SPECIFICATION AND CONTRACT PROPOSAL

IN RESPECT OF

The Pavillion at the Recreation Ground, BS36 1LU

FOR AND ON BEHALF OF

WINTERBOURNE PARISH COUNCIL

WBC REF: 2241154

05 MARCH 2025

WESTERN
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SECTION ONE

PROJECT INTRODUCTION

1.0 INTRODUCTION

PROJECT OUTLINE

1.1. The project comprises the construction of single-storey side and front extensions, internal refurbishments and the erection of a new canopy as detailed herein.

The following documents have been provided for review:

Architectural detailed drawings (Appendix C)

- (3)001 – Proposed Location Plan, dated 29 October 2024
- (3)002-1 – Existing Block Plan, dated 29 October 2024
- (3)002-2 – Proposed Block Plan, dated 29 October 2024
- (4)003 – Existing GA Floor Plan, dated 19 December 2024
- (4)004 – Existing GA Roof Plan, dated 19 December 2024
- (4)005 – Existing GA Elevations, dated 19 December 2024
- (4)006 – Proposed GA Floor Plan, dated 19 December 2024
- (4)007 – Proposed GA Roof Plan, dated 19 December 2024
- (4)008 – Proposed GA Elevations, dated 19 December 2024
- (4)009 – Section A, dated 19 December 2024
- (4)010 – Section B, dated 29 October 2024
- (4)011 – Section C, dated 19 December 2024
- (4)012 – Demolition Plan, dated 19 December 2024
- (4)013 – Roof Joists, dated 19 December 2024
- (4)014 – Foundations, dated 19 December 2024
- (4)015 – Lighting and Sockets, dated 19 December 2024

Structural detailed drawings (Appendix D)

- M2-3167-SK-04-A1 – Structural drawing notes, dated January 2025
- M2-3168-SE-01-A1 – Structural Calculations, dated 12 February 2025
- M2-3168-SK-01-A1 - Proposed substructure, dated January 2025
- M2-3168-SK-02-A1 – Proposed superstructure, dated January 2025
- M2-3168-SK-03-A1 – Details, dated January 2025

THE CONTRACT OUTLINE

1.2. The Contract will be between Winterbourne Parish Council (“the Employer”) and the Contractor (“the Contractor”) and will be administered by the Contract Administrator who is to be confirmed.

1.3. The form of contract will be the JCT Minor Works Building Contract with contractor designed portion 2016 (JCT MWD 2016) as per the amendments contained herein.

1.4. The Mechanical and Electrical works are to form the contractors designed portion.

SYNOPSIS OF CONTRACT WORKS

1.5. Western Building Consultants Limited is responsible for the preparation of this Specification & Contract Amendments.

1.6. The Contractor is to take onboard the Specification to meet these requirements by (wherever necessary) appointing their own design consultants in order to enable works to be executed as briefly summarised below (“the Works) (please note this is not an exhaustive description but merely indicative of the main areas of works):

- Soft strip of existing areas
- Demolition works including removal of existing walls, glazing and fixtures.
- External and internal drainage works
- Substructure works inclusive of groundworks, mass fill concrete footings and raft foundations.
- Superstructure works inclusive of render faced external cavity walls, structural beams and columns, pitched to roof with Velux rooflights, various external glazing and doors.
- Internal finishes inclusive of wall finishes, floor finishes and ceiling finishes
- Mechanical and Electrical (M&E) works to form the Contractor’s Designed Portion (CDP)
- External works and landscaping

1.7. All necessary protective works are to be undertaken to protect the remainder of the property and adjacent buildings, including external areas, to ensure no consequential damage as a result of the undertaking of these works. The final programme will require agreement before works commence and may be subject to change prior to this time. The programme should allow to work within the confines of the restrictive site. No delays will be entertained as a result of inadequate programme facilities.

1.8. No additional costs whatsoever will be entertained by the Employer for any restrictions imposed on the Contractor as a result of the confined site.

CONTRACTORS APPOINTMENT AND DESIGN RESPONSIBILITIES

1.9. The contractor is solely responsible for the drafting and execution of the Construction Phase Health & Safety Plan, together with all day-to-day Health and Safety management.

