

CONSTRUCTION NOTES

GENERAL

1. For setting out refer to architects drawings.
2. All dimensions in mm unless otherwise noted.

FOUNDATIONS

1. Foundations shall be founded on undisturbed ground or on trench fill concrete founded on undisturbed ground
2. The formation level of strip foundations shall be horizontal with all loose material removed. The trench sides and steps shall be, as near as possible, vertical.
3. Trenches shall be kept free of water and should any part of a trench formation level be affected by rainwater, ground water or drying, it should be re-bottomed.
4. Where foundations are stepped, the height of the step should not exceed the thickness of the foundation.
5. The overlap of strip foundations shall be not less than 2 times the vertical dimension of the step, S or the thickness of the foundation T, or 300mm whichever is the larger. The step shall not be greater than 2 times the thickness of the foundations and shall course with the walling material.
6. The overlap of trench fill foundations shall be not less than 2 times the vertical dimension of the step, S or 1000mm, whichever is the larger.
7. Drainage pipes and services to strip foundations shall pass through the rising wall above the foundation and not through or below the strip foundations themselves. Adequate lintels shall be provided in the masonry. Services passing through substructure walls shall accommodate movement which may be achieved by a 50mm clearance gap all round, or a sleeve, with 50mm clearance gap all round and suitably sealed.
8. Where drainage pipes and services to trench fill foundations pass through the trench fill, they shall be either sleeved or passed through a suitably strengthened opening and suitably sealed.
9. Trial pits and slit trenches from previous site investigation works shall be excavated and filled with lean mix concrete where these shall affect new foundations.

CONCRETE SPECIFICATION

1. Concrete specification in accordance with IS EN 206-1:2013. Cement type CEM I N conforming to EN 197-1. The Maximum aggregate nominal upper size shall be 20mm u.n.o.

Element	Specification	Exposure Class	Water/Cement Ratio	Minimum Cement Content (kg/m3)
Lean Mix Blinding	C20/25	X0	0.70	260
Lean Mix Trench Fill	C20/25	X0	0.70	260
Underpinning	C30/37	XC3	0.55	320
Foundations	C30/37	XC3	0.55	320
Below Ground Concrete Elements	C30/37	XC3	0.55	320
Beams	C30/37	XC3	0.55	320
Walls	C30/37	XC3	0.55	320
Columns	C30/37	XC3	0.55	320
Slabs	C30/37	XC3	0.55	320
Screeds	C30/37	XC3 10mm aggregate	0.55	320
External Pavements	C40/50	XD3, XF4	0.45	400

2. Cover to reinforcement

Element	Cover
Foundations	50mm
Beams	35mm
Walls	35mm
Columns	35mm
Slabs	35mm
Screeds	35mm
External pavements	55mm

3. Concrete mix designs shall be provided for review by the engineer prior to placing of concrete.
4. All reinforcement bars shall have a yield strength of 500 N/mm² for bars denoted H. Reinforcement certificates shall be provided for review by the engineer prior to delivery to site.
5. Concrete screeds shall have 1 layer of A252 mesh located at half the depth of the screed u.n.o.
6. Concrete cubes shall be taken for each concrete truck delivery to site. The contractor shall take 3 cubes from each delivery. 1 no. cube shall be crushed at 7 days and 2 no. cubes shall be crushed at 28 days. The cubes shall be tested by an authorized testing laboratory and the results shall be submitted the engineer within 3 days of receipt of the results.

