# A R C H I T E C T U R A L
# S P E C I F I C A T I O N

OF WORK TO BE CARRIED OUT AND MATERIALS TO BE USED IN

MULTI PARTY FRAMEWORK AGREEMENT FOR REPAIR AND MAINTENANCE WORKS TO OCCUPIED UNITS AND PROPERTIES OWNED OR MANAGED BY DUBLIN CITY COUNCIL HOUSING DEPARTMENT

FOR

DUBLIN CITY COUNCIL

November 2026

CITY ARCHITECT
DUBLIN CITY COUNCIL
CITY ARCHITECT'S DIVISION
FLOOR 2, BLOCK 4,
CIVIC OFFICES,
WOOD QUAY,
DUBLIN 8

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DEFINITIONS

Where reference is made to a particular standard, make,source,process,trademark,type or patent that is not to be regarded as the de-facto requirement and in all such cases it should be understood that such indications must be treated strictly and solely for reference purposes only , to which the words "or equal and approved" will always be appended.

Words importing the singular only also include the plural and vice versa where the context requires.

The term "Replace" shall mean the removal of the existing item and the replacement with a new item.

The term "fixing by" used in conjunction with any method of fixing shall not be deemed to include any fixing materials but shall be interpreted as a definition of fixing method only.

The term "approved" "directed" and "selected" shall mean the approval direction and selection in writing of the Architect.

The term " flat " has been used in this document to describe work to both flat or apartment.

Abbreviations

EN ..... Relates to European Standards

NSAI ..... National Standards Authority of Ireland

CPR ..... Construction Product Regulation (EU) No. 305/2011

Where reference is made in the Contract documents to an Irish or EN Standard Specification or code of Practice, the issue shall be that of the latest addition, Imperial or Metric, as appropriate at the "Designated date"

TENDER ITEMS AND NOTES

A No alterations shall be made by the Contractor in the text of the Contract documents. If any alteration or addition be made by him such alteration or addition shall not be recognised and the text of the Contract documents (as prepared by the Quantity Surveyor) will be rigidly adhered to.

B All items in the Pricing Document Volume C must be priced . The rates, extensions and totals to be in Euro's to two decimals. The tenderer's costs and charges must be spread over the items in the Pricing Document in a balanced manner so that the rate or price for each item fairly represents the costs and charges for the work described therein. Should any item herein be left unpriced, it shall be held to be included in the prices given for other items of the work. Bracketing or grouping together of items for pricing will not be accepted.

C The rates inserted in Volume C will be checked to insure that they are priced in a fair and balanced manner and to ensure that there is no strategic pricing of the more commonly used items. If any tendered amounts are deemed to be abnormally low or abnormally high the Contractor will be required to provide a breakdown of their constituent elements. Any failure to provide such information ,when requested , may exclude the tender from further consideration. Should it be necessary to rebalance any rates it will be done so by D.C.C. Quantity Surveying Division with the Contractors agreement and in keeping with the original tender amount.

D If having considered the information provided ( both in the tender and in any response for detailed breakdown of rates ) , the Employer is of the view that the Contractor's tendered rates or prices in the Pricing Document do not reflect a fair allocation of the Notional Tender Total , the Employer may reject the tender.

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| A | The cost of complying with all the conditions obligations and liabilities described in the Specification, Form of Tender and in the GCCC Term Maintenance Contract will be deemed to be spread over and included in the prices given in the Pricing Document except where expressly the subject of a specific item. | | | | |
| B | Where the Preliminaries section is not priced the Contractors rates will be deemed to include for all preliminary items associated with the works including but not limited to - attendances, insurances, waste management, scaffolding, hoisting, temporary access, protection of existing properties ; complying with health and safety requirements and building regulations; any necessary liaison with Utility companies, Specialist Sub-Contractors, state and other agencies or the Employers Representative ; obtaining of any necessary Certificates or Guarantees ; disposal of normal construction waste to authorised waste facilities and for protecting all work elements during the execution of the works. No claims relating to any of these items or any other prelimary item will be entertained. | | | | |
| C | Where prelims are priced - total cost of prelims will be expressed as a percentage of the total amount of the other elements in the schedule of rates and this percentage will be applied to the value of any work under the term maintenance contract | | | | |
| D | Persons or firms tendering are requested to refer to the Conditions of Contract Form of Tender and Specification which must be read in conjunction with this Bill of Approximate Quantities. All of the aforementioned documents form the Contract. | | | | |
| E | Consultation and liasing with the relevant representatives of Dublin City Council is an important facet of this work. Include for collection and delivery of keys; collecting all certificates etc. | | | | |

PRELIMINARY PARTICULARS

Project

Local Area Term Maintenance and Refurbishment Works

Parties and Consultants

Employer:

Housing

Housing Maintenance

Block 2, Floor 3

Civic Offices

Dublin 8

Architects:

City Architect

City Architect's Division

Block 4 West , Floor 2

Civic Offices

Dublin 8.

Quantity Surveyors:

Chief Quantity Surveyor

Quantity Surveyor's Division

Block 4 West , Floor 1

Civic Offices,

Dublin 8.

## DESCRIPTION OF THE WORKS

Dublin City Council administers the maintenance and refurbishment of the existing residential stock in it's eleven Local Electoral Housing Area's ( Lot's 1 - 11 ) : Lot 1. Ballymun-Finglas , Lot 2. Artane - Whitehall, Lot 3.Donaghmede , Lot 4 Clontarf , Lot 5 Cabra-Glasnevin , Lot 6.North Inner City , Lot 7 South West Inner City, Lot 8 South East Inner City , Lot 9 Ballyfermot-Drimnagh , Lot 10 Kimmage-Rathmines , Lot 11 Pembroke . It is intended to establish 12 framework agreements, one for each of the eleven Housing Area's plus one extra 12.City Wide Area - Site Works , to carry out maintenance and refurbishment works under the terms of the Public Works Term Maintenance and Refurbishment Works Contract and under the direction of the Housing Maintenance Section.

Work done in the City Wide Area - Site Worksa ( Lot 12 ) will generally be work which is not covered by rates in this Volume C , e.g. external works to flat complexes; chewing gum removal from streets; electric gates and fob access to blocks of flats. All Contractors who qualify to be included in Lot 1-11 will be automatically included in Lot 12. City Wide Area - Site Works. All works carried out in Lot 12 will be awarded by way of a mini competition as set out in the Framework Agreement.

## Electoral Area Map

Refer to the Electoral Area Digital Map included in the tender documents showing the eleven Local Electoral Housing Area's mentioned.

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| TERM AND MAXIMUM SUM FOR EACH AREA<br><br>Lot 1 : Ballymun-Finglas : 24 months and 4 Million Euro<br><br>Lot 2 : Artane-Whitehall : 24 months and 4 Million Euro<br><br>Lot 3 : Donaghmede : 24 months and 4 Million Euro<br><br>Lot 4 : Clontarf : 24 months and 4 Million Euro<br><br>Lot 5: Cabra-Glasnevin : 24 months and 4 Million Euro<br><br>Lot 6 : North Inner City : 24 months and 4 Million Euro<br><br>Lot 7 : South West Inner City : 24 months and 4 Million Euro<br><br>Lot 8 : South East Inner City : 24 months and 4 Million Euro<br><br>Lot 9 : Ballyfermot-Drimnagh : 24 months and 4 Million Euro<br><br>Lot 10 : Kimmage-Rathmines : 24 months and 4 Million Euro<br><br>Lot 11 : Pembroke : 24 months and 4 Million Euro<br><br>Lot 12 : City Wide Area - Site Works : 24 months and 4 Million Euro | | | | |

SCOPE OF THE WORKS

This Contract is for the Minor Repair and Maintenance of Dublin City Councils existing residential stock of Flats and Houses ( All Occupied ) in it's eleven Local Electoral Housing Area's ( Lot's 1 - 11 ) : Lot 1. Ballymun-Finglas , Lot 2. Artane - Whitehall, Lot 3.Donaghmede , Lot 4 Clontarf , Lot 5 Cabra-Glasnevin , Lot 6.North Inner City , Lot 7 South West Inner City, Lot 8 South East Inner City , Lot 9 Ballyfermot-Drimnagh , Lot 10 Kimmage-Rathmines , Lot 11 Pembroke .Where possible in this framework the work carried out to the flats and houses will be the very MINIMUM required , e.g. deep cleaning of bathrooms and kitchens, carpentry repairs , servicing boilers and upgrading electrical systems. However all work will comply with the building regulations , health and safety regulations and with the specifications ; this may require in some cases to replace windows , doors , heating and electrical systems.

Some repairs are minor ( such as a leak ) and will be dealt with by way of a Repair Request , priced by contractor using rates from Volume C and adding a Call-Out charge. It is possible that this Repair Request for a leak could turn into a Task Order if the contractor finds extensive damage , the contractor will inform the Foreman/AMO and he will issue a task order for the work involved.

DCC receive approximately 70,000 Repair Requests annually , half of these repair requests will be taken care of by Direct Labour , the majority of the remainder will be by Repair Requests and a small amount by Task Order. When refurbishment and/or maintenance work is required then 'Task Orders /Repair Requests' will be issued to the contractor ranked number one in the area. 'Task Orders /Repair Requests' will be valued on the basis of the Pricing Document submitted by contractor, ranking number one under the terms of the contract.

Tasks will be allocated to framework members in accordance with the Framework Rules as set out in the 'Framework Agreement for use with Term Maintenance and Refurbishment Works Contract' document , subject to contactors demonstrating their capacity as outlined in the Service Level Agreement Document which is included in the Tender Documentation. 'Task Orders /Repair Requests' will be issued to the contractor ranked number one until such time as it is deemed by the Housing Maintenance Section that this contractor has reached his capacity. When this occurs then Task Order/Orders may be issued to contractor number 2 and so on in succession. Initially, all contractors will be treated as having a capacity of 10 tasks. Subject to the Contractor demonstrating sufficient operational capacity, satisfactory performance, and compliance with the timeframes specified by the Area Maintenance Officer, the Contracting Authority may, at its sole discretion, increase that allocation up to a maximum of forty (40) units at any one time. Where the Housing Maintenance Section determines that a Contractor has reached its operational capacity, is unable to accept further allocations, or has reached the maximum allocation permitted by the Contracting Authority, Task Orders may be issued to the next-ranked Contractor and thereafter to subsequent ranked Contractors in succession as required.

It is not possible to estimate accurately the number or value of 'Task Orders / Repair Requests' that may be required during the Contract Term or the number of 'Task Orders / Repair Requests' that each Contractor will get in each Area. The Maximum Sum stated in the Schedule is the maximum sum to be expended for the purposes of the contract, however no guarantee is given in relation to the extent of the expenditure. The amount to be expended is budget related and may not reach the level of the Maximum Sum.

The quantities and figures in the Pricing Document are notional quantities and are included for Tender assessment purposes only. They do not describe the extent of the works to be executed under the contract.

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| | ORDER OF THE WORKS<br><br>The tender competition will establish the framework of contractors for all Area's. The framework will consist of a maximum of 25 contractors for all Area's. The Lowest Tenderer when the bids are assessed ( price and quality) will be ranked number one (the highest rank) for all Area's. Tenderers whose marks for the area's under consideration is not ranked lower than position 25 of the ranking order when the bids are assessed will form the framework of contractors for those area's. In the 12th Area , the City Wide Area - Site Works , a mini competition will be held to allocate work in that area ( as set out in the Framework Agreement). | | | | |
| A | Any works commenced or opened up by the Contractor must be completed by continuous work and closed up by him. If the contractor is unable to complete/close up work for any reason, he must ensure that all of the necessary temporary protection is in place and that all of the services (water, gas, electricity etc), temporary or otherwise, must be in good working order prior to his departure. Any failure to comply with this requirement will entitle the Housing Maintenance Section to employ another Contractor to complete the works at jobbing rates and deduct the cost from any sums due to the Contractor. | | | | |

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| | ASBESTOS | | | | |
| A | While carrying out refurbishment work for Dublin City Council under this Contract there is potential for exposure to ACM's ( Asbestos Containing Material ). Contractors will arrange to survey each property to identify ACM's ( which may be present in insulation, floor finishes ,ceiling finishes , roofing materials etc.) so that they can be safely removed in preperation for refurbishment work to that property. Contractors will have the oppurtunity to price for this survey in the General Section of this Volume C . Where Asbestos Containing Material is required to be removed from the property prior to any refurbishment work, it's removal must be carried out by Specialist Asbestos Contractors. Following removal of the ACM's a site clearance for 'Re-occupation Certificate' must be obtained from a competent independent analyst prior to re-occupancy of the area in accordance with Regulation 15 (10) of the Safety Health and Welfare at Work ( Exposure to Asbestos ) Regulations 2006-2010. | | | | |
| B | The Specialist Asbestos Contractor must provide documentation showing the location, type and cost of Asbestos removed , and this documentation must be presented to DCC Quantity Surveyors prior to any payment being made for any Task Order under this contract. Payment will then be made when the Completion Certificate is issued for the property and the final account is agreed with DCC's Quantity Surveyor's. | | | | |
| | DISPOSAL OF RUBBISH , WHITE GOODS AND FURNITURE | | | | |
| C | All the rates in this Volume C ( where removal is required) are deemed to include for removal and disposal off site. Rates for Furniture and White Goods removal and disposal are included in the General Section. Skips are only required to remove rubbish from Houses ( priced with 8 hours labour per skip ), however Flats and some Houses will require the use of a licenced truck to remove rubbish ( priced at one skip load by volume with 8 hours labour ). The Area Maintenance Officer will determine the number of skips required to remove rubbish from any property. | | | | |

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| | INSURANCES | | | | |
| A | Provide for all insurances as outlinedin Clause 11 of the Conditions of Contract | | | | |
| B | Providing for paying all Employer's contribution under the Social Welfare and Intermittent Unemployment Insurances Acts and for complying with the Social Welfare (Commencement of Employment) Regulations 1988 and 1989. | | | | |
| | SAFETY, HEALTH AND WELFARE AT WORK - DUTIES OF PSCS | | | | |
| C | The Contractor must include for complying in full with Regulation 12(1)(a) of the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). and must provide a Safety and Health Plan and must include for the appointment of a competent person (nominated by the Contractor and to whom the Employer does not object), to act as and carry out the duties of Project Supervisor for the duration of the construction stage as set out in the Safety and Health Act 2005 Section 17 and the Safety, Health and Welfare at Work (Construction) Regulations 2013. He must also provide for the Project Supervisor for the Construction Stage (A) giving notice to the National Authority for Occupational Safety and Health prior to commencement of work on site in accordance with the First Schedule of the Safety, Health and Welfare at Work(Construction) Regulations, 2013 and (B) preparing a Safety File , making any necessary adjustment and on completion of the Contract delivering the Safety File to the Employer. | | | | |
| D | Provide for carrying out the provisions of the Conditions of Employment and Holidays (Employees) Acts, the FAS Levy-Grant Schene, the Safety and Health Act, 2005 and the Safety Health and Welfare at Work (Construction) Regulations, 2006 including the provision of a Safety Statement and all other legislation and Trade Union Conditions of employment whereby the cost of labour is affected. | | | | |

PAYMENTS

A Payments will be made in accordance with Clause 6 of the Conditions of Contract .

B The Area Maintenance Officer (A.M.O.) will survey a property and generate a 'Task Order (Repair Request)' for the work to be done to that property. On receipt of the 'Task Order (Repair Request)' the Contractor will submit a priced 'Task Order (Repair Request)' at least a month before the Completion Date , based on the rates in the pricing document ( Volume C ) , to DCC's Quantity Surveyor. Due to the volume of payments to Contractors in any month payment can only be guaranteed where all the documentation is received by the 'noting day' includind any invoices relating to ESB, Bord Gais and Asbestos . If documentation arrives late the payment will fall into the next months schedule. Payments are on a monthly basis and are made when the priced 'Task Order (Repair Request)' and extras are agreed and upon receipt of the 'Completion Certificate' from the A.M.O. , payment will then be recommended.

C In the case where the 'Preliminaries and Insurances' are priced in Volume C , the Preliminaries and Insurances will be payable as a percentage of the works executed i.e. the amount included in the Pricing Document for Preliminaries and Insurances will be converted into a percentage of the Tender sum(excluding cost of Preliminaries and Insurances). This percentage will be added to each Task Order to cover Preliminaries and Insurances for the Works.

D Before a Completion Certificate is issued the Contractor will have to furnish to the A.M.O. all necessary Certificates such as RECI ,RGI, Fire , Asbestos etc.

E Asbestos Invoices must show the location , type and cost of removal of the asbestos from any property requiring Asbestos removal.

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| | WORKING HOURS / CALL OUT CHARGES | | | | |
| A | It is intended that work will generally be carried out during normal working hours, Monday to Friday. Normal working hours will be defined as 0800 to 1700 hours Monday to Friday. A Task Order / 'Repair Request' may be e.g. to repair a broken front door lock , the supply and fix rate in Volume C may not cover the costs involved for this one off repair item. Contractors will have the oppurtunity in the General Section to price for a Call Out charge which can be added to the final account submitted by the Contractor to the AMO on completion of every 'Repair Request' . | | | | |
| B | From time to time Contractors will be asked to operate outside normal working hours ( Monday to Sunday - items of work outside normal working hours will most likely be emergency works). A Task Order / 'Repair Request' may be e.g. to repair a broken front door lock , the supply and fix rate in Volume C may not cover the costs involved for this one off repair item done outside normal working hours. Contractors will have the oppurtunity in the General Section to price for a Call Out charge which can be added to the final account submitted by the Contractor to the AMO on completion of every 'Repair Request' . | | | | |
| | FOREMAN | | | | |
| C | The Contractor must keep upon the works a competent general foreman or site agent and any instructions given to him shall be deemed to be given to the Contractor. | | | | |
| | WAGES AND PRICE VARIATIONS | | | | |
| D | No adjustment of the rates for measured work submitted in the accepted tender will be made due to the effects of variations in the rates of wages, expenses, labour on-costs or changes in the market prices of goods and materials. The tender rates will apply for the duration of the contract | | | | |

NOTES FOR TENDERING CONTRACTORS

The Pricing Document has not been prepared in accordance with ARM, but by way of measured Notional Quantities and "Spot Items" inclusive of everything necessary to restore the article or area to a standard acceptable to the Architect.

The Pricing Documents consist of the following sections;

(a) Preliminary Items

(b) Maintenance Works in Various Sections

(c) General Section

(d) General Summary

The successful Contractor will be paid at the rates contained in the Pricing Document for work done as per the Task Orders as instructed and verified by the Area Maintenance Officer.

A Rates for Maintenance and Refurbishment Works must include for everything necessary to bring the existing damaged construction to the level described in the Specification and to the normal standard of construction expected by Dublin City Council and in full compliance with the Building Regulations.

B Rates for the provision of new Doors, Windows, Central Heating Systems, Electrical Systems, Bathrooms, Kitchens etc. must include for the removal and disposal of the existing items or systems.

C Items described as " Replace" - the rate must ALSO include for taking down and removing off site the existing works and making good up to repaired or replaced item.

D Preparatory work must include cutting back, opening up and removal from site of damaged materials.

E Repairing windows must include for easing and adjusting casements but removal of broken glass and cleaning rebates must be included with reglazing.

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| A | Any costs incurred for carrying out investigative work shall be deemed to be included in the costs of the repairs. | | | | |
| B | All tipping fees and disposal charges willbe deemed to be included in the rates in this document . | | | | |
| C | A particular requirement of security is necessary at all times for plant, tools and vehicles while the Contractor iscarrying out the works. | | | | |
| D | Subject to Health and Safety Requirements it is recommended that employees or representatives of the Contractor do not work alone on the sites. The rates in the Pricing Document must include for this factor. | | | | |
| E | All overhead costs are deemed to be included in the rates eg Insurances,Plant and Machunery ,Scaffolding , administration, travel, subsistance, welfare etc. | | | | |

CONTRACT

FORM TYPE AND CONDITIONS OF CONTRACT

The Conditions of Contract shall be the Public Works Term Maintenance and Refurbishment Works Contract (PW - CF11v 1.7) dated 25/11/ 2025.

A schedule of the Clause headings in the Conditions of Contract has been set out below to enable the Contractor to allow for the cost of complying with the Conditions.

Should any Clause be left unpriced the cost of complying with these Clauses shall be deemed to be included with the unit rates elsewhere in this Pricing Document.

Clauses which have been covered elsewhere by an item in the Pricing Document have been indicated.

Note that the Tender Price based on the Pricing Document will be classified as indicational only, to facilitate the signing of the Contract and not as a definitive representation of the quality and quantity of the works or of the Contract Sum.

Conditions of Contract (PW - CF11v 1.7)

| | Clause |
|---|---|
| A | 1. This Contract |
| B | 2. Duration of Term |
| C | 3. Task Orders |
| D | 4. Completing Tasks |
| E | 5. Quotation for Tasks |
| F | 6. Payment |
| G | 7. Site operations and Works |
| H | 8. Contractor's Personal |
| I | 9. Pay and conditions of employment of workers |
| J | 10. Loss and damage |

| | | | | | |
|---|---|---|---|---|---|
| A | 11. Insurances | | | | |
| B | 12. Property | | | | |
| C | 13. Ethics in Public Office | | | | |
| D | 14. Law and disputes | | | | |
| E | 15. Contractor's risk of loss and damage to the Works and Employer's existing facilities | | | | |
| | <u>CONTRACTORS LIABILITY</u> | | | | |
| F | The Contractor must provide for the efficient protection of the public, the employers, officers, servants, visitors, property and all other persons occupying or using the site. | | | | |
| G | The Contractor must take all reasonable precautions to minimise nuisance to the occupants/users of adjoining properties and the general public and must include for complying with all statutory regulations in this regard. | | | | |
| H | The Contractor shall be responsible for negotiations as may be required with the Local Authority or adjoining owners for any encroachment necessary for carrying out any work outside the site boundaries if required. | | | | |
| | <u>Obligations and restrictions imposed by the Employer</u> | | | | |
| | The use of any materials found on site | | | | |
| I | All articles of value and/or of antiquarian or archaeological interest which may be found on the property of the Employer must be handed over to the Area Maintenance Officer | | | | |
| | Any other obligation or restriction | | | | |
| J | The Contractor must permit the Employer and his representatives access to the site at all times | | | | |
| K | Prevent trespass on adjoining property | | | | |

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| A | Obtain permission from the owners and occupiers of adjoining properties if it is necessary to obtain access for any purpose in connection with the Works. Indemnify and insure the Employer against all charges arising therefrom | | | | |
| B | The Employer does not bind itself to accept the lowest or any tender. Tenderers will not be remunerated for any trouble or expense they may incur in preparing their tenders | | | | |
| | <u>General Facilities and Obligations</u> | | | | |
| | For convenience in pricing, items for the following have been given | | | | |
| C | Allow for facilitating the works of Specialist Sub-Contractors and all Firms or Authorities to be employed on the site during the progress of the contract including reasonable use of scaffolding, plant, etc., as indicated in the Specification | | | | |
| D | Persons engaged upon the works must insofar as practicable and without affecting the efficiency of the work be recruited from the local offices of FAS to the extent that the total labour requirement of the Contract exceeds the Contractor's core workforce | | | | |
| | <u>Supervision and co-ordination of the works</u> | | | | |
| E | Provide for all necessary supervision and co-ordination of the works. | | | | |
| F | No claims will be entertained for costs arising from the protection of the Contractor's plant, tools or vehicles during the course of Maintenance or Associated works or at any other time during the course of the Contract | | | | |
| | Plant, Tools and Vehicles | | | | |
| G | Provide all plant, tools and vehicles | | | | |
| H | Provide for bringing to site and removing on completion | | | | |
| I | Provide for maintaining on site for the duration of the works | | | | |

| | | | | | |
|---|---|---|---|---|---|
| A | Provide for protecting all plant, tools and vehicles | | | | |
| | <u>Scaffolding</u> | | | | |
| B | Provide, erect and remove on completion all scaffolding required including safetynetting and any overhead cantilevered pedestrian canopies required in the rates . Scaffolding will be required for many tasks in the refurbishment and maintenance of houses and flats including, but not limited to, work to chimneys , repairs to roofs, provision of rooflights and fireproofing of party walls where tiles need to be stripped etc. | | | | |
| C | No claims will be entertained for costs arising from the protection of the Contractor's employees during the course of Maintenance or Associated works or at any other time during the course of theContract | | | | |
| | <u>Site administration and Security</u> | | | | |
| D | Provide any temporary security as may be required during the course of the Contract, including any special security the Contractor considers necessary | | | | |
| E | Allow for providing all necessarywatching and artificial lighting and everything necessary by day and night for the due protection and security of the works and of the public | | | | |
| F | Provide for proper site administration, including the keeping ofStatutory Records | | | | |
| G | Allow for any protective clothing as may be deemed necessary for the satisfactory completion of the works | | | | |
| | Task Orders | | | | |
| H | Include for all costs associated with pricing the Task Orders including liasing with specialists and domestic sub-contractors | | | | |
| | Travel | | | | |
| I | The Contractor must include here for all travel costs associated with the works. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Transport for workpeople | | | | |
| A | Provide all transport required for workpeople | | | | |
| | Water for work | | | | |
| B | Water for the use of the Works and connections from main will be provided free by the Local Authority. Allow for paying the charges made by the Waterworks Department for connection other than for dwellings and supplying all requisite pipes and other necessary apparatus in every way complying with the Local Authorities Waterworks Regulations (See Specification) | | | | |
| | Lighting and power for the works | | | | |
| C | Provide for the installation, maintenance, temporary distribution about site, payment of charges for current and adaption of all necessary artificial lighting and power required for the Works and remove on completion | | | | |
| | Welfare Facilities | | | | |
| D | Provide facilities for work people in compliance with the fourth schedule of the safety and welfare at work ( construction) regulations | | | | |
| E | Safety Health and Welfare at Work provisions | | | | |
| F | Provide for the operation of the Safe Pass and Construction Skills Certificates Schemes | | | | |
| G | Provide for safety officers and all safety supervisors, first aiders, inspectors | | | | |
| H | Provide for tests and certificates on plant and equipment | | | | |
| I | Provide for safety signs and signals | | | | |
| J | Provide for personal protective clothing and personal protective equipment | | | | |
| K | Provide and maintain emergency routes and exits and designated personnel responsible for emergency procedures | | | | |
| L | Provide energy distribution installations | | | | |

| | | | | | |
|---|---|---|---|---|---|
| A | Provide temporary fire detection and fire fighting systems | | | | |
| B | Maintain appropriate working conditions and work stations | | | | |
| C | Provide and maintain on site traffic routes | | | | |
| D | Provide first aid equipment and firstaid room | | | | |
| | <u>Traffic regulations</u> | | | | |
| E | The Contractor must make necessary arrangements with the Garda Local Authority etc.and must comply with their requirements including wheel washing, etc., to provide access for lorries, plant, etc., to the site. Comply with all traffic regulations or restrictions. Obtain and comply with the conditions of necessary Road Closure Order(s) required and pay all costs and expenses in connection therewith. | | | | |
| | <u>Maintenance of public and private roads</u> | | | | |
| F | Allow for protecting the road construction including road channels or road passing through and/or adjoining the site and also all water mains, gas mains, sewers and other services on, under or over the site, against damage by the movement of plant, vehicles ( particularly tracked vehicles ) or workmen during the building operations, by covering trenches and agreed crossing points with hard dry materials, steel chequer plates or other approved method. The Contractor shall be held responsible for and must make good at his own expense, all such damage | | | | |
| G | No mechanical plant or vehicles shall be permitted to cross a paved public footway unless there is a permanent footway crossing in existence or a temporary footway crossing has been constructed. The footway crossing must be the only point at which mechanical plant or vehicles enter the site. | | | | |
| H | The Contractor must at all times keep all public and private roads, footpaths, etc., entirely free of excavated materials, debris, rubbish, etc. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| A | Pay all tipping fees and allow for removing all rubbish and superfluous materials associated with same, from the site with all reasonable speed from time to time keeping the roads passing through and/or adjoining the site free from mud and debris at all times and leaving the site roads and adjoining grounds absolutely clear. Burning of rubbish/debris is not allowed on site. | | | | |
| | <u>Temporary fencing, hoardings, screens, fans, planked footways, guardrails, gantries and similar items inclusive of safety netting</u> | | | | |
| B | Provide all such as may be necessary and required by the Local Authority or State requirements. | | | | |
| | Control of noise pollution and compliance with statutory obligations | | | | |
| C | Take adequate precautions to protect persons and property from damage or nuisance caused by noise or pollution. Any enforced delay resulting from lack of such adequate precautions will not be regarded as force majeure. Comply with all other obligations. | | | | |
| | <u>Protecting the Works</u> | | | | |
| D | Allow for protecting the whole of the works from inclement weather, traffic or other causes and make good any damage occurring. | | | | |
| | Tax Clearance | | | | |
| E | It will be a condition for the award of this Contract that the successful tenderer will be able to produce promptly a tax clearance certificate. | | | | |
| | Trade Union and Local Labour | | | | |
| F | Every possible means must be availed of on the part of the Contractor and his Foreman in charge of the works to ascertain that the clauses of the General Conditions of Contract with reference to Trade Union and Local Labour are complied with. | | | | |

# C20 Demolition

To be read with Preliminaries/General Particulars

GENERAL REQUIREMENTS

110 DESK STUDY/ SURVEY

- Scope: Before starting deconstruction/ demolition work, examine available information,and carry out a survey of:
  - the structure or structures to be deconstructed/ demolished,
  - the site on which the structure or structures stand, and
  - the surrounding area.
- Report and method statements: Submit, describing:
  - Form, condition and details of the structure or structures, the site, and the surrounding area.
    Extent: refer to Architect's Drawings .
  - Type, location and condition of features of historical, archaeological, geological or ecological importance.
  - Type, location and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures, or by noise, vibration and/ or dust generated during deconstruction/ demolition.
  - Identity and location of services above and below ground, including those required for the Contractor's use, and arrangements for their disconnection and removal.
  - Form and location of flammable, toxic or hazardous materials, including lead-based paint, and proposed methods for their removal and disposal.
  - Form and location of materials identified for reuse or recycling, and proposed methods for removal and temporary storage.
  - Proposed programme of work, including sequence and methods of deconstruction/ demolition.
  - Details of specific pre-weakening required.
  - Arrangements for protection of personnel and the general public, including exclusion of unauthorized persons.
  - Arrangements for control of site transport and traffic.
  - Special requirements: Site waste management plan development and proposals .
- Format of report: Digital .

120 EXTENT OF DECONSTRUCTION/ DEMOLITION

- General: Subject to retention requirements specified elsewhere, deconstruct/ demolish structures down to foundation level: Break up and dig out foundations.

130 GROUNDWORKS

- Old foundations, slabs and the like: Break out in locations and to the extents stated.
- Contaminated material: Remove, and carry out remediation required by theEnforcing Authority.

140 BENCH MARKS

- Unrecorded bench marks and other survey information: Give notice when found. Donot remove marks or destroy the fabric on which they are found.

SERVICES AFFECTED BY DECONSTRUCTION/ DEMOLITION

210 SERVICES REGULATIONS

- Work carried out to or affecting new and/ or existing services: Carry out in accordancewith the byelaws and/ or regulations of the relevant Statutory Authority.

220 LOCATION OF SERVICES

- Services affected by deconstruction/ demolition work: Locate and mark positions.
- Mains services marking: Arrange with the appropriate authorities for services to belocated and marked.
  - Marking standard: In accordance with National Joint Utilities Group 'Guidelines on the positioning and colour coding of underground utilities' apparatus'.

230 SERVICES DISCONNECTION ARRANGED BY CONTRACTOR

- General: Arrange with the appropriate authorities for disconnection of services and removal of fittings and equipment owned by those authorities prior to starting deconstruction/ demolition.

240 DISCONNECTION OF DRAINS

- General: Locate, disconnect and seal disused foul and surface water drains.
- Sealing: Permanent, and within the site.

250 LIVE FOUL AND SURFACE WATER DRAINS

- Drains and associated manholes, inspection chambers, gullies, vent pipes and fittings:
  - Protect; maintain normal flow during deconstruction/ demolition.
  - Make good any damage arising from deconstruction/ demolition work.
  - Leave clean and in working order at completion of deconstruction/ demolition work.
- Other requirements: Post completion camera survey to be carried out.

260 SERVICE BYPASS CONNECTIONS

- General: Provide as necessary to maintain continuity of services to occupied areas of the site on which the deconstruction/ demolition is taking place and to adjoining sites/ properties.
- Minimum notice to adjoining owners and all affected occupiers: 72 hours, if shutdownis necessary during changeover.

270 SERVICES TO BE RETAINED

- Damage to services: Give notice, and notify relevant service authorities and/ orowner/ occupier regarding damage arising from deconstruction/ demolition.
- Repairs to services: Complete as directed, and to the satisfaction of the service authorityor owner.

DECONSTRUCTION/ DEMOLITION WORK

310 WORKMANSHIP

- Standard: Demolish structures in accordance with BS 6187.
- Operatives:
  - Appropriately skilled and experienced for the type of work.
  - Holding, or in training to obtain, relevant CITB Certificates of Competence.
- Site staff responsible for supervision and control of work: Experienced in the assessment of risks involved and methods of deconstruction/ demolition to be used.

320 GAS OR VAPOUR RISKS

- Precautions: Prevent fire and/ or explosion caused by gas and/ or vapour from tanks, pipe

330 DUST CONTROL

- General: Reduce airborne dust by periodically spraying deconstruction/ demolition works with an appropriate wetting agent. Keep public roadways and footpaths clear of mud and debris.
- Lead dust: Submit method statement for control, containment and clean-up regimes.

340 HEALTH HAZARDS

- Precautions: Protect site operatives and general public from hazards associatedwith vibration, dangerous fumes and dust arising during the course of the Works.

350 ADJOINING PROPERTY

- Temporary support and protection: Provide. Maintain and alter, as necessary, as work proceeds. Do not leave unnecessary or unstable projections.
- Defects: Report immediately on discovery.
- Damage: Minimize. Repair promptly to ensure safety, stability, weather protection and security.
- Support to foundations: Do not disturb.

370 PARTLY DEMOLISHED STRUCTURES

- General: Leave in a stable condition, with adequate temporary support at each stage to prevent risk of uncontrolled collapse. Make secure outside working hours.
- Temporary works: Prevent overloading due to debris.
- Access: Prevent access by unauthorized persons.

380 DANGEROUS OPENINGS

- General: Provide guarding at all times, including outside of working hours. Illuminateduring hours of darkness.
- Access: Prevent access by unauthorized persons.

390 ASBESTOS-CONTAINING MATERIALS – KNOWN OCCURRENCES

- General: If materials containing asbestos are known to be present : Refer toAsbestos Survey Report.
- Removal: By contractor licensed by the Health and Safety Authority, and prior to other works starting in these locations.

391 ASBESTOS-CONTAINING MATERIALS – UNKNOWN OCCURRENCES

- Discovery: Give notice immediately of suspected asbestos-containing materials when discovered during deconstruction/ demolition work. Avoid disturbing such materials.
- Removal: Submit statutory risk assessments and details of proposed methods for safe removal.

410 UNFORESEEN HAZARDS

- Discovery: Give notice immediately when hazards such as unrecorded voids,tanks, chemicals, are discovered during deconstruction/ demolition.
- Removal: Submit details of proposed methods for filling, removal, etc.

MATERIALS ARISING

520 RECYCLED MATERIALS

- Materials arising from deconstruction/ demolition work: Can be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification andin accordance with any site waste management plan.
- Evidence of compliance: Submit full details and supporting documentation.
  - Verification: Allow adequate time in programme for verification of compliance.

# D20 Excavating and filling

To be read with Preliminaries/General Particulars

GENERALLY/THE SITE

112 SITE INVESTIGATION REPORT
- If required refer to Information Pack, note not all works must require a site investigation report.

145 VARIATIONS IN GROUND WATER LEVEL
- Give notice: If levels encountered are significantly different from levels in thesite investigation report or previously measured.

CLEARANCE/EXCAVATING

164 TREE ROOTS
- Protected area: Do not cut roots within precautionary protection area.
  - Size of area: Circle around each tree with radius of half the tree's height, measuredfrom the trunk.
- Excavation in protected area:
  - Method: By hand.
  - Backfill as soon as possible or temporarily line with polyethylene sheet to reduce evaporation.
- Outside protected area: Give notice of roots exceeding 25 mm and do not cutwithout approval.
- Cutting:
  - Make clean smooth cuts with no ragged edges.
  - Pare cut surfaces smooth with a sharp knife.
  - Treatment of cut roots: Not required.
- Backfill: As dug material, enriched with phosphate fertilizer.

168 SITE CLEARANCE
- Timing: Before topsoil stripping, if any.
- General: Clear site of rubbish, debris and vegetation. Do not compact topsoil.
- Treatment: Apply a suitable residual herbicide to areas to receive gravel surfacing.

170 REMOVING SMALL TREES, SHRUBS, HEDGES AND ROOTS
- Identification: Clearly mark trees to be removed.
- Small trees, shrubs and hedges: Cut down
- Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas
- Safety: Comply with HSE/ Arboriculture and Forestry Advisory Group safety leaflets.

180 CHIPPING AND SHREDDING
- General: Permitted, remove arisings from site.

220 STRIPPING TOPSOIL

- General: Before beginning general excavation or filling, strip topsoil from areas where there must be regrading, buildings, pavings/ roads and other areas shown on drawings.
- Depth:
  - Remove to an average depth of 300 mm.
  - Give notice where the depth of topsoil is difficult to determine.
- Handling: Handle topsoil for reuse or sale in accordance with clause 225.
- Around trees: Do not remove topsoil from below the spread of trees to be retained.
- Site storage: Keep separate from excavated sub-soil.

225 HANDLING TOPSOIL

- Standard: To BS 3882.
- Aggressive weeds:
  - Species: Included in the Weeds Act, section 2 or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
  - Give notice: Obtain instructions before moving topsoil.
- Contamination: Do not mix topsoil with:
  - Subsoil, stone, hardcore, rubbish or material from demolition work.
  - Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
  - Oil, fuel, cement or other substances harmful to plant growth.
  - Other classifications of topsoil.
- Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

244 EXCAVATIONS ADJACENT TO EXISTING FOUNDATIONS

- Prior to commencing excavation:
  - Excavate trial pits adjacent to existing foundations to determine extent and formation levels.
  - Allow for inspection of trial pits.
  - Allow time for amendment of details if required.
    Time period: 5 working days .
- Backfill material to new excavation: Per Engjneer's Specification .

## D21 Ground gas collection and venting systems

To be read with Preliminaries/General Particulars.

GENERAL

120 GROUND GAS COLLECTION AND VENTING SYSTEM GENERALLY

- Site investigation: investigations may have been carried out- this is project specific. If an investigation has been carried out a copy must be included in the mini-tender documents.
- Gases to be collected and vented: Radon.
- Gas collection:
  - Venting layer and membrane: Venting hardcore layer to Structural Engineers design. Loose laid polymeric gas retardant damp proof membrane, as section J40.
  - Pipework: PVC-U to EN 1401.
- Depressurization sumps: Plastics type.
  - Type: Passive.
  - Size: Submit proposals.

SYSTEM PERFORMANCE

240 DESIGN

- Design: Complete the design of the ground gas collection and venting system with regard to free passage of air. Ensure that the permeability of the hardcore layer remains effective throughout the extent of the building's foundations. Provide free airways at approximately the same level as the depressurisation sump by means of gaps in internal foundation rising walls equivalent to 12,500mm² per metre run of wall.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
- Builder's work: Submit requirements.

PRODUCTS

325 VENTING PIPEWORK

- Material: Rigid polypropylene or PVC-U to EN 1401.
- Size: DN110.
- Accessories: [
  - 90° bends, tee-pieces, couplers
  - Gastight ring seals
  - Gastight preformed collars at rising wall penetrations
  - Compressible sealant between pipes and masonry at rising wall penetrations].

375 PLASTICS DEPRESSURIZATION SUMPS

- Material: Rigid polypropylene or medium density polyethylene (MDPE).
- Maximum serviceable area per sump: 250m³.
- Wall thickness (minimum): [4mm].
- Number of Spigots: [4].
- Additional Requirements: [Rot-proof].

400 GROUND LEVEL PIPE CAPS

- Material: Plastic.
- Type: [Flush].
- Profile: [Square or rectangular frame with removeable 110mm diameter circular section].
- Colour: Black.
- Marking: Raised lettering stating "Radon Sump Connection Point".
- Additional Requirements: [
  - Screw-fixed
  - Sealed against water and rodent ingress
  - Tamper-proof].

420 VENTING PIPEWORK - VERTICAL

- Material/ Standard: PVC-U to EN 1329-1.
- Size: DN 110.
- Accessories: Caps for tops of pipes.

EXECUTION

635 INSTALLING PLASTICS DEPRESSURIZATION SUMPS

- Position: As per Architects drawings.
- Area served (maximum): 250 m².
- Base: Compacted hardcore.
  - Thickness: As per Structural Engineers drawings.
- Blinding: Sand.
  - Thickness: As per Structural Engineers drawings.

640 INSTALLING VENTING HARDCORE LAYERS

- Filling: Spread and level in 150 mm maximum layers. Thoroughly compact each layer whilst maintaining enough voids to allow efficient venting.

670 LAYING VENTING PIPEWORK

- Position: Lay just below floor slab in venting hardcore layer.
- Jointing: Ring seals to EN 681-1.
- At rising wall penetrations, provide 50mm clearance around pipes to allow for sealing.

COMPLETION

910 INSPECTION OF GROUND GAS COLLECTION AND VENTING SYSTEM

- Notice for inspection (minimum): 3 days.
- Defects: Report immediately.

920 DOCUMENTATION

- Operation and maintenance instructions: Submit.
- Record drawings: Submit.
  - Number of copies: One.

## E20 Formwork for in situ concrete

To be read with Preliminaries/ General conditions.

GENERALLY/ PREPARATION

216 ABOVE SLAB INSULATION [Project Specific- to be included in mini-tender drawings and specifications]

- Type: agreement Certified Rigid phenolic foam boards to EN 13166.
- Core: [CFC/HCFC free rigid phenolic resin foam, Class 0 fire performance, negligible smoke obscuration].
- Facings: [Low emissivity gas tight foil facings bonded to both sides of the insulation core during manufacture].
- Reaction to Fire: s1 d0 to EN 13501.
- Density (minimum): [35kg/m³].
- Water Vapour Resistivity: [>100MNs/gm].
- Thickness:
- - Under slab: 100 mm
  - Above slab, Under Screed : 150mm.
  - To edge of slab 50mm & 30mm as per Architects drawings.
- Compressive strength (minimum): 120 kPa.
- Thermal conductivity (maximum): 0.020 W/mK.
- Additional Requirements:[
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified
  - Polythene vapour control layer, minimum 125 micron / 500 gauge].

217 UNDERSLAB INSULATION [Project Specific- to be included in mini-tender drawings and specifications]

- Type: Rigid extruded polystyrene boards to EN 13164.
- Core: [CFC/HCFC free rigid extruded polystyrene].
- Facings: [Smooth facings bonded to both sides of the insulation core duringmanufacture].
- Reaction to Fire: Class E to EN 13501.
- Density (minimum): [30kg/m³].
- Water Vapour Resistivity: [>700MNs/gm].
- Thickness:
  - Under slab: 190mm generally / 100mm to C1/C2 garages, as per Architects drawings.
  - To edge of slab 50mm & 30mm as per Architects drawings.
- Compressive strength (minimum): 300 kPa.
- Thermal conductivity (maximum): 0.038 W/mK.
- Additional Requirements:[
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified
  - Polythene vapour control layer, minimum 125 micron / 500 gauge].

CONSTRUCTION

316 UNDERSLAB INSULATION

- Cutting: Neat and accurate to edges and around penetrations.
- Laying:
  - Tightly butted, break-bonded, fitted tightly at edges and around service penetrations.
  - Where two or more layers of insulation are required, they must be horizontally offset relative to each other so that, as far as possible, the board joints in any two adjacent layers do not coincide with each other.
  - Fully supported on firm, even substrate.
  - A polythene vapour control layer, minimum 125 micron / 500 gauge must be laid overthe boards. Ensure the polythene sheet has 150 mm overlaps, taped joints, and is turned up 300mm at the walls to allow wall airtightness memrbane to be taped to it.
- Insulation surfaces: Protect from indentation by spacers and other items.
- Concrete placement: Restrain insulation against movement.

317 PERIMETER INSULATION

- Cutting: Neat and accurate to edges and around penetrations.
- Laying: The top of the strip of insulation board must be level with the top of the floor screed and the bottom must be level with the bottom of the horizontal floor insulation, and be closely butted up to it.
- Insulation surfaces: Protect from indentation by spacers and other items.
- Concrete placement: Restrain insulation against movement.

## E41 Worked finishes to in situ concrete

To be read with Preliminaries/ General conditions.

GENERALLY/ PREPARATION

140 SAMPLES AVAILABLE FOR INSPECTION
Type: Power ground finish asclause 410
Location: 1x1m area in one ground floor stairwell or as specified

410 POWER GROUND FINISH FOR WEARING SURFACES
Ginding: Remove 102 mm from surface
Timing: when concrete is sufficiently hard for fine aggregate surface particles not to be dislodged.
Cleaning: Remove dust and wash down.
Surface on completion: even glass-paper texture, free from blemishes and trowel marks.

521 SURFACE SEALER [TO GROUN FLOOR STAIRWELLS OR AS SPECIFIED]
Manufacturer: Contractor's choise
Product reference: film former (non-penetrating0 clear polyurethane sealer, water-based, medium sheen – submit proposals to Engineer
Number of coats: [2]
Substrate:
Moisture content: As recommended by sealer manufacturer. Test relative humidity to BS 8203, Annex A where required to verify suitability.
Condition prior to application: cured, clean and free from contaminants.
Primer: one coat surface sealer diluted in accordance with manufacturer's instructions
Application: evenly to dry surfaces to form an effective seal.

# F10 Brick/ block walling

To be read with Preliminaries/ General conditions.

TYPES OF WALLING

120 CLAY FACING BRICKWORK GENERALLY

- Bricks: To EN 771-1.
  - Manufacturing Process: Stock.
  - Texture: Sandcreased.
  - Size: 215x102.5x65mm.
  - Tolerance Category: [T2].
  - Range Category: [R1].
  - Mean Compressive Strength (minimum): [15N/mm²].
  - Durability Designation: [F2 S2].
  - Water Absorption: [Equal to or less than 15%].
  - Configuration: [Single frog].
  - Special shapes:
    - Squint bricks to suit angles on drawings
    - External angle bricks to suit angles on drawings
    - Internal angle bricks to suit angles on drawings
    - Queen closers
    - King closers
    - Half batts
    - Three-quarter batts
    - Rebated stretcher (pistol) bricks
    - Solids (unfrogged).
- Samples and Reference Panels: [Required. Refer to clauses 735 & 741].
- Mortar:
  - Standard & Mix: Refer to Structural Engineers design.
  - Additional requirements: Pigmented ready-mixed coloured mortar. Approval subject to reference panels .
- Bond: Half lap stretcher.
- Joints: Flush.
- Features: As per Architects drawings.

255 CONCRETE FACING BLOCKWORK Generally

- Blocks: To BS EN 771-3.
  - Manufacturer: Contractor's choice.

  Product reference: Submit proposals.
  - Configuration: Solid.
  - Compressive strength:

  Mean value: to Engineer's specification.

  Characteristic value: Not applicable.

  Category: ONE.
  - Freeze/ Thaw resistance: Not to be left exposed.
  - Work sizes (length x width x height): 440 x 100 x215 mm.
  - Finish/ Colour: Fairfaced/Natural.
  - Special shapes: None.
  - Additional requirements: Reaction to fire class:A1.
- Mortar: As section Z21.
  - Standard: To BS EN998-2.
  - Mix: to Engineer's specification.
  - Additional requirements: None.
- Bond: Half lap stretcher.
- Joints: Bucket handle.
- Features: None.

WORKMANSHIP GENERALLY

435 CONDITIONING OF CLAY BRICKS

- Bricks and blocks delivered warm from manufacturing process: Do not use until cold.
- Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

505 LAYING GENERALLY

- Mortar joints: Fill vertical joints. Lay bricks on a full bed.
- Bond where not specified: Half lap stretcher.
- Vertical joints in brick facework: Even widths. Plumb at every fifth cross joint

525 ACCURACY

- Courses: Level and true to line.
- Faces, angles and features: Plumb.
- Permissible deviations:
  - Position in plan of any point in relation to the specified building reference line and/ or point at the same level ± 10 mm.
  - Straightness in any 5 m length ± 5 mm.
  - Verticality up to 3 m height ± 10 mm.
  - Verticality up to 7 m height ± 14 mm.
  - Overall thickness of walls ± 10 mm.
  - Level of bed joints up to 5 m (brick masonry) ± 11 mm.

536 HEIGHT OF LIFTS IN WALLING USING CEMENT GAUGED OR HYDRAULICLIME MORTAR

- Lift height (maximum): 1.2 m above any other part of work at any time.
- Daily lift height (maximum): 1.5 m for any one leaf.

545 LEVELLING OF SEPARATE LEAVES

- Locations for equal levelling of cavity wall leaves: As follows:
  - Every course containing vertical twist type ties or other rigid ties.
  - Every third tie course for double triangle/ butterfly ties.
  - Courses in which lintels must be bedded.

560 COURSING BRICKWORK

- Gauge: Four brick courses including bed joints to 300 mm.

581 LAYING FROGGED BRICKS

- Single frogged bricks: Frog uppermost.
- Frog cavity: Fill with mortar.

595 LINTELS

- Bearing: Ensure full length masonry units occur immediately under lintel ends.

635 JOINTING

- Profile: Consistent in appearance.

645 ACCESSIBLE JOINTS NOT EXPOSED TO VIEW

- Jointing: Struck flush as work proceeds.

695 ADVERSE WEATHER

- General: Do not use frozen materials or lay on frozen surfaces.
- Air temperature requirements: Do not lay bricks:
  - In cement gauged mortars when at or below 4°C and falling or unless it is at least 1°C and rising.
- Temperature of walling during curing: Above freezing until hardened.

- Newly erected walling: Protect at all times from:

- Rain and snow.
- Temperatures below 4°C.
- Drying out too rapidly in hot conditions and in drying winds.

ADDITIONAL REQUIREMENTS FOR FACEWORK

735 BRICK SAMPLES

- General: Before placing orders with suppliers submit for approval of appearance labelled samples of the following: Bricks as in clause F10/120 .
- Selection of samples: Representative of the range in variation of appearance.

741 FINISHED MASONRY WORK REFERENCE PANELS

- General: Before proceeding to construct the following walling types, construct six reference panels as specified for Architect's approval before commencement of brickwork forming any of the finished works. Give 3 days notice for inspection when panels are dry.
- Selection of masonry units: Reasonably representative of the average quality of thewhole order to be delivered .
- Panel types:
  - Walling type: F10/120 .
    Location: On site in good light .
    Size: 1.5 x 1.5 m .
    Other requirements:
    - built in window sill
    - six different coloured mortar samples .

750 COLOUR CONSISTENCY OF MASONRY UNITS

- Colour range: Submit proposals of methods taken to ensure that units are ofconsistent and even appearance within deliveries.
- Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
- Finished work: Free from patches, horizontal stripes and racking back marks.

765 APPEARANCE

- Brick selection: Do not use units with damaged faces or arrises.
- Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
- Quality control: Lay masonry units to match relevant reference panels.
  - Setting out: To produce satisfactory junctions and joints with built-in elementsand components.
  - Coursing: Evenly spaced using gauge rods.
- Lifts: Complete in one operation.
- Methods of protecting facework: Submit proposals.

780 GROUND LEVEL

- Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

810 FIXING OF BRICK SLIPS

- Adhesive system: Epoxy adhesive .
- Concrete substrate:
  - Preparation: Remove laitance and expose aggregate.
  - Substrate surface: Clean and free of loose material.
- Slips:
  - Preparation of slips: Clean and free of loose material.
  - Slips: Fully bonded.
- Movement joints in substrate: Do not bridge.
- Pointing: Allow adhesive bedding to set. Use same mortar as adjacent facework andfinish to same profile.

830 CLEANLINESS

- Facework: Keep clean.
- Mortar on facework: Allow to dry before removing with stiff bristled brush.
- Removal of marks and stains: Rubbing not permitted.

## F30 Accessories/ sundry items for brick/ block/ stone walling

To be read with Preliminaries/ General conditions.

CAVITIES

115 CONCRETE FILL TO BASE OF CAVITY

- Concrete generally: To EN 206.
  - Designated concrete: To engineer's specification .
    Workability: High.
- Extent: Maintain 75 mm between top of fill and external ground level and a minimum of225 mm between top of fill and ground level dpc except in areas where level access to be achieved; DPC cloaks as per detail
- Placement: Compact to eliminate voids.

120 CLEANLINESS

- Cavity base and faces, ties, insulation and exposed dpcs: Free from mortar and debris.

130 PERPEND JOINT WEEP HOLES

- Form: Open perpend joint.
- Locations: Through outer leaf immediately above base of cavity, at cavity trays,stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
- Provision: At not greater than 1000 mm centres and not less than two over each opening.

152 FULL FILL CAVITY INSULATION [EXTERNAL WALLS & PARTITION WALLS]

- Type: Rigid polyisocyanurate foam boards to EN 13165.
- Core: CFC/HCFC free rigid polyisocyanurate (PIR) foam.
- Facings: Low emissivity gas tight foil facings bonded to both sides of the insulation core during manufacture with high impact polystyrene 5mm tapered fluted profiled outer skin to provide a drainage plane.
- Edge Profile: Rebated all 4 edges.
- Density (minimum): 30kg/m³.
- Face size (nominal length x width): 1200 x 450mm.
- Thickness: 150 mm.
- Thermal conductivity (maximum): 0.021 W/mK.
- Reaction to fire classification to EN 13501 (minimum): F.
- Compressive strength (minimum): [100 kPa].
- Water Vapour Resistivity: [>100MNs/gm].
- Additional requirements:
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified.
- Accessories: [
  - Preformed internal & external folding corner panels, 150mm thick
  - Meter box panels
  - Riser panels 150mm thick
  - Jointing strips].
- Placement: Continuous and free of mortar and debris. Install in full accordance with manufacturer's recommendations.

153A FULL FILL CAVITY INSULATION [MASONRY CAVITY PARTITION WALLS]

- Type: Stone wool batts to EN 13162.
- Thickness: 150mm / 75mm - refer to Architect's Drawings.
- Thermal conductivity (maximum): 0.037 W/mK
- Reaction to fire classification to EN 13501: A1.
- Additional requirements:
  - Zero ozone depletion potential & global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified.
- Placement: Continuous and free of mortar and debris. Install in full accordance with manufacturer's recommendations.
- Installation requirements:
  - Joints: Butted, no gaps.

166 VENTILATION GRILLES IN EXTERNAL WALLING [TO OUTSIDE]

- Work sizes: 215x140mm.
- Material: Aluminium.
- Finish: [Polyester powder coated. Colour - to be confirmed by architect].
- Other requirements: Include insect proof screen.

167 VENTILATION GRILLES IN EXTERNAL WALLING [TO INSIDE]

- Work sizes: 215x140mm.
- Material: Plastics.
- Colour: [White].
- Other requirements: Include insect proof screen.

183 CAVITY CLOSERS FIRE RATED

- Type: One piece, to include integral insulation and integral DPC.
- Material: Extruded uPVC.
- Core: Foil-encased mineral wool .
- Width: [150mm].
- R-Value (minimum): [0.77m²K/W].
- Thermal conductivity of core (maximum): [0.038 W/mK].
- Fire resistance rating to EN 1363 (minimum): EI 30
- Additional Requirements:[
  - Fins to provide plastering key
  - Projecting fixing flange
  - Zero ozone depletion potential
  - Low global warming potential
  - Agrément Certified]
- Accessories: [
  - Fixing ties
  - Jointing strips where required
  - All bracing / other fittings required to complete the installation]

REINFORCING/ FIXING ACCESSORIES

214A CAVITY WALL TIES Stainless Steel Double Triangle Wall tie

- Standard: To EN 845-1.
  - Type: 2 (Masonry general purpose)
- Material/ finish: Austenitic stainless steel - material/ coating reference 3.
- Sizes: 250mm.
- End types: Symmetrical triangle.
- Design embedment length (minimum): 50mm.
- Movement: Non tolerant.
- Additional requirements: Slope tolerance: Not tolerant.

218A SHEAR WALL TIES TO JUNCTION OF PARTY WALL AND EXTERNAL WALL BLOCK

- Standard: To EN 845-1.
  - Type: 2 (Masonry general purpose)
- Material/ finish: Austenitic stainless steel - material/ coating reference 1.
- Sizes: 250mm.
- End types: Symmetrical triangle.
- Design embedment length: 50mm.
- Additional requirements: None.

228 FIXING TIES IN MASONRY CAVITY WALLS WITH FULL FILL CAVITYINSULATION

- Embedment in mortar beds (minimum): 50 mm.
- Placement: Sloping slightly downwards towards outer leaf, without bending. Drip centred in the cavity and pointing downwards.
- Spacing: Staggered in alternate courses.
  - Horizontal centres: 750mm.
  - Vertical centres: 450 mm.
- Provision of additional ties:
  One row to support lowest row of insulation batts.
  Within 225 mm of reveals of unbonded openings and at the vertical reveals of unsupported masonry.
  - Spacing: In every course.

242A SURFACE MOUNTED CHANNELS/ SLOTS

- Material: Austenitic stainless steel.
- Type: Attached lug.
- Profile: Rectangular.
- Size (width x depth): 25x14mm.
- Length: Refer to Spandrel Balcony detail drawings.
- Fixing: Stainless steel M10 expanding bolt and 30x30x3mm washer.

246 CHANNEL/ SLOT TIES GENERALLY

- Standard: To EN 845-1.
- Material/ finish: Austenitic stainless steel - material/ coating reference 1.
- Sizes: 28/28mm.
- Channel/ slot fixing: Embedded - cast into concrete retaining walls / beams as requried.
- End types: Asymmetrical dovetail slot end with twisted plate surface end.
- Design embedment length (minimum): 50mm.
- Additional requirements: None.

FLEXIBLE DAMP PROOF COURSES/ CAVITY TRAYS

330 DAMP PROOF COURSE - [BITUMEN POLYMER]
Manufacturer: [Contractor to submit for approval] .
- Product reference: [A bitumen polymer high performance DPC system. With awarded Agrément Certificate. Used in constructions where high mortar adhesion is required. Consult manufacturer's technical literature for details.

330A DAMP PROOF COURSE - [PITCH POLYMER]
Manufacturer: [Contractor to submit for approval] .
- Product reference: [High Performance DPC. A pitch polymer high performance DPC system] .

331 DAMP PROOF COURSE -
- Standard: To EN 14909.
- Material: Reinforced polymeric.
- Minimum thickness: 0.6mm.
- Reaction to fire: [Class F].
- Water vapour transmission (maximum): [0.50 g/m²/day].
- Resistance to impact: [>250mm].
- Resistance to static loading: [>20kg].
- Joint strength (minimum): [150 N/50mm].
- Nail tear resistance (minimum): [260N (MD) / 260N (CD)].
- Resistance to cold bend: [< -40°C].
- Additional requirements: [Agrément certified].

346 SITE FORMED FLEXIBLE SHEET CAVITY TRAYS
- Standard: To EN 14909.
- Material: Reinforced polymeric.
- Minimum thickness: [0.6mm].
- Reaction to fire: [Class F].
- Water vapour transmission (maximum): [0.50 g/m²/day].
- Resistance to impact: [>250mm].
- Resistance to static loading: [>20kg].
- Joint strength (minimum): [150 N/50mm].
- Nail tear resistance (minimum): [260N (MD) / 260N (CD)].
- Resistance to cold bend: [< -40°C].
- Additional requirements: [Agrément certified].

365 GAS RESISTANT DPCS/ CAVITY TRAYS
- Standard: To EN 14909.
- Material: [Reinforced polymeric].
- Resistant to: [radon, methane, hydrocarbons].
- Minimum thickness: [0.44mm].
  Reaction to fire: [Class F].
  Water vapour transmission (maximum): [0.50 g/m²/day].
  Resistance to impact: [>250mm].
  Resistance to static loading: [>20kg].
  Joint strength (minimum): [150 N/50mm].
  Nail tear resistance (minimum): [260N (MD) / 260N (CD)].
  Resistance to cold bend: [< -40°C].
  Additional requirements: [Agrément certified].

386 PREFORMED DPC/ CAVITY TRAY JUNCTION CLOAKS/ STOP ENDS [ALL UNITS]
- Standard: To EN 14909.
- Material: Reinforced polymeric.
- Types (suitable for mortar bedding or surface fixing as required): [
  - Stop ends

- Internal & external corner cloaks
- Change of level cloaks
- Special cloaks to base of door reveals at level thresholds
- Jamb cloaks
- Pipe cloaks
- Windpost cloaks
- Column cloaks
- Column stop ends
- Radius trays]

- Minimum thickness: [0.8mm].
- Reaction to fire: [Class F].
  Water vapour transmission (maximum): [0.50 g/m²/day].
  Resistance to impact: [>250mm].
  Resistance to static loading: [>20kg].
  Joint strength (minimum): [150 N/50mm].
  Nail tear resistance (minimum): [260N (MD) / 260N (CD)].
  Resistance to cold bend: [< -40°C].
- Additional requirements: [
  - Rigid joint supports
  - Surface fixing strips
  - Primer as recommended by manufacturer
  - Double sided jointing tape and/or adhesive as recommended by manufacturer
  - Agrément certified].
- Placement: Seal laps with dpcs and/ or cavity trays.

INSTALLATION OF DPCS/ CAVITY TRAYS

415 HORIZONTAL DPCS

- Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
- Width: At least full width of leaf unless otherwise specified. Edges of dpc not covered with mortar or projecting into cavity.
- Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
- Overall finished joint thickness: As close to normal as practicable.

425 GROUND LEVEL DPCS

- Joint with damp proof membrane: Continuous and effectively sealed.

435A STEPPED DPCS IN EXTERNAL WALLS

- External walls on sloping ground: Install dpcs not less than 150 mm above adjoining finished ground level.For areas where level access is required Double wrap DPC asper details.

445A SILL DPCS

- Form and placement: In one piece and turned up at back and sides.

455 COPING/ CAPPING DPCS

- Placement: Bed in one operation to ensure maximum bond between masonry units, mortar and dpc.
- Dpcs crossing cavity: Provide rigid support to prevent sagging.

465 SEALING DPCS GENERALLY

- Overlaps and junctions: Seal with double sided jointing tape or adhesive recommended by dpc manufacturer .

475 SITE FORMED CAVITY TRAYS

- Requirements to prevent downward ingress of water:
  - Profiles: To match those shown on drawings. Firmly secured.

- Joint treatment: Use unjointed wherever possible, otherwise lap at least 100 mm and seal to produce a free draining and watertight installation.
- Horizontal cavity trays: Support using cavity closer.
- Sloping cavity trays: Prevent sagging.
- Cleanliness: Free from debris and mortar droppings.

485 CAVITY TRAYS OVER OPENINGS AND OTHER CAVITY BRIDGINGS
- Length: To extend not less than 150 mm beyond ends of lintels/ bridgings.

495 GAS RESISTANT DPCS/ CAVITY TRAYS
- Joint treatment: Use unjointed wherever possible, otherwise lap at least 150 mm and seal to form a gas and watertight installation.
- Joint with damp proof membrane: Overlap dpc/ cavity tray not less than 150 mm.

515A DPC/ CAVITY TRAY LEADING EDGE IN FACEWORK - FLUSH
- Treatment at face of masonry Finish flush and clear of mortar at the following locations: bri ck course below all metal window cills. .

570 JAMB DPCS AT OPENINGS
- Joint with cavity tray/ lintel at head: Full underlap.
- Joint with sill/ horizontal dpc at base: Full overlap.
- Projection into cavity: Not less than 25 mm.
- Relationship with frame: In full contact.

JOINTS

610A MOVEMENT JOINTS WITH SEALANT TO EXTERNAL FACING BRICKWORK
- Joint preparation and sealant application: As section Z22.
- Filler: Closed cell polyethylene foam.
  - Thickness: To match design width of joint.
  - Description: Low density, compressible, closed cell polyethylene filler forexpansion joints in brickwork and blockwork.
  - Placement: Build in as work proceeds with no projections into cavities and tocorrect depth to receive sealant system.
  - Colour: To match adjoining brickwork.

650 POINTING IN FLASHINGS
- Joint preparation: Free of debris and lightly wetted.
- Pointing mortar: As for adjacent walling.
- Placement: Fill joint and finish flush.

660 PINNING UP TO SOFFITS
- Top joint of loadbearing walls: Fill and consolidate with mortar.

MISCELLANEOUS ITEMS

850A WALL PLATES
- Placement: On full bed of mortar on DPC, to correct horizontal level.

970A REFUSE CHUTES AND ACCESSORIES

Purpose designed bin chutes built into structure as per drawings comprising: 8mm aluminium mill finished chute fixed on battens to concrete structure mill finished aluminium doors complete with stop and handle on continuous hinge mill finished aluminium cill.

G20 CARPENTRY/ TIMBER FRAMING/ FIRST FIXING

To be read with Preliminaries/ General conditions.

GENERAL INFORMATION/ REQUIREMENTS

150 STRENGTH GRADING OF TIMBER

- Grader: Any company currently registered under a third party quality assurance scheme operated by a certification body.
- Grading and marking of timber:
  - Timber of a target/finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20% with no reading being in excess of 24% and clearly marked as 'DRY' or 'KD' (kiln dried).
  - Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
  - Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

TYPES OF TIMBER

210 GRADED SOFTWOOD FOR [DECKING SUPPORTS ].

- Grading standard: To BS 4978 or BS EN 519 or other national equivalent and so marked.
- Strength class to BS EN 338: C [ *].
- Treatment: [preservative treated].
- Moisture content at time of erection: As clause 450.

230 GRADED SOFTWOOD FOR [TIMBER DECKING TO BALCONIES AND ROOF TERRACES].

- Species and origin: [Scandanavian Red Spruce, ribbed finish, board sizes 32 thick x 120].
- Grading standard: To the appropriate standard or rules for the specified grade and so marked.
  - Grade: [GS].
- Treatment: [preservative treated].
- Moisture content at time of erection: As clause 450.

270 UNGRADED SOFTWOOD FOR [INTERNAL NON-STRUCTURAL USE (partition sole plates, battens for pannelling, grounds/battens for curtain tracks/poles].

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: [ Sawn generally, regularized for wall battens. ].
- Treatment: [preservative treated].
- Moisture content at time of erection: As clause 450.

270A UNGRADED SOFTWOOD FOR [BATTENS AND COUNTERBATTENS IN ZINC ROOF BUILD-UP].

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: [ Sawn generally ].
- Treatment: [preservative treated].
- Moisture content at time of erection: As clause 450.

270B UNGRADED SOFTWOOD FOR [BATTENS AND COUNTERBATTENS IN SHIP LAP TIMBER BOARDING].

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: [ regularized ].
- Treatment: [preservative treated].
- Moisture content at time of erection: As clause 450.

270C UNGRADED SOFTWOOD FOR [EXTERNAL NON-STRUCTURAL USE (Packing, Fillets, Firrings,etc.)].

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots

wider than half the width of the section.

- Surface finish: [ Sawn generally, ].
- Treatment: [preservative treated].
- Moisture content at time of erection: As clause 450.

310 PLYWOOD FOR [VALLEY GUTTERS].

- Standard: To the relevant national standards and quality control procedures specified in BS 5268-2, and so marked.
  - Type: [Exterior WBP].
  - Grade: [III, To suit valley gutter detail].
  - Nominal thickness/ number of plies: [25mm].
  - Finish: [unsanded].
- Treatment: [-].

310A PLYWOOD FOR [COPINGS IN ZINC CLADDING ].

- Standard: To the relevant national standards and quality control procedures specified in BS 5268-2, and so marked.
  - Type: [Exterior WBP].
  - Grade: [III, To suit zinc coping detail].
  - Nominal thickness/ number of plies: [25mm].
  - Finish: [unsanded].
- Treatment: [-].

WORKMANSHIP GENERALLY

401 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND HARDWOOD TIMBER

- Dimensions: Dimensions in this specification and shown on drawings are target sizes as defined in BS EN 336.
- Tolerances: The tolerance indicators (T1) and (T2) specify the maximums permitted deviations from target sizes as stated in BS EN 336, clause 5.3:
  - Tolerance class 1 (T1) for sawn surfaces.
  - Tolerance class 2 (T2) for further processed surfaces.

402 CROSS SECTION DIMENSIONS OF NONSTRUCTURAL SOFTWOOD TIMBER

- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
- Maximum permitted deviations from finished sizes: As stated in BS EN 1313-1:
  - Clause 6 for sawn sections.
  - Clause NA. 2 for further processed sections.

420 WARPING OF TIMBER

- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 519 for softwood, or BS 5756 for hardwood.

430 SELECTION AND USE OF TIMBER

- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.
- Notches and holes: Position in relation to knots or other defects such that the strength of members must not be reduced.
- Scarf joints, finger joints and splice plates: Do not use without approval.

440 PROCESSING TREATED TIMBER

- Cutting and machining: As much as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
- Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

450 MOISTURE CONTENT

- Moisture content of timber and wood based products at time of installation: Not more than:

- Covered in generally unheated spaces: 24%.
- Covered in generally heated spaces: 20%.
- Internal in continuously heated spaces: 20%.

451 MOISTURE CONTENT TESTING

- Procedure: When instructed, test timber sections with an approved electrical moisture meter.
- Test sample: Test 5% but not less than 10 lengths of each cross-section in the centre of the length.
- Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

510 PROTECTION

- Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Timber and components: Store under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.
- Trussed rafters: Keep vertical during handling and storage.

520 EXPOSED END GRAIN

- Components: Seal exposed end grain of the following before delivery to site: [all treated timbers].
- Sealer: [An extra coat of primer.].

550 EXPOSED TIMBER

- Planed structural timber exposed to view in completed work: Prevent damage to and marking of surfaces and arrises.

JOINTING TIMBER

570 JOINTING/FIXING GENERALLY

- Generally: Where not specified precisely, select methods of jointing and fixing and types, sizes and spacings of fasteners in compliance with section Z20.

ERECTION AND INSTALLATION

770 ADDITIONAL SUPPORTS

- Provision: Where not shown on drawings, position and fix additional studs, noggings or battens for appliances, fixtures, edges of sheets, etc.
- Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

H31 METAL PROFILED/ FLAT SHEET CLADDING/ COVERING

To be read with Preliminaries/ General conditions.