1.10. Where reference is made within this Specification document to any specific products or manufacturers, alternatives of an equal or better quality and performance may only be substituted subject to prior written approval of the Contract Administrator.

SECTION TWO

CONTRACT AMENDMENTS

PRELIMINARY AMENDMENTS (JCT MWD 2016)

2.0 PRELIMINARIES & GENERAL CONDITIONS OF CONTRACT

GENERAL DESCRIPTION OF THE WORKS

2.1. **The Works Comprise:** The construction of single-storey side and front extensions, internal refurbishments and the erection of a new canopy.

2.2. **Location:** The Pavillion at the Recreation Ground, BS36 1LU

2.3. **Access:** Access to the site is via Sarah Lucy of Winterbourne Parish Council Tel. 01454 776922.

PROJECT PARTIES AND CONSULTANTS

2.5. **Employer:** Winterbourne Parish Council

2.6. **Contractor:** Shall mean the company whose tender is accepted by the Employer.

2.7. **Contract Administrator:** To be Confirmed.

2.8. **Principal Designer:** To be Confirmed.

2.9. **Principal Contractor:** Shall mean the “Contractor”.

PRICING

2.10. **Tender price all-inclusive:** The Contractor shall allow for everything indicated by the tender documents and from a careful inspection of the site including any and all foreseeable additional work and risks. Include in the tender price for handing over the Works clean, functional and complete. <u>The tender shall be a fixed price.</u>

2.11. **Tender submissions:** The Contractor shall submit the Form of Tender using the address provided together with the tender cost summary sheet. The Contractor must comply with the instructions given in the covering letter/email of invitation to tenderers.

2.12. A fully priced specification must be submitted with the tender return.

FORM OF CONTRACT

2.13. The Contractor shall ensure that the conditions and amendments are understood by and (where appropriate) apply to all sub-contractors and suppliers (whether domestic or named) and others who may be affected by the works and that the provisions are (where appropriate) incorporated into all contracts or amendments with such persons.

ARTICLES OF AGREEMENT

2.14. **The Agreement:** Is to be signed and dated by both parties.

2.15. **The Employer and the Contractor:** Shall be as stated in Section 2.5 and Section 2.6, respectively, of this Schedule of Works.

RECITALS

2.16.	1st	Works to be carried shall be as stated in Section 1.
	2nd	Mechanical and Electrical Installations.
	3rd	Schedule of Works and Contract Drawings included in Appendix C hereof.
	4th	A copy of the Priced Contract Specification.
	5th	Construction Industry Scheme (CIS) applicable.
	6th	CDM Regulations 2015 apply.
	7th	The Sixth Recital (Framework Agreement) is deleted.
	8th	Supplemental Provisions 1, 2, 3 and 6 apply. Supplemental Provisions 4 and 5 do not apply.

ARTICLES

2.17.	1	Contractors obligations.
	2	Contract Sum: to be completed following acceptance of the tender by the Employer.
	3	Contract Administrator will be as Section 2.7.
	4	Principal Designer will be as Section 2.8.
	5	Principal Contractor will be as Section 2.9.
	6	Adjudication – applies.
	7	Arbitration – applies.

	8	Legal proceedings – English Law and Jurisdiction of English Courts apply.

CONTRACT PARTICULARS

2.17.	5^{th} Recital	Base Date – Will be 10 days from the Tender return date.
	5^{th} Recital	Construction Industry Scheme (CIS) Employer at base date – is not a “contractor" for the purposes of CIS.
	6^{th} Recital	CDM Regulations – The project is notifiable and all the CDM Regulations apply.
	6^{th} Recital	Framework Agreement – does not apply.
	7^{th} Recital	Supplemental Provisions 1,2,3 and 6 apply. Supplemental Provisions 4 and 5 do not apply. In respect of Supplemental Provision 6 the respective nominees of the Parties are; Employer’s Nominee – To be confirmed. Contractor’s Nominee – To be agreed with Contractor.
	Article 7	Arbitration – Applies.
	2.3	Commencement date – To be agreed with Contractor.
	2.3	Completion date – To be agreed with Contractor.
	2.9	Liquidated damages: at the rate of £500 per week.
	2.11	Rectification period is to be 12 months from the date of practical completion.
	4.3	Interim Valuation Dates are to be one month after the works commencement date and thereafter at monthly intervals.
	4.3	Payments due prior to practical completion – 95 per cent
	4.3	Payments due on or after practical completion – 97.5 per cent
	4.3	Fluctuations Provisions - No fluctuations provision applies
	4.8.1	Supply of documentation for computation of amount to be finally certified – 3 months from the date of practical completion.
	5.3	Contractors PL insurance – injury to persons or property: Minimum £1,000,000.00 (One Million Pounds and Zero Pence) for any one occurrence or series of occurrences arising out of one event.