STEELWORK SPECIFICATION

1. All fabricated structural steelwork shall be CE marked in accordance with EN 1090-1 and shall be Execution Class EXC 2 unless otherwise noted.
2. All steelwork shall be grade S275 or S355 in accordance with BS EN 10025. Steel certificates shall be provided for review by the engineer prior to delivery to site.
3. Steelwork paint specification:

All interior hidden steelwork shall be to environment category C2 based on BS EN ISO 12944
System number B3

Shop applied:	
Surface preparation	Blast clean to Sa2.5
Coatings	80 µm High solid epoxy zinc phosphate primer

All interior visible steelwork shall be to environment category C2 based on BS EN ISO 12944
System number B10

Shop applied:	
Surface preparation	Blast clean to Sa2.5
Coatings	80 µm High build zinc phosphate epoxy primer

Site applied:	
Coatings	60 µm Alkyd finish

Steelwork in facades including roof structures

All steelwork in clear separation from the outer leaf shall be to environment category C2 based on BS EN ISO 12944
System number B3

Shop applied:	
Surface preparation	Blast clean to Sa2.5
Coatings	80 µm High solid epoxy zinc phosphate primer

All steelwork in contact with the outer leaf shall be to environment category C3 based on BS EN ISO 12944 with an additional coating
System number B17

Shop applied:	
Surface preparation	85 µm Hot dip galvanize to BS EN ISO 1461
Coatings	2 Coats totalling 200 µm heavy duty bitumen

All external steelwork shall be to environment category C5 based on BS EN ISO 12944
System number E11

Shop applied:	
Surface preparation	Hot dip galvanize to BS EN ISO 1461
Coatings	Mordant wash 40 µm Epoxy primer 100 µm High build epoxy MIO

4. Painting works records and test certificates shall be provided for review by the engineer prior to delivery to site.
5. Fire protection shall consist of an intumescent paint coating to architects detail.
6. Note that any intumescent paint coating applied to the above steelwork must be compatible with the above paint specification.
7. All steelwork in contact with the ground shall have 2 coats totalling 200 µm of heavy duty bitumen emulsion paint to 150mm above ground level.
8. Steel beams supported on concrete bearing pads shall be grouted with 25mm of 50N non shrink grout over the full area of the bearing plate. The ends of the beam shall be fully grouted with no air gaps with 50N non shrink grout or concrete with an aggregate size of 10mm.
9. All welded connections shall be 6mm continuous fillet welds unless otherwise noted.
10. All structural steel bolted connections shall have a minimum of 4 no. grade 8.8 M20 bolts unless otherwise noted.

MASONRY SPECIFICATION

1. Concrete blocks for use above dpc level shall comply with IS EN 771.
2. Solid concrete blocks for use below dpc level shall comply with IS EN 771 and have a density exceeding 1500kg/m³, or a compressive strength not less than 7.3N/mm² and shall be frost resistant. Alternatively, autoclaved aerated concrete blocks for use below dpc level shall comply with IS EN 771 and shall be suitable for use below dpc level.
3. Autoclaved aerated concrete blocks, Quinlite or similar approved, shall be used for all rising blockwork walls and internal blockwork leafs. Refer to the current Quinlite Product Guide for technical information and installation guidelines with particular reference to the Guidance Notes.
4. Autoclaved aerated lightweight concrete blocks shall be independently tested with certification and certificates shall be provided to the engineer for review prior to delivery to site.
5. Autoclaved aerated lightweight concrete blocks shall be constructed in strict accordance with the manufacturer's details and recommendations.
6. Masonry specification:

Location	Block Strength	Mortar Type
Below dpc level masonry (Internal leaf)	13N Solid concrete blocks	Type ii (Sulphate Resisting Portland Cement) (1:4 Cement : Sand)
Below dpc level masonry (External leaf)	13N Solid concrete blocks	Type ii (Sulphate Resisting Portland Cement) (1:4 Cement : Sand)
GL to Roof (Internal leaf)	13N Solid concrete blocks	Type iii (1 : 6 Cement : Sand)
GL to Roof (External leaf)	13N Solid concrete blocks	Type iii (1 : 6 Cement : Sand)

7. All wall ties, tension straps, hangers, brackets and steel lintels shall be in accordance with IS EN 845 - specification for ancillary components for masonry.
8. All ancillary components shall be independently tested with certification and certificates shall be provided to the engineer for review prior to delivery to site.
9. Wall ties shall be supplied by Ancon or similar approved manufacturer. Wall ties in accordance with BS5628 shall be spaced above and below dpc level as follows:

Maximum spacing (mm)	Horizontally	Vertically
General wall area (0-15m)	900	450
At jamb openings and movement joints	within 225 of openings	300

10. Vertical movement joints shall be provided in the outer leaf and straight unbroken lengths of wall as outlined below.

