MORGAN

ENGINEERING CONSULTANTS

Structural Specification

To be read in conjunction with all drawings.

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1. General

1.1. Do not scale drawings. The Contractor is to check all dimensions on site before carrying out any work.

1.2. This specification together with the Structural Engineer's drawings are to be read in conjunction with Architect's and all other Consultant's drawings and specifications, which should be used to verify layout, setting out, finishes etc. Any discrepancies are to be reported to the Architect before proceeding with the works.

1.3. The Contractor must ensure that the Architect has agreed all necessary party wall notices prior to carrying out works under, on or adjacent to the party wall.

1.4. The Contractor must ensure all Planning, Grade listed & Building Control Approvals are in place prior to carrying out the works.

1.5. Setting out details are shown on the Architect's drawings unless noted otherwise on the drawings.

1.6. All setting-out dimensions are to be confirmed on-site by the contractor.

1.7. The Contractor is to inform the Architect and Structural Engineer if the existing fabric, including foundations, is opened up and found to be inadequate, unsuitable to support the proposed works, or at variance from the details shown on the drawings.

1.8. Items noted on the drawings "to be confirmed on-site" are to be exposed by the Contractor for inspection by the Structural Engineer at the earliest opportunity.

1.9. Holes or chases must not be cut through any structural members without the written consent of the Structural Engineer.

1.10. Nothing included or omitted from this outline specification will relieve the Contractor of his duty to carry out the works in accordance with current standards of safety and good building practice.

1.11. All finishes DPC, DPM, Waterproofing, Insulations etc. are to be specified by other consultants and are to meet Building Regulation Standards as a minimum.

1.12. All materials and workmanship are to be to Approved Document 7 & the standards set out within.

1.13. The contractor is to implement all standards set out within the Building Regulations Documents (lateral restraint straps, tying etc) as part of the general build.

2. Tolerances

2.1. All tolerances are to be agreed with the Architect. The Contractor will be responsible for ensuring that sufficient tolerances are provided and integrated throughout all elements of the works.

2.2. The Contractor is to take account of tolerances detailed elsewhere in the drawings, appended specifications, and British Standards when complying with the above clause.

3. Materials & Workmanship

3.1. All articles, materials and goods shall be new and of good quality, suitable for the required purpose and shall conform to the appropriate British Standard where such exists. Where references to the above are made it shall be inferred that the latest edition applies, together with subsequent amendments, unless otherwise specified.

3.2. All materials and workmanship are to be to Approved Document 7 & the standards set out within.

4. Temporary Works & Stability.

4.1. The Contractor is to complete all necessary Risk Assessment & Method Statements for the proposed works before they commence. Records of the Risk Assessments & Method Statements are to be made available upon request.

4.2. The Contractor is entirely responsible for maintaining the stability of all existing buildings and structures, within and adjacent to the works, and of all the works from the date of possession of the site until practical completion of the works.

4.3. The Contractor shall design, install, and maintain all necessary temporary works and shall advise both the Architect and Structural Engineer at least ten working days from the commencement of the works, of their proposals for temporary supports and sequence of construction for the works. These proposals shall be supported by design calculations if requested.

4.4. The design of temporary works shall include an assessment of the loads to be resisted and is to be undertaken by a competent person. Due regard shall be given to lateral stability as well as to the support of vertical loads. Temporary shoring to vertical elements (eg. Party Walls) to be designed to resist a minimum of 5% of dead load, supported by the element, above any level of the point of contact of the shoring.

4.5. The Contractor is to familiarise themselves with the building and its structure so that he is aware of the nature and magnitude of the loads to be supported.

4.6. Care is to be taken to ensure that temporary props remain adequately seated and tightened so that support to the structure above is not allowed to yield during building operations.

4.7. The Contractor is to ensure that the temporarily propped structure is adequately wedged, pinned & packed off the permanent works prior to the removal of any temporary supports.

4.8. The Contractor shall ensure that any completed or partially completed structural element is not overloaded. Details of design loads may be obtained from the Structural Engineer.

4.9. All temporary works to support the sides of excavations for new foundations shall be designed in accordance with BS 5975 and any other approved documents.