5.A, 5.B and 5.4C	Insurance of the works – insurance option: Option C applies.
5.4A and 5.4B	Percentage to cover professional fees – Not applicable
5.4C	Insurance arrangements – Contractor to provide all risks insurance, insure the site for the duration of the works and provide collateral warranties for any design work undertaken. Employer to notify insurers of the Works.
7.2	Adjudication – The Nominating body is: The Royal Institution of Chartered Surveyors
Schedule 1 (paragraph 2.1)	Arbitration – appointor of Arbitrator (and of any replacement): The Royal Institution of Chartered Surveyors

PROGRAMMING

2.18. The works are required to be completed prior to the end of to be agreed – exact program to be agreed with Contractor.

2.19. The Contractor shall be responsible for the coordination and programming of the works and will be required to submit to the Contract Administrator (CA) his proposed programme of work prior to commencement. The Contractor shall issue an updated, current programme to the CA on a weekly basis.

2.20. The Contractor is responsible for co-ordinating and programming all directly employed sub-contractors into the overall programme of works.

SECTION THREE

SCHEDULE OF WORKS

3.0 SCHEDULE OF WORKS

PRELIMINARY NOTES

GENERAL

3.1. By completing, signing and submitting a Tender, the Contractor confirms that they have understood and allowed for all of the requirements as set out herein and as detailed on the Proposed Plans (where applicable). The Contractor, by signing and submission, therefore confirms that the full scope of works together with the standard and quality expected has been appreciated and allowed for within their tender cost. Contractors Overheads and Profit (OHP) to be included.

SNAGGING PROCESS & CONDUCT

3.2. By completing and returning this tender, you are committing to a “correct first time” approach whereby we expect all works executed by the contractor to be undertaken regularly and diligently until the agreed Practical Completion (PC) date. We allow for 1no. Snagging Inspection at PC and 1no. inspection following completion of the work items identified in the Snagging Schedule (signed by the contractor when they believe all Snagging completed).

3.3. If upon inspection by the CA it transpires that not all Snagging items have actually been satisfactorily completed (to the reasonable satisfaction of the CA), then the CA reserves the right to counter charge the contractor for additional time accrued until such a time that the works are deemed acceptable. Time charged will be at our prevailing hourly rate – full details available from our office at the point of tender.

- Retention figure of 2.5% over a 12 month defect period.

EMPLOYEE/TEAM PERSONNEL

3.4. The following is to apply to all site trades and Main Contractor personnel. It is the responsibility of the Main Contractor to undertake the checks and prepare adequate risk and management assessments specific to the “Works”.

3.5. All contractors should be vetted by the Disclosure and Barring Service or hold a valid CRB disclosure - Main Contactor to confirm.

PROVISIONAL SUMS & TENDER INCLUSIONS

3.6. All Provisional Sums as outlined within the Schedule of Works are to be included and allowed for at the point of tender.

3.7. The Contractor is not to allow for any other Provisional/Prime Cost Sums unless previously agreed with the CA. If not previously agreed with the CA, the Contractors submission will be taken as a fixed price for those elements of works asked for.

MASTER PROGRAM/INFORMATION FLOW

3.8. Prior to the Pre-Contract Meeting between all parties, the appointed Contractor is to provide the CA with a fully detailed copy of the proposed Program, depicting critical path items and milestones.

3.9. Prior to the Pre-Contract Meeting between all parties the appointed Contractor is to provide the CA with a fully detailed Information Required Schedule in electronic format with key dates annotated for when certain information is to be required by (where this information/design decisions are to be made by the CA/Employer/Design Team.)

CONTRACT INSTRUCTIONS

3.10. The Contractor (and all associated sub-contractors, personnel and supply chain) are only to take variations and instructions together with confirmation of scope or queries direct from either the CA or the Client and not any other attendee, visitor, supplier or consultant (no matter who they work for).