Material	Joint width	Normal spacing
Clay brick	16mm	12m (15 maximum)
Calcium silicate brick	10mm	7.5m to 9m
Concrete blocks or bricks	10mm	6m
Any masonry in a parapet wall	10mm	Half the above spacing and 1.5m from corners

11. The spacing of the first movement joint from a return shall not be more than half of the above stated dimensions.
12. Movement joints in foundations shall be continued through the superstructure and shall run the full height of the masonry wall and be a minimum of 25mm wide.
13. Wall ties shall be provided on either side of movement joints.
14. Load bearing walls, including separating walls shall be provided with lateral restraint at each floor level, at ceiling level below a roof and along the gable edge of a pitched roof.
15. Lateral restraint shall be provided at not more than 1.8m centers by means of either restraint type joist hangers, or restraint straps with a cross section of at least 30mm x 5mm.

16. Precast concrete or in-situ concrete door and window thresholds as per the architect's details shall be built into the internal leaf across the door threshold with a minimum embedment depth of 215mm each side or cast integral with the RC floor slab. Reinforcement to thresholds shall consist of 4 no. H12 bars and H10 links at 200c/c.
17. Doors and windows shall be supported on galvanized steel 100x100 angles 200mm long bolted to the precast or in-situ concrete thresholds at required support points with 2 no. M12 hot dip galvanized anchor bolts per angle.

18. Wall ties shall be embedded a minimum of 50mm onto each masonry leaf. Wall ties crossing a cavity shall have a drip at the mid-span of the cavity. Masonry shall be connected to steel columns with flat L shaped tall ties at 225mm vertically with 5.5x50mm galvanized self drilling screws.
19. Load bearing insulation blocks shall have a minimum compressive strength equal to the compressive strength of the masonry it supports. The insulation shall be independently tested with certification and certificates shall be provided to the engineer for review prior to delivery to site.
20. Masonry support brackets shall be stainless steel grade 1.4301 and supplied by Ancon or similar approved. Brackets shall be suitable for the supported width and height of masonry.

TIMBER SPECIFICATION

1. All new timber shall be grade C16 u.n.o. All structural timber shall be clearly marked to show its strength class.
2. All new roof timber including rafters, joists, purlins, battens, wall plates and sharking to be preservative treated for a pitched roof structure in accordance with BS5268:1989 part 5.
3. Wall plates shall be bedded to line and level using nails or straps to hold them down. Wall plates shall generally be in lengths of not less than 3m but shorter lengths shall extend over at least 3 joists/rafters or trusses. Wall plates shall be joined using half lapped joints at corners and in running lengths.
4. Timber wall plates shall be connected to solid block work with M12 grade 8.8 chemical anchor bolts with oversized washers at 900mm centers.
5. Timber wall plates shall be connected to the top flanges of steel beams with M12 grade 8.8 bolts with oversized washers at 600mm centers staggered along length of beam.
6. Timber joists shall extend a minimum of 12mm above the top and 2mm below the bottom of steel support beams.
7. Timber bridging and blocking shall be provided to all timber floors, flat roofs and pitched roofs.
8. Timber blocking and bridging shall be 3/4 x the depth of the joist and the same width as the joist.
9. Timber blocking shall be installed between adjacent joists at each support a maximum of 150mm from the end of the joist and skew nailed with 2 no. 4x75mm steel wire nails.
10. Timber bridging shall be installed as follows:

Joist span	Rows of bridging
Up to 2.5m	None required
2.5m to 4.5m	1 row at midspan
Over 4.5m	Maximum 2.5m centers, spaced equally along the span

11. Timber bridging shall be installed between adjacent joists as required and skew nailed with 2 no. 4x75mm steel wire nails.
12. Timber packing consisting of blocking sections shall be provided between the wall and the first joist.
13. Solid timber joists shall be doubled up to support a light weight stud partition or to form trimmers.