4.10. Excavations shall in no circumstances encroach within 45° of the bottom near side of any existing footing.

5. Demolition

5.1. Demolition is to be carried out to and in accordance with BS 5975, BS 6187: 2011, Health and Safety Executive Guidance Notes and any other relevant statutory undertakings or regulations.

5.2. Demolition is to be undertaken in the reverse order of construction. No part of the structure is to be left in an unsupported condition overnight or for long periods.

5.3. Demolition is to be undertaken in a manner which avoids excessive noise and nuisance. All work is to be well-watered to minimise dust. All material is to be carted away from the site as soon as practicable.

6. Excavating & Filling

6.1. Trial pits are to be excavated prior to construction to confirm the site ground conditions. A site-specific ground investigation is recommended.

6.2. The groundwater level on the site is not known.

6.3. Inspect all available drawings and make enquiries about existing services on site. Verify positions and depth of all services before the commencement of work on site. Services which are being retained during any phase of the works are to be protected.

6.4. Before starting work verify with the Architect which existing fences, gates, walls, paved areas, trees, shrubs, hedges, bushes and any other site features are to be removed. Materials arising are to be removed from the site.

6.5. Workmanship for excavating to comply with BS 8000: 2014.

6.6. Where an excavation encroaches below a line drawn at an angle of 45° from the horizontal from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto must be completed before the higher excavation is made.

6.7. Make advance arrangements with the Building Control officer and/or Architect for the inspection of foundations and trenches requested at the beginning of the works. Remove the last 150mm of excavations just before inspection. Trim excavations to required profiles and levels, and remove all loose materials. Unless otherwise instructed seal formations within 4 hours of inspection with concrete or other specified fill.

6.8. Backfill any excavations for foundations taken deeper than required with lean mix concrete. Excavations other than foundations taken deeper than required may be backfilled with well-graded granular material.

6.9. A Hardcore to be granular material, free from harmful matter, well graded, passing a 75mm BS sieve and one of the following:

- Crushed concrete, brick or tile, free from old plaster.
- Gravel.

Spread and level both backfilling and general filling in layers not exceeding 150mm. Thoroughly compact each layer with a vibratory roller, vibrating plate compactor, vibro- tamper, power rammer or other suitable means appropriate to the area being worked.

6.10. Hardcore underground bearing concrete slabs are to be as above and not less than 150mm thick, unless noted otherwise on the drawings. Excavate extra material as necessary. Increase the thickness of hardcore as necessary to make up levels from stripped site levels to the underside of slabs.

6.11. Surfaces over hardcore to receive sheet overlays or concrete to be blinded with sufficient sand or fine gravel to fill interstices and provide a close smooth surface (50mm min thickness), unless noted otherwise on the drawings. Permissible deviations on the surface level are to be +0 -15mm.

6.12. Minimum void under suspended ground floors to be 300mm for precast concrete and 300mm for timber floors. Suspended in-situ concrete floors shall be cast over a suitable void former to provide a void of 150mm under the slab, unless noted otherwise on the drawings.

7. Foundations

7.1. The foundation design is based on the assumption that strata capable of providing a design bearing capacity of 100kN/m² UNO, will be found at the depths indicated. Foundations shall be founded at the depths indicated. The discovery of conditions not in accordance with this assumption shall be reported to the Engineer before proceeding with the construction of the foundations.

7.2. Bottoms of all foundation excavations shall be trimmed, levelled, and protected from inclement weather.

7.3. Bottoms of excavations to receive reinforced concrete shall be blinded with not less than 50mm of designated concrete grade GEN1 to BS EN 206, BS 8500-1 and BS 8500-2.

7.4. Foundations taken down lower than the depths indicated shall, with the approval of the Engineer and NHBC, Building Control or other statutory bodies, be made up with designated concrete grade GEN3 to BS EN 206, BS 8500-1 and BS 8500-2.

7.5. Foundation excavations and the surrounding site shall be kept free of water.

7.6. In order to suit levels, the bottoms of foundation excavations may be stepped a maximum of 500mm high by a minimum of 1000mm long unless otherwise noted on the drawings.

7.7. The Contractor is responsible and liable for ensuring the stability of the works and services at all stages of construction.