TYPES OF CLADDING/ COVERING SYSTEM

120 METAL [WALL CLADDING TO ROOF LEVEL APARTMENTS]

Support structure: [Contractor to submit for approval].
- Bearing width (minimum): [_____] mm
- Pitch: [90] °

External sheets: [_____].
- Manufacturer: [Contractor to submit for approval].
- Product reference: [Contractor to submit for approval]
profile depth : 25mm
overall width : 700mm including lap
horizontal joints : lap joints or with a special profile
vertical joints: to manufacturer's recommendations
profile length: max. 4m
laying direction : horizontal
corner/head: To manufacturer's recommendations
bottom profile: to manufacturer's recommendations ].
- Material: [Zinc alloy].
- Thickness (nominal): [1.0mm].
- Finish side 1 (outer): [Pre-weathered PRO].
Colour: [Contractor to submit for approval].
- Finish side 2 (inner): [-].
Colour: [Contractor to submit for approval].
- Other requirements: [-].

Accessories: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching.].

Primary cladding/ covering sheet fasteners: [in accordance with the manufacturer's recommendations with suitable self drilling/self tapping stainless steel screws or pop rivets secured to a load bearing support structure].
- Fastener profile location: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].
- Number of fasteners per sheet width:
Eaves and end laps: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].
Intermediate supports: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].

End laps size (minimum): [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching] mm.

Sealing laps:
- End laps: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].
- Side laps: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].

Stitching laps:
- End laps: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].
- Side laps: [Consult with Rheinzink UK for recommendations and details on fastenings, fasteners, laps and stitching].

Spacers: [Consult with Rheinzink UK for recommendations and details on fastenings, fasteners, laps and stitching].
- Fasteners: [Consult with manufacturer for recommendations and details on fastenings, fasteners, laps and stitching].

Breather membrane: As clause 280.

Thermal insulation: [80 mm Rainscreen board- Contractor to submit for approval ].

Vapour control layer: [as clause 200].

Acoustic insulation: [Contractor to submit for approval].

- Lining sheets: [Contractor to submit for approval].
- Special features: [Contractor to submit for approval].

GENERAL REQUIREMENTS

170 DESIGN

- Cladding/ covering system: Complete detailed design and submit before commencement of fabrication.
  - Standard: To BS 5427-1.
- Related works: Coordinate in detailed design.

172 THERMAL PERFORMANCE/ BRIDGING

- Requirement: Complete thermal design of the cladding/ covering system to avoid excessive thermal bridging.
  - Standard: MCRMA Technical Paper No 14.

175 PRODUCT SAMPLES

- General: Before commencing detailed design, submit labelled samples of the following: [trapezoidal panel type T 25/88-700 ].

176 FASTENER SAMPLES

- General: During detailed design, submit labelled samples of each type of fastener.

DESIGN/ PERFORMANCE REQUIREMENTS

185 PERFORMANCE COMPLIANCE

- Verification: Before commencing fabrication, submit evidence based on laboratory testing or computer modelling.
  - Verifying authority: [].

187 DEFLECTION OF METAL CLADDING/ COVERING

- Roof covering: Maximum permitted deflection under distributed loads as a multiple of span and due to:
  - Dead load: [n/a].
  - Dead and imposed loads: [n/a].
  - Dead and wind loads: [n/a].
- Wall cladding: Maximum permitted deflection under distributed loads as a multiple of span and due to:
  - Dead and wind loads: [L/120 and in accordance with the structural engineers recommendations].

196 INTEGRITY OF CLADDING/ COVERING

- Requirement: Determine profiles, sizes and thicknesses of sheets, the sizes, number and spacing of fixings, configuration and location of spacer systems and incorporation of other accessories and fittings to ensure cladding/ covering system must resist factored dead, imposed and design live loads, and accommodate deflections and thermal movements without damage, in accordance with BS 5427 -1.
- Primary fasteners: Not to be subjected to any bending moment.
- Wind loads: Calculate to BS 6399-2, Standard Method and BS 5427-1 appropriate to location, exposure, height, building shape and size, taking account of existing and known future adjacent structures.
- Imposed roof load (no access): As determined from BS 6399 -3 and BS 5427 -1.
- Permanent imposed roof loads: [not applicable].
- Temporary imposed roof loads: [not applicable].
- Impact loads: To BS 8200:
  - Location and category: [roof garden/balcony C].

198 WATER PENETRATION

- Requirement: Under site exposure conditions, moisture must not penetrate onto internal surfaces, or into cavities not designed to be wetted.

200 AVOIDANCE OF INTERSTITIAL CONDENSATION

- Requirement: Determine interstitial condensation risk of cladding/ covering system using

the method described inBS 5250 Appendix D. If necessary, provide a vapour control layer to ensure that damage and nuisance from interstitial condensation does not occur.

- Outdoor psychrometric conditions (notional): To BS 6229, table 6 as follows:

| | Winter | Summer |
|---|---|---|
| - Temperature | -5°C | 18°C |
| - Relative humidity | 90% | 65% |
| - Vapour pressure | 0.361 kPa | 1.341 kPa |

- Indoor psychrometric conditions (notional): As follows:
  - Temperature: [20] °C.
  - Relative humidity: [55] %
  - Vapour pressure: [1.285] kPa.
- Calculated amount of winter interstitial condensate: Not to exceed [0.5] kg/m².
- Calculated annual net condensate retention: Not greater than 5% of winter condensate.
- Vapour control layer provision: As clause [261].

202 AVOIDANCE OF SURFACE CONDENSATION

- Requirement: Determine surface condensation risk of cladding/ covering system using the method described in BS EN ISO 13788. If necessary, revise thermal insulation to provide satisfactory temperature factor (fmin). ensure that damage and nuisance from surface condensation does not occur.

FIXING CLADDING/ COVERING

215 PAINTING STRUCTURE

- Sequence: Paint outer surface of supporting structure before fixing cladding/ covering.

219 FASTENERS

- Non specified fasteners: Recommended for the purpose by the cladding/ covering manufacturer.

221 FITTINGS AND ACCESSORIES

- Non specified fittings and accessories: Recommended for the purpose by the cladding/ covering manufacturer.

223 PREVENTION OF ELECTROLYTIC ACTION

- Isolating tape: Type recommended by cladding/ covering manufacturer.
  - Location: To contact surfaces of supports and sheets of dissimilar metals.

261 VAPOUR CONTROL MEMBRANE

- Material: [1000 gauge polyester reinforced virgin polythene].
  - Vapour resistance (minimum): [500] MNs/g.
- Continuity: No breaks and with the minimum of joints.
  - Penetrations and abutments: Seal to vapour control membrane with tape. Achieve full bond.
  - Laps: Not less than 150 mm, seal with tape. Achieve full bond.
- Tape: Double sided sealant with vapour resistivity not less than the vapour control membrane.
  - Size (width and thickness): [15mm wide, 2 mm thick].
- Repairs and punctures: Seal with lapped patch of vapour control membrane and continuous band of sealant tape along edges

280 BREATHER MEMBRANE

- Standard: To BS 4016, type 3.
- Manufacturer: [Contractor to submit for approval].
  - Product reference: [Contractor to submit for approval].
- Continuity: No breaks. Minimise joints.
  - Penetrations and abutments: Attach to breather membrane with tape. Achieve full bond.
  - Laps: Not less than 150 mm, bond with tape. Achieve full bond.
- Tape: As recommended by breather membrane manufacturer.
- Repairs: Lapped patch of breather membrane material secured with continuous band of tape on edges.
- Junctions at flashings, sills, gutters etc. Overlap and allow free drainage to exterior.

310 PURPOSE MADE COLD FORMED METAL ACCESSORIES

Material: [zinc alloy].

- Thickness/ gauge: [to manufacturer's recommendations].

- Finish/ Colour: [pro weathered].

Fasteners:
- Type: [(to manufacturers recommendations].
- Location: [(to manufacturers recommendations].
- Fixing centres: [(to manufacturers recommendations] mm.

410 FIXING SHEETS GENERALLY

Cut sheets and flashings: To give clean true lines, with no burrs.

Penetrations: Cut openings to minimum size necessary.
- Edge reinforcement: [(to manufacturers recommendations].

Sheet orientation: Lay with exposed joints of side laps away from prevailing wind unless shown otherwise on drawings.

Sheet ends, laps and raking cut edges: Fully supported and with fixings at top of lap.

Fasteners: Drill holes. Position at regular intervals in straight lines, centred on support bearings.
- Oversized drilled holes: Position fasteners centrally.
- Fasteners torque: Sufficient to correctly compress washers.

Debris: Remove dust and other foreign matter before finally fixing sheets.

Completion: Check fixings to ensure watertightness and that sheets are secure.

Cut edges: Paint to match face finish.

460 ACCOMMODATION OF THERMAL MOVEMENT

Sheet type/ location: [Contractor to submit for approval].

Method: [(to manufacturers recommendations].

470 STRUCTURAL MOVEMENT JOINTS

Type: Cover flashing fixed on one side over gap between sheets.

Location: Coincident with structural movement joint.

Width of gap: To match structural movement joint requirements.

Requirement: Weathertight.

480 FLASHINGS/ TRIMS GENERALLY

Lap joint treatment:
- Vertical and sloping flashings/ trims: End laps to be same as for adjacent sheeting.
- Horizontal flashings/ trims: End laps to be 150 mm, sealed and where possible arranged with laps away from prevailing wind.

Method of fixing: To structure in conjunction with adjacent sheeting. Otherwise to sheeting.
- Fasteners: [(to manufacturers recommendations].

481 FLASHINGS/ TRIMS

Locations: [bottom, head, window reveals].

Fasteners: [(to manufacturers recommendations].

482 BUTT JOINTED FLASHINGS/ TRIMS

Locations: [subject to detail design].

Butt straps: 300 mm wide and made from sheet of same material and finish.

Butt joints: Seal.

540 ABUTMENTS

Junctions with flashings: Weathertight and neatly dressed down.

550 SEALING LAPS ON EXTERNAL SHEETS

Sealant tape: Types recommended by sheet manufacturer.
- Position: Below fixing positions in straight unbroken lines, parallel to and slightly back from edge of sheet.

Seal quality: Effective, continuous and not overcompressed.

End laps: Sealant tape positions:
- Single line tape: Immediately below line of fasteners.
- Second line tape (where specified): Slightly set back from edge of external sheet.

- Side laps: Sealant tape positions:
  - Single line tape: Outside line of fasteners.
  - Second line tape (where specified): On other side of fasteners.

## H65 Single lap roof tiling

To be read with Preliminaries/ General conditions.

TYPES OF TILING

115 CONCRETE ROOF TILING GENERALLY

- Substrate: Rafters at 600 mm.
- Pitch: 33° & 43°.
- Underlay: Vapour permeable. Vapour resistance<0.25MNs/g-1.
  - Recycled content: Contractor's choice.
  - Direction: Parallel to eaves.
  - Head-lap (minimum): 100 mm.
- Battens:
  - Size: 50 x 35mm.
  - Fixing: To BS EN 1991-1-4.
- Tiles: To BS EN 490, interlocking.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Colour: As selected by Architect, profile and appearance, as selected by Architect.
    Submit proposals for approval.
  - Size: 420x334mm.
  - Recycled content: Contractor's choice.
  - Head-lap: As recommended by tile manufacturer.
  - Fixing:
    Fixing of local areas: As recommended by tile manufacturer.
    Fixing of general areas: As recommended by tile manufacturer.
- Accessories: Sealant to underlay at ventilator tiles.

TILING GENERALLY

210 BASIC WORKMANSHIP

- General: Fix tiling and accessories to make the whole sound and weathertight at earliest opportunity.
- Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
- Fixings for accessories: As recommended by tile manufacturer.
- Gutters and pipes: Keep free of debris. Clean out at completion.

240 UNDERLAY

- Handling: Do not tear or puncture.
- Laying: Maintain consistent tautness.
- Vertical laps (minimum): 100 mm wide, coinciding with supports and securely fixed.
- Fixing: Galvanized steel, copper or aluminium 20 x 3 mm clout head nails.
- Eaves: Where exposed, underlay must be BS 8747, Annex B, Type 5U, or an equivalent UV durable type.
- Penetrations: Use proprietary underlay seals or cut underlay to give a tight, watertight fit around pipes and components.
- Ventilation paths: Do not obstruct.

245 BATTENS/ COUNTERBATTENS - TREATED

- Timber: Sawn softwood.
  - Species: To BS 5534, clause 4.12.1.
  - Permissible characteristics and defects: Not to exceed limits in BS 5534, annex C.
  - Grading: Factory pre-graded with site grading of knots and wane.
  - Moisture content at time of fixing and covering (maximum):22%.
- Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
  - Type: Organic solvent.

265 BATTEN FIXING

- Setting out: Align parallel to ridge in straight horizontal lines to gauge of the tile. Align on adjacent areas.
- Batten length (minimum): Sufficient to span over threesupports.
- Joints in length: Square cut. Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
- Additional battens: Provide where unsupported laps in underlay occur between battens.
- Fixing: Each batten to each support. Splay fix at joints in length.

275 TILE FIXING

- Setting out: Lay each course with tails aligned.
- Ends of courses: Use special tiles to maintain bond and to ensure that cut tiles are as large as possible.
- Perimeter tiles: Fix tiles in eaves and top courses, and at verges, abutments and each side of valleys and hips.
- Nail fixed tiles: Use nails recommended by tile manufacturer. Fix through every hole.
- Clip fixed tiles: Use clips recommended by tile manufacturer.

280 LOCAL AND GENERAL FIXING AREAS

- Definitions:
  - Local areas: Bands of tiling around edges or obstructions of each plane of the roof. Calculate extent of each band in accordance with BS 5534, section 5.
  - General areas: Remaining areas of roof tiling.

290 MORTAR BEDDING/ POINTING

- Mortar: As section Z21, 1:3 cement:sand, with plasticizing admixtures permitted.
  - Bond strength providing resistance to uplift: To BS 5534.
- Weather: Do not use in wet or frosty conditions or when imminent.
- Preparation of tiles and accessories to be bedded: Wet and drain surface water before fixing.
- Appearance: Finish neatly as work proceeds and remove residue.

EDGES/ JUNCTIONS/ FEATURES

305 GENERALLY

- Fittings and accessories: As recommended by tile manufacturer.Do not improvise.
  - Exposed fittings and accessories: To match tile colour and finish.
- Cut tiles: Cut only where necessary, to give straight, clean edges.
- Flashings: Fix with or immediately after tiling. Formneatly.

325 FIRE SEPARATING WALLS

- Separating walls: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide fire stopping.
- Boxed eaves: Completely seal air paths in plane of separating wall with wire reinforced mineral wool, not less than 50 mm thick, fixed to rafters and carefully cut to shape to provide fire stopping.

355 VENTILATED EAVES - SEPARATED GRILLES/TRAYS

- Fascia grilles:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
- Ventilator trays:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Fix to provide free passage of air over insulation.
- Underlay support: Treated timber tilting fillet.
  - Continuous to prevent water retaining troughs.
- Gutter: Dress underlay or underlay support tray to form drip into gutter.
- Eaves filler units for profiled tiles: Fix to close underside of first coursetiles.
- First course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

445 MORTAR BEDDED VERGESWITH BEDDED UNDERCLOAK

- Underlay: Carry 50 mm onto outer leaf of gable wall and bed on mortar.
- Undercloak: Fibre cement sheet.
  - Position: Over underlay, level with underside of tiling battens,sloping towards verge.
  - Projection: 38-50 mm, beyond face of Finished wall.
  - Bedding: On mortar identical to that used in gable walling.
- Tiling battens: Carry onto undercloak by not less than 50 mm.
- Verge clips: Fix to every tiling batten.
- Verge tiles:
  - Bedding: Flush with undercloak on 75 mm wide bed of mortar.
  - Fixing: Do not displace or crack mortar.

620 VALLEYS

- Underlay: Cut to rake. Dress over tilting fillets to lap onto valley. Do not lay under lead.
  Roof tiles: Cut adjacent tiles to fit neatly.
  - Bedding: On mortar on fibre cement undercloaks laid loose each side of valleys.
  - Valley width between tiles: 100 mm.

660 SIDE ABUTMENTS

- Underlay: Turn up not less than 100 mm at abutments.
- Abutment tiles: Cut as necessary. Fix close to abutments.

675 TOP EDGE VENTILATED ABUTMENTS

- Underlay: Provide air gap at abutmentas recommended by ventilator manufacturer.
- Abutment ventilator:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.

690 ROOF WINDOWS

- Underlay: Turn up not less than 100 mm at window surrounds under integralflashings.
- Roof tiles: Cut as necessary and fix closely all round.

740 MORTAR BEDDED RIDGES

- Underlay: Lay courses over ridge.
  - Overlap (minimum): 150 mm.
- Ridge tiles:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Bedding: On mortar, continuous to edges and solid to joints.
  - Fixing: Where rigid masonry walls support or abut ridge secure ridge tiles within 900 mm of such walls to ridge boards or supplementary ridge battens with self-sealing non- ferrous fixings.
  - Gable end ridge tiles: Fill ends with mortar and slips of tiles finished flush.
- Ridge terminals:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.

840 VENTILATOR TILES

- Ventilator tiles:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Requirement: To ventilate roofvoid.
  - Positions: In second top tile course.

850 ROOF SLOPE TERMINALS

- Ventilator tiles:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Connect to soil and vent pipes.

# H71 Lead sheet coverings/ flashings

To be read with Preliminaries/ General conditions.

TYPES OF LEADWORK

420 COVER FLASHINGS TO ASPHALTED FLAT ROOFS

- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 100 mm.
  - Cover: Overlap to upstand of not less than 75 mm.
- Fixing: Lead wedges into bed joint, clips to lead upstand at laps and 500 mm centres.

430 COVER FLASHINGS TO ROOFLIGHTS

- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 100 mm.
  - Overlap to upstand: Not less than 50 mm.
  - Cover to roof: Not less than 75 mm.
- Fixing: Nail top edge at 150 mm centres and welt edge. Clips to lead upstand at laps and 500 mm centres.

458 STEP AND COVER FLASHING WITH SECRET GUTTER AT SIDE ABUTMENTS

- Lead step and cover flashing:
  - Thickness: 2.00 or 2.24 mm (Code 5).
  - Dimensions:
    Lengths: Not more than 1500 mm.
    End to end joints: Lap of not less than 100 mm.
    Upstand: Not less than 85 mm with overlap to gutter lining upstand of not less than 65 mm.
    Cover to roof: Not less than 150 mm.
  - Fixing: Lead wedges at every course and clips at not more than 500 mm centres along free edge.
- Lead secret gutter lining:
  - Thickness: 2.00 or 2.24 mm (Code 5).
  - Dimensions:
    Lengths: Not more than 1500 mm.
    End to end joints: Laps of not less than 150 mm.
    Upstand: Not less than 65 mm above tiles.
  - Fixing: Dress into secret gutter and form a welted edge at side to be tiled. Nail top edge of each sheet. Dress bottom end neatly into eaves gutter.

471 FLASHINGS PREFORMED LEAD SLEEVES (SVP PIPES ETC)

- Manufacturer: Submit proposals.
- Lead:
  - Thickness:1.75 or 1.80 mm (Code 4)
  Preparation: [Base flange to be primed with bitumen primer]
- Dimensions:
  Diameter as required to suit individual pipes. Height must be a minimum of 150mm, but extend to the top of the pipe and either be turned into the pipe (larger metal pipes) or feature a separate lead weathering trim that is fitted tightly to the rim of the pipe and extending down a minimum of 23mm both inside and outside the pipe.

480 LEAD SLATES

- Manufacturer: Submit proposals.
- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Base: Not less than 400 x 400 mm.

GENERAL REQUIREMENTS/ PREPARATORY WORK

510 WORKMANSHIP GENERALLY

- Standard: To BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
- Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
- Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
- Preforming: Measure, mark, cut and form lead prior to assembly wherever possible.
- Marking out: With pencil, chalk of crayon. Do no use scribers or other sharp instruments without approval.
- Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
- Solder: Use only where specified.
- Sharp metal edges: Fold under or remove as work proceeds.
- Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
  - Protection: Prevent staining, discolouration and damage by subsequent works.

515 LEADWELDING

- In situ leadwelding: Not permitted.

610 SUITABILITY OF SUBSTRATES

- Condition: Dry and free of dust, debris, grease and other deleteriousmatter.

640 TIMBER FOR USE WITH LEADWORK

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content: Not more than 22% at time of fixing and covering. Give notice if greater than 16%.
- Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Commodity Specification C8.

FIXING LEAD

710 FIXINGS

- Nails to timber substrates: Copper clout nails to BS 1202-2, or stainless steel (austenitic) clout nails to BS 1202-1.
  - Shank type: Annular ringed, helical threaded or serrated.
  - Shank diameter: Not less than 2.65 mm for light duty or 3.35 mm for heavy duty.
  - Length: Not less than 20 mm or equal to substrate thickness.
- Screws to concrete or masonry substrates: Brass or stainless steel to BS 1210, tables 3 or 4.
  - Diameter: Not less than 3.35 mm.
  - Length: Not less than 19 mm.
  - Washers and plastic plugs: Compatible with screws and lead.
- Screws to composite metal decks: Self tapping as recommended by the deck and lead manufacturer/ supplier for clips.

715 CLIPS

- Manufacturer: Submit proposals.
- Material:
  - Lead clips: Cut from sheets of same thickness/ code as sheet beingsecured.
  - Copper clips:
    Thickness: 0.60 mm.
    Temper: BS EN 1172, designation R220 in welts, seams and rolls, R240 elsewhere; dipped in solder if exposed to view.
  - Stainless steel clips:
    Thickness: 0.46 mm.
    Grade: BS EN 10088, 1.4301(304) terne coated if exposed to view.
- Dimensions:
  - Width: 50 mm where not continuous.
  - Length: To suit detail.
- Fixing clips: Secure each to substrate with either two screw or three nail fixings not more than 50 mm from edge of lead sheet. Use additional fixings where lead downstands exceed 75 mm.
- Fixing lead sheet: Welt clips around edges and turn over 25 mm.

770 WEDGE FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/chase.
  - Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: Contractor's choice.
  - Application: As section Z22.

780 WEDGE FIXING INTO DAMP PROOF COURSE JOINTS

- Joint: Rake/ cut out under damp proof course to a depth of not less than 25 mm.
- Lead: Dress lead into joint.
  - Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: Submit proposals.
  - Application: As section Z22.

JOINTING LEAD

880 WELTEDJOINTS

- Joint allowance: 50 mm overlap and 25 mm underlap.
- Copper or stainless steel clips: Fix to substrate at not more than 450 mm centres.
- Overlap: Welt around underlap and clips and lightly dress down.

970 PATINATION OIL

- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Location: Flashings above slate roofs.
- Application: As soon as practical, apply a smear coating to lead, evenly in one direction and in dry conditions.

# H72 Aluminium strip/ sheet coverings/ flashings

To be read with Preliminaries/ General conditions.

TYPES OF ALUMINIUM WORK

420 COVER FLASHINGS GENERALLY

- Aluminium: Coated sheet/ strip.
  - Alloy designation: EN AW-1050A.
  - Temper: H12.
  - Finish: Polyester powder coated, minimum dry film thickness: 60 microns. Colour: RAL colour to be agreed by the Architect.
  - Thickness: 1.0mm.
- Dimensions:
  - Lengths: Not more than 2 m, with end to end joints lapped not less than 100 mm.
  - Cover to roofing upstand: Not less than 75 mm, with bottom edge welted 15 mm.
- Fixing: Aluminium wedges into bed joint, clips to bottom edge, at laps and 450 mm centres.

480 MISCELLANEOUS FLASHINGS SILLS

- Aluminium: Coated sheet.
  - Alloy designation: EN AW-1050A.
  - Temper: H12.
  - Finish: Polyester powder coated, minimum dry film thickness: 60 microns. Colour: RAL colour to be agreed by the Architect.
  - Thickness (minimum): 2.0mm.
- Additional requirements: [
  - Closed ends
  - Sills formed and folded as one complete piece without joints or welded elements
  - Solid plastic underlay support as clause 635].

490 PERFORATED SOFFIT CLADDING PANELS TO BALCONIES

- Aluminium: Coated sheet.
  - Alloy designation: EN AW-6082.
  - Temper: T6.
  - Finish: Polyester powder coated, minimum dry film thickness: 60 microns. Colour: RAL colour to be agreed by the Architect.
  - Thickness (minimum): 3.0mm.
- Additional requirements: [
  - Panels formed and folded as one complete piece without joints or welded elements
  - Folded returns all 4 sides
  - 6.3mm & 19.3mm diameter perforations, factory cut before powdercoating].

GENERAL REQUIREMENTS/ PREPARATORY WORK

512 WORKMANSHIP GENERALLY

- Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
- Operatives: Trained in the application of aluminium coverings/ flashings. Submit records of experience on request.
- Folding: Factory folded using mechanical or manual presses to give straight, regular and tight bends, leaving panels free from ripples, kinks, buckling and cracks.
- Folding/bending on site - not permitted.
- Finished aluminium work: Fully supported, adequately fixed to resist wind uplift and able to accommodate thermal movement without distortion or stress.
  - Protection: Prevent staining, discolouration and damage by subsequent works.

515 WELDING

- In situ welding: Not permitted.

565A MOCK-UP

- General: At an agreed stage construct a mock-up as follows:
  One complete sill, one complete balcony soffit and one complete wall cladding panel
- Purpose To agree standard of workmanship.
- Inspection: Arrange to be carried out. Obtain approval of appearance before proceeding.
  Retain mock-up in undisturbed condition until completion of aluminium installation.

610 SUITABILITY OF SUBSTRATES

- Condition: Dry and free of dust, debris, grease and other deleterious matter.

635 SOLID RECYCLED PLASTIC BOARD UNDERLAY [TO SILLS & ZINC FASCIAS]

- Recycled content: [100% recycled plastic].
- Material: [Any one or a mix of LDPE/HDPE/PP].
  - Composition: [Solid core, through coloured].
- Finished size: [175 x 18mm].
  - Length: [As per Architect's drawings].
- Colour: [Black].
- Methods of fixing and fasteners: [As section Z20].

## J15 Membranes & Airtightness

To be read with Preliminaries/General Particulars

AIRTIGHTNESS CONSTRUCTION, PRODUCTS, TESTING
The buildings must be constructed to be airtight, in excess of the standard specified in Technical
Guidance Document Part L (2007).

1. The Building Contractor must arrange for Air leakage testing to be carried out by specialist contractor in two stages, one during construction, when windows, doors and apartments can be initially sealed, and one on completion of the units prior to handover.

Individual units to be identified randomly by architect at each stage, and each stage test must be carried out in different apartments. A total of 60 air leakage tests to be carried out on different apartments / houses, and failed air leakage tests must be corrected at the contractors risk & expense.

All dwellings must pass the air leakage testing regime.

2. Air tightness tests must be carried out in line with IS EN 13829:2001(1), and the relevant clauses of Technical Standard Number 1 of the Airtightness Testing and Measurement Association (www.attma.org). The air tightness test result must be expressed as an Air Permeability (units m3/h/m2 of total surface area @ 50 Pa).

Air Permeability must not exceed 3 m3/h/m2 @ 50 Pa. The number of tests to be carried out must not be less than set out in Building Regulations 2007 Technical Guidance Document L (Paragraph 1.5.4.2 and following).

AIRTIGHTNESS ASSESSMENTS

Pre-emptive airtightness quality assessments must be carried out before finishes are applied (i.e. plasterboard, skim plaster), by depressurization or pressurization (i.e.A blower door test). This test must be overseen by a trained airtightness installer/supervisor.

The following conditions must be met during the test:
External envelope must be complete when the test is carried out. Internal doors must be wedged open. All doors, windows and fixed vents must be closed throughout the test. Mechanical ventilation systems must be temporarily sealed. Drains and water traps must be filled with water. Any areas of temporary sealing or other deviations from the standard test procedure to be recorded in the test report.

If the building air leakage rate is greater than specified (3 m3/h/m2 @ 50 Pa) the contractor must take appropriate remedial action before further work is carried out..

Further investigations include a site audit of the air tight envelope while de-pressurised, localised smoke leakage test, full scale smoke leakage test, thermographic survey, reductive sealing of components and building areas / elements to record their contribution.

Further tests must be carried out until the air permeability is not greater than 3 m3/h/m2 @ 50 Pa. The contractor must bear the cost of all air tightness works, tests and any remedial works. The contractor must operate a Quality Management System for airtightness. An airtightness supervisor (e.g. site foreman) must be appointed early in the construction process and he must be familiar with key details for airtightness.
AIRTIGHTNESS MATERIALS

Airtightness barriers, tapes and accessories must be used to ensure the required air permeability is achieved. These must be fitted in accordance with architects drawings and manufacturer's recommendations.

In general, airtightness barriers, tapes and accessories must be:

1. Made of air impermeable material
2. Continuous
3. Of sufficient strength
4. Long lasting and must not dry out or crack
5. Glue must be waterproof and be able to perform when exposed to high humidity on site
6. Able to accommodate movement of structuralelements
7. Easily applied in areas difficult to access
8. Durable and accessible for maintenance or replacement
9. Simple for the installer to use

GROUND FLOORS
Ground floors are in-situ concrete on radon barrier membranes, and do not require further airtightness measures. The radon barrier must be lapped into the wall dpc as specified.

INTERMEDIATE CONCRETE FLOORS
Intermediate concrete floors are reinforced concrete, and do not need further airtightness measures. Wall plaster must extend fully up to soffit and down to top of intermediate reinforced concrete floor slabs.

INTERMEDIATE TIMBER FLOORS, INTERMEDIATE TIMBER CEILINGS
Intermediate timber floors and ceilings do not need to be airtight. However, the airtightness of the external wall must not be compromised by the construction of the floor or ceiling.

Floor and ceiling joists must be supported on joist hangers. An airtight membrane must be built into walls at the joint where hangers are fitted, one layer under and a second over the hanger. The edges of these membranes must be covered with expanded metal strips to provide a key for the wall plaster. All to be constructed in accordance with architects drawings and manufacturer's recommendations.

WALLS
Blockwork walls are airtight only when plastered. Plaster all external walls continuously with at least 20mm plaster layer from concrete floor to GF ceiling and from first floor, floor, to first floor ceiling, etc. Ensure airtight junctions with ceiling airtightness membranes and with membranes at timber floor joists. All external walls to be plastered before internal stud partitions are erected to reduce potential air leakage between internal stud and external block wall.

AIRTIGHT SEALING TAPE FOR PLASTER:
Type: [Split back high performance fleece laminated tape. Expandable synthetic base material with acrylate adhesive].
Size: [0.5mm thick (minimum) x 80mm (minimum) wide].
Temperature resistance: [-40 °C to +90 °C].
Accessories/features: [Suitable for plastering over].
Other requirements: [All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer].

AIRTIGHT SEALING TAPE: [GENERALLY]
Type: [Split back high performance fleece laminated tape. Expandable synthetic base material with acrylate adhesive].
Size: [0.5mm thick (minimum) x 60mm (minimum) wide].
Temperature resistance: [-40°C to +90°C].
Accessories/special features: [Suitable for plastering over].
Other requirements: [All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer].
AIRTIGHT SEALING TAPE FOR EXTERNAL WINDOWS DOORS AND ROOFLIGHTS:
Type: [Split back high performance fleece laminated tape. Expandable synthetic base material with acrylate adhesive].

Size: [0.5mm thick (minimum) x 60mm wide (minimum)].

Sd value (minimum): [2.8m].
Temperature resistance: [-40°C to+90°C].
Accessories / Special features: [Suitable for plastering over].
Additional requirements: [All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer]

AIRTIGHT VAPOUR CONTROL LAYER TO CEILINGS UNDER TIMBER ROOFS:
Standard: To EN 13984
Type: [Composite polypropylene fleece].
Thickness: [0.5mm nominal].
Sd value: [2m minimum / 10m maximum].
Reaction to fire: [Class E].
Temperature resistance: [-40°C to +80°C].
Fixing: [The membrane, and junctions with other materials, must be constructed in accordance with architects drawings and manufacturer's recommendations. VCL membrane to be overlapped a minimum of 100mm at joints and sealed with airtight tape].
Other requirements: [
All service penetrations to be sealed using a highly malleable 60mm wide high performance airtight tape with PE base material with a polyester fabric reinforcement and acrylate adhesive
Where VCL membrane must be sealed to external block walls, it must be lapped down external walls (approx 80mm). A strip of expanded metal must be fixed in front of the VCL membrane. Plaster coat to be applied over thmust achieve an airtight connection between the walls and the roof. All of above to be in accordance with architects drawings and manufacturer's recommendations].

OPENINGS
Where services penetrate the airtightness membrane or the inner leaf, voids must be kept to a minimum and sealed with an appropriate product.

AIRTIGHT SEALING TAPE TO PIPE PENETRATIONS:
Type: [Highly flexible butyl rubber tape with adhesive on one side].
Size: [2mm thick (minimum) x 80mm (minimum) wide].
Temperature resistance: [-40 °C to +100 °C].
Accessories/features: [Suitable for plastering over].
Other requirements: [All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer].
Execution: Cut to a suitable length and press back in and around the pipe penetration.

AIRTIGHT SEALING PASTE TO CONDUIT PENETRATIONS:
Type: [Acrylate polymer paste].
Temperature resistance: [-30 °C to +60 °C].
Other requirements: [All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer].
Execution: All conduits to be plugged in accordance with manufacturers recommendations. Ends of conduits to be embedded 360 degrees just above socket/light box.

ELECTRICAL SOCKETS AND SWITCH BOXES
Where inner leaf blockwork is chased for electrical conduit, the chase must be kept to a minimum depth and the conduit must be covered by the full depth of the wall plaster. W here inner leaf blockwork is chased for electrical back boxes, the depth of the chase must be kept to the minimum and the back of the chase must be plastered with 12mm sand and cement scratch coat. The back box is then fitted on top of the plaster.

ROOFING SLATING MEMBRANE
- Vapour permeable underlay to EN 12311.
- Weight (minimum) 145g/m².
- Vertical laps (minimum): 100mm, coinciding with supports
- Horizontal laps (minimum): 100mm.
- 150mm minimum overlap at ridge.

- Agrément certified.

- Fixings: galvanized, sherardized or stainless steel large head nails or stainless steel staples. Maintain consistent tautness.
- Eaves detail: fit PVC underlay support tray to BS 8747 Annex B, type 5U, or equivalent UVdurable type. Slate overhang to be 45mm to 55mm.

# J21 Mastic asphalt roofing/ insulation/ finishes

To be read with Preliminaries/ General conditions.

TYPES OF COATING/ PAVING

140 COLD DECK ROOF COATING TO CARPARK ROOF
- Substrate: Concrete deck with screed to falls.
  - Preparation: None required.
- Separating layer (loose laid): Glass tissue fleece, 50-70 g/m².
  - Laps (minimum): 50mm.
- Coating: Polymer modified mastic asphalt.
  - Application: 20mm nominal thickness in two coats.
- Surface protection: Sedum roof, stone ballast and mineral faced cap sheet.
- Accessories: None required.

190 SKIRTINGS/ VERTICAL WORK GENERALLY
- Substrate: Brickwork.
  - Preparation: High bond primer.
- Separating layer: Not required.
- Keying: Not required.
- Coating: Polymer modified mastic asphalt.
  - Application: 18mm nominal thickness in three coats.
  - HeiGht above finished roof level (minimum): To exceed depth of growing medium by 150mm.
  - Fillet profile: 45° angle, 40 mm minimum width on face.
- Surface protection: Mineral surfaced bituminous capsheet, torch applied.
- Accessories: None required.

PERFORMANCE

210 ROOF PERFORMANCE
- General: Secure, free draining and weathertight.

PRODUCTS

322 PRIMER TO SKIRTINGS/VERTICAL WORK AND PIPES
- Type: High bond bitumen primer as recommended by mastic asphalt manufacturer.

341 PREFORMED SLEEVES, TRIMS, ETC
- Type: 0.6 mm galvanized steel flanged sleeve.
- Size: 110x150mm upstand.

342 PIPE SLEEVES
- Material: Lead.
- Thickness: 1.75 or 1.80mm (Code 4).

401 SEPARATING LAYER (LOOSE LAID)
- Type: Glass tissue fleece, 50-70 g/m².
  - Laps (minimum): 50mm.

403 MASTIC ASPHALT (ROOFING)

- Type: Polymer modified.
  - Application: 20mm nominal thickness in two coats.
- Water Vapour Resistivity: >100,000 MNs/g
- Fire Performance (External fire exposure roof test): [FAA designated when tested to BS476 -3: 2004 or equivalent]
- Additional requirements: [
  - Manufactured to EN ISO 9000 (Quality Assurance)
  - Agrément Certified].

455 SAND FOR RUBBING

- Type: Clean, coarse sand from natural deposits, free from loam.
  - Size: Passing a 600 micrometre sieve and retained on a 212 micrometre sieve.

491 MINERAL FACED CAP SHEET

- Type: 3 layer APP modified bitumen polyester .
- Performance to EN 12311:

-Tensile strength (longitudinal): 1300N minimum
-Tensile strength (transverse): 1000N minimum
-Elongation at break (longitudinal): 45% minimum
-Elongation at break (transverse): 45% minimum
Moisture resistance factor to EN 1931:>20000μ
Weight (minimum): 5.5kg/m².
Thickness (minimum): 4mm .

EXECUTION GENERALLY

510 ADVERSE WEATHER

- General: Do not lay mastic asphalt in wet or damp conditions unless effective temporary cover is provided over working area.
- Unfinished areas of the roof: Keep dry.

520 INCOMPLETE WORK

- Daywork joints in warm roofs and edges of phased roofing: Adequately protected andfully weathertight.

530 APPLYING PRIMERS

- Coverage per coat (minimum): 5m²/L.
- Surface coverage: Even and full.
- Coats: Fully bonded. Allow volatiles to dry off thoroughly between coats.

SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM DECK ROOF INSULATION

615 SUITABILITY OF SUBSTRATES

- Substrates generally:
  - Secure, even textured, clean, dry and frost free.
- Before laying asphalt ensure that the base must even falls with no areas which must pond.
- Preliminary work: Completed, including:
  - Chases (minimum): 25 x 25 mm.
  - External angles: Chamfered where required to maintain full thickness of mastic asphalt.
  - Formation of upstands and kerbs.
  - Grading to correct falls.
  - Movement joints.
  - Penetrations/ Outlets.
- Moisture content and stability of substrate: Must not impair integrity of roof.

642 KEYING TO VERTICAL/ SLOPING DENSE CONCRETE

- Surface preparation: Remove mould oil, clean and apply proprietary high bond primer or proprietary keying mix of cement:sand slurry incorporating a bonding agent.

645 KEYING TO NEW BRICKWORK

- Joints: Flush pointed. Ensure brickwork and joints are clean.
- Surface preparation: Apply high bond primer.Ensure that primer continues intochases. Allow to dry thoroughly before application of asphalt.

ASPHALTING

720 DELIVERY

- Condition of mastic asphalt as delivered to site:
  - Hot-prepared, do not remelt on site, or
  - Blocks: Remelt on site, mix thoroughly. Temperature of material (maximum), 230°C.

730 TRANSPORTING

- Transport distances: Minimize to avoid excessive cooling of molten mastic asphalt.
- Buckets, barrows or dumpers used for mastic asphalt: Line with minimum quantity offine inert dust. Use silica or similar acid resisting dust where acid resisting mastic asphalt is being used.

736 LOCALIZED HEATING

- Blowlamps and gas torches: Not permitted to be used, except for drying substrates.

745 LAYING MASTIC ASPHALT

- Standard: To BS 8218 or equivalent standard.
- Application:
  - In bays (generally not exceeding 1800mm wide) to even thickness.
  - Re-heated asphalt: Do not use.
  - Junctions between bays and fillets must be properly married: the laid asphalt being heated by the application of hot molten material, and the whole being worked so thatthe joints are neatly made.
- External angles, junctions and tuck-ins: Maintain full thickness of asphalt.
- Fillets at internal angles: Form solid fillets in all internal angles after cleaning andwarming with an asphalt poultice, fully fused to asphalt coating and not less than 40mm wide on face and at an angle of approximately 45 degrees to the horizontal.
- Previously laid coats: Protect whilst exposed.
- Successive coats:
  - Timing: Apply without delay and within same working period.
  - Coats: Apply at right angles to preceding.
  - Stagger joints between bays in consecutive coats (minimum): 150mm.
- Clean and heat the edges of previously laid coats by poulticing with hot asphalt. Remove and discard poultice and cut away edge to remove sand rubbed material before jointing. Lay new asphalt whilst poulticed surface is still hot.
- Ensure complete fusion of asphalt at all joints to give a continuous watertight membrane.
- Blowing: Pierce and make good affected areas while mastic asphalt is still atworking temperature.
- Completion: During final floating operation, whilst asphalt is still warm, apply sand to horizontal surfaces and rub in well using wooden float. Remove surplus material.
- Buckets used for carrying molten asphalt to be dusted with a fine inert dust. On no account must ashes or oil be used for this purpose.
- Surface condition at completion: Smooth and free from imperfections. Firmly adhered, weatherproof and free draining.

750 MASTIC ASPHALT SKIRTINGS AND VERTICAL WORK

- Top edge: Tuck into 25 x 25 mm continuous splayed chase or groove.
- External angles: Maintain full thickness of asphalt.
- Splayed top: Form to shed water away from substrate.

SURFACING

875 LAYING MINERAL FACED CAP SHEETS

- Setting out: Neatly, with carefully formed junctions.
- Face of capsheet: Do not mark, crease or stain.
- Ensure a neat bead of bitumen extrudes at all laps.

COMPLETION

915 INSPECTION

- Interim and final roof inspections: The waterproofing system must providefor manufacturer's weekly site inspections and reports for same.

930 FLOOD TEST TO PODIUM

- Condition of roof prior to testing:
  - Coating: Complete to a stage where integrity can be tested.
  - Surface: Clean.
- Outlets: Externally cover and seal. Protect against damage from water pressure using temporary kerbs. Do not use plugs to seal outlets.
- Flood levels: Submit proposals. In no case higher than kerbs.
- Flood duration: Two days.
- Inspection: Regular, to detect leaks.
- Completion of test: Slowly drain roof. Do not overload or flood outlets.
- Test results: Submit.

940 COMPLETION

- Roof areas: Clean.
  - Outlets: Clear.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed mastic asphalt roof coating: Do not damage. Protect from petroleumbased solvents and other chemicals, traffic and adjacent or high level working.

# J30 Liquid applied tanking/ damp proofing

To be read with Preliminaries/General Particulars

TYPES OF TANKING/ DAMP PROOFING

120 COLD APPLIED TANKING TO PLANTERS

- Substrate: Brickwork and concrete.
- Preparation: Brickwork to be levelled with application of cement slurry.
- Coating: Liquid asphaltic composition.
  - Application: Two coats; first coat 1.5 m²/L, second coat 2.5 m²/L.
- Additional requirements: Agrément certified.

EXECUTION

205 SUITABILITY OF SUBSTRATE

- Substrates generally:
  - Smooth, even textured, clean, dry and frost free.
  - Within tolerances for level and surface regularity.
  - Vertical and horizontal surfaces: Correctly prepared and free from irregularities.
- Curing period for concrete substrates (minimum): 7 days.
- Moisture content and stability of substrate: Must not impair integrity of finishedtanking/ damp proofing.
- Preliminary work: Complete including:
  - Chases.
  - External angles.
  - Formation of upstands and kerbs.
  - Movement joints.
  - Penetrations/ Outlets.

215 COATING APPLICATION

- Adjacent surfaces exposed to view in finished work: Protect.
- Coatings:
  - Apply in dry atmospheric conditions when substrate is dry.
  - Uniform, continuous coverage. Do not allow to pool in hollows.
  - Firmly adhered to substrate and free from imperfections.
  - Prevent damage to finished coatings.
- Penetrations: Impervious.

220 COLD APPLIED COATINGS

- Thinning: Not permitted unless recommended by manufacturer.
- Successive coats:
  - Allow to dry before applying next.
  - Apply at right angles to previous.

230 BITUMINOUS COATINGS

- Air and surface temperatures (minimum): 5°C.
- Weather conditions: Do not apply if there is a risk of rain during application and drying unless effective temporary cover is provided over working area.
  - Unavoidable wetting of construction or coatings: Minimize and make good damage.

COMPLETION

310 INSPECTION

- Interim and final inspections: Submit reports.

340 BACKFILLING TO EXTERNAL COATINGS

- Timing: Carry out as soon as possible after tanking and protection are complete.

## J40 Flexible sheet waterproofing/ damp proofing

TO BE READ WITH PRELIMINARIES/ GENERAL CONDITIONS AND ENGINEER'S SPECIFICATION

110 SOFT BLINDING TO HARDCORE BEDS

- Material: Soft sand.
  - Thickness (minimum): 50mm.
- Finish on completion: Smooth, consolidated bed free of sharp projections.

TYPES OF TANKING/ DAMP PROOFING

147 LOOSE LAID GAS RETARDANT DAMP PROOFING GENERALLY

- Substrate: Sand blinded hardcore to Engineer's Specification.
- Standard: To EN 13967.
- Type: High performance multi layered reinforced polyethylene membrane incorporating a gas resistant aluminium foil. Resistant to radon, methane and hydrocarbon.
  - Thickness/ Gauge: 0.4mm minimum.
  - Number of Layers (minimum): [six]
  - Aluminium foil gauge (minimum) [12µm]
  - Weight (minimum): [360g/m²]
  - Tear resistance: [>350N]
  - Moisture vapour transmission: [<0.03g/m²/day]
  - Radon Transmittance: [<1x10-9m/s]
  - Methane Transmittance: [<0.005ml/m²/h/atm]
- Joints:
  - Surfaces to be joined: Clean and dry beyond full width of joint.
  - Laps (minimum): 150mm.
  - Jointing: [Hot air welded or bonded with double sided tape as recommended by manufacturer].
  - Sealing: By means of welded joints. Gas resistant foil backed tape wheredouble-sided jointing tape is used.
- Accessories:
  - Reinforcing strips to corners & angles
  - Preformed collars with retention clips
  - Liquid tanking membrane
  - Protection boards.

191 POST APPLIED SELF-ADHESIVE GAS RETARDANT TANKING/DAMP PROOFING MEMBRANE

- Substrate: Concrete / blockwork.
- Type: [High performance self-adhesive multi layered reinforced polyethylene membrane incorporating a gas resistant aluminium foil].
- Standard: To EN 13967 or EN 13969
- Primer: Required, as clause 336.
- Number of layers: One.
- Thickness/ Gauge: 0.8mm minimum.
- Bonding: Full. Smooth out to exclude air.
- Joints:
  - Surfaces to be joined: Clean and dry beyond full width of joint.
  - Laps (minimum): Side and end laps 150mm.
  - Sealing: Roll to fully adhere.
- Accessories:
  - Reinforcing strips to corners & angles
  - Preformed collars
  - Liquid tanking membrane
  - Protection boards.

298 PRE-APPLIED GAS RETARDANT TANKING/DAMP PROOFING MEMBRANE

- Substrate: Sand blinded hardcore.
- Type: High performance flexible polyethylene.
- Standard: To EN 13967.
- Number of layers: One.
  - Thickness/ Gauge: 1.2mm minimum.
- Bonding to concrete: To form an integral and permanent bond to placed concreteto prevent water migration at the interface of the membrane and structural concrete.
- Joints: [Hot air welded or bonded by dual adhesive laps as recommended by manufacturer].
  - Surfaces to be joined: Clean and dry beyond full width of joint.
  - Laps (minimum): 150mm.
  - Sealing: By means of welded joints. Adhesive laps - roll membrane to fully adhere.
- Accessories:
  - Reinforcing strips to corners & angles
  - Preformed collars
  - Liquid tanking membrane.

## WORKMANSHIP

310 WORKMANSHIP GENERALLY

- Condition of substrate:
  - Clean and even textured, free from voids and sharp protrusions.
  - Moisture content: Compatible with damp proofing/ tanking.
- Air and surface temperature: Do not apply sheets if below minimum recommendedby membrane manufacturer.
- Condition of membrane at completion:
  - Neat, smooth and fully supported, dressed well into abutments and around intrusions.
  - Completely impervious and continuous.
  - Undamaged. Prevent puncturing during following work.
- Permanent overlying construction: Cover membrane as soon as possible.

325 INSPECTION

- Give notice: Before covering any part of membrane with overlying construction.
- Membranes to be inspected for damage, prior to concrete pour or installation ofprotection board. Repairs to be in accordance with manufacturers recommendations.

336 PRIMERS

- Type: A suitable and tested primer supplied by the same manufacturer as the membrane.
- Coverage per coat (minimum): As recommended for the purpose by membrane manufacturer.
- Application: [Brush or roller applied].
- Curing: Allow to dry thoroughly before covering.

345 COLD APPLIED BONDING COMPOUNDS

- Type and application: As recommended for the purpose by the membrane manufacturer.

350 ANGLES IN BONDED DAMP PROOFING/ TANKING

- Preformed rot proof fillet to internal angles:
  - Size (minimum): 50 x 50 mm, splay faced.
  - Bedding: Bitumen mastic or bonding compound.
- Reinforcing strip to all angles:
  - Material: As damp proofing tanking.
  - Width (minimum): 300 mm.
  - Timing: Apply before main sheeting.
- Dressing of main sheeting onto adjacent surfaces (minimum): 100 mm.

361 JUNCTIONS WITH DPCS/ CAVITY TRAYS

- Adjoining surfaces: Clean and dry.
- Dpcs/ Cavity trays: Lap and fully bond/ seal with sheeting.
  - Laps (minimum): 150mm.
  - Bonding/ Sealing: Bonding compound or double sided gas resistant tapeas recommended by manufacturer.

371 PREFORMED COLLARS FOR PIPES, DUCTS, CABLES, ETC.

- Sealing: Fully bond to penetrations and sheeting using double-sided jointing tape.
  - Laps (minimum): [150mm].
- Completed junctions: Impervious.

381 PROTECTION BOARDS FOR DAMP PROOFING/ TANKING

- Type: Bituminous.
  - Performance: Non compressive, rot resistant.
- Thickness: 3mm minimum.
- Application: Membrane surface clean and free from contaminants.
  - Bonding: Taped.
  - Board joints: Primed and taped, roll to fully adhere.
  - Board contact with membrane: Secure and continuous.
- Backfilling: Carry out when tanking, loading and protection are complete.

# J41 Reinforced bitumen membrane roof coverings

To be read with Preliminaries/General Particulars.

TYPES OF ROOF COVERING

112 BUILT-UP REINFORCED BITUMEN MEMBRANE WARM DECK ROOF COVERING TO APARTMENT & DUPLEX TERRACES

- Substrate: Concrete deck.
  - Preparation: Bitumen primer.
- Vapour control layer: Polyester carrier coated with SBS rubber modified bitumen.
- Insulation: Polyisocyanurate (PIR) rigid urethane foam board, tapered.
- Waterproof covering:
  - First layer: Polyester carrier coated with SBS rubber modified bitumen.
    Attachment: Fully torch bonded to insulation.
  - Top layer/ Capsheet: SBS polymer modified bitumen membrane with polyester/glass fibre dual-laminate base fabrics, graphite coated.
    Attachment: Fully torch bonded.
  - Flashings and detail work: Additional layer of SBS polymer modified bitumenmembrane, mineral surfaced.
- Surface protection: Precast concrete paving slabs on pedestal supports.
- Accessories: Pipe collars.

210 ROOF PERFORMANCE

- General: Secure, free draining and weathertight.

PRODUCTS

321 PRIMER

- Type: Bitumen primer.

326 BONDING COMPOUND

- Type: Oxidized bitumen bonding compound to BS 3690: Part 2 or equivalent standard, grade as recommended by manufacturer for the conditions and type of surface. 95/25 if roof pitch is less than 20 degrees, 115/15 if roof pitch exceeds 20 degrees.

330 TIMBER TRIMS, ETC

- Quality: Planed. Free from wane, pitch pockets, decay and insect attack (exceptambrosia beetle damage).
- Moisture content at time of covering (maximum): 22%.
- Preservative treatment: CCA as section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C8.

335 ANGLE FILLETS

- Material: Perlite.
  - Size (minimum): 50x50mm, triangular in section.
- Restriction: Fillets under torch-on bitumen membranes to be non-combustible.

396 VAPOUR CONTROL LAYER

- Type: Polythene sheet.
- Base (carrier): Polyester, minimum weight 170g/m².
- Core: Polyester reinforced aluminium.
- Thickness (minimum): 1000 gauge).

402 BUILT-UP REINFORCED BITUMEN WATERPROOF COVERING

- First layer: Sand finished SBS rubber modified bitumen with thermofusible film to underside
  - Thickness (minimum): [3mm].
  - Base (carrier): [Polyester, minimum weight 170g/m²].
  - Low temperature flexibility: [-20°C].
  - Attachment: [Fully torch bonded to insulation].
- Top layer/ Capsheet: Mineral surfaced SBS polymer modified bitumen membrane with polyester/glass fibre dual-laminate base fabrics, graphite coated. Thermofusible film to underside.
  - Thickness (minimum): [4.5mm].
  - Base (carrier): [Graphite coated polyester/glass fibre laminate, minimum weight 270g/m²].
  - External fire performance: [Froof (T4)].
  - Reaction to fire: [Broof (T4)].
  - Tensile strength (N/50mm) to EN 12311: [>700]
  - Elongation at break (%) to EN 12311: [>25]
  - Low temperature flexibility: -25°C.
  - Attachment: Fully torch bonded.
- Flashings and detail work: Additional layer of mineral surfaced, SBS polymermodified bitumen membrane.
- Guarantee: 20 years.

421 WARM DECK TAPERED ROOF INSULATION

- Type: Rigid thermoset polyisocyanurate (PIR) roofboard to EN 13165.
- Core: CFC/HCFC free rigid polyisocyanurate (PIR) foam.
- Facings: Bituminous glass tissue facing (both sides) autohesively bonded to the insulation core during manufacture.
- Density (minimum): 32 kg/m³.
- Thermal conductivity (maximum): [0.024 W/mK for insulant thickness >120mm]
- Compressive strength (minimum): [150kPa].
- Water Vapour Resistivity: [>100MNs/gm].
- Edge profile: Square.
- Thickness: 80mm minimum.
- Falls (minimum): [1 in 80].
- External fire exposure roof test (BS 476-3) when waterproofed with 3 layer built–up feltand a loading coat of 10 mm chippings: [FAA]
- Reaction to fire class: [E].
- Fixing: [Insulation to be bonded to vapour control layer with hot bitumen].
- Placement: Install in full accordance with manufacturer's recommendations.
- Additional requirements: [
  - 25mm matching perimeter insulation to inside face of parapet walls
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified].

421A WARM DECK NON - TAPERED ROOF INSULATION

- Type: Rigid thermoset polyisocyanurate (PIR) roofboard to EN 13165.
- Core: CFC/HCFC free rigid polyisocyanurate (PIR) foam.
- Facings: Bituminous glass tissue facing (both sides) autohesively bonded to the insulation core during manufacture.
- Density (minimum): 32 kg/m³.
- Thermal conductivity (maximum): [0.024 W/mK for insulant thickness >120mm]
- Compressive strength (minimum): [150kPa].
- Water Vapour Resistivity: [>100MNs/gm].
- Edge profile: Square.
- Thickness: 150 mm.
- Falls (minimum): [1 in 80].
- External fire exposure roof test (BS 476-3) when waterproofed with 3 layer built–up feltand a loading coat of 10 mm chippings: [FAA]
- Reaction to fire class: [E].
- Fixing: [Insulation to be bonded to vapour control layer with hot bitumen].
- Placement: Install in full accordance with manufacturer's recommendations.
- Additional requirements: [
  - 25mm matching perimeter insulation to inside face of parapet walls
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified].

466 PRECAST CONCRETE PAVING SLABS

- Standard: To EN 1339, hydraulically pressed.
- Colour: To be agreed.
- Finish: Smooth, matt.
- Size: 600x600x50mm.
- Recycled content: 20% (minimum) to EN ISO 14021.
- Arrises: [Square].
- Water absorption and freeze/ thaw resistance class: [2].
- Bending strength class: [3].
- Abrasion resistance class: [4].
- Slip/ Skid resistance: [USRV >60].
- Breaking load class: [140].

468 SUPPORT SYSTEM FOR PRECAST CONCRETE PAVING SLABS

- Type: Polypropylene, adjustable.
- Loading: 400kg per unit.
- Dimensions: To achieve a clearance range shown on Architect's drawings.
- Accessories:
  - 2-lugged type adjacent to perimeters
  - Anti-shock levellers
  - Slope correctors.

EXECUTION GENERALLY

515 ADVERSE WEATHER

- General: Do not lay coverings in high winds, wet or damp conditions or in extremes of temperature unless effective temporary cover is provided over working area.
- Unfinished areas of roof: Keep dry. Protect edges of laid membrane from wind action.

520 INCOMPLETE WORK

- End of working day: Provide temporary seal to prevent water infiltration.
- On resumption of work: Cut away tail of membrane from completed area and removefrom roof.

535 APPLYING PRIMERS

- Coverage per coat (minimum): 4-6m²/L.
- Surface coverage: Apply by mopping, brushing to achieve an even and full cover of the surface.
- Allow to dry thoroughly before covering.

545 APPLYING BONDING COMPOUNDS

- Roof sited boilers: Permitted.
- Boilers must be either thermostatically controlled or manually controlled using standard calibrated thermometers.
- Submit a 'Hot Work Permit' to the Architect prior to commencing work, obtain agreement before proceeding and comply with its requirements
- Comply with Information Sheet 18 'Code of practice for safe handling of hot bitumen for roofing purposes', in the FRCAB Handbook, produced by the Flat Roofing Contractors' Advisory Board and National Federation of Roofing Contractors.
- Temperature of compound: Suitable to achieve bond over whole surface. Do not overheat.
- Heat sensitive insulation materials: Use cold bituminous adhesive or overlays recommended by the insulation manufacturer.
- Application: Materials and method as bitumen membranemanufacturer's recommendations.

SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM DECK ROOF INSULATION

610 SUITABILITY OF SUBSTRATES

- Substrates generally: Secure, clean, dry, smooth, and free from frost, contaminants, voids and protrusions.
- Preliminary work: Complete including:
  - Grading to correct falls.
  - Formation of upstands, kerbs, box gutters, sumps, grooves, chases andexpansion joints.
  - Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability of substrate: Must not impair roof integrity.

640 FIXING TIMBER TRIMS

- Fasteners: Sherardized steel screws.
- Fixing centres (maximum): 600mm.

675 LAYING VAPOUR CONTROL LAYER

- Attachment: Securely bond to substrate.
- Side and end laps: 50mm side laps, 75mm end laps, fully sealed.
- Penetrations: Fully seal using bonding or taping methods recommended by manufacturer.
- Edges of insulation at roof edges, abutments, upstands, kerbs, penetrations and thelike: Enclosed with vapour control layer:
  - Dressed up sufficiently, providing 25mm (minimum) seal when overlapped by theroof covering; or
  - Turned back 150 mm (minimum) over the insulation and sealed down.

685 LAYING WARM DECK ROOF INSULATION

- Setting out:
  - Long edges: Fully support and run at right angles to edge of roof.
  - Joints: Tightly butted, break-bonded, fitted tightly at edges and aroundservice penetrations.
  - End joints: Stagger.
- Cutting: Neat and accurate to edges and around penetrations.
- Bedding: Full bed of bonding compound.
- Mechanical fixing: Not required.
- Protection to exposed edges of insulation: Reduced thickness treated timber batten, outer edge chamfered at changes in level.
- Completion: Boards must be in good condition, well fitting and with no springing, flexing or rocking.

WATERPROOF MEMBRANES/ ACCESSORIES

712 LAYING REINFORCED BITUMEN MEMBRANES GENERALLY

- Lay roof covering in accordance with BS 8217 and BS 8000 Part 4 or equivalent standards and in accordance with the manufacturer's fixing instructions.
- Ancillary products and accessories, where not specified, to be types recommended for the purpose by the manufacturer.
- Direction of laying: Unrolled up the slope.
  - Where practicable, install so that water drains over and not into laps.
- Side and end laps: 75mm and 100mm respectively. Seal using materials and method recommended by bitumen membrane manufacturer.
- Head and side laps: Offset.
- Top layer/ capsheet: Fully bond.
- Successive layers: Apply without delay. Do not trap moisture.
- Strips of bitumen membrane for 'linear' details: Cut from length of roll.
- Completed coverings: Firmly attached, fully sealed, smooth, weatherproof andfree draining.
- Maintain a minimum of 50% fully trained operatives on site throughout the installation period.
  - In order to achieve the required quality of roofing, steps must be taken toensure that: a) The design intentions are understood; b) the work is regularly monitored by the manufacturer to assure conformance.
  - Equipment must be sited as close as is practicable to the area being worked.
  - Roofing materials must be checked upon arrival on site to ensure that they; a) are correctly marked and/or, where applicable, are in the manufacturers wrappers; b) conform to the specification; c) are sufficient for the work.
  - Goods that do not meet requirements must be removed from site.

740 TORCH-ON BONDING OF REINFORCED BITUMEN MEMBRANE

- Bond: Full over whole surface, with no air pockets.
- Excess compound at laps of top layer/ capsheet: Leave as continuous bead.

776 SKIRTINGS AND UPSTANDS

- Angle fillets: Fix by bitumen bonding or nailing.
- Form upstands at ends of rolls by carrying felt up without using separate strip. Elsewhere use matching strips of felt, maintaining the specified laps.
- Carry all layers of felt in staggered formation up the upstand, fully bonding each layer. Where practicable carry top layer of felt over top of upstand.
  - Top layer felt to be mineral surfaced as recommended by Manufacturer.
- Securement of felt to top of upstand: As recommended by bitumen membrane manufacturer.

SURFACING

840 LAYING PRECAST CONCRETE PAVING SLABS

- Condition of substrate: Clean.
- Setting out: Minimize cutting.
- Joints: Open.
  - Width: Predetermined by support system.
  - Perimeter/ Upstands margins: Predetermined by support system.
- Completion: Slabs must be level and stable.

COMPLETION

910 INSPECTION

- Interim and final roof inspections: Submit reports.

912 WARRANTY

- The work must be carried out by a Manufacturer's licensed approved Roofing Contractor leading to the provision of manufacturers 20-year guarantee covering materials and workmanship for a period of 20 years from practical completion.

930 FLOOD TEST

- Condition of roof before testing: Complete to a stage where integrity of bitumen membrane covering can be tested.
- Outlets: Externally cover and seal. Protect against damage from water pressure using temporary kerbs. Do not use plugs to seal outlets.
- Flood levels: Submit proposals. In no case higher than kerbs.
- Flood duration: Two days.
- Inspection to detect leaks: Regular.
- Completion of test: Slowly drain roof. Do not overload or flood outlets.
- Test results and warranty: Submit on completion of testing.

940 COMPLETION

- Roof areas: Clean.
- Outlets: Clear.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed membrane: Do not damage. Protect from chemicals, traffic and adjacentor high level working.

# J42 Single layer polymeric sheet roof coverings / Glassfibre flat roofing

To be read with Preliminaries/ General conditions.

TYPES OF ROOF COVERING

110 WARM DECK ROOF COVERING FLAT ROOFS GENERALLY

- Substrate:
  - Concrete deck screeded to falls
  - Plywood deck/ OSB-3 (Smart Ply / Sterling Board).
  - Preparation: Primer.
- Roof covering system: Fully adhered fleece backed EPDM, mechanically fixedat perimeters and upstands.
  - Lower protection layer (loose laid): Not required.
  - Vapour control layer: Sand finished SBS rubber modified bitumen with thermofusible film to underside.
  - Insulation: PIR foam board.
  - Separating layer (loose laid): Polyester fleece.
  - Waterproof membrane: Fleece backed Ethylene propylene diene monomer(EPDM). Refer to clause 405.
    Width: 1m.
    Thickness: 1.5mm.
    Colour: Black.
  - Upper protection layer (loose laid): Not required.
- Surface protection: Not required.
- Accessories: Edge trims and pipe collars.

PERFORMANCE

210 ROOF PERFORMANCE

- Roof covering: Secure, free draining and weathertight.

PRODUCTS

321 PRIMER GENERALLY

- Type: As membrane manufacturer's/ supplier's recommendations.

326 BONDING ADHESIVE GENERALLY

- Type: As membrane manufacturer's/ supplier's recommendations for conditions and surface.

330 TIMBER TRIMS, ETC

- Quality: Planed. Free from wane, pitch pockets, decay and insect attack exceptambrosia beetle damage.
- Moisture content at time of covering (maximum): 22%.
- Preservative treatment: As recommended for purpose by waterproofcovering manufacturer.

341 PREFORMED SLEEVES

- Type: 0.6 mm galvanized steel flanged sleeve with 0.5mm unreinforced membrane laminate.
- Manufacturer: As roof membrane.
- Size: 110x150mm upstand.

350 PERIMETER TRIMS

- Type: Preformed aluminium or galvanised steel to membranemanufacturer's recommendations.
- Fixings: Mechanical fixings to membrane manufacturer's/ supplier's recommendations.
- Additional requirements: Continuous sealant as required, to membrane manufacturer's recommendations.

356 MECHANICAL FASTENERS, WASHERS, PRESSURE PLATES, ETC

- Type: Batten strips and mechanical fixings as per membranemanufacturer's recommendations.
- Additional requirements: [Primer].

376 EXPANSION JOINTS IN SUBSTRATES

- Bridging strips: EPDM with compressible tubes, as supplied by membrane manufacturer. Fixing: Mechanically fixed to batten strips.
- Size: 150mm minimum width.

396 VAPOUR CONTROL LAYER

- Type: Sand Finished SBS rubber modified bitumen with thermofusible film to underside.
- Base (carrier): Polyester, minimum weight 170g/m².
- Core: Polyester reinforced aluminium.
- Thickness (minimum): 3mm.

405 WATERPROOF MEMBRANE

- Type: Fleece backed Ethylene propylene diene monomer (EPDM), suitable for fully adhered and mechanically attached fixing.
- Tensile strength to EN 12311-2: Longitudinal: >250 N/50 mm. Transverse: >200 N/50mm..
  - Elongation at break to EN 12311-2: Longitudinal: >300%. Transverse: >300%.
- Tear resistance to EN 12310-2: [>40N].
- Cold bending test at -30 °C to EN 1109/EN 495-5: [No cracking].
- Reaction to fire to EN 13501-1: [ Class E ].
- External fire performance to EN 13501-5: [ Broof(t1) ].
- Width (minimum): 2m.
- Overall thickness (minimum): 1.5mm.
- Colour: Black.
- Guarantee: Minimum 25 years.
- Additional requirements: [
  - Primer
  - Bonding adhesive
  - Mechanical fixing strips & fixings
  - Double-sided jointing tape
  - Seam sealant
  - Internal & external corners
  - All other accessories required by the manufacturer to complete the system
  - Agrément certified].

421 WARM DECK ROOF INSULATION

- Type: Rigid thermoset polyisocyanurate (PIR) roofboard to EN 13165.
- Core: CFC/HCFC free rigid polyisocyanurate (PIR) foam.
- Facings: Coated glass tissue based facing (both sides) autohesively bonded tothe insulation core during manufacture.
- Density (minimum): 32 kg/m³.
- Edge profile: Square.
- Thickness: 150mm & 175mm.
- Face size (nominal length x width): 2400 x 1200mm.
- Thermal conductivity (maximum): [0.024 W/mK for insulant thickness >120mm]
- Compressive strength (minimum): [150 kPa].
- Water Vapour Resistivity: [>300MNs/gm].
- External fire exposure roof test (BS 476-3) when waterproofed with 3 layer built–up feltand a loading coat of 10 mm chippings: [FAA]
- Reaction to fire class: [E].
- Fixing: [Insulation to be suitable for either mechanical or bonded fixing].
- Placement: Install in full accordance with manufacturer's recommendations.
- Additional requirements: [
  - 50mm matching perimeter insulation to inside face of parapet walls
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified].

422 WARM DECK TAPERED ROOF INSULATION

- Type: Rigid thermoset polyisocyanurate (PIR) roofboard to EN 13165.
- Core: CFC/HCFC free rigid polyisocyanurate (PIR) foam.
- Facings: Coated glass tissue based facing (both sides) autohesively bonded to the insulation core during manufacture.
- Density (minimum): 32 kg/m³.
- Edge profile: Square.
- Thickness: 100mm minimum.
- Falls (minimum): [1 in 80].
- Face size (nominal length x width): 1200 x 1200mm.
- Thermal conductivity (maximum): [0.024 W/mK for insulant thickness >120mm]
- Compressive strength (minimum): [150 kPa].
- Water Vapour Resistivity: [>100MNs/gm].
- External fire exposure roof test (BS 476-3) when waterproofed with 3 layer built–up feltand a loading coat of 10 mm chippings: [FAA]
- Reaction to fire class: [E].
- Fixing: [Insulation to be suitable for either mechanical or bonded fixing].
- Placement: Install in full accordance with manufacturer's recommendations.
- Additional requirements: [
  - 25mm matching perimeter insulation to inside face of parapet walls
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified].

482 PIPE COLLARS

- Type: [Preformed EPDM].
- Manufacturer: As roof membrane.
- Size: 110mm diameter.
- Additional requirements: [Lap sealant and primer].

483 CONDUIT FLASHINGS

- Type: [Preformed EPDM].
- Manufacturer: As roof membrane.
- Size: To allow variable diameters.
- Additional requirements: [Lap sealant and primer].

EXECUTION GENERALLY

510 ADVERSE WEATHER

- General: Do not lay membrane at temperatures below 5°C or in wet or damp conditions unless effective temporary cover is provided over working area.
- Unfinished areas of roof: Keep dry and protect edges of laid membrane from wind action.

520 INCOMPLETE WORK

- End of working day: Provide temporary seal to prevent water infiltration.
- On resumption of work: Cut away tail of membrane from completed area and remove from roof.

530 APPLYING PRIMERS

- Coverage per coat (minimum): In accordance with manufacturer's recommendations.
- Surface coverage: Even and full.
- Coats: Fully bonded. Allow volatiles to dry off thoroughly between coats.

SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM DECK ROOF INSULATION

610 SUITABILITY OF SUBSTRATES

- Surfaces to be covered: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
- Preliminary work: Complete, including
  - Grading to correct falls.
  - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
  - Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability of substrate: Must not impair integrity of roof.

640 FIXING TIMBER TRIMS

- Fasteners: Sherardized steel screws.
- Fixing centres (maximum): 400 mm.

670 LAYING VAPOUR CONTROL LAYER

- Laying:
  - Fully bonded, flat and smooth (if insulation must be bonded)
  - Loose laid, flat and smooth (if insulation must be mechanically fixed).
- Side and head laps: Minimum 150mm. Seal using materials and method as membrane manufacturer's/ supplier's recommendations.
- Upstands, kerbs and other penetrations: Enclose edges of insulation. Fully seal at abutment by bonding or taping.