3.11. Should the Contractor deviate and proceed with variations or scope received from anyone except the above, then they do so at their own risk with no cost agreement and no payment for that item being applicable or quantifiable as part of this Contract.

TENDER RETURNS

3.12. The Contractor shall allow for everything indicated by the tender documents, include any items the Contractor deems in addition to this Specification and Contract Proposal, and from a careful inspection of the site including any all-foreseeable additional work and risks. Include in the tender price for handing over the Works clean, functional and complete. The tender shall be a fixed price. All items of work clearly needed to complete the work, and which ought to have been included within the Contractors tender will be deemed to have been included in the tender. Returning a Tender is an absolute that all tender pack information has been considered and allowed for inclusive of whether detailed herein or on any of the appended plans or accompanying documentation.

SITE INSPECTIONS

3.13. The Contractor is to ensure the works are always carried out to a high standard. Periodic site inspections will be undertaken by the CA to ensure the works have been carried out in line with the Specification, as well as for valuation purposes. Further ad-hoc site inspections will be undertaken by the CA throughout the works. The CA/Principal Designer will undertake impromptu site inspections to review progress without prior notice. The submission of this tender underlines the acceptance of these terms.

PROGRAMME

3.14. The works are to be undertaken and completed with a handover date that is to be agreed with the Contractor. The Contractor is to make all necessary allowances for extended work matters to accommodate this programme and the submission of this tender underlines the acceptance of these terms.

SCHEDULES OF CONDITION

3.15. Before work commences the Contractor shall prepare, submit and agree with the Contract Administrator a Schedule of Condition of the internal and external parts of the property which are likely to be affected by the Works. The scope and format of the schedule will be agreed with the Contract Administrator. The Schedule shall comprise descriptive text supported by photographs.

3.16. The Schedule of Condition must be available and agreed prior to commencement of the works. The Contractor shall make good or replace to the satisfaction of the CA any damage, marks or missing components/fittings caused as a consequence of the execution of the works unless such damage was shown on the agreed Schedule.

ENABLING WORKS

To be read alongside building regulation drawings and structural engineering drawings.

3.17. The Contractor is to be fully responsible for the site set up to include all appropriate Health & Safety provisions in accordance with the requirements of the CDM Regulation and the Pre-Construction Information.

3.18. The Contractor is responsible for the safe storage and removal of all waste and safe storage of materials within the confines of the site.

3.19. The Contractor (appointed for these works) is to be solely responsible for delivering the full works as directed herein.

3.20. Contractor parking will be located along the roadside or on the drive if agreed with Client. Please ensure that no vehicles block or prevent vehicle movements on nearby roads. No vehicles should be parked on the pavements.

3.21. The Contractor is to ensure little disruption to neighbouring properties which will remain in full occupation throughout the duration of the works.

3.22. Allow for the establishing and maintaining of secure compound area, location to be agree prior to commencement, together with any off-site storage areas. Allow for all welfare facilities to be provided within the compound area in order for the works to proceed expediently. Allow for all associated fencing/hoardings.

3.23. Allow for the provision of a secure storage container for the storage and protection of items delivered to site. Storage container to be located in the secure compound area.

3.24. All works detailed in this specification shall be undertaken strictly in accordance with the manufacturers written instructions and recommendations, British Standards and other approved codes of practice.

3.25. Prior to commencement of works allow for all associated services to be temporarily isolated to ensure a safe working area. The Contractor is to allow for provision of all necessary temporary site power supplies together with all other temporary services as necessary (Contractor to remove on completion of the works). Allow for the identification and survey of all existing service runs and the demarking on site and relevant protection works to ensure no services are inadvertently disturbed.

3.26. Contractors signage – The Contractor is to provide, where relevant, appropriate adequate rigid and quality warning signage suitable for a site of this nature in order to alter visitors of the hazards and also a designated site office with signage, signing in books and all associated facilities. Spare provisions to include spare hard hats and high vis jackets for all visitors.

3.27. The Contractor is to maintain a secure site at all times with all materials, waste, skips and the like maintained securely and cleared on a daily basis. Fire escape routes in the building shall be maintained and kept clear at all times.