14. Trimmed openings may be needed around staircase openings and chimneys. Solid trimmed joists may be supported using either joist hangers or notches.

15. Timber joists connected together shall be connected with M10 grade 8.8 bolts with toothed plate connectors and oversized washers staggered at 600mm centers at 1/3 depths of the joists or nails shall be staggered at 450mm centers approximately 20mm from the top and bottom of the joist. Toothed plate, split ring and shear plate connectors should be used in strict accordance with the manufactures recommendations.

16. Joist hangers shall be the correct size for the timber joists and nailed through all holes provided. The heel of the joist hanger shall be fully supported against the supporting structure.

17. Joists shall be connected to joists hangers in accordance with the manufactures recommendations. The joist hanger shall be connected to the top flange of a steel beam with 1 no. 5.5x50mm galvanized self drilling screw.

18. Joist hangers shall be stamped on the base or gusset with the minimum compressive strength of block for which they are recommended. The minimum bearing for hangers on masonry shall be 75mm.

19. The masonry course to carry the joist hangers shall be level, at the correct height and the hangers shall not be cut into the walling.

20. Solid joists shall be notched into the hanger to keep the ceiling line level.

21. Lateral restraint straps shall be installed at a maximum of 2m centers around the perimeter of the floor and across intermediate supports. Straps shall be of galvanized mild steel with a cross section of 30x5mm. Straps should be turned down tight against the external face of the internal masonry leaf by 100mm. Noggings shall be installed at strap locations where the straps are perpendicular to the joists and shall be connected across at least 3 no. joists with 2 no 3.75x30mm square twisted nails to each joist and 2 no. 3.75x30 square twisted nails to each nogging. Noggings shall be 3/4 x depth of the joist and the same width as the joist. Straps perpendicular to the joists shall be recessed flush with the top of the joist. Straps shall be connected to the sides of joists which are parallel to the straps with 4 no. 4x50mm wood screws at a minimum of 150mm centers.

22. Holding down straps shall be installed at a maximum of 1.8m centers to both wall plates and roof rafters. Straps shall be of galvanized mild steel with a cross section of 30x2.5mm. Straps should be connected to the top face of the wall plate with 2 no. 4x50mm wood screws, to the vertical face of the wall plate with 1 no. 4x50mm wood screw and to the vertical face of the masonry wall with 5 no. 4x75mm hardened steel nails at 150mm centers or No. 12 wood screws x 50mm long into plugs shall be used.

23. Restraint straps shall be fixed to the underside of the rafters, to the top of ceiling joists and shall be provided at a maximum of 1.8m centers. The rafters shall not be notched to make the straps flush with the rafter. Restraint straps shall bear onto the centre of bricks or blocks and not on mortar joints and may be fixed onto the side, top or bottom as appropriate for all joists types.

24. Plywood floor sheeting shall be laid with the face grain perpendicular to the span of the joists. Plywood floor sheeting shall be connected to the top of joists with 3.35x65mm plain wire nails or 3x65mm annular ring shank nails at 150mm maximum centers around the perimeter and at 300mm maximum centers along joists.

25. Plywood roof sheeting shall be laid with the face grain perpendicular to the span of the joists. Plywood roof sheeting shall be connected to the top of joists with 4x50mm wood screws at 150mm centers or 3x50mm ring shank nails at 100mm centers along the length of the joist. All butt joints and joints with loose tongues shall be supported on joists or noggings. All end joints shall occur over joists or noggings (44mm minimum thickness). Board thickness shall be not less than 16mm for 450mm joist centers and 18mm for 600mm centers.