690 LAYING WARM DECK ROOF INSULATION

- Setting out:
  - Long edges: Fully supported and running at right angles to edge of roof.
  - Joints: Tightly butted, break-bonded, fitted tightly at edges and aroundservice penetrations.
  - Where two or more layers of insulation are required, they must be horizontally offset relative to each other so that, as far as possible, the board joints in any two adjacent layers do not coincide with each other.
  - End joints: Staggered.
- Cutting: Neat and accurate to edges and around penetrations.
- Attachment: Full bed of cold bitumen bonding compound (if insulation must be bonded).
- Mechanical fixing:
  Minimum of six nylon telescopic tube fasteners per board, installed fully in accordance with manufacturer's recommendations (if insulation must be mechanically fixed).
  If two layers of insulation must be installed, the base layer must be mechanically fixed with minimum 1 No. fixing in the centre of the insulation board before fixing the top layer.
- Completion: Boards must be in good condition, well fitting and secure. Protect surfaces from damage.

WATERPROOF MEMBRANES/ ACCESSORIES

720 ADHESIVE BONDING OF WATERPROOF MEMBRANE

- Setting out: Perpendicular to the deck direction.
- Attachment: Fully self-adhered.
  - Do not wrinkle or stretch.
- Surface condition at completion: Fully sealed, smooth, weatherproof and free draining.

755 TAPE JOINTING OF WATERPROOF MEMBRANE

- Side and end joints:
  - Laps (minimum): 100mm.
  - Preparation: Prime, clean and dry surfaces beyond full width of joint.
  - Sealing: Apply self adhesive tape. Mate and roll together. Do not wrinkle or stretch membrane. Apply seam sealant to joints under sedum roofing.
- Condition at completion: Fully sealed, smooth, weatherproof and free draining.

775 PERIMETER DETAILS FOR ELASTOMERIC MEMBRANES

- Upstands, edge trims, drips, kerbs, etc: Preformed from waterproof membrane material.
- Reinforcing strip: Lay at edge of horizontal roof plane.
  - Securing: Mechanically fasten.
- Roof membrane: Dress over perimeter profiles.
  - Sealing: Bond to substrate and to secured perimeter reinforcing strip.

785 ROOF PENETRATIONS THROUGH ELASTOMERIC MEMBRANES

- Roof membrane: Cut around penetrations.
- Flanged sleeve:
  - Type: Preformed flanged sleeve.
  - Installation: Dress over and around penetration.
  - Seating: Flush to roof membrane.
  - Roof membrane overlap to flange (minimum): 75 mm beyond fasteners.
  - Sealing: Bond top edge to pipe with mastic sealant and secure with clamping ring.

COMPLETION

910 INSPECTION

- Interim and final roof inspections: Submit reports.

930 FLOOD TEST TO ALL FLAT ROOFS

- Condition of roof prior to testing:
  - Waterproof membrane complete to a stage where integrity can be tested.
- Outlets: Externally cover and seal. Protect against damage from water pressure using temporary kerbs. Do not use plugs to seal outlets.
- Flood levels: Submit proposals. In no case higher than kerbs.
- Flood duration: Two days.
- Inspection: Regular, to detect leaks.
- Completion of test: Slowly drain roof. Do not overload or flood outlets.
- Test results and warranty: Submit on completion of testing.

940 COMPLETION

- Roof areas: Clean.
  - Outlets: Clear.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed membrane: Do not damage. Protect from traffic and adjacent or highlevel working.

# GLASSFIBRE FLAT ROOFING

## INTRODUCTION

The roof must be laid onto a dry deck in dry conditions at a temperature not below 5 degrees C.

This guide relates only to the application of the GRP laminate and flowcoat and does not cover the design or structural details for the roof itself. The deck should be of 18 mm exterior plywood or OSB3 board (Smart Ply/Sterling Board) and be well fixed to the underlying joists. OSB3 board (Smart Ply) is preferable to plywood as the GRP bond to these boards is far superior than to plywood. You can apply to concrete if it is bone dry but if moisture is present this should be sealed first with G4sealer

The deck may be a new deck or may be formed over an existing roof. You should ensure that the new deck is laid to adequate falls in order to allow good drainage, so that there is no standing water on the roof after completion. Always try to plan starting a roof when a settled period of weather is forecast.

## MATERIALS

Once the new deck has been formed you will need the following:

Glassfibre cloth: Emulsion bound chopped strand mat (CSM). The number of layers is at the discretion of the contractor. We normally recommend 2 layers of 450g/m" cloth which equates to approximately 1 kg per m2, particularly if applying to plywood or other materials such as concrete because of the risk of de-lamination. You can however choose to put down 1 layer of 450g/m2 or 600g/m2 For 450 g/m2 allow approx. 500gm per m2; for 600g/m2 allow approx. 700gm per m2. This allows for a 10% overlap/wastage

Resin: The resin: glass ratio will be between 2.25 and 2.5:1 which means for 2 layers 450g/m2CSM you will use 2.25 – 2.5kg resin. For 1 layer 450 CSM you should allow approx. 1.25 – 1.5kg per m2 and for 1 x layer 600 CSM allow approx. 1.5 – 1.75 kg/m2. Better to err on the high side to ensure you have sufficient to finish the job

## FLOWCOAT

**Flowcoat:** Allow **0.5-0.8 kg/m²**. Note that this material is pigmented, normally a dark grey.
**Catalyst:** This is the hardener for the resin and flowcoat. Use at **2-3% in cool weather** and **1-2% in warm conditions**. A 2% addition equates to approximately **20 cc per litre**.
**N.B.** To prevent splashes in the eyes or onto the skin, it is safest to use a calibrated dispenser.
**Brushes and Rollers:** For applying and consolidating the resin and flowcoat.
**Acetone:** Solvent for cleaning brushes and rollers after use.
**Protective Clothing:** Gloves, coveralls, safety glasses and fume masks.
**Trims:** Various preformed GRP trims can be used for edge details or, alternatively, these details can be formed with prepared timber.

## APPLICATION

Once the new deck has been prepared, the work is carried out in the following sequence:
1. **Trimming:** Fitting the GRP (Glass Reinforced Plastic) edge trims or assembling the timber edge detail.
2. **Bandaging:** Reinforcing the board joints.
3. **Laminating:** Applying the GRP membrane (glass fibre mat plus resin).
4. **Top Coating:** Applying the flowcoat.

## TRIMMING

The edge trims are supplied in **3 m lengths** and must be fitted by nailing the bonding edge to the deck. The fascia, drip and upstand trims must be bonded to an underlying slate batten in order to support the edge. The drip trim can be offset to ensure that the drip extends over the gutter. Preformed corners may be used or, if preferred, the corners can be sealed **on site** by **mitring and patching with GRP**.

## THE CHOICE OF TRIMS IS AS FOLLOWS:

**Drip Fascia:** Used wherever the roof drains into a gutter.
**Edge Fascia:** Used along any free-standing edge where no drainage is required.
**Wall Flashing:** Used in place of lead wall flashing, usually in conjunction with fillet trims.
**Fillet Trims:** Used wherever a roof meets an abutting wall.
**Expansion Joint:** Used only on roofs over **100 m²**.
**Flat Flashing:** Used mainly as a **plate flashing** where a pitched roof meets a GRP flat roof.

## BANDAGING

All board joints and all trims must be **bandaged** to the roof to ensure that no stress cracking can occur at the joints. A **3-inch-wide glass fibre bandage** is applied to each joint and to all trim edges. These bandages must be well consolidated.

The procedure for bandaging is the same, on a smaller scale, as that used for the main laminate. A small amount of resin, usually about **1 kilogram**, is decanted into a small bucket and mixed with catalyst (see the catalyst addition chart for guidance on the correct amount of catalyst). The resin is then applied to the board joints and trim edges with either a **3-inch brush** or a small roller.

The pre-cut glass bandage is then rolled out over the resin, and a further amount of resin is applied to the glass, which is allowed to **wet out** before being consolidated with a small consolidation roller.
All detail work should also be completed at this stage. Drain outlets, channels, pipes and roof fittings can all be sealed with GRP. You may find that a brush is more useful than a roller for consolidating the glass fibre around these details.

## LAMINATING

The main laminate should be applied before or after the bandage has cured. The laminating should be planned depending on the air temperature. Long runs should be attempted in cool conditions, while short runs must be used in warm conditions.

Remember that the resin will always cure faster in hot conditions, and an allowance must be made for this when deciding how much glass fibre to lay in one mix. Direct sunshine will cause an almost instant cure.

Before the laminate is applied, the glass must be pre-cut to the desired lengths. The laminate need not be laid to falls, i.e. it does not matter in which direction the joints are lapped.
Clear all unnecessary items off the roof and dust off. Mix sufficient resin and catalyst to complete the first "run" (allow a 2.5:1 resin-to-glass ratio). Wet out the first area to be covered using a 6" long-pile roller and roll out the glass cloth. Apply the remainder of the resin to the glass and consolidate with the consolidation roller, ensuring that no dry patches of cloth remain and that no air is trapped in the laminate.

Continue with the next "run" of glass, overlapping the first by 50 mm. Do not step on the wet glass and resin. Continue this until the roof has been completely covered and the laminate has been well consolidated.

## FLOW COATING

The laminated roof must be flow coated as soon as possible. Try not to leave the laminate overnight. Test the laminate for cure by applying slight finger pressure. The laminate is about half cured when it is impossible to move the glass fibres within the resin matrix. At this point, it should withstand light foot traffic so that you may stand on the laminate to complete the top coating.

Mix sufficient flowcoat to complete the roof, using the same amount of catalyst as was used for the main laminate. Decant a small amount to finish the edges and all detail work with a small paintbrush, and apply the remainder to the main roof area with a clean 6" short-pile roller.

Ensure that the flowcoat is applied evenly and is not more than 0.5 mm thick. If the flowcoat is applied too generously, there is a danger that it may crack

The roof is then complete and may take several days to fully cure. It should not deteriorate and may be cleaned occasionally with soap and warm water. DO NOT USE BLEACH or any strong alkali on the roof. The roof should withstand foot traffic and may have planters or tiles or other decorative finishes applied to it with no detrimental effects. The edge trims may be painted.

NOTE: Do not apply flowcoat under extreme sunshine/heat as the wax component can evaporate and the flowcoat may cure with a tacky finish.

| % Catalyst | Catalyst Addition (per litre of resin) | 5°C | 10°C | 20°C |
|---|---|---|---|---|
| 1% | 10 ml/litre resin | 4 hrs | 2 hrs | 30 mins |
| 2% | 20 ml/litre resin | 3 hrs | 1 hr | 20 mins |
| 3% | 30 ml/litre resin | 2.5 hrs | 30 mins | 10 mins |
| 4% | 40 ml/litre resin | 2 hrs | 25 mins | 5 mins |

HINTS ON CATALYST ADDITIONS

1. Never use less that 1% even in summer. Just mix less at a time.

2. Never use more than 4% - the cure time will not reduce with more catalyst beyond 4%.

3. Never underestimate the effect of temperature. Resins will not cure at or below freezing and will always cure much faster in direct sunlight.

5. You can buy catalysts of different strengths, to partially compensate for winter and summer conditions.

6. Remember any catalysed resin left in the bucket may exotherm. Heat is generated as it cures and it must be left well away from other Stored materials. Water should be poured over the resin layer in order to suppress heat build-up.

TROUBLESHOOTING

If these instructions have not been followed you may encounter some problems when laying the roof or after its completion. Please read the following to avoid later problems:

1. **Delamination of the laminate from the boards:** Moisture in the deck when laminating. **Note:** GRP bonding to **OSB3 board** is superior to that of plywood.
2. **Flaking and cracking of the flowcoat:** Flowcoating onto a wet laminate or applying the flowcoat too thickly.
3. **Resin cures too fast:** Conditions may be too hot for laying resin, or too much catalyst may have been added.
4. **Flowcoat cures too fast:** See No. 3.
5. **Resin cures too slowly or not at all:** No catalyst has been added, or the temperature is too low. The cure may stop as the temperature drops to freezing.
6. **Patchy or streaky cure of resin or flowcoat:** Insufficient catalyst or inadequate mixing.
7. **Resin does not cure and appears milky white:** Water contamination.
8. **Excessive fibre pattern:** Too little resin and insufficient consolidation.
9. **Take care not to confuse the acetone with the catalyst, as this will not work!**

HEALTH AND SAFETY:

Please refer to the labels or the resin, catalyst and acetone containers and note the hazardous nature of the products and the safety precautions to be taken when using them. For further information refer to the relevant MSDS (Material Safety Data Sheets) - available on request.

# K10 Plasterboard dry linings/ partitions/ ceilings

To be read with Preliminaries/ General conditions.

TYPES OF DRY LINING

145 WALL LINING SYSTEM (METAL STUDS)

- Cavity between wall and studs: 30mm
  Wall lining height: 2.5m
  Head condition: concrete slab
  Deflection allowance: as per structural requirements - ENG
  Structural performance:
  - Strength grade to BS 5234-2: Medium
  - Sound Insulation Rating: 59 RwdB
- Fire performance:
  - Reaction to fire: 180mins
- Fire resistance of complete wall lining assembly: 180mims
- Thermal resistance (R) of complete wall lining assembly (excluding surface resistances): conductivi
  Metal framing: Type recommended by board manufacturer to complete the partition system and achieve specified performance.
- Insulation: Mineral wool batts suitable for steel frame partitions
  - Recycled content: 80% recycled glass
  - Thickness: 50mm
  - Conductivity: 0.036W/mK
- Acoustical sealant applied around perimeter to boarded side of partition framework.
- Linings: 12.5mm Wallboard
- Finishing: 2mm skimcoat plaster (or carlite finish), painted

205 LINING ON TIMBER STUD PARTITIONS

- Background: Studs at 600 mm centres.
- Metal resilient (acoustic) bars: Not required.
- Linings: 12.5mm plasterboard.
  - Fixing: Screws.
- Finishing: Skim coat plaster.
  - Primer/ Sealer: Not required.
  - Accessories: Beads/ stops as clause 693.
- Other requirements:
  - Insulation as section P10
  - Fire stopping around service penetrations as section P12.

206 LINING ON TIMBER TO MASONRY WALLS

- Background: 45x45mm battens at 400mm centres.
- Metal resilient (acoustic) bars: Not required.
- Linings: 15mm plasterboard.
  - Fixing: Screws.
- Finishing: Skim coat plaster.
  - Primer/ Sealer: Not required.
  - Accessories: Beads/ stops as clause 693.
- Other requirements:
  - AVCL as clause 207
  - Insulation as section P10
  - Fire stopping around service penetrations as section P12.

207 AIRTIGHT VAPOUR CONTROL LAYER TO WALLS

- Standard: To EN 13984

- Type: Composite polypropylene fleece.
- Thickness: 0.5mm nominal.
- Sd value: 2m minimum / 10m maximum.
- Reaction to fire: [Class E].
- Temperature resistance: [-40°C to +80°C].
- Fixing: Held in place with Vertical Timber Battens at 450mm centres. VCL membrane to be overlapped a minimum of 100mm at joints and sealed with airtight tape, as clause 251.
- Other requirements: All service penetrations to be sealed using a highly malleable60mm wide high performance airtight tape with PE base material with a polyester fabric reinforcement and acrylate adhesive

216 SUSPENDED CEILING SYSTEM UNITS D,E,F,G,H,J & K

- Lining board: 12.5 mm plasterboard.
  - Finishing: Skim coat plaster.
    Primer/ Sealer: Not required.
  - Accessories: Beads/ stops. Joint tape..
- Suspension system: As recommended by lining manufacturer to complete theceiling system and achieve specified performance.
  - Grid type: Double with galvanised steel primary & secondary channels.
    Spacings: [Primary grid at 1200mm centres, secondary grid at 450mmmaximum centres].
  - Hangers: Galvanised steel anles fixed to soffit with galvanised steel soffit cleatsat 1200mm spacings in each direction.
    Length: To give ceiling soffit height above finished floor level as per Architects drawings.
  - Perimeter trims: [Galvanised steel channels].
  - Top fixing: To suit structural soffit of precast concrete.
  - Accessories: [Angles, connecting clips, cleats, spacers, adaptors, screws and any other items required by the manufacturer to complete the installation correctly].
- Insulation: Mineral wool to EN 13162; thermal conductivity (maximum) 0.045 W/m²K.
  - Reaction to fire (Euroclass): A1.
  - Thickness: 100mm.
- Access units: Required.
- Integrated services fittings: None.
- Other requirements: Fire stopping around service penetrations as section P12.
- System performance:
  - Standard: To EN 13964.
  - Structural: The ceiling system must safely support all anticipated loads includingservices fittings.
    Uniformly distributed load (maximum): 30 kg/m².
    Additional loads/ pressures: Luminaires, smoke & heat detectors.
    Section deflection (maximum): [L/400 but never greater than 4mm].
  - Fire performance:
    Reaction to fire: Not required.
  - Fire resistance: Not required.
  - Airborne sound insulation (complete floor and ceiling assembly):
    Weighted sound reduction index, Rw (minimum), to EN ISO 717-1: 60 dB.
    Other requirements: Primary channels to run in direction of main services in ceiling void.

245 CEILING LINING ON TIMBER JOISTS / BATTENS

- Background: Joists at 400mm centres or battens as per architects drawings .
- Metal resilient (acoustic) bars: Not required .
- Linings: 12.5mm plasterboard .
  - Fixings: Screws .
- Finishing: Skim coat plaster .
  - Primer/ Sealer: Not required .
  - Accessories: Metal beads/ stops recommended by board manufacturer .
- Other requirements: Fire stopping around service penetrations as section P12 .

251 AIRTIGHT SEALING TAPE GENERALLY

- Type: Split back high performance fleece laminated tape. Expandable synthetic base material with acrylate adhesive.
- Size: 0.5mm thick (minimum) x 60mm (minimum) wide.
- Temperature resistance: [-40°C to +90°C].
- Accessories/special features: Suitable for plastering over.
- Other requirements: All porous surfaces e.g. blockwork to be primed with a solventprimer as recommended by the tape manufacturer.

GENERAL/ PREPARATION

330 PREPARATION OF MASONRY TO RECEIVE WALL LININGS
- General: Suitable to receive lining system. Cutting, chasing and making good completed.
- Holes, gaps, service penetrations, perimeter junctions and around openings: Seal.

335 ADDITIONAL SUPPORTS
- Framing: Accurately position and securely fix to give full support to:
  - Partition heads running parallel with, but offset from main structural supports.
  - Fixtures, fittings and service outlets. Mark framing positions clearly and accurately on linings.
  - Board edges and lining perimeters, as recommended by board manufacturer to suit type and performance of lining.

COMPONENTS

416A GYPSUM PLASTERBOARD STANDARD BOARD
- Type: To EN 520, type A.
- Mass per unit area (minimum): 7.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x9.5mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

416B GYPSUM PLASTERBOARD STANDARD BOARD
- Type: To EN 520, type A.
- Mass per unit area (minimum): 8.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x12.5mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

416C GYPSUM PLASTERBOARD STANDARD BOARD
- Type: To EN 520, type A.
- Mass per unit area (minimum): 10.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x15mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

417 GYPSUM PLASTERBOARD MOISTURE RESISTANT

- Type: To EN 520, type H1.
- Mass per unit area (minimum): 8.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x12.5mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

417A GYPSUM PLASTERBOARD MOISTURE RESISTANT

- Type: To EN 520, type H1.
- Mass per unit area (minimum): 10.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x15mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

418 GYPSUM PLASTERBOARD IMPROVED FIRE PROTECTION

- Type: To EN 520, type F.
- Mass per unit area (minimum): 11.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x12.5mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

419 GYPSUM PLASTERBOARD IMPROVED SOUND INSULATION

- Type: To EN 520, type D.
- Mass per unit area (minimum): 10.0 kg/m².
- Reaction to fire to EN 13501-1: A2-s1,d0.
- Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
- Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
- Flexural strength to EN 520: [Conforms].
- Dimensions: [1200x2400x12.5mm].
- Edge profiles: [Square or tapered].
- Exposed surface: Suitable to receive skim coat finish.

421 GYPSUM PLASTERBOARD INSULATION BACKED FOR MECHANICAL FIXING, OVERALL THICKNESS 62.5mm

- Insulation component:
  - Type: Rigid phenolic foam to EN 13166.
  - Core: [CFC/HCFC free rigid phenolic resin foam, Class 0 fire performance, negligible smoke obscuration].
  - Facings:
    Front: Glass tissue bonded to the insulation core during manufacture.
    Rear: Low emissivity gas tight foil facings bonded to both sides of the insulation core during manufacture.
  - Thickness: [50mm].
  - Compressive strength (minimum): 100 kPa.
  - Density (minimum): [35kg/m³].
  - Water Vapour Resistivity: [>100MNs/gm].
  - Thermal conductivity to EN 12524 (maximum): [0.020 W/mK].
- Additional Requirements:[
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)].

- Gypsum plasterboard component (bonded to insulation component at manufacture):
  - Type: [To EN 520, type A].
  - Mass per unit area (minimum): [8.0 kg/m²].
  - Water vapour resistance factor (μ) to EN 12524 (minimum): [10].
  - Thermal conductivity to EN 12524 (maximum): [0.25 W/mK].
  - Flexural strength to EN 520: [Conforms].
  - Dimensions: [1200x2400x12.5mm].
  - Edge profiles: [Square or tapered].
  - Exposed surface: [Suitable to receive skim coat finish].

- Reaction to fire to EN 13501-1: [B-s1,d0].

425 JOINTING TAPE GENERALLY

- Type: Paper based .
- Suitability: Reinforcement to flat joints in skim finish to plasterboard .

431 ACCESS PANELS APARTMENT CEILINGS

- Type: Standard (non-fire rated) .
  - Sizes: 450x450mm & 550x550mm .
- Frame: Plaster bead .
- Panel: 1.2mm thick (minimum) zinc coated mild steel. Polyester powder coat factory finish - colour: white .
- Panel infill: [Not required].
- Lock: Tamper proof and operated by castellated key .

433 ACCESS PANELS HOUSE CEILINGS

- Type: Refer to section L20 .

INSTALLATION

435 DRY LININGS GENERALLY

- General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
- Cutting plasterboards: Neatly and accurately without damaging core or tearing paper facing.
  - Cut edges: Minimize and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
- Fixings boards: Securely and firmly to suitably prepared and accurately levelled backgrounds.
- Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

446 CEILINGS

- Sequence: Fix boards to ceilings before installing dry lined walls and partitions.
- Orientation of boards: Fix with bound edges at right angles to supports and with ends staggered in adjacent rows.

465 STAGGERED STUD PARTITIONS

- Horizontal frame members (noggins, bearers, etc.) and boards: Fix betweenalternate studs and not touching adjacent offset studs.

485 SUSPENDED CEILING GRIDS

- Setting out: Accurately aligned and level.
  - Grid members and hangers: Centres to suit specified linings and imposed loads.
  - Additional grid members: Provide bracing and stiffening at upstands, partitionheads, access hatches, etc.
- Fixing: Securely at perimeters, grid joints, top and bottom hanger fixings.

505 INSTALLING MINERAL WOOL INSULATION

- Fitting insulation: Closely butted joints and no gaps. Use fasteners to prevent slumping or displacement.
- Services:
  - Electrical cables overlaid by insulation: Sized accordingly.
  - Ceilings: Cut insulation around electrical fittings, etc.

520 SEALING GAPS AND AIR PATHS

- Location of sealant: To perimeter abutments and around openings.
- Application: To clean, dry and dust free surfaces as a continuous bead with no gaps.
  - Gaps greater than 6 mm between floor and underside of plasterboard: After sealing, fill with jointing compound.

555 FIRE STOPPING AT PERIMETERS OF DRY LINING SYSTEMS

- Material: Tightly packed mineral wool or intumescent mastic/ sealant.
- Application: To perimeter abutments to provide a complete barrier to smoke and flame.

560 JOINTS BETWEEN BOARDS

- Tapered edged plasterboards:
  - Bound edges: Lightly butted.
  - Cut/ unbound edges: 3 mm gap.
- Square edged plasterboards: 3 mm gap.
- Square edged fibre reinforced gypsum boards: 5 mm gap.

566 VERTICAL JOINTS

- Joints: Centre on studs.
  - Partitions: Stagger joints on opposite sides of studs.

571 HORIZONTAL JOINTS

- Edges of boards: Support using additional framing.

580 INSULATION BACKED PLASTERBOARD

- General: Do not damage or cut away insulation to accommodate services.
- Installation at corners: Carefully cut back insulation or plasterboard as appropriatealong edges of boards to give a continuous plasterboard face, with no gaps in insulation.

595 DEFLECTION HEADS

- Fixing boards: Do not fix to head channels.

610 FIXING PLASTERBOARD TO TIMBER

- Fixing to timber: Securely at the following centres (maximum):
  - Nails: 150 mm.
  - Screws to partitions/ wall linings: 300 mm. Reduce to 200 mm at external angles.
  - Screws to ceilings: 230 mm.
- Position of nails/ screws from edges of boards (minimum):
  - Bound edges: 10 mm.
  - Cut/ unbound edges: 13 mm.
- Position of nails/ screws from edges of timber supports (minimum): 6 mm.

FINISHING

680 SKIM COAT PLASTER FINISH

- Plaster type Board finish/finish plaster to EN 13279-1 type B1/20/2.
  - Thickness: 2-3 mm.
- Joints: Fill and tape except where coincident with metal beads.
- Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level ortrowel marks.

693 RIGID BEADS/STOPS

- Internal: To EN 13658-1.
- External: To EN 13658-2.

695 INSTALLING BEADS/ STOPS

- Cutting: Neatly using mitres at return angles.
- Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
- Finishing: After joint compounds/ plasters have been applied, remove surplusmaterial while still wet from surfaces of beads exposed to view.

# K11 Rigid sheet flooring/ sheathing/ decking/ sarking/ linings/ casings

To be read with Preliminaries/ General conditions.

TYPES OF FLOORING/ SHEATHING/ DECKING/ SARKING/ LINING/ CASINGS

112 WOOD-BASED SHEETS GENERALLY

- Standard: To EN 13986.
  - Evidence of compliance: Submit.

320 PLYWOOD FLOORING HOUSE UPPER FLOOR BATHROOMS

- Substrate: Timber/Metal composite joists.
  - Additional supports: As clause935.
- Flooring: Plywood manufactured to the relevant standards and quality control procedures specified in EN 636, and so marked.
  - Type: Contractor's choice.
  - Performance class to EN 636: [ Class 2 (Suitable for use in humid areas or exposure to occasional wetting)].
  - Bond quality to EN 314-2: [ Class 2 (Humid conditions, appropriate for interior situations with humidity higher than class 1 levels, and for protected exterior applications)].
  - Nominal thickness/ number of plies: 18mm.
  - Edges: Tongued and grooved all edges.
  - Other requirements: CE Marked.
- Setting out: Long edges running across joists. End joints central over joists and staggered.
- Fixing to joists:
  - Fasteners: 50mm x 8 gauge wood screws into pilot holes.
  - Fixing centres (maximum):
    Around floor perimeter and along short edges of each board: 150 mm.
    Along intermediate supports: 300 mm.
  - Fixing distance from edges: 25 mm from long edges and minimum 10 mm fromshort edges.
- Joint treatment: PVA adhesive.
- Expansion provision:
  - Clear expansion gap around perimeter of floor area and upstands: 1mm per metre run of floor, with a minimum gap of 10mm.
  - Intermediate expansion/ movement joints: As recommended by flooring manufacturer.

515 PLYWOOD ROOF DECKING

- Substrate: Roof joists to Engineers design.
  - Additional supports: To Engineers design.
- Decking: Plywood manufactured to the relevant standards and quality controlprocedures specified in BS EN 636, and so marked.
  - Type: Contractor's Choice.
  - Grade: Performance class to EN 636: Class 2 (Suitable for use in humid areas or exposure to occasional wetting).
    - Bond quality to EN 314-2: Class 2 (Humid conditions, appropriate for interior situations with humidity higher than class 1 levels, and for protected exterior applications.
  - Nominal thickness/ number of plies: 18mm.
  - Edges: Tongued and grooved all edges.
  - Other requirements: CE Marked.
- Setting out: Long edges running across supports. End joints central over joistsand staggered.
- Fixing:
  - Fasteners: 50 mm x 8 gauge wood screws into pilot holes.
  - Fixing centres:
    Along each support: 25 mm from each long edge and at maximum 300 mm centres between.
    Around perimeter of roof area: Maximum 300 mm centres.
- Expansion provision:
  - Clear expansion gap around perimeter of roof area and upstands: 10 mm.
  - Intermediate expansion/ movement joints: As recommended by decking manufacturer.

516 OSB-3 BOARD (Smart Ply) – Glassfibre Flat Roofing

- Substrate: Roof joists to Engineers design.
  - Additional supports: To Engineers design.
- Decking: OSB-3 sterling board manufactured to the relevant standards and quality control procedures specified in BS EN 636, BBA approved, and somarked.
  - Type: Contractor's Choice.
  - Grade: Performance class to EN 636: Class 2 (Suitable for use in humid areas or exposure to occasional wetting).
    - Bond quality to EN 314-2: Class 2 (Humid conditions, appropriate for interior situations with humidity higher than class 1 levels, and for protected exterior applications.
  - Nominal thickness/ number of plies: 18mm.
  - Edges: Tongued and grooved all edges.
  - Other requirements: CE Marked.
- Setting out: Long edges running across supports. End joints central over joistsand staggered.
- Fixing:
  - Fasteners: 50 mm x 8 gauge wood screws into pilot holes.
  - Fixing centres:
    Along each support: 25 mm from each long edge and at maximum 300 mm centres between.
    Around perimeter of roof area: Maximum 300 mm centres.
- Expansion provision:
  - Clear expansion gap around perimeter of roof area and upstands: 10 mm.
  - Intermediate expansion/ movement joints: As recommended by decking manufacturer.

620 PLYWOOD SARKING

- Substrate: 50x44mm treated softwood battens at 400mm ctrs.
  - Additional supports: Rafters to Engineers design.
- Sarking: Plywood manufactured to the relevant standards and quality controlprocedures specified in EN 636, and so marked.
  - Type: Contractor's choice.
  - Performance class to EN 636: [ Class 2 (Suitable for use in humid areas or exposure to occasional wetting)].
  - Bond quality to EN 314-2: [ Class 2 (Humid conditions, appropriate for interior situations with humidity higher than class 1 levels, and for protected exterior applications)].

- Nominal thickness/ number of plies: 18mm.

  - Edges: Square.
  - Other requirements: CE Marked.
- Setting out: Long edges running across rafters. End joints central over raftersand staggered.
- Fixing to each rafter:
  - Fasteners: 50 mm x 8 gauge wood screws into pilot holes.
  - Fixing centres (maximum):
    Around roof perimeter and along short edges of each board: 150 mm.
    Along intermediate supports: 300 mm.
  - Fixing distance from edges: 25 mm from long edges and minimum 10 mm from short edges.

795B WALL LINING ON METAL FRAMING 3mm Aluminium Sheeting with randomperforations comprising 6.3mm and 19.5mm diameter holes

- Substrate: Masonry blockwork/Concrete - refer to Architect's Drawings.
  - Cavity width (substrate to frame): Walls: 12.5mm Ceilings : 46mm .
- Framing:
  - Manufacturer: Contractor's choice.
    -.
  - Size: 46 X 50mm .
  - Framing centres (maximum): 1000mm.
- Setting out lining: Long edges of boards running parallel to supports:
  Gap between adjacent boards :Varies- refer to Architect'sDrawings
  -.
- Accessories/ Other requirements: Location of fixings to be agreed with Architect.

875 MEDIUM DENSITY FIBREBOARD Moisture Resistant MDF windowboards throughout

- Substrate: Masonry/ Softwood - refer to Architect's Drawings.
  - Additional supports: SW Battens.
- Medium density fibreboard: To BS EN 622-5, Type MDF.H.
  - Manufacturer/ Supplier: Contractor's choice.
    Product reference: -.
  - Formaldehyde class to BS EN 622-1: Class E2.
  - Fire rating: Class 1 surface spread of flame to BS 476-7.
  - Thickness: 18 mm.
  - Edges: Square.
  - Recycled content: Contractor's choice.
  - Other requirements: -.
- Setting out: Long edges running along supports.
  - Gap between adjacent boards: N/A.
- Fixing to supports:
  - Fixing centres (maximum):
    Around board edges: 100 mm.
    Along intermediate supports: 150 mm.
  - Fixing distance from edges (minimum): 12 mm.
- Joint treatment: Bonded with PVA adhesive to BS EN 204, class D3.
- Accessories: -.

WORKMANSHIP

910 INSTALLATION GENERALLY

- Timing: Building to be weathertight before fixing boards internally.
- Moisture content of timber supports (maximum): 18%.
- Joints between boards: Accurately aligned, of constant width and parallel toperimeter edges.
- Methods of fixing, and fasteners: As section Z20 where not specified otherwise.

935 ADDITIONAL SUPPORTS

- Additional studs, noggings and battens:
  - Provision: In accordance with board manufacturer's recommendations and as follows:
    Tongue and groove jointed rigid board areas: To all unsupported perimeter edges.
    Butt jointed rigid board areas: To all unsupported edges.
  - Size: Not less than 50 mm wide and of adequate thickness.
  - Quality of timber: As for adjacent timber supports.
  - Treatment (where required): As for adjacent timber supports.

940 BOARD MOISTURE CONTENT AND CONDITIONING

- Moisture content of boards at time of fixing: Appropriate to end use.
- Conditioning regime: Submit proposals.

960 FIXING GENERALLY

- Boards/ sheets: Fixed securely to each support without distortion and true to line and level.
- Fasteners: Evenly spaced in straight lines and, unless otherwise recommended by board manufacturer, in pairs across joints.
  - Distance from edge of board/ sheet: Sufficient to prevent damage.
- Surplus adhesive: Removed as the work proceeds.

980 OPEN JOINTS

- Perimeter joints, expansion joints and joints between boards: Free from plaster,mortar droppings and other debris.
- Temporary wedges and packings: Removed on completion of board fixing.

# L10 Windows/ Rooflights/ Screens/ Louvres

To be read with Preliminaries/ General conditions.
See APPENDIX A for PVC-U Double and Triple Glazed Windows

Prevention of falls from windows
In dwellings where a window has an opening section through which a person may fall, (having particular regard to children under five years old), and is more than 1400 mm above external ground level, suitable safety restrictors must be provided (see Diagram 9). Safety restrictors must restrain the window sufficiently to prevent such falls. Restrictors can be either an integral part of the window operating gear or separate items of hardware which can be fitted to a window at the time of manufacture or at installation. Restrictors must operate so that they limit the initial movement of an opening section to not more than 100 mm.

Note: Lockable handles or restrictors, which can only be released by removable keys or other tools, must not be fitted to window opening sections required for escape purposes (see TGD B Fire Safety).

GENERAL

110 EVIDENCE OF PERFORMANCE
- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

115 TIMBER PROCUREMENT
- Timber (including timber for wood based products): Obtained from well managed forests and/ or plantations in accordance with:
  - The laws governing forest management in the producer country or countries.
  - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
  - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
  - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.
- Certification scheme: Sustainable Forestry Initiative (SFI), with Chain of Custody/ Programme for the Endorsement of Forest Certification (PEFC).
  - Other evidence: None.

120 SITE DIMENSIONS
- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: ALL EXTERNAL WINDOWS

PRODUCTS

412 COMPOSITE WINDOWS ALUMINIUM CLAD TIMBER - OPENABLE

- Standard: To EN 14351.
- Exterior frame cladding: Extruded aluminium alloy profiles to EN 755. The claddingmust be fixed to allow full air circulation and drainage behind and must be clear of the timber surface by approximately 5mm. Composite systems are not permitted.
  - Factory Finish: Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed.
- Interior frame section: Softwood, Class 2 to BS 1186 or equivalent standard.
  - Factory surface treatment: [Vacuum/pressure deep impregnated preservative to EN 351-1 to achieve a 60 year 'desired service life' for external joinery].
  - Factory finish as delivered: Semi-gloss clear water based lacquer.
- Moisture content on delivery: [12% ± 3%].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): 0.8 W/m²K.
- Resistance to wind load test pressure to EN 12210 (minimum): Class 4 (2400 Pa test pressure).
- Resistance to wind load frame deflection to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness to EN 12208 (minimum): [ Class 9A (600Pa test pressure)].
- Air permeability to EN 12207: [ Class 4 (600Pa test pressure)].
- Load bearing capacity of safety devices to EN 14609: [ Pass ].
- Operating forces to EN 13115: [ Class 1 ].
- Factory Fitted Insulated Glazing: Drained and ventilated dry glazed system: Triple-glazed units with clear float glass.
  - Standard: [To EN 1279].
  - Beading: External, extruded aluminium.
- Components: [
  - Warm edge spacer bars.
  - Argon gas filled cavities.
  - Soft low-E coating to cavity face of inner pane.
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
- Ironmongery/ Accessories:
  - Factory cut 290x12-14mm slot for humidity sensitive air inlet with free area of4000mm². Ventilators to be located at window frame head only-vents located in jambs are not acceptable.
  - Factory fitted steel handles, matt chrome finish.
  - Concealed 180° hinges with integrated child safety restrictors.
  - Concealed restrictors.
  - All concealed ironmongery to be positioned behind the weather gasket..
- Operation: [Top hung, outward opening. 180° reversible hinges to allow safe cleaning of the outer face from within the building].
- Fixing: In accordance with manufacturer's recommendations.
- Additional Requirements:[
  - Agrément certified.
  - Secured by Design licensed.
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001 (Environmental Management).
  - Minimum 10 year manufacturer's warranty for frame, ironmongery & sealed glazing units.].

413 COMPOSITE WINDOWS ALUMINIUM CLAD TIMBER - WITH AUTOMATIC OPENING LIGHTS

- Standard: To EN 14351.
- Exterior frame cladding: Extruded aluminium alloy profiles to EN 755. The claddingmust be fixed to allow full air circulation and drainage behind and must be clear of the timber surface by approximately 5mm. Composite systems are not permitted.
  - Factory Finish: Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed.
- Interior frame section: Softwood, Class 2 to BS 1186 or equivalent standard.
  - Factory surface treatment: [Vacuum/pressure deep impregnated preservative to EN351-1 to achieve a 60 year 'desired service life' for external joinery].
  - Factory finish as delivered: Semi-gloss clear water based lacquer.
- Moisture content on delivery: [12% ± 3%].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): 0.8 W/m²K.
- Resistance to wind load test pressure to EN 12210 (minimum): Class 4 (2400 Pa test pressure).
- Resistance to wind load frame deflection to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness to EN 12208 (minimum): [ Class 9A (600Pa test pressure)].
- Air permeability to EN 12207: [ Class 4 (600Pa test pressure)].
- Load bearing capacity of safety devices to EN 14609: [ Pass ].
- Operating forces to EN 13115: [ Class 1 ].
- Factory Fitted Insulated Glazing: Drained and ventilated dry glazed system: Triple-glazed units with clear float glass.
  - Standard: [To EN 1279].
  - Beading: External, extruded aluminium.
- Components: [
  - Warm edge spacer bars.
  - Argon gas filled cavities.
  - Soft low-E coating to cavity face of inner pane.
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
- Ironmongery/ Accessories:
  - Actuator to M&E Engineer's specification.
  - All concealed ironmongery to be positioned behind the weather gasket.
- Operation: [The window must automatically open outwards to provide rapid ventilation of smoke and if appropriate, emergency egress].
- Fixing: In accordance with manufacturer's recommendations.
- Additional Requirements:[
  - Agrément certified.
  - Secured by Design licensed.
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001 (Environmental Management).
  - Minimum 10 year manufacturer's warranty for frame, ironmongery & sealed glazing units.].

414 COMPOSITE WINDOWS ALUMINIUM CLAD TIMBER - FIXED

- Standard: To EN 14351.
- Exterior frame cladding: Extruded aluminium alloy profiles to EN 755. The claddingmust be fixed to allow full air circulation and drainage behind and must be clear of the timber surface by approximately 5mm. Composite systems are not permitted.
  - Factory Finish: Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed.
- Interior frame section: Softwood, Class 2 to BS 1186 or equivalent standard.
  - Factory surface treatment: [Vacuum/pressure deep impregnated preservative to EN 351-1 to achieve a 60 year 'desired service life' for external joinery].
  - Factory finish as delivered: Semi-gloss clear water based lacquer.
- Moisture content on delivery: [12% ± 3%].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): 0.8 W/m²K.
- Resistance to wind load test pressure to EN 12210 (minimum): Class 4 (2400 Pa test pressure).
- Resistance to wind load frame deflection to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness to EN 12208 (minimum): [ Class 9A (600Pa test pressure)].
- Air permeability to EN 12207: [ Class 4 (600Pa test pressure)].
- Load bearing capacity of safety devices to EN 14609: [ Pass ].
- Operating forces to EN 13115: [ Class 1 ].
- Factory Fitted Insulated Glazing: Drained and ventilated dry glazed system:Triple-glazed units with clear float glass.
  - Standard: [To EN 1279].
  - Beading: External, extruded aluminium.
- Components: [
  - Warm edge spacer bars.
  - Argon gas filled cavities.
  - Soft low-E coating to cavity face of inner pane.
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
- Ironmongery/ Accessories:
  - Factory cut 290x12-14mm slot for humidity sensitive air inlet with free area of4000mm². Ventilators to be located at window frame head only-vents located in jambs are not acceptable.
- Operation: [Fixed].
- Fixing: In accordance with manufacturer's recommendations.
- Additional Requirements:[
  - Agrément certified.
  - Secured by Design licensed.
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001 (Environmental Management).
  - Minimum 10 year manufacturer's warranty for frame, ironmongery & sealed glazing units.].

416 COMPOSITE WINDOWS ALUMINIUM CLAD TIMBER - COMBINATION

- Standard: To EN 14351.
- Exterior frame cladding: Extruded aluminium alloy profiles to EN 755. The claddingmust be fixed to allow full air circulation and drainage behind and must be clear of the timber surface by approximately 5mm. Composite systems are not permitted.
  - Factory Finish: Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed.
- Interior frame section: Softwood, Class 2 to BS 1186 or equivalent standard.
  - Factory surface treatment: [Vacuum/pressure deep impregnated preservative to EN 351-1 to achieve a 60 year 'desired service life' for external joinery].
  - Factory finish as delivered: Semi-gloss clear water based lacquer.
- Moisture content on delivery: [12% ± 3%].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): 0.8 W/m²K.
- Resistance to wind load test pressure to EN 12210 (minimum): Class 4 (2400 Pa test pressure).
- Resistance to wind load frame deflection to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness to EN 12208 (minimum): [ Class 9A (600Pa test pressure)].
- Air permeability to EN 12207: [ Class 4 (600Pa test pressure)].
- Load bearing capacity of safety devices to EN 14609: [ Pass ].
- Operating forces to EN 13115: [ Class 1 ].
- Factory Fitted Insulated Glazing: Drained and ventilated dry glazed system: Triple-glazed units with clear float glass.
  - Standard: [To EN 1279].
  - Beading: External, extruded aluminium.
- Components: [
  - Warm edge spacer bars.
  - Argon gas filled cavities.
  - Soft low-E coating to cavity face of inner pane.
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
- Ironmongery/ Accessories:
  - Factory cut 290x12-14mm slot for humidity sensitive air inlet with free area of4000mm². Ventilators to be located at window frame head only-vents located in jambs are not acceptable.
  - Factory fitted steel handles, matt chrome finish.
  - Concealed 180° hinges with integrated child safety restrictors.
  - Concealed restrictors.
  - All concealed ironmongery to be positioned behind the weather gasket..
- Operation: [
  - Top hung, outward opening. 180° reversible hinges to allow safe cleaning of theouter face from within the building
  - Fixed
  - Refer to Architect's drawings for fenestration design].
- Fixing: In accordance with manufacturer's recommendations.
- Additional Requirements:[
  - Agrément certified.
  - Secured by Design licensed.
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001 (Environmental Management).
  - Minimum 10 year manufacturer's warranty for frame, ironmongery & sealed glazing units.].

465 ROOFLIGHTS [FIXED TO FLAT ROOFS]

- Size: 900x1200mm.
- Type: Rectangular.
- Frame: PVC, insulated. Integral with rooflight.
  - Colour: White.
- Kerb: PVC-U.
- Thermal performance (U-value maximum): 1.4 W/m²K.
- Fire performance (minimum): Broof(t4) when classified to EN 13501-5.
- Glazing details:
  Fixed double-glazing:
  - 6mm clear laminated inner pane with low e coating
  - 4mm clear float
  - 14mm argon filled cavity
  - protective clear polycarbonate dome cover.
- Other requirements: Extension frame for warm roof installation.
- Fixing: As per manufacturer's recommendations.

485 ROOF WINDOWS [TO PITCHED ROOFS]

- Standard: To EN 14351.
- Materials:
  - Exterior sash cladding: Extruded aluminium alloy profiles to EN 755.
  - Factory finish: [Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed].
  - Interior frame sections: [Softwood, class 2 to BS 1186 or equivalent standard].
  - Factory finish as delivered: [Polyurethane lacquer. Colour: White].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): [ 0.85 W/m²K ].
- Resistance to wind load test pressure classification to EN 12210 (minimum): [ Class 3 (1200 Pa test pressure)].
- Relative frontal deflection classification to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness classification to EN 12208 (minimum): [ Class 9A (600 Pa test pressure)].
- Air permeability classification to EN 12207: [ Class 4 (600 Pa test pressure)].
- Reaction to fire to EN 13501 (minimum): [ Class E ].
- Load bearing capacity of safety devices to EN 14609: [Pass].
- Operation: Centre pivot.
- Factory Fitted Insulated Glazing: Triple-glazed units with clear float glass.
  - Standard: To EN 1279.
  - Beading: External, extruded aluminium.
- Components: [
  - Warm edge spacer bars.
  - Krypton gas filled cavities.
  - Laminated inner pane with soft low-E coating to cavity face of inner pane.
  - Mid pane with soft low-E coating.
  - Toughened outer pane with anti-dew coating.
  - Acoustic attenuation Rw + Ctr (minimum): 37 dBA.
- Flashings: By window manufacturer to suit: Zinc roofing.
- Accessories:
  - Underfelt collar with drainage gutter
  - Insulation collar
  - Vapour barrier collar
  - Internal lining kit
  - Trickle vent with free area of 4000mm²
  - Anodised aluminium handle.
- Fixing: To manufacturer's recommendations.
- Additional requirements: [
  - Agrément certified
  - Minimum 10 year warranty for frame, ironmongery & sealed glazing units
  - Roof windows to be sealed back to VCL with airtightness tape as clause 695]

491 ROOF VENTILATORS

- Standard: To EN 12101-2.
- Type: Automatic opening ventilator.
- Controls: Heavy duty linear actuator.
- Operation: [160° opening. The vent must open automatically to provide rapid ventilation of smoke].
- Resistance to heat class: [B300E].
- Nominal size: [To provide free area required by the building fire certificate].
- Upstand: [300mm PVC]
  - Thermal performance (U-value maximum): [ 0.8 W/m²K ].
  - Colour: [White].
- Factory Fitted Glazing: [Quadruple layer polycarbonate, clear].
  - Thermal performance (U-value maximum): [ 1.4 W/m²K ].
  - Acoustic attenuation Rw + Ctr (minimum): 22 dBA.
- Accessories/ Special features:
  - Actuator positioned to allow roof access
  - Upstand flashing to accept roof membrane
  - Electromagnetic lock.
- Fixing: In accordance with manufacturer's recommendations.

515 GLAZED WOOD SCREENS

- Location: Protected corridors/lobbies/stairwells.
- Timber: Generally to EN 942.
  - Species: Hardwood as table NA.2.
  - Appearance class: J20.
  - Moisture content on delivery: 9-13%.
- Assembly adhesive: PVAC to EN 204, Class D4 .
- Joinery workmanship: As section Z10.
- Finish as delivered: Prepared and primed for painting.
- Fire performance:
  - 30 minute integrity & insulation
  - 60 minute integrity & insulation.
- Glazing details: Fire resistant glass as section L40.
- Special features/ Other requirements: None.
- Fixing: Screw fixed and pelleted as clause 780.

695 AIRTIGHT SEALING TAPE EXTERNAL WINDOWS, ROOFLIGHTS & ROOF WINDOWS GENERALLY

- Type: impregnated PUR flexible foam with adhesive and film.
- Colour: Black
- Impermeable to driving rain: DIN EN 1027 $\geq$ 1,000Pa
- Air permeability coefficient: DIN EN 12114 a= 0.00m3/(h-m-(daPa)n)
- Size: to be suitable for size of glazing section, variable widths and thickness available
- Sd value (minimum): to DIN EN ISO 12572 50:1 (internal $\geq$ 25; external $\leq$ 0.5)
- Temperature resistance: -40°C to +90°C.
- Accessories / Special features: Pre-compressed tape, 100% air tight at internal seal area, vapour diffusion gradient from inside outwards (50:1), suitable for plastering over, capable of dealing with movement of structural elements and temporary longitude changes,
- Additional requirements: All porous surfaces e.g. brickwork to be primed with asolvent primer as recommended by the tape manufacturer.

EXECUTION

710 PROTECTION OF COMPONENTS

- General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry floored and covered storage.
- Stored components: Stack vertical or near vertical on level bearers, separated withspacers to prevent damage by and to projecting ironmongery, beads, etc.

751 BUILDING IN

- General: Not permitted unless indicated on drawings.

765 WINDOW INSTALLATION GENERALLY

- Installation: Into prepared openings.
- Gap between frame edge and surrounding construction:
  - Minimum: 3mm.
  - Maximum: 10mm.
- Distortion: Install windows without twist or diagonal racking.

770A PROPRIETARY CAVITY CLOSERS IN PREPARED OPENINGS

- Location: Ensure correct positioning in relation to window frames. Do not displace during fixing operations.

775 WEDGES & PACKERS

- Wedges: Use wedges to assist in setting frames square and plumb prior to fixing. Use 2 wedges at each corner (placed on the end grain only) and remove after packing andfixing is complete. Do not use wedges for fixing windows.
- Packers:
  - Material: Rot-proof.
  - Distortion: Do not force packers into openings. Vary packer thickness to ensure frames are plumb and square without twist or bow.
  - Continuous packer to be used under frames.
  - Expanding Polyurethane Foam to provide thermal continuity around window frames

780 FIXING OF WOOD FRAMES

- Standard: As section Z20.
- Fasteners: Stainless steel wood screws .
  - Spacing: When not predrilled or specified otherwise, position fasteners not more than 150 mm from ends of each jamb, adjacent to each hanging point of opening lights, and at maximum 450 mm centres.

785 FIXING OF COMPOSITE FRAMES

- Standard: As section Z20.
- Fasteners: Galvanised carbon steel frame cramps, 30-35mm wide. 3.5mm thick and of sufficient length to ensure good fixing to structure.
  - Spacing: When not predrilled or specified otherwise, position fasteners not more than 150 mm from ends of each jamb, adjacent to each hanging point of opening lights, and at maximum 600 mm centres.
    Cavity Closers must not be damaged.

790 FIRE RESISTING FRAMES

- Gap between back of frame and reveal: Completely fill with intumescent mastic or tape.

811 WEATHERTIGHT SEALANT JOINT TAPE

- Type: Impregnated polyurethane foam, pre-compressed, self adhesive.
  - Weathertightness against driving rain to EN 1027 (minimum): [600 Pa].
  - Vapour Resistivity to EN ISO 12207: [$\mu < 100$].
  - Flame Retardancy to DIN 4102 or equivalent standard: B1, self extinguishing
  - Reaction to fire classification to EN 13501 (minimum): F.
  - Depth: Joint depth to be equal or greater than joint width.
  - Application: As section Z22 to prepared joints.
- Additional requirements: [
  - Agrément certified.
  - Warranty: 15 years minimum].

815 SEALANT JOINTS

- Sealant:
  - Standard (EN ISO 11600 class): F25 LM.
  - Type : One part low modulus neutral cure silicone.
  - Colour: Black.
  - Application: As section Z22 to prepared joints. Finish triangular fillets to a flat or slightly convex profile. Sealant to finish 10-12mm from bottom of jambs to allow for drainage of decompression zone.
    Windows and door frames to have 150mm wide airtightness membrane taped to full frame perimeter prior to installation to allow for taping to the primaryy airtightness membrane after installation.

825 IRONMONGERY

- Checking/ Adjusting/ Lubricating: Carry out at Completion and ensure correct functioning.

# L20 Doors/ shutters/ hatches

To be read with Preliminaries/ General conditions.

GENERAL

110 EVIDENCE OF PERFORMANCE

- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

112 TIMBER PROCUREMENT

- Timber (including timber for wood-based products): Obtained from well-managedforests and/ or plantations in accordance with:
  - The laws governing forest management in the producer country or countries.
  - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
  - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
  - Evidence that suppliers have adopted and are implementing a formalenvironmental purchasing policy for timber and wood-based products.
- Certification scheme: Sustainable Forestry Initiative (SFI), with Chain ofCustody/ Programme for the Endorsement of Forest Certification (PEFC).
  - Other evidence: None.

116 FIRE RESISTING DOORS/ DOOR ASSEMBLIES/ DOORSETS

- Door products: As defined in EN 12519.
- Evidence of fire performance: Provide certified evidence, in the form of a product conformity certificate, directly relevant fire test report or engineering assessment, thateach door/ door assembly/ doorset supplied must comply with the specified requirements for fire or smoke resistance if tested to BS 476-22 or equivalent standard, EN 1634-1 or EN1634-3. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
- Components, assemblies or sets must be marked to the relevant product standard and/ or third party certification rating.

130 NON FIRE RESISTING DOORS/ DOOR ASSEMBLIES/ DOORSETS

- Provide certified evidence, in the form of a product conformity certificate or engineering assessment, that each door/ doorset/ assembly supplied must comply with the specified requirements to EN 14351-1. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hingesand seals.
- Components and assemblies must be marked to the relevant product standard and/ or third party certification rating.

150 SITE DIMENSIONS

- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: All doors & hatches.

PRODUCTS

230 WOOD FLUSH DOORS Internal

- Manufacturer: Contractor's choice.
  - Product reference: -.
- Facings: Interior grade plywood.
- Lippings: Concealed lippings to long edges.
- Preservative treatment: Not required.
- Finish as delivered: Primer and undercoat, as section M60.
- Glazing/ Infill details: Refer to Internal Door Schedule.
  - Manifestation: As drawing.
  - Beading: For glazed doors - refer to Internal Door Schedule.
- Thermal performance (U-value maximum): NA.
- Other requirements: -.

310 WOOD DOOR FRAMES Internal

- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Species: Softwood.
- Preservative treatment: Not required.
- Finish as delivered: Prepared and primed, as section M60.
- Perimeter seals: Not required.
- Thermal performance: Unrated.
- Fixing: Plugged and screwed as section Z20.

431 WOOD DOORSETS E30 / FD30 FIRE RESISTING

- Materials: Generally to EN 942.
- Fire resistance rating to EN 1634-1 and/or BS 476-22 or equivalent standard: [ 30 minutes integrity ].
- Strength class to EN 1192: [ Class 4 (severe duty)].
- Sound insulation rating (minimum): [27 dBA].
- Door leaf: [44mm solid core]
  - Framework: [50x36mm MDF internal stiles and rails, minimum density 700 kg/m³. Top rails to have an additional 30mm hardwood rail to accommodate concealed door closers where required].
  - Core: Multi-layer particleboard, minimum density 560 kg/m³.
  - Facings: Koto veneer or Kraft paper, minimum thickness 0.7mm.
  - Lippings: Concealed 44x10mm solid hardwood lippings to all 4 edges.
  - Finish as delivered: Primed by manufacturer for painting.
- Frame and architraves:
  - Wood species: European redwood, minimum density 450 kg/m³.
  - Appearance class to EN 942: J20.
  - Finish as delivered: Primed by manufacturer for painting.
- Preservative treatment: Not required.
- Glazing/ Infill details: Where required - Clear fire-resisting glazing.
  - Manifestation: Not applicable.
  - Beading: Internal.
- Moisture content on delivery: 8-14%.
- Ironmongery: As ironmongery schedule. Doors & frames to be factory prepared for all ironmongery.
- Perimeter seals: 10x4mm intumescent fire seals (colour: black) rebated into door frame.
- Fixing: Plugged and screwed as section Z20.

438 WOOD DOORSETS E60 Sa / FD60 S FIRE RESISTING AND SMOKE CONTROL

- Materials: Generally to EN 942.
- Fire resistance rating to EN 1634-1 and/or BS 476-22 or equivalent standard: [ 60 minutes integrity ].
- Strength class to EN 1192: [ Class 4 (severe duty)].
- Sound insulation rating (minimum): [27 dBA].
- Door leaf: [54mm solid core]
  - Framework: [50x46mm MDF internal stiles and rails, minimum density 700 kg/m³. Top rails to have an additional 30mm hardwood rail to accommodate concealed door closers where required].
  - Core: Multi-layer particleboard, minimum density 560 kg/m³.
  - Facings: Koto veneer or Kraft paper, minimum thickness 0.7mm.
  - Lippings: Concealed 54x10mm solid hardwood lippings to all 4 edges.
  - Finish as delivered: Primed by manufacturer for painting.
- Frame and architraves:
  - Wood species: European hardwood, minimum density 650 kg/m³.
  - Appearance class to EN 942: J20.
  - Finish as delivered: Primed by manufacturer for painting.
- Preservative treatment: Not required.
- Glazing/ Infill details: Where required - Clear fire-resisting glazing.
  - Manifestation: Doors to Communal Circulation Spaces - Units D,G,H,J,K - Refer to Internal Door Schedule.
  - Beading: Internal.
- Moisture content on delivery: 8-14%.
- Ironmongery: As ironmongery schedule. Doors & frames to be factory prepared for all ironmongery.
- Perimeter seals: 20x4mm (or 2no. 10x4mm) combined intumescent fire & brush smoke seals (colour: black), rebated into door frame.
- Fixing: Plugged and screwed as section Z20.

450 WOOD DOORSETS INSULATED ENTRANCE DOORS

- Sound insulation rating (minimum): [27 dBA].
- Door leaf:
  - Framework: [Solid timber internal stiles and rails].
  - Core: CFC-free rigid PU or PIR insulation.
  - Sub-facings: [0.5mm galvanised steel or aluminium sheet].
  - Inner facings: Minimum 4mm thick plywood or HDF, veneered.
  - Outer facings: Minimum 4mm thick plywood or HDF, factory prepared and painted with water-based micro porous opaque paint, minimum dry film thickness: 100 microns.
  - Finish as delivered: RAL colour to be agreed on site with the Architect.
- Frame:
  - Frame sections: Softwood, class 2 to BS 1186 or equivalent standard.
  - Factory surface treatment: Vacuum/ pressure deep impregnated preservative to,class NP3 to BS 8417 or equivalent standard to achieve a 60 year 'desired service life' for external joinery.
  - Finish as delivered: Factory prepared and painted with water-based microporousopaque paint, minimum dry film thickness: 100 microns. Colour: RAL colour to be agreed on site with the Architect.
  - Moisture content on delivery: [12% ± 3%].
- Strength & Stability / Resistance to wind load test pressure to EN 12210 (minimum): [ Clas s 3 (1200Pa test pressure)].
- Watertightness to EN 12208 (minimum): [ Class 7A (300Pa test pressure)].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole unit u-value) (maximum): [ 1.2 W/m²K ].
- Air Permeability to EN 12207: [ Class 4 (600Pa test pressure)]
- Factory fitted glazing: Triple glazed sealed units with clear float glass.
- Standard: To EN 1279.
- Components:
  - Warm edge spacer bars
  - Argon gas filled cavities
  - Soft low-E coating to cavity face of inner pane
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
  - Solid timber beading to match door veneer.
- Ironmongery:
  - Aluminium level access threshold.
  - 3no. stainless steel butt hinges.
  - Factory fitted letter-plate compliant with EN 13724:2002 with internal and external flaps must be fixed to the door leaf.
  - Factory fitted multi-point locking system with single euro profile cylinder. Lever handles in satin anodised aluminium.
  - Factory fitted spyhole.
  - Factory fitted stainless steel kick-plates both sides.
  - All concealed ironmongery to be positioned behind the weather gasket.
- Perimeter seals: Silicone weatherseals / EPDM & silicone gaskets to glazed unit.
- Fixing: In accordance with recommendations of the manufacturer.
- Operation: [Manual, inward opening].
- Additional requirements: [
  - Agrément Certified.
  - Secured By Design licensed.
  - Manufactured in accordance with EN ISO 9001 (Quality Management System) andEN ISO 14001 (Environmental Management System) or equivalent.
  - Minimum 10 year manufacturer's warranty for door, frame & sealed glazing units.

481 STEEL DOORSETS GENERALLY

- Door leaf:
  - 43mm minimum leaf thickness.
  - True vertical lock seams. Top & bottom channels TIG welded.
  - 1.2mm electro zinc coated steel facings to EN 10152 with composite honeycomb core.
  - Finish as delivered: Smooth polyester powder coated, minimum dry film thickness:60 microns. RAL colour: to be agreed.
- Frame: 1.5mm electro zinc coated steel to EN 10152, single rebate, welded seamless.
  - Finish as delivered: Smooth polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed.
- Threshold: [15mm rebated].
- Ironmongery: As ironmongery schedule. Door & frames to be factory prepared for all ironmongery.
- Perimeter seals: EPDM weatherseal.
- Other requirements: Flush security astragal.
- Fixing: Adjustable fitting bolts.

521 COMPOSITE EXTERNAL SLIDING DOORS ALUMINIUM CLAD TIMBER

- Standard: To EN 14351.
- Arrangement: Single leaf bottom rolling with top guide.
  - Track system: Sealed roller bearings on hardened aluminium alloy track.
- Exterior frame cladding: [Extruded aluminium alloy profiles to EN 755. The cladding must be fixed to allow full air circulation and drainage behind and must be clear of the timber surface by approximately 5mm. Composite systems are not permitted].
  - Factory Finish: [Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed].
- Interior frame section: [Softwood, Class 2 to BS 1186 or equivalent standard].
  - Factory surface treatment: [Vacuum/pressure deep impregnated preservative to EN 351-1 to achieve a 60 year 'desired service life' for external joinery].
  - Factory finish as delivered: [Semi-gloss clear water based lacquer].
- Moisture content on delivery: [12% ± 3%].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): [ 0. 9 W/m²K ].
- Resistance to wind load test pressure to EN 12210 (minimum): [ Class 4 (2400 Patest pressure)].
- Resistance to wind load frame deflection to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness to EN 12208 (minimum): [ Class 9A (600Pa test pressure)].
- Air permeability to EN 12207: [ Class 4 (600Pa test pressure)].
- Operating forces to EN 13115: [ Class 1 ].
- Factory Fitted Insulated Glazing: [Drained and ventilated dry glazed system: Triple-glazed units with clear float glass].
  - Standard: [To EN 1279].
  - Beading: [External, extruded aluminium].
- Components: [
  - Warm edge spacer bars.
  - Argon gas filled cavities.
  - Soft low-E coating to cavity face of inner pane.
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
- Ironmongery/ Accessories: [
  - Factory cut 290x12-14mm slot for humidity sensitive air inlet with free area of4000mm². Ventilators to be located at window frame head only-vents located in jambs are not acceptable.
  - Factory fitted espagnolette locking system with thumb turn & handle internally.
  - Factory fitted steel handles, matt chrome finish.
  - All concealed ironmongery to be positioned behind the weather gasket.].
- Operation: [Manual, sliding].
- Fixing: [In accordance with manufacturer's recommendations].
- Additional Requirements:[
  - Agrément certified.
  - Secured by Design licensed.
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001 (Environmental Management).
  - Minimum 10 year manufacturer's warranty for frame, ironmongery & sealed glazing units].
    - Where required - Galvanised Steel Angle Support to by Window Supplier.

522 COMPOSITE EXTERNAL GLAZED DOORS ALUMINIUM CLAD TIMBER

- Standard: To EN 14351.
- Exterior frame cladding: [Extruded aluminium alloy profiles to EN 755. The cladding must be fixed to allow full air circulation and drainage behind and must be clear of the timber surface by approximately 5mm. Composite systems are not permitted].
  - Factory Finish: [Polyester powder coated, minimum dry film thickness: 60 microns. RAL colour: to be agreed].
- Interior frame section: [Softwood, Class 2 to BS 1186 or equivalent standard].
  - Factory surface treatment: [Vacuum/pressure deep impregnated preservative to EN 351-1 to achieve a 60 year 'desired service life' for external joinery].
  - Factory finish as delivered: [Semi-gloss clear water based lacquer].
- Moisture content on delivery: [12% ± 3%].
- Thermal transmittance to EN ISO 10077-1&2 (Uw - whole window U-value)(maximum): [ 0.9 W/m²K ].
- Resistance to wind load test pressure to EN 12210 (minimum): [ Class 4 (2400 Patest pressure)].
- Resistance to wind load frame deflection to EN 12210 (minimum): [ Class C (<1/300)].
- Watertightness to EN 12208 (minimum): [ Class 9A (600Pa test pressure)].
- Air permeability to EN 12207: [ Class 4 (600Pa test pressure)].
- Load bearing capacity of safety devices to EN 14609: [ Pass ].
- Operating forces to EN 13115: [ Class 1 ].
- Factory Fitted Insulated Glazing: [Drained and ventilated dry glazed system: Triple-glazed units with clear float glass].
  - Standard: [To EN 1279].
  - Beading: [External, extruded aluminium].
- Components: [
  - Warm edge spacer bars.
  - Argon gas filled cavities.
  - Soft low-E coating to cavity face of inner pane.
  - Acoustic attenuation Rw + Ctr (minimum): 33 dBA.
- Ironmongery/ Accessories: [
  - Factory cut 290x12-14mm slot for humidity sensitive air inlet with free area of4000mm². Ventilators to be located at window frame head only-vents located in jambs are not acceptable.
  - Factory fitted multi-point locking system with single euro profile cylinder. Lever handles in satin anodised aluminium. Flush bolts top & bottom in secondary leaf whererelevant.
  - Factory fitted friction stay to primary leaf.
  - Factory fitted steel handles, matt chrome finish.
  - All concealed ironmongery to be positioned behind the weather gasket.].
- Operation: [Manual, outward opening].
- Fixing: [In accordance with manufacturer's recommendations].
- Additional Requirements:[
  - Agrément certified.
  - Secured by Design licensed.
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001 (Environmental Management).
  - Minimum 10 year manufacturer's warranty for frame, ironmongery & sealed glazing units]
  - Where required - Galvanised Steel Angle Support to by Window Supplier.

526 SLIDING POCKET DOORS GENERALLY

- Fire resistance rating: None.
- Strength class to EN 1192: Class 4 (severe duty).
- Sound insulation rating (minimum): 27 dBA.
- Arrangement: Single leaf & paired leafs.
  - Track system: As ironmongery schedule.
- Door leaf: 44mm solid core.
  - Framework: [50x36mm MDF internal stiles and rails. Top rails to have an additional 30mm hardwood rail to accommodate sliding door components].
  - Core: [Multi-layer particleboard, minimum density 560 kg/m³].
  - Sub-facings: [4mm MDF sheets bonded to both sides of framework & core].
  - Facings: [Koto veneer or Kraft paper, minimum thickness 0.7mm].
  - Lippings: [Concealed 44x10mm solid hardwood lippings to all 4 edges].
  - Finish as delivered: Primed by manufacturer for painting.
  - Glazing/ Infill details: Not required.
    Manifestation: Not required.
- Operation: Manual.
- Ironmongery: As ironmongery schedule.
- Other requirements: Jamb kit.

640 HATCHES TO UNITS A1,A2,B1,B2,C1,C2 & E1

- Size: 600x600mm.
- Panel: 16mm thick melamine faced chipboard with ABS edging. Colour: white.
- Thermal performance: Insulated to achieve a minimum overall U-value of 0.78 W/m²K for the complete component.
- Operation: Manual.
- Other requirements:
  - Supplied with airtight double sided adhesive tape
  - Gasket seal between hatch and frame
  - Supplied with push/pull rod.

EXECUTION

710 PROTECTION OF COMPONENTS

- General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.
- Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

730 PRIMING/ SEALING

- Wood surfaces inaccessible after installation: Primed or sealed as specified before fixing components.

740 CORROSION PROTECTION

- Surfaces to be protected: Where required - Steel support angle .
- Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic impregnated tape.
  - Timing of application: Before fixing components.

750 FIXING DOORSETS

- Timing: After associated rooms have been made weathertight and the work of wet trades is finished and dried out.

770 DAMP PROOF COURSES ASSOCIATED WITH BUILT IN WOOD FRAMES

- Method of fixing: To backs of frames using galvanized clout nails.

780 DAMP PROOF COURSES IN PREPARED OPENINGS

- Location: Correctly positioned in relation to door frames. Do not displace during fixing

operations.

790 FIXING OF WOOD FRAMES

- Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamband at 600 mm maximum centres.

800 FIXING OF LOOSE THRESHOLDS

- Spacing of fixings: Maximum 150 mm from each end and at 600 mm maximum centres.

809 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS/ ROLLERSHUTTERS/ CURTAINS

- Installation: By a firm currently registered under a third party accredited fire door installer scheme in accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.

810 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS/ ROLLERSHUTTERS/ CURTAINS

- Gaps between frames and supporting construction: Filled as necessary in accordancewith requirements for certification and/ or door/ doorset manufacturer's instructions.

820 SEALANT JOINTS

- Sealant:
  - Manufacturer: Contractor's choice .
    Product reference: Contractor's choice .
  - Colour: To match frames .
  - Application: As section Z22 to prepared joints. Triangular fillets finished to a flat or slightly convex profile.

830 FIXING IRONMONGERY GENERALLY

- Fasteners: Supplied by ironmongery manufacturer.
  - Finish/ Corrosion resistance: To match ironmongery.
- Holes for components: No larger than required for satisfactory fit/ operation.
- Adjacent surfaces: Undamaged.
- Moving parts: Adjusted, lubricated and functioning correctly at completion.

840 FIXING IRONMONGERY TO FIRE RESISTING DOOR ASSEMBLIES

- General: All items fixed in accordance with door leaf manufacturer'srecommendations ensuring that integrity of the assembly, as established by testing, is notcompromised.
- Holes for through fixings and components: Accurately cut.
  - Clearances: Not more than 8 mm unless protected by intumescent paste or similar.
  - Lock/ Latch cases for fire doors requiring $\geq$ 60 minutes integrity performance: Coated with intumescent paint or paste before installation.

850 LOCATION OF HINGES

- Primary hinges: Where not specified otherwise, positioned with centre lines 250 mmfrom top and bottom of door leaf.
- Third hinge: Where specified, positioned with centre line 250 mm below centre line oftop hinge .
- Hinges for fire resisting doors: Positioned in accordance with door leafmanufacturer's recommendations.

870 INSTALLATION OF EMERGENCY EXIT DEVICES

- Standard: Unless specified otherwise, install panic bolts/ latches in accordance with EN 1125.