7.8. Reinforced concrete shall be compacted by means of a mechanical vibrating poker and the workability shall be such that, when compacted, a dense concrete, free from voids shall be produced.

7.9. Construction joints in mass concrete foundations shall be located at least 1.5m from any foundation junction, pad base or step-in underside of the foundation. Joints are to be formed against a vertical grout tight shutter and shall incorporate 4 H16 bars x 800 long (2 top, 2 bottom) with 100mm cover to sides.

7.10. Footings are to be founded 300mm below the invert of any adjacent/perpendicular existing or proposed drainage, or as shown on the drawing, whichever is deeper.

7.11. The Contractor is to ensure, so far as reasonably practical, that the client has obtained all necessary Building Regulations and/or similar approval before he commences work on site.

7.12. The Contractor is to ensure that the Building Control Officer is notified for his inspection of the bottom of all foundations prior to concreting.

8. Foundations in Clay

8.1. Foundation depths shown on the drawings are based on the greater of:

Depth to suit trees to remain as shown on the drawings.
Depth to suit trees to be removed as shown on the drawings.
Depths to suit new tree and shrub planting as shown on the drawings.
Depths shown are to be measured from existing or final ground levels, whichever gives the greatest depth, unless otherwise shown on the drawings.

8.2. Foundation depths shall be increased as required to penetrate a minimum of 500mm below any root activity. Depths determined by this requirement shall not be less than those shown on the drawings.

8.3. To ensure compliance by the Contractor, a Banksman shall be employed to inspect excavated soil during the final 500mm of any excavation. The Banksman should break open clumps of soil excavated to examine the soil for roots. If in doubt the Engineer should be consulted before proceeding further with the construction of the foundations.

8.4. All foundations shall be constructed with a vertical face without the presence of any overbreak or concrete overspill. The Engineer is to be informed if such criteria are not met to agree on appropriate remedial action.

8.5. Foundation depths shown apply only to the location of buildings and details of trees & shrubs shown on the drawings. Report to the Engineer if site conditions or details of trees/shrubs vary from the information shown.

8.6. Where no details of proposed planting are shown on the drawings, the Client/Employer shall ensure that new planting complies with the following requirements:

Water demand of tree (see NHBC Standards, Ch. 4.2: Appendix 4.2B)	**No tree planting zone for minimum foundation depth**
High	1.25 x mature height
Moderate	0.75 x mature height
Low	0.50 x mature height

Volume change potential	**No shrub zone (m)**
High	3.0
Medium	2.5
Low	2.0
NOTE: Maximum mature height of shrub = 3.0m	

8.7. Foundations to each plot, or group of units shall bear onto consistent ground conditions throughout.

8.8. Where foundations bear into non-shrinkable soils (such as sands and gravels) which are underlain by shrinkable clay, foundation depths may be varied to suit site conditions subject to the receipt of prior written approval of the Engineer and Local Authority.

8.9. Where non-shrinkable soils (such as sands and gravels) underlie shrinkable clays, foundation depths may be varied to suit site conditions subject to the receipt of prior written approval of the Engineer and Local Authority.

8.10. Sleeves/lintels etc. to allow drains and services to pass through foundations and substructure walls shall allow for the following potential ground heave:

Soil volume change potential (see note 2)	Potential ground heave
High	150 mm
Medium	100 mm
Low	50 mm

8.11. The Contractor is to ensure, so far as reasonably practical, that the client has obtained all necessary Building Regulations and/or similar approval before he commences work on site.

8.12. Foundations in Clay are to be provided with the following heave protection.

- Trench Fill Foundations

Provide compressible material against the inside face of all external wall foundations greater than 1.5m deep to give a 35mm void. The compressible material is to be positioned 500mm above the bottom of the foundation.

9. Masonry

9.1. Workmanship is to comply generally with BS 5628. Brickwork to be BS EN 771. Blockwork to be to BS 6073.

9.2. New brickwork above dpc is to be a minimum 10N/mm2 capacity with mortar designation (iii). Unless noted otherwise.

9.3. New blockwork above dpc is to be of minimum strength of 3.6 N/mm² capacity with mortar designation (iii). Unless noted otherwise.