26. Softwood tongued and grooved floor boarding shall be closely clamped together and nailed with 2 no. 3x65mm ring shank nails to each joist. Nail heads shall be punched below the timber surface and the ends shall be staggered. The end of a board shall be supported on a minimum of half the width of the supporting joists. Board thickness shall not be less than 16mm for 450mm joist centers and 19mm for 600mm centers.

27. An expansion gap of at least 1.5mm to 2mm shall be allowed between each panel.

28. Movement gaps at abutment with rigid upstands shall be not less than 10mm and gaps between square edge boards shall not exceed 3mm.

29. Trussed rafter roofs and traditional cut roofs shall be supported on timber wall plates and held down with straps. Trussed rafter roofs and traditional cut rafters shall be fixed to the wall plate with a minimum of two 4.5mm x 100mm long galvanized round wire nails, skew nailed, one from each side of the rafters or with truss clips fixed in accordance with the manufactures recommendations.

30. Rafter joists shall be connected to wall plates with galvanized mild steel joist clips fixed in accordance with the manufactures recommendations.

31. All fixings within the external or roof cavity shall be galvanized mild steel or stainless steel.

32. All timber bracing to rafters shall be at least 100mm x 25mm in section and twice nailed to each rafter and to the wall plate with 3.5mm x 65mm long galvanized round wire nails. Diagonal bracing shall be fixed at approximately 45 degrees on plan across the roof. At cross bracing intersections, a 100mm x 25mm x 600mm splice plate shall be fixed with a minimum of 4 no. 3.35mm x 65mm long galvanized round wire nails each side of the intersection driven through bracing and clenched over.

33. Notching to timber joists up to 250mm in depth shall be located between span/10 and span/5 along the top edge from the support and shall be a maximum size of 0.15 times the depth of the joists.

34. Drilling to timber joists up to 250mm in depth shall be located between span/4 and span/2.5 and shall be a maximum size of depth/4.

35. Holes shall be kept apart by at least three times the hole diameter.

36. The faces of all cut timber sections shall be coated with 2 liberal coats of preservative treatment in accordance with BS 52688:1989.

ENGINEERED TIMBER JOISTS

1. The engineered timber floor joist system shall be independently tested with certification and certificates shall be provided to the engineer for review prior to delivery to site.
2. Engineered timber floor joists shall be installed in strict accordance with the manufacturer's recommendations.
3. Fabrication drawings shall be provided to the engineer for review prior to manufacture.

4. All ancillary components, tension straps, hangers, brackets, etc. shall be approved by the manufacture for use with the system.

TIMBER ROOF TRUSSES

3. Timber roof trusses shall be designed in accordance with BS5268-3 or EC5.
2. Timber roof trusses shall be installed in strict accordance with the manufacturer's recommendations.
3. Fabrication drawings shall be provided to the engineer for review prior to manufacture.

ANCHOR BOLTS SPECIFICATION

1. Anchor bolts shall be installed in accordance with the Health and Safety Authority's Code of Practice for the Design and Installation of Anchors.
2. All anchor bolts shall be approved by the European Technical Approval board and have a suitable European Technical Approval (ETA) for the required application. ETA certificates shall be provided to the engineer for review prior to use.
3. All interior anchor bolts shall be zinc plated and passivated.
4. All exterior anchor bolts shall be hot dip galvanized.
5. All exterior anchor bolts in contact with the ground shall be encased in concrete with 50mm cover or shall be of stainless steel grade 1.4401.

WATERPROOFING

1. Waterproofing membranes shall be in accordance with the architect's details to be installed as per the manufactures guidelines. The manufactures guidelines shall be strictly adhered to in relation to the moisture content of base material.
2. Suitable fixings shall be used where fixing through waterproof membranes which shall be installed as per the manufactures guidelines.
3. Waterproofing details shall be submitted to the engineer for review prior to construction.