# L30 Stairs/ ladders/ walkways/ handrails/ balustrades

To be read with Preliminaries/ General conditions.

PRELIMINARY INFORMATION/ REQUIREMENTS

115 TIMBER PROCUREMENT

- Timber (including timber for wood based products): Obtained from well managed forests and/ or plantations in accordance with:
  - The laws governing forest management in the producer country or countries.
  - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
  - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
  - Evidence that suppliers have adopted and are implementing a formalenvironmental purchasing policy for timber and wood based products.
- Certification scheme: Forest Stewardship Council (FSC).
  - Other evidence: None.

COMPONENTS

231 INTERNAL WOOD STAIRS HOUSES

- Components:
  - Treads: 25mm European oak, bullnosed.
  - Risers: 2 layers of 9mm plywood to EN 635-2, appearance class II.
  - Strings: 44mm European redwood.
  - Newels: 92x92mm European oak, chamfered top & edges with decorative kerf.
  - Guarding: 41x41mm European redwood balusters, chamfered.
  - Handrails: 50mm diameter European oak with groove for balusters.
    Lower handrail: Not required.
- Timber: Generally to EN 942.
  - Appearance class: J10.
  - Moisture content at time of installation: 9-13%.
- Adhesive: PVAC to EN 204, class D1.
- Finish as delivered: Sanded for clear staining / painting.
- Workmanship: To section Z10.
- Other requirements:
  - Matching balustrade to landings - Refer to Clause 512
  - Thrust blocks
  - Anti-creak blocks.

271 STAIRS PRECAST

- Component material, grade, finish as delivered:
  - Treads: Precast concrete with 56x10mm cast-in rebates .
  - Risers: Precast concrete.
  - Guarding: Mild steel, as clauses 552,553,554.
  - Handrails: Composite - Mild steel, as clauses 552,553,554 with European Oak - referto Architect's Drawings .
    Lower handrail: Not required.
- Workmanship:
  - Metalwork: To section Z11.
- Other requirements: Applied slip resistant inserts to treads as clause 586.

512 WOOD BALUSTRADES HOUSES

- Components:
  - Guarding: [41x41mm European redwood balusters, chamfered].
  - Handrails: [50mm diameter European oak with groove for balusters].
  - Baserails: [65x28mm European Oak].
- Timber: Generally to EN 942.
  - Appearance class: J10.
  - Moisture content at time of installation: 9–13%.
- Adhesive: PVAC to EN 204, class D1.
- Finish as delivered: Sanded for clear staining / painting.
- Workmanship: To section Z10.
- Other requirements: None.
- Fixing: Through fixing to joists.
  - Centres: 100mm.

552 PURPOSE MADE BALUSTRADES DUPLEXES

- Component material, grade and finish as delivered:
  - Guarding (balusters): 50x8mm low carbon steel flats - polyester powder coated.
  - Handrails: 50mm half round European Oak on 50x8mm low carbon steel flats -polyester powder coated.
    Lower handrail: Not required.
- Workmanship:
  - Joinery: To section 10.
  - Metalwork: To section Z11.
- Other requirements: All welds ground smooth.
- Fixing: Anchor fixed to concrete to Engineers detail.
  - Centres: 100mm.

553 PURPOSE MADE BALUSTRADES APARTMENT STAIRS

- Component material, grade and finish as delivered:
  - Guarding (balusters): 50x8mm low carbon steel flats - polyester powder coated.
  - Handrails: 50mm half round European Oak on 50x8mm low carbon steel flats -polyester powder coated.
    Lower handrail: Not required.
- Workmanship:
  - Joinery: To section Z10.
  - Metalwork: To section Z11.
- Other requirements: All welds ground smooth.
- Fixing: Anchor fixed to concrete to Engineers detail.
  - Centres: 100mm.

554 PURPOSE MADE BALUSTRADES EXTERNAL STAIRS- UNIT TYPE F1

- Component material, grade and finish as delivered:
  - Guarding (balusters): 50x8mm low carbon steel flats - galvanized to EN ISO 1461 and polyester powder coated.
  - Handrails: 50mm half round European Oak on 50x8mm low carbon steel flats- galvanized to EN ISO 1461 and polyester powder coated.
    Lower handrail: Not required.
- Workmanship:
  - Joinery: To section Z10.
  - Metalwork: To section Z11.
- Other requirements: All welds ground smooth.
- Fixing: Anchor fixed to concrete to Engineers detail.
  - Centres: 100mm.

586 APPLIED SLIP RESISTANT CAST INSERTS TO PRECAST STAIRS

- Material: Epoxy resin bound carborundum in extruded PVC housing.
  - Format: Strip for insertion, 8mm thick, pre finished.
  - Slip resistance – water wet (minimum): PTV of 45 to EN 13036.
- Size/ Coverage:
  - To tread: 1000x55mm.
  - To riser: Not applicable.
- Colour: Black.
- Accessories: None.

INSTALLATION

610 MOISTURE CONTENT

- Temperature and humidity: Monitor and control internal conditions to achievespecified moisture content in wood components at time of installation.

620 PRIMING/SEALING/PAINTING

- Surfaces inaccessible after assembly/installation: Before fixing components, applyfull protective/decorative treatment/coating system.

630 CORROSION PROTECTION OF DISSIMILAR MATERIALS

- Components/ substrates/ fasteners of dissimilar materials: Isolate using washers/sleeves or other suitable means to separate materials to avoid corrosion and/ or staining.

640 INSTALLATION GENERALLY

- Fasteners and methods of fixing: To section Z20.
- Structural members: Do not modify, cut, notch or make holes in structural members,except as indicated on drawings.
- Temporary support: Do not use stairs, walkways or balustrades as temporary support or strutting for other work.
- Applied finishes: Substrates to be even, dry, sound and free from contaminants. Make good substrate surfaces and prepare/ prime as finish manufacturer's recommendation before application.

680 INSTALLATION OF TREAD INSERTS/ NOSINGS

- Tread rebates: Fully cleaned, sound and level.
- Fixing:
  - Fixings: Epoxy adhesive.

# L40 General glazing

To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS

110 PREGLAZING
- Preglazing of components: Not permitted.

145 WORKMANSHIP GENERALLY
- Glazing generally: To BS 6262 or equivalent standard.
- Integrity: Glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
- Dimensional tolerances: Panes/ sheets to be within ± 2 mm of specified dimensions.
- Materials:
  - Compatibility: Glass/ plastics, surround materials, sealers, primers and paints/ clear finishes to be used together to be compatible. Avoid contact between glazing panes/ units and alkaline materials such as cement and lime.
  - Protection: Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.

152 PREPARATION
- Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing.

156 GLASS GENERALLY
- Standards: To BS 952 or equivalent standard and relevant parts of:
  - EN 572 for basic soda lime silicate glass.
  - EN 1096 for coated glass.
  - EN 1863 for heat strengthened soda lime silicate glass.
  - EN 12150 for thermally toughened soda lime silicate safety glass.
  - EN ISO 12543 for laminated glass and laminated safety glass.
- Panes/ sheets: Clean and free from obvious scratches, bubbles, cracks, rippling, dimples and other defects.
  - Edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across the surface are acceptable if groundout.

180 BEAD FIXING WITH PINS
- Pin spacing: Regular at maximum 150 mm centres, and within 50 mm of each corner.
- Exposed pin heads: Punched just below wood surface.

181 BEAD FIXING WITH SCREWS
- Screw spacing: Regular at maximum 225 mm centres, and within 75 mm of each corner.

TYPES OF GLAZING

506 FIRE RESISTANT TAPE/ STRIP GLAZING TO PROTECTED CORRIDORS/STAIRWELLS/LOBBIES

- Fire resistance rating to EN 13501-2: EI 60 (60 minutes integrity and insulation) .
- Impact rating to EN 12600: [ 1B1 ] .
- Pane material: 23mm clear fire rated laminated safety glass - internal grade .
  - Orientation: Not applicable .
- Frame/ Surround material: Hardwood with minimum density 640 kg/m³, as section L10 .
- Beads:
  - Material: Hardwood with minimum density 640 kg/m³ .
  - Location: One side of rebated frame .
  - Fixing: Stainless steel screws and cups at maximum 200 mm centres .
- Glazing system:
  - Tape/ Strip: Intumescent strip .
  - Pointing sealant: Silicone mastic .
- Installation: By a firm currently registered under a certified accreditation scheme for the installation of fire resistant glazing, in accordance with glazing manufacturer's recommendations.

507 FIRE RESISTANT TAPE/ STRIP GLAZING TO PROTECTED CORRIDORS/STAIRWELLS/LOBBIES

- Fire resistance rating to EN 13501-2: EI 30 (30 minutes integrity and insulation) .
- Impact rating to EN 12600: [ 2B2 ] .
- Pane material: 15mm clear fire rated laminated safety glass - internal grade .
  - Orientation: Not applicable .
- Frame/ Surround material: Hardwood with minimum density 640 kg/m³, as section L10 .
- Beads:
  - Material: Hardwood with minimum density 640 kg/m³ .
  - Location: One side of rebated frame .
  - Fixing: Stainless steel screws and cups at maximum 200 mm centres .
- Glazing system:
  - Tape/ Strip: Intumescent strip .
  - Pointing sealant: Silicone mastic .
- Installation: By a firm currently registered under a certified accreditation scheme for the installation of fire resistant glazing, in accordance with glazing manufacturer's recommendations.

525 FIRE RATING

- Assessment of capability: Submit proposed construction details of designated items to an accredited laboratory or other approved authority for assessment of capability ofachieving specified fire ratings.
  - Test standard: To EN 1364-1.
- Assessment/ test results and reports: Submit immediately they are available, and before installing glazing.
- Designated items: Fire resistant glazed screens.

555 GLASS MIRRORS GENERALLY

- Standard: To EN 1036.
- Mirror material: Float glass, silvered to give maximum reflection, free from tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions.
  - Thickness: 6 mm .
  - Pre-drilled for fixings: [required].
  - Backing: Metal foil.
  - Edge treatment: Polished bevel.
- Background: Plastered masonry/plasterboard.
  - Air gap between back of mirror and background: [3mm].
- Fixing method: Dome top wood screws with polyethylene sleeves and washers at 600mm centres.
- Installation: Fixed accurately and securely without overtightening fasteners, to provide a flat surface giving a distortion free reflection.

640 MANIFESTATION TO GLAZING

- Design: As Architect's drawings.
- Technique: Applied film.

# M20 Plastered/ Rendered/ Roughcast coatings

To be read with Preliminaries/ General conditions.

TYPES OF COATING

110 CEMENT:LIME:SAND RENDER TO EXTERNAL WALLS

- Substrate: Concrete blockwork.
  - Preparation: Rake out joints for key.
- Cement:lime:sand mortar:
  - Type: Contractor's choice.
  - Pigment: Not required.
- Undercoats:
  - Mix (cement:lime:sand): 1:0.5:4–4.5.
    Cement type: Contractor's choice.
  - Thickness (excluding dubbing out and keys): Undercoat 8–12 mm.
- Final coat:
  - Mix (cement:lime:sand): 1:1:5–6.
    Cement type: Contractor's choice.
    Other requirements: None.
  - Thickness: 6–8 mm.
  - Finish: Plain.
- Accessories: Galvanised stops and beads.

205 GYPSUM PLASTER ON CEMENT GAUGED UNDERCOATS APARTMENT STAIRWELLS

- Substrate: Concrete blockwork.
  - Preparation: Rake out joints for key.
- Undercoats:
  - Mix: Group 3 mortar.
  - Thickness (excluding dubbing out and keys): 10mm.
- Final coat: Gypsum plaster to EN 13279-1, type B1/20/2 .
  - Thickness: 2-3mm.
  - Finish: Smooth.
- Accessories: Galvanised beads and stops.

215 LIGHTWEIGHT GYPSUM PLASTER TO INTERNAL MASONRY WALLS

- Substrate: Concrete blockwork.
  - Preparation: Bonding agent recommended by plaster manufacturer.
- Undercoats: To EN 13279-1, types B4/20/2 & C3/20 .
  - Thickness (excluding dubbing out and keys): 11mm.
- Final coat: Finish plaster to EN 13279-1, type B1/20/2 .
  - Thickness: 2-3 mm.
  - Finish: Smooth.
- Accessories: Galvanised beads and stops.

291 PARGE COAT GENERALLY

- Substrate: Concrete blockwork.
  - Preparation: Brush clean.
- Render:
  - Mix: 1:1:6 cement:lime:sand.
  - Thickness: 8mm (nominal), 6mm (minimum).
  - Finish: Scratched horizontally to provide key.

358 AIRTIGHT SEALING TAPE FOR PLASTER GENERALLY

- Type: Split back high performance fleece laminated tape. Expandable synthetic base material with acrylate adhesive.
- Size: 0.5mm thick (minimum) x 80mm (minimum) wide.
- Temperature resistance: [-40 °C to +90 °C].
- Accessories/features: Suitable for plastering over.
- Other requirements: All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer.

361 AIRTIGHT SEALING TAPE TO PIPE PENETRATIONS GENERALLY

- Type: Highly flexible butyl rubber tape with adhesive on one side.
- Size: 2mm thick (minimum) x 80mm (minimum) wide.
- Temperature resistance: [-40 °C to +100 °C].
- Accessories/features: Suitable for plastering over.
- Other requirements: All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer.
- Execution: Cut to a suitable length and press back in and around the pipe penetration.

362 AIRTIGHT SEALING PASTE TO CONDUIT PENETRATIONS GENERALLY

- Type: Acrylate polymer paste.
- Temperature resistance: [-30 °C to +60 °C].
- Other requirements: All porous surfaces e.g. blockwork to be primed with a solvent primer as recommended by the tape manufacturer.
- Execution: All conduits to be plugged in accordance with manufacturers recommendations. Ends of conduits to be embedded 360 degrees just above socket/light box.

## MATERIALS AND MARKING OF MORTAR

439 CEMENTS FOR MORTARS

- Cement: To EN 197-1.
  - Types: Portland cement, CEM I.
    Portland slag cement, CEM II.
    Portland fly ash cement, CEM II.
  - Strength class: 32.5, 42.5 or 52.5.
- White cement: To EN 197-1.
  - Type: Portland cement, CEM1.
  - Strength class: 52.5.
- Sulfate resisting Portland cement: To EN 197-1.
  - Strength class: 42.5.
- Masonry cement: To EN 998-1.

441 SAND FOR CEMENT GAUGED MORTARS

- Standard: To EN 13139.
  - Grading: 0/2 or 0/4 (CP or MP); Category 2 fines.
- Colour and texture: Consistent. Obtain from one source.

444 LIME FOR CEMENT GAUGED MORTARS

- Standard: To EN 459-1.
  - Type: CL 90S.

PREPARING SUBSTRATES

510 SUITABILITY OF SUBSTRATES
- Soundness: Free from loose areas and significant cracks and gaps.
- Cutting, chasing, making good, fixing of conduits and services outlets and thelike: Completed.
- Tolerances: Permitting specified flatness/ regularity of finished coatings.
- Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

527 RAKING OUT FOR KEY
- Joints in existing masonry: Rake out to a depth of 13 mm (minimum).
  - Dust and debris: Remove from joints.

541 BONDING AGENT APPLICATION
- General: Apply evenly to substrate to achieve effective bond of plaster/ rendercoat. Protect adjacent joinery and other surfaces.

BACKINGS/ BEADS/ JOINTS

600 ADDITIONAL FRAMING SUPPORTS FOR BACKINGS
- Framing: Accurately position and securely fix to give full support to fixtures, fittings and service outlets.
- Support board edges and perimeters: As recommended by board manufacturer to suit type and performance of board.

610 FIXING PLASTERBOARD BACKINGS TO TIMBER
- Fixings, accessories and installation methods: As recommended by board manufacturer.
- Fixing: At the following centres (maximum):
  - Nails: 150 mm.
  - Screws to partitions/ walls: 300 mm. Reduce to 200 mm at external angles.
  - Screws to ceilings: 230 mm.
- Position of nails/ screws from edges of boards (minimum):
  - Bound edges: 10 mm.
  - Cut/ unbound edges: 13 mm.
- Position of nails/ screws from edges of supports (minimum): 6 mm.
- Nail/ screw heads: Set below surface. Do not break paper or gypsum core.

612 JOINTS IN PLASTERBOARD BACKINGS
- Ceilings:
  - Bound edges: At right angles to supports and with ends staggered in adjacent rows.
  - Two layer boarding: Stagger joints between layers.
- Partitions/ walls:
  - Vertical joints: Centre on studs. Stagger joints on opposite sides of studs.
    Two layer boarding: Stagger joints between layers.
  - Horizontal joints:
    Two layer boarding: Stagger joints between layers by at least 600 mm. Support edges of outer layer.
- Joint widths (maximum): 3 mm.

631 BEADS/ STOPS FOR INTERNAL USE
- Material: Galvanized steel to EN 13658-1.

641 BEADS/ STOPS GENERALLY

- Location: External angles and stop ends except where specified otherwise.
- Corners: Neat mitres at return angles.
- Fixing: Secure, using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
- Finishing: After coatings have been applied, remove surplus material while still wet, from surfaces of beads/ stops exposed to view.

647 CRACK CONTROL AT JUNCTIONS BETWEEN DISSIMILAR SOLID SUBSTRATES

- Locations: Where defined movement joints are not required. Where dissimilar solid substrate materials are in same plane and rigidly bonded or tied together.
- Crack control materials:
  - Isolating layer: Building paper to BS 1521 or equivalent standard.
  - Metal lathing: Internally: Galvanized steel plain expanded metal with spacers.
- Installation: Fix metal lathing over isolating layer. Stagger fixings along both edges of lathing.
- Width of installation over single junctions:
  - Isolating layer: 150 mm.
  - Lathing: 300 mm.
- Width of installation across face of dissimilar substrate material (column, beam, etc.with face width not greater than 450 mm):
  - Isolating layer: 25 mm (minimum) beyond junctions with adjacent substrate.
  - Lathing: 100 mm (minimum) beyond edges of isolating layer.

651 MOVEMENT JOINTS GENERALLY

- Installation: Centred over joint in substrate.
  - Fixing: Stainless steel screws or as recommended by joint manufacturer.

673 PLASTERING OVER CONDUITS/ SERVICE CHASES

- General: Prevent cracking over conduits and other services.
- Services chased into substrate: Isolate from coating by covering with galvanized metal lathing, fixed at staggered centres along both edges.

INTERNAL PLASTERING

710 APPLICATION GENERALLY

- Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
- Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
  - Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Drying out: Prevent excessively rapid or localized drying out.

715 FLATNESS/ SURFACE REGULARITY

- Sudden irregularities: Not permitted.
- Deviation of plaster surface: Measure from underside of a straight edge placed anywhere on surface.
  - Permissible deviation (maximum) for plaster not less than 13 mm thick: 3 mm in any consecutive length of 1800 mm.

721 DUBBING OUT

- General: Correct substrate inaccuracies.
- New smooth dense concrete and similar surfaces: Dubbing out prohibited unlesstotal plaster thickness is within range recommended by plaster manufacturer.
- Dub out to a maximum thickness of 25mm in separate coats.
- Thickness of any one coat (maximum): 8mm.
- Mix: As undercoat.
- Application: Achieve firm bond. Allow each coat to set sufficiently before the nextis applied. Cross scratch surface of each coat.

725 UNDERCOATS GENERALLY

- General: Rule to an even surface. Cross scratch to provide a key for the next coat.
- Undercoats on metal lathing: Work well into interstices to obtain maximum key.
- Undercoats gauged with Portland cement: Do not apply next coat until drying shrinkageis substantially complete.

742 THIN COAT PLASTER

- Preparation for plasters less than 2 mm thick: Fill holes, scratches and voids with finishing plaster.

777 SMOOTH FINISH

- Appearance: A tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Avoid water brush, excessive trowelling and over polishing.

M21 INSULATION WITH RENDERED FINISH

To be read with Preliminaries/ General Conditions.

GENERAL/ SYSTEM REQUIREMENTS

MINERAL WOOL EXTERNAL WALL INSULATION SYSTEM (Mechanically Fixed).

A mechanically fixed externally insulated mineral fibre based façade system for installation onto masonry substrates available with rendered finishes, suitable for use on buildings up to and above 18 metres in height (dependent upon location and finishes specified).
BBA Agrément Certified.
THERE MAY BE A REQUIREMENT FOR CAVITY BARRIERS TO OPENINGS IN THE SYSTEM.

Manufacturer: Contractor to submit for approval

Latent Defects Warranty: An insurance backed guarantee covering materials and workmanship for a period of 10 years.

Survey of Existing Walls / Substrates

120 To assess the suitability of the substrate prior to commencement of installation, carry out a survey of each elevation of the existing structural substrate.
Include the following:
Condition of substrate.
Form of the substrate (with particular regard to line / straightness).
A schedule of repairs necessary to leave the substrate in a suitable condition to receive the system.
A schedule of services, fixtures and fittings to be either removed or installed to facilitate correct installation of the system.
A schedule of areas where the maximum spacing capacity of the helix spiral fixing system is likely to be exceeded, and adjustment of either the substrate or the finished facade must be required.
Any other information considered relevant.

Structural substrate: External concrete walls.

Substrate Condition: Masonry Substrate: Ensure proposed system is suitable if wet dash render is the substrate. A Pre-Render inspection must be completed before application.

Substrate Preparation: Ensure all shrubs, trees and lichen are removed from the walls and surrounding areas. If necessary use a fungicidal wash to kill any vegetation on the wall and power wash clean. Remove all electrical cables and plumbing by approved installers. All electrical cables must be sleeved through if approved by utility providers. Test selected fixings to ensure they hold securely in the wall. Make good as necessary.

Substrate Pre-treatment: Depending upon specific site conditions, there may be a requirement for additional surface pre-treatment(s). Consult the manufacturer for advice.

Insulation support rails: A PVC Started horizontal starter track/or as per manufacturer's system requirement; 2.0 m. Size of starter track to suit thickness of insulation.

Method of fixing: A wind loading assessment is required to determine the fixing requirement(s) for each project.
Contact the manufacturer to discuss wind loadings and arrange an assessment for

the particular project.

Starter tracks (and firebreak rails where required) fixed using stainless steel

hammer drive fixings. Size, length and spacing of fixings to be in accordance with manufacturer's recommendations and on-site pull out tests. Contractor to ensure that the system complies with CP3: Chapter V: Part 2: 1972 in relation to its structural stability.
Fixings to be at maximum 300mm centres and with a fixing in the nearest available suitably sized hole to the end of the track.
Packing shims to be used to overcome surface irregularities in the substrate.

Helix spiral adjustable fixings to be used with mineral fibre insulation onto dense substrate. Size, length and spacing of fixings to be in accordance with manufacturer's recommendations and on-site pull out tests. Contractor to ensure that the system complies with CP3: Chapter V: Part 2: 1972 in relation to its structural stability.
NOTE: Additional fixings must be required around openings and at corners. Consult manufacturer for further information.

Where the thickness of mineral fibre insulation is 150 mm or greater, each 1200 x 600 mm insulation board must be fixed with a minimum of 6 helix spiral fixings per board, (part boards pro-rata).

Insulation: Mineral Fibre boards as recommended by the manufacturer for use with the overall system.
Thermal Conductivity 0.036 W/Mk to BS 3958-5: 1986 & DIN 52 612.
Density: 140 kg/m³
Minimum Compressive strength: 20 kN/m² @ 10% compression

Mineral Fibre boards used to create horizontal (and vertical where required) firebreaks in conjunction with manufacturer's recommended adhesive of minimum width 120mm (100mm in vertical fire barriers) to close the cavity and provide a smoke barrier where the cavity does not exceed 24mm.
Thermal Conductivity 0.039 W/Mk to BS 3958-5: 1986 & DIN 52 612.
Density: 140 kg/m³
Minimum Compressive strength: 20 kN/m² @ 10% compression

ALTERNATIVELY: where the cavity exceeds 24 mm, compressed mineral fibre quilt (minimum width 400mm) may be used behind the Mineral Fibre boards in lieu of the adhesive, and the firebreaks restrained by stainless steel firebreak fixings at maximum 300mm centres.

Install all firebreaks as per manufacturer's standard details for this system and as described in Clause(s) 510 below.
Rows (courses) of insulation must be installed straight, level / plumb and true, with a minimum of surface undulations. Cut insulation as accurately as possible to avoid open joints.

Insulation – Board Size & Thickness: 120m thick Mineral Fibre. 1200mm x 600mm board size, square edged.
50mm thick boards for use at reveals to openings. Board thicknesses may vary – refer to Architects drawings.

Beads/ Trims: Perforated Aluminium starter tracks or PVC starter tracks @ 2.0M, pre-drilled by the installer with minimum 6mm diameter holes at maximum 75mm centres, centrally along the entire length of the profile.

PVC Mesh Angle

beads. Armoured Angle

beads.

Joint Sealing Tape - compressible waterproof sealing tape.

Seal Beads. to seal interfaces, provide enhanced movement capabilities and a clean finished edge at reveals & heads of openings.
Seal Bead for use on un-insulated reveals / heads.
Seal Bead for side attachment to window / door frames, etc.

Seal Bead with integrated PU sealing tape for face attachment to window / door frames, etc.
Seal Beads are not to be used around cills or at the bottom of openings in the system.

Clip Profile - designed to clip onto the front edge of Aluminium Starter Tracks, used to ensure the minimum render thickness is achieved at the base of the system and support the bottom edge of the render coatings, and must be installed wherever mineral reinforcing coats are specified or wherever the total render coatings depth is 6mm or greater.

Filler Foam or proprietary adhesive around the edges

NOTE: The above are standard items used with this system. Refer to construction issue drawings for information regarding the requirement for other beads / trims in specific locations.
Consult with the manufacturer for recommendations and details.

Fixings into / through system: Contact the manufacturer for recommendations and details.

Reinforcing coat: Calcium silicate based or proprietary reinforcing coat. Thickness to be nominal 5mm ensuring the reinforcing mesh is fully embedded and a level surface is provided.

Primer: Apply 1 full coat by brush or roller and allow to dry thoroughly.

Reinforcement: Glass Fibre / AVU fibre Reinforcing Mesh embedded into the basecoat.

In high traffic, vandal prone and anticipated impact areas additional reinforcement must be Armour Mesh.
Areas where Armour Mesh must be applied must be clearly defined either within the contract documentation or marked on construction drawings.

Render / Finish: Mineral Finish- Dry dash on a 4mm damp basecoat, or as per manufacturer's instructions

Thickness: 6-8 mm marble dash

Colour/aggregate: To be agreed on site.
NOTE:
The use of surface finishes with a light reflectance value of less than 20% is restricted on External Wall Insulation Systems. Written approval for the use of surface finishes whose LRV is less than 20% must be obtained from the manufacturer before orders are placed.

310 DESIGN: Contractor to complete the detailed design of the system and associated features shown on the drawings to meet the requirements of this specification.

320 INTEGRITY:
The installation must be weathertight under all anticipated conditions. Consult with the manufacturer for specific details and relating to particular conditions.
The installation must be capable of resisting all dead loads and design live loads, including impact and wind loads, and accommodate all thermal movements without damage.
Render systems must not be applied to horizontal or near-horizontal surfaces. To enable the integrity of the system to be maintained at parapets / wall heads, it must be necessary to install copings or cappings. Render systems must not be continued over wall heads / parapets without the provision of suitable protection.

below must be:
Category II - 10 Joules using a single layer of Glass Fibre Reinforcing Mesh - and the render must not be perforated using a 12mm indentor.

(The standard ETA requirement for impact resistance is based upon impacts using energy of 3 Joules & 10 Joules).

The above categories are defined in the Guideline for European Technical Approval ETAG 004 and correspond to the degrees of exposure in use. They do not include an allowance for acts of vandalism.

340 WIND LOADING: Wind Loading must be calculated to EN 1991 - 1 - 4: 2005 + A1: 2010. In accordance with EN 1990: 2002, it is recommended that a load factor of 1.5 be applied to the calculated values to determine the ultimate wind suction load(s) to be resisted by the system.
TO ENABLE ECONOMIC DESIGN, ACCURATE CALCULATIONS INDICATING NEGATIVE WIND LOADS MUST BE PRESENTED TO THE MANUFACTURER AT THE EARLIEST POSSIBLE OPPORTUNITY, IN ORDER TO ENABLE A WIND LOAD / FIXING ASSESSMENT TO BE CARRIED OUT.

361 SAMPLE(S):
A site sample of not less than 2sqm is required to ascertain the final colours of decorative renders and set the standard of workmanship for the project.
Obtain approval before starting work.
Keep sample(s) available on site throughout the contract for inspection/comparison purposes.

380 UNIFORMITY OF COLOUR AND TEXTURE: Once samples of coatings have been approved do not change type or proportion of constituent materials. Ensure that supplies of materials are sufficient to give consistent and uniform colour and texture.

INSTALLATION

410 Installation to be carried out by a contractor approved by the manufacturer.
Installation must be made strictly in accordance with the manufacturer's instructions. Reference must be made to the project specification, method statement, drawings, technical data sheets, and all other relevant literature. Consult with the manufacturer for latest literature.

420 ADVERSE WEATHER: Do not use materials that are or have been frozen. Do not apply materials to frost bound surfaces. Do not apply when the air or surface temperature is below 5 degrees Centigrade.
Maintain temperature of the work above freezing until material has fully hardened.
Protect newly rendered surfaces against rain and snow by covering when precipitation occurs.
Remove and replace coatings damaged by rain or frost.

440 PULL OUT TEST(S) ON FIXING PINS to be carried out on site to prove the suitability of the structural background and determine the size and number of fixings required. Give advance notice of testing to allow CA the opportunity to be present.

460 CLEANLINESS: Carefully protect all existing work and approaches using suitable boards, sheets, etc. Clean off any droppings from finished work immediately.

470 RENDER THICKNESS GAUGES or other suitable means must be used to ensure the specified coating thickness.

480 CURING: Allow all mortar / render coats and primer coats to dry out thoroughly before applying subsequent coats.
Take all necessary precautions to prevent newly rendered surfaces from drying out too rapidly.

490A CONSTRUCTION / CONTRACTION JOINTS: The system may be carried over construction / contraction joints within the building structure.

490B MOVEMENT JOINTS: It may be possible – depending upon the degree and direction of movement expected - to extend the system over movement / expansion / deflection / structural joints within the building structure.

Form joints accurately to detail and in locations shown on the drawings. If modifications to any joint location or design are necessary on site, agree revisions with CA before proceeding.

Expansion beads are not necessary unless there is an expansion break on the building itself or a day joint is required.

510A HORIZONTAL FIRE BARRIERS: Non-combustible material to BS476:Part 4
Size: Minimum 200mm (or as otherwise described above) x total thickness of external wall insulation.
Adhere to the substrate using full width coverage of non-combustible mineralic adhesive between back of fire break insulation and structural background. Closely butt at joints and intersections, leaving no gaps. Incorporate any mechanical fixings as shown on the drawings or described elsewhere.

The provision of horizontal fire barriers must be compliant with Building Regulations and to Building Control approval.
Refer to the manufacturer's standard details for specific fire barrier design.

510B VERTICAL FIRE BARRIERS: Install vertical fire barriers where required to achieve integrity of fire compartments using non-combustible material to BS476: Part 4. Minimum 200mm wide (or as otherwise described above) x total thickness of external wall insulation, must be used in a staggered pattern to ensure a band of non- combustible material extending 100mm wide for the full height of the compartment. Adhere to the substrate using full width coverage of non-combustible mineralic adhesive between back of fire break insulation and structural background. Closely butt at joints and intersections, leaving no gaps.

The provision of vertical fire barriers must be compliant with Building Regulations and to Building Control approval.
Refer to the manufacturer's standard details for specific fire barrier design.

510C CAVITY BARRIERS TO OPENINGS: Install cavity fire barriers of an approved design above and to the sides of all openings through the system to meet the requirements of the relevant national Building Regulations and to Building Control approval.
Cavity barriers may consist of an appropriately positioned and fire resistant window / door frame, or other suitable non-combustible material or approved material of limited combustibility.

510D FIRE BARRIER FIXINGS: All Specified fixings to fire barriers to be stainless steel or as otherwise approved by the manufacturer.
Where the inclusion of such fixings is visible at the face of the insulation, this must introduce a cold bridge and may therefore result in the appearance of light spots in the render finish.

520 SUPPORTS FOR SERVICES/FITTINGS: Provide secure supports within the insulation for soil and rainwater pipe brackets, aerials, cameras, lighting, signage and the like in locations shown on drawings. Consult with the manufacturer for fixing methods / details.

530 SEALANT JOINTS: Location(s): At all interfaces between insulation / render and dissimilar materials.
Sealant:
Compressible waterproof Joint Sealing Tape. Width and installed thickness as per manufacturer's recommendations.
PVC Stop Beads in conjunction with mastic sealant in locations where there is insufficient room / provision for Joint Sealing Tape to be installed.

NOTE: Performance requirements, specification and suitability of mastic sealants to be determined by the Architect.

550 INSPECTION OF COMPLETED INSTALLATION: As soon as possible after completion of the work and before removing scaffolding, carry out an inspection with the Architect to identify any defects.

EPS EXTERNAL WALL INSULATION SYSTEM (Mechanically Fixed).

A mechanically fixed externally insulated EPS based façade system with rendered finish for buildings not exceeding 18 metres in height.
BBA Agrément Certified.
THERE MAY BE A REQUIREMENT FOR CAVITY BARRIERS TO OPENINGS IN THE SYSTEM.

Manufacturer: Contractor to submit for approval

Latent Defects Warranty: An insurance backed guarantee covering materials and workmanship for a period of 10 years.

Survey of Existing Walls / Substrates

120 To assess the suitability of the substrate prior to commencement of installation, carry out a survey of each elevation of the existing structural substrate.
Include the following:
Condition of substrate.
Form of the substrate (with particular regard to line / straightness).
A schedule of repairs necessary to leave the substrate in a suitable condition to receive the system.
A schedule of services, fixtures and fittings to be either removed or installed to facilitate correct installation of the system.
A schedule of areas where the maximum spacing capacity of the helix spiral fixing system is likely to be exceeded, and adjustment of either the substrate or the finished facade must be required.
Any other information considered relevant.

Structural substrate: External concrete walls.

Substrate Condition: Masonry Substrate: Existing substrate may require liquid waterproofing DPM or equivalent up to 225mm above FFL and line of existing DPC prior to installation of insulation. Protect below DPC insulation when backfilling.

Substrate Preparation: Remove existing loose base render (if applicable). Make good as necessary.

Substrate Pre-treatment: Depending upon specific site conditions, there may be a requirement for additional surface pre-treatment(s). Consult the manufacturer for advice.

Insulation support rails: Helix spiral adjustable fixings to be used with tongue & grooved EPS insulation onto dense substrate. Size, length and spacing of fixings to be in accordance with manufacturer's recommendations and on-site pull out tests. Contractor to ensure that the system complies with CP3: Chapter V: Part 2: 1972 in relation to its structural stability.

Method of fixing: A wind loading assessment is required to determine the fixing requirement(s) for each project.
Contact the manufacturer to discuss wind loadings and arrange an assessment for the particular project.

Starter tracks (and firebreak rails where required) fixed using stainless steel

hammer drive fixings.
Size, length and spacing
of fixings to be in
accordance

with manufacturer's recommendations and on-site pull out tests. Contractor to ensure that the system complies with CP3: Chapter V: Part 2: 1972 in relation to its structural stability.
Fixings to be at maximum 300mm centres and with a fixing in the nearest available suitably sized hole to the end of the track.
Packing shims to be used to overcome surface irregularities in the substrate.

Helix spiral adjustable fixings to be used with mineral fibre insulation onto dense substrate. Size, length and spacing of fixings to be in accordance with manufacturer's recommendations and on-site pull out tests. Contractor to ensure that the system complies with CP3: Chapter V: Part 2: 1972 in relation to its structural stability.
NOTE: Additional fixings must be required around openings and at corners. Consult manufacturer for further information.

Where the thickness of mineral fibre insulation is 150 mm or greater, each 1200 x 600 mm insulation board must be fixed with a minimum of 6 helix spiralfixings per board, (part boards pro-rata).

Insulation: EPS Board CFC/HCFC free with fire retardant additive.
Thermal Conductivity: 0.036 W/Mk to EN 13163: 2001 & DIN 52 612.
Minimum Compressive strength: 90 kN/m² @ 10% compression

IMPORTANT NOTE:
STORED MATERIALS AND THE APPLICATION AREA (FACADE) MUST BE SHIELDED FROM DIRECT SUNLIGHT TO AVOID EXCESS HEAT GAIN IN THE INSULATION. SHADING THE MATERIAL MUST HELP TO MINIMISE SHRINKAGE OF THE INSULATION AND AVOID SUBSEQUENT DAMAGE TO RENDER COATINGS. IT IS ALSO STRONGLY RECOMMENDED THAT INSULATION THICKNESSES OF 160MM OR GREATER BE APPLIED IN TWO LAYERS, WITH BOTH HORIZONTAL AND VERTICAL JOINTS STAGGERED. THE TWO LAYERS OF INSULATION MUST BE ADHERED USING ADHESIVE, WITH THE 2ND LAYER (IF THE 1ST LAYER IS FIXED BY OTHER MEANS) BEING TONGUED & GROOVED BOARDS.
Mineral Fibre insulation used to create horizontal (and vertical where required) firebreaks.
Thermal Conductivity 0.040 W/Mk to BS 3958-5: 1986 & DIN 52 612.
Density: 95 kg/m³
Minimum Compressive strength: >40 kN/m² @ 10% compression

Adhered to the substrate using a full bed of adhesive where the cavity does not exceed 24mm and with mechanical fixings where required (see section 510 below).
Where the width of the cavity exceeds 24mm, use Mineral Fibre insulation thicker than the surrounding insulation to reduce the thickness of adhesive to less than 24mm.
Alternate courses in vertical fire barriers must be staggered horizontally by 100mm.

ALTERNATIVELY: where the cavity exceeds 24 mm, compressed mineral fibre quilt (minimum width 400mm) may be used behind the Mineral Fibre boards in lieu of the adhesive, and the firebreaks restrained by stainless steel firebreak fixings at maximum 300mm centres.

Install all firebreaks as per manufacturer's standard details for this system and as described in Clause(s) 510 below.
Rows (courses) of insulation must be installed straight, level / plumb and true, with a minimum of surface undulations. Cut insulation as accurately as possible to avoid open joints.

| | |
|---|---|
| Insulation – Board Size & Thickness: | 80-90 mm thick EPS. 1000mm x 500mm board size with tongued & grooved edges Board thicknesses may vary – refer to Architects drawings.<br><br>120mm thick Mineral Fibre. 1000mm x 200mm board size, square edged, for use as firebreaks. |
| Beads/ Trims: | Perforated Aluminium starter tracks 2.0M, pre-drilled by the installer with minimum 6mm diameter holes at maximum 75mm centres, centrally along the entire length of the profile.<br><br>PVC Mesh Angle<br><br>beads. Armoured Angle<br><br>beads.<br><br>Joint Sealing Tape - compressible waterproof sealing tape.<br><br>Seal Beads. to seal interfaces, provide enhanced movement capabilities and a clean finished edge at reveals & heads of openings.<br>Seal Bead for use on un-insulated reveals / heads.<br>Seal Bead for side attachment to window / door frames, etc.<br>Seal Bead with integrated PU sealing tape for face attachment to window / door frames, etc.<br>Seal Beads are not to be used around cills or at the bottom of openings in the system.<br><br>Clip Profile - designed to clip onto the front edge of Aluminium Starter Tracks, used to ensure the minimum render thickness is achieved at the base of the system and support the bottom edge of the render coatings, and must be installed wherever mineral reinforcing coats are specified or wherever the total render coatings depth is 6mm or greater.<br><br>Filler Foam.<br><br>NOTE: The above are standard items used with this system. Refer to construction issue drawings for information regarding the requirement for other beads / trims in specific locations.<br>Consult with the manufacturer for recommendations and details. |
| Fixings into / through system: | Contact the manufacturer for recommendations and details. |
| Reinforcing coat: | Calcium silicate based reinforcing coat. Thickness to be nominal 5mm ensuring the reinforcing mesh is fully embedded and a level surface is provided.<br><br>Primer: Apply 1 full coat by brush or roller and allow to dry thoroughly. |
| Reinforcement: | Glass Fibre Reinforcing Mesh.<br><br>In high traffic, vandal prone and anticipated impact areas additional reinforcement must be Armour Mesh.<br>Areas where Armour Mesh must be applied must be clearly defined either within the contract documentation or marked on construction drawings. |
| Render / Finish: | Cement free silicone resin render containing a minimum of 20% silicone resin content by mass of the binder. Basecoat incorporating flexil additive. Protect below DPC insulation when backfilling. |

100mm x 100mm perimeter of washed pea gravel to selected colour.

| | |
|---|---|
| Thickness: | 1.5mm |
| Texture: | Stippled. |

Colour/aggregate: To be agreed on site.
NOTE:
The use of surface finishes with a light reflectance value of less than 20% is restricted on External Wall Insulation Systems. Written approval for the use of surface finishes whose LRV is less than 20% must be obtained from the manufacturer before orders are placed.

310 DESIGN: Contractor to complete the detailed design of the system and associated features shown on the drawings to meet the requirements of this specification.

320 INTEGRITY:
The installation must be weathertight under all anticipated conditions. Consult with the manufacturer for specific details and relating to particular conditions.
The installation must be capable of resisting all dead loads and design live loads, including impact and wind loads, and accommodate all thermal movements without damage.
Render systems must not be applied to horizontal or near-horizontal surfaces. To enable the integrity of the system to be maintained at parapets / wall heads, it must be necessary to install copings or cappings. Render systems must not be continued over wall heads / parapets without the provision of suitable protection.

330 IMPACT LOADING: Resistance to hard body impact and perforation as categorised below must be:
Category II - 10 Joules using a single layer of Glass Fibre Reinforcing Mesh - and the render must not be perforated using a 12mm indentor.
(The standard ETA requirement for impact resistance is based upon impacts using energy of 3 Joules & 10 Joules).

The above categories are defined in the Guideline for European Technical Approval ETAG 004 and correspond to the degrees of exposure in use. They do not include an allowance for acts of vandalism.

340 WIND LOADING: Wind Loading must be calculated to EN 1991 - 1 - 4: 2005 + A1: 2010. In accordance with EN 1990: 2002, it is recommended that a load factor of 1.5 be applied to the calculated values to determine the ultimate wind suction load(s) to be resisted by the system.
TO ENABLE ECONOMIC DESIGN, ACCURATE CALCULATIONS INDICATING NEGATIVE WIND LOADS MUST BE PRESENTED TO THE MANUFACTURER AT THE EARLIEST POSSIBLE OPPORTUNITY, IN ORDER TO ENABLE A WIND LOAD / FIXING ASSESSMENT TO BE CARRIED OUT.

361 SAMPLE(S):
A site sample of not less than 2sqm is required to ascertain the final colours of decorative renders and set the standard of workmanship for the project.
Obtain approval before starting work.
Keep sample(s) available on site throughout the contract for inspection/comparison purposes.

380 UNIFORMITY OF COLOUR AND TEXTURE: Once samples of coatings have been approved do not change type or proportion of constituent materials. Ensure that supplies of materials are sufficient to give consistent and uniform colour and texture.

INSTALLATION

410 Installation to be carried out by a contractor approved by the manufacturer. Installation must be made strictly in accordance with the manufacturer's instructions. Reference must be made to the project specification, method statement, drawings, technical data sheets, and all other relevant literature. Consult with the manufacturer for latest literature.

420 ADVERSE WEATHER: Do not use materials that are or have been frozen. Do not apply materials to frost bound surfaces. Do not apply when the air or surface temperature is below 5 degrees Centigrade.
Maintain temperature of the work above freezing until material has fully hardened. Protect newly rendered surfaces against rain and snow by covering when precipitation occurs.
Remove and replace coatings damaged by rain or frost.

440 PULL OUT TEST(S) ON FIXING PINS to be carried out on site to prove the suitability of the structural background and determine the size and number of fixings required. Give advance notice of testing to allow CA the opportunity to be present.

460 CLEANLINESS: Carefully protect all existing work and approaches using suitable boards, sheets, etc. Clean off any droppings from finished work immediately.

470 RENDER THICKNESS GAUGES or other suitable means must be used to ensure the specified coating thickness.

480 CURING: Allow all mortar / render coats and primer coats to dry out thoroughly before applying subsequent coats.
Take all necessary precautions to prevent newly rendered surfaces from drying out too rapidly.

490A CONSTRUCTION / CONTRACTION JOINTS: The system may be carried over construction / contraction joints within the building structure.

490B MOVEMENT JOINTS: It may be possible – depending upon the degree and direction of movement expected - to extend the system over movement / expansion / deflection / structural joints within the building structure.

Form joints accurately to detail and in locations shown on the drawings. If modifications to any joint location or design are necessary on site, agree revisions with CA before proceeding.

510A HORIZONTAL FIRE BARRIERS: Non-combustible material to BS476:Part 4
Size: Minimum 200mm (or as otherwise described above) x total thickness of external wall insulation.
Adhere to the substrate using full width coverage of non-combustible mineralic adhesive between back of fire break insulation and structural background. Closely butt at joints and intersections, leaving no gaps. Incorporate any mechanical fixings as shown on the drawings or described elsewhere.

The provision of horizontal fire barriers must be compliant with Building Regulations and to Building Control approval.
Refer to the manufacturer's standard details for specific fire barrier design.

510B VERTICAL FIRE BARRIERS: Install vertical fire barriers where required to achieve integrity of fire compartments using non-combustible material to BS476: Part 4. Minimum 200mm wide (or as otherwise described above) x total thickness of external wall insulation, must be used in a staggered pattern to ensure a band of non-combustible material extending 100mm wide for the full

height of the compartment. Adhere to the substrate using full width coverage of non-combustible mineralic adhesive between back of fire break insulation and structural background. Closely butt at joints and intersections, leaving no gaps.

The provision of vertical fire barriers must be compliant with Building Regulations and to Building Control approval.
Refer to the manufacturer's standard details for specific fire barrier design.

510C CAVITY BARRIERS TO OPENINGS: Install cavity fire barriers of an approved design above and to the sides of all openings through the system to meet the requirements of the relevant national Building Regulations and to Building Control approval.
Cavity barriers may consist of an appropriately positioned and fire resistant window / door frame, or other suitable non-combustible material or approved material of limited combustibility.

510D FIRE BARRIER FIXINGS: All Specified fixings to fire barriers to be stainless steel or as otherwise approved by the manufacturer.
Where the inclusion of such fixings is visible at the face of the insulation, this must introduce a cold bridge and may therefore result in the appearance of light spots in the render finish.

520 SUPPORTS FOR SERVICES/FITTINGS: Provide secure supports within the insulation for soil and rainwater pipe brackets, aerials, cameras, lighting, signage and the like in locations shown on drawings. Consult with the manufacturer for fixing methods / details.

530 SEALANT JOINTS: Location(s): At all interfaces between insulation / render and dissimilar materials.
Sealant:
Compressible waterproof Joint Sealing Tape. Width and installed thickness as per manufacturer's recommendations.
PVC Stop Beads in conjunction with mastic sealant in locations where there is insufficient room / provision for Joint Sealing Tape to be installed.
NOTE: Performance requirements, specification and suitability of mastic sealants to be determined by the Architect.

550 INSPECTION OF COMPLETED INSTALLATION: As soon as possible after completion of the work and before removing scaffolding, carry out aninspection with the Architect to identify any defects.

# M40 Stone/ concrete/ quarry/ ceramic tiling/ mosaic

To be read with Preliminaries/ General conditions.

TYPES OF TILING/ MOSAIC

112 TILING TO WALLS GENERALLY

- Tiles: Ceramic bevelled edge.
  - Colour: White.
  - Finish: Glazed.
  - Size: 150x75mm.
  - Thickness: 6mm.
- Background/ Base: Plasterboard as section K10.
  - Preparation: Primer as recommended by adhesive manufacturer.
- Intermediate substrate: Not required.
- Bedding: Adhesive bed - notched trowel method, as clause 650.
  - Reinforcement: Not applicable.
  - Adhesive to EN 12004: C2TE.
- Joint width: 2mm.
- Grout: Proprietary improved cementitious.
  - Type/ classification to EN 13888: CG2WA.
  - Admixture: None.
- Movement joints: Proprietary PVC type to all tiled internal corners.
- Accessories:
  - Solid aluminium sqaure edge & corner profile tile edge trims to all exposed edges
  - 600x300mm flush tiled access panels with magnetic touch latches.

GENERAL

210 SUITABILITY OF BACKGROUNDS/ BASES

- Background/ base tolerances: To permit specified flatness/ regularity of finished surfaces given the permissible minimum and maximum thickness of bedding.
- New background drying times (minimum):
  - Concrete walls: 6 weeks.
  - Brick/ block walls: 6 weeks.
  - Rendering: 2 weeks.
  - Gypsum plaster: 4 weeks.
- New base drying times (minimum):
  - Concrete slabs: 6 weeks.
  - Cement:sand screeds: 3 weeks.

250 SAMPLES

- General: Submit representative samples ofthefollowing:
  Each type of tile.

PREPARATION

380 NEWPLASTER

- Plaster: Dry, solidly bedded, free from dust and friable matter.
- Plaster primer: Apply if recommended by adhesive manufacturer.

390 PLASTERBOARD BACKGROUNDS

- Boards: Dry, securely fixed and rigid with no protruding fixings and face to receive decorative finish exposed.

FIXING

510 FIXING GENERALLY

- Colour/ shade: Unintended variations within tiles for use in each area/ room are not permitted.
  - Variegated tiles: Mix thoroughly.
- Adhesive: Compatible with background/ base. Prime if recommended by adhesive manufacturer.
- Use of admixtures with cementitious adhesives: Only admixtures approved by adhesive manufacturer.
- Cut tiles: Neat and accurate.
- Fixing: Provide adhesion over entire background/ base and tile backs.
- Final appearance: Before bedding material sets, make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.
- Surplus bedding material: Clean from joints and face of tiles without disturbing tiles.

531 SETTING OUT

- Joints: True to line, continuous and without steps.
  - Joints on walls: Horizontal, vertical and aligned round corners.
- Cut tiles: Minimize number, maximize size and locate unobtrusively.
- Joints in adjoining floors and walls: Align.
- Joints in adjoining floors and skirtings: Align.
- Movement joints: Where locations are not indicated, submit proposals.

551 FLATNESS/ REGULARITY OF TILING

- Sudden irregularities: Not permitted.
- Deviation of surface: Measure from underside of a 2 m straightedge with 3 mm thick feet placed anywhere on surface. The straightedge must not be obstructed by the tiles and no gap must be greater than 6 mm, i.e. a tolerance of $\pm$ 3 mm.

561 LEVEL OF TILING ACROSS JOINTS

- Deviation (maximum) between tile surfaces either side of any type of joint:
  - 1 mm for joints less than 6 mm wide.

650 ADHESIVE BED - NOTCHED TROWEL METHOD (WALLS)

- Application: By 3 mm floated coat of adhesive to dry background in areas of approximately 1 m². Comb surface.
- Tiling: Press tiles firmly onto float coat.

MOVEMENT JOINTS/ GROUTING/ COMPLETION

826 STRIP MOVEMENT JOINTS GENERALLY

- Type: PVC.
- Joint width: 6mm.
- Fixing to base: Bed in adhesive.
- Joints: Extend through tiles and bedding to base.

875 GROUTING

- Sequence: Grout when bed/adhesive has set sufficient to prevent disturbance of tiles.
- Joints: 6 mm deep (or depth of tile if less). Free from dust and debris.
- Grouting: Fill joints completely, tool to profile, clean off surface. Leave free from blemishes.
  - Profile: Flush.
- Polishing: When grout is hard, polish tiling with a dry cloth.

885 COLOURED GROUT

- Staining of tiles: Not permitted
- Evaluating risk of staining: Apply grout to a few tiles in a small trial area. If discoloration occurs apply a protective sealer to tiles and repeat trial.

# M50 Rubber/ plastics/ cork/ lino/ carpet tiling/ sheeting

To be read with Preliminaries/ General conditions.

TYPES OF COVERING

151 SHEETING LINOLEUM

- Location: Refer to Finishes Schedule.
- Base: Power floated concrete.
  - Preparation: As clause 431.
- Flooring roll: Linoleum to EN ISO 24011.
  - EN ISO 10874 class: 23 (Domestic heavy).
  - Composition: [Minimum 95% natural raw materials of which a minimum 72% arerapidly renewable].
  - Surface treatment: [Factory applied 2 coat water based UV cured protective finish].
  - Slip resistance to EN 14041: DS.
  - Ramp test (DIN 51130 or equivalent standard): R9.
  - Reaction to fire to EN 14041: Cfl-s1.
  - Width: 2000mm.
  - Thickness: 2mm.
  - Colour/ pattern: To be agreed by the architect.
- Adhesive (and primer if recommended by manufacturer): As clause 640.
- Seam welding: Hot welding with matching coloured rod.
- Finishing: As clause 821.
- Other requirements:
  - Independent test reports against growth of MRSA and 'Norovirus Surrogate Virus
  - Minimum 25 year manufacturer's warranty.

152 SHEETING - LINOLEUM

- Location: Refer to Finishes Schedule.
- Base: Plywood as per section K11.
- Flooring roll: PVC with particle based enhanced slip resistance to EN 13845.
  - EN ISO 10874 class: 23 (Domestic heavy).
  - Composition: [Reinforced vinyl with a PVC wear layer with inlaid slip resistantparticles. Smooth finished].
  - Surface treatment: [Factory applied PUR protective finish].
  - Slip resistance to EN 14041: DS.
  - Ramp test to DIN 51130 or equivalent standard (minimum): R10.
  - Barefoot Ramp test to DIN 51097 or equivalent standard (minimum): [ Class B ].
  - Slip resistance ramp test value to EN 13845: [ ESf - ESb ].
  - Slip resistance: Pendulum test to BS 7976 or equivalent standard: [ PTV >36 ].
  - Surface roughness (Rz) (minimum) to BS 1134 or equivalent standard: [ 20 ].
  - Reaction to fire to EN 13501: Bfl-s1.
  - Width: 2000mm.
  - Thickness: 2mm.
  - Wearlayer thickness (minimum): [0.8mm].
  - Colour/ pattern: To be agreed by the architect on site.
- Adhesive (and primer if recommended by manufacturer): As clause 640.
- Seam welding: Hot welding with matrching coloured rod.
- Finishing: As clause 821.
- Other requirements:

  Independent test reports against growth of MRSA and 'Norovirus Surrogate Virus
  Minimum 25 year manufacturer's warranty.

153 SHEETING - LINOLEUM

- Location: Unit Type D3 - wet room- Refer to Finishes Schedule.
- Base: Power floated concrete.
- Flooring roll: PVC with particle based enhanced slip resistance to EN 13845.
  - EN ISO 10874 class: 34 (Commercial very heavy).
  - Composition: [Reinforced vinyl with a PVC wear layer with inlaid slip resistantparticles. Embossed finished].
  - Surface treatment: [None].
  - Slip resistance to EN 14041: DS.
  - Ramp test to DIN 51130 or equivalent standard (minimum): R11.
  - Barefoot Ramp test to DIN 51097 or equivalent standard (minimum): [ Class C ].
  - Slip resistance ramp test value to EN 13845: [ ESb ].
  - Slip resistance: Pendulum test to BS 7976 or equivalent standard: [ PTV >36 ].
  - Surface roughness (Rz) (minimum) to BS 1134 or equivalent standard: [ 20 ].
  - Reaction to fire to EN 13501: Cfl-s1.
  - Width: 2000mm.
  - Thickness: 2mm.
  - Wearlayer thickness (mimimum): [1.0mm].
  - Colour/ pattern: To be agreed by the architect on site.
- Adhesive (and primer if recommended by manufacturer): As clause 640.
- Seam welding: Hot welding with matching coloured rod.
- Accessories: [
  - 20x20mm PVC cove formers with skirting height 150mm
  - PVC shower threshold profiles
  - PVC level access drain].
- Finishing: As clause 821.
- Other requirements:
  -Independent test reports against growth of MRSA and 'Norovirus Surrogate Virus
  -Minimum 25 year manufacturer's warranty

154 SHEETING LINOLEUM.

- Location: Refer to Finishes Schedule.
- Base: Power floated concrete.
  - Preparation: As clause 431
    -.
- Flooring roll: Linoleum on corkment backing to BS EN 687.
  - EN ISO 10874 class : 23 (Domestic heavy.
    Composition:: Minimum 95% natural raw materials of which a minimum 72% are rapidly renewable.
  - Surface treatment: Factory applied 2 coat water based UV cured protective finish.
  - Slip potential:
    Slip resistance to EN 14041: DS.
    Surface roughness (Rz) (minimum) to BS 1134: or equivalent standard.
  - Recycled content: 95%.
  - Width: 2000mm.
  - Thickness: 4.0mm.
  - Colour/ pattern: To be agreed by the architect on site.
- Adhesive (and primer if recommended by manufacturer): As clause 640.
- Seam welding: Hot welding with matching coloured rod.
- Accessories: PVC skirtings in selected colour.
- Finishing: As clause 821.
- Other requirements:
  -Independent test reports against growth of MRSA and 'Norovirus Surrogate Virus
  - Minimum 25 year manufacturer's warrant
  -Sheeting to achieve 14 dB impact sound reduction (ISO 717-2). y.

## GENERAL REQUIREMENTS

210 WORKMANSHIP GENERALLY

- Base condition after preparation: Rigid, dry, sound, smooth and free from grease, dirt and other contaminants.
- Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks and stains.

220 SAMPLES

- Covering samples: Before placing orders, submit representative sample of each type.

250 LAYOUT - ROLL MATERIALS

- Setting out of seams: Agree setting out for sheeting types M50/ 151 & 152 .

251 LAYOUT - SEAMS IN ROLL MATERIALS

- Setting out: Minimise occurrences of seams and cross seams.
- Cross seams: Not permitted in following locations: Bathrooms.

330A COMMENCEMENT

- Required condition of works prior to laying materials:
  - Building is weathertight and well dried out.
  - Wet trades have finished work.
  - Paintwork is finished and dry.
  - Conflicting overhead work is complete.
  - Floor service outlets, duct covers and other fixtures around which materials must be cut are fixed.

  Moisture content of concrete screeds is within parameters required by manufactuter.
- Notification: Submit not less than 48 hours before commencing laying.

345 CONDITIONING

- Prior to laying: Condition materials by unpacking and separating in spaces where they must be laid. Maintain resilient flooring rolls in an upright position.
- Conditioning time and temperature (minimum): As recommended by manufacturer with time extended by a factor of two for materials stored or transported at a temperature of less than 10°C immediately prior to laying.

350 ENVIRONMENT

- Temperature and humidity: Before, during and after laying, maintain approximately at levels which must prevail after building is occupied.
- Ventilation: Before during and after laying, maintain adequate provision.

## PREPARING BASES

431 NEW WET LAID BASES

- Base drying aids: Not used for at least four days prior to moisture content testing.
- Base moisture content test: Carry out in accordance with BS 5325, Annexe A or equivalent standard or BS 8203, Annexe A or equivalent standard.
  - Locations for readings: In all corners, along edges, and at various points over area being tested.
- Commencement of laying coverings: Not until all readings show 75% relative humidity or less.

440 SUBSTRATES TO RECEIVE THIN COVERINGS

- Trowelled finishes: Uniform, smooth surface free from trowel marks and other blemishes. Abrade suitably to receive specified floor covering material.

465 SMOOTHING/ LEVELLING UNDERLAYMENT COMPOUND

- Type: Latex cement.
- Locations: To all concrete floor areas which are not sufficiently level / smooth toreceive sheet floor finish.
- Application: Skim with smoothing underlayment compound to give a smooth, even surface.

LAYING COVERINGS

620 COLOUR CONSISTENCY

- Finished work in any one area/ room: Free from banding or patchiness.

640 ADHESIVE FIXING GENERALLY

- Adhesive type: As specified, as recommended by covering/ underlay, manufacturer oras approved.
- Primer: Type and usage as recommended by adhesive manufacturer.
- Application: As necessary to achieve good bond.
- Finished surface: Free from trowel ridges, high spots caused by particles on the substrate, and other irregularities.

650 SEAMS

- Patterns: Matched.
- Joints: Tight without gaps.

680 SEAM WELDING COVERINGS

- Commencement: At least 24 hours after laying, or after adhesive has set.
- Joints: Neat, smooth, strongly bonded, flush with finished surface.

720 DOORWAYS

- Joint location: On centre line of door leaf.

745 EDGINGS AND COVER STRIPS

- Material/ finish: Brushed stainless steel .
- Fixing: Secure with edge of covering gripped. Use matching fasteners where exposed to view

780 TRAFFICKING AFTER LAYING

- Covering types: ALL.
- Traffic free period: Until adhesive is set.

COMPLETION

821 FINISHING LINOLEUM & PLASTICS FLOORING

- Cleaning operations:
  - Wash floor with water containing neutral (pH 6-9) detergent. If necessary, lightly scrub heavily soiled areas.
  - Rinse with clean water, removing surplus to prevent damage to adhesive. Allow to dry.

# M60 Painting/clear finishing

To be read with Preliminaries/General Particulars.

COATING SYSTEMS

112 EMULSION PAINT TO INTERNAL PLASTERED SURFACES (WALLS / CEILINGS)
- Surfaces: Uncoated.
  - Preparation: As clause 410.
- Initial coats: Thinned primer as recommended by manufacturer.
- - Number of coats: 1.
- Finishing coats: Water-based emulsion, mid sheen.
  - Number of coats: 2.

135 GLOSS PAINT TO INTERNAL JOINERY (SOFTWOOD & MDF) (SKIRTINGS/ ARCHITRAVES / DOORS / SILLS)
- Surfaces: Preprimed and sealed.
  - Preparation: As clause 410.
- Initial coats: Thinned primer as recommended by manufacturer.
  - Number of coats: 2.
- Finishing coats: Water-based high gloss.
  - Number of coats: 1.

196 SPECIAL COATING TO POWDERCOATED GALVANISED STEEL
- Surfaces: Powdercoated galvanised steel.
  - Preparation: Mist coat, thinned 25-30%.
- Initial coats: Primer as recommended by manufacturer.
  - Number of coats: 1.
- Finishing coats: 2 component polyurethane with anti-corrosive pigments. .
  - Number of coats: 1.

GENERALLY

215 HANDLING AND STORAGE
- Coating materials: Deliver in sealed containers, labelled clearly with brand name, typeof material and manufacturer's batch number.
- Materials from more than one batch: Store separately. Allocate to distinct parts or areas of the work.

220 COMPATIBILITY
- Coating materials selected by contractor:
  - Recommended by their manufacturers for the particular surface and conditions of exposure.
  - Compatible with each other.
  - Compatible with and not inhibiting performance of preservative/fire retardant pretreatments.

280 PROTECTION
- 'Wet paint' signs and barriers: Provide where necessary to protect other operativesand general public, and to prevent damage to freshly applied coatings.

320 INSPECTION BY COATING MANUFACTURERS

- General: Permit manufacturers to inspect work in progress and take samples of their materials from site if requested.

PREPARATION

410 PREPARATION GENERALLY

- Standard: In accordance with BS 6150 or equivalent standard.
- Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
- Substrates: Sufficiently dry in depth to suit coating.
- Efflorescence salts: Remove.
- Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
- Surface irregularities: Remove.
- Laitance on concrete surfaces: remove.
- Joints, cracks, holes and other depressions: Fill flush with surface, to providesmooth finish.
- Dust, particles and residues from preparation: Remove and dispose of safely.
- Water based stoppers and fillers:
  - Apply before priming unless recommended otherwise by manufacturer.
  - If applied after priming: Patch prime.
- Oil based stoppers and fillers: Apply after priming.
- Doors, opening windows and other moving parts:
  - Ease, if necessary, before coating.
  - Prime resulting bare areas.

471 PREPRIMED WOOD

- Areas of defective primer: Take back to bare wood and reprime.

481 UNCOATED WOOD

- General: Provide smooth, even finish with arrises and moulding edges lightly roundedor eased.
- Heads of fasteners: Countersink sufficient to hold stoppers/fillers.
- Resinous areas and knots: Apply two coats of knotting.

560 UNCOATED CONCRETE

- Release agents: Remove.

580 UNCOATED PLASTER

- Nibs, trowel marks and plaster splashes: Scrape off.
- Overtrowelled 'polished' areas: Key lightly.

590 UNCOATED PLASTERBOARD

- Depressions around fixings: Fill with stoppers/ fillers

APPLICATION

712 COATING GENERALLY

- Application standard: In accordance with BS 6150, clause 9 or equivalent standard.
- Conditions: Maintain suitable temperature, humidity and air quality during applicationand drying.
- Surfaces: Clean and dry at time of application.
- Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
- Overpainting: Do not paint over intumescent strips or silicone mastics.
- Priming coats:
  - Thickness: To suit surface porosity.
  - Application: As soon as possible on same day as preparation is completed.
- Finish:
  - Even, smooth and of uniform colour.
  - Free from brush marks, sags, runs and other defects.
  - Cut in neatly.
- Doors, opening windows and other moving parts: Ease before coating and between coats.

720 PRIMING JOINERY

- Preservative treated timber: Retreat cut surfaces with two flood coats of a suitable preservative before priming.
- End grain: Coat liberally allow to soak in, and recoat.

# M61 Intumescent coatings for fire protection of steelwork

To be read with Preliminaries/General Particulars

PROTECTIVE COATING SYSTEMS

112 ON SITE COATING TO PRIMED STEEL GENERALLY

- Use/ location: Exposed faces of steel beams.
- Fire resistance to BS 476-21 or equivalent standard: 60 minutes.
- Preparation and priming: By steelwork contractor.
- Intumescent coating system:
  - Manufacturer: A system from a member of the Association for Specialist Fire Protection . Product reference: Submit proposals.
  - Intumescent coat:
    Type: Thin film, water-based.
    Finish: Non-visible areas: Basic and Visible areas: Normal decorative.
  - Top sealer coat:
    Type: Water-based polyurethane.
    Colour: White.
- Bolt head/ Nut protection: As main steelwork.

GENERAL REQUIREMENTS

206 VALIDATION OF MATERIALS

- Project specific evaluation of intumescent coating materials:
  - Standard: In accordance with BS 8202-2 or equivalent standard.
  - Test results: Submit on request.

212 WORKING PROCEDURES

- Standard: In accordance with BS 8202-2 or equivalent standard.
- Give notice: Before commencing surface preparation and coating application.
- Quality control: Record project specific procedures for surface preparation and coating application.

215 WORKING CONDITIONS

- General: Maintain manufacturer's recommended temperature, humidity and airquality conditions during application and drying.
- Surface condition: Clean and dry at time of application.

220 APPLICATOR'S PERSONNEL

- Operatives: Trained/ experienced in anticorrosive and intumescent coatings.
- Evidence of training/ experience: Submit on request.

230 APPLICATOR'S PERSONNEL

- Operatives: From a firm currently registered under a certified accreditation scheme for the application of intumescent coatings. Trained/ experienced in anticorrosive and intumescent coatings.
- Evidence of training/ experience: Submit on request.

252 SPRAYED COATING APPLICATION ON SITE

- Standard: In accordance with BS 8202-2 or equivalent standard.
- Spray drift: Minimize.
- Uncoated areas of steel: Connection surfaces, areas to be welded, built in areasand support surfaces.
- Masking: Protect designated adjacent surfaces.
  - Designated surfaces: None.

270 INSPECTION

- Permit intumescent manufacturer to:
  - Inspect work in progress.
  - Inspect quality control records.
  - Take dry film thickness and other measurements.
  - Take samples of products.
- Intumescent manufacturer's inspection reports: Submit without delay.

APPLICATION OF COATINGS

410 INTUMESCENT COATING DRY FILM THICKNESS (DFT)

- Applicable coatings: Intumescent and top sealer coat.
- Required dft: Determine for every steel member to give specified period of fireresistance. Use intumescent coating manufacturer's current published loading tables.
  - Special sections and partial fire exposure conditions: Obtain required dft in writing from manufacturer.
- Schedule and drawings: Submit at least two weeks before starting work.
  - Schedule content: Member sizes, weights/ thicknesses, loading conditions, etc. showing, for each variant, the exposed perimeter/ sectional area (Hp/A) ratio and required dft.
  - Drawing content: Steelwork drawings marked in colour to show required dft foreach member.

420 MEASUREMENT OF INTUMESCENT DFT

- Primer dft: Determine average dft (for deduction from total dft after applicationof intumescent).
- Intumescent dft: Determine at:
  - 500 mm centres along each coated plane of universal sections (8 planes), and rectangular hollow sections (4 planes).
  - 125 mm centres along coated circular hollow sections, spread evenly around circumference.
- Acceptance standard:
  - Average intumescent dft: Not less than required dft (exclusive of primer and topsealer).
  - Local intumescent dft: Not less than 80% of required dft. Areas greater than 100 mm equivalent diameter with a dft of less than 80% of required dft must be brought up to thickness.

440 BASIC FINISH

- Definition: Reasonably smooth and even. Orange peel, other texture, minor runsand similar minor defects are acceptable.

450 NORMAL DECORATIVE FINISH

- Definition: Good standard of cosmetic finish generally, when viewed from a distance of 5m or more. Minor orange peel or other texture is acceptable.

490 TOP SEALER COAT

- Application: To achieve dft recommended by manufacturer and to give an even,solid, opaque appearance, free from runs, sags and other visual defects.

COMPLETION

530 RECORDS OF INTUMESCENT APPLICATION

- On completion of intumescent work, submit:
  - Accurate surface preparation, coating and intumescent application records.
  - Fire resistance certificates.
  - Intumescent manufacturer's recommendations for maintenance and overcoating.

# N10 General fixtures/ furnishings/ equipment

To be read with Preliminaries/General Particulars.

PRODUCTS

112 PURPOSE MADE HOT PRESS SHELVING

- Timber: To EN 942.
  - Species: European redwood.
  - Appearance class: J10.
  - Moisture content on delivery: 9 to 13%.
- Profile: Square edged.
  - Finished face width: 44mm.
  - Finished thickness: [20mm].
- Finish as delivered: Sanded.
- Fixings: Wood screws.
- Joinery workmanship: As section Z10.

295 RECESSED MATWELL FRAMES GENERALLY.

- Material: Aluminium.
  - Finish: Mill.
  - Colour: Natural.
- Size: As per Architect's drawings.
- Angles:
  - Corners: Mitred and welded.
  - Angle size: 21x15x3mm thick.
- Predrilled: Required for screw fixing.

305 ENTRANCE MATTING GENERALLY.

- Arrangement: Inset internal.
- Material: Rubber with nylon wipers.
- Format: [Closed construction].
- Colour: Black.
- Thickness: 17mm.
- Additional requirements:
  - Spacer strips
  - Levelling compound as required.