9.4. Brickwork and blockwork are to be laid properly bonded as agreed with the Architect and fully bonded into existing work or as specified otherwise on the drawings. All perpends must be fully filled with mortar.

9.5. New facing brickwork below dpc is to be minimum 20N/mm2 capacity, foundation quality with mortar designation (ii). Unless noted otherwise.

9.6. All other masonry below dpc is to be minimum 7.3N/mm2 capacity, foundation quality with mortar designation (ii). Unless noted otherwise.

9.7. Do not lay masonry when the ambient air temperature is less than 5°C.

9.8. Cavity wall ties shall be stainless steel double triangle type ties to BS EN 845-1, for cavities of 75mm or less, spaced at 450crs vertically, 900crs horizontally staggered, and at 225crs vertically 150mm from all openings, corners, movement joints and reveals. Minimum embedment to be 50mm into each masonry leaf. Cavities of greater than 75mm width to have stainless steel vertical twist ties at similar centres.

9.9. Movement joints in facing brickwork are to be formed by building with a 10mm expanded foam filler board, ancon deboned ties @ 225mm vert ctrs & a waterproof mastic seal.

9.10. Where pinning up to soffits is required, completely fill the joint at the top of loadbearing walls with 1:3 cement/sharp sand dry pack mortar, well rammed into position using temporary shuttering.

9.11. Carry up work with no portion or section of wall more than 1.2m above another at any time, raking back between levels. Do not carry up work higher than 1.5m in one day.

9.12. Spacing of movement joints in brickwork and blockwork are not to exceed 12.0m internally and 6.0m from corners, respectively.

9.13. Provide stainless steel bed joint reinforcement, Ancon AMR, at 225 and 450mm vertical centres above external doors & windows. Bed joint reinforcement to extend 450mm minimum past door / window line.

9.14. All steel lintels to be fully galvanised and have a minimum 150mm bearing to each end unless noted otherwise.

10. Lintels

10.1. External walls: provide proprietary lintels as specified on the drawings or equivalent approved by an alternative manufacturer.

10.2. Internal walls: provide proprietary Catnic box lintels to loadbearing internal walls as specified on the drawings or equivalent approved by an alternative manufacturer.

10.3. Provide proprietary Catnic internal lintel to small openings in non-loadbearing blockwork walls or equivalent approved by an alternative manufacturer.

10.4. All steel lintels are to be fully galvanised and have a minimum 150mm bearing to each end unless noted otherwise.

11. Timber

11.1. New timber in the works is to be minimum grade C24 to BS 5268. Unless noted otherwise.

11.2. New timber in the works is to be vacuum impregnated with preservative to BS 5268: Part 5 and the manufacturer's recommendations. Cut ends are to be thoroughly treated with brush applied coats of appropriate preservative before fixing. All preservatives are to be to the Architect's approval.

11.3. Structural timbers may only be drilled or cut for services as noted below.

Notches in the joists are to be at the top and located between 0.1 and 0.25 of the span from the support. Notch cannot be deeper than 0.125 of the joist depth.
Holes in the joists are to be along the centre with maximum diameter of 0.125 of the joist depth.

11.4. Sizes of new structural timbers noted on the drawings are sawn basic sizes.

11.5. All screws, nails, timber connectors, joist hangers, steel straps etc, are to be galvanised. Joist hangers, straps, connectors etc, shall be purpose made and of manufacture or performance stated on the drawings. All such items are to be fixed in accordance with the manufacturer's recommendations, unless shown otherwise on the drawings.

11.6. All existing timbers are to be inspected at the beginning of the works by a specialist sub-contractor for rot and infestation. Details of replacing or strengthening any defective timbers recommended by the specialist are to be agreed on-site.

11.7. Trimmers to openings in floors and ceiling construction shall be jointed to the trimming joists with joist hangers unless noted otherwise on the drawings.

11.8. Double up joists under new partitions running parallel to the joist span. Doubled joists are to be bolted together at 600mm centres using M12 bolts and oversize washers, unless noted otherwise on the drawings.

Provide solid noggins under new partitions running perpendicular to the joist span.