GENERAL NOTES

1. All works shall be carried out in a safe manner and in accordance with the following:
- The Irish Building Regulations
 - Safety, Health and Welfare at Work Act, 2005
 - Safety, Health and Welfare at Work (General Application) Regulations, 2007
 - Safety, Health and Welfare at Work (construction) Regulations, 2013
2. All site development works shall be carried out in strict accordance with the construction drawings, the requirements of the Local Authority and the Department of the Environment Recommendations for Site Development Works in housing areas.
3. This drawing should be read in conjunction with all other contract documentation, including drawings and specifications.
4. Do not scale from this drawing - use stated dimensions only. If in doubt ask the engineer.
5. The Contractor shall submit a copy of their company safety statement and a site specific safety statement to the Engineer prior to commencement of works on site. The site specific safety statement shall detail precautions to be taken when dealing with hazardous materials (where required).
6. The Contractor shall submit a detailed method statement for the proposed works prior to commencement of operations on site.
7. The Contractor shall erect all boundary fencing and secure the site prior to the commencement of other site operations. The Contractor shall maintain the site boundary fencing for the duration of the works.
8. The Contractor is solely responsible for locating, protecting and maintaining all existing services within the site boundary and in the areas affected by the works. The Engineer has provided information on known services but gives no guarantee that this information, provided by third parties, is correct or that these are the only services on the site.
9. Prior to the commencement of the works the Contractor shall inspect and survey (as required) all existing sewers and manholes which are to be protected and maintained. Cleaning, where instructed, shall be carried out using a jetvac with a working pressure of not less than 2500psi. All branch connections discovered shall be traced and located on site. all details of completed inspections / surveys shall be forward to the engineer for consideration as soon as the information is available.
10. The Contractor shall carry out a CCTV survey of the newly constructed sewers and manholes on completion of the works. Where defects are discovered the Contractor shall carry out the necessary repairs, as specified by the Engineer, at no additional cost to the Client.
11. The Contractor shall notify the engineer in writing of the name and location of all tips used for the disposal of material off site.
12. The Contractor shall ensure that adequate provisions are in place to prevent the spread of dirt, mud and site material on the public road. The Contractor shall ensure that the public roads around the site are cleaned on a daily basis with a mechanical suction sweeper.
13. Prior to the commencement of the works on site the contractor shall erect advance warning signs on approach roads to alert drivers of the site entrance. The Contractor will be required to address traffic management in their method statement.
14. The Contractors attention is drawn to the fact that local residents may be affected by the works. The Contractor shall take all necessary measures to ensure disturbance and inconvenience is kept to a minimum. The contractor shall take measures to minimise the noise and dust levels on the site.
15. Trenching of foundation excavations, the pumping of ground water and disposal of same into the public sewer (including obtaining the relevant discharge licenses) is the responsibility of the Main Contractor.

NOTES:

For setting out refer to Architect's drawings. This drawing to be read in conjunction with all other Architectural and Engineering drawings and all other relevant drawings and Specifications. DO NOT SCALE THIS DRAWING. Figured dimensions only to be used in all cases. Verify dimensions on site and report any discrepancies immediately. This drawing is copyright and must not be reproduced, transmitted or stored in any form without the permission of Stem Consulting Engineers Ltd. except as agreed on this project.

T01	BP	AS	FOR TENDER	27.11.2023
Rev	Dm	Chkd	Amendments	Date

Rev	Dm	Chkd	Amendments	Date
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Drawing Sheet Size	A1
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Client :	B.O.M Stanhope Street Girls Secondary School, Stoneybatter, Dublin 7
Project :	Roof Works at Stanhope Street Girls Secondary School, Stoneybatter, Dublin 7
Title :	Construction Notes
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