360 MISCELLANEOUS FITTINGS

- Item: Postboxes - Apartment Lobbies.
- Standard: To EN 13724: Accept A4 post.
- Format: Vertical. Front delivery & retrieval.
- Size/ Capacity: 270x370x110mm (wxhxd).
- Material: Electro coated zinc steel to EN 10152.
- Finish/ Colour: Polyester powder coated. Colour: RAL colour to be agreed with the Architect.
- Fixing: Surface wall mounted.
- Other requirements:
  - Anti-theft baffle
  - Cam lock with 2 keys.

EXECUTION

710 MOISTURE CONTENT OF WOOD AND WOOD-BASED BOARDS

- Standard: To EN 942
- Moisture content on delivery: 9-13%
- Temperature and humidity: During delivery, storage, fixing and to handovermaintain conditions to suit specified moisture contents of timber components.

770 TRIMS

- Lengths: Wherever possible, unjointed between angles or ends of runs.
- Running joints: Where unavoidable, obtain approval of location and method of jointing.
- Angle joints: Mitred.

COMPLETION

910 GENERAL

- Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
- Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 APPLIANCES

- Test: Ensure that all functions and features work correctly.
- Documentation: Submit guarantees, instruction manuals, etc.

# N11 Domestic kitchen fittings, furnishings and equipment

To be read with Preliminaries/ General conditions.

PRODUCTS

313 REFERENCE UNITS FOR INSPECTION

- General: Fabricate one of each of the following as part of the required quantity, and arrange for inspection before starting repetitive fabrication: [One complete kitchen on site for the Architect's approval before the full production run commences].

314 SAMPLES

- General: Before placing orders submit representative samples of the following:
  - Laminated and edged door and drawer front
  - Handles
  - Hinges
  - Drawer runners.
- Delivered materials/ products: To match samples.

315 FITTED BASE UNITS GENERALLY

- Standard: To BS 6222 -2 and -3 or equivalent standard, and EN 14749.
- Structural performance: To BS 6222-2 or equivalent standard, test level H.
- Dimensions: To EN 1116.
- Surface finishes: To BS 6222-3 or equivalent standard.
- Doors and drawer fronts:
  - Core Material: Particleboard to EN 312, Type P3.
    Thickness: [18mm].
  - Facing Sheet: [High pressure melamine laminate to EN 438, ClassVGS].
    Nominal thickness: [0.7mm].
    Fire Rating: [Class 1].
    Finish and colour: Smooth, high gloss finish to selected colour. Colour to be confirmed on site by the architect.
  - Backing Sheet: [Durability & fire rating as per facing sheet].
    Finish and colour: [Smooth. White].
  - Edges: 2mm ABS, to match door colour.
  - Other requirements:
    - 110° concealed stainless steel soft close sprung hinges.
    - Handles: Integrated type in extruded silver anodised aluminium fixed into rebate in top of doors (samples to be provided for architect's approval).
    - ¾ wire carousels stainless steel chrome plated.
    - Pull-out units with stainless steel chrome plated baskets.
    - 150mm adjustable legs to base of units.
    - Removeable plinths finished in 1.2mm brushed anodised aluminium.
    - Zinc plated steel brackets to BS 1706 or equivalent standard.
    - Drawer Units:
      Fully lipped 15mm type P3 particleboard drawer base.
      Epoxy coated steel sides & backs to BS 6222-2 or equivalent standard, level H.
      Zinc plated steel runners with double nylon rollers.
- Side panels, plinths and shelves:
  - Core Material: Particleboard to EN 312, Type P3.
    Thickness: [18mm].
  - Facing Sheet: [High pressure melamine laminate to EN 438, ClassVGS].
    Nominal thickness: [0.7mm].
    Fire Rating: [Class 1].
    Finish and colour: [Smooth, high gloss finish to selected colour. Colour to be confirmed on site by the architect].
  - Backing Sheet: [Durability & fire rating as per facingsheet].

Finish and colour: [Smooth. White].

- Edges: [0.4mm ABS].
- Other requirements: [Sides drilled for 3 adjustable shelf positions].

• Back panels and drawer bases:
- Core Material: [Particleboard to EN 312, Type P3].
  Thickness: [15mm].
- Facing Sheet: [High pressure melamine laminate to EN 438, ClassVGS].
  Nominal thickness: [0.7mm].
  Fire Rating: [Class 1].
  Finish and colour: [Smooth. White].
- Backing Sheet: [Durability & fire rating as per facing sheet].
  Finish and colour: [Smooth. White].
- Edges: [0.4mm ABS].

• Other requirements: [
- 45mm service void to rear of base units
- Proprietary waste bins in frame (to suit 600mm wide drawer box): 2x12 litre, 2x7.5 litre, grey plastic].

325 FITTED WALL UNITS GENERALLY

• Standard: To BS 6222 -2 and -3 or equivalent standard, and EN 14749.
• Structural performance: To BS 6222-2 or equivalent standard, test level H.
• Dimensions: To EN 1116.
• Surface finishes: To BS 6222-3 or equivalent standard.
• Doors:
- Core Material: Particleboard to EN 312, Type P3.
  Thickness: [18mm].
- Facing Sheet: [High pressure melamine laminate to EN 438, ClassVGS].
  Nominal thickness: [0.7mm].
  Fire Rating: [Class 1].
  Finish and colour: [Smooth, high gloss finish to selected colour. Colour to be confirmed on site by the architect].
- Backing Sheet: [Durability & fire rating as per facing sheet].
  Finish and colour: [Smooth. White].
- Edges: [2mm ABS, to match door colour].
- Other requirements: [
- 110° concealed stainless steel soft close sprung hinges.
- Bi-fold hinges to corner unit doors.
- Handles: Integrated type in extruded silver anodised aluminium fixed into rebate in bottom of doors (samples to be provided for architect's approval).
- Zinc plated steel brackets to BS 1706 or equivalent standard.

• Side panels, shelves and pelmets:
- Core Material: Particleboard to EN 312, Type P3.
  Thickness: [18mm].
- Facing Sheet: [High pressure melamine laminate to EN 438, ClassVGS].
  Nominal thickness: [0.7mm].
  Fire Rating: [Class 1].
  Finish and colour: Smooth, high gloss finish to selected colour. Colour to be confirmed on site by the architect.
- Backing Sheet: [Durability & fire rating as per facing sheet].
  Finish and colour: [Smooth. White].
- Edges: 0.4mm ABS.
- Other requirements: Sides drilled for 3 adjustable shelf positions.

• Back panels:
- Core Material: [Particleboard to EN 312, Type P3].
  Thickness: [15mm].
- Facing Sheet: [High pressure melamine laminate to EN 438, ClassVGS].
  Nominal thickness: [0.7mm].
  Fire Rating: [Class 1].
  Finish and colour: [Smooth. White].
- Backing Sheet: [Durability & fire rating as per facingsheet].
  Finish and colour: [Smooth. White].

- Edges: [0.4mm ABS].

345 WORKTOPS GENERALLY

- Standard: To BS 6222-3 or equivalent standard.
- Core Material: Particleboard to EN 312, Type P3.
  - Thickness: 38mm.
  - Leading edge: [Double postformed, 3mm radius. Laminate to wrap under leadingedge and finish with PUR hot melt adhesive seal].
  - Facing Sheet: [High pressure melamine laminate to EN 438, Class HGP].
  - Nominal thickness: [0.7mm].
  - Fire Rating: [Class 1].
  - Finish and colour: [Smooth. Colour to be confirmed on site by the architect].
- Exposed edges: Stainless steel strip.
- Support: On base units.
- Other requirements: None.

355 SINKS, TAPS, TRAPS AND WASTES GENERALLY

- Sinks:
  - Standard: To EN 13310.
  - Configuration: Reversible 1½ bowl with single drainer.
  - Overall size: 965x500mm.
  - Material: Stainless steel grade 1.4301 (type 304) to EN 10088-2. Thickness (minimum): 0.7mm.
- Tap/ chainstay/ overflow holes:
  - One tap hole, centre.
  - Chainstay hole.
  - Overflow hole.
- Taps: Mixer, dual flow, swivel spout.
  - Operation: Single lever handle.
  - Material: Chrome plated brass.
  - Other requirements:
    Inbuilt water saving flow aerator
    Inbuilt water saving cartridge
    Maximum flow rate : 6litres/min
    Ceramic disc cartridges
- Wastes: Plug and chain.
  - Standard: To EN 274-1, -2 and -3.
  - Size: DN40.
  - Material: Chromed steel.
  - Tail: Slotted.
- Traps: Bottle.
  - Standard: To EN 274-1, -2 and -3.
  - Size: DN40.
  - Material: Plastic.
  - Depth of seal (minimum): 75 mm.
- Accessories: All fixings and brackets required to complete the installation.

365 APPLIANCES

- Item: Integrated Extract Hood.
- Colour and finish: Silver metallic lacquered.
- Width: 600mm.
- Type: [Mounted between 2 wall units or wall mounted].
- Extraction rate to EN 61591: [220m³/h minimum, 370m³/h maximum].
- Noise level to EN 60704-3 and EN 60704-2-13 at maximum normal setting: extractionrate: [63dB(A) re 1 pw (49dB(A) re 20 µPa sound pressure)].
- Other reuirements:
  - rocker switch control for extractor speeds and light.
  - 3 power levels.
  - 2x40W lights.
  - 2 metal grease filter cassettes.

- removable synthetic grease filter.

- suitable for ducted or recirculating operation.
- EU energy efficiency class (minimum): E.

395 SEALANT
- Standard: To EN ISO 11600, class F20 HM.
- Type: One part silicone.
- Colour: Black.

EXECUTION

630 INSTALLING UNITS AND WORKTOPS
- General: Well fitting, stable and secure.

645 INSTALLING APPLIANCES
- Connections: Provide to electric and hot and cold water services.

655 INSTALLING SINKS, TAPS AND WASTES
- Water supply: To EN 806-2 and -4 and in accordance with M&E engineers specification.
- Taps:
  - Fixing: Secure, watertight seal with the appliance.
- Wastes:
  - Bedding: Waterproof jointing compound.
  - Fixing: With resilient washer between appliance and backnut.

660 SEALANT BEDDING AND POINTING
- Application: As section Z22.
- Bedding: Sink to top of worktop.
- Pointing: Between units and splash backs.

670 INSTALLING TRIMS AND MOULDINGS
- Lengths: Un-jointed between angles or ends of runs.
- Angle joints: Mitred.

COMPLETION

910 GENERAL
- Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
- Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 APPLIANCE COMMISSIONING
- Appliance operation, functions and controls: Verify.
- Documentation: Submit guarantees, instruction manuals, etc.

# N13 Sanitary appliances and fittings

To be read with Preliminaries/ General conditions.

PRODUCTS

301 WCS AND CISTERNS GENERALLY

- Type: Back to wall, close coupled cistern with integral trap.
- Pan:
  - Standards: To EN 33 and EN 997.
  - Material: Vitreous china, white.
  - Rim type: [Box].
- Seat and cover:
  - Type: Slow close mechanism.
  - Material: Plastic.
  - Finish/ Colour: White, to match pan.
  - Hinges: [Stainless steel top fixed].
- Pan connector:
  - Standard: To BS 5627 or equivalent standard.
  - Type: Flexible.
  - Colour: White, to match pan.
- Cistern:
  - Material: Vitreous china.
  - Finish/ Colour: White, to match pan.
- Flushing arrangement: Compact type float operated valve and siphon, to BS 1212-4or equivalent standard and float to BS 2456 or equivalent standard.
  - HOUSES: Cistern to be suitable for low pressure gravity fed system.
  - APARTMENTS: Cistern to be suitable for pumped pressurised system.
  - Operating control: Push button, chrome plated plastic.
  - Water supply connection: Bottom with internal overflow.
  - Flush volume: Dual flush 6 / 3 litre or 6 / 4 L.
- Flush pipe: Not required.
- Accessories: All fixings and brackets required to complete the installation.

336 WASH BASINS WALL HUNG SEMI-PEDESTAL

- Standard: To EN 14688.
- Sizes:
  - 550mm wide x 440-460mmdeep
  - 450mm wide x 340-360mmdeep
  - 350mm wide x 300mm deep

  .
- Material: Vitreous china, white.
- Tap/ Chainstay/ Overflow holes:
  - One tap hole, centre
  - Overflow hole.
- Water supply fittings: Basin fixed spout mixer tap.
  - Material: [Chrome plated brass].
  - Water supply temperature (maximum): To M&E Engineer's specification.
  - Flow rate (maximum): 4 litres/min.
  - HOUSES: [Cistern to be suitable for low pressure gravity fed system].
  - APARTMENTS: [Cistern to be suitable for pumped pressurised system].
  - Operation: Single lever handle.
  - Other requirements:
    - Inbuilt water saving flow aerator
    - Inbuilt water saving cartridge
    - Ceramic disc cartridges
- Wastes: Pop up.
  - Standards: To EN 274-1, -2 and -3.
  - Size: DN 40.

- Material: Plastics, chrome plated.

- Tail: Slotted.

- Traps: Bottle.
  - Standards: To EN 274-1, -2 and -3.
  - Size: DN 40.
  - Material: Plastics, self colour.
  - Depth of seal (minimum): 75 mm.
- Accessories: All fixings and brackets required to complete the installation.

356 BATHS RECTANGULAR

- Standard: To EN 14516.
- Size: 1700 x 700mm.
- Volume to overflow (maximum): Manufacturer's standard.
- Material: 2mm porcelain enamelled steel, white.
- Tap/ Chainstay/ Overflow holes: Two tap holes / combined overflow and chainstay hole.
- Water supply fittings: 2 hole fixed spout mixer tap with flexible shower hose and handspray.
  - Material: [Chrome plated brass].
  - Water supply temperature (maximum): To M&E Engineer's specification.
  - Flow rate (maximum): To M&E Engineer's specification.
  - HOUSES: [Cistern to be suitable for low pressure gravity fed system].
  - APARTMENTS: [Cistern to be suitable for pumped pressurised system].
  - Operation: Single or dual lever.
  - Other requirements:
    - Inbuilt water saving flow aerator
    - Inbuilt water saving cartridge
    - Ceramic disc cartridges
- Wastes: Combined pop up and overflow.
  - Standards: To EN 274-1, -2 and -3.
  - Size: DN 40.
  - Material: Plastics, chrome plated.
  - Tail: Slotted.
- Traps: Tubular, P type.
  - Standards: To EN 274-1, -2 and -3.
  - Size: DN 40.
  - Material: Plastics, self colour.
  - Depth of seal (minimum): 50 mm.
- Accessories:
  - Acrylic removeable side panels (white to match bath).
  - 600-700mm chrome plated solid brass shower slide rail with adjustable handspray holder.
  - Chrome plated solid brass shower handspray, single function microphone type.
  - Stainless steel double interlocked shower hose, 1750mm minimum length. 7-9mmbore (houses), 12mm bore (apartments).
  - All fixings and brackets required to complete the installation.

357 FOLDING BATH SCREENS GENERALLY

- Standard: To EN 14428.
- Size: 1500 x 800mm.
- Format:
  - Straight.
  - 4 panels.
  - Concelaed fixings.
  - Magnetic rigid seals.
- Material:
  - 5mm toughened clear safety glass.
  - Polished aluminium framing.
- Fixings: Concealed wall fixings.

376 SHOWER UNITS GENERALLY

- Shower fittings: Thermostatic shower mixer, exposed.
  - Material: Chrome plated brass.
  - Operating control: Manual, single lever or dual twist.
  - Water supply temperature (maximum): To M&E Engineer's specification.
  - Flow rate: 8litres/min.
  - Other requirements:
    - TMV3 approved.
    - Temperature limiter.
  - In built water saving flow aerator
    - Ceramic disc cartridges.
- Wastes: Grated, top access .
  - Standards: To EN 274-1, -2 and -3.
  - Size: DN 40.
  - Material: Stainless steel.
  - Tail: Unslotted.
- Traps: Tubular, P type.
  - Standards: To EN 274-1, -2 and -3.
  - Size: DN 40.
  - Material: Plastics, self colour.
  - Depth of seal (minimum): 50 mm.
- Enclosure:
  - Pivoted door and fixed screen in 8mm toughened clear safety glass.
  - Polished aluminium framing
  - Chrome plated double handle.
  - Concealed fixings.
  - Standard: To EN 14428.
- Accessories:
  - 600-700mm chrome plated solid brass shower slide rail with adjustable handspray holder.
  - Chrome plated solid brass shower handspray, single function microphone type.
  - Stainless steel double interlocked shower hose, 1250mm minimum length. 7-9mmbore (houses), 12mm bore (apartments).
  - All fixings and brackets required to complete the installation.

439 MIRRORS GENERALLY

- Type: Refer to section L40.

585 SEALANT FOR POINTING

- Standard: To EN ISO 11600.
  - Class: F20 HM.
- Type: One part silicone.
- Colour: White.

EXECUTION

610 INSTALLATION GENERALLY

- Assembly and fixing: Surfaces designed to falls to drain as intended.
- Fasteners: Nonferrous or stainless steel.
- Supply and discharge pipework: Fix before appliances.
- Fixing: Fix appliances securely to structure. Do not support on pipework.
- Jointing and bedding compounds: Recommended by manufacturers of appliances, accessories and pipes being jointed or bedded.
- Appliances: Do not use. Do not stand on appliances.
- On completion: Components and accessories working correctly with no leaks.
- Labels and stickers: Remove.

615 COMPATIBILITY OF COMPONENTS

- Sanitaryware: All sanitaryware items must consist of functionally compatible components from a single co-ordinated suited range obtained from a single manufacturer.
- Brassware: All brassware items must consist of functionally compatible components from a single co-ordinated suited range obtained from a single manufacturer.
  - Exceptions: Shower hose, handspray and sliderail.

620 NOGGINGS AND BEARERS

- Noggings, bearers, etc. to support sanitary appliances and fittings: Position accurately. Fix securely.

630 TILED BACKGROUNDS OTHER THAN SPLASHBACKS

- Timing: Complete before fixing appliances.
- Fixing appliances: Do not overstress tiles.

650 INSTALLING WC PANS

- Floor mounted pans: Screw fix and fit cover caps over screw heads. Do not use mortar or other beddings.
- Seat and cover: Stable when raised.

670 INSTALLING CISTERNS

- Cistern operating components: Obtain from cistern manufacturer.
  - Float operated valve: Matched to pressure of water supply.
- Overflow pipe: Fixed to falls and located to give visible warning of discharge.
  - Location: Agreed, where not shown on drawings.

715 INSTALLING TAPS

- Fixing: Secure against twisting.
- Seal with appliance: Watertight.

Supply documentation confirming installed flow rates
Supply manufacturer's maintenance instructions and warranties

720 INSTALLING WASTES AND OVERFLOWS

- Bedding: Waterproof jointing compound.
- Fixing: With resilient washer between appliance and backnut.

760 SEALANT POINTING

- Pointing: Joints between appliances and walls .

# N17 Portable fire fighting systems

To be read with Preliminaries/ General Conditions.

GENERAL

110 PORTABLE FIRE EXTINGUISHER SYSTEM APARTMENTS - UNITS D AND G-K
- Type: Foam.
  - Capacity: 6 L.
  - Supports: Fixing bracket.

120 PORTABLE FIRE EXTINGUISHER SYSTEM APARTMENTS
- Type: Carbon dioxide.
  - Capacity: 2 kg.
  - Supports: Fixing bracket.

150 FIRE BLANKET SYSTEM TO ALL KITCHENS
- Type: Light duty.
- Size: 1x1m.
- Supports: Mounting brackets.

SYSTEM PERFORMANCE

210 DESIGN
- Design: Complete the design of the portable fire fighting system.
  - Basis: To Fire Officer's requirements.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

230 COLOUR CODING
- Portable fire extinguishers: Colour code in accordance with EN 3.

PRODUCTS

315 CARBON DIOXIDE EXTINGUISHERS
- Standard: To EN 3-10.

335 FOAM EXTINGUISHERS
- Standard: To EN 3-10.

415 FIRE BLANKETS - LIGHT DUTY
- Standard: To EN 1869.

EXECUTION

610 INSTALLING PORTABLE FIRE EXTINGUISHERS
- Mounting height above finished floor level: Bracket fixed at 1m.

650 INSTALLING FIRE BLANKETS
- Mounting height above finished floor level: 1200mm.

## COMPLETION

### 910 CLEANING

- Protective wrappings: Remove.
- Cleaning: Clean off and wipe down container finishes.

### 925 TESTING

- Test standard: To IS 291.
- Test times: At completion.
- Notice for testing (minimum): 5 days.

# P10 Sundry insulation/ proofing work

SUNDRY INSULATION/ PROOFING WORK

To be read with Preliminaries/ General conditions.

TYPES OF INSULATION

130 INSULATION LAID BETWEEN CEILING TIES/ JOISTS

- Material: Mineral wool to EN 13162.
- Thermal conductivity (maximum): [0.040 W/mK].
- Reaction to fire classification to EN 13501-1: [A1].
- Recycled content: 80% (minimum) to EN ISO 14021.
- Thickness: 100 mm.
- Installation requirements:
  - Installation standard: To BS 5803-5 or equivalent standard.
  - Joints: Butted, no gaps.
  - Insulation at perimeter: Carried over wall plates.
  - Eaves ventilation: Unobstructed.
  - Service holes: Sealed, and debris removed before laying insulation.
  - Electric cables overlaid by insulation: Sized accordingly.
  - Water cistern platforms: No insulation underneath.

136 INSULATION LAID ACROSS CEILING TIES/ JOISTS

- Material: Mineral wool to EN 13162.
  Thermal conductivity (maximum): [0.040 W/mK].
  Reaction to fire classification to EN 13501-1: [A1].
- Recycled content: 80% (minimum) to EN ISO 14021.
- Thickness: 200 mm.
- Installation requirements:
  - Installation standard: To BS 5803-5 or equivalent standard.
  - Insulation widths: Widest practical.
  - Laid direction: At right angles to ties/ joists.
  - Joints: Butted, no gaps.
  - Insulation: Fitted neatly around rafter ends and extended over wall plates.
  - Service holes: Sealed, and debris removed before laying insulation.
  - Eaves ventilation: Unobstructed.
  - Electric cables overlaid by insulation: Sized accordingly.
  - Water cistern platforms: No insulation underneath. Insulation to be carried over water cisterns.

175 INSULATION TO LOFT ACCESS HATCHES

- Material: Mineral wool mat to EN 13162.
- Thermal conductivity (maximum): [0.040 W/mK].
- Reaction to fire classification to EN 13501-1: [A1].
- Recycled content: 80% (minimum) to EN ISO 14021.
- Thickness: Same as loft insulation.
  - Laying: Cut to fit, with no gaps, and fix securely.
- Edges of hatch: Refer to section L20 for access hatch specification.

186 SOFFIT INSULATION [GENERALLY]

- Locations: [As shown on Architect's drawings].
- Type: Rigid phenolic foam boards to EN 13166.
- Core : CFC/HCFC free rigid phenolic resin foam, Class 0 fire performance,negligible smoke obscuration.
- Facings: Low emissivity gas tight foil facings bonded to both sides of the insulation core during manufacture.
- Facings to bottom layer of insulation: [Low emissivity gas tight foil facings bonded to both sides of the insulation core during manufacture. One face to have 6mm calcium silicate board bonded during manufacture]
- Density (minimum): 35kg/m³.
- Water Vapour Resistivity: [>100MNs/gm].
- Thickness: 160mm comprised of 2no. 80mm layers.
- Compressive strength (minimum): [100 kPa].
- Thermal conductivity (maximum): [0.020 W/mK].
- Installation requirements:
  - Joints: Butted, no gaps. Fit insulation tightly around service penetrations.
  - Fasteners: Stainless steel soffit insulation fixings (approved by insulation manufacturer) with minimum 35mm diameter retaining head.
- Additional Requirements:[
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified]

188 WALL INSULATION [TO BASEMENT BREAK TANK ROOM & CWS TANK AREA TO TYPE D BIN STORE]

- Type: Rigid polyisocyanurate foam boards to EN 13165.
- Core : CFC/HCFC free rigid polyisocyanurate (PIR) foam.
- Facings: Low emissivity gas tight foil facings bonded to both sides of the insulation core during manufacture.
- Density (minimum): 30kg/m³.
- Thickness: 100mm.
- Thermal conductivity (maximum): [0.021 W/mK].
- Reaction to fire classification to EN 13501 (minimum): [F].
- Compressive strength (minimum): [100 kPa].
- Water Vapour Resistivity: [>100MNs/gm].
- Installation requirements:
  - Joints: Butted, no gaps. Fit insulation tightly around service penetrations.
  - Fasteners: Stainless steel insulation fixings (approved by insulation manufacturer) with minimum 35mm diameter retaining head.
- Additional Requirements:[
  - Zero ozone depletion potential
  - Low global warming potential
  - Manufactured to EN ISO 9001(Quality Management), EN ISO 14001(Environmental Management) and BS OHSAS 18001 (Health and Safety)
  - Agrément Certified]

195 INSULATION FITTED BETWEEN STUDS [INTERNAL STUD WALLS]

- Material: Mineral wool to EN 13162.
- Thermal conductivity (maximum): [0.044 W/mK].
- Reaction to fire classification to EN 13501-1: A1.
- Recycled content: 80% (minimum) to EN ISO 14021.
- Thickness: 75mm.
- Installation requirements:
  - Joints: Butted, no gaps.
  - Fasteners: Use where necessary to retain insulation and/ or prevent slumping.

196 INSULATION FITTED BETWEEN BATTENS [DRYLINING TO EXTERNAL WALLS]

- Material: Mineral wool to EN 13162.
- Thermal conductivity (maximum): [0.044 W/mK].
- Reaction to fire classification to EN 13501-1: A1.
- Recycled content: 80% (minimum) to EN ISO 14021.
- Thickness: 25mm.
- Installation requirements:
  - Joints: Butted, no gaps.
  - Fasteners: Use where necessary to retain insulation and/ or prevent slumping.

245 INSULATION FITTED BETWEEN FLOOR JOISTS

- Material: Mineral wool to EN 13162.
- Thermal conductivity (maximum): [0.044 W/mK].
- Reaction to fire classification to EN 13501-1: [A1].
- Recycled content: 80% (minimum) to EN ISO 14021.
- Thickness: 100 mm.
- Installation requirements:
  - Support: Not required.
  - Joints: Butted, no gaps.
  - Service holes: Sealed, and debris removed before laying insulation.

315 AIRTIGHT VAPOUR CONTROL LAYER TO HOUSE CEILINGS UPPER FLOORS

- Standard: To EN 13984
- Material: Composite polypropylene fleece.
- Sd value: 2m minimum / 10m maximum.
- Temperature resistance: [-40°C to +80°C].
- Installation requirements:
  - Setting out: Joints minimized.
  - Method of fixing: Staples at 250mm centres maximum to underside of rafters; membrane not sagging.
  - Joints: At supports only, lapped 150mm minimum.
  - Openings: Membrane fixed to reveals.
  - Joints and edges: Sealed with double sided tape with vapour resistivity not less than the vapour control layer.
- Penetrations: Sealed.
- Other requirements: All service penetrations to be sealed using a highly malleable60mm wide high performance airtight tape with PE base material with a polyester fabric reinforcement and acrylate adhesive.

425 SLEEVED MINERAL WOOL CAVITY BARRIERS

- Material: Mineral wool to EN 13162 sleeved in polyethylene with flanges.
- Fire resistance rating to EN 1363: EI 60.
- Reaction to fire classification to EN 13501-1: [A1].
- Size: To suit 150mm cavity width.
- Additional requirements:
  - Independent third party fire test certified.
  - Water repellent and rot proof.
- Installation requirements:
  - Fasteners: Staples at maximum 150 mm centres.
  - Vertical barriers: Fixed by both flanges.
  - Horizontal barriers: Fixed by upper flange only.
  - Joints and intersections: Butted, with barriers compressed along full length to give complete seal.

## P12 Fire stopping systems

To be read with Preliminaries/ General conditions.

1. Doors
    a. All internal doors in flats, maisonettes, senior citz to be FD30S doorsets. This is a 30 minute fire resistant wooden door, frame and iron mongery set with a self closer, intumescent strip and cold smoke seals.
    b. External doors on flats with deck access need to be self closing FD30S (minimum 30 minute fire resistance with a smoke seal) and a u-value not greater than 1.6W/m^2K.
    c. External doors on flats that open to an internal stairwell to be self closing FD30S.
2. Attic hatches.
    a. All attic hatches from flats to be 60 min fire rated.
    b. Attic hatches from 2 storey houses need not be fire rated.
    c. Attic hatches on the landing or top floor bedroom of a 3 or more storey house needs to be 30 minute fire rated.
3. Attic Separation.
    a. The dividing wall between attics belonging to two adjoining houses, maisonettes, senior citizen units needs to be 60 minute fire rated from both sides.

4. Fire Sealing:
    a. A 5 storey blocks with a ground floor unit and 2 duplex units above it, requires 60 minute fire separation between all units, this must involve:
        i. 60 minute fire stopping at the floor level in the kitchen, where the services come through the floor. Typically beneath the sink.
        ii. 60 minute fire stopping the same services at kitchen ceiling or above at the bedroom floor.
        iii. 60 minute fire stopping the same services at the ceiling level of the bedroom.
        iv. 60 minute fire stopping around all feeds into the hotpress.
        v. 60 minute fire stopping the service shaft behind the whb at floor and ceiling level in the bathroom.
        vi. The service shaft walls (ie the vertical boxout containing the water pipes) to be 30 minute fire rated construction.
        vii. 60 minute fire stopping at floor and ceiling level the service shaft accessible from the balcony.
        viii. Replacing the internal timber panels to the inside face of the service shaft in (f) above, with 30 minute fire resistant construction.
        ix. The underside of the stairs in the duplex apartments in the 5 storey blocks need to be fire rated. This can be achieved by using fire resistant plasterboard on the slope in the living room.

    b. All 4 storey blocks or other 5 storey blocks – whilst the above has been noted in the gullwing or 5 storey parapet roof blocks, this level of required sealing has not been noted in the 4 storey blocks although the general rule of thumb is that an opening between units must be 60 minute fire sealed.

    c. Any penetrations through the floor from a 1st floor level maisonette or older senior citizen style unit to the ground floor unit to be 60 minute fire sealed.

GENERAL

131 FIRE STOPPING SYSTEM TO INDIVIDUAL SERVICES PENETRATIONS PLASTIC PIPES >40mm DIAMETER THROUGH FIRE RESISTING WALLS & FLOORS

- Fire resistance: As fire drawings.
- Penetration seal: Pipe collar - surface mounted intumescent as clause 381.
  - Size: To suit pipe diameter.
- Capping sealant: Not required. Gap sealant required as clause 730.

141 FIRE STOPPING SYSTEM TO MULTIPLE SERVICES PENETRATIONS THROUGH FIRE RESISTING WALLS & FLOORS

- Fire resistance: As fire drawings.
- Board barrier:
  - Material: Mineral wool ablative coated batts as clause 366.
    Thickness (minimum): 60mm.
    Number of layers: As recommended by the manufacturer to achieve the required fire resistance.
  - Framing: Not required.
- Capping sealant: One-part acoustic fire resisting intumescent acrylic as clause 396.

142 FIRE STOPPING SYSTEM TO CABLE TRAY SERVICES PENETRATIONS TO CABLE TRAYS IN MASONRY COMPARTMENT WALLS

- Fire resistance: As fire drawings.
- Penetration seal: [Fire stop laminate as clause 331].
  - Size: [To suit cable tray dimensions].
- Gap width or height (nominal): 50mm.
- Gap filler: Not required.
- Capping sealant: Not required.

161 LINEAR GAP SEALING TO TOP OF INTERNAL MASONRY COMPARTMENT WALLS

- Fire resistance: As fire drawings.
- Gap width or height (nominal): 25mm.
- Gap filler: Mineral wool ablative coated batts as clause 366.
- Capping sealant: One-part acoustic fire resisting intumescent acrylic as clause 396.

162 LINEAR GAP SEALING TO MOVEMENT JOINTS IN MASONRY COMPARTMENT WALLS

- Fire resistance: As fire drawings.
- Gap width or height (nominal): 10 mm.
- Gap filler: Sealant backing material.
- Capping sealant: One-part acoustic fire resisting intumescent acrylic as clause 396.

163 LINEAR GAP SEALING TO CABLE TRAYS IN MASONRY COMPARTMENT WALLS

- Fire resistance: As fire drawings.
- Gap width or height (nominal): 60 mm.
- Gap filler: Fire stop laminate as clause 331.
- Capping sealant: Not required.

PRODUCTS

305 PRODUCT CERTIFICATION
- Certification: For products specified generically, submit evidence of compliance with the specification.
- Acceptable evidence: Independent third party fire testing certificate.

331 FIRE STOP LAMINATE
- Standard: To EN 1366-3.
- Type: Fire retardant foam laminated on both sides with graphite based intumescent polymer.
  - Fire rating: Up to 4 hours.
- Strip width: Wider than cable tray width, cut to suit.

366 MINERAL WOOL RIGID BATTS - ABLATIVE COATED
- Standard: To EN 13162 & EN 1366-3.
- Type: High density mineral wool insulation slab, finished on both faces with an ablative coating.
  - Fire rating: Up to 2 hours.

381 PIPE COLLAR - SURFACE MOUNTED INTUMESCENT
- Standard: To EN 1366-3.
- Type: Steel shell with graphite based intumescent liner.
  - Fire rating: Up to 4 hours.

386 SEALANT BACKING MATERIAL
- Standard: To EN 1366-3.
- Type: Impregnated polyurethane.
  - Fire rating: Up to 4 hours.

396 SEALANT - ONE-PART ACOUSTIC FIRE RESISTING INTUMESCENT ACRYLIC
- Standard: To EN 1366-3.
- Type (To EN ISO 11600): Class F20LM.
  - Fire rating: Up to 4 hours.
  - Weighted sound reduction Rw (minimum): [57dB].

EXECUTION

620 WORKMANSHIP GENERALLY
- Gaps: Seal gaps between building elements and services, to provide fire resistanceand resist the passage of smoke.
- Adjacent surfaces: Prevent overrun of sealant or mortar on to finished surfaces.

651 INSTALLING FIRE STOP LAMINATE
- Fitting of strips: In accordance with manufacturers instructions.
- Shrink wrapping: If applicable, do not remove

695 APPLYING INTUMESCENT PUTTY PADS
- Sequence: Install putty pads after services are permanently installed.
- Loose dust and combustible materials: Remove from the opening.

720 INSTALLING MINERAL WOOL ABLATIVE COATED BATTS

- Installing batts: Fit tight into void between the penetrating services and the surrounding construction to form a solid barrier.
  - Brackets: Not applicable.
    Bracket fixing: n/a.
- Face of batts: Flush with the surface of wall, floor or soffit.
- Joints between batts: Close butt joints. Seal both sides with one-part acoustic fireresisting intumescaent acrylic as clause 396.
- Gaps between services and barrier: Seal with fire resisting sealant.

730 FIXING PIPE COLLARS

- Collar fixing: Self-tapping screws, stainless steel.
- Gap around collar: Seal with gap filler and sealant.
- Length of wraps: Not applicable.

740 INSERTING SEALANT BACKING MATERIAL

- Preparation: Removed debris from service penetration.
- Installation: Insert joint filler to full depth of joint leaving sufficient depth to apply sealant.

745 APPLYING SEALANTS GENERALLY

- Application: As section Z22.

750 APPLYING CAPPING SEALANT

- Preparation: De-grease, etc using cleaner recommended by sealant manufacturer.
- Priming: Primer as recommended by sealant manufacturer.
- Depth of sealant: As recommended by sealant manufacturer to achieve the requiredfire resistance.
- Temperature: Do not apply water based sealants when they could be damaged by frost.

COMPLETION

910 CLEANING

- Masking tapes: Remove.
- Cleaning: Clean off splashes and droppings. Wipe down finishes.

920 INSPECTION

- Notice for inspection (minimum): 5 working days.

# P20 Unframed isolated trims/ skirtings/ sundry items

To be read with Preliminaries/ General conditions

112 SOFTWOOD SKIRTINGS

- Quality of wood: To EN 942.
  - Species: European redwood.
  - Appearance Class: J10.
- Moisture content at time of fixing: 9-13%.
- Preservative treatment: Not required.
- Fire rating: To EN 13501-1, Class C.
- Profile: Chamfered.
  - Finished size: 19 x 120mm.
- Finish as delivered: Sanded.
- Fixing: Plugged, screwed and filled at 450mm centres.

150 METAL ACCESS COVERS TO SVP's IN CAVITY WALLS

- Material: Galvanized carbon steel.
  - Thickness: 2mm.
- Finish: Polyester powder coating. RAL colour to be agreed with the Architect..
- Fixing: Clip-on to brackets.
- Metalwork: As section Z11.

210 MEDIUM DENSITY FIBREBOARD WINDOW SILL & HEAD BOARDS

- Standard: To EN 622-5.
  - Type: MDF.H.
  - Formaldehyde class: To EN 622-1, Class E1.
- Fire rating: To EN 13501-1, Class C.
- Thickness: 18mm.
  Edges: Square.
- Finish: Prepared and primed as section M60.
- Recycled content: Contractor's choice.
- Support/ Fixing: Fix to softwood grounds with lost head nails at 400mm centres.

255 PARTICLEBOARD BUILT-IN WARDROBES

- Support/fixing: Pinned and glued to softwood framing.
- Doors:
  - Core material: [Particleboard to EN 312].
    Type: [ P2 ].
    Thickness: [18mm].
  - Facing sheet: [High pressure melamine laminate to EN 438, Class VGS].
    Nominal thickness: [0.7mm].
    Fire rating: [Class 1].
    Colour/ Finish: [White/ Smooth].
  - Backing sheet:
    Durability/ Fire rating: As for facing sheet.
    Colour/ Finish: [White/ Smooth].
  - Edge treatment: [2mm ABS, to match door colour].
  - Other requirements/ accessories: [
  - 90 degree concealed stainless steel soft close sprung hinges
  - Recessed shelving supports
  - 32mm diameter stainless steel mushroom door knobs, concealed fixings
  - Stainless steel drawer bar handles 340mm length, 12mm diameter, concealed fixings
  - Polished chrome-plated steel wardrobe rails, 30 x 15 x 0.7 mm, nickel-plated steelend supports
  - Zinc plated steel brackets to BS 1706 or equivalent
  - 19x125 Plinth to match door finish].
- Side panels and cornices:
  -Core Material: [Particleboard to EN 312].
    Type: [ P2 ].
    Thickness: [18mm].
  - Facing sheet: [High pressure melamine laminate to EN 438, Class VGS].
    Nominal thickness: [0.7mm].
    Fire rating: [Class 1].
    Colour/ Finish: [White/ Smooth].
  - Backing sheet:
    Durability/ Fire rating: As for facing sheet.
    Colour/ Finish: [White/ Smooth].
  - Edge treatment: [0.4mm ABS].
- Back panels:
  - Core Material: [Particleboard to EN 312].
    Type: [ P2 ].
    Thickness: [15mm].
  - Facing sheet: [High pressure melamine laminate to EN 438, Class VGS].
    Nominal thickness: [0.7mm].
    Fire rating: [Class 1].
    Colour/ Finish: [White/ Smooth].
  - Backing sheet:
    Durability/ Fire rating: As for facing sheet.
    Colour/ Finish: [White/ Smooth].
  - Edge treatment: [0.4mm ABS].
- Drawers:
  - Core Material: [Plywood].
    Thickness: [Fronts: 18mm / Base, sides & backs: 12mm].
  - Facing sheet: [High pressure melamine laminate to EN 438, Class VGS].
    Nominal thickness: [0.7mm].
    Fire rating: [Class 1].
    Colour/ Finish: [White/ Smooth].
  - Drawer units: fully lipped 12mm plywood drawer base, sides & backs, zinc plated steel runners with double nylon rollers.

- Shelves
  - Core Material: [Plywood].
    Thickness: [18mm].
  - Facing sheet: [High pressure melamine laminate to EN 438, Class VGS].
    Nominal thickness: [0.7mm].
    Fire rating: [Class 1].
    Colour/ Finish: [White/ Smooth].

EXECUTION

510 INSTALLATION GENERALLY

- Joinery workmanship: As section Z10.
- Metal workmanship: As section Z11.
- Methods of fixing and fasteners: As section Z20 where not specified.
- Straight runs: To be in one piece, or in long lengths with as few joints as possible.
- Running joints: Location and method of forming to be agreed where not detailed.
- Joints at angles: Mitre, unless shown otherwise.
- Position and level: To be agreed where not detailed.

# P21 Door/ window ironmongery

To be read with Preliminaries/ General conditions.

PRE-TENDER

10 QUANTITIES AND LOCATIONS
- Quantities and locations of ironmongery are in the door schedule .
- Fixing: As sections L10 and L20.

GENERAL

125 IRONMONGERY FROM SINGLE PROPRIETARY RANGE
- Source: Single co-ordinated range .
- Principal material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Items unavailable within selected range: Inform the Architect of selected manufacturer/supplier and range. Where particular items are unavailable within therange, alternatives compatible in performance, design, style, material, colour and finish must be submitted for approval.

141 SAMPLE BOARDS
- General: Before placing orders with suppliers submit a sample board, containinglabelled samples of ironmongery and showing methods of fixing.
- Range: Include Every item of ironmongery .
  - Conformity: Retain board on site in an approved location for the duration of the contract. Ensure conformity of ironmongery as delivered with labelled samples.

171 IRONMONGERY FOR DOORSETS
- Relevant products: Ironmongery fixed to, or morticed into, the component parts of a doorset assembly.
- Provide ironmongery in Configurations packaging, clearly labelled to identify the products. Where necessary, deliver the packs of non-projecting items to the door set manufacturer for factory fitting and deliver the other packs to site.

172 IRONMONGERY FOR FIRE DOORS
- Relevant products: Ironmongery fixed to, or morticed into, the component parts of a fire resisting door assembly.
- Compliance: Ironmongery included in successful tests to EN 1634-1 or BS 476-22or equivalent standard on door assemblies similar to those proposed.
  - Certification:
    - CERTIFIRE (or equivalent independent third party fire testing) Certificates(Registration Number to be provided)
    - EC Certificates of Conformity
    - Manufacturers Declarations of Performance
    - Evidence of Manufacturer's Quality Assurance .
- Melting point of components (except decorative non functional parts): 800°C minimum.All fire door ironmongery must comply with the provisions of BS 8214 or equivalent standard. Over morticing of the door leaf must be avoided and any voids around the lock body, flush bolts etc. must be filled with intumescent paste or similar fire proofing material.
- All fire door Ironmongery must comply with the provisions of BS 8214 or equivalent standard with regard to the position of ironmongery in proximity to intumescent seals.
- The contractor must be required to follow the specific requirements noted in the relevant CERTIFIRE (or equivalent independent third party fire testing) Certificate for the product being installed. Particular attention is drawn to the use of intumescent cases for locks and intumescent backing strips for hinges. Close co-ordination must be required between the door supplier and the ironmongery supplier.

180 STRENGTH CLASS OR CATEGORY OF DUTY FOR DOOR IRONMONGERY

- Requirement: To EN 1192, Class 4.
- General: Durability of ironmongery components to be compatible with stated categoryof duty of each door leaf.
  - Exclusions: Ironmongery with specific duty or 'category of use' defined elsewhere.
  - Documentation: Before placing orders with suppliers submit documentation showing product compliance with stated category of duty.

DOOR HANGING DEVICES

316 SINGLE AXIS DOOR HINGES TO INTERNAL FIRE AND NON-FIRE RATEDDOORSETS WITH A MAXIMUM ADJUSTED DOOR WEIGHT OF 120KG

- Standard: To EN 1935.
  - Hinges to doors on escape routes and fire/ smoke control doors: CE marked.
- Minimum classification grades:
  - Category of use: 4 (Severe duty) .
  - Durability: 7 (200,000 test cycles) .
  - Test door mass: 6 (120kg) .
  - Suitability for use on fire/ smoke doors: 1 (Suitable) .
  - Safety: 1 .
  - Corrosion resistance: 4 (Very high resistance) .
  - Security - Burglar resistance: 0 (Not suitable) .
  - Hinge grade: 13 .
- Type: 3 knuckle butt .
- Size: 100x75mm .
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Other requirements:
  - Radiused corners
  - Phosphorous bronze bushes
  - Self-lubricating low friction maintenance free bearings
  - Fixed pin
  - Congruent fixing pattern
  - Certifire approved (or equivalent independent third party fire testing)
  - Pre-cut intumescent hinge pads by hinge manufacturer to all fire/ smoke control doors
  - Fixing: minimum 5x32mm woodscrews
  - 25 year maintenance free manufacturer's warranty
  - Fire Certification to demonstrate suitability for use on FD30 & FD60 Timber Doors/Frames as well as FD30, FD60, FD120 & FD240 MetalDoors/Frames
  - Adjustable weight of door to be calculated as per hinge manufacturers recommendations .

317 SINGLE AXIS DOOR HINGES TO INTERNAL FIRE AND NON-FIRE RATEDDOORSETS WITH A MAXIMUM ADJUSTED DOOR WEIGHT OF 160KG

- Standard: To EN 1935.
  - Hinges to doors on escape routes and fire/ smoke control doors: CE marked.
- Minimum classification grades:
  - Category of use: 4 (Severe duty) .
  - Durability: 7 (200,000 test cycles) .
  - Test door mass: 7 (160kg) .
  - Suitability for use on fire/ smoke doors: 1 (Suitable) .
  - Safety: 1 .
  - Corrosion resistance: 4 (Very high resistance) .
  - Security - Burglar resistance: 0 (Not suitable) .
  - Hinge grade: 14 .
- Type: 3 knuckle butt .
- Size: 100x75mm .
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Other requirements:
  - Radiused corners
  - Phosphorous bronze bushes
  - Self-lubricating low friction maintenance free bearings

- Fixed pin

- Congruent fixing pattern
- Certifire approved (or equivalent independent third party fire testing)
- Pre-cut intumescent hinge pads by hinge manufacturer to all fire/ smoke control doors
- Fixing: minimum 5x32mm woodscrews
- 25 year maintenance free manufacturer's warranty
- Fire Certification to demonstrate suitability for use on FD30 & FD60 Timber Doors/Frames as well as FD30, FD60, FD120 & FD240 MetalDoors/Frames
- Adjustable weight of door to be calculated as per hinge manufacturers recommendations .

361 DOOR TRACK AND RUNNING GEAR TO POCKET DOORS

- Standard: To EN 1527.
- Minimum classification grades:
  - Category of use: - (no classification).
  - Durability: 6 (100,000) .
  - Door mass: 2 (51-100kg) .
  - Fire resistance: 0 (Not approved) .
  - Safety: - (no classification).
  - Corrosion resistance: 0 (no defined resistance) .
  - Security: - (no classification).
  - Category of door: 1 .
  - Initial friction: 3 .
- Opening dimensions: As per Architect's drawings .
- Top track: [Aluminium]
- Floor track: [Aluminium channel, recessed].
- Rollers: [Nylon].
- Accessories:
  - Recessed handles as section P21
  - Rubber buffers
  - Clip stops with adjustable retention .
- Operation: Smooth and quiet.
  - Safety: Doors not able to come off track when in use.

DOOR OPERATING DEVICES

413 CONCEALED OVERHEAD DOOR CLOSERS TO INTERNAL FIRE ANDNON-FIRE RATED DOORSETS AS SCHEDULED

- Standard: To EN 1154.
  - Door closing devices to fire/ smoke control doors: CE marked.
- Minimum classification grades:
  - Category of use: 3 (Closing doors from at least 105° open) .
  - Durability: 8 .
  - Door closer power size: Adjustable EN 2-4 .
  - Suitability for use on fire/ smoke doors: 1 (Suitable) .
  - Safety: 1 .
  - Corrosion resistance: 3 (High resistance) or 4 (Very high resistance) .
- Type: Concealed cam-action with rapidly decreasing opening torque. Non-handed, with slide channel .
- Other functions:
  - Latching action, adjustable
  - Closing speed, adjustable
  - Closing force, adjustable.
- Materials:
  - Aluminium body & slide channel
  - Mild steel slide arm .
- Other requirements:[
  - Manufacturers intumescent kit for fire doors in accordance with fire door ratings.
  - Manufacturers cushioned limiting stay.
  - Fire Certification to demonstrate suitability for use on FD30 & FD60 Timber Doors/Frames as well as FD30, FD60, FD90, FD120 & FD240 MetalDoors/Frames.
  - Extended spindles to be fitted where required.

- Shown to be capable of assisting a door achieve the opening force requirements of

Building Regulations Part M on doors from 733mm wide at power size 3.Torque curve graph evidence to be submitted for opening force.
- Temperature dependence +40°C and -15°C: =3s =25s.
- Certifire approved (or equivalent independent third party fire testing).
- 2 years (minimum) manufacturer's warranty.

• Operational adjustment:
- Variable power: Adjustable by spring. Matched to the sizes and weights of doors.
- Latched doors: Override latches and/ or door seals when fitted.
- Unlatched doors: Hold shut under normal working conditions.
- Closing against smoke seals of fire doors: Positive. No gaps.

414 SURFACE MOUNTED OVERHEAD DOOR CLOSERS TO INTERNAL FIRE ANDNON-FIRE RATED DOORSETS UP TO 1600mm WIDE AS SCHEDULED

• Standard: To EN 1154.
- Door closing devices to fire/ smoke control doors: CE marked.

• Minimum classification grades:
- Category of use: 4 (Closing doors from 180° open) .
- Durability: 8 .
- Door closer power size: Adjustable EN 2-5 .
- Suitability for use on fire/ smoke doors: 1 (Suitable) .
- Safety: 1 .
- Corrosion resistance: 3 (High resistance) or 4 (Very high resistance) .

• Type: Surface mounted cam-action with rapidly decreasing opening torque. Non-handed, with slide channel .

• Other functions:
- Backcheck, adjustable
- Delayed closing, adjustable .

• Materials: [
- Aluminium body & slide channel
- Mild steel slide arm] .

• Other requirements:[
- Manufacturers Angle Bracket for push side mounting.
- Fire Certification to demonstrate suitability for use on FD30 & FD60 Timber Doors/Frames as well as FD30, FD60, FD90, FD120 & FD240 MetalDoors/Frames.
- Shown to be capable of assisting a door achieve the opening force requirements of Building Regulations Part M on doors from 733mm wide at power size 3.Torquecurve graph evidence to be submitted for opening force.
- Temperature dependence +40°C and -15°C: =3s =25s.
- Certifire approved (or equivalent independent third party fire testing).
- 2 years (minimum) manufacturer's warranty.

• Operational adjustment:
- Variable power: Adjustable by spring. Matched to the sizes and weights of doors.
- Latched doors: Override latches and/ or door seals when fitted.
- Unlatched doors: Hold shut under normal working conditions.
- Closing against smoke seals of fire doors: Positive. No gaps.

415 CONCEALED JAMB MOUNTED DOOR CLOSERS TO INTERNAL FIRE ANDNON-FIRE RATED DOORSETS AS SCHEDULED

• Standard: To EN 1154 & EN 1634.
- Door closing devices to fire/ smoke control doors: CE marked.

• Minimum classification grades:
- Category of use: 3 (Closing doors from at least 105° open) .
- Durability: 8 .
- Door closer power size: EN 3 .
- Suitability for use on fire/ smoke doors: 1 (Suitable) .
- Safety: 1 .
- Corrosion resistance: 3 (High resistance) or 4 (Very high resistance) .

• Type: Concealed jamb mounted .

• Other functions:
- Latching action, adjustable
- Closing speed, adjustable

- Rounded plate .

- Materials: Polished chrome .
- Other requirements:[
  - Manufacturers intumescent kit for fire doors in accordance with fire door ratings.
  - Fire Certification to demonstrate suitability for use on FD30 & FD60Timber Doors/Frames.
  - Temperature dependence +40°C and -15°C: =3s =25s.
  - Certifire approved (or equivalent independent third party fire testing).
  - 2 years (minimum) manufacturer's warranty.
- Operational adjustment:
  - Fixed power: Matched to the sizes and weights of doors.
  - Latched doors: Override latches and/ or door seals when fitted.
  - Unlatched doors: Hold shut under normal working conditions.
  - Closing against smoke seals of fire doors: Positive. No gaps.

DOOR SECURING DEVICES

526 MORTICE SASHLOCKS GENERALLY

- Standard: To EN 12209.
  - CE marked.
- Type: Vertical Din type euro profile cylinder mortice sashlock.
- Minimum classification grades:
  - Category of use: 3 (High frequency of use).
  - Durability: X (200,000 cycles, 120N load on latch bolt).
  - Door mass and closing force: 8 (Up to 200kg door mass; 15N maximum closing force).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 0 .
  - Corrosion resistance and temperature: G (Very high resistance).
  - Security and drill resistance: 2 (Low security, no drill resistance).
  - Field of door application: B (mortice, hinge door).
  - Type of key operation and locking: A (Cylinder lock or latch, manually locking).
  - Type of spindle operation: 2 (For light duty unsprung lever handle operation).
  - Key identification requirement: 0.
- Backset: 60mm.
- Spacing: [72mm].
- Material/ finish:
  - Forend (radiused): 1.3mm (minimum) thick satin stainless steel grade 1.4301 (304)
  - Strikeplate (radiused): 1.5mm (minimum) thick satin stainless steel, grade 1.4301 (304)
  - Case: Mild steel
  - Follower: Stainless steel.
- Dimensions: [
  - Case: 92x165x15-16mm
  - Forend: 235mm long x 24mm wide
  - Strikeplate: 24mm wide].
- Keying: Unique masterkey system.
- Other requirements: [
  - Intumescent lock casings to be fitted to door locks installed in fire doors.
  - Solid stainless steel latch and deadbolt.
  - 24° short travel follower.
  - Spindle grip in follower.
  - Single throw 20mm bolt.
  - Rebate kits as scheduled.
  - Certifire approved (or equivalent independent third party fire testing).

527 MORTICE DEADLOCKS GENERALLY

- Standard: To EN 12209.
  - CE marked.
- Type: Vertical Din type euro profile cylinder mortice deadlock.
- Minimum classification grades:
  - Category of use: 3 (High frequency of use).
  - Durability: X (200,000 cycles, 120N load on latch bolt).
  - Door mass and closing force: 8 (Up to 200kg door mass; 15N maximum closing force).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 0 .
  - Corrosion resistance and temperature: G (Very high resistance).
  - Security and drill resistance: 2 (Low security, no drill resistance).
  - Field of door application: B (mortice, hinge door).
  - Type of key operation and locking: A (Cylinder lock or latch, manually locking).
  - Type of spindle operation: 0 (Lock without follower).
  - Key identification requirement: 0.
- Backset: 60mm.
- Spacing: [72mm].
- Material/ finish:
  - Forend (radiused): 1.3mm (minimum) thick satin stainless steel grade 1.4301 (304)
  - Strikeplate (radiused): 1.5mm (minimum) thick satin stainless steel, grade 1.4301 (304)
  - Case: Mild steel.
- Dimensions: [
  - Case: 92x165x15-16mm
  - Forend: 235mm long x 24mm wide
  - Strikeplate: 24mm wide].
- Keying: Unique masterkey system.
- Other requirements: [
  - Intumescent lock casings to be fitted to door locks installed in fire doors.
  - Solid stainless steel deadbolt.
  - Single throw 20mm bolt.
  - Rebate kits as scheduled.
  - Certifire approved (or equivalent independent third party fire testing).

528 MORTICE BATHROOM LOCKS GENERALLY

- Standard: To EN 12209.
  - CE marked.
- Type: Vertical Din type mortice bathroom lock.
- Minimum classification grades:
  - Category of use: 3 (High frequency of use).
  - Durability: X (200,000 cycles, 120N load on latch bolt).
  - Door mass and closing force: 8 (Up to 200kg door mass; 15N maximum closing force).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 0 .
  - Corrosion resistance and temperature: G (Very high resistance).
  - Security and drill resistance: 1 (Minimum security, no drill resistance).
  - Field of door application: B (mortice, hinge door).
  - Type of key operation and locking: G (Lock or latch without key operation, manually locking).
  - Type of spindle operation: 2 (For light duty unsprung lever handle operation).
  - Key identification requirement: 0.
- Backset: 60mm.
- Spacing: [78mm].
- Material/ finish:
  - Forend (radiused): 1.3mm (minimum) thick satin stainless steel grade 1.4301 (304)
  - Strikeplate (radiused): 1.5mm (minimum) thick satin stainless steel, grade 1.4301 (304)
  - Case: Mild steel
  - Follower: Stainless steel.
- Dimensions: [
  - Case: 92x165x15-16mm

- Forend: 235mm long x 24mm wide

- Strikeplate: 24mm wide].
- Other requirements: [
  - Intumescent lock casings to be fitted to door locks installed in fire doors.
  - Solid stainless steel latch and deadbolt.
  - 24° short travel follower.
  - Spindle grip in follower.
  - Single throw 20mm bolt.
  - Rebate kits as scheduled.
  - Certifire approved (or equivalent independent third party fire testing).

529 MORTICE LATCHES GENERALLY

- Standard: To EN 12209.
  - CE marked.
- Type: Vertical Din type mortice latch.
- Minimum classification grades:
  - Category of use: 3 (High frequency of use).
  - Durability: X (200,000 cycles, 120N load on latch bolt).
  - Door mass and closing force: 8 (Up to 200kg door mass; 15N maximum closing force).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 0 .
  - Corrosion resistance and temperature: G (Very high resistance).
  - Security and drill resistance: 1 (Minimum security, no drill resistance).
  - Field of door application: B (mortice, hinge door).
  - Type of key operation and locking: 0.
  - Type of spindle operation: 2 (For light duty unsprung lever handle operation).
  - Key identification requirement: 0.
- Backset: 60mm.
- Material/ finish:
  - Forend (radiused): 1.3mm (minimum) thick satin stainless steel grade 1.4301 (304)
  - Strikeplate (radiused): 1.5mm (minimum) thick satin stainless steel, grade 1.4301 (304)
  - Case: Mild steel
  - Follower: Stainless steel.
- Dimensions: [
  - Case: 92x165x15-16mm
  - Forend: 235mm long x 24mm wide
  - Strikeplate: 24mm wide].
- Other requirements: [
  - Intumescent lock casings to be fitted to door locks installed in fire doors.
  - Solid stainless steel latch.
  - 24° short travel follower.
  - Spindle grip in follower.
  - Rebate kits as scheduled.
  - Certifire approved (or equivalent independent third party firetesting).

531 MORTICE MULTI-POINT LOCKS TO EXTERNAL ENTRANCE DOORSGENERALLY

- Standard: To DIN 18251 or equivalent standard & prEN 15685.
  - CE marked.
- Type: Euro profile 3-point locking system.
- Minimum classification grades:
  - Category of use: 3 (High frequency of use).
  - Durability: M (200,000 cycles, 25N load on latch bolt).
  - Door mass and closing force: 5 (Up to 200kg door mass; 25N maximum closing force).
  - Suitability for use on fire/ smoke doors: B (Suitable for use in fire andsmoke-proof doors, based on a test in accordance with EN 1634).
  - Safety: 0 .
  - Corrosion resistance and temperature: F (High resistance).
  - Security and drill resistance: 0.
  - Key identification requirement: 0.
- Backset: 60mm.
- Material/ finish: Satin stainless steel grade 1.4301 (304).
- Fire Rating: [EI 30]

- Keying: Unique masterkey system.

- Other requirements: [
  - 4-part clamp follower.
  - Reversible latch.
  - 3no. hardened steel deadbolts.
  - Intumescent lock casings to be fitted to door locks installed in fire doors.
  - Supplied with 1no Centre Bolts Strike & 2no Additional Bolts Strikes.

550 CYLINDERS KEY & THUMBTURN

- Standard: To EN 1303.
  - CE marked.
- Type: Restricted profile Euro key & thumbturn cylinder.
- Minimum classification grades:
  - Category of use: 1 (Low frequency of use).
  - Durability: 6 (100,000 cycles).
  - Door mass and closing force: 0 (No requirement).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 0 .
  - Corrosion resistance and temperature: C (High resistance).
  - Key related security: 4 (High security).
  - Attack resistance: 1.
- Material/ finish: Simulated stainless steel.
- Size: [
  - 71mm 35/35 for 44mm thick doors
  - 81mm 40/40 for 54mm thick doors].
- Other requirements: [
  - Supplied with 2no. keys
  - Cylinders to be built under a unique masterkey system for the building.
  - In order to provide the facility to tie other doors into the masterkey system the system must be capable of accommodating other cylinder types such as cam locks, UK oval cylinders, Scandinavian oval cylinders, padlocks and special offsets for externaldoors.
  - Certifire approved (or equivalent independent third party fire testing).

551 CYLINDERS SINGLE

- Standard: To EN 1303.
  - CE marked.
- Type: Restricted profile Euro single cylinder.
- Minimum classification grades:
  - Category of use: 1 (Low frequency of use).
  - Durability: 6 (100,000 cycles).
  - Door mass and closing force: 0 (No requirement).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 0 .
  - Corrosion resistance and temperature: C (High resistance).
  - Key related security: 4 (High security).
  - Attack resistance: 1.
- Material/ finish: Simulated stainless steel.
- Size: [45mm 35/10 for 44mm thick doors].
- Other requirements: [
  - Supplied with 2no. keys
  - Cylinders to be built under a unique masterkey system for the building.
  - In order to provide the facility to tie other doors into the masterkey system the system must be capable of accommodating other cylinder types such as cam locks, UK oval cylinders, Scandinavian oval cylinders, padlocks and special offsets for externaldoors.
  - Certifire approved (or equivalent independent third party fire testing).

552 CYLINDERS DOUBLE

- Standard: To EN 1303.
  - CE marked.
- Type: Restricted profile Euro double cylinder.
- Minimum classification grades:
  - Category of use: 1 (Low frequency of use).

- Durability: 6 (100,000 cycles).

- Door mass and closing force: 0 (No requirement).
- Suitability for use on fire/ smoke doors: 1 (Suitable).
- Safety: 0 .
- Corrosion resistance and temperature: C (High resistance).
- Key related security: 4 (High security).
- Attack resistance: 1.

• Material/ finish: Simulated stainless steel.
• Size: [
- 71mm 35/35 for 44mm thick doors
- 81mm 40/40 for 54mm thick doors].
• Other requirements: [
- Supplied with 2no. keys
- Cylinders to be built under a unique masterkey system for the building.
- In order to provide the facility to tie other doors into the masterkey system the system must be capable of accommodating other cylinder types such as cam locks, UK oval cylinders, Scandinavian oval cylinders, padlocks and special offsets for externaldoors.
- Certifire approved (or equivalent independent third party fire testing).

571 EMERGENCY EXIT DEVICES TO BINSTORE STREET EXITS IN UNITS D AND G-K AND COURTYARD ACCESS GATE FROM G-K BASEMENT

• Standard: To BS EN 179.
- Emergency exit devices for locked doors on escape routes: CE marked.
• Manufacturer: Contractor's choice .
- Product reference: Contractor's choice .
• Type: Push pad .
• Material/ finish: Powder coated steel, colour to match door furniture .
• Additional requirements: External locking attachment to be suited with other locks .

572 PERFORMANCE SPECIFICATION FOR EMERGENCY EXIT DEVICES -

• Standard: To BS EN 179.
- Emergency exit devices for locked doors on escape routes: CE marked.
• Minimum classification grades:
- Category of use: 3.
- Durability: 7 .
- Door mass: 6 .
- Suitability for use on fire/ smoke doors: 1 .
- Safety: 1.
- Corrosion resistance: 4 .
- Security: 4 .
- Projection of operating element: 1 .
- Type of operation: B: Push pad operation .
• Material/ finish: Powder coated steel, colour to match door furniture .
• Additional requirements: External locking attachment to be suited with other locks .

587 WC THUMBTURN & INDICATOR SET TO BATHROOMS

• Type: Disabled WC thumbturn & indicator set .
• Size: 54x8mm .
• Material/ finish: Polished stainless steel, grade 1.4301 (304) .
• Emergency release facility: Required.
• Mounting: Sub rose to be steel construction with bolt through fixing possibility only. Cover rose to be stainless steel clip on type.
• Other Requirements : Elongated turn for easy use

DOOR FURNITURE

623 LEVER HANDLE SETS GENERALLY

• Standard: To EN 1906.
• Minimum classification grades:
- Category of use: 4 (High frequency of use) .
- Durability: 7 .

- Door mass: - (no classification).
- Fire resistance: B (For smoke control and fire resistance door assemblies) .

- Safety: 1 (Safety application) .
- Corrosion resistance: 4 (Very high resistance) .
- Security: 0 (Not approved for use on burglar resistant doors) .
- Type of operation: U (Unsprung) .

- Style: 130mm long, straight mitred lever .
- Size: 20mm diameter .
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Mounting: Sub rose to be steel un-sprung construction with bolt through fixing possibility only. Bolts from one side to screw into threaded lugs on the other side. Sub rose to have self-lubricating, maintenance free bearings. Cover rose to be stainless steel clip on type.
- Rose: [53x8mm thick, satin stainless steel, grade 1.4301 (304)].
- Additional requirements: Levers to have been cycle tested to over 1 million cycles .

624 LEVER HANDLE SETS ON CYLINDER BACKPLATES

- Standard: To EN 1906.
- Minimum classification grades:
  - Category of use: 4 (High frequency of use) .
  - Durability: 7 .
  - Door mass: - (no classification).
  - Fire resistance: B (For smoke control and fire resistance door assemblies) .
  - Safety: 1 (Safety application) .
  - Corrosion resistance: 4 (Very high resistance) .
  - Security: 0 (Not approved for use on burglar resistant doors) .
  - Type of operation: U (Unsprung) .
- Style:
  - 130mm long, straight mitred lever, 20mm diameter.
  - 220x40mm radius corner euro profile backplate 78mm c/c .
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Mounting: Screw fixed with backplate to incorporate self-lubricating, maintenancefree bearings .
- Additional requirements: Levers to have been cycle tested to over 1 million cycles .

630 CUPBOARD KNOBS GENERALLY

- Style: Ball .
- Size: 50mm diameter knob on 53x8mm rose .
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Mounting: Knob fixed to rose. Rose with M5 lugs and bolted through back of door using matching blank rose .

640 CYLINDER PULLS GENERALLY

- Type: Euro profile cylinder pull .
- Shape: Rectangular with radiused corners .
- Size: 80x40mm .
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Mounting: Face fix .

655 PULL HANDLES GENERALLY

- Standard: To BS 8424 or equivalent standard.
- Minimum classification grades:
  - Category of use: 4 (Severe duty).
  - Durability: 2 .
  - Door mass: - (no classification).
  - Suitability for use on fire/ smoke doors: 1 (Suitable).
  - Safety: 1 .
  - Corrosion resistance: 4 (Very high resistance).
- Shape: D handle.
- Diameter: 19mm.
- Distance between centres: 225 mm.
- Material/ finish: Satin stainless steel, grade 1.4401 (316).
- Mounting: Bolt through.

660 RECESSED PULL HANDLES FOR POCKET SLIDING DOORS

- Shape: Rectangular with oval top/bottom.
- Dimensions: 110x50mm.
- Material/ finish: Satin stainless steel, grade 1.4301 (304).
- Mounting: Face fix, concealed.
- Additional requirements None.

675 PUSH PLATES GENERALLY

- Size: 380x75x1.5mm .
- Material/ finish: Satin stainless steel, grade 1.4401 (316) .
- Mounting: Face fix .
- Additional requirements:
  - Radiused corners
  - Drilled and countersunk for fixings .

691 KICK PLATES GENERALLY

- Size: 150mm high x 1.5mm thick x full width of door leaf between stops less3mm tolerance at both ends .
- Material/ finish: Polished stainless steel, grade 1.4301 (304) .
- Mounting: Plates to be pre-drilled and countersunk for screw fixing .
- Additional requirements: Radiused corners .

711 CYLINDER ESCUTCHEONS GENERALLY

- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Keyhole type: Euro profile cylinder .
- Size: [53x8mm].
- Usage: To cylinder locks where no handle backplate is specified to be fitted .
- Mounting: [Sub rose to be steel construction with bolt through fixing possibility only. Bolts from one side to screw into threaded lugs on the other side. Cover rose to be stainless steel clip on type].

721 DOOR STOPS [FLOOR MOUNTED]

- Type: Oval floor mounted with black rubber buffer .
- Shoe material: [Satin stainless steel].
- Size: [44mm diameter].
- Mounting: [Dual fixing with anchor bolt and screw fix].
- Usage: To doors opening against walls other than those fitted with closers with aback check facility, or where a wall mounted stop is required .

722 DOOR STOPS [WALL MOUNTED]

- Type: Wall mounted on rose with black rubber buffer .
- Shoe / rose material: [Satin stainless steel].
- Size: [82mm projection].
- Mounting: [Concealed fixing 50mm rose].
- Usage: As per Architect's drawings .

732 LETTER PLATES GENERALLY

- Standard: To EN 13724.
- Minimum classification grades:
  - Type of aperture: 4 .
  - Aperture size: 2 (30-40mm x 230-280mm .
  - Corrosion resistance: 4 (Very high resistance) .
  - Security: 2 .
- Operation: Inward opening sprung flap .
- Material/ finish: Satin stainless steel, grade 1.4401 (316) .
- Features:
  - Fully integrated spacer
  - Inner flap
  - Draughtstripped .

855 WEATHERSTRIP TO DOOR HEAD AND JAMBS -

- Manufacturer: External Door and Screen Manufacturer- integral to system .
  - Product reference: - .
- Type: Elastomeric wiping strip in metal carrier .
- Size: To suit door .
- Material/ finish: Satin anodized aluminium .

894 NUMERALS ENTRANCE DOORS

- Type: Stand-off .
- Size: [125mm high x 4mm thick].
- Material/ finish: Satin stainless steel, grade 1.4301 (304) .
- Mounting: Concealed fixing with threaded sockets with bolts .

960 WEATHERSTRIP TO WINDOWS -

- Manufacturer: Window Manufacturer - integral to system.
  - Product reference: -.
- Type: Elastomeric compression strip in metal carrier.
- Size: To suit window.
- Material/ Finish: Self finished.

# Q10 Kerbs/ edgings/ channels/ paving accessories

TO BE READ WITH PRELIMINARIES/ GENERAL CONDITIONS.

TYPES OF KERBS/EDGINGS AND CHANNELS

113 PRECAST CONCRETE EDGINGS

- Standard: To EN 1340.
- Recycled content: Contractor's choice.
- Designations: BN Kerb, bullnosed.
- Size (width x height x length): 150x125x915mm.
- Special shapes: None.
- Finish: As cast.
- Colour: Natural.
- Bending strength: Class 1.
- Weathering resistance: Class 2.
- Abrasion resistance: Class 3.
- Slip/ skid resistance: No requirement.
- Bedding: Cement mortar.
- Joints generally: Dry, 2-3mm gap.
- Sealant movement joints: Not required.
- Accessories: None.