3.28. Allow for the temporary covering and protection required throughout the Contract period.

3.29. Allow for cleaning the area of works as it proceeds and at the end of each and every working day.

3.30. Please ensure that you obtain all necessary licenses for storage of materials and locations of skips.

DEMOLITION

To be read alongside building regulations drawings and structural engineering drawings.

3.31. Trace and locate sources of water, gas, electrical and other service pipework, cables and conduit. Allow for all necessary labelling of services, particularly electrical, to ensure that temporary connections are identified. Strip out redundant services.

3.32. Remove and set aside to an area identified by the client all furniture, fittings and other items within the areas of work.

3.33. Allow for any temporary propping, where required, for the demolition works.

3.34. Allow for the removal of the existing internal fixtures and fittings. Inclusive of, but not limited to:

- Kitchen fixtures, fittings and installations

- Clubroom fixtures, fittings and installations
- Changing room fixtures, fittings and installations
- WC fixtures, fittings and installations

3.35. Allow for the removal of the existing internal walls and waste away off site.

3.36. Allow for the removal of existing internal and external doors and waste away off site.

3.37. Allow for the removal of existing external glazing and waste away off site.

CONCRETER AND BRICKLAYER

To be read alongside building regulation drawings and structural engineering drawings.

3.38. Allow for a trial hole to be dug in existing foundations and liaise with building control and WBC to assess whether foundations are suitable for the extension.

3.39. Excavate for foundations to new extension walls front and side 600 mm wide and 800x800mm for pads beneath columns, and to 1000 mm below ground level, or to below the level of any adjacent drains. All to Building Control approval.

3.40. Into excavated footing trenches, lay Gen1 concrete min 600x600mm deep and 800x800mm for pads, all in accordance with Approved Document Part A and to the satisfaction of Building Control.

3.41. Construct new foundation and ground floor slab as follows:

- 150mm compacted hardcore base layer
- 50mm sand blinding layer
- 150mm RC35/40 concrete slab with 1No. layer A252 mesh to top
- 1200 gauge DPM Radon Barrier
- 150mm Rigid (PIR) Celotex Insulation
- 75mm Liquid Screed

3.42. Provide perimeter insulation to all new substructures.

3.43. Provide a 25mm Isolation Joint wherever the new foundation and existing foundations interact.

3.44. Install M16 Stainless Steel Bars circa 450mm long, resin anchored between the new foundation and existing Kitchen foundation at 250mm centres.

3.45. Install M16 Stainless Steel Bars circa 300mm long, resin anchored between the new foundation and existing Dining Room foundation at 250mm centres.

3.46. Construct new external walls as follows:

- External leaf to be 100mm 7N block with white render finish.
- 75mm Celoxtex CW4000 with 50mm residual clear cavity to provide a minimum 125mm cavity above ground level.
- Lean mix concrete 225mm cavity fill below ground level.
- Internal leaf to be 100mm 7N dense blockwork.
- 12.5mm plasterboard on dabs taped at joints internally.

3.47. Construct new external wall to building frontage as follows:

- Facing external leaf to be brick to match existing walls.
- 75mm Celoxtex CW4000 with 50mm residual clear cavity to provide a minimum 125mm cavity above ground level.
- Lean mix concrete 225mm cavity fill below ground level.
- Internal leaf to be 100mm 7N dense blockwork.
- 12.5mm plasterboard on dabs taped at joints internally.

3.48. Provide DPC to minimum of 150mm above ground level. DPM to rise up wall and lap into DPC.

3.49. Join new external walls to existing walls with Ancon or similar stainless steel starter system and provide compressible/cement/mastic joint externally.

3.50. Construct new load bearing internal walls as follows:

- 100mm concrete block
- 12.5mm plasterboards on dabs taped at joints to both sides

3.51. Install structural beams and columns to structural engineers drawings.

CARPENTER

To be read alongside building regulation drawings and structural engineering drawings.

3.52. Box in all structural steelwork with one layer of 15mm fireline board or two layers of 12.5mm plasterboard to provide 30 minutes fire resistance.

3.53. Box in all Soil Vent Pipes (SVP) as indicated.

3.54. Allow for the supply and fit of timber window boards, skirtings and architraves profile to match existing.

3.55. For all new joinery allow for all knotting and associated preparations prior to decorations.

3.56. Allow for the supply and installation of aluminium framed windows as indicated. To meet 1.6W/m^{2}K with 4:16:4 low E glass. Trickle ventilation to be provided. Security shutters to be provided.