11.9. In all new timber floors full depth noggins 50mm wide are to be provided along lines of support and at mid span for spans exceeding over 2500mm and at 1/3 and 2/3 span positions for spans exceeding 4500mm, unless noted otherwise on the drawings.

11.10. Timber floor joist shall have minimum bearings of 100mm on masonry and 75mm on steel beams or timber plates except as noted on the drawings. Timber floor joists shall not be built into party wall constructions but shall be supported on proprietary joist hangers at such locations. Restraint type joists hangers capable of resisting tensile forces, in accordance with BS 5628-1 appendix C to be used. Alternatively, provide restraint straps at not more than 2.0m centres using 30mm x 5mm galvanised straps with a turn down length of 100mm and straight length of 600mm. Straps fixed to floor joists with 50mm, No.10 screws at not more than 110mm centres and a minimum of 4 fixings.

11.11. Double joists shall be provided under non-load bearing studwork partitions running parallel with joist spans, under baths and under airing cupboard

11.12. All members supported on proprietary hangers shall be accurately cut to provide a full contact with the base of the hanger and shall be fixed in accordance with the hanger manufacturer's instructions. Joists shall be rebated to lie flush with underside of hangers.

11.13. All members fitted into steel beams shall provide a good fit to the web of the beam and shall be notched the minimum amount required to clear the beam flanges. Where steel beams are specified within the floor depth, the underside of joists shall be 5mm below the underside of the beams.

11.14. External and party walls parallel with joists spans shall be restrained at top of floor joist level at not more than 2.0m centres with galvanised 30 x 5.0mm straps extending over a minimum of 3 joists. Noggins not less than 75% of joist depth and timber blocking adjacent to walls shall be fixed between joists at all strap locations. Straps shall be fixed to members/noggins with not less than 4 no. 32 x 3.5mm galvanised or sherardised square twisted nails.

11.15. End joists shall be positioned approximately 50mm from masonry walls. Joist centres generally shall be equal and shall not exceed the design centres shown on the drawing. Multiple joists, where shown on the drawings shall be securely nailed together at not more than 600mm centres.

11.16. Unless specified otherwise, securely fix strutting between joists at centres as follows:

Joist span of 2.5m to 4.5m: - one row at centre of span.

Joist span over 4.5m: - two rows equally spaced.

Strutting shall take the form of: Solid softwood strutting not less than 38mm thick at least three-quarters of the depth of the joist.

11.17. Timber wall plates shall not be less than 50x100mm in cross-section (except where otherwise noted on the drawings) and shall be laid to level on a mortar bed on masonry walls or fixed to steel beams by suitable powder actuated fasteners or minimum M8 dia. bolts at not more than 900mm centres.

11.18. Wall plates shall be strapped down to masonry walls at not more than 2.0m centres in houses and 1.25m centres in flats with galvanised 30x2.5mm straps having a size of not less than 100x900mm. Straps shall be securely fixed to wall plates with not less than 2No. 32x3.5mm galvanised or sheradised square twisted nails and to walls with not less than 6No. proprietary plastic plugs and 50mmx12G woodscrews evenly spaced along the strap.

11.19. All loose timber rafters, ceiling joists, prefabricated trussed rafters and the like shall be fixed to timber wall plates, purlins etc. with suitable proprietary galvanised truss clips. All nail holes in truss clips shall be filled with 32x3.5mm galvanised or sherardised square twisted nails.

11.20. Gable walls, Party Walls and internal partitions extending into the roof space shall be restrained at the top of ceiling joists and underside of rafter level at no more than 2.0m centres with galvanised 30x5.0mm straps having a size of not less than 100x900mm. Noggins not less than 75mm deep and timber blocking adjacent to walls shall be fixed between members at all strap locations. Straps shall be fixed between members at all strap locations. Straps shall be fixed to members/noggins with not less than 4No. 32x3.5mm galvanised or sherardised square twisted nails.

11.21. Timber members shall not penetrate fire stop walls in roofs. Provide suitable galvanised metal hangers to support trusses, rafters etc., as required to avoid such penetrations.