160 CONCRETE BLOCK EDGINGS

- Standard: To EN 1338.
- Recycled content: 50% (minimum) to EN ISO 14021.
- Size: 200x100x80mm.
- Special shapes: None.
- Finish: To match permeable concrete paving blocks as section Q24.
- Colour: To match permeable concrete paving blocks as section Q24.
- Bedding: Fresh concrete races to Engineer's specification.
- Joints generally: Dry, 2 mm gap.
- Sealant movement joints: Not required.

175 LINEAR SLOT DRAINAGE CHANNEL SYSTEMS

- Materials:
  - Channel: [Polymer concrete]
  - Slot: [Stainless steel, grade 304]
- Type of fall: Constant invert.
- Nominal bore: 100mm.
- Invert depth: [255mm].
- Slot type & width: Offset, 10mm.
- Load class to EN 1433: D400.
- Accessories:
  - Inspection units with removable grade 304 stainless steel inspection lid, intakearea 10000mm²/m.
  - Universal endcaps.
- Bedding: Fresh concrete races.
- Joints generally: Drain unions as required.

182 DRAINAGE CHANNEL SYSTEMS WITH GRATINGS [TO BASEMENT CARPARK]

- Channel: [Polymer concrete]
- Type of fall: Constant invert.
- Nominal bore: [200mm].
- Invert depth: [310mm].
- Accessories:
  - Universal endcaps
  - Sump units with silt buckets.
- Bedding: Fresh concrete races.
- Joints generally: Drain unions as required.
- Cover gratings: Ductile iron, slotted.
  - Fixings: Friction clips.
  - Load class to EN 1433: D400.
  - Finish/ Colour: Black.

183 DRAINAGE CHANNEL SYSTEMS WITH GRATINGS [TO BIN STORES UNITS D AND G-K]

- Channel: [Polymer concrete]
- Type of fall: Constant invert.
- Nominal bore: [100mm].
- Invert depth: [300mm].
- Accessories:
  - Gully assembly comprising top, base, bucket and grating
  - Universal endcaps.
- Bedding: Fresh concrete races.
- Joints generally: Drain unions as required.
- Cover gratings: Galvanized steel, slotted.
  - Fixings: Friction clips.
  - Load class to EN 1433: C250.
  - Finish/ Colour: Galvanized.

ROADS/PAVING ACCESSORIES/ MARKING/ DEMARCATION

305 TREE GRILLES AND SURROUNDS

- Manufacturer:_____.
  - Product reference:_____.
- Size:_____.
- Material:_____.
- Finish:_____.
- Colour:_____.
- Bedding/ fixing:_____.
- Accessories:_____.

305A TREE GRILLES AND SURROUNDS

Refer to Landscape Architect's Specification

- ----.
- --. -.

391 ROAD MARKING PAINT [UNITS G-GK BASEMENT CAR PARK]

- Surface: [Powerfloated concrete].
  - Preparation: [2 coats floor sealer as per specification section M60/181].
- Paint: High build single pack epoxy linemarking paint .
  - Dry film thickness (minimum): 150 microns
  - Number of coats: 1 .
- Colour: White for bay parkings, Yellow cross-hatch for delineation of disabled parking bay - refer to Architect's Drawings .
- Surfaces to receive markings: Clean and dry, loose material removed.
- Application:
  - Spray applied. Uniform, with no streaks or ragged edges.
  - Do not apply if air or surface temperature is below 5°C, when humidity is high or the surface is wet or likely to be wet during the drying period.
- Additional requirements: [Contractor to provide stencils for numerals, lines, wheelchair symbols, arrows and any other markings as indicated on Architect's drawings]

LAYING

510 LAYING KERBS, EDGINGS AND CHANNELS

- Cutting: Neat, accurate and without spalling. Form neat junctions.
  - Long units (450 mm and over) minimum length after cutting: 300 mm.
  - Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
- Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh concrete.
- Securing of units: After bedding has set, secured with a continuous haunching ofconcrete or on a race of fresh concrete with backing concrete cast monolithically.

520 ADVERSE WEATHER

- Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1° C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

570 CHANNELS

- Installation: To an even gradient, without ponding or backfall.
- Lowest points of channels: 6 mm above drainage outlets.

580 DRAINAGE CHANNEL SYSTEMS

- Installation: To an even gradient, without ponding or backfall. Commence layingfrom outlets.
- Silt and debris: Removed from entire system immediately before handover.
- Washing and detritus: Safely disposed without discharging into sewers or watercourses.

620 ACCURACY

- Deviations (maximum):
  - Level: ± 6 mm.
  - Horizontal and vertical alignment: 3 mm in 3 m.

# Q25 Slab/ brick/ sett/ cobble pavings

To be read with Preliminaries/ General conditions.

GENERAL

120 CONCRETE FLAG PAVING SYSTEM FLEXIBLE CONSTRUCTION
- Subgrade improvement layer: Not required.
  - Compacted thickness: Not applicable.
- Granular sub-base: To Engineer's specification.
  - Compacted thickness: 150mm.
- Base: Not required.
  - Thickness: Not required.
- Laying course: Sand.
  - Accessories: Geotextile sheet below laying course.
- Paving units: Concrete flags.
- Jointing: Sand.
  - Bond: Straight line.
- Accessories: Channels and kerbs, as section Q10.

127 PEDESTAL SUPPORTED PAVING SLAB/ FLAG SYSTEM ROOF TERRACES.
- Preparation of existing base: Not required.
- Paving support: Pedestals as clause 485.
- Paving units: Concrete slabs.
- Accessories: None.

PRODUCTS

316 CONCRETE FLAGS FOR FLEXIBLE CONSTRUCTION
- Standard: To EN 1339.
- Recycled content: 20% (minimum) to EN ISO 14021.
- Colour: Natural.
  - Finish: Smooth, matt.
  - Nominal sizes: 600x600x50mm.
- Arrises: Square.
- Water absorption and freeze/ thaw resistance class: 2.
- Bending strength class: 1.
- Abrasion resistance class: 4.
- Slip/ Skid resistance: USRV >60.
- Breaking load class: 70.

317 CONCRETE FLAGS ON PEDESTAL SUPPORTS
- Standard: To EN 1339.
- Recycled content: 20% (minimum) to EN ISO 14021.
- Colour: Natural.
  - Finish: Smooth, matt.
  - Nominal sizes: 600x600x63mm.
- Arrises: Square.
- Water absorption and freeze/ thaw resistance class: 2.
- Bending strength class: 3.
- Abrasion resistance class: 4.
- Slip/ Skid resistance: USRV >60.
- Breaking load class: 140.

366 GEOTEXTILE SHEET BELOW SAND LAYING COURSE

- Type: Nonwoven virgin polypropylene, minimum weight 100g/m², minimum thickness 1.0mm.

395 SAND FOR FLEXIBLE LAYING COURSE AND JOINTING OF CONCRETEFLAG PAVING GENERALLY.

- Standard: To BS 7533-4 or equivalent standard, unbound construction laying course and jointing material.
- Purity: Free from deleterious salts, contaminants, lime and cement.
- Procurement: Obtain from one source and ensure consistent grading.

485 SUPPORT PEDESTALS To support paving slabs generally

- Type: Adjustable.
- Material: Polypropylene.
- Loading: [400kg per unit].
- Dimensions: To achieve a clearance range shown on Architect's drawings.
- Additional pedestals: 2 lugged type adjacent to perimeters.
- Accessories:
  - Anti-shock levellers
  - Slope correctors.

EXECUTION

610 MATERIAL SAMPLES

- Samples representative of colour and appearance of designated materials: Submitbefore placing orders.
  - Designated materials: All pavings.

620 ADVERSE WEATHER

- General:
  - Temperature: Do not lay or joint paving if the temperature is below 3°C on a falling thermometer or below 1°C on a rising thermometer.
  - Frozen materials: Do not use. Do not lay bedding on frozen or frost covered bases.
- Paving with mortar joints and/ or bedding:
  - Protect from frost damage, rapid drying out and saturation until mortar has hardened.
- Paving laid and jointed in sand:
  - Stockpiled bedding sand: Protect from saturation.
  - Exposed areas of sand bedding and uncompacted areas of sand bedded paving:Protect from heavy rainfall.
  - Saturated sand bedding: Remove and replace, or allow to dry before proceeding.
  - Laying dry-sand jointed paving in damp conditions: Brush in as much jointing sand as possible. Minimize site traffic over paving. As soon as paving is dry, top up joints and complete compaction.

625 LAYING PAVINGS - GENERAL

- Appearance: Smooth and even with regular joints and accurate to line, level and profile.
- Falls: To prevent ponding.
- Bedding of paving units: Firm so that rocking or subsidence does not occur or develop.
  - Bedding/ Laying course: Consistently and accurately graded, spread and compacted to produce uniform thickness and support for paving units.
- Slopes: Lay paving units upwards from the bottom of slopes.
- Paving units: Free of mortar and sand stains.
- Cutting: Cut units cleanly and accurately, without spalling, to give neat junctions with edgings and adjoining finishes.

630 LEVELS OF PAVING

- Permissible deviation from specified levels:
  - Generally: ± 6 mm.
- Height of finished paving above features:
  - At gullies: +6 to +10 mm.
  - At drainage channels and kerbs: +3 to +6 mm.

637 REGULARITY OF PAVED SURFACES

- Maximum undulations in the surface of pavings (except tactile paving surfaces) under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm.
- Joints between paving units or utility access covers:
  - Joints flush with the surface: difference in level between adjacent units to be nomore than twice the joint width (with a 5 mm max difference in level).
  - Recessed, filled joints: difference in level between adjacent units to be no greater than2 mm; the recess to be no deeper than 5 mm.
  - Unfilled joints: difference in level between adjacent units to be no greater than 2 mm.
- Sudden irregularities: Not permitted.

640 COLOUR BANDING

- General: Unless premixed by manufacturer, select from at least 5 separate packs in rotation to avoid colour banding.

646 PROTECTION

- Cleanliness: Keep paving clean and free from mortar droppings, oil and othermaterials likely to cause staining.
- Materials storage: Do not overload pavings with stacks of materials.
- Handling: Do not damage paving unit corners, arrises, or previously laid paving.
- Access: Restrict access to paved areas to prevent damage from site traffic and plant.

656 CONDITION OF SUB-BASES/ BASES BEFORE SPREADING LAYING COURSE

- Trenches and excavation of soft or loose spots in subgrade: Fill and thoroughly compact.
- Granular surfaces: Lay and compact so as to be sound, clean, smooth andclose-textured enough to prevent migration of bedding/ laying course materials into the sub-basedduring compaction and use, free from movement under compaction plant and free from compaction ridges, cracks and loose material.
- Sub-base level tolerances: To BS 7533-7, Annex A or equivalent standard.
- Levels and falls: Accurate and within the specifiedtolerances.
- Drainage outlets: Within 0-10 mm of the required finished level.
- Features in sand bedded paving (including mortar bedded restraints and drainage ironwork): Complete to required levels; adequately bed and haunch in mortar.

675 LAYING GEOTEXTILE SHEET EDGING STRIPS

- Location: Immediately below sand laying course, abutting features which interrupt the laying course, including:
  - Perimeters/ Edge restraints/ Kerbs.
  - Other types of paving.
  - Drainage fittings, e.g. channels and manholes.
- Edge detail: Turn sheet up to a height not less than thickness of sand bedding to form an upstand fitted neatly against features.
- Width: 2000mm.
- Jointing: Lap by 300mm.

685 LAYING GEOTEXTILE SHEET OVERLAYS

- Location: Immediately below sand bedding course.
- Laying: Fit neatly at edge restraints and other features that interrupt sand bedding course, e.g. drainage fittings, channels, manholes and kerbs.
- Edge detail: Turn sheet up to form an upstand against features, height not less than thickness of sand bedding.
- Width: 2000mm.
- Jointing: Lap by 300mm.

712 LAYING FLAG AND SLAB PAVING - SAND LAYING COURSE AND JOINTING

- Standard: In accordance with BS 7533-4 or equivalent standard.
- Laying course:
  - Nominal thickness after compaction: 30mm with a tolerance of -10 to + 5 mm.
- Joint width: 2-5 mm.

810 PEDESTAL INSTALLATION

- Surface to accept pedestals: Clean and free of debris.
- Setting out: Mark centre-point of pedestal on substrate surface, withperpendicular guidelines to ensure square layout.
  - Orientation: Align parallel with adjacent features.
  - Spacing: To suit paving material and dimensions.
- Movement tolerance at perimeter of paver system (maximum): 5 mm.

COMPLETION

915 COMPLETION OF PAVING WITH DRY SAND OR FINE AGGREGATE FILLED JOINTS

- Sand dressing: Leave a thin layer of dry jointing sand over the paving, sweep clean before practical completion.
- Final compaction of the surface course: In accordance with BS 7533-3.
- Vacuum cleaning machines: Not allowed.

# R10 Rainwater drainage systems

To be read with Preliminaries/ General conditions.

GENERAL

115 GRAVITY RAINWATER DRAINAGE SYSTEM [HOUSES]
- Rainwater outlets: Zinc.
- Gutters: Zinc.
- Pipework: Zinc.
- Below ground drainage: To Civil and M&E Engineer's design.
- Disposal: To surface water drainage.
- Accessories: Refer to respective clauses.

116 GRAVITY RAINWATER DRAINAGE SYSTEM [APARTMENTS]
- Rainwater outlets: Insulated & cast aluminium.
- Gutters: None.
- Pipework: Zinc & uPVC.
- Below ground drainage: To Civil and M&E Engineer's design.
- Disposal: To surface water drainage.
- Accessories: Refer to respective clauses.

SYSTEM PERFORMANCE

221 COLLECTION AND DISTRIBUTION OF RAINWATER
- General: Complete, and without leakage or noise nuisance.

PRODUCTS

356 ZINC GUTTERS
- Standard: To EN 612.
- Profile: Half round with beaded front edge.
- Thickness: 0.7mm.
- Nominal size: 120mm.
- Finish: Preweathered.
- Brackets: Galvanized steel and zinc, fascia type.
  - Fixings: Stainless steel screws.
    Size: As supplied bymanufacturer.
- Accessories:
  - Half-round expansion joints
  - Half-round 90° one-piece corners
  - Half-round stop ends
  - Plug-in universal outlets
  - 220 x 220 x 220mm Box hopper heads where indicated

  All accessories to be in matching zinc from the same manufacturer as gutters and downpipes.

360 SEALANT FOR GUTTERS
- Type: Zinc compatible adhesive.

366 INSULATED RAINWATER OUTLETS [TO APARTMENT ROOFS]

- Type: Vertical spigot.
  - Material: Rigid polyurethane.
  - Nominal size: [75mm outside diameter for connection to zinc pipework / 110mmoutside diameter for connection to uPVC pipework].
- Roof construction: EPDM on insulation on concrete deck.
  - Roof insulation thickness: 150mm.
- Type of grate/ Fittings: Dome grating - plastics material. EPDM connectingmembrane fused to the outlet body to suit EPDM roof membrane.
- Outlet: Type and direction to suit pipework with suitable adaptors and connections.
- Accessories:
  - Extension pieces
  - Stainless steel adaptor (reducer) couplings for connection to zinc pipework.

367 ALUMINIUM RAINWATER OUTLETS [TO BALCONIES]

- Type: 90° spigot.
  - Material: Cast aluminium.
  - Nominal size: [62mm outside diameter].
- Balcony construction: Plastic boarding on steel deck.
- Type of grate/ Fittings: Flat grating. Clamping ring to suit EPDM waterproofing membrane.
- Outlet: Type and direction to suit pipework with suitable adaptors and connections.
- Accessories: Couplings for connection to uPVC pipework.

368 TWO-WAY ALUMINIUM RAINWATER OUTLETS [TO APARTMENT PARAPET WALLS]

- Type: Two-way, female threaded.
  - Material: Cast aluminium.
  - Nominal size: [75mm pipe].
- Roof construction: [EPDM on insulation on concrete deck].
  - Roof insulation thickness: [150mm].
- Type of grate/ Fittings: Flat grating. Clamping piece to suit EPDM waterproofing membrane
- Outlet: Type and direction to suit pipework with suitable adaptors and connections.
- Accessories: 500mm long plastic BSP male threaded spigot adaptors.

426 PVC-U PIPEWORK - SEALED

- Standard: To EN 1329-1.
- Wall thickness: Minimum - 3.2mm / Maximum - 3.5mm.
- Recycled content: 50% (minimum) to EN ISO 14021.
- Nominal size: DN110.
- Colour: Grey.
- Brackets: PVC-U pipe or socket brackets at 1800mm centres maximum.
  - Fixings: Stainless steel screws.
    Size: 40 x 4 mm.
- Accessories:
  - Access fittings
  - Insulation
  - Intumescent collars as section P12.

438 ZINC PIPEWORK

- Standard: To EN 612.
- Shape: Round.
- Thickness: 0.7 mm.
- Nominal size: 80mm & 100mm diameter.
- Finish: Natural.
- Brackets: Galvanized steel and zinc, self locking.
  - Fixings: Stainless steel screws.
    Size: As supplied bymanufacturer.
- Accessories:
  - Downpipe connectors
  - Zinc compatible adhesive
  - 50mm diameter pipe for overflow warnings.

451 INSULATION TO INTERNAL PIPEWORK

- Material: Preformed flexible mineral fibre split tube.
- Weighted sound reduction index, Rw (minimum), to EN ISO 717-1: [30 dB].
- Thermal conductivity (maximum): 0.045 W/mK.
- Thickness: 50mm.
- Fire performance: Non-combustible in accordance with ISO 1182.

EXECUTION

600 PREPARATION

- Work to be completed before commencing work specified in this section:
  - Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
  - Painting of surfaces which must be concealed or inaccessible.

605 INSTALLATION GENERALLY

- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Plastics and galvanized steel pipes: Do not bend.
- Allowance for thermal and building movement: Provide and maintain clearance asfixing and jointing proceeds.
- Protection:
  - Fit purpose made temporary caps to prevent ingress of debris.
  - Fit access covers, cleaning eyes and blanking plates as the work proceeds.

606 INSTALLATION GENERALLY

- Obtain all components for each type of pipework/guttering from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Plastics and metal pipes: Do not bend.
- Allowance for thermal and building movement: Provide and maintain clearance asfixing and jointing proceeds.
- Protection:
  - Fit purpose made temporary caps to prevent ingress of debris.
  - Fit access covers, cleaning eyes and blanking plates as the work proceeds.

610 FIXING AND JOINTING GUTTERS

- Joints: Watertight.
- Brackets: Securely fixed.
  - Fixings: Plugged and screwed into masonry.
    Fixing centres: 600 mm.
  - Additional brackets: Where necessary to maintain support and stability, provide atjoints in gutters and near angles and outlets.
- Roofing underlay: Dressed into gutter.

615 SETTING OUT EAVES GUTTERS - TO FALLS

- Setting out: To true line and even gradient to prevent ponding or backfall. Position high points of gutters as close as practical to the roof and low points not more than 50 mm below the roof.
- Outlets: Align with connections to below ground drainage.

631 INSTALLING INSULATED RAINWATER OUTLETS

- Fixing: Secure. Fix before connecting pipework.
  - Method: Connecting membrane bonded to roof waterproofing membrane.
- Junctions between outlets and pipework: Accommodate movement in structureand pipework.

632 INSTALLING ALUMINIUM RAINWATER OUTLETS

- Fixing: Secure. Fix before connecting pipework.
  - Method: Secured through flange to supporting structure.
- Junctions between outlets and pipework: Accommodate movement in structureand pipework.

636 FIXING PIPEWORK

- Pipework: Fix securely, plumb and/ or true to line.
- Make changes in direction of pipe runs only where shown on drawings.
- Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
- Externally socketed pipes and fittings: Fix with sockets facing upstream.
- Additional supports: Provide as necessary to support junctions and changes in direction.
- Vertical pipes:
  - Provide a loadbearing support at least at every storey level.
  - Tighten fixings as work proceeds so that every storey is self supporting.
  - Wedge joints in unsealed metal pipes to prevent rattling.
- Wall and floor penetrations: Isolate pipework from structure.

640 FIXING VERTICAL PIPEWORK

- Bracket fixings: Plugged and screwed into masonry.
- Distance between bracket fixing centres (maximum): 1500 mm.

640A FIXING VERTICAL PIPEWORK

- Bracket fixings: Plugged and screwed into masonry.
- Distance between bracket fixing centres (maximum): 1500 mm.

Recessed Downpipes socket connections with concealed fixings and galvanised Mid steel plate incorporated into Masonry - refer to Architect's Drawings

650 JOINTING PIPEWORK AND GUTTERS

- General: Joint with materials and fittings that must make effective and durableconnections.
- Jointing differing pipework and gutter systems: Use adaptors intended for the purpose.
- Cut ends of pipes and gutters: Clean and square. Remove burrs and swarf. Chamferpipe ends before inserting into ring seal sockets.
- Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
- Junctions: Form with fittings intended for the purpose.
- Jointing material: Strike off flush. Do not allow it to project into bore of pipes andfittings.
- Surplus flux, solvent jointing materials and cement: Remove.

655 JOINTING INTERNAL PIPEWORK

- Jointing: Solvent welded with lubricated ring seal joints at no more than 1.8 m spacing.

660 JOINTING EXTERNAL PIPEWORK

- Jointing: Downpipe connectors & zinc compatible adhesive.

680 FIXING INSULATION TO INTERNAL PIPELINES AND GUTTERS

- Fixing: Secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on 'blind' side of pipeline.
  - Method: Aluminium foil self adhesive tape.
- Timing: Do not fit insulation until completion of pipe airtightness or leakage testing.

686 IDENTIFICATION OF INTERNAL RAINWATER PIPEWORK

- Standard: Clearly marked, in accordance with BS 1710 or equivalent standard.

700 ACCESS FOR TESTING AND MAINTENANCE

- General: Install pipework and gutters with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
- Access fittings and rodding eyes: Position so that they are not obstructed.

COMPLETION

900 TESTING GENERALLY

- Dates for testing: Give notice.
  - Period of notice (minimum): 5 days.
- Preparation:
  - Pipework: Complete, securely fixed, free from defects, obstruction and debris before testing.
- Testing:
  - Supply clean water, assistance and apparatus.
  - Do not use smoke to trace leaks.
- Records: Submit a record of tests.

907 INTERNAL PIPEWORK TEST

- Preparation: Temporarily seal open ends of pipework with plugs.
- Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug.
- Testing: Pump air into pipework until gauge registers 38 mm.
- Required performance:
  - Allow a period for temperature stabilization, after which the pressure of 38 mm must be maintained without loss for at least 3 minutes.

910 GUTTER TEST

- Preparation: Temporarily block all outlets.
- Testing: Fill gutters to overflow level and after 5 minutes closely inspect for leakage.

920 IMMEDIATELY BEFORE HANDOVER

- Construction rubbish, debris, swarf, temporary caps and fine dust which may enter the rainwater system: Remove. Do not sweep or flush into the rainwater system.
- Access covers, rodding eyes, outlet gratings and the like: Secure complete with fixings.

# R12 Below ground drainage systems

To be read with Preliminaries/ General conditions.

GENERAL

110 BELOW GROUND DRAINAGE SYSTEMS GENERALLY

- Surface water and rainwater drainage sources: Composite gullies and Rainwater downpipes (nonsiphonic), as section R10.
- Foul drainage sources: Sanitary appliances, as section N13.
- Land drainage sources: None .
- Pressure relief drainage sources: None .
- Pipes, bends and junctions: PVC-U - plain wall.
  - Accessories: Access points.
- Manholes, inspection chambers, traps, and separators: Inspection chambers - plastics.
  - Accessories: Submit proposals .
- Disposal: To sewer to Engineer's details.
- Accessories – general: Access covers and frames.

PRODUCTS

317 COMPOSITE GULLIES BACK INLET

- Standards:
  - Cast iron: To BS 437 and Kitemark certified, or Agrémentcertified.
  - Clay: To BS EN 295-1 and Kitemark certified, or Agrémentcertified.
  - Plastics: To BS 4660 and Kitemark certified, or Agrémentcertified.
  - Polypropylene: To BS EN 1852-1.
- Material: Plastics.
- Manufacturer: Contractor to submit for approval.
- Traps:
  - Product reference: UG42 ring seal double socket gully trap or equal approved.
- Raising pieces:
  - Product reference: UW401 solvent weld single socket or equal approved.
  - Heights: Refer to Architect's drawings.
- Hoppers:
  - Product reference: UG48 quare solvent weld hopper with grating or equal approved.
- Covers:
  - Product reference: Supplied with hopper.
  - Type: Loose grating.
  - Material: Plastics.
  - Sizes: 160 x 160 mm.
  - Loading grades to BS EN 124: A15.
- Silt buckets: Plastics.
  - Product reference: Submit proposals.

329 PIPES, BENDS AND JUNCTIONS - SUPPLY

- Pipes and fittings: From same manufacturer for eachpipeline.

346 PIPES, BENDS AND JUNCTIONS - PVC-U - PLAIN WALL FOUL DRAINAGE

- Standard: BS EN 1401-1, class SN4, with flexible joints, Kitemark certified.
- Manufacturer: Contractor to submit for approval.
  - Product reference: Solid Wall or equal approved.
- Recycled content: As manufactured.
- Sizes: DN 100 and DN 160.
- Application area code: UD.

353 ACCESS POINTS - PLASTICS FOUL DRAINAGE

- Standard: To BS 4660 and Kitemark certified, to BS EN 13589-1, or Agrément certified.
- Manufacturer: Contractor to submit for approval.
- Nominal diameter: 250mm.

- Product reference: UCC7 mini access chamber with level invert; three socket inlets and

socket outlet; complete with riser, or equal approved.
- Access covers and frames:
  - Product reference: Galco CL300SR recessed unit or equal approved.
  - Loading grades to BS EN 124: A15.

379 WARNING MARKER TAPES FOUL DRAINAGE
- Type: Heavy gauge polyethylene.
- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Colour: Yellow with black lettering.
- Widths: 150 mm.
- Message: FOUL SEWER BELOW.
- Wire detection aid: Not required.

401 INSPECTION CHAMBERS - PLASTICS GENERALLY
- Standard: To BS 7158 or BS EN 13598-1, or Agrément certified.
- Diameter: 450 mm.
- Manufacturer: Contractor to submit for approval.
- Bases:
  - Product reference: UCC3 or equal approved with URM604 level invert reducer pieces.
- Shaft units:
  - Product reference: UCR2 riser with set UCC10 riser clips, or equal approved.
- Access covers and frames:
  - Product reference: Galco CL450SR recessed unit or equal approved.
  - Loading grades to BS EN 124: A15.

401 MANHOLES AND INSPECTION CHAMBERS -CONCRETE GENERALLY
- Standard:
  To BS 5911-3 AND BS EN 1917 AND Kitemark certified or
  To BS 5911-4 and BS EN 1917

Manufacturer: Contractor's choice
Shape: As per Structural Engineer's drawings
Sizes: As per Structural Engineer's drawings.
Cement type and content: As per Structural Engineer's drawings.
Chamber sections
  Product reference: submit proposals
  Jointing type: as per Structural Engineer's drawings
Cover slabs:
  Product reference: Recessed type to accept paving- submit proposals
  Thickness: as per Engineer's drawings.
  Loading grades to BS EN 124: A15
  Openings: to suit access covers
Steps: As per Structural Engineer's drawings

EXECUTION

613 EXCAVATED MATERIAL
- Turf, topsoil, hardcore, etc: Set aside for use in reinstatement.

616 SELECTED FILL FOR BACKFILLING
- Selected fill: As-dug material, free from vegetable matter, rubbish, frozen soil and material retained on a 40 mm sieve.
  - Compaction: By hand in 100 mm layers.

623 LOWER PART OF TRENCH – GENERAL
- Trench up to 300 mm above crown of pipe: Vertical sides, width as small aspracticable.
  - Width (minimum): External diameter of pipe plus 300 mm.

631 TYPE OF SUBSOIL

- General: Where type of subsoil at level of crown of pipe differs from that stated for the type of bedding, surround or support, give notice.

635 FORMATION FOR BEDDINGS

- Timing: Excavate to formation immediately before laying beddings or pipes.
- Mud, rock projections, boulders and hard spots: Remove. Replace with consolidated bedding material.
- Local soft spots: Harden by tamping in bedding material.
- Inspection of excavated formations: Give notice.

670 UPVC PIPE SURROUND GENERALLY

- Type of subsoil: Refer to soil investigation report.
- Granular material:
  - Pipe sizes DN 100 and DN 150: Size 4/10.
  - Pipe sizes DN 225 and DN 300: Size 4/10, 10/20 or 4/20.
- Bedding:
  - Material: Granular, compacted over full width of trench.
  - Thickness (minimum): 150 mm.
- Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
- Initial testing before placing surround: Required.
- Surround:
  - Material: Granular.
  - Depth: To 150 mm above crown of pipe.
  - Compaction: By hand.

678 CLASS Z SURROUND PIPES NEAR BUILDINGS

- Type of subsoil: Refer to soil investigation report.
- Blinding:
  - Material: Concrete (general).
  - Thickness (minimum): 25 mm.
  - Width: Full width of trench.
  - Allow to set before proceeding.
- Pipes:
  - Temporary support: Folding wedges of compressible board. Prevent flotation.
  - Clearance under pipes (minimum): 100 mm.
  - Adjust pipes to line and gradient.
- Initial testing before placing surround: Required.
- Surround:
  - Material: Concrete Grade 20N.
  - Depth: To 150 mm above crown of pipe.
  - Width: Full width of trench.
- Vertical construction joints:
  - Location: At face of flexible pipe joints.
  - Material: 18 mm thick compressible board precut to profile of pipe.
  - Socketed pipes: Fill gaps between spigots and sockets with resilient material to prevent entry of concrete.

680 CONCRETE SURROUND FOR PIPE RUNS NEAR FOUNDATIONS

- Class Z surround: Provide in locations where bottom of trench is lower than bottom of foundation and as follows (horizontal clear distance between nearest edges of foundations and pipe trenches):
  - Trenches less than 1 m from foundations: Top of concrete surround not lower than bottom of foundation.
  - Trenches more than 1 m from foundations: Top of concrete surround not lower than D mm below bottom of foundation, where D mm is horizontal distance of trench from foundation, less 150 mm.

683 LAYING PIPELINES

- Laying pipes: To true line and regular gradient on even bed for full length of barrel with sockets (if any) facing up the gradient.
- Ingress of debris: Seal exposed ends during construction.
- Timing: Minimize time between laying and testing.

685 JOINTING PIPELINES

- Connections: Durable, effective and free from leakage.
- Junctions, including to differing pipework systems: With adaptors intended for the purpose.
- Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
- Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
- Allowance for movement: Provide and maintain appropriate clearance at ends of spigots as fixing and jointing proceeds.
- Jointing material: Do not allow to project into bore of pipes and fittings.

687 CONCRETE SURROUND FOR CROSSOVERS

- Class Z surround: Provide where two pipelines (other than plastics pipes) cross with less than 300 mm separation.
  - Extent, on both pipes: 1 m centred on the crossing point, and beyond as necessary to come within 150 mm of nearest flexible joints.

689 PIPELINES PASSING THROUGH STRUCTURES

- Pipelines that must be cast in or fixed to structures (including manholes, catchpits and inspection chambers): Provide 600 mm long rocker pipes adjacent to the external face of the structure (or both faces where appropriate, e.g. walls to footings), with flexible joints at both ends.
  - Distance to rocker pipe from structure (maximum):150 mm.
- Provision for movement for pipelines that need not be cast in or fixed to structures (e.g. walls to footings):
  - Rocker pipes as specified above; or
  - Openings in the structures to give 50 mm minimum clearance around the pipeline. Closely fit a rigid sheet to each side of opening to prevent ingress of fill or vermin.

691 BENDS AT BASE OF SOIL STACKS

- Type: Nominal 90° rest bends.
  - Radius to centreline of pipe (minimum): 200 mm or 750mm for dwellings over 2-storeys.
- Height of invert of horizontal drain at base of stack below centreline of lowest branch pipe (minimum): 450 mm.
- Bedding: Do not impair flexibility of pipe couplings.
  - Material: Concrete (general).

693 DIRECT CONNECTION OF GROUND FLOOR WCS TO DRAINS

- Drop from crown of WC trap to invert of drain (maximum): 1.5m.
- Horizontal distance from the drop to a ventilated drain (maximum): 6 m.

699 CONNECTIONS TO SEWERS

- General: Connect new pipework to existing adopted sewers to the requirements of the adopting authority or its agent.

705 INITIAL TESTING OF PIPELINES

- Before testing:
  - Cement mortar jointing: Leave 24 h.
  - Solvent welded pipelines: Leave 1 h.
- Method: Block open ends of pipelines to be tested and pressurise. Air test short lengths to BS EN 1610.

711 TRENCH SUPPORTS

- Removal of trench supports and other obstacles: Sufficient to permit compacted filling of all spaces.

715 BACKFILLING TO PIPELINES

- Backfilling above top of surround or protective cushion: Material excavated from trench, compacted in layers 300 mm (maximum) thick.

- Heavy compactors: Do not use before there is 600 mm (total) of materialover pipes.

718 BACKFILLING OVER CONCRETE

- Minimum times from placing concrete:
  - Backfilling generally: 24 h.
  - Heavy compactors and traffic loads: 72 h.

720 BACKFILLING UNDER ROADS AND PAVINGS

- Backfilling from top of surround or protective cushion up to formation level: Granular sub-base material, laid and compacted in 150 mm layers.

728 LAYING WARNING MARKER TAPES

- Installation: During backfilling, lay continuously over pipelines.
- Depth: 300-400 mm.
  - Pipelines deeper than 2 m: Lay an additional tape 600 mm above the top of the pipeline.

732 TEMPORARY BRIDGES

- Trench bridges: As necessary to prevent construction traffic damaging pipes after backfilling.

734 INSTALLING ACCESS POINTS AND GULLIES

- Bedding:
  - Material: Concrete.
  - Thickness (minimum): 150 mm.
- Surround:
  - Material: Concrete Grade 20N.
  - Thickness (minimum): 150 mm.
  - Height: Full height.
- Backfilling: -.
  - Material: Not required.
  - Compaction: By hand in 100 mm layers.
- Setting out relative to adjacent construction features: Square and tightly jointed.
- Permissible deviation in level of external covers and gratings: +0 to -6mm.
- Raising pieces (clay and concrete units): Joint with 1:3 cement:sand mortar.
- Exposed openings: Fit purpose made temporary caps. Protect from traffic.

741 INSTALLING INSPECTION CHAMBERS - PLASTICS

- Bedding:
  - Material: Concrete Grade 20N.
  - Thickness (minimum): 150 mm.
- Surround:
  - Material: Concrete Grade 20N.
  - Thickness (minimum): 150 mm.
- Backfilling: Selected fill.
  - Compaction: By hand in 100 mm layers.
- Concrete collar:
  - Material: Not required.
  - Thickness (minimum): Not required.
  - Width (minimum): Not required.
- Seating: Not required.

773 INSTALLING ACCESS COVERS AND FRAMES

- Seating: Not required.
- Bedding and haunching of frames: Continuously.
  - Material: 1:3 cement:sand mortar.
  - Top of haunching: 30 mm below surrounding surfaces.
- Horizontal positioning of frames:
  - Centred over openings.
  - Square with joints in surrounding paving.
- Vertical positioning of frames:

- Level; or
- Marry in with levels of surrounding paving.

- Permissible deviation in level of external covers and frames: +0 to-6 mm.

776 EXPOSED OPENINGS IN INSPECTION CHAMBERS, ACCESS POINTS, FITTINGS AND EQUIPMENT

- General: Fit purpose made temporarycaps. Protect from site traffic.

COMPLETION

901 REMOVAL OF DEBRIS AND CLEANING

- Preparation: Lift covers to manholes, inspection chambers and access points. Remove mortar droppings, debris and loose wrappings.
  - Timing: Before cleaning, final testing, CCTV inspection if specified, and immediately before handover.
- Cleaning: Thoroughly flush pipelines with water to remove silt and check for blockages. Rod pipelines between access points if there is any indication that they may be obstructed.
- Washings and detritus: Do not discharge into sewers or watercourses.
- Covers: Securely replace after cleaning and testing.

911 TESTING AND INSPECTION

- Dates for testing and inspection: Give notice.
  - Period of notice: 3 working days.

921 FINAL TESTING OF PRIVATE GRAVITY DRAINS AND SEWERS UP TO DN 300

- Before testing:
  - Cement mortar jointing: Leave 24 h.
  - Solvent welded pipelines: Leave 1 h.
- Standard: To Building Regulations.
- Method: Water.

941 WATERTESTING OF MANHOLES AND INSPECTION CHAMBERS

- Timing: Before backfilling.
- Standard:
  - Exfiltration: To BS EN 1610.
  - Method: Testing with water (method W).
  - Infiltration: No identifiable flow of water penetrating the chamber.

978 LIFTING KEYS

- Lifting keys: Supply suitable keys for each type of accesscover.
  - Timing: At completion.

# Z10 Purpose made joinery

To be read with Preliminaries/ General conditions.

115 FABRICATION

- Standard: To BS 1186-2, or equivalent standard.
- Sections: Accurate in profile and length, and free from twist and bowing. Formed out of solid unless shown otherwise.
  - Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Joints: Tight and close fitting.
- Assembled components: Rigid. Free from distortion.
- Screws: Provide pilot holes.
  - Screws of 8 gauge (4 mm diameter) or more and screws into hardwood:Provide clearance holes.
  - Countersink screws: Heads sunk at least 2 mm below surfaces visible in completed work.
- Adhesives: Compatible with wood preservatives applied and end uses of timber.

125 CROSS SECTION DIMENSIONS OF TIMBER

- General: Dimensions on drawings are finished sizes.
- Maximum permitted deviations from finished sizes:
  - Softwood sections: To EN 1313-1:-
    Clause 6 for sawn sections.
  - Hardwood sections: To EN 1313-2:-
    Clause 6 for sawn sections.
    Clause NA.3 for further processed sections.

130 PRESERVATIVE TREATED WOOD

- Cutting and machining: Completed as far as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
- Surfaces exposed by minor cutting and/ or drilling: Treat as recommended bymain treatment solution manufacturer.

140 MOISTURE CONTENT

- Wood and wood based products: Maintained within range specified for thecomponent during manufacture and storage.

210 LAMINATED PLASTICS VENEERED BOARDS/ PANELS

- Fabrication: To British Laminated Plastics Fabricators Association Ltd (BLF) fabricating standards.
- Balancing veneer: From decorative veneer manufacturer and of similar composition. Applied to reverse side of core material.
- Finished components: Free from defects, including bow, twist, scratches, chipping, cracks, pimpling, indentations, glue marks, staining and variations in colour and pattern.
- Joints visible in completed work: Tight butted, true and flush.

220 WOOD VENEERED BOARDS/ PANELS

- Core material and veneers: Conditioned before bonding.
- Setting out: Veneer features and grain pattern aligned regularly and symmetrically unless instructed otherwise.
- Balancing veneer: Applied to reverse side of core material.
  - Moisture and temperature movement characteristics: As facing veneer.
- Veneer edges: Tight butted and flush, with no gaps.
- Tolerance of veneer thickness (maximum): ± 0.5 mm.
- Finished components: Free from defects, including bow, twist, scratches, chipping, splits, blebs, indentations, glue marks and staining.
- Surface finish: Fine, smooth, free from sanding marks.

250 FINISHING

- Surfaces: Smooth, even and suitable to receive finishes.
  - Arrises: Eased unless shown otherwise on drawings.
- End grain in external components: Sealed with primer or sealer as section M60and allowed to dry before assembly.

# Z11 Purpose made metalwork

To be read with Preliminaries/ General conditions.

315 MATERIALS GENERALLY

- Grades of metals, section dimensions and properties: To appropriate European Standards. When not specified, select grades and sections appropriate for the purpose.
- Prefinished metal: May be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected.
- Fasteners: To appropriate European Standards and, unless specified otherwise, of same metal as component being fastened, with matching coating or finish.

365 COATED STEEL FLAT PRODUCTS

- Hot dip zinc coated carbon steel sheet and strip for cold forming: To EN 10346 and EN 10143.

FABRICATION

515 FABRICATION GENERALLY

- Contact between dissimilar metals in components: Avoid.
- Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
  - Moving parts: Free moving without binding.
- Corner junctions of identical sections: Mitre.

520 COLD FORMED WORK

- Profiles: Accurate, with straight arrises.

525 ADHESIVE BONDING

- Preparation of surfaces of metals to receive adhesives:
  - Degrease.
  - Abrade mechanically or chemically etch.
  - Prime: To suit adhesive.
- Adhesive bond: Form under pressure.

527 WELDING GENERALLY.

- Welding procedures:
  - Method and standard: Metal arc welding to EN 1011-1 and -2..
  - Welding Procedure Specification (WPS): Not required.
- Preparation:
  - Joint preparation: Clean thoroughly.
  - Surfaces of materials that must be self-finished and visible in the completed work: protect from weld splatter.
- Jointing:
  - Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
  - Dissimilar metals: Welding not permitted.
  - Strength requirements: Welds to achieve design loads.
  - Heat straightening: Obtain approval.
  - Complex assemblies: Agree priority for welding members to minimize distortioncaused by subsequent welds.
  - Tack welds: Use only for temporary attachment.
  - Jigs: Provide to support and restrain members during welding.
  - Filler plates: Obtain approval.
  - Lap joints: Minimum 5 x metal thickness or 25 mm, whichever is greater.
  - Weld terminations: Clean and sound.

FINISHING

720 FINISHING WELDED AND BRAZED JOINTS VISIBLE IN COMPLETE WORK

- Standard: To EN ISO 8501-3.
  - Preparation grade: P2.
- Butt joints: Smooth, and flush with adjacent surfaces.
- Fillet joints: Neat.
- Grinding: Grind smooth where indicated on drawings.

745 PREPARATION FOR APPLICATION OF COATINGS

- General: Complete fabrication, and drill fixing holes before applying coatings.
- Paint, grease, flux, rust, burrs and sharp arrises: Remove.

785 GALVANIZING

- Standard: To EN ISO 1461.
- Preparation:
  - Vent and drain holes: Provide in accordance with EN ISO 14713-1 and -2. Seal after sections have been drained and cooled.
  - Components subjected to cold working stresses: Heat treat to relieve stresses before galvanizing.
  - Welding slag: Remove.
  - Component cleaning: To BS EN ISO 8501-3.
  - Grade: St 2½.

COMPLETION

910 DOCUMENTATION

- Submit:
  - Manufacturer's maintenance instructions.
  - Guarantees, warranties, test certificates, record schedules and log books.

920 COMPLETION

- Protection: Remove.
- Cleaning and maintenance: Carry out in accordance with procedures detailed in fabricators' guarantees.

# Z21 Mortars

To be read with Preliminaries/ General conditions.

CEMENT GAUGED MORTARS

110 CEMENT GAUGED MORTAR MIXES

- Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

120 SAND FOR SITE MADE CEMENT GAUGED MASONRY MORTARS

- Standard: To BS EN 13139.
- Grading: 0/2 (FP or MP).
  - Fines content where the proportion of sand in a mortar mix is specified as a range (e.g. 1:1: 5-6):
    Lower proportion of sand: Use category 3 fines.
    Higher proportion of sand: Use category 2 fines.
- Sand for facework mortar: Maintain consistent colour and texture. Obtain from one source.

160 CEMENTS FOR MORTARS

- Cement: To BS EN 197-1 and CE marked.
  - Types: Portland cement, CEM I.
    Portland limestone cement, CEM ll/A-L or CEM ll/A-LL.
    Portland slag cement, CEM II/B-S.
    Portland fly ash cement, CEM II/B-V.
  - Strength class: 32.5, 42.5 or 52.5.
- White cement: To BS EN 197-1 and CE marked.
  - Type: Portland cement, CEM I.
  - Strength class: 52.5.
- Sulfate resisting Portland cement:
  - Types: To BS 4027 and Kitemarked.
    To BS EN 197-1 fly ash cement, CEM ll/B-V and CE marked.
  - Strength class: 32.5, 42.5 or 52.5.
- Masonry cement: To BS EN 413-1 and CE marked.
  - Class: MC 12.5.

180 ADMIXTURES FOR SITE MADE CEMENT GAUGED MORTARS

- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
- Other admixtures: Submit proposals.
- Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

190 RETARDED READY TO USE CEMENT GAUGEDMORTAR

- Standard: To BS EN 998-2.
- Lime for cement:lime:sand mortars: Nonhydraulic to BS EN 459-1.
  - Type: CL 90S.
- Pigments for coloured mortars: To BS EN 12878.
- Time and temperature limitations: Use within limits prescribed by mortar manufacturer.
  - Retempering: Restore workability with water only within prescribed time limits.

200 STORAGE OF CEMENT GAUGED MORTAR MATERIALS

- Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
- Factory made ready-mixed lime:sand/ ready to use retarded mortars: Keep in covered containers to prevent drying out or wetting.
- Bagged cement/ hydrated lime: Store off the ground in dry conditions.

210 MAKING CEMENT GAUGED MORTARS

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
  - Mix proportions: Based on dry sand. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
  - Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.
- Working time (maximum): Two hours at normal temperatures.
- Contamination: Prevent intermixing with other materials.

# Z20 Fixings and adhesives

To be read with Preliminaries/ General conditions.

PRODUCTS

310 FASTENERS GENERALLY

- Materials: To have:
  - Bimetallic corrosion resistance appropriate to items beingfixed.
  - Atmospheric corrosion resistance appropriate to fixing location.
- Appearance: Submit samples on request.

320 PACKINGS

- Materials: Noncompressible, corrosion proof.
- Area of packings: Sufficient to transferloads.

335 NAILED TIMBER FASTENERS

- Nails:
  - Steel: To EN 10230-1.
  - Copper: To EN 1202-2.
  - Aluminium: To BS 1202-3 or equivalent standard.

340 MASONRY FIXINGS

- Light duty: Plugs and screws.
- Heavy duty: Expansion anchors or chemical anchors.

350 PLUGS

- Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

360 ANCHORS

- Types:
  - Expansion: For use in substrate strong enough to resist forces generated by expansion of anchor.
  - Adhesive or chemical:
    For use in substrate where expansion of anchor would fracture substrate.
    For use in irregular substrate where expansion anchors cannot transfer load on anchor.
  - Cavity: For use where the anchor is retained by toggles of the plug locking onto the inside face of the cavity.

375 WOOD SCREWS

- Type:
  - Wood screws (traditional pattern).
    Standard: To BS 1210, or equivalent standard.
    - Wood screws.
    Pattern: Parallel, fully threaded shank or twin thread types.
- Washers and screw cups: Where required must be of same material as screw.

380 MISCELLANEOUS SCREWS

- Type: To suit the fixing requirement of the components and substrate.
  - Pattern: Self-tapping, metallic drive screws, or power driven screws.
- Washers and screw cups: Where required to be of same material as screw.

395 ADHESIVES GENERALLY

- Standards:
  - Hot-setting phenolic and aminoplastic: To BS 1203, or equivalent standard.
  - Thermosetting wood adhesives: To EN 12765.
  - Thermoplastic adhesives: To EN 204.

410 POWDER ACTUATED FIXING SYSTEMS

- Types of fastener, accessories and consumables: As recommended by tool manufacturer.

EXECUTION

610 FIXING GENERALLY

- Integrity of supported components: Select types, sizes, quantities and spacings of fixings, fasteners and packings to retain supported components without distortion or loss of support.
- Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers/ sleeves to avoid bimetallic corrosion.
- Appearance: Fixings to be in straight lines at regular centres.

620 FIXING THROUGH FINISHES

- Penetration of fasteners and plugs into substrate: To achieve a secure fixing.

630 FIXING PACKINGS

- Function: To take up tolerances and prevent distortion of materials and components.
- Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
- Locations: Not within zones to be filled with sealant.

640 FIXING CRAMPS

- Cramp positions: Maximum 150 mm from each end of frame sections and at 600mm maximum centres.
- Fasteners: Fix cramps to frames with screws of same material as cramps.
- Fixings in masonry work: Fully bed in mortar.

650 NAILED TIMBER FIXING

- Penetration: Drive fully in without splitting or crushing timber.
- Surfaces visible in completed work: Punch nail heads below wrot surfaces.
- Nailed timber joints: Two nails per joint (minimum), opposed skew driven.

660 SCREW FIXING

- Finished level of countersunk screw heads:
  - Exposed: Flush with timber surface.
  - Concealed (holes filled or stopped): Sink minimum 2 mm below surface.

670 PELLETED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
- Finished level of pellets: Flush with surface.

680 PLUGGED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Plugs: Glue in to full depth of hole.
- Finished level of plugs: Projecting above surface.

695 USING POWDER ACTUATED FIXING SYSTEMS

- Powder actuated fixing tools: To BS 4078-2 or equivalent standard.
- Operatives: Trained and certified as competent by tool manufacturer.

700 APPLYING ADHESIVES

- Surfaces: Clean. Adjust regularity and texture to suit bonding and gap fillingcharacteristics of adhesive.
- Support and clamping during setting: Provide as necessary. Do not mark surfaces ofor distort components being fixed.
- Finished adhesive joints: Fully bonded. Free of surplus adhesive.

# Z22 Sealants

To be read with Preliminaries/General Particulars.

PRODUCTS

310 JOINTS GENERALLY

- Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

EXECUTION

610 SUITABILITY OF JOINTS

- Presealing checks:
  - Joint dimensions: Within limits specified for the sealant.
  - Substrate quality: Surfaces regular, undamaged and stable.
- Joints not fit to receive sealant: Submit proposals for rectification.

620 PREPARING JOINTS

- Surfaces to which sealant must adhere:
  - Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease,surface water and contaminants that may affect bond.
  - Clean using materials and methods recommended by sealant manufacturer.
- Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primeror sealant.
- Backing strip and/ or bond breaker installation: Insert into joint to correct depth,without stretching or twisting, leaving no gaps.
- Protection: Keep joints clean and protect from damage until sealant is applied.

630 APPLYING SEALANTS

- Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
- Environmental conditions: Do not dry or raise temperature of joints by heating.
- Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
- Sealant profiles:
  - Butt and lap joints: Slightly concave.
  - Fillet joints: Flat or slightly convex.
- Protection: Protect finished joints from contamination or damage until sealant has cured.

# Z31 Powder coatings

To be read with Preliminaries/ General conditions.

120 POWDER COATING MATERIALS

- Manufacturer: Obtain from one only of the following: Submit proposals.
- Selected manufacturer: Submit details before commencement of powder coating including:
  - Name and contact details.
  - Details of accreditation schemes.
  - Technical data of product including current Agrément certificates.

215 WORKING PROCEDURES

- Comply with the follow following standards.
  - Aluminium components: To EN 12206-1.
  - Steel components: To EN 13438.
  - Safety standards: To British Coatings Federation 'Code of safe practice - Application of thermosetting powder coatings by electrostatic spraying', or equivalent standard.

222 POWDER COATING APPLICATORS

- Applicator requirements:
  - Approved by powder coating manufacturer.
  - Currently certified to EN ISO 9001.
  - Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer.
  - Applicator to use only one plant.
  - Selected applicator: Submit details before commencement of powder coatingincluding: Name and contact details.
    Details of accreditation schemes.

225 GUARANTEES

- Powder coating manufacturer and applicator guarantees:
  - Submit sample copies before commencement of powder coating.
  - Submit signed project specific copies on completion of work.

230 CONTROL SAMPLES

- Sequence: Prior to ordering materials for the works, obtain approval of appearance for:
  - Powder coated samples: Of various grades and forms of background metal to beused, showing any colour, texture and gloss variation.
  - Fabrication samples: Showing joint assembly, how powder coating is affected andhow any cut metal edges are finished and protected.
- Samples to include the following information:
  - Product reference.
  - Colour.
  - Reference number.
  - Name.
  - Gloss level.

240 QUALITY ASSURANCE SYSTEM

- Requirement: Powder and coating application to the following designated components must be tested and approved in accordance with the Qualicoat system.
  - Designated components: All.

260 COMPONENT DESIGN

- Condition of components to be powder coated:
  - To comply with relevant recommendations of BS 4479-1, -3, and -4, orequivalent standards.
  - Of suitable size to fit plant capacity.
  - Of suitable thickness to withstand oven curing.

315 PRETREATMENT OF ALUMINIUM COMPONENTS

- Condition of components to be pretreated:
  - Free from corrosion and damage.
  - All welding and jointing completed and finish off as specified.
  - Free from impurities including soil, grease, oil.
  - Suitable for and compatible with the pretreatment process.
- Conversion coating requirements:
  - Chromate system: To EN 12206-1.
  - Chromate-free system: To EN 12206-1. Submit details before using.
- Rinsing requirements: Use demineralized water. Drain and dry.

330 PRETREATMENT OF STEEL COMPONENTS

- Condition of components to be pretreated:
  - Free from corrosion and damage.
  - All welding and jointing completed and finish off as specified.
  - Free from impurities including soil, grease, oil.
  - Suitable for and compatible with the pretreatment process.
- Conversion coating requirements: To EN 13438.
- Rinsing requirements: Use demineralized water. Drain and dry.

432 EXTENT OF POWDER COATINGS

- Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces must be deemed 'significant surfaces' for relevant EN 13438 performance requirements.

435 APPLICATION OF POWDER COATINGS

- Surfaces to receive powder coatings: Free from dust or powder deposits.
- Powder colours: Obtain from one batch of one manufacturer.
- Commencement of powder coating: To be continuous from pretreatment.
- Jig points: Not visible on coated components.
- Curing: Controlled to attain metal temperatures and hold periods recommended by powder coating manufacturer.
- Stripping and recoating of components: Only acceptable by prior agreement of powder coating manufacturer. Stripping, pretreatment and powder coating must be inaccordance with manufacturer's requirements.
- Overcoating of components: Not acceptable.

445 PERFORMANCE AND APPEARANCE OF POWDER COATINGS

- For aluminium components:
  - Standard: To EN 12206-1.
- For steel components:
  - Standard: To EN 13438.
- Visual inspection after powder coating: Significant surface viewing distances to beas specified in the relevant Standard, unless specified otherwise.
- Colour and gloss levels: To conform with approved samples.

450 ALUMINIUM ALLOY FABRICATIONS

- Units may be assembled:
  - Before powder coating.
  - From components powder coated after cutting to size.
  - Where approved, from components powder coated before cutting to size.
- Exposure of uncoated background metal: Not acceptable.
- Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

460 STEEL FABRICATIONS

- Unit assembly: Wherever practical, before powder coating.
- Exposure of uncoated background metal: Not acceptable.
- Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

470 FIXINGS

- Exposed metal fixings: Powder coat together with components, or coat with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.

480 DAMAGED COMPONENTS - REPAIR/ REPLACEMENT

- Before delivery to site: Check all components for damage to powder coatings. Replace damaged components.
- Site damage: Submit proposals for repair or replacement.

510 PROTECTION

- Powder coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
- Protective coverings: Must be:
  - Resistant to weather conditions.
  - Partially removable to suit building in and access to fixing points.
- Protective tapes in contact with powder coatings: Must be:
  - Low tack, self adhesive and light in colour.
  - Applied and removed in accordance with tape and powder coating manufacturers' recommendations. Do not use solvents to remove residues as these are detrimental to the coating.
- Inspection of protection: Carry out monthly. Promptly repair any deterioration or deficiency.

535 DOCUMENTATION

- Submit the following information for each batch of powder coated components:
  - Supplier.
  - Trade name.
  - Colour.
  - Type of powder.
  - Method of application.
  - Batch and reference number.
  - Statutory requirements.
  - Test certificates.
  - Maintenance instructions.

550 COMPLETION

- Protection: Remove.

APPENDIX A

## 1.00 WINDOWS REGLAZING & WINDOW REPLACEMENT

WINDOWS REGLAZING
When issued as part of a Task Order under the Local Area Term Maintenance and Refurbishment Works contract, the following section replaces or supplements the relevant specification clauses in TYPICAL ARCHITECTURAL SPECIFICATION.

REPLACE GLAZING IN EXISTING FRAMES
Where instructed in the Task Order, the glazing, both single and double, must be removed from the existing uPVC window frames. The frames must be reglazed with double glazing units as described below. In replacing the glazing, all seals and beads must be replaced. Beads must match the materials of the window frames.

REPLACE SASH SEALS
Seals between opening sashes and frames must be replaced. The seals must meet the requirements of the TYPICAL ARCHITECTURAL SPECIFICATION for PVC-U replacement windows.

DOUBLE/TRIPLE GLAZING UNITS
Double-glazed units must be approved sealed units. Internal pane to be Low E coated glass, with soft coat on inside of internal pane. 16mm Argon-filled gap between panes. Standard configuration to be 4mm-16mm-4mm. Glazing to double glazed units must be meet the durability requirements of class C of European Standard EN1096. Sealed glazing units complying with mechanical performance conforming to standard of BS EN 572-2 must be used throughout. The U-Value of the unit must have a thermal transmittance of 1.4 $W/m^2/K$(double glazed) and 1.1 W/m2K (triple glazed). Light and solar performance are in accordance with EN 410.
All sealed glazing units must have a 10-year guarantee.

PERFORMANCE
When new glazing and new sash seals have been fitted, the window frames sashes and glazing must meet the Air Permeability, Water Tightness and Wind Resistance requirements of the TYPICAL ARCHITECTURAL SPECIFICATION for PVC-U replacement windows.

## 2.00 WINDOW REPLACEMENT

### 2.01 SCHEDULE OF THE WORKS

The work must consist of:-

Installation of new PVC-U double and TRIPLE-glazed windows.

### 2.02 Replacement of Windows

All existing windows must be replaced with double and TRIPLE glazed PVC-U units as scheduled. Installation, making good and decoration as described in the specification (see Section 3.0).

## 3.00 SPECIFICATION FOR PVC-U REPLACEMENT WINDOWS

### 3.01 SCOPE OF THE WORKS

The installation of white PVC-U replacement windows must be carried out by an approved

specialist contractor and must include for all works in this connection as follow:-

Removal of existing windows, measuring opes, breaking out, installation of new windows, making good internal plaster reveals, fixing of new window boards and architraves, bedding and mastic pointing, making good on completion and the repair of damaged cills, heads and jambs and reveals. All works in this connection must be carried out in an agreed and phased manner to the satisfaction of the Architect.

All u-PVC window or screen profiles specified for use must comply with 7412 “Plastic Windows Made From PVC-U Extruded Hollow Profiles” and B.S. 7413: 1991 “White PVC-U Extruded Hollow Profiles With Heat Welded Corner Joints For Plastics Windows: Materials Type A”.

3.02 REPLACEMENT WINDOW TYPE AND DESIGN

The replacement windows to be supplied must be manufactured in extruded white PVC-U. Units must provided with double glazing or single glazing as scheduled. Samples and Technical Information for each window type on the Frame Section, Sashes, Seals and Ironmongery fittings etc. must be provided together with information on installation and fixings as part of the tender documents. Full size sections at heads, cills, jambs, mullions and centre rails must be submitted. Failure to provide any of the above information must invalidate the tender. Declaration of Performance to be submitted prior to approval

Windows must be produced to the general requirements of these tender documents but the tenderer is responsible for the detail sectional design and performance of the windows and in particular for their resistance to weather as required below.

If the tender company considers that any provision of this specification would affect the ability of their window assembly to perform to the standards cited, a submission must be made in writing for consideration by the Architect.

3.03 PERFORMANCE

All units to be designed to conform with the most severe ratings as set down in IS EN 14351-1:2006 + A1:2010, for resistance to fire and/or smoke leakage characteristics. Supporting documentation must be provided.

3.04 MATERIAL
The material used must comply with DIN 7748 (1979) (min.) for PVC 2423 high impact resistance. Regrind material must not be used.

3.05 MEASUREMENT

The Contractor must check the quantity and size of all openings, to ensure that the correct number and proper fitting sizes are fabricated for the contract. Details of the cross sections of head, cill and jambs must be enclosed with the tender documents, and these details must be strictly adhered to for the fixing and fabrication of all units.

3.06 TEST CERTIFICATES

Valid Test Certificates from recognised institutes must be submitted for the window systems with tenders. Tenderers must indicate if their systems carry an Agrement Certificate. The successful tender must allow for having three units of each type from standard production selected and tested by ENTERPRISE IRELAND for compliance with this specification before commencement of the contract and during the course of the contract. All tendering

companies must submit a sample of a window type with their tender. Failure of a sample in testing may invalidate the contract.

3.07 GUARANTEES

The Contractor must unconditionally guarantee both a) all PVC-U screens, windows and doors, including Ironmongery, glazing and double glazed sealed units and b) the installation of the windows, for a period of not less than 10 years from the date of installation.

3.08 SOUND

Sound Insulation is required from the single glazed units by tight weather-seals to give a performance of 29 dB.

3.09 PROFILE SYSTEMS

Only multi-chamber profiles must be acceptable with the main walls 3mm in thickness and the system must include all additional profiles to carry out the complete range of solutions required.

3.10 PROFILE JOINTS

Mitre cut frames and sashes must be jointed by a butt welding process on a suitable machine and the mitres must be finished flush. Milled grooves at the mitres must not be accepted. Transom joints must also be welded.

3.11 REINFORCEMENT

All windows must be reinforced in accordance with the BPF Windows Group Code of Practice for "The Reinforcement of High Impact Modified PVC-U Windows and Doorsets" (Ref. 323/1 October 1991). Design Wind Pressure to be taken as 2000 Pa. Reinforcement must not be located in the chamber used for drainage and must be fixed in the profile using stainless steel screws, positioned to maintain the structural integrity of the frame and satisfactory thermal separation. All reinforcement must be hot-dip galvanised mild steel complying with BS 2989.

3.12 GLASS

Glazing of the windows must be from the internal side and only systems allowing for the same must be selected for security and maintenance reasons. All external glass surfaces must be capable of being cleaned from inside the flat.

All glazing must comply with the safety recommendations of BS 6262: Part 4: Code of Practice for Glazing for Buildings, Safety Related to Human Impact.

All single glazed windows must be glazed in 4mm thickness clear float glass unless stated otherwise or approved pattern obscure glass where specified. Double glazing units to consist of 2 No. 4mm clear panes with a 16mm air space hermetically sealed and meeting the requirements of IS 330. Glazing to doors & Laminated panes to be 6.4 mm Laminated Glass Both Sides.

All glazing must be supported by spacer blocks and support blocks with the latter glued in place to prevent slipping. Gaskets must be used inside and outside, must have correct lip design for expelling rain flow, be properly trimmed at corners and supported along their entire length. Co-extruded beads must only be acceptable if approval by Architect.

## 3.13 WATER DRAINAGE

Sashes and frames must be designed to drain in a controlled manner via the external pre-chamber in such a way that the water cannot penetrate the main chamber where the reinforcing sections are. Outlets must be milled in the form of 25 x 5 mm slots, offset and with the rough edges removed. Outlets visible on the face of the profile must be capped to prevent wind penetration.

Condensation must also be disposed of in the same way, and it must be trapped at the internal glazing bead. A solution which allows condensation to be collected at the internal window board level must not be accepted.

## 3.14 SEALS

A two lip seal must be provided at two points between the sash and frame, one at the inner surface of the frame and the other at mid-point on the frame, leaving the area in front of it as a pre-chamber or decompression chamber. All corners must be mitred and solvent glued. There must be no joints except at corners. The material used must be E.P.D.M manufactured in accordance with B.S. 4255 : Part 1.

## 3.15 WINDOW AND DOOR IRONMONGERY AND FITTINGS

All hinges, catches and fasteners must be to the approval of the Architect. Hinges and components must be high security fearless friction stays in stainless steel Type 430 or similar approved. Fittings of a tried and tested commercial manufacture and design only must be accepted and all metal components, high security handles, etc., must be ground, brushed, anodised, electroplated and provided with surface protection.
All opening sashes must have a three-point closing mechanism, and concealed espagnolette operated by a handle. Espagnolette roller cams must be mushroom-headed in a single piece in brass. Handle assemblies and espagnolette mechanisms must be compatible.

Doors to have a 3 point closing mechanism as above with central closing device. Door handles to be Cotswold ES 900 or similar approved in brushed aluminium.

Door handles to be fitted with Cylinder Door Locks with turn knob. Cylinder Door Locks to be "Mila" Cylinder 213 and/or 204 or similar approved equivalent.

For tilt and turn windows provide single handle tilt and turn fittings such as FAVORIT-KF3TBT or similar approved for handle function, a tilt first function is required with variable handle position, double-sided toothed rack coupling and switch barrier in tilt position. The position of handles must be agreed with the architect before installation. All window sashes located over sinks in kitchens to be placed lower than midway up the sash frame to allow for easier operation.

Inward opening sections with only one handle such as MILA 1011S and 1010/01 or similar approved in brushed aluminium.

Important:- All windows installed must be readily openable from inside the dwelling.

a) Key locking operating systems are not to be installed.

b) Where a window is situated immediately adjacent to a balcony, veranda or ground level, the window must be installed with a button operated handle without child proof restrictors or to other detail as approved by Architect.

c) Where a window is situated above ground floor level and not immediately served by a balcony or verandah, a locking handle is not to be installed but child proof restrictors are required.

3.15 A FASTENERS

All fasteners used in the manufacture of PVC-U windows and doors must be to the approval of the architect and must meet the following specification.

All fasteners used to attach hardware must be manufactured from non-magnetic austenitic steel to B.S. 3111 : 1979 and must be covered by a 20 year manufacturer's warranty, with the exception of those fasteners used for reinforcement retainment.

Fasteners for friction stay applications must be supplied with a low profile head to prevent interference with the friction stay.

All fasteners used to attach the hardware must preferably fasten into the reinforcement, where this is not practical then the fasteners must fix through two walls of PVC-U or a single wall where a screw port has been provided.

Fasteners for reinforced PVC-U must incorporate a welded carbon steel drill point and the connecting threads into the reinforcement must also be austenitic stainless steel.

Fasteners for un-reinforced PVC-U must have a single thread flank diameter of 4.3mm with a fully threaded self piecing point.

3.16 TRIMS

Any items of trim must be compatible with the window / door system in both colour and dimension.

3.17 CILLS

Where applicable, the installer must build up the existing concrete cills and provide a metal cill section in white which must cover the existing. The new cill must project a minimum of 25mm beyond the wall face with a suitable drip. The ends of the cills must be properly welded and sealed. The cill must also form a proper upstand to the underside of the window frame.

3.18 VENTS

Provide windows with permanent ventilation where indicated on the window schedules. Vents to be over glazing type, manufactured in a single extruded profile with a polyester coated finish in black. Each vent must operate with a revolving mechanism which can provide a trickle vent facility in a permanently fixed position such as the MILA 8000 or similar approved. The vents must have removable fly screens for easy cleaning and maintenance. The ventilation assembly must be watertight to over 300 Pa, at a design wind pressure of over 2000 N/m2 to B.S. 6375 : Part 1 : 1989.
All vents to comply with the 1997 Building regulations.

NOTE 1 : Contractor to check re suitability of all vents for all window types prior to manufacturer of windows.
NOTE 2 : Contractor to check positions of all vents for kitchen windows in relation to position of Gas Central Heating boiler flues prior to

manufacturer of windows.

## 3.19 WINDOW INSTALLATION & FIXING

Installation and fixing of windows must be in accordance with the BPF Windows Group Code of Practice for the Installation of PVC-U Windows and Doorsets and IS 3210: 1987 Code of Practice for the Installation and Replacement of Windows and Doors.

The Contractor is expected to examine the existing windows prior to tendering and to establish whether extension pieces or risers are necessary to fit the new components neatly into existing reveal/cill constructions, and to have made allowance in his tender for same if required.

Fixing to be by means of purpose made expansion bolts through the main frame, the bolts penetrating at least 60mm into the wall of the aperture, or through stainless steel fixing straps (previously screwed into the frame) projecting on the internal side of the window. This latter to be such that it can be covered by the plaster to the reveal without risk of cracking in the plaster. Fixings must be between 150mm and 200mm from each corner and not more than 600mm apart.

Screws and bolts must be in stainless steel together with the fixing lugs. When fixing the elements into the wall or on the cills care must be taken to ensure that no water can penetrate the drilling area.

After fixing, all gaps between the frame and the surrounding structure must be filled with a mineral wool fires and smoke barrier affording 60 minutes fire resistance, to be mechanically fixed to the structure of the building and in accordance with the manufacturer's instruction.

Having installed the unit, the gap between the main frame and the masonry must in the range of 5-10mm. A proprietary silicone based sealant must be used for sealing the external face. The sealant must be white and must comply with BS 5889. Where this gap is greater than 10mm over window heads a sand, lime, cement filler (6:1:1) must be used externally.

Internally the plaster or tiled surrounds must be made good and left ready for decoration. PVC-U liners are not to be used except in exceptional circumstances as agreed by the Architect .

## 3.20 EXTERNAL FINISHING

The contractor must carefully remove all existing windows specified for renewal and to cause the minimum damage to opes and adjoining finishes. Removal of components to be in accordance with IS 3210: 1987. Before installing the new components the openings must be cleared of dust and debris and in the case of cavity walls a check made that the existing d.p.c. is in position and not damaged. Any defects must be made good.

The new frames must be inserted behind the vertical d.p.c. position in all cases. Any deviation from this position must be agreed prior to the installation.

When measuring the openings, the condition of the structure must be examined. If there are cracks or signs of movement which might indicate faults in the structure, the Architect, must be informed and the defects recorded.

External plaster reveals must be made good and painted with one coat of masonry stabilising fluid , one coat of undercoat and one finishing coat of high gloss both to I.S.32 to selected colour.

Method of removal to ensure brick reveals are not damaged .However in the

event that damage does occur , external brick reveals to be made good where damaged , with approved replacement method and material.

The Contractor must make good at his own expense any damage to the structure, fittings or decorations resulting from his operations.

The Contractor must include in his tender for scraping down, preparing and painting all external window cills with application of a fairing coat throughout to Architects approval consisting of a 2mm Polymer Rich Cementitious Render.

The tender must include for a subsequent application of an approved anti- carbonation/elastomeric coating to Architects approval.

The Contractor must carefully remove all existing timber/PVC-U windows specified for renewal and to cause the minimum damage to the window ope and adjoining finishes. Removal of windows to be in accordance with I.S. 3210 : 1987. Before installing the new window the opening must be cleared of dust and debris and in the case of cavity walls a check made that the existing d.p.c. is in position and not damaged. Any defects must be made good.

The new window frames must be inserted behind the vertical d.p.c. position in all cases. Any deviation from this position must be agreed prior to the installation.

When measuring the openings, the condition of the structure must be examined. If there are cracks or signs of movement which might indicate faults in the structure, the Architect, must be informed and the defects recorded.

The Contractor must make good at his own expense any damage to the structure, fittings or decorations resulting from his operations.

The asphalt surfaces of balconies must be protected from damage during the course of the works.

