorative feature where indicated on the drawings. Posts to be, unless otherwise specified, be spaced at 1125mm centres and where indicated have 150mm x 150mm x 3mm base plates welded on.

The length of the posts to suit building in detail shown on the drawings.

The decorative panels, unless otherwise specified, shall be fixed to 12mm mild steel lugs, welded to the support posts, with M8 x 25mm long hexagon socket countersunk screws burred over on the underside.

X.33 Workmanship

Workmanship and materials shall generally be in accordance with Section Q 'Metalwork'

X.34 Shop Drawings

Where requested shop drawings to be provided by the manufacturer for all locations before fabrication.

X.35 Changes in Level and Direction

All dimensions of support posts and panels to take into account all steps, changes in level and direction.

X.36 Galvanizing

All mild steel components shall be hot dipped galvanized in accordance with Clause Q.16.

X.37 Painting

All finished railings to be painted in accordance with Clause V.32.

APPENDIX A: List of References and standards

item No.	Clause	Reference	Comment
1.	X.1	IS 130:1980	Chain link Fencing
2.	X.2	IS EN 12839:2012	Precast concrete products – Elements for fences (to replace IS EN 12839:2001)
3.	X.8	BS 1722-11:2006	Fences – Specification for prefabricated wood panel fences.
4.	X.20	BS 1722-12:2006	Fences – Specification for steel fences.

All documents are in separate files

Appendix 1 – G.F.C. H. installations

Appendix 2 – Electrical installations

Appendix 3 – Kitchen Installations

Appendix 4 – Energy Upgrade (Attic & wall insulation & ventilation)

Appendix 5 – Landscaping

Appendix 6 – Drawings: typical dwelling layouts