11.22. Timber Fixing Schedule

TIMBER FIXING SCHEDULE

SOLE PLATE TO BLOCKWORK - SOLE PLATE CLIPS TO BE PROVIDED AT 0.6m CTRS AND FIXED WITH 2 X 5mm DIA 65mm LONG SCREWS AND PLUGS INTO MASONRY AND NAILED INTO TIMBER WITH 2 X 2 3.5mm DIA 65mm LONG ANNULAR RING SHANKED NAILS FROM EITHER SIDE
STUD TO SOLEPLATE / WALL PLATE - 2 X 2 3.5mm DIA 75mm LONG ANNULAR RING SHANKED NAILS CROSS NAILED FROM EITHER SIDE
MULTI / CRIPPLE STUD – 3.5mm DIA 75mm LONG ANNULAR RING SHANKED NAILS @ 150mm CTRS FROM EITHER SIDE
MULTI JOIST - M12 GRADE 4.6 BOLTS, WASHERS & DOG TOOTH PLATES @ 300mm CTRS STAGGERED ABOUT THE CENTRE LINE
FLITCH BEAM - M12 GRADE 4.6 BOLTS & WASHERS @ 300mm CTRS STAGGERED ABOUT THE CENTRE LINE
COLLAR TIE – M12 GRADE 4.6 BOLT, WASHERS & DOG TOOTH PLATES TO EACH END
LINTEL - 3.5mm DIA 75mm LONG ANNULAR RING SHANKED NAILS @ 150mm CTRS FROM EITHER SIDE
JOIST TO STUD WALL - SIMPSON STRONG TIE HANGERS, FIXED TO MANUFACTURERS SPECIFICATION
JOIST TO STEEL BEAM - SIMPSON STRONG TIE HANGERS, FIXED TO MANUFACTURERS SPECIFICATION
LINTEL TO STUD - 2 X 2 3.5mm DIA 75mm LONG ANNULAR RING SHANKED NAILS CROSS NAILED FROM EITHER SIDE
JOIST TO JOIST - SIMPSON STRONG TIE HANGERS, FIXED TO MANUFACTURERS SPECIFICATION
RAFTER TO STUD WALL - SIMPSON STRONG TIE HANGERS FIXED TO MANUFACTURERS SPECIFICATION
OSB/PLY - 3.5mm DIA 65mm LONG ANNULAR RING SHANKED NAILS @ 150mm CTRS
RESTRAINT STRAPS - LIGHT DUTY RESTRAINT STRAPS TO BE PROVIDED AT 1.2m CTRS AND FIXED WITH 4 X 3.5mm DIA 65mm LONG ANNULAR RING SHANKED NAILS
NOGGINS - NOGGINS TO BE PROVIDED BETWEEN JOISTS AND STUDS AT 1.2m CTRS AND FIXED THROUGH WITH 2 X 2 3.5mm DIA 75mm LONG ANNULAR RING SHANKED NAILS CROSS NAILED FROM EITHER SIDE

12. Steelwork

12.1. All materials, fabrication, workmanship and erection of steelwork shall be in accordance with the National Steelwork Specification for Building Construction, as published by the British Constructional Steelwork Association.

12.2. All structural steel sections are to be Grade S355 to BS EN 10025, unless noted otherwise on the drawings.

12.3. Steelwork connections shall comprise not less than:

2 No M16 dia. gr. 8.8 bolts for members up to 25 kg/m

4 No. M16 dia. gr. 8.8 bolts for all other members, except where otherwise shown on the drawings.

Where connection loads are provided by the Engineer, the steelwork contractor shall design connections which will be subject to comment by the Engineer.

12.4. All welding is to comply with BS EN 1011. Site welding shall not be permitted except with the written approval of the Structural Engineer.

12.5. All welds are to be 6mm fillet welds or full-strength butt welds, unless noted otherwise on the drawings.

12.6. Steel beams shall at least have the minimum bearings on masonry walls as shown on the drawings. Where no details of bearings are shown provide bearings to the full width of the supporting leaf or 150mm whichever is greater.

12.7. Steel columns shall be raised or lowered to the correct levels off foundations/masonry supports using sawn steel packs not less than 75mm square. Allowance shall be made for nominal 25mm thickness of grout between column baseplates and foundations/masonry supports. Grout shall take the form of neat cement slurry with a non-shrink additive and should be just fluid enough to pour.