3.21 INTERNAL FINISHING

Internal reveals must be repaired and plastered where necessary following installation works. New window boards must be provided in hardwood, screw fixed in pairs in position at approximately 400mm centres (no nearer than 75mm from each end of window boards ) with screw heads pelleted. Window boards must be properly sanded down and finished with three coats polyurethane varnish. All new timber must be clean, sound and properly seasoned, free from any defects, natural or otherwise.

Plaster reveals must be finished smoothly. New plaster must be sealed and reveals must be painted with two coats of IS 32 undercoat for oil paint. All coats of paint must be thoroughly dry before subsequent coats are applied and rubbed down with fine waterproof abrasive where necessary. All paints and other materials to be supplied by an approved firm. (If the finish of the existing reveal is gloss paint a coat of gloss paint must be applied).

The contractor is only expected to repair and paint the internal window reveals that he is working on. Under no circumstances is he to get involved with requests from tenants to paint rooms or to undertake any additional work unless authorised to do so by Dublin City Council.

Materials supplied must be used strictly in accordance with the maker’s instructions.

All rubbish must be cleared as it accumulates and the dwellings left clean and fit

for occupation.

## 3.22 SAFETY

The Contractor must propose a means of carrying out the Installation that ensures public safety and continues access to all flats during construction.

APPENDIX B

INSULATION / VENTILATION FOR EXISTING DOMESTIC DWELLINGS.

This Specification must be read in conjunction with the following documentation:

- SEAI Better Energy Scheme Contractors Code of Practice and Standards and Specifications Guidelines Latest Version (Version 6.0 March 2013)
- The Current Irish Building Regulations.
- NSAI Agrément Certification
- Relevant European and British Standards.
- Manufacturer's Instructions.
- S.R.54: Code of practice — Methodology for the energy efficient retrofit of existing domestic dwellings (In draft format at time of writing of specification)

Introduction

To maximise the energy and CO2 savings achieved with each installation, this document sets out the requirements that must apply to any professional installation of cold roof loft insulation (in addition to any contract and scheme rules that may apply).

Definitions

A loft or attic for the purposes of this specification is the attic space directly below the roof of a domestic dwelling, not used for accommodation but often for storage.

A cold roof is a situation created by insulation of a loft at joist level (whereas a warm roof is created by insulation at rafter level).

General requirements

All installers contracted to perform all insulation works must:

(a) Undertake the measures without detrimental effect on the dwelling;

(b) Explain all measures to be undertaken, including ancillary works such as removal of boards; obtain the client's approval prior to works commencing; and ensure that the client is satisfied with the work;

(c) Ensure that the measures do not compromise the safety of the household or the contents and structure of the dwelling;

(d) Work in a manner ensuring their own safety and that of the householder and any other parties.

(e) Ensure that all legal and statutory obligations in relation to the work are met.

Cleanliness and tidiness

The contractor carrying out the installation works must leave the fitted materials, the areas being worked on and surrounding areas clean and undamaged.

All debris directly resulting from the insulation of the loft space and the cavity wall insulation installation must be removed by the installer, immediately following completion of the work.

Manufacturers' instructions

All approved materials must be installed in accordance with the respective manufacturers' instructions. If a manufacturer's instructions contravene or render not applicable any clause in this specification, then the specification must have priority over the manufacturer's instructions.

Works Specification:

This specification is broken down into the following 5 areas of work due to be undertaken under the scheme and each section may be broken down further depending on the measure.

1. Ceiling Level Attic Insulation
2. Cavity Wall Insulation
3. Ventilation
4. Draughtproofing
5. Positive Input Ventilation

SECTION 1. CEILING LEVEL ATTIC INSULATION SECTION

Measures covered under the Attic Insulation Section are as follows:

- 1. Ceiling Level Attic Insulation
- 2. Access Walkways (Walkway to Cold Water Storage Tank and Feed and Expansion Tank (and other serviceable appliances located in attic)
- 3. Raised Storage Area
- 4. Pipe Insulation
- 5. Cold Water Storage Tank Jackets & Feed and Expansion Tank Jackets
- 6. Insulation and draught-proofing of loft hatches
- 7. Warning Signs and Attic Guarantee

## Materials

### 1.1 Ceiling Level Attic Insulation

Minimum insulating performance

- If applicable, the local building regulations requirements must be met.
- If building regulations do not apply, the client or programme requirements must be met.
- The target u-Value to be achieved for lofts insulated at ceiling level is, in as much as is physically and economically feasible - 0.16 W/m2K.

U-value calculations must be in accordance with Conventions for U-value calculations (BR 443, 2006 Edition) and TGD L - Conservation of Fuel and Energy – Dwellings of the Building Regulations 2011.

### Approval

All materials used in the insulation of an attic at ceiling level must be manufactured to a relevant Irish, British or European Standard.

Suitable materials for loft insulation (informative) The industry standards governing these materials are listed in Appendix 2: Index of Industry Standards.

- Mineral wool rolls and slabs
- Blown mineral fibre granules or pellets
- Blown cellulose fibre
- Rigid foam board

## Scope and extent

### Coverage

The insulation works must cover the entire loft space, including all tanks and pipes, unless there is a compelling reason, which must be documented.

### State of repair

An initial survey of the loft space must be carried out prior to commencement of any works. This must be documented, retained by the contractor and a copy attached to the certificate

No works must be carried out unless the state of repair of the roof space meets the requirements below:

### Ventilation

Ventilation is a necessary requirement of loft spaces to prevent the risk of harmful condensation forming. This is particularly the case when additional insulation is fitted, as the loft space must be colder in winter than previously. If there are distinct signs of inadequate ventilation pre-installation, such as mustiness, wet or dry rot or mould growth, the works must not progress until the ventilation issue is addressed.

Recommended remedial action must be recorded in the survey.

The ventilation requirements are detailed in Section 3.

### Rainwater penetration

There must be no visible rainwater penetration or evidence of such penetration. If it

is identified that there is rainwater penetration, the works must be postponed until the

necessary repairs are carried out.

Ceiling condition

The ceiling must be in a good visible state of repair.

Electrical connections

There must be no visible defects in the electrical wiring of the roof space, e.g. trailing cables or exposed wires.

Roof members

There must be no visible corrosion of the structural metal connections in the roof members.

Leakage

There must be no evidence of leakage from existing water supply pipeworks or tanks.

Ventilation impediment

Where existing insulation has been pushed into the eaves and is impeding the necessary ventilation, this must be moved prior to the top-up being carried out. If necessary, insulation interrupters/rafter trays must be fitted to ensure the air path remains open. Refurbishment products are available for this purpose.

Irreparable ceiling holes

There must be no penetrations through the ceiling that cannot be sealed. All holes at ceiling drops for pipes and other services must be sealed where practically possible using silicone sealant, foam, tape, or a combination of these. Holes or gaps in the ceiling too large to fill require building work which would need to take place before any loft insulation works.

Pre-existing insulation

(a) Existing loft insulation which is still fit for purpose must be left in situ and topped up to achieve at least the U-Value specified in the programme. Examples of insulation being unfit for purpose include health and safety concerns (e.g. due to vermin infestation or bird litter).

(b) Existing water tank insulation must not be modified if in compliance with programme specification. Existing pipe insulation must not be modified if in compliance with programme specification.

(c) Sections of un-insulated pipework included in the roof space insulation works, which lie wholly below the upper level of the new material and are completely covered by it, do not require insulating.

(d) Additional roof space is considered separately for the purposes of qualification for loft insulation work. Where a roof space exists over a building extension which has had insulation fitted this extension must be assessed. Extensions can be topped up to the level proposed in the programme.

(e) Where insulation is present around pipework and this does not meet the standards laid out in this document, then this must be removed and the correct size of pre-formed material applied. If removal of the old material is likely to cause damage to pipes resulting in leaks, etc., then pre -formed material with a larger than normal bore may be fitted over the existing material.

## Asbestos

Important: Asbestos and asbestos-containing Materials (ACMs) are sometimes found in the loft spaces where it is usedto insulate water tanks and pipes etc., and in heating systems for flues etc.

All ACMs can be highly dangerous if disturbed. When encountering ACMs in a loft space, installers must follow their own procedures. Refer to http://www.hsa.ie/eng/Your_Industry/Chemicals/Asbestos/ for further guidance and http://www.hsa.ie/eng/Your_Industry/Chemicals/Asbestos/Legislation/ for legal requirements associated with asbestos.

If an installer identifies a water tank or pipes made out of Asbestos or ACMs and decides that installing a tank jacket may release asbestos containing particles, the loft insulation work must not proceed. The client must be advised to have the tank replaced under controlled conditions and only until after that work has been completed must the loft be insulated. The client must

also be advised that completing the loft insulation without insulating the cold water tank would significantly increase the risk of the tank freezing in cold weather.

## VENTILATION

All ventilation inlets in the roof space inadvertently sealed during the installation or blocked with the original insulation material must be cleared. If necessary, insulation interrupters/rafter trays must be fitted to ensure the air path remains open. Refurbishment products are available for this purpose.
If no designed ventilation exists in the roof space, refer to BS 5250 [2]. In addition, the following recommendations may be used including when using blown or spayed insulation materials:

Ventilation in the roof space must be the equivalent of a continuous 10mm gap at low level with an insulation interrupter/rafter tray over the top of the insulation to provide at least a 25mm gap (to account for underlay drape and rafter centres) if soffit or fascia ventilation already exists. Additional ventilation in the soffit or on the fascia may need to be added. If this is not possible then tile or slate ventilators must be used to provide the guaranteed air path from loft space to outside atmosphere on either side of the roof at low level. Ensure that any penetrations through the underlay are properly detailed and protected.

High level ventilation: the equivalent of a continuous 5mm gap must also be considered if the roof pitch is in excess of 35 degrees or the span in excess of 10m.
In all cases, ventilation of the loft space must not be made worse by the loft insulation installed and be sufficient to prevent the harmful effects of condensation. Effective sealing of gaps in the ceiling must also limit the risk of condensation forming within the loft space.

### Cavity Walls

The insulation material must not enter the cavity of any cavity wall. To minimise cold bridging, where possible, the loft insulation must link to the cavity wall insulation (if present).

### Clearance from flues or chimneys

The insulation material must be retained a minimum of 75mm, maximum 150mm from flues or metal chimneys, unless the insulating product is non-combustible or of limited combustibility as defined by Building Regulations approved documents, such as a reaction to fire classification of A1 or A2 in accordance with BS EN 13501-1 [3].
Where the product meets these criteria the insulation must be installed up to the outer casing of the flue or chimney.

### Clearance from electrical apparatus

The insulation material must be retained at a minimum of 75mm (maximum 150mm) from all electrical apparatus penetrating the ceiling. In the case of loose insulation material a permanent physical restraint must be used, (e.g. boarding or expanded metal rings). Any cable passing over such a restraint must be protected against damage by the restraint.
Where the electrical apparatus is a recessed light fitting that is not type “F-capped”, the fitting must either be replaced with a fitting that is certified “F-capped” or have covers placed over them which are certified “F-capped” in accordance with relevant industry standards. [4] Once all downlighters are fitted with “F-capped” certified equipment, they must be covered by insulation material without leaving a gap.

Any transformers or ballast units (e.g. for halogen or LED lighting) must be placed on a suitably sized plate (typically 150x150mm) made from non-combustible material, which sits on top of the insulation. Transformers or ballast units must not be buried under insulation material unless they are specifically approved for this purpose.

Insulation Coverable Downlights

the Building Regulations state that you must lay continuous insulation over a ceiling space. Insulation functions like a jacket for a room or building and traps in the warm air. Without using insulation correctly, warm air must escape through the ceiling space.

When recessed downlights are installed, holes must be cut into the ceiling to mount them in. Not only do these holes reduce the ceilings fire integrity but they allow heat to escape. Downlights can get hot, especially when using halogens and a gap must be left between them and the insulation. It would have been common practice during construction / installation that electricians would cut around the insulation to reduce the risk of it catching fire.

Heat rises and downlights act as chimneys, drawing out the warm air from a room, especially when a cold loft space is situated above them. The problem is worsened when there is a gap in the insulation.

There are a number ways to deal with this problem:

1. Fit a loft cap or fire cap. Please note that fitting a basic fire hood has no effect whatsoever.





2. Fit a box protector or insulation support box, then the lay insulation over it.



3. Install insulation coverable downlights and lay insulation directly over them.



By fixing this problem you are potentially creating a new one; you are cutting off the ventilation to the lamp (or bulb) inside the downlight. This can reduce the life expectancy of the bulb. This is a problem particularly with expensive LEDs that are supposed to last for over 20 years; you would be less musting to throw them away like a halogen. The more energy efficient you make the installation, the less the bulb might last.

Only fire rated downlights that carry the F Capped Approval are suitable for laying insulation directly over them. Although some downlights are F Capped and can be covered with insulation, manufacturers don't recommend it as it could reduce the life expectancy.

### High-ampere electric cables

Electric cables supplying immersion heaters, electric showers, electric cookers, socket outlets or any other apparatus over 6 amp rating must not be covered by thermal insulation. Cables to these appliances must be lifted above the insulation. If this is not possible, the insulation must be retained at a minimum distance of 75mm from these cables along their entire length in the loft area to provide adequate ventilation for these cables to prevent them from overheating.

### Existing boards

Where the loft of a dwelling has boards covering all or part of the loft floor, these must be removed prior to the insulation being applied. The removal may be carried out by the installer, the client or a third party.

Depending on the roof pitch, a distance of 1500mm or more must be required between the eaves area and the outer edge of any existing board, for the installer to be able to block joist tunnels tightly. Any boards too close to the eaves to be blocked tightly must have to be removed.

## 1.2 Access Walkways (Walkway to Cold Water Storage Tank and Feed and Expansion Tank (and other serviceable appliances located in attic)

Where an access walkway is required for access to the water tank(s)or other appliances in the loft, or the client commissioned the installation of a walkway and/or storage platform, the following installation requirements apply:

### Structural integrity of joists

Prior to fitting the new walkway, the state of repair of the existing ceiling and support joists must be determined. The ceiling structure must be capable of supporting the weight of the new walkway, the existing and new insulation material and the loads imposed during the installation of these measures. Otherwise a walkway must not be installed.

### Clearance and insulation under the walkway

The walkway area must be cleared of all items and material except any existing insulation material laid between the joists. This must be repositioned as necessary to provide the maximum insulation under the walkway. Check that there are no junction boxes, cables or pipes that project above the level of the ceiling joists. If possible re-route these away from the path of the new walkway.

### Materials and minimum dimensions

Contractor must construct a permanent boarded walkway from the roof access point to the tank ball valve position and / or the appliance location. The boarded access walkway must be constructed of minimum dimensions of 50x50mm soft wood battens laid across rafters, notched over pipes and cable crossings, said battens to be securely screw fixed in place to rafters. 19mm thickness by 450mm wide flooring grade chipboard to be fixed to battens base with screws. This walkway must be supported above the first layer of insulation to prevent any compaction of insulation below the walkway.

### Path and construction

The panels must be laid from as near the loft hatch opening as possible to adjacent to the water tank or other appliance.

Where the walkway is laid across joists (i.e. the walkway runs perpendicular to the joists), all panel to panel joints must be either on the joist line, or additional noggins must be used. The panels must not extend over the bearers by more than 50mm in any direction.

### Panels attachment
All panels must be secured to the joists, using zinc plated, countersunk screws. These must be screwed flush with the top surface of the panel, or slightly recessed. There must be a minimum of four screws per panel. Nails must not be used as panel/board fixing.

### Insulation around the walkway
Insulation material must be installed underneath walkways, but never on top. Quilt material must be laid up to the edge of the panels. Where blown material is used, arrangements must be made to retain the material off the top surface of the walkway.

## 1.3 Raised Storage Area.
There must be a storage area of 4 square meters provided to all properties. This storage area must be located adjacent to the hatch or walkway and must be in addition to any walkway (the walkway must not form part of the 4 square meters).
Where a storage platform is required, the following installation requirements apply:

### Structural integrity of joists
Prior to fitting the new storage platform, the state of repair of the existing ceiling and support joists must be determined. The ceiling structure must be capable of supporting the weight of the new storage platform, the existing and new insulation material and the loads imposed during the installation of these measures. Otherwise a storage platform must not be installed.

### Clearance and insulation under the walkway

The storage platform area must be cleared of all items and material except any existing insulation material laid between the joists. This must be repositioned as necessary to provide the maximum insulation under the storage platform. Check that there are no junction boxes, cables or pipes that project above the level of the ceiling joists. If possible re-route these away from the path of the new storage platform.

### Materials and minimum dimensions
Contractor must construct a storage platform adjacent to the attic hatch location. The storage platform must be located in such a position that it is easily accessible from the attic hatch. The storage platform must not form part of the boarded walkway. The storage platform must be constructed of 19mm flooring grade chipboard affixed to 125mm PIR board with a thermal conductivity of 0.021W/mK laid across rafters, notched over pipes and cable crossings, to be securely screw fixed in place to rafters. This walkway must be supported above the first layer of insulation to prevent any compaction of insulation below the walkway.

### Path and construction
The panels must be laid from as near the loft hatch opening as possible and positioned that the storage platform is easily usable and accessable.

### Panels attachment
All panels must be secured to the joists, using zinc plated, countersunk screws. These must be screwed flush with the top surface of the panel, or slightly recessed. There must be a minimum of four screws per panel. Nails must not be used as panel/board fixing.

### Insulation around the walkway
Insulation material must be installed underneath walkways, but never on top. Quilt material must be laid up to the edge of the panels. Where blown material is used, arrangements must be made to retain the material off the top surface of the walkway.

## 1.4 Pipe insulation
### Domestic Hot Water Pipes and Central Heating Pipes
For the prevention of heat loss all domestic hot water pipes and central heating pipes in the loft must be insulated over their entire length. Insulation at control and isolating valves must be arranged to allow ready access to the operating facilities of such.

The minimum thickness of the insulating material must be as required in TGD G – Hygiene of the Building Regulations 2008 (Re-printed July 2011) &
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

## Water Supply and Expansion Pipes

All pipes containing water or which must contain water at infrequent intervals (excluding overflow pipes) must be insulated over their entire length. Insulation at control and isolating valves must be arranged to allow ready access to the operating facilities of such. The minimum thickness of the insulating material must be as specified in the table below:

**Appendix**
**Table 1**

**Minimum insulation thickness (mm) to protect against freezing for domestic cold water systems (12 hour period)**

| Outside diameter (mm) | Inside diameter bore (mm) | Extreme installation Inside the building but outside the envelope of the insulation | | | | |
|---|---|---|---|---|---|---|
| | | $\lambda$ = 0.020 | $\lambda$ = 0.025 | $\lambda$ = 0.030 | $\lambda$ = 0.035 | $\lambda$ = 0.040 |
| 15 | 13.6 | 23 | 35 | 53 | 78 | 113 |
| 22 | 20.2 | 10 | 14 | 18 | 23 | 28 |
| 28 | 26.2 | 7 | 9 | 11 | 13 | 16 |
| 35 | 32.6 | 5 | 7 | 8 | 10 | 11 |

**Initial water temperature: +2$^0$C**
**Minimum ambient temperature: -6$^0$C**
**Permitted ice formation: 50%**
**Evaluation period: 12 hours.**

**Note 1:** Thicknesses given are calculated specifically against the criteria noted in the table. These thicknesses may not satisfy other design requirements

**Note 2:** Some of the insulation thicknesses given are too large to be applied in practice. The purpose of including very high thicknesses is to demonstrate that the application of a material of the given thermal conductivity ($\lambda$) is not able to provide the degree of frost protection on the pipe size indicated under the design conditions. Therefore in order to increase the degree of frost protection it is necessary to increase the pipe size, select an insulation with a lower thermal conductivity or use some means of putting heat back into the system.

**Extract from BS 5422: 2009 Table 30**

Pipe insulation materials

Pre-formed thermal insulating materials must be used and be applied to pipework in accordance with the manufacturer's recommendations. Where pre-formed insulation cannot be used, (e.g. two pipes clipped together or single pipe clipped to woodwork or wall), then a proprietary type of strip insulation (e.g. fibre glass strip with plastic backing) may be used. The thermal resistance of this type of installation must be the same as the equivalent pre-formed material

NOTE: Care must be taken when using an alternative insulation material, in these situations, not to over-tighten the fixings.

Gaps at insulation material joints. No gaps must be visible where the insulating material is joined. Joints must be covered with appropriate insulation tape and the length of the pipe insulation at a minimum of 500mm centres, tape must be applied in such a manner to cover the circumference of that pipe insulation at least 3 times.

Foreseeable mechanical strain

Additional protection must be applied to the insulation via a suitable covering where foreseeable mechanical damage can be inflicted upon the insulating material.

Durability of pipe insulation
All insulation must be properly secured. Where tape is used to secure the insulation, a good quality material must be chosen that must remain in place for several years without loosening or becoming ineffective.

Stop cocks and other protruding features
Stop cocks, pipework with oversized joints (e.g. “speed-fit” pipework) or other protruding features must be insulated using either oversized pipe insulation or where this is not possible, other means providing at least the same level of insulation must be used, e.g. spiral pipe wrap.

1.5 Cold Water Storage Tank Jackets & Feed and Expansion Tank Jackets
Tank jacket
The cold water supply tank and feed and expansion tanks must have a new or existing insulation jacket fitted which complies with relevant industry standards and also TGD G – Hygiene of the Building Regulations 2008 (Re-printed July 2011).
The cold water cistern, when located in the attic, has the top and sides of the cistern insulated.
The area underneath the cistern must be left uninsulated and continuity of tank and ceiling insulation must be ensured (see Diagram 3). Where raised tanks are used, to aid head pressure, the ceiling must be insulated as normal and all surfaces of the tank insulated separately. Provision must be made to ensure ventilation of the tank.

**Diagram 3 Insulated pipes and cisterns in roof space** *(Par. 1.9)*

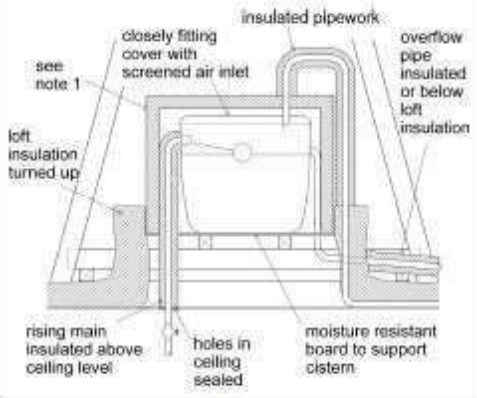
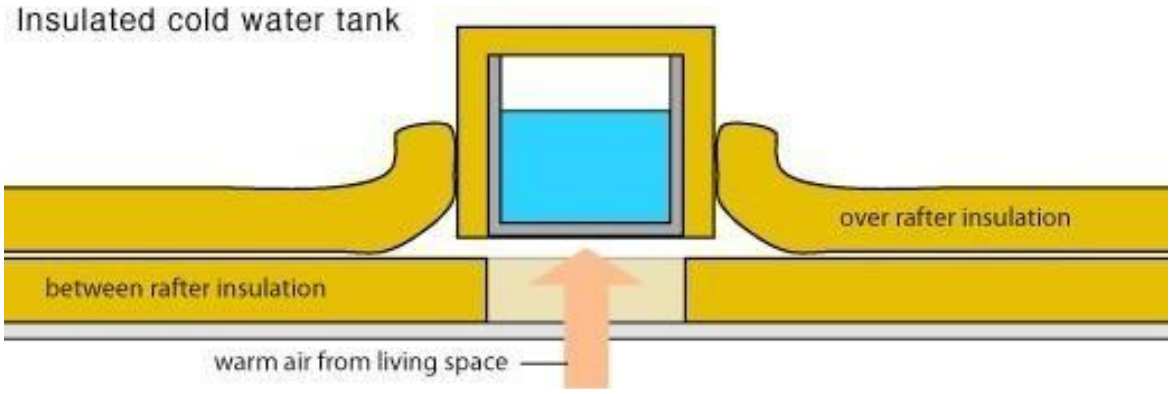



Diagram for clarification only.
Note 1: Insulation U-value to be not less than 0.3 W/m$^2$K as per TGD L Table 1.

Where a standard jacket cannot be fitted, one must be constructed which must:
- be tightly fitting but not airtight;
- be opaque;
- be of material not likely to fragment nor contaminate any condensate which may form on its underside;
- exclude insects;
- be securely fixed in position;
- not impart taste, colour, odour or toxicity to the water;
- not promote or foster microbial growth under the conditions where the tank is installed;
- be of material which is corrosion resisting or must be coated internally with corrosion resisting material;
- be arranged to accommodate any vent or expansion pipes in closely-fitting, purpose-made holes or sleeves;
- be made of materials compatible with those of the tank.
- be of solid construction and able to support in excess of its own weight.

A cold-water tank located 300mm or more above the ceiling joists must be completely enclosed and insulated, i.e. the insulation must be applied to the underside of the tank.
If the tank is located less than 300mm above the joists, the insulation must form a continuous layer with the tank insulation, as illustrated below:




Tank accessibility
The insulation when applied to the tank must take into account any domestic hot water expansion pipe outlets and the insulation must be easily removable for access to the inside of the tank.
Neither the insulation nor the fastenings must interfere with the correct operation of the water control valve and mechanism.
Tank insulation thickness
The minimum insulation thickness of the tank insulation must be as specified in the relevant industry standard(s).
Insulating jacket
A correctly sized insulating jacket, tested and approved to the relevant industry standard, must be fitted to the cold water storage tank.

1.6 Insulation and draught-proofing of loft hatches
Required level of insulation
The loft hatch cover must be completely insulated as far as practical to at least the same U- Value degree as the rest of the roof space. As a minimum, the requirements of the current Building Regulations (Part L) must apply.
Loft hatch insulation cover
The existing loft hatch must be left in situ and insulated and draughtproofed. The hatch must be insulated to the same level as the remainder of the attic. The draughtproofing is covered in the draughtproofing section.
Special requirement for blown fibrous materials
In the case of blown fibrous materials, a suitable barrier must be provided around the loft hatch to ensure that the insulating material does not fall into the dwelling when the loft hatch cover is opened (in line with applicable industry standards).

Loft ladders
Where an existing loft ladder is in situ (either a stira or stira type ladder or an aluminium folding / sliding ladder, an attempt must be made to insulate the trapdoor as per the scheme specification. An attempt must also be made to draughtproof the hatch (this is further covered in the draughtproofing section of this document)
1.7 Warning Signs and Attic Guarantee
Two labels must be fixed on two adjacent sides of the loft access to warn the householder of the dangers when entering a loft space. Particular reference must be made to the insulation material covering the ceiling joists
NOTE: These labels must be fitted, even where a new access walkway has been installed.
DANGER - CEILING JOISTS ARE COVERED BY INSULATION MATERIAL.
THE FLOOR BETWEEN THE JOISTS IS FRAGILE. IT MUST NOT CARRY YOUR WEIGHT. YOU MUST NOT ENTER UNLESS A CRAWL BOARD IS PLACED ACROSS THE JOISTS.

Self-certification of "Roof Space Insulating Works"

After completion of the work, the installer must provide a signed and stamped certificate which must be pinned up in the roof space adjacent to the point of access. The certificate must contain the following information:

- The installer company's name and registered address, aswell as the name or employee number of the individual who undertook or oversaw the installation.
- Address at which the insulation was installed.
- The date on which the work was carried out.
- The area of the roof space insulated in m².
- The approximate proportion of the area left uninsulated, if applicable, together with a justification.
- The material including the name of the manufacturer, its thermal conductivity and the relevant British Standard or certificate from a UKAS accredited third party certification body used for insulating:
- the roof space;
- the cold water tank;
- the pipe work;
- the loft hatch.
- The installed [average] thickness in mm of all the materials for:
- the roof space (settled thickness for blown materials);
- the cold water tank;
- the pipe work;
- the loft hatch.
- The materials used for the lid of the cold water tank, the name of the manufacturer and the relevant British Standard or certificate from a UKAS accredited third party certification body.
- Advice on the action to be taken if the insulation material becomes damaged or wet.

The certificate must also contain the following comment: The insulation fitted in the loft is an integral part of the building energy efficiency provision and must not be removed or disturbed unless for essential work. If such work is undertaken and the insulation has to be moved it must be carefully replaced in its original position, particular care must be made to maintain any ventilation paths especially at the eaves.

SECTION 2. CAVITY WALL INSULATION SECTION

Contractors of cavity wall insulation must be approved by the NSAI Agrément and must agree to carry out the installation to the standards required by this approval and certification.

Product Standards & Specification

Materials to be used in the insulation of a cavity wall must be certified by the NSAI Agrément. The objective of this Scheme must put in place materials that must achieve a level of performance in the home, equivalent to the standard required in the most recent update of Part L of the Building Regulations. Thus, the objective for Cavity Wall Insulation must, in as much as is physically and economically feasible, achieve a U-value of 0.27 W/m2K for external walls.

This economic feasibility refers only to the economic performance of the installation itself. For example, where in exceptional circumstances a home may require significant additional modifications when compared to a normal case, making the initial investment in the insulation solution inappropriate compared to the benefit the Customer must get out of the investment. Economic feasibility in this case does not refer to the ability of the Customer to fund their portion of the capital cost for a conventional installation.

Building Regulations

Building Regulations (Part B): The insulation must be suitable for use in masonry cavity walls so that it does not compromise the property's ability to resist internal fire spread within the structure.

Building Regulations (Part C): When installed as per the system supplier and manufacturer guidelines, the product must not affect the property's ability to resist weather and ground moisture.

Building Regulations (Part D): When installed as per the system supplier's guidelines, the system must meet the Building Regulations requirements for materials and workmanship.
Building Regulations (Part F): The insulation must also be suitable for use on a property and meet the ventilation requirements.

Building Regulations (Part J): Correct installation must also satisfy the Building Regulations suchthat the installation does not increase the risk of the property catching fire through the use of a heat producing appliance.

Building Regulations (Part J): Correct installation must also satisfy the Building Regulations such that the installation does not increase the risk of the property catching fire through the use of a heat producing appliance.

Building Regulations (Part L): The insulation system must conserve energy in keeping with the Building Regulations.
The installation of foam or bead insulation systems into the voids of Hollow Block Walls must not be supported by the programme.
The design and installation of the recommended works must not compromise the ventilation, air quality, humidity (and the potential for condensation) and quality of living environment in the home. Particular care must be given to the potential impact on the living environment in the home resulting from any measures installed under the Scheme. It is the duty of the Contractor to prevent any detrimental changes to the living environment and to recommend to the Customer on any measures necessary to ensure that there is no detrimental change to the living environment as a result of the works.

Installation Standards & Specifications

- All cavity wall insulation mustbe installed in accordance with the specifications laid out by the system supplier and in accordance with the relevant system's NSAI Agrément certificate.
- A survey of the walls must be carried out prior to the installation by a trained surveyor on behalf of the approved Contractor. A complete survey, including a boroscope survey, report is required and must be provided to the Customer. This must ascertain the suitability of the property for the recommended insulation system. Existing buildings must be assessed in accordance with BS 8208: Part 1: 1985.
- Any defects recorded in the survey, which may affect the performance of the insulation system when installed, must be notified to, and rectified by, the Customer with or without the involvement of the Contractor before installation work commences.
- Installation must be carried out by the system supplier or manufacturer or a Contractor approved by the system supplier/manufacturer. Approved Contractors are required to carry out a full survey of the property, comply with the system installation procedure specified by the system supplier/manufacturer and at least one member of an installation team must carry an identity card issued by the system supplier/manufacturer.
- Cavity filling with expanded polystyrene must not be carried out where PVC

sheathed electrical cables are passing through the cavity but are not protected within electrical conduits.

- If the cavity is uncapped, it must be closed at the top of the wall and at the top of any opening in order to comply with the Building Regulations Technical Guidance Document (Part B, 2007). There are a number of different methods for capping of existing walls, which must be discussed with the Customer prior to completion.
- Particular attention must be paid to ensuring that gas, oil and solid fuel appliances are correctly ventilated as per the system supplier's specifications and the Building Regulations (Part J).
- Ventilation openings must be checked to ensure there are no obstructions due to the insulant. All flues must also be checked for obstructions using an appropriate test (e.g. smoke test).
- An NSAI Agrément Certificate or supplier guarantee must be issued to the customer where applicable. Certification is valid once the conditions outlined in the certificate are met.
- The Contractor must indicate to the Customer the methods he intends to use to ensure the successful insulation of the full extent of the cavity wall.

## SECTION 3. VENTILATION

Proper ventilation of a home is necessary in order to ensure:

- Adequacy of fresh air for a healthy and comfortable environment for the occupants
- Adequacy of the air supply for safe operation of particular types of fuel burning appliances
- Minimisation of condensation risk
- Avoidance of radon accumulation in affected areas

### Ventilation Types

- Uncontrolled (and unintended) air infiltration – through the porosity of the building structure or through looseness in detailing or workmanship of openings such as doors and windows which 'provides' ventilation on an arbitrary basis but is not an appropriate basis on which to rely for ensuring occupant safety, health or comfort.
- Purposeful ventilation provision which may be to varying degrees controlled e.g. MVHR, humidistat actuated extract fans, closable wall vents, trickle vents or uncontrolled e.g. permanent wall vents, in accordance with TGD F to the Building Regulations.

Key is avoidance of disturbance to any such proper existing provisions, and making all reasonable effort by way of works execution.
In undertaking the works, and on the basis of the findings of an initial assessment of the home, the contractor must:

Ensure that the works to be undertaken must not compromise the existing necessary ventilation provisions in the home to the detriment of the air quality and / or living environment therein.
Inform the homeowner where it is noted that the existing necessary ventilation provisions have already been adversely affected by actions of the homeowner or other parties
Inform the homeowner of any aspects of ventilation considered to be inadequate or potentially unsafe (particularly with rooms containing a fuel burning appliances). Guidance on background ventilation is provided in TGD F 2002 (6500mm2 ventilation opening per habitable room) and permanent ventilation(minimum. 6500mm2) for heat producing appliances in TGD J 1997 for pre 2006 housing.

These points are aimed at ensuring that the contractor takes all reasonable action to ensure that proper ventilation provisions are installed in the home and that the homeowner is made aware of the proper operation and maintenance of such provisions.

This section may be subdivided into 2 areas 1. – Wall ventilation (to ventilate habitable rooms and rooms containing open flued heat producing appliances and 2. Roof Ventilation to prevent the build up of condensation in roof spaces.

1 – Wall Ventilation.
Permanent and Background Ventilation Requirements when Installing Wall Insulation
The ventilation provisions identified below must be installed prior to undertaking any wall insulation works:

| | Requirement | Acceptable Solutions[iii] |
|---|---|---|
| **Any Room with Open Flued Heat Producing Appliance[i] Present** | • Permanent Ventilation<br>• Min. Free Area 6,500mm$^2$<br>• Cover: Permanent, not user-adjustable | Proprietary integrated[iv] ventilation system, certified to IS EN 13141-1: 2004 with a minimum equivalent area of 5,000mm$^2$ |
| **Habitable Room[ii] No Open Flued Heat Producing Appliance[i] Present** | • Background Ventilation<br>• Min. Free Area 6,500mm$^2$<br>• Cover: User adjustable | Conventional construction method (a sleeve with a minimum internal diameter of 102mm) with appropriate vent covers |

i. The minimum permanent ventilation provisions identified above relate to solid fuel appliances.
a. For open fires the ventilation opening(s) must have a total free area of at least 50% of theappliance throat opening area, with a minimum 6,500mm2 being permanent.
b. For other solid fuel appliances the ventilation openings must have a total free area of atleast 550mm2 per kW of rated output above 5 kW, with a minimum 6,500mm2 beingpermanent.

Please refer to TGD Part J for further guidance on permanent ventilation requirement.
If the surveyor / installer identifies a gas burning appliance (Natural gas or LPG) and believe that thecurrent ventilation provision is anyway inadequate, then the matter must be referred in the first instance to an RGI Registered Installer for expert advice. No attic or wall insulation works must proceed until this is resolved.

ii. Habitable room: A room in a dwelling used for living or sleeping purposes, but does not include a kitchen having a floor area of less than 6.5m2.
iii. Alternative solutions may be utilized where they can be demonstrated to achieve the prescribed ventilation rates
iv. Such products / systems typically comprise a complete solution of vent sleeve, baffle / anti-draft mechanism and internal and external vent covers / cowls. Installers are responsible for selecting the correct product on the basis of the requirements above and the manufacturers certified data. Installers must adhere fully to manufacturers installation instructions.

Internal Rooms
Where there is an open flued heat producing appliance present in an internal room, please do not install cavity wall insulation.
Where there is no open flued heat producing appliance in an internal room, please refer to the following link prior to the installation of background ventilation.
http://www.environ.ie/en/Publications/DevelopmentandHousing/BuildingStandards/FileDownLoad,1647,en.pdf (page 16). Following the installation of an adequate background vent in the internal room, cavity wallinsulation may be installed once the other wall ventilation

requirements in that property are met.

Notes:
A balanced-flued appliance / room sealed appliance does not rely on the room in which it is located as a source of air i.e. combustion air is provided directly from the outside and so permanent ventilation provisions do not apply. (If in doubt about the appliance types please refer to a suitably qualified plumber).

Where a portable fuel burning appliance is present within a dwelling, the area in which the appliance is located must comply with permanent ventilation requirements. The home owner must be notified in writing that a portable fuel burning appliance requires permanent ventilation and must not be operated in a room / space without permanent ventilation.

Trickle vents must not be considered as a means of permanent ventilation. However they may be considered as a means of background ventilation, but must be in good working order. Proprietary integrated solutions are preferred for permanent ventilation situations because of their certified performance and draught minimization functionality for added occupant comfort.

Adequate permanent ventilation must be installed where a flue is still in place but:
• An electric fire has been fitted within the fireplace, and/or
• The fireplace opening is covered over, (e.g. the opening is covered with plasterboard or plywood).

Please note: Where wall insulation is recommended and the client refuses to have the appropriate ventilation requirement installed, wall insulation work must not be installed. In instances where wall insulation is not installed in a property, the permanent and background ventilation requirements outlined in this document must not be installed. The guidance on this advisory note only relates to properties upgraded under this programme.

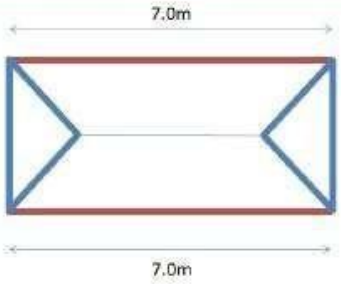
2. – Roof Ventilation
Assessing the Additional Roof Ventilation Provisions required
The following process must be followed when assessing a property for additional roof ventilation;

A. Quantify the total roof ventilation requirement for the property in accordance the Better Energy Homes specification (see table 1 below for additional guidance notes);
B. Assess and calculate the level of existing roof ventilation present;
C. Calculate the additional roof ventilation provisions required by simple subtraction (A – B);
D. Survey the property to identify the most cost effective and appropriate method to achieve the additional requirement.
E.

As per the Building Regulations Part F, SEAI require that the attics of roofs with a pitch of 15 degrees or more, must have ventilation openings at eaves level to promote cross- ventilation. These openings must have an area on opposite sides at least equal to continuous ventilation running the full length of the eaves and 10mm wide. See Table 1 below for sample dwelling calculations
Additional ridge / high level ventilation is required under BEWH in:
o roofs where the pitch exceeds 35º;
o roofs with a span greater than 10 m (regardless of pitch);
• Additional ridge / high level ventilation, equivalent in area to a continuous opening of 5mm must be provided in lean-to/mono-pitch roofs.

Attic measures must NOT be installed in properties with a dormer roof or roof with a pitch <15 degrees.

**Sample Roof Formats and Ventilation Calculations**

| Roof Layout | Guidance Notes on Ventilation Provision |
|---|---|
| Fig 1   | Standard roof plan.<br><br>Ventilators to achieve opening equivalent to continuous strip, 10 mm wide, along eaves as per TGD Part F of Building regulations.<br><br>To calculate the ventilation provision for the attic the eaves length (dimensioned lines) is measured and multiplied by the continuous opening size required<br>(7,000mm + 7,000mm) x 10mm = 140,000mm$^2$.<br><br>This figure is divided by the capacity of the ventilator and the requisite number of ventilators to be installed along the eaves, per manufacturer's instructions. All ventilators should be positioned symmetrically and at equal centres in as much as is practicable.<br><br>For example, where the ventilation requirement of the attic space is 140,000mm$^2$ (as per Fig. 1), a soffit ventilator that provides 10,000mm$^2$/m at 0.2m centres will require 70 soffit ventilators in total (140,000mm$^2$ ÷ 10,000mm$^2$/m = 14m ÷ 0.2m centres = 70 soffit ventilators)<br><br>Note: The gable / hipped ends are not taken into consideration when calculating the ventilation provision required for the attic space. |

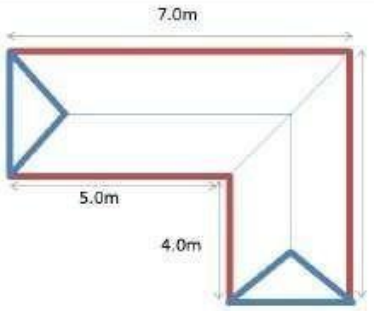
| | | |
|---|---|---|
| Fig 2 |  | L shaped roof plan.<br><br>Ventilators to achieve opening equivalent to continuous strip, 10 mm wide, along eaves as per TGD Part F of Building regulations.<br><br>For the purpose of calculating the ventilation provision required for the attic, each eave length is assessed individually. The extent of eaves to be considered is indicated by the red lines. The eave length is measured and multiplied by the continuous opening size required.<br><br>The total attic ventilation requirement should amount to (7,000mm + 6,000mm + 4,000mm + 5,000mm) x 10mm = 220,000mm$^2$<br><br>This figure is divided by the capacity of the ventilator and the requisite number of ventilators to be installed along the eaves, per manufacturer's instructions. All ventilators should be positioned symmetrically and at equal centres in as much as is practicable.<br><br>For example, where the ventilation requirement of the attic space is 220,000mm$^2$ (as per Fig. 2), a soffit ventilator that provides 10,000mm$^2$/m at 0.2m centres will require 110 soffit ventilators in total (220,000mm$^2$ ÷ 10,000mm$^2$/m = 22m ÷ 0.2m centres = 110 soffit ventilators)<br><br>Note: The gable/hipped ends are not taken into consideration when calculating the ventilation provision required for the attic space. |

Table 1. Sample Roof Formats and Ventilation Calculations

## SECTION 4. DRAUGHTPROOFING

Draught proofing contractors must be competent to complete the installation and must agree to complete the work as set out in the guidance document entitled BS 7386:1997 Specification for draught strips for the draught control of existing doors and windows in housing. Draught proofing must be installed in accordance with Best Practice Guides/ Technical Guides supplied by the material manufacturer. Where a product is covered by an NSAI Agrément Certificate it must be installed in accordance with this certificate and by such qualified people as specified.

### Product Standards & Specification

Materials to be used for draught proofing must be manufactured to a relevant Irish, British or European Standard.
Draught proofing of windows and doors must be installed as per manufactures instruction and must be installed as per draught strip class relating to nominal and maximum compression of the strips.
Other NSAI Agrément certified products may also be used. It is the responsibility of the Contractor to ensure that the optimum solution for each Customer is achieved, within the cost constraints and preference of each Customer.

### Building Regulations

- Building Regulations (Part B): The draught proofing must be suitable for use so that it does not compromise the property's ability to resist internal fire spread within the internal linings and internal fire spread within the structure and external fire spread.
- Building Regulations (Part C): When installed as per the system supplier's guidelines, the insulation must not affect the property's ability to resist weather and ground moisture.

- Building Regulations (Part D): When installed as per the system supplier's guidelines, the insulation must meet the Building Regulations requirements for materials and workmanship.
- Building Regulations (Part F): The draught proofing must also be suitable for use on a property and meet the ventilation requirements.
- Building Regulations (Part J): Correct installation of the system must also satisfy the Building Regulations such that the installation does not increase the risk of the property catching fire through the use of a heat producing appliance.
- Building Regulations (Part L): The draught proofing must conserve energy in keeping with the Building Regulations.

The design and installation of the recommended works must not compromise the ventilation, air quality, humidity (and the potential for condensation) and quality of living environment in the home. Particular care must be given to the potential impact on the living environment in the home resulting fromany measures installed under the Scheme. It is the duty of the Contractor to prevent any detrimental changes to the living environment and to recommend to the Customer on any measures necessary to ensure that there is no detrimental change to the living environment as a result of the works.

Installation Standards & Specifications

- Draught proofing must be carried out using materials that are approved by an Irish, British or European Standard for draught proofing and installed in accordance with the relevant Irish, British or European Standards, where available.
- Manufacturer's instructions must be followed.The following are intended to be helpful guidelines.
- Where carrier based products are used, initial compression of the draught strip is listed in the table below.The recommended gap sizes given by the manufacturers assume this compression on fitting and take into account the need to avoid fixing positions too close to the edge of timber sections.
- Draught strips must be fixed utilising all available fixing holes and if necessary, additional fixing holes must be made in line with the existing fixing holes to ensure that the draught strip is firmly fixed at a maximum of 25mm from each end of the carrier.
- Corners must be butt, mitered or notch cut as appropriate with a maximum gap of 1mm at the corners to ensure a good seal at the join.
- All fixings must be fully driven home perpendicular to the structure being draughtproofed.
- It is recommended that draught proofing must not be applied to windows/doors in a dwelling with a fixed heating device or gas cooking appliance that doesn't have the correct permanent ventilation provisions as detailed in TGD Part J of the Building Regulations.

APPENDIX 1: REQUIRED THICKNESSES FOR ACHIEVING TARGET U-VALUES:
The following table specifies the required thickness of the various materials to achieve target U-Values of 0.14 W/(m²K) as required by the 2019 building regulations.
Note: U-values must be calculated using the conventions and methods set out in BR443 [9]. Indicative thicknesses required for specific insulation materials can be seen in the table below.
Any required thickness T (in millimetres) can be estimated from the target U-Value U (in W/(m²K)) and the respective material's thermal conductivity k (in W/mK) by using the following formula:
T [mm] = 1/U * k * 1000

| Material | Density [kg/m³] | Thermal Conductivity (k) [W/mK] | Nominal Required Thickness [mm] |
|---|---|---|---|
| Mineral wool rolls or slabs (BS EN 13162:2008) | 12 | 0.044 | 275 |
| | 18 | 0.04 | 250 |
| | 25 | 0.035 | 220 |
| Blown glass fibre (BS EN 13162:2008) | 15 | 0.044 | 275 |
| Blown cellulose fibre (BS 5803 Part 3) | 25 | 0.04 | 250 |
| Phenolic foam board (BS EN 13166:2008) | 30 | 0.021 | 131 |
| Polyurethane board (BS EN 13165:2008) | 30 | 0.025 | 156 |
| Urea formaldehyde (UF) FOAM | 10 | 0.04 | 250 |
| Spray applied rigid closed-cell polyurethane (PUR) insulation | 30 | 0.03 | 188 |
| Expanded polystyrene (EPS, BS EN 13163:2008) | 25 | 0.035 | 219 |

For all materials: Where a certification document (e.g. BBA approval or other certificate from a UKAS accredited third party certification body) gives a different k value than the table above, the certificate must have priority.
For materials not listed in the table (e.g. sheep's wool or polyester), please refer to the relevant certification documents (e.g. BBA approval or other certificate from a UKAS-accredited third party certification body) for thermal conductivity. Indicative required thicknesses can be calculated using the formula above, but this cannot replace 90:90 calculations in accordance with BR443.

# Appendix 2: Index of Industry Standards

Reference: Section 3.3 Suitable materials for loft insulation
The following list is informative only, and not binding or comprehensive. New standards may have been published, and/or standards may have been superseded or updated since the release of this specification.
Mineral wool rolls and slabs
- BS EN 13162:2008: Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification (confirmed current on 2011-01-05)

Blown mineral wool granules or pellets
- BS EN 14064-1:2010: Thermal insulation products for buildings. In-situ formed loosefill mineral wool (MW) products. Specification for the lo ose-fill products before installation
- BS EN 14064-2:2010: Thermal insulation products for buildings. In-situ formed loosefill mineral wool (MW) products. Specification for the installed products(both confirmed current on 2011-03-04)

Blown cellulose fibre
- BS 5803-3:1985: Thermal insulation for use in pitched roof spaces in dwellings. Specification for cellulose fibre thermal insulation for application by blowing

- BS 5803-4:1985: Thermal insulation for use in pitched roof spaces in dwellings. Methods for determining flammability and resistance to smouldering
- BS 5803-5:1985: Thermal insulation for use in pitched roof spaces in dwellings. Specification for installation of man-made mineral fibre and cellulose fibre insulation

(all confirmed current on 2011-06-14) - ENs under development

Phenolic foam board

- BS EN 13166:2008: Thermal insulation products for buildings. Factory made products of phenolic foam (PF). Specification. (confirmed current 2011-11-18)

Wool-based batts

- No agreed industry standards available.
- BBA approval available.
- European Technical Approvals (ETAs) available via the Common Understanding of Assessment Procedure (CUAP).

Spray applied rigid closed-cell polyurethane (PUR) insulation

- No agreed industry standards currently available, but Euro Norm (EN) under development.
- BBA approval available.

Polyester fibre mats (delivered in rolls)

- No agreed industry standards available
- BBA approval available
- European Technical Approvals (ETAs) available via CUAP.

Rigid foam board

Polyurethane boards:

- BS EN 13165:2008: Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification (confirmed current on 2011-03-14)
- BS 4841, 2006, parts 1 to 6 (confirmed current on 2011-03-14)

Expanded polystyrene (EPS) boards

- BS EN 13163:2008: Thermal insulation products for buildings. Factory made products of expanded polystyrene (EPS). Specification (confirmed current on 2011-03-14)

Extruded polystyrene (XPS) boards

- BS EN 13164:2008: Thermal insulation products for buildings. Factory made products of extruded polystyrene foam (XPS). Specification(confirmed current on 2011-03-14)

## APPENDIX C- FIREPLACE SPECIFICATION

### Fireplaces:-

Solid Eagle Black Granite fireplace having 100mm return to wall and timber shelf 1000mm x 125mm x 50mm. Made in Solid Eagle Black Granite and fitted with 406mm wrap around stainless steel frame to fire opening. Slabbed in high alumina cement fondu Lafarge BS915 and zone 2 sand. Reinforced with extruded ribbed “W” section reinforcement rods having 4 mild steel clips, 13mm x 3mm with 6mm fixing holes, 2 on top and 1 on either side of surround.

### Hearths:-

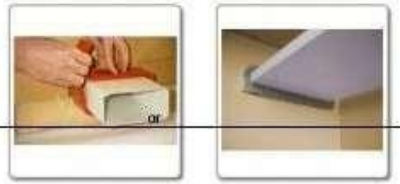
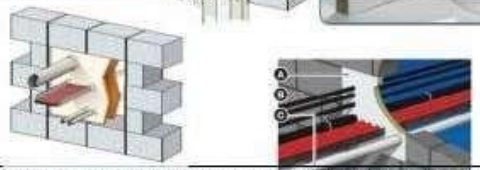
Solid Eagle Black Granite hearth 1000mm x 500mm x 70mm in 4 pieces having 2 piece granite hearth plate to fire opening. Slabbed in high alumina cement fondu Lafarge BS 915 and zone 2 sand. Reinforced with extruded ribbed “W” section reinforcement rods. Slabbed finish on back of hearth to be flush. Hearth to be platform finish.

### Firebacks:-

406mm Fireclay Fireback or equally approved with temperature rating of 1520◦C, complete with corrugated paper to rear and backfilled with Vermiculite.

Firebaskets and Frets:-
406mm Reinforced Firebasket with a minimum content of 15% chrome, capable of withstanding the burning of recognised smokeless fuel. Complete with 406mm Copper Lustre Fret.

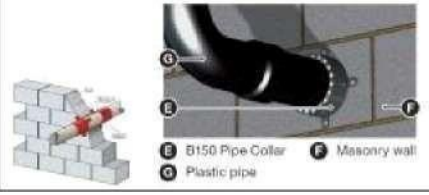
NB: Fireplaces & Hearths made suitable for use with Solid Fuel or Gas Fires and fitted to British Code of Practice 403 and BS 8303: 1994.

| Item | Context | Surrounding Construction | Product Type | Engineering Note | Sample product or equal |
|---|---|---|---|---|---|
| 01.0 | Bathroom vent duct | Fire rated partition wall or Fire Batt infill. | Intumescent wrap | Wrap must be surrounded by hard construction that it can expand against to seal plastic duct product. Product must have been tested to BS476 Parts20 and 22 and certified to have achieved at least 30 minutes fire resistance. | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements: |
| | | | |  | |
| | | | |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br>Envirograf® CLVM IntumescentClipper for circular toilet ventilation units. |
| 02.0 | Fire Batt fire stopping | Concrete/masonry wall<br>Concrete/masonry floor<br>Drywall (Stud) walls | Fire Batt |  | Nullifire B747-50 Fire Barrier, utilising Nullifire M701 or FS721 Acrylic Sealant (troweled on sealant) to all uncoated edges, and uncoated areas before friction fitting board. Fill all gaps with M701. Permissible services that can be fire stopped:<br>• Single and bunched cables<br>• Cable trays<br>• Cable ladders<br>• Trunking<br>• Blank openings<br>• Ducting/dampers<br>• Metallic pipes<br>• Plastic pipes |
| 03.0 | Multiple services penetrations of STUD wall | Multiple services penetrations of STUD wall | Fire Batt |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>Nullifire B747-50 Fire Barrier, utilising Nullifire M701 or FS721 Acrylic Sealant (troweled on sealant) to all uncoated edges, and uncoated areas before friction fitting board. Fill all gaps with M701. |
| 04.0 | Services through protected entrance hallways within apartments | Multiple services penetrations of STUD wall | Fire Batt | Studframing to create hard edged surround around aperture through which services penetrate. Aperture to then be filled with Fire Batt, ablative coated mineral fibre board that must be used with associated intumescent mastic. Board to be aligned and located within the opening, ensuring a tight friction fit. Sealant to be applied to all uncoated areas before friction fitting board. All gaps to be filled with Sealant. | Nullifire B747-50 Fire Barrier, utilising Nullifire M701 or FS721 Acrylic Sealant (troweled on sealant) to all uncoated edges, and uncoated areas before friction fitting board. Fill all gaps with M701. |

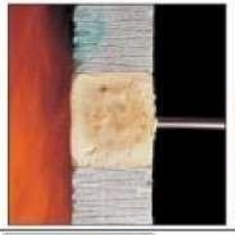
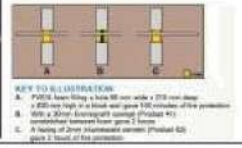
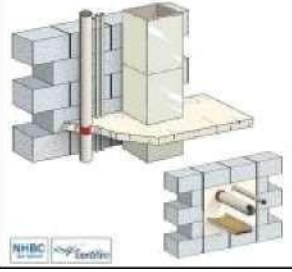


APPENDIX D- FIRE STOPPING SPECIFICATION SCHEDULE

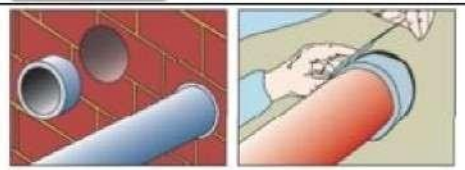
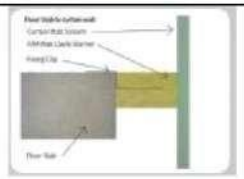
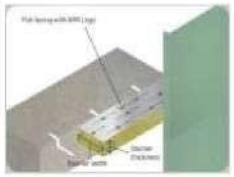
APPENDIX D- FIRE SHOPPING SPECIFICATION SCIIE DULE

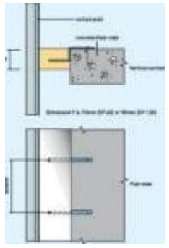
| Item FSD/ | Context | Surrounding Construction | Product Type | Engineering Note | Sample product or equal |
|---|---|---|---|---|---|
| 05.0 | Fire resistant Sealant | • Masonry to masonry<br>• Masonry to steel<br>• Steel to steel<br>• Masonry to timber<br>• Around pipes, services and cables<br>• Expansion joints in compartment walls and floors<br>• Sealing in and around lightweight flexible partitioning<br>• Gaps between timber door frames and the substrate<br>• Gaps between window frames and the substrate<br>• Decorative joints<br>• Sealing around service penetration, steel pipes, steel ducts, duct trays, cables and cable trays | Fire resistant acrylic sealant providing at least 60 minutes' fire protection at building gaps and movement joints, whilst allowing up to 20% movement. To be tested in accordance with EN 1366-4 as meeting fire resistance period of 60 minutes integrity and insulation, and classified according to EN 13501. |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>M701 Nullifire Fire Resistant Sealant • Used in conjunction with Nullifire B747 Coated Board System for large service penetrations |
| 06.0 A | PVC pipe penetration of CONCRETE compartment floor | Concrete / Masonry Floor<br>Surface mounted fires stopping. | Surface mounted Intumescent Collar for plastic pipes from 55mm to 160mm diameter pipes, To be tested in accordance with EN 1366-3 as meeting fire resistance period of 60 minutes integrity and insulation, and classified according to EN 13501. | Horizontal penetrations<br><br><br>A B150 Pipe Collar B Ceiling<br>C Masonry wall D Plastic pipe | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>B150 Nullifire surface mounted Pipe Collar, with M701 Nullifire Acrylic Sealant for cold smoke sealing.<br>Permissible services:<br>• PVC pipes<br>• UPVC pipes<br>• ABS pipes<br>• PE pipes<br>• PP pipes<br>• Composite pipes |
| 06.0 B | PVC pipe penetration of CONCRETE compartment floor | Concrete / Masonry Floor or Wall<br>In-plane fire stopping. | In-plane Intumescent wrap for plastic pipes from 55mm to 160mm, for internal construction only.<br>Walls to be either centrally wrapped or wrapped on either face finished so as to be flush with the finished face of the wall. |  | Nullifire B300 self adhesive intumescent pipe wrap, utilising either M701 Acrylic Sealant, B220 Structural Compound or B270 High Strength Structural Compound. Permissible services:<br><br>• PVC pipes<br>• UPVC pipes<br>• ABS pipes<br>• PE pipes<br>• PP pipes<br>• Composite pipes |
| 07.0 | PVC pipe penetration of Concrete Wall | Concrete / Masonry Wall | Fire Collar, surface mounted. | Vertical penetrations<br><br><br>E B150 Pipe Collar F Masonry wall<br>G Plastic pipe | |

2 1

| Item FSD/ | Context | Surrounding Construction | Product Type | Engineering Note | Sample product or equal |
|---|---|---|---|---|---|
| 08.0 | Electrical cable, wiring penetrations of fire rated walls | Solid construction. Drywall construction. | Fire Stopping Sealant for Small diameter holes allowing services to pass through. |    | CONTRACTOR TO SUBMIT FOR APPROVAL The following product is deemed to comply with requirements: M701 Nullifire Fire Resistant Sealant |
| 09.0 | Electrical socket casing penetration | Plasterboard membrane penetrated by recessed switch or socket box. Framed wall. | Pre-formed fire resisting intumescent cover, tested to at least 60 minutes, to be fitted inside switch / socket box to restore fire resisting integrity of plasterboard membrane. Product to be tested to BS476-20 & 22, or to EN1633-3, and capable of being retro-fitted to existing sockets as well. |   | CONTRACTOR TO SUBMIT FOR APPROVAL The following product is deemed to comply with requirements: (a) Astroflame's Astro FRA socket box cover, (b) Envirograf 69 Fire and Sound Trap (FST). |
| 10.0 | Multiple Service Penetration | Unsupported multiple services penetrations of floor or wall. Multiple services penetrations of CONCRETE floor. | Fire stopping high strength fast curing structural compound. |  | CONTRACTOR TO SUBMIT FOR APPROVAL The following product is deemed to comply with requirements: Nullifire B270 Fire Stop Compound. |

APPENDIX D- FIRE SHOPPING SPECIFICATION SCIIE DULE

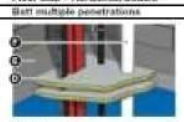
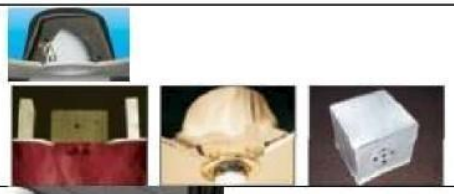
| | | | | | |
|---|---|---|---|---|---|
| 11.0 | Ventilation Duct | Fire rated partition wall or Fire Batt infill. | Intumescent Duct Sleeve. Product to be tested to BS476-20 & 22, or to EN1633-3, and capable of being retro-fitted to existing ducts as well. |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>Astroflame's Astro DS Duct Sleeve for plastic ducting. |
| 12.0 | Ventilation Duct | Concrete or masonry wall | Intumescent Duct Wrap acting as a sleeve. |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>Astroflame's Astro Duct Wrap for flat plastic ducting<br>(For use on uPVC and FB ducting) |
| 13.0 | Intumescent Paint treatment of Shelf | Stainless Steel Shelf Angle to be painted with fire protected coating for 60 minutes protection. | Intumescent paint and primer. | Steel to be degreased first and coated with a suitable primer to take intumescent paint. Intumescent paint to be applied in sufficient thickness and atmospherically dry and suitable conditions. | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br>Astro ISS Paint or equivalent. |
| 14.0 | Fire Stopping of external cavity wall around perimeter of the flat | Concrete slab to external masonry facade feat. | Foil Faced Rockwool stone wool Fire and Smoke Barrier affording 60 minutes fire resistance, to be mechanically fixed to concrete structure of building. |   | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>(a) Rockwool SP60 Firestop Cavity Slab System using the SP Firestop Fixing Brackets to affix to face of concrete slab [They are supplied in two standard types, namely (i) SP/S Fixing Bracket designed for cavities up to, and including 100mm wide and (ii) SP/L Fixing Bracket for cavities over 100mm and up to 400mm wide]. The SP Fixing Brackets should be cut on site as necessary to allow at least 75% penetration of the Firestop.<br>(b) AIM Cavity Wall Fire Barrier & Fire Barrier Slab (and Smoke Barrier). |



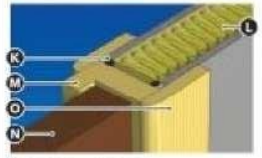




APPEf4DIX D- FIRE STOPPING SPECIFICATIO N SCI·IE DULE

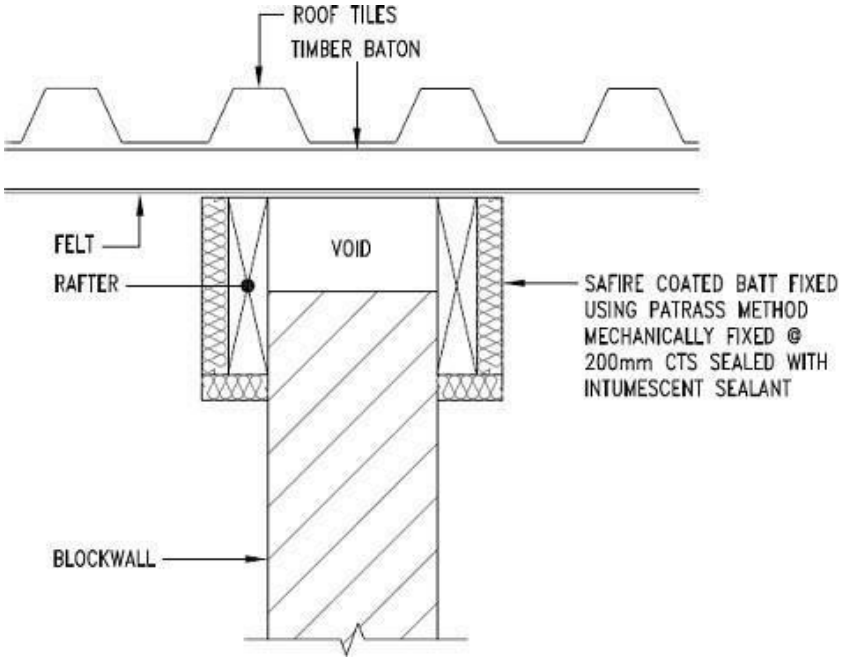
| Ite m | Context | Surrounding Construction | Product Type | Engineering Note | Sample product or equal |
|---|---|---|---|---|---|
| 16. 0 | Gaps over studded wall partitions | Fire rated framed wall leaves gap between head of wall frame and soffit of slab overhead. | Fire Batt |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>Nullifire B747-50 Fire Barrier, utilising Nullifire M701 or FS721 Acrylic Sealant (troweled on sealant) to all uncoated edges, and uncoated areas before friction fitting board. Fill all gaps with M701. |
| 17. 0 | Gaps over concrete block wall partitions | Fire rated block wall leaves gap between head of wall and soffit of slab overhead. | Fire Batt | | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>Nullifire B747-50 Fire Barrier, utilising Nullifire M701 or FS721 Acrylic Sealant (troweled on sealant) to all uncoated edges, and uncoated areas before friction fitting board. Fill all gaps with M701. |
| 18. 0 | Conduits, ducts, trunking, or other items of wiring systems | Concrete or masonry wall or floor. Fire Batt infilled aperture. | Fire resistant acrylic sealant providing at least 60 minutes' fire protection at building gaps and movement joints, whilst allowing up to 20% movement. To be tested in accordance with EN 1366-4 as meeting fire resistance period of 60 minutes integrity and insulation, and classified according to EN |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>M701 Nullifire Fire Resistant Sealant. |
| 19. 0 | Gas pipe penetration of fat compartment wall | Concrete or masonry wall. Hole not more than 40mm diameter. | Fire resistant acrylic sealant providing at least 60 minutes' fire protection at building gap. To be tested in accordance with EN 1366-4 as meeting fire resistance period of 60 minutes integrity and insulation, and classified according to EN |  | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>M701 Nullifire Fire Resistant Sealant. |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| ~pace | | Where cable covers can be laid over a suspended ceiling in roof area or where floorboards are already lifted. | fitted cover recessed adaptor. | | |
| allow | | | allow | | |

| Item ref'y | Context | Surrounding Construction | Product Type | Engineering Note | Sample product or equal |
|---|---|---|---|---|---|
| 22.0 | Fire rated weathering board to soffit of external wall | Affixed to stainless steel Shelf Angle and channel assembly to brick facade. | Non-combustible file rated to BS476-4 or classified as A1 to EN13501 hard board suitable for external exposure. | Board to be fixed with either adhesive in accordance with manufacturer's instructions. | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br>RCM Y Wall board (flexible calcium silicate based fibre cement building board).<br>RCM Siltech Board (a non-combustible Calcium Silicate |
| 23.0 | Fire<br>Door frame to wall gap | Timber stud partition wall<br>Concrete wall | Fire resistant acrylic sealant providing at least 60 minutes' fire protection at building gap. To be tested in accordance with EN 1366-4 as meeting fire resistance period of 60 minutes integrity and insulation, and classified according to EN 13501. | Door frame<br><br>K M701 Acrylic Sealant<br>L Wall substrate<br>M Timber/steel door frame<br>N Door leaf<br>O Architrave<br> | CONTRACTOR TO SUBMIT FOR APPROVAL<br>The following product is deemed to comply with requirements:<br><br>M701 Nullifire Fire Resistant Sealant. |

Attic Separation.

a. The dividing wall between attics belonging to two adjoining houses, maisonettes, senior citizen units needs to be 60 minute fire rated from both sides. Below is a detail for use in older existing buildings.