12.8. Site modifications to structural steelwork shall not be carried out unless prior approval has been obtained from the Engineer.

12.9. All structural steelwork shall be blast cleaned to BS 7079 : Part A1, preparation grade Sa21/2 and, except where specified as galvanised, shall be painted with a suitable good quality high build epoxy zinc phosphate primer to provide a dry film thickness of not less than 75 microns. A pre-fabrication primer may be used at the fabricators discretion. The contractor shall ensure that the primer used is compatible with subsequent coatings specified by others. (e.g. intumescent paint).

12.10. Steelwork specified as galvanised shall be blast cleaned as above & hot dip galvanised to BS EN ISO 1461:2022 minimum coating thickness 85 microns.

12.11. All steelwork below dpc level or built within the masonry wall cavity shall be site painted with a compatible high build epoxy zinc phosphate primer to provide a dry film thickness of not less than 125 microns, to achieve an overall primer coating of 200 microns of zinc phosphate primer/buildcoat or equal. Steelwork below dpc shall also be encased in not less than 100mm of concrete not weaker than specified on the drawings. The Engineer is not responsible for dimensional information except where shown on their drawings. All setting out information, dimensions etc. Shall be calculated from the architect's drawings & site.

12.12. Steelwork Contractor to co-ordinate with Main Contractor and cladding Contractor to provide all necessary secondary steelwork, trimming etc. as required around all doors, windows and the like.

12.13. Erection & setting out of steelwork. Set out and erect to BS EN 1090-2. Provide all temporary erection bracing necessary to ensure stability of the building during erection. Remove when it is safe

to do so, timing to be agreed with the Main Contractor. Do not distort steelwork and do not exceed stress limits during erection unless otherwise approved.

12.14. Unless prior written approval is given by the Structural Engineer, the steelwork shall not be used for any temporary lifting or as part of a fall arrest system.

12.15. Fire protection to all steelwork is to be to the Architect's details.

13. Manufactured Timber Floor Joists

13.1. All structural timber floor members, and framing connections/hangers to be designed and manufactured by specialist. Design to be in accordance with Building Regulations and NHBC Standards.

13.2. The setting out and dimensions shall be in accordance with the Architect's and specialist's drawings.

13.3. Timber floor joists shall not be built into party or external wall constructions but shall be supported on proprietary joist hangers to the joist supplier's requirements at such locations.

13.4. All members supported on proprietary hangers are to have full contact with the base of the hanger and shall be fixed in accordance with the hanger manufacturer's instructions.

13.5. All members fitted onto steel beams to be supported on proprietary joist hangers to detail by floor joists manufacturer. Where steel beams are specified within the floor depth, the underside of joists shall be 5mm (minimum) below the underside of the beam.

13.6. External and party walls parallel with joist spans shall be restrained at top of floor joist level at not more than 2.0m centres in houses and 1.25m in flats with galvanised 30 x 5.0mm straps extending below top flange for a minimum of 3 joists. Noggins not less than 75% of joist depth and timber blocking adjacent to walls shall be fixed between joists at all strap locations. Straps shall be fixed to members/noggins with not less than 4 No. 32 x 3.5mm galvanised or sherardised square twisted nails (or alternative detail by joist manufacturer).

13.7. All noggins/struts/blockings are to be in strict accordance with manufacturer's details.

13.8. Overall stability of timber floors during construction to detail by joist manufacturer.

13.9. Engineered timber joists to be designed to BS5268, the span directions shown & an unfactored design load of

Dead Load: 0.75kN/m2

Live Load: 2.00kN/m2

13.10. Reference should be made to the proprietary floor joist designer/manufacturer details regarding the allowable positioning and sizes of service penetrations through the floor members.

14. Manufactured Timber Roof

14.1. All structural timber roof members, and framing connections/hangers to be designed and manufactured by specialist. Design to be in accordance with Building Regulations and NHBC Standards.

14.2. Timber roof joists shall not be built into party or external wall constructions but shall be supported on proprietary hangers/connectors at such locations.

14.3. All members supported on proprietary hangers are to have full contact with the base of the hanger and shall be fixed in accordance with the hanger manufacturer's instructions.

14.4. All members fitted onto steel beams to be supported on proprietary joist hangers to detail by roof joists manufacturer. Where steel beams are specified within the roof depth, the underside of joists shall be 5mm (minimum) below the underside of the beam.

14.5. External and party walls parallel with joist spans shall be restrained at top of joist level at not more than 2.0m centres with galvanised 30 x 5.0mm straps extending below top flange for a minimum of 3 joists. Noggins not less than 75% of joist depth and timber blocking adjacent to walls shall be fixed between joists at all strap locations. Straps shall be fixed to members/noggins with not less than 4 no. 32 x 3.5mm galvanised or sherardised square twisted nails (or alternative detail by joist manufacturer). Straps shall be securely fixed to wall plates with not less than 2 No. 32 x 3.5mm galvanised or sheradised square twisted nails and to walls with not less than 6 No. proprietary plastic plugs and 50mm x 12G woodscrews evenly spaced along the strap.

14.6. All noggins/struts/blockings are to be in strict accordance with manufacturer's details.

14.7. Overall stability of timber roofs during construction to detail by joist manufacturer.

14.8. Engineered roof joists to be designed to BS5268, the span directions shown & an unfactored design load of
Dead Load: 1.25kN/m2

Live Load: 0.85kN/m2

Wind: To BS6399

14.9. Timber members shall not penetrate fire stop walls in roofs. Provide suitable galvanised metal hangers to support joists etc., as required to avoid such penetrations.

14.10. Overall stability of timber roofs during construction to detail by joist manufacturer of the depth of the joist.

15. Drainage

15.1. All levels are to be confirmed on-site.

15.2. Refer to Architect's drawings for above-ground drainage locations.

15.3. The contractor shall, before commencing the works, verify all existing outfall chamber invert levels and site and setting out dimensions. The contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions, and alignment of all parts of the works.

15.4. All earthworks are to be undertaken in accordance with the specification for highway works, including laying, tolerances, compaction, site preparation and material selection and grading.

15.5. Connection pipework to public sewers to be clay, concrete or ductile iron.

15.6. All building drainage to be installed and tested in compliance with the building regulations 2000 drainage and waste disposal, approved document H, 2002 edition.

15.7. All components and materials are to be manufactured and supplied in accordance with the relevant British Standards, laid and backfilled in accordance with the manufacturer's instructions and the relevant British Standards.

15.8. Insitu concrete for use in general drainage works shall be in accordance with BS:8500, the recommendations of the site investigation report and bre digest 1 "concrete in aggressive ground" to meet any expected sulphate conditions.

15.9. All gullies, channels and manhole covers are to be set 5mm lower than indicated on the drawing (i.e. 5mm lower than the adjacent surface). all drain and sewer pipes are to be laid soffit to soffit, unless shown otherwise.

15.10. All above-ground drainage to incorporate rodding access facilities.

15.11. All manhole covers and frames shall be manufactured from ductile iron and comply with BS EN: 124 and be marked 'FW' or 'SW'. they shall be non-ventilating type and have closed keyways. the minimum frame depth shall be 100mm. Manhole covers in trafficked areas to be D400 grade, C250 grade to be used in pedestrian only locations.

15.12. Small lightweight access covers should be secured (e.g. with screws) to deter unauthorised access.

15.13. Inspection chambers and manholes in buildings to have mechanically fixed airtight covers unless the drain itself has watertight access covers.

15.14. Manholes deeper than 1m to have galvanised steel step irons or fixed ladders.

15.15. Manhole covers within block paved areas are to be recessed with block paving to match.

15.16. All drainage channels and gullies to include 'heelguard' grating.

15.17. Contractor to undertake a pre-construction cctv drainage survey to confirm that no existing third party connections require maintaining or diverting through the development site.

15.18. All pipework connections to be made matching soffit level.

15.19. All manhole cover levels shown are approximate and should be adjusted accordingly to suit the external levels strategy.

15.20. All foul & surface water drainage appliances & downpipe connection to have water sealed traps.