APPENDIX E

Mechanical Services Specification Boiler Replacement

Programme 2021-1 - 08/04/2021

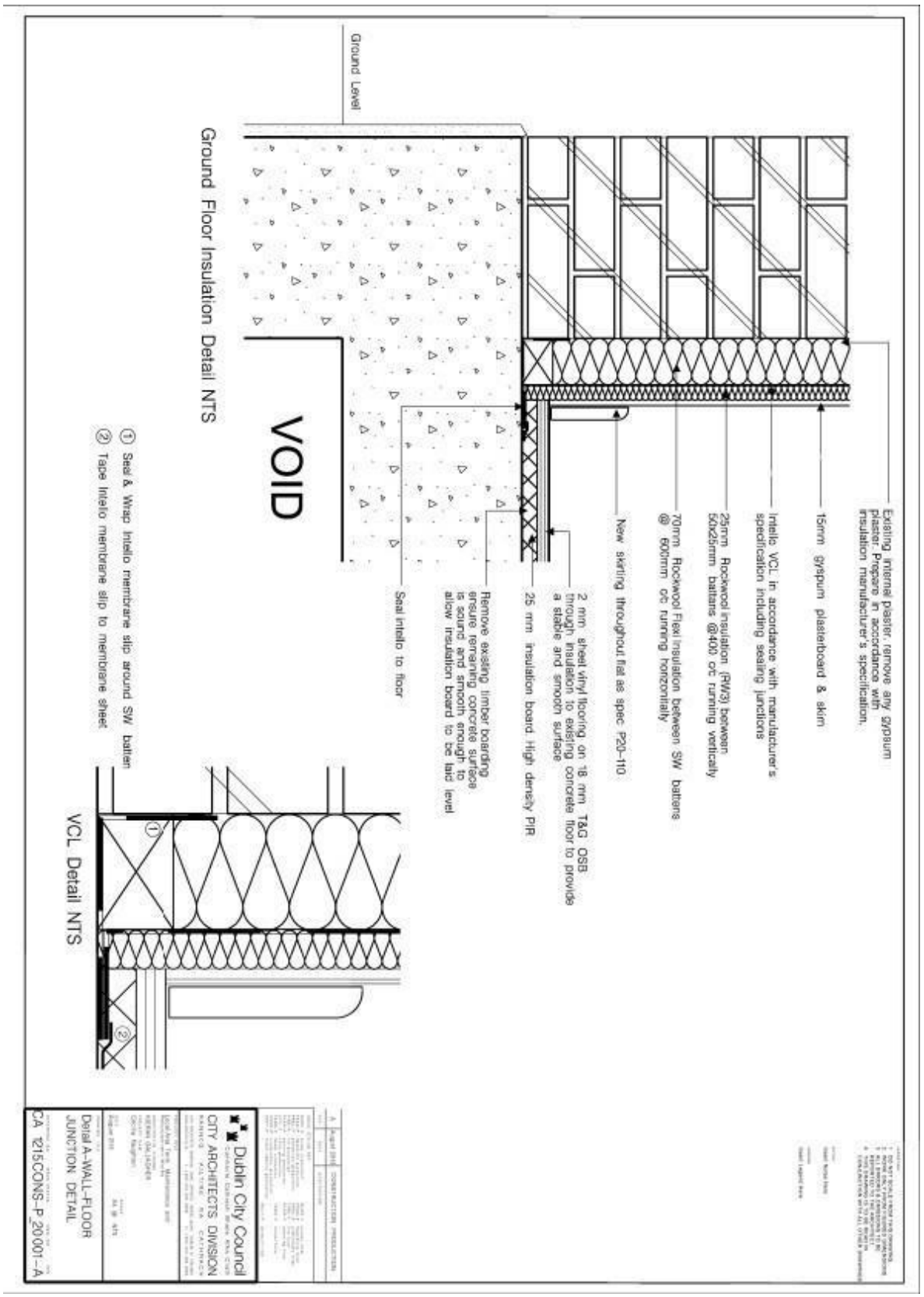
This document is included as a separate specification with the contract documents

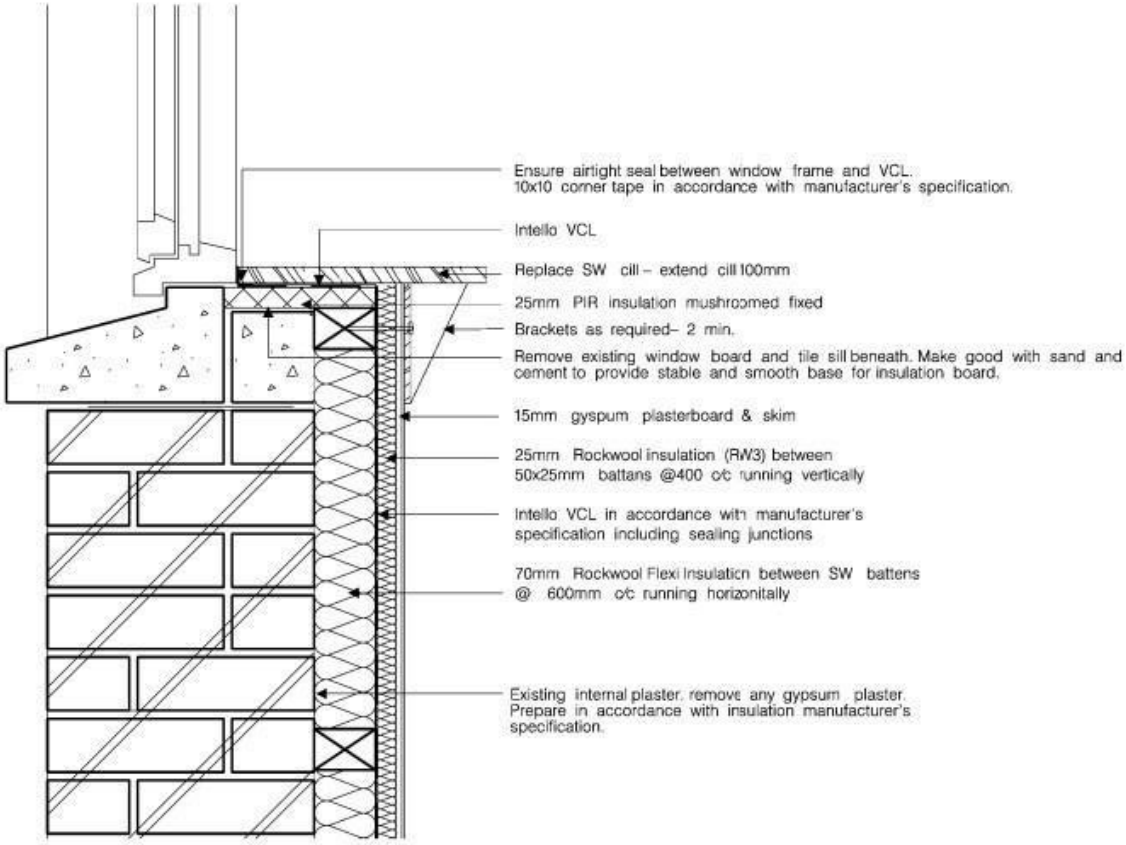
APPENDIX F

DCC General Specifications Electrical Installations incl. amendment May2026

General Specification for Electrical Installations in residential dwellings in DCC. This document is included as a separate specification with the contract documents

# DRAWINGS


Existing internal plaster, remove any gypsum plaster. Prepare in accordance with insulation manufacturer's specification.
15mm gypsum plasterboard & skim
Intello VCL in accordance with manufacturer's specification including sealing junctions
25mm Rockwool insulation (RW3) between 50x25mm battens @400 o/c running vertically
70mm Rockwool Flexi Insulation between SW battens @ 600mm o/c running horizontally
New skirting throughout flat as spec P20-110
2 mm sheet vinyl flooring on 18 mm T&G OSB through insulation to existing concrete floor to provide a stable and smooth surface
25 mm insulation board. High density PIR
Remove existing timber boarding ensure remaining concrete surface is sound and smooth enough to allow insulation board to be laid level
Seal Intello to floor
Ground Level
VOID
Ground Floor Insulation Detail NTS
① Seal & Wrap Intello membrane slip around SW batten
② Tape Intello membrane slip to membrane sheet
VCL Detail NTS
Dublin City Council
CITY ARCHITECTS DIVISION
Detail A-WALL-FLOOR JUNCTION DETAIL
CA 1215CONS-P 20001-A




1. DO NOT SCALE FROM THIS DRAWING.
2. WORK ONLY FROM FIGURED DIMENSIONS.
3. ALL ERRORS & OMISSIONS TO BE REPORTED TO THE ARCHITECT.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS

Insert Notes Here

Insert Legend Here

| REV | DATE | DESCRIPTION |
|---|---|---|
| A | August 2013 | CONSTRUCTION PRODUCTION |

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

CITY ARCHITECTS DIVISION
RANNÓG AILTIRE NA CATHRACH

PROJECT TITLE
Local Area Term Maintenance and Refurbishment Works

ARCHITECT IN CHARGE
KIERAN GALLAGHER

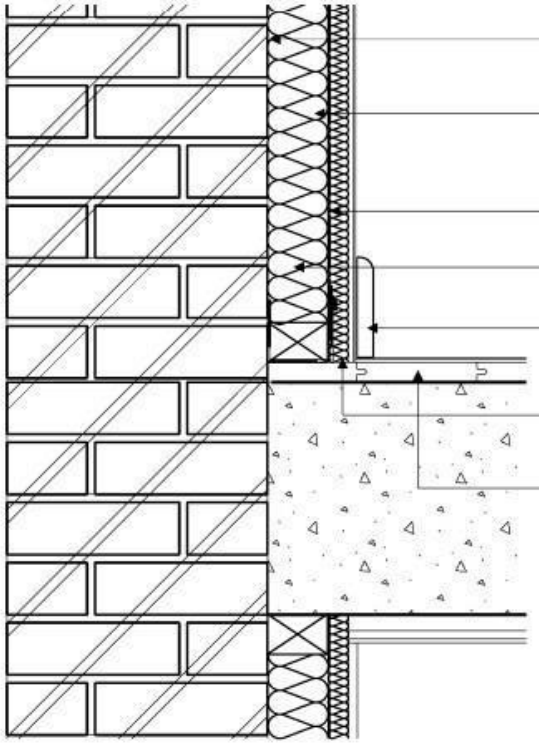
PROJECT TEAM
Cecilia Naughton

DATE
August 2013

SCALE
A4 @ NTS

DRAWING TITLE
Detail B–Window Cill Detail

REFERENCE NO. | ISSUE STATUS | DWG. NO. | REV.
CA 1215CONS–P 20002–A



Existing internal plaster, remove any gypsum plaster. Prepare in accordance with insulation manufacturer's specification.

15mm gyspum plasterboard & skim

25mm Rockwool insulation (RW3) between 50x25mm battans @400 c/c running vertically

Intello VCL in accorcance with manufacturer's specification including sealing junctions

70mm Rockwool Flexi Insulation between SW battens @ 600mm c/c running horizonitally

Painted softwood skirting to match existing in height, thickness and profile.

Ensure airtight seal between window frame and VCL.
10x10 corner tape in accordance with manufacturer's specification.

Existing timber floor boarding.

| | | |
|---|---|---|
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| REV | DATE | DESCRIPTION |

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CITY ARCHITECTS DIVISION
RANNOG AILTIRE NA CATHRACH

Local Area Term Maintenance and Refurbishment Works

ARCHITECT IN CHARGE
KIERAN GALLAGHER

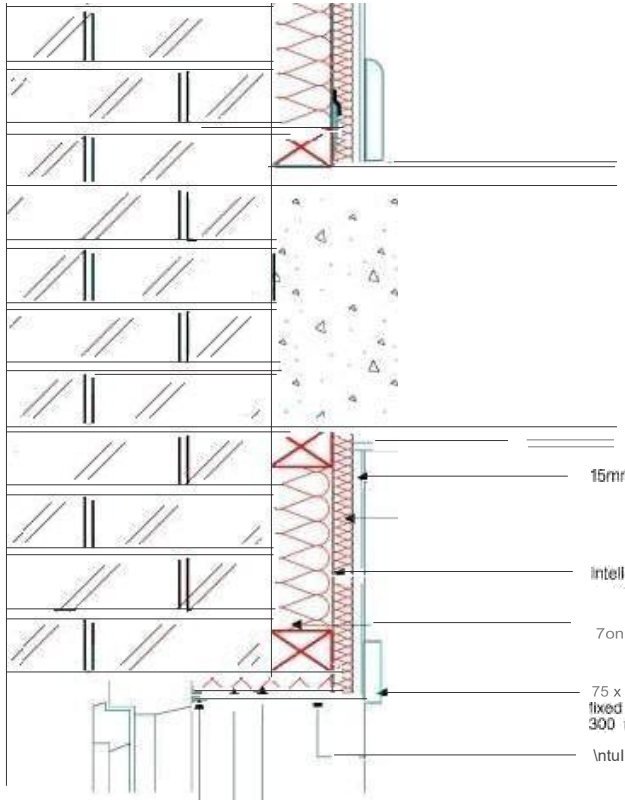
PROJECT TEAM
Cecilia Naughton

DATE
August 2013

SCALE
A4 @ NTS

DRAWING TITLE
Detail C –WALL–FLOOR JUNCTION DETAIL

REFERENCE NO. | ISSUE STATUS | DWG NO. | REV
CA 1215CONS–P 20003–A

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4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS

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| A | August 2013 | CONSTRUCTION PRODUCTION |

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
CITY ARCHITECTS DIVISION

DATE August 2013 A4 @ NTS

Do1aiT D Window HeadDeta

A 1215 CONS P 20004-A

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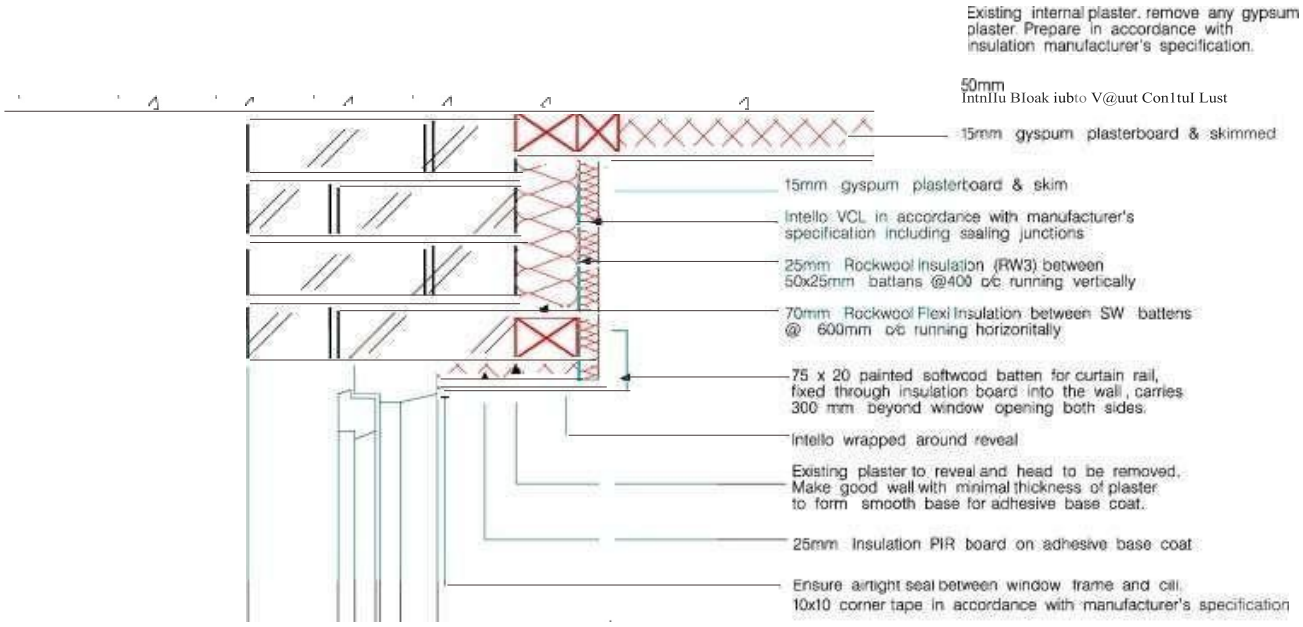
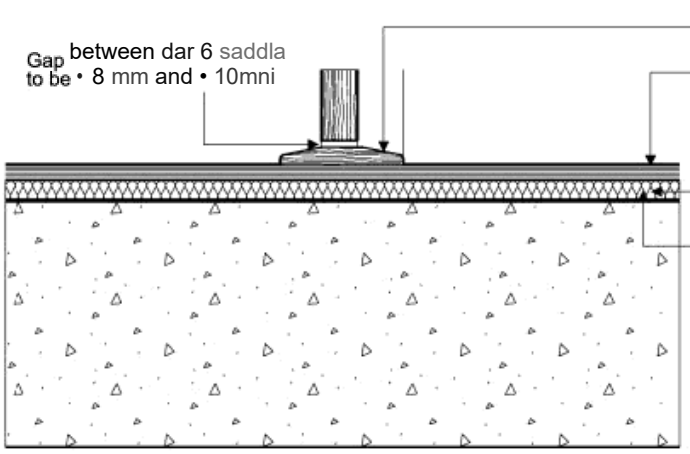
2 WORK ONLY FROM FIGURED DIMENSIONS
3 ALL ERRORS & OMISSIONS TO BE REPORTED TO THE ARCHITECT.
4 THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS.




Dublin City Council
CITY ARCHITECTS DIVISION
RANNOG AITIRE NA CATHRACH

Da1aiI E Wind ow Head Delay

EA 1215CONS P 20005— A

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3. ALL ERRORS & OMISSIONS TO BE REPORTED TO THE ARCHITECT.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS.

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| REV | DATE | DESCRIPTION |
|---|---|---|
| A | August 2013 | CONSTRUCTION PRODUCTION |

Dublin City Council
Comhairle Cathrach Bhaile Atha Cliath
CITY ARCHITECTS DIVISION
RANNOG AILTIRE NA CATHRACH

PROJECT TITLE
Local Area Term Maintenance and Refurbishment Works

ARCHITECT IN CHARGE
KIERAN GALLAGHER

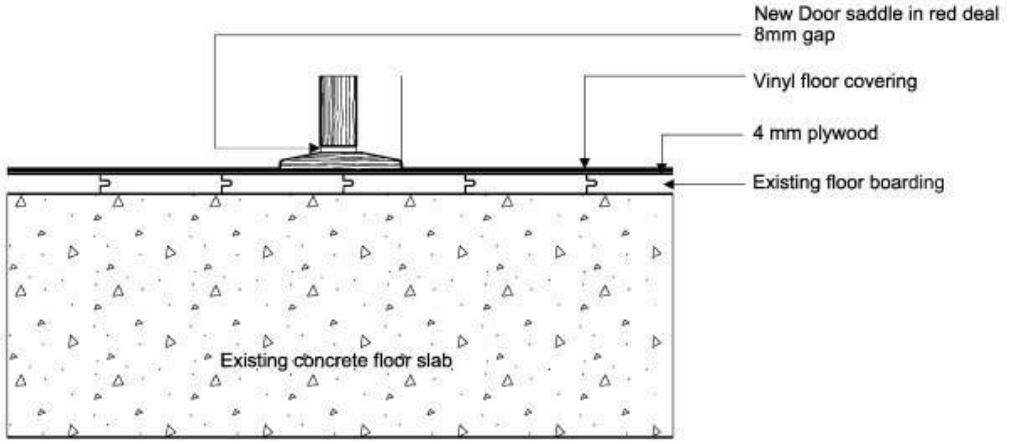
Cecilia Naughton

DATE
August 2013

SCALE
A4 @ NTS

DRAWING TITLE
Detail F—Floor losulgtion Detail

REFERENCE NO. CA 1215CONS- P 20006-A

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| REV | DATE | DESCRIPTION |
|---|---|---|
| A | August 2013 | CONSTRUCTION PRODUCTION |

ISSUE STATUS KEY

| | | | |
|---|---|---|---|
| SCHM-P | scheme production | SCHM-T | scheme (trial) |
| FEAS-P | feasibility production | FEAS-T | feasibility (trial) |
| PREL-P | preliminary production | PREL-T | preliminary (trial) |
| FIN-P | fin production | FIN-T | fin (trial) |
| PLAN-P | planning production | PLAN-T | planning (trial) |
| DTL-P | detail production | | |
| TEND-P | tender production | TEND-T | tender (trial) |
| CONS-P | construction production | - | - |
| DEPT-P | detail liability production | - | - |
| | | AS-BUILT-P | as-built (trial) |

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

CITY ARCHITECTS DIVISION
RANNÓG AILTIRE NA CATHRACH

CITY ARCHITECTS DIVISION, CIVIC OFFICES, WOOD QUAY, DUBLIN 8, IRELAND
www.dublincity.ie T +353 (0)1 222 3656 F +353 (0)1 222 3659

PROJECT TITLE
Local Area Term Maintenance and Refurbishment Works

ARCHITECT IN CHARGE
KIERAN GALLAGHER

PROJECT NAME
Cecilia Naughton

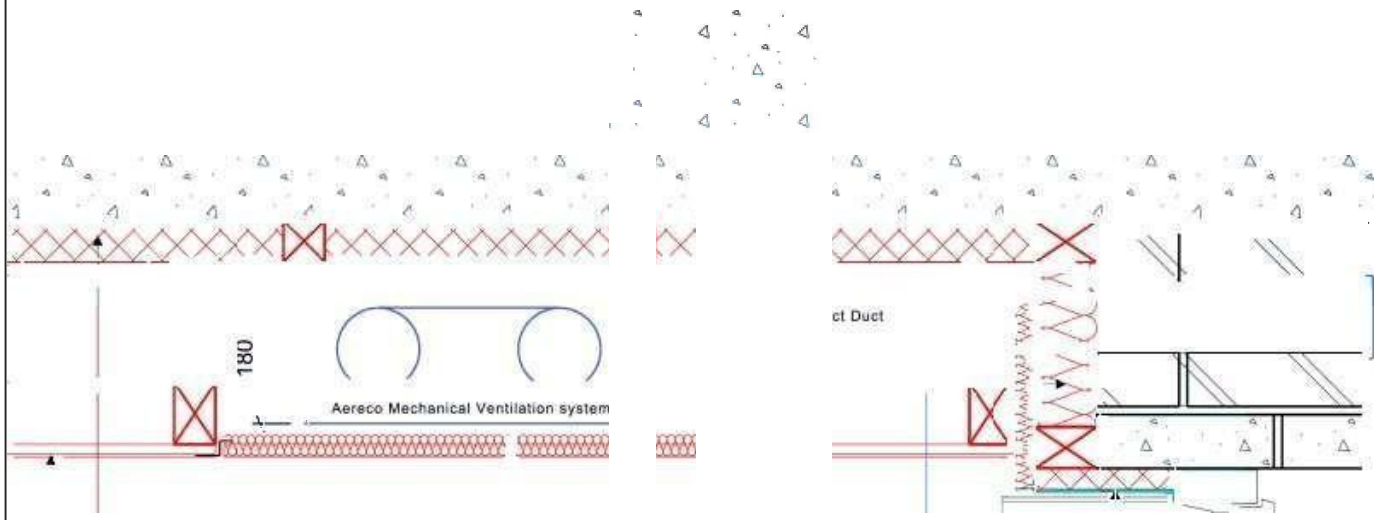
DATE
August 2013

SCALE
A4 @ NTS

DRAWING TITLE
Detail G– Floor Detail

REFERENCE NO. | ISSUE STATUS | ORIG. NO. | REV.
CA 1215CONS-P_20007–A

# ROOF

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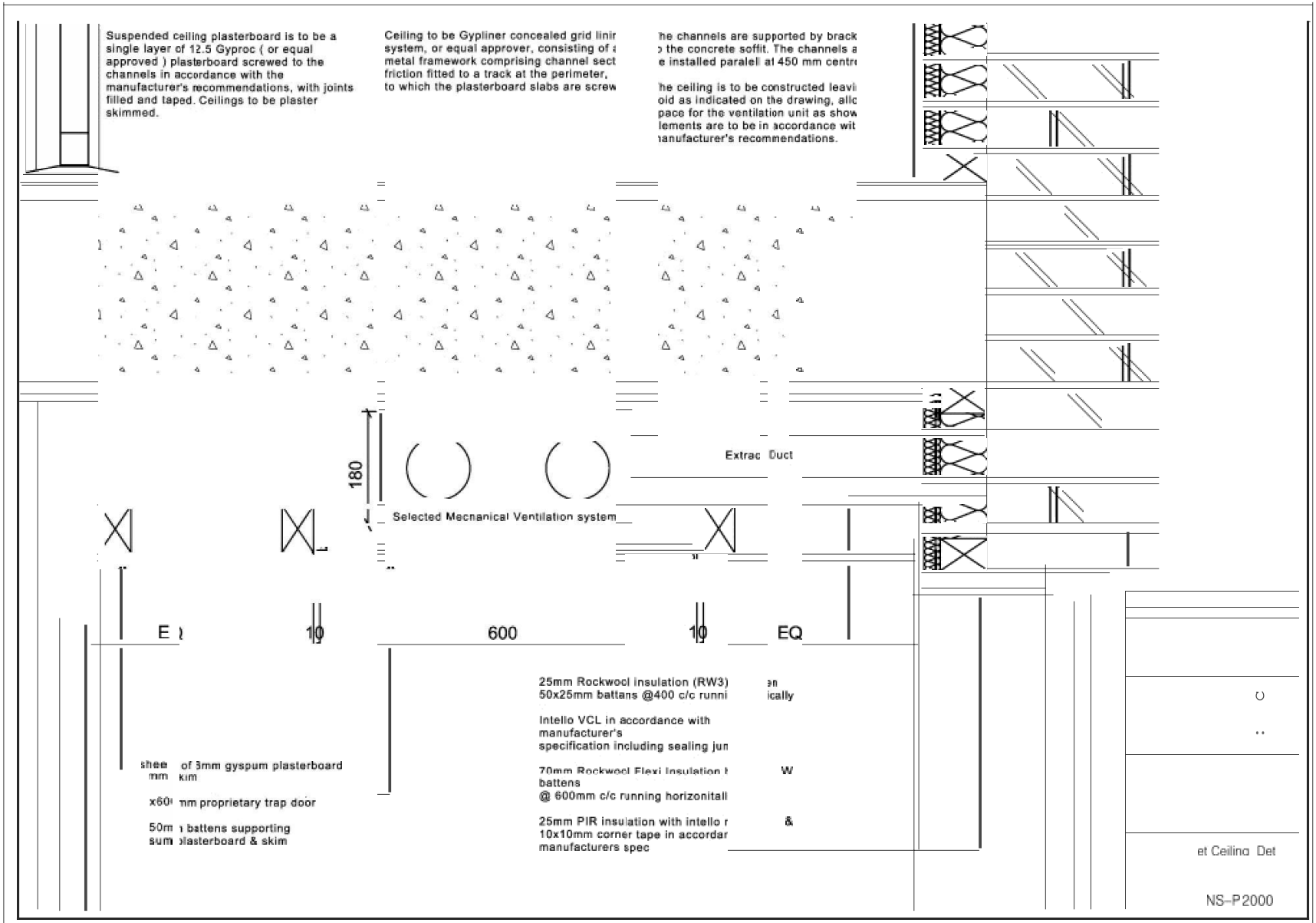
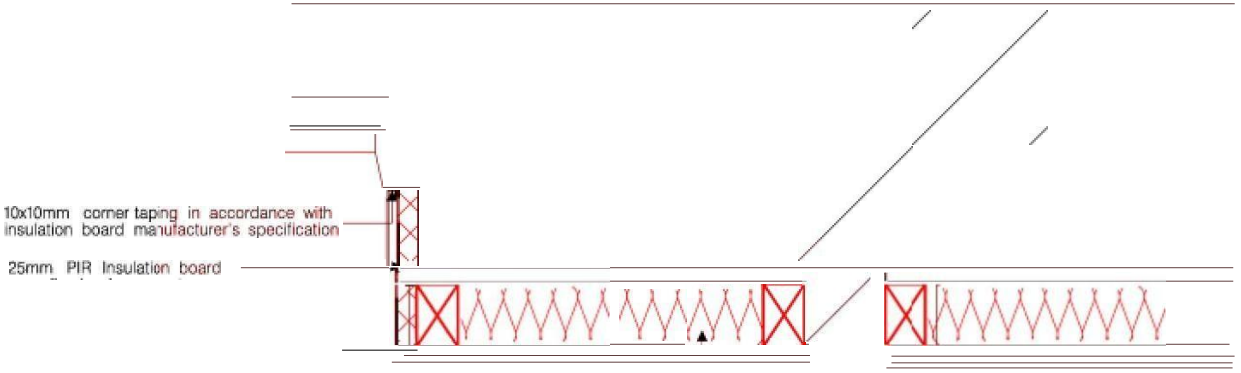
CITY ARCHITECTS DIVISION

Detail H
Window Head Detail
Mechanical

CA 1215CONS-P_20008-A


Suspended ceiling plasterboard is to be a single layer of 12.5 Gyproc ( or equal approved ) plasterboard screwed to the channels in accordance with the manufacturer's recommendations, with joints filled and taped. Ceilings to be plaster skimmed.
Ceiling to be Gypliner concealed grid linir system, or equal approver, consisting of a metal framework comprising channel sect friction fitted to a track at the perimeter, to which the plasterboard slabs are screw
he channels are supported by brack the concrete soffit. The channels a e installed paralell at 450 mm centr
he ceiling is to be constructed leavi oid as indicated on the drawing, allc pace for the ventilation unit as show lements are to be in accordance wit anufacturer's recommendations.
180
Extrac Duct
Selected Mecnanical Ventilation system
600
EQ
25mm Rockwool insulation (RW3)
50x25mm battans @400 c/c runni
Intello VCL in accordance with manufacturer's specification including sealing jun
battens @ 600mm c/c running horizonitall
25mm PIR insulation with intello r
10x10mm corner tape in accordar manufacturers spec
of 3mm gyspum plasterboard
x60 mm proprietary trap door
50m battens supporting
sum plasterboard & skim
et Ceiling Det
NS-P2000




lhinkr+eds Of Qlaslef IO 1c*rti 0Mcr0fh
baae lot adhastva bese ooaf.

25mm Rockwool insulation (RW3) between 50x25mm battans @400 c/c running vertically

In4a¥n VCL in a'oont danne with msnufantuter's speo\IcaIon induéng seaeng |vcbons

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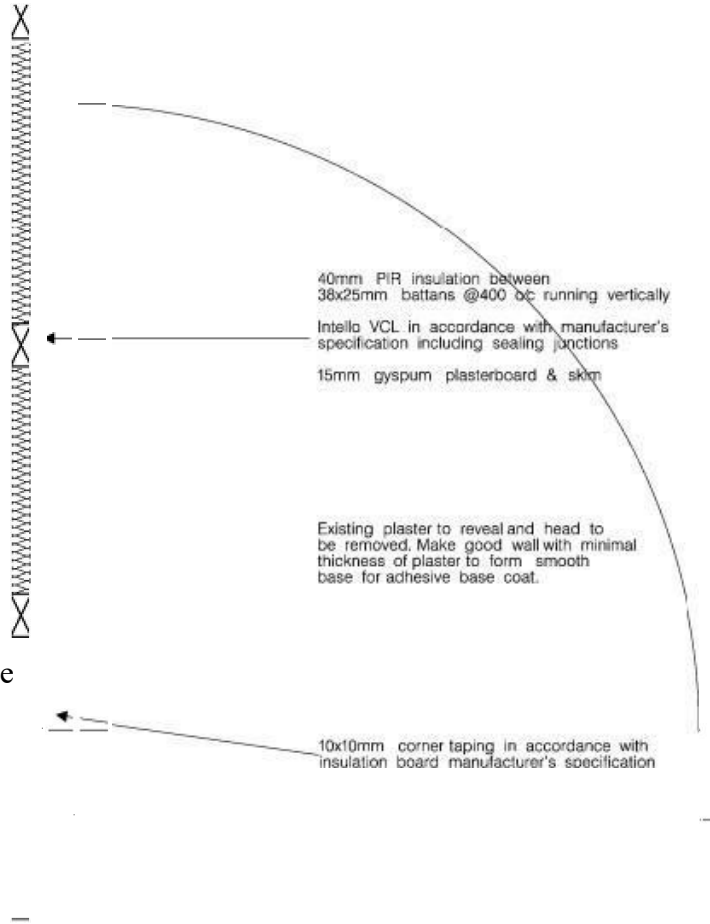
Ex:ig1ing intetn8f plgg1er. tem9ve any gram pasler.Pfepara in contdanne with nsulatinri manufacturer's specification.

Dublin City Council

CITY ARCHITECTS DIVIS ION

Da1aiI K—Window Jamb Deta

CA 1215CONS- P 20010-A

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| A | August 2013 | CONSTRUCTION PRODUCTION | |
| REV | DATE | DESCRIPTION | |

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

CITY ARCHITECTS DIVISION
RANNOG AILTIRE NA CATHRACH

PROJECT TITLE
Local Area Term Maintenance and Refurbishment Works

ARCHITECT IN CHARGE
KIERAN GALLAGHER

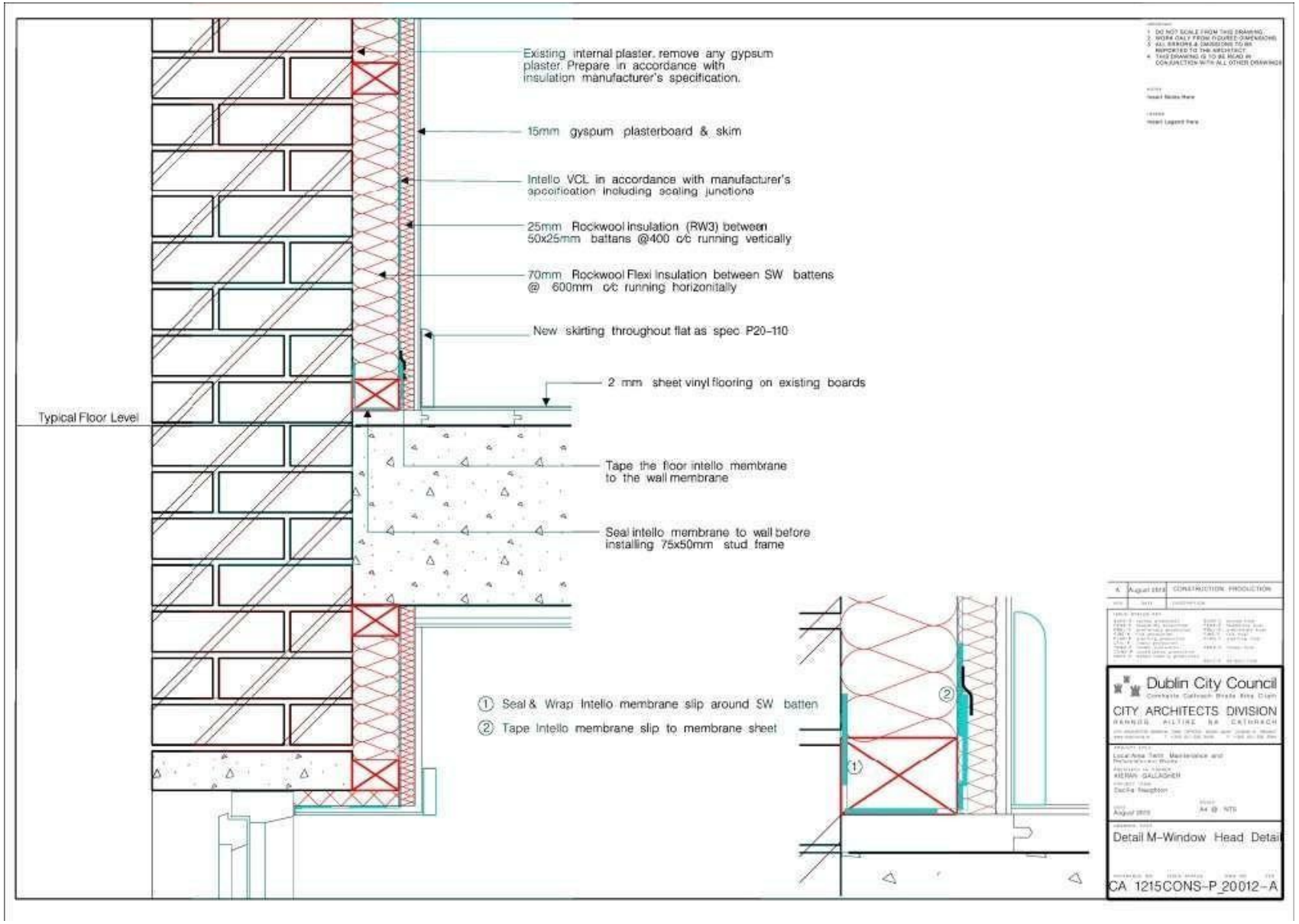
PROJECT TEAM
Cecilia Naughton

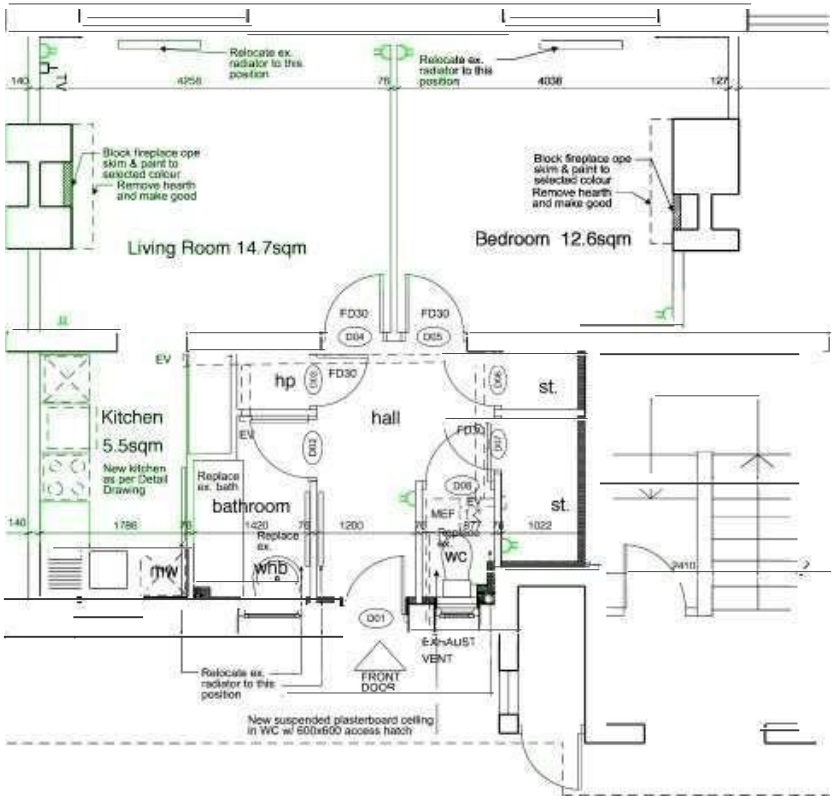
DATE
August 2013

SCALE
A4 @ NTS

DRAWING TITLE
Detail L–Entrance Hall
Hall Door Jamb Detail

CA 1215 CONS–P_20 011 – A


Existing internal plaster, remove any gypsum plaster. Prepare in accordance with insulation manufacturer's specification.
15mm gypsum plasterboard & skim
Intello VCL in accordance with manufacturer's specification including sealing junctions
25mm Rockwool insulation (RW3) between 50x25mm battens @400 c/c running vertically
70mm Rockwool Flexi insulation between SW battens @ 600mm c/c running horizontally
New skirting throughout flat as spec P20-110
2 mm sheet vinyl flooring on existing boards
Typical Floor Level
Tape the floor intello membrane to the wall membrane
Seal intello membrane to wall before installing 75x50mm stud frame
① Seal & Wrap Intello membrane slip around SW batten
② Tape Intello membrane slip to membrane sheet
Dublin City Council
CITY ARCHITECTS DIVISION
Detail M-Window Head Detail
CA 1215CONS-P_20012-A




TYPICAL 1 BED - TYPE 'A' UNITS- NTS(APPROx 46.5 M2-AREA OF UNITS VARY
GROUND FLOOR

1 DO NOT SCALE FROM THIS DRAWING
2 WORK ONLY FROM FIGURED DIMENSIONS
3 ALL ERRORS & OMISSIONS TO BE REPORTED TO THE ARCHITECT.
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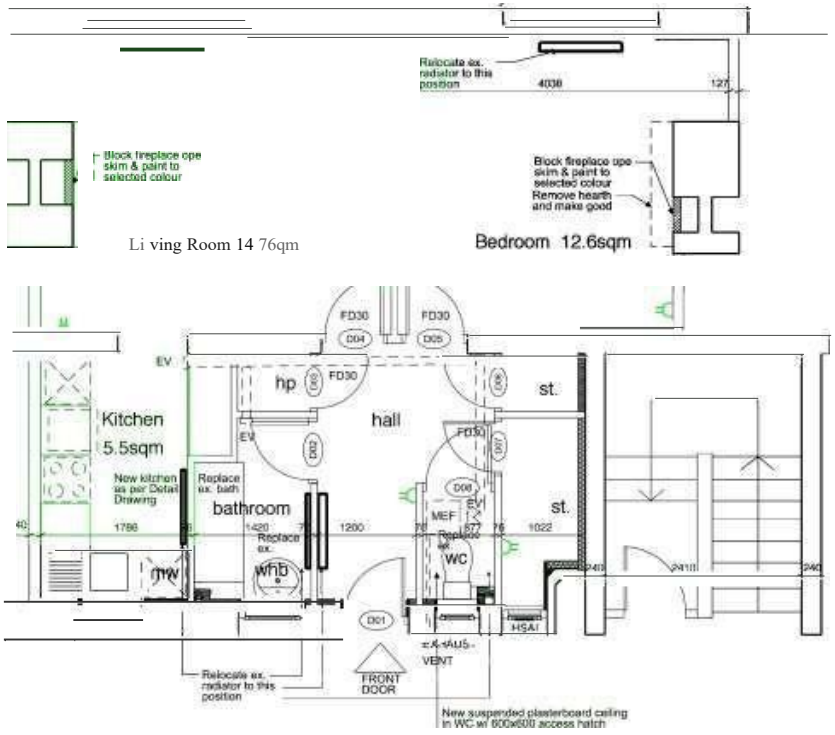
CITY ARCHITECTS DIVISION

RANNOG AITIRE NA CATHRACH

TYPICAL 4 BED TYPE "A"
GROUNO FLOOP

?4 1215 CONS -P 21 001—A




TYPICAL 1 BED- TYPE 'A' (APPROX AREA 46.3 M2- AREA OF UNITS VARY)
UPPER FLOOR- NTS

DuL›lif1 City Council

CITY ARCHITECTS DIVISION

TYPICAI ' KFD—W "A'
UP *EP FLOOP

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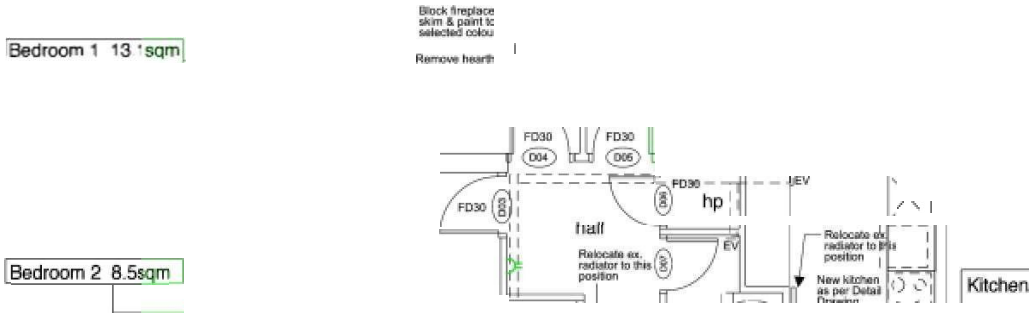
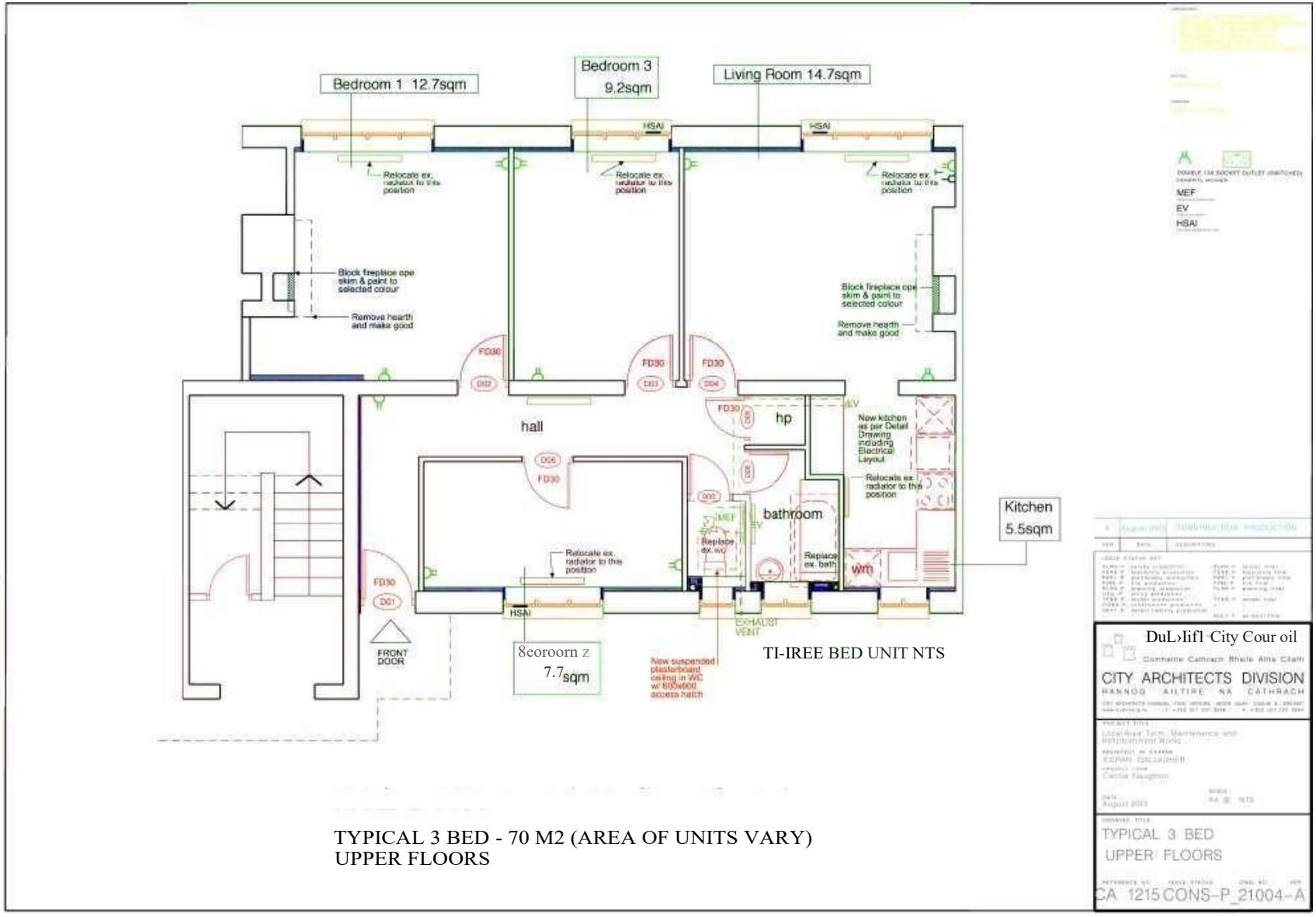



TYPICAL2 BED -TYPE 'A' - 57.83 M2 (AREA OF UNITS VARY)
GROUND FLOOR- NTS

Dublin City Counci
CITY ARC HITECT B DI\US ION

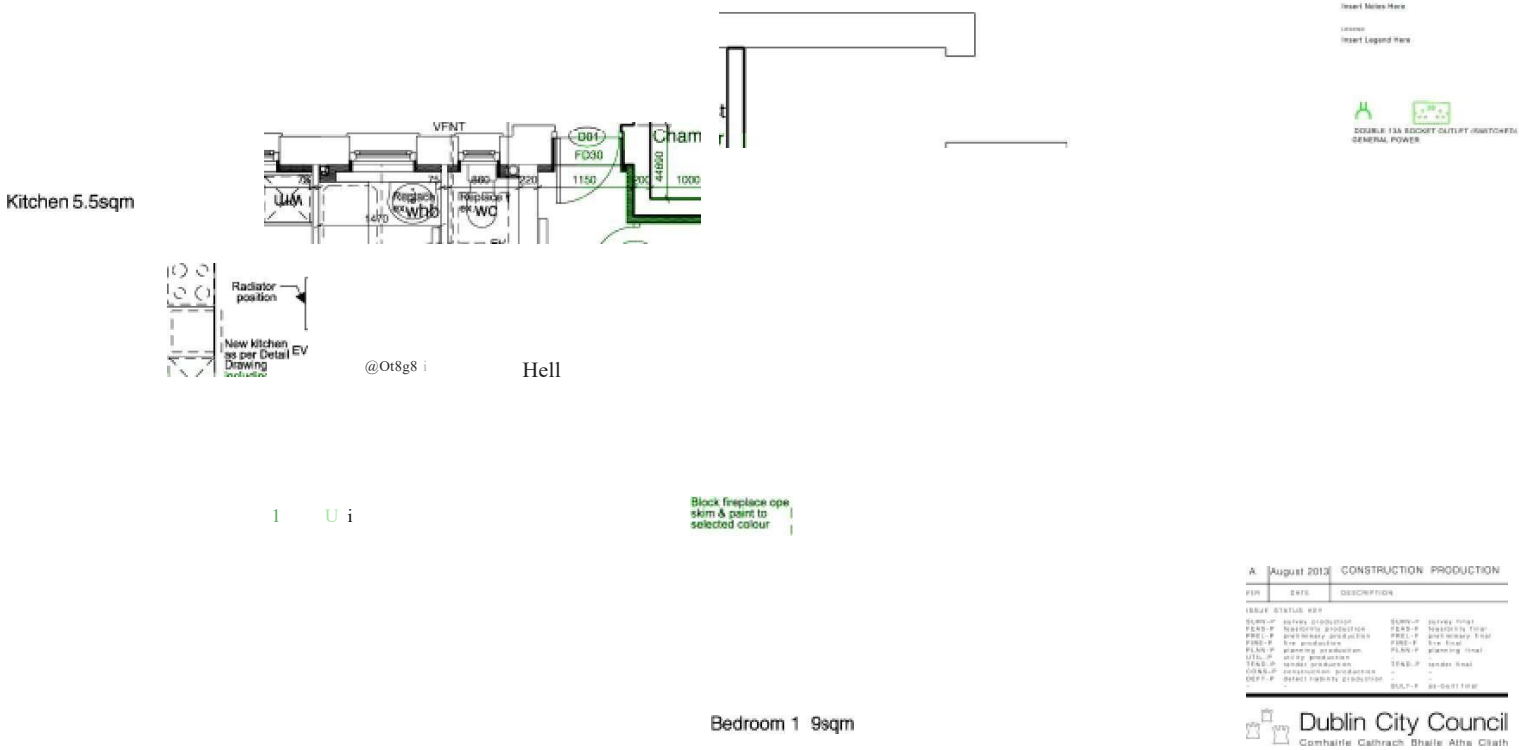
TYPICAL 2 BEO - JYF'E 'A
GROUND FLOOR

EA 12"1Ti CANS—P 21003-"e




TI-IREE BED UNIT NTS

TYPICAL 3 BED - 70 M2 (AREA OF UNITS VARY)
UPPER FLOORS

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Insert Notes Here

Insert Legend Here

DOUBLE 13A SOCKET OUTLET (SWITCHED) GENERAL POWER

| REV | DATE | DESCRIPTION |
|---|---|---|
| A | August 2013 | CONSTRUCTION PRODUCTION |

ISSUE STATUS KEY

| | | | |
|---|---|---|---|
| SURV-P | survey production | SURV-F | survey final |
| FEAS-P | feasibility production | FEAS-F | feasibility final |
| PREL-P | preliminary production | PREL-F | preliminary final |
| FIRE-P | fire production | FIRE-F | fire final |
| PLAN-P | planning production | PLAN-F | planning final |
| UTIL-P | utility production | | |
| TEND-P | tender production | TEND-F | tender final |
| CONS-P | construction production | - | - |
| DEPT-P | detail/interim production | - | - |
| | | BUILT-F | as-built/record |

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
CITY ARCHITECTS DIVISION

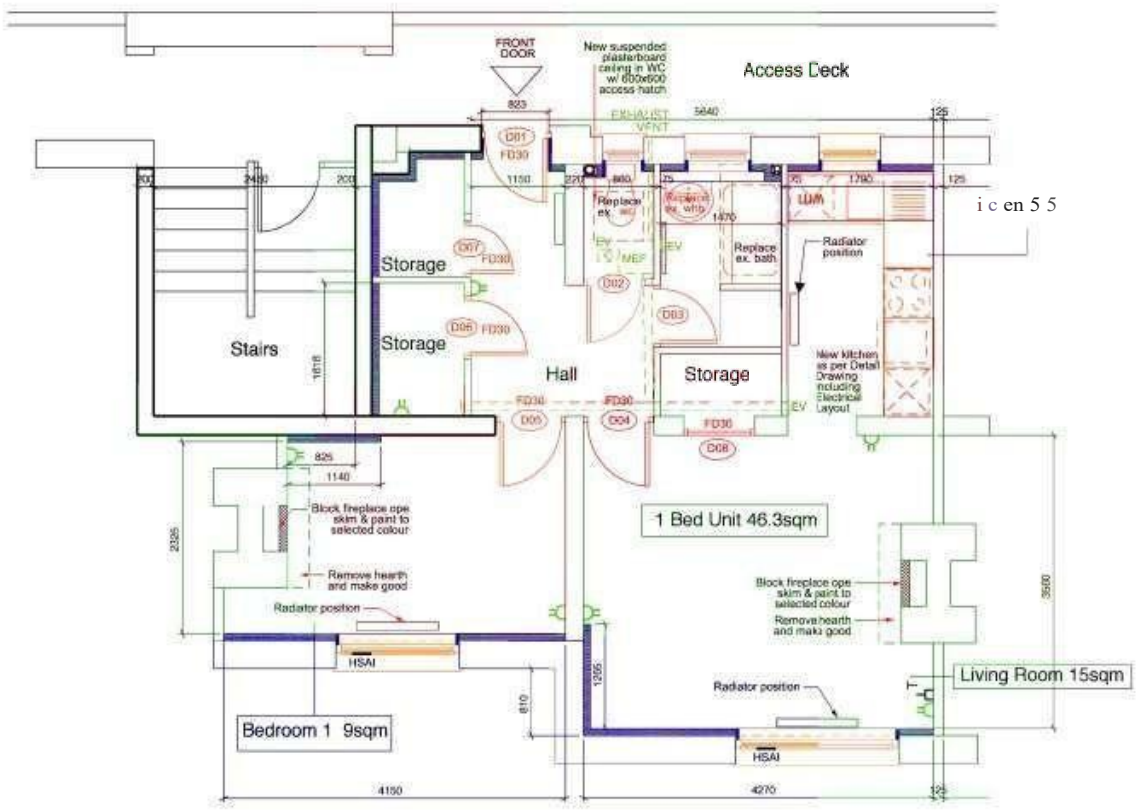
TYPICAL 1 BED- TYPE 'B'- (APPRox 4g.z M2- AREAS OF UNITS VARY)
GROUND FLOOR - NT6

Cecilia Naughton

DATE: August 2013
SCALE: A4 @ NTS

DRAWING TITLE:
TYPICAL 1 BED– TYPE 'B'
GROUND FLOOR

REFERENCE NO. | ISSUE STATUS | DWG NO. | REV.
CA 1215 CONS–P_21005–A




TYPICAL 1 BED- TYPE 'B' 46.3 M2 (AREA OF UNITS VARY)
UPPER FLOORS - NTS

DuLȝlifl City Cc›ur cil
Comhairle Cathrach Bhaile Átha Cliath
CITY ARCHITECTS DIVISION
RANNOG AILTIRE NA CATHRACH

TYPICAL 1 BED– TYPE 'B'
UPPER FLOORS

CA 1215CONS-P_21006-A





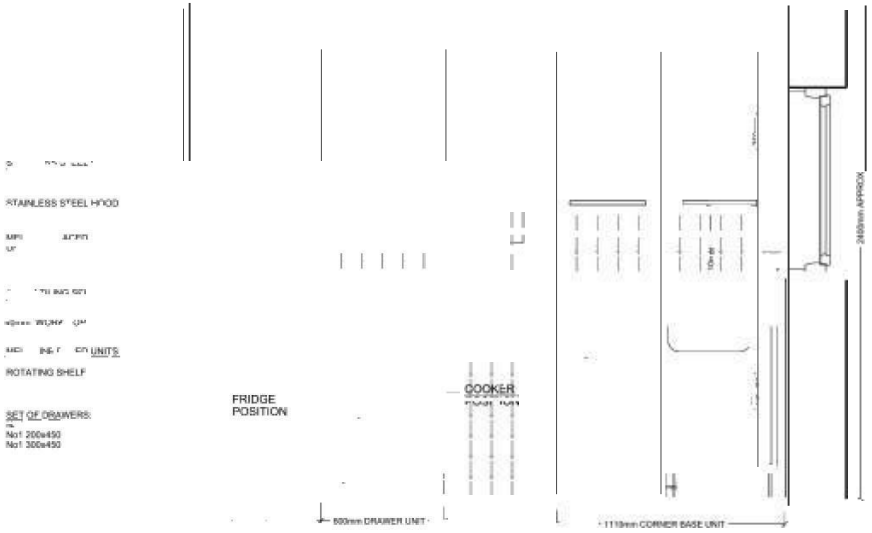


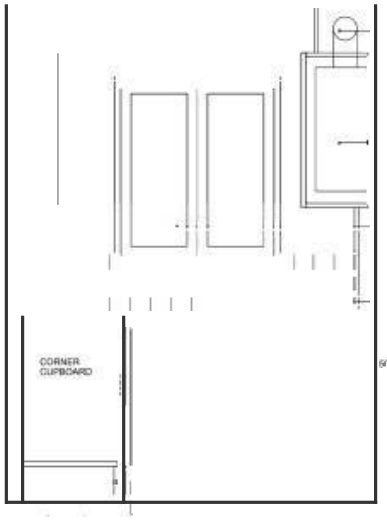
TYPICAL 2 BED - TYPE 'B' - 58.9 M2- (AREA OF UNITS VARY)
GROUND FLOOR - NTS

TYPICAL 2 BED —TYPE ’B”
GROUND FLOOR

EA 1’215 C‹ NS-P 21007- A


KITCHEN ELEVATION A NTS
KITCHEN ELEVATION C NTS
KITCHEN PLAN 1:50
KITCHEN ELEVATION B NTS
RAD
SWITCHED FUSED SPUR OUTLET 13A OR AS INDICATED
UNSWITCHED FUSED SPUR OUTLET, 5A OR AS INDICATED
SINGLE 13A SOCKET OUTLET (SWITCHED REMOTELY) GENERAL POWER
SWITCH FOR SINGLE 13A SOCKET
DOUBLE 13A SOCKET OUTLET (SWITCHED) GENERAL POWER
DOUBLE 13A SOCKET OUTLET (SWITCHED) GENERAL POWER - MOUNTED AT BENCH HEIGHT
COOKER UNIT
KITCHEN
KA
Kitchen units are to be in accordance with Specification section NA1.
Note that sink base unit is to be 18mm plywood, not chipboard.
Submit 3 proposals for kitchen style, for ER to select.
Submit 3 samples, for ER to select, of base colour, door colour, worktop colour, inset sink, extract hood, door handles and sealants.
KB
Tile wall to height and extent shown, from worktop to underside of wall units.
Tiling is to be in accordance with Specification section NA1 122.
Submit at least 3 samples, for ER to select, of tile size, shape, design and colour.
KC
Electrical installation to be in accordance with the "Specification for Design and Installation of Electrical Services Installation". Each worktop section to have a switched two socket.
One socket at location of fridge and of washing machine, below worktop level. These two sockets to have isolating switches near by above worktop level.
All sockets, switches and control boxes above worktop to be at a consistent height approximately 1.2m above floor level.
The cooker extract fan is NOT to be linked to the light switch (see Spec item 1.11.1). It is to have an isolating switch.
KD
Condensing boiler at least 90% efficient, with separate pressure vessel.
KE
Provide wall unit around boiler and other equipment, at same height as other wall units. Box in pipe risers between worktop and wall unit. Boxing depth to be kept to minimum. Box in between wall unit and ceiling. Boxing to match kitchen units.
A August 2015 CONSTRUCTION PRODUCTION
Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
CITY ARCHITECTS DIVISION
RANNOG AILTIRE NA CATHRACH
Local Area Term Maintenance and Refurbishment Works
KIERAN GALLAGHER
Cecilia Naughton
August 2015
A4 @ NTS
TYPICAL KITCHEN LAYOUT
ELECTRICAL LAYOUT
CA 1215 CONS-P_23001-A




WALL UNIT SPECIFIED

WINDOW

BOX IN PIPES

100X100mm TILING

40mm WORK-TOP

600mm BASE UNIT IN PLYWOOD MELAMINE FACED UNITS

MELAMINE FACED FILLER PANEL

1. DO NOT SCALE FROM THIS DRAWING.
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KITCHEN

KA
Kitchen units are to be in accordance with Specification section N11.

Note that sink base unit is to be 18mm plywood, not chipboard.

Submit 3 proposals for kitchen style, for ER to select.
Submit 3 samples, for ER to select, of base colour, door colour, worktop colour, inset sink, extract hood, door handles and sealants.

KB
Tile wall to height and aspect from worktop to underside of wall units.

Tiling is to be in accordance with Specification section N40 122.
Submit at least 3 samples, for ER to select, of tile size, shape, design and colour.

KC
Electrical installation to be in accordance with the "Specification for Design and Installation of
Each worktop section to have a switched twin socket.

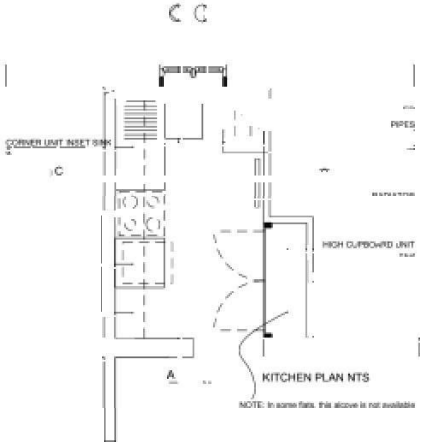
One socket at location of fridge and of washing machine, below worktop level. These two sockets to have worktop level.

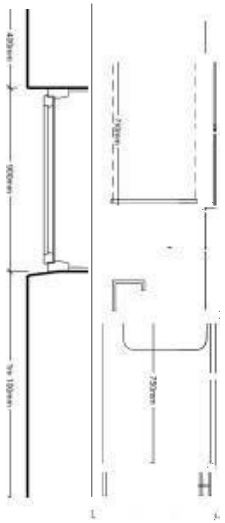
All sockets, switches and control boxes above worktop to be at a consistent height approximately 1.2m above floor level.

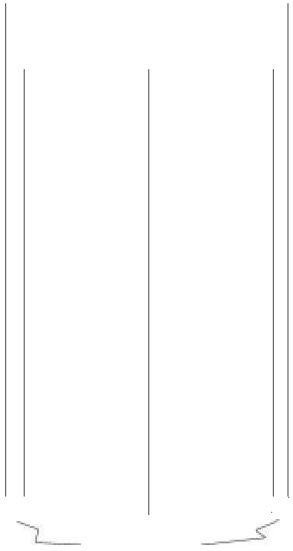
The cooker extract fan is NOT to be linked to the light switch (see Spec item 1.11.1). It is to have an isolating switch.

KD
Condensing boiler at least 90% efficient, with

KE
Provide wall unit around boiler and other equipment
Box in
Boxing depth to be kept to minimum.
Box in between wall unit and ceiling.
Boxing to match kitchen units.
wall units
and wall unit



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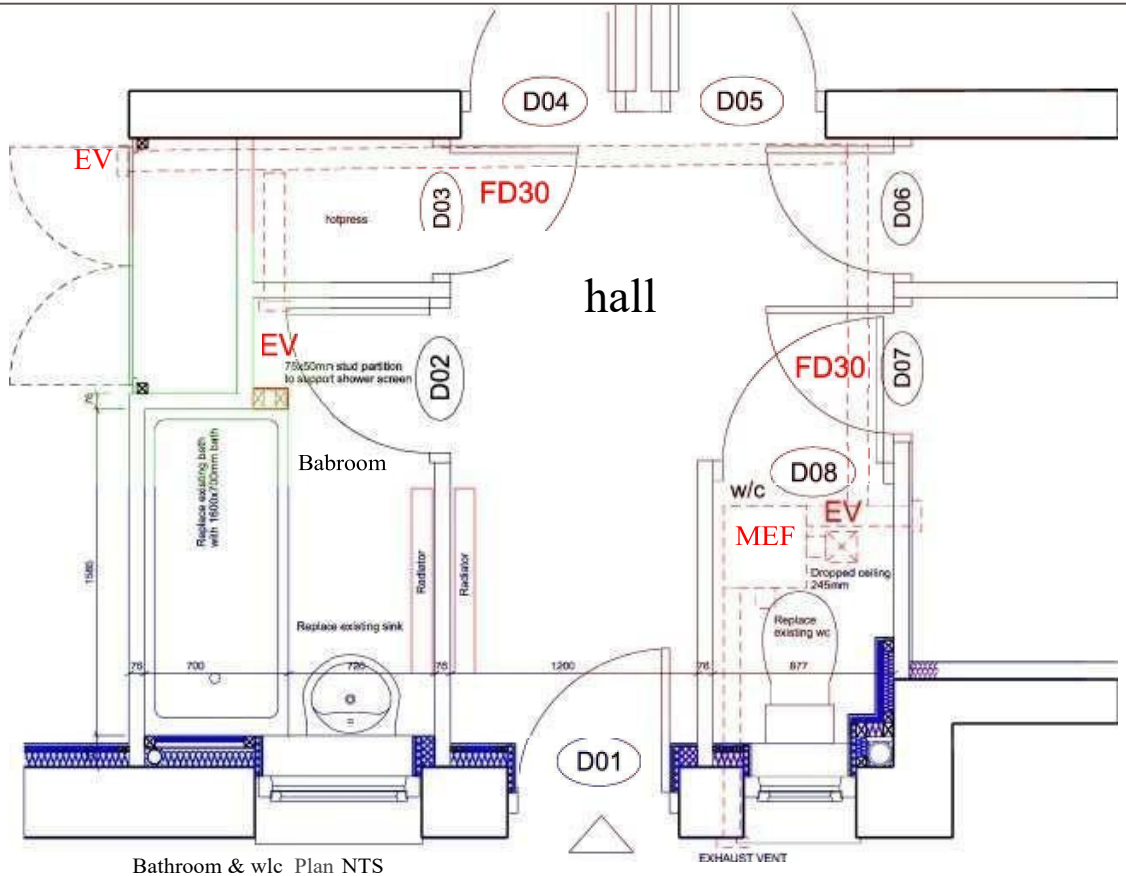
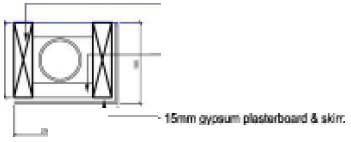
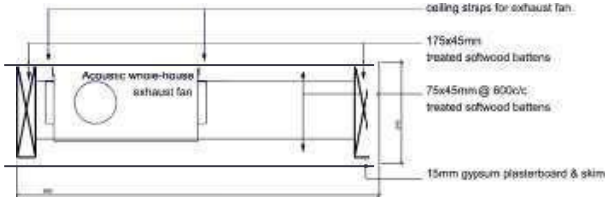



Bathroom & wlc Plan NTS




Ducting Bulk Head NTS




Exhaust Fan Bulk Head (w/c) NTS

Dublin City Council

CITY APCHITE CTS DIVIII IN

TYPICAL BATHROOM

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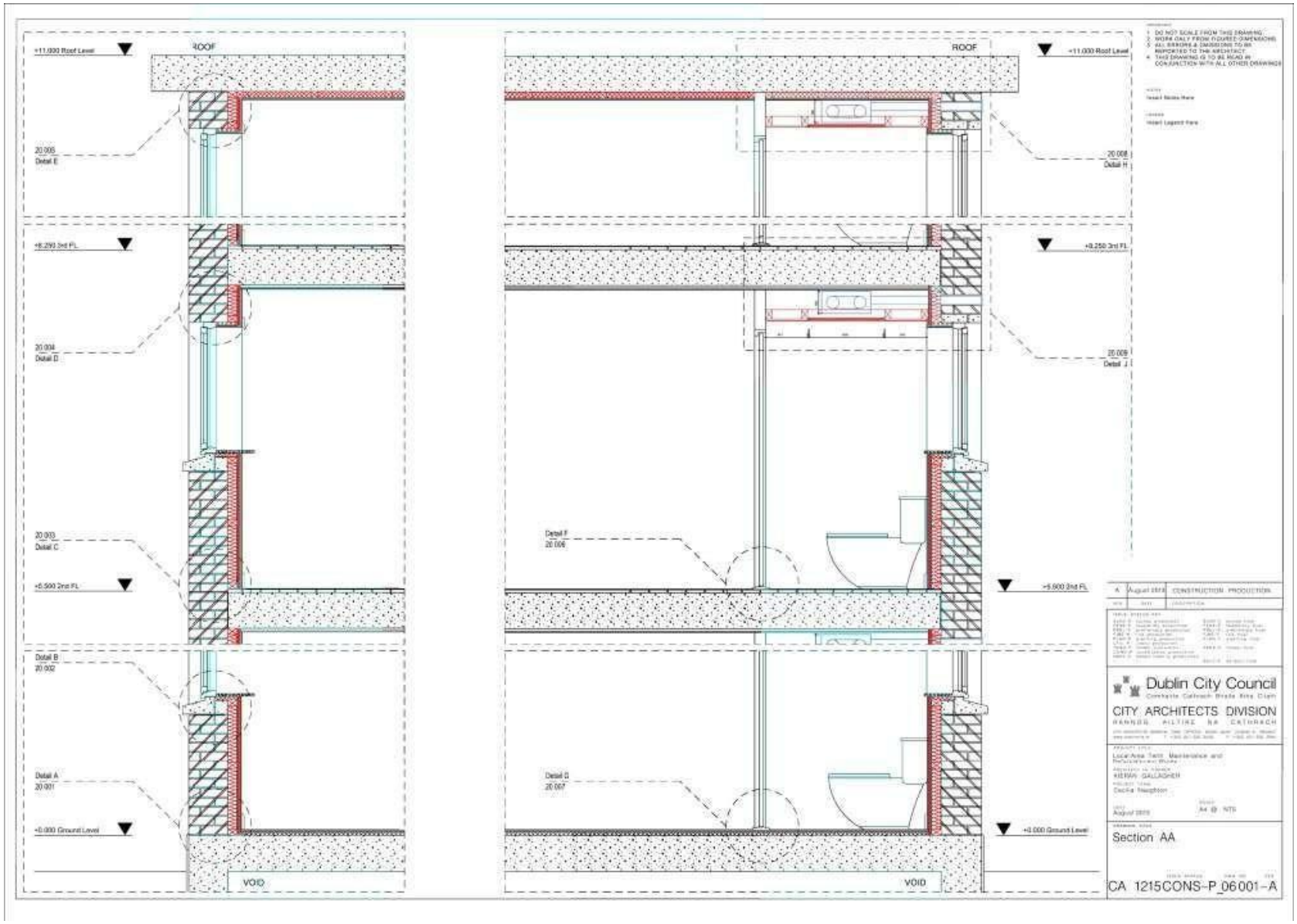
ROOF
+11.000 Roof Level
20.005
Detail E
+8.250 3rd FL
20.004
Detail D
20.003
Detail C
+5.500 2nd FL
Detail B
20.002
Detail A
20.001
+0.000 Ground Level
VOID
ROOF
+11.000 Roof Level
20.008
Detail H
+8.250 3rd FL
20.009
Detail J
Detail F
20.006
+5.500 2nd FL
Detail G
20.007
+0.000 Ground Level
VOID
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Local Area Taxis Maintenance and
KIERAN GALLAGHER
Cecilia Naughton
August 2015
A4 @ NTS
Section AA
CA 1215CONS-P_06001-A

REFERENCES

National Standards Authority of Ireland
Irish/European Standards:

| | | |
|---|---|---|
| IS | 1 | Portland Cement |
| IS | 5 | Aggregates for concrete |
| IS6:1974 | | Concrete sewer pipes with spigot and socket joints and concrete fittings . |
| IS | 8 | Hydrated limit for Building purposes |
| IS | 16 | Knotting |
| IS | 20 | Concrete building blocks |
| IS | 28 | Linseed oil putty for use in wooden frames |
| IS | 32 | Hard glossed enamel paints and appropriate undercoats . |
| IS | 36 | Bitumen roofing felt |
| IS | 48 | Flush wood doors – timber core |
| IS | 57 | Damp proof courses |
| IS | 63 | Wood windows |
| IS | 91 | Clay building bricks |
| IS | 96 | Moisture content of timber for building |
| I.S.EN 124: 1994. | | Gully Tops and manhole tops for vehicle and pedestrian access . |
| IS | 129 | Emulsion Paints |
| IS | 134 | Polythene Pipe Type 32 |
| IS | 189 | Concrete Building Blocks / Bricks . |
| IS | 196 | Wood doorsets |
| IS | 261 | Cast Iron Road Furniture |
| IS | 268 | Metal wall ties for masonry walls |

IS/EN 295–1:1992 Vitrified clayware pipes and fittings and pipe joints for drain sewers.

-END-