3.57. Allow for the supply and installation of a 5-pane bifold aluminium frame glazed doors to the building's frontage. To meet 1.6W/m^{2}K with 4:16:4 low E glass. Trickle ventilation to be provided. Ensure glazing is laminated safety glass. Security shutters to be provided.

3.58. Allow for the supply and installation a glazed main entrance door. Allow for a 1000mm clear width per leaf. To meet 1.6W/m^{2}K with 4:16:4 low E glass. Trickle ventilation to be provided. Security shutters to be provided.

3.59. Allow for the supply and installation of six sets of twin rooflights to fit openings in roof joists.

3.60. Allow for the supply and installation of grey louvred plant room doors.

3.61. Provide insulated cavity closers at all new openings.

3.62. Infill existing walls with new non-load bearing internal partition walls as follows:

- Timber studwork to suit width of existing walls
- Rockwool quilt between studwork
- 12.5mm plasterboard on either side

3.63. Construct new non-load bearing internal partition walls as follows:

- 50x75mm timber studwork
- 50mm Rockwool quilt between studwork
- 12.5mm plasterboard on either side

3.64. Provide Amwell or similar specification IPS panelling to shower cubicles. Contractor to provide samples to the CA to confirm colour prior to installation on site.

3.65. Form new ceilings as follows:

- 12.5mm plasterboard on dabs with scrim tape to joints

3.66. Form new roof as to extended areas, comprising:

- Metal sheet roofing with colour and profile to match.
- 150mm rigid (PIR) Celotex XR4000 insulation
- 22mm plywood decking
- Posi Joist / Web Joist 304x122 at 600 centres
- Vapour Control Layer (VCL)

3.67. Provide Rockwool insulation batts between posi joists / web joists at head of walls.

3.68. Provide 150mm metal half-round guttering to fall elevation and connect to existing downpipes.

3.69. Form new canopies, comprising:

- Metal sheet roofing with colour and profile to match.
- 150mm rigid (PIR) Celotex XR4000 insulation
- 22mm plywood decking
- Posi Joist / Web Joist 304x122 at 600 centres
- Vapour Control Layer (VCL)
- Provide 22mm timber cladding to external soffit of joists

3.70. Provide large metal fascias where indicated to match existing.

3.71. Allow a provisional sum of £10,000.00 for the supply and installation of the bar fixtures and fittings.

3.72. Allow for the supply and installation of timber benching with metal support within changing rooms.

3.73. Allow a provisional sum of £15,000.00 for the supply and installation of kitchen fixtures and fittings.

3.74. Allow for the supply and installation of softwood internal doors. All firedoors to provide at least 30 minutes of fire resistance.

3.75. Allow for the supply and installation of washroom fittings inclusive of toilets, washbasins and showers.

3.76. Allow for the supply and installation of a DOC M pack to the accessible WC.

3.77. Allow for the supply and install of lockers as indicated.

3.78. Allow for the supply and install of softwood skirting boards to all areas excluding those finished with vinyl floors.

INTERNAL FINISHES

To be read alongside building regulations drawings and structural engineering drawings.

3.79. Allow for 3mm plaster skim to internal walls and ceilings as indicated.

3.80. Allow for mist and two coat emulsion paint finish to internal walls and ceilings as indicated.

3.81. Allow for the supply and installation of Altro Whiterock hygienic wall cladding to all showers, WCs, changing rooms, store room and kitchen.

3.82. Allow for the supply and installation of Altro Atlas 40 heavy duty 4mm industrial safety floor (Vinyl) to all showers, WCs, changing rooms, store room, plant room, kitchen and bar. Finish to cove at walls and form vinyl skirting. Colour is to be confirmed with CA prior to installation.

3.83. Allow for the supply and installation of carpet tiles to the clubroom, lobbies, circulation and scoreboard room. Colour is to be confirmed with CA prior to installation.

3.84. Allow for the supply and installation of barrier matting to any entrances.

3.85. Allow for painting to all timber window boards, skirtings and architraves to match existing.

3.86. Allow for making good to inner face of existing internal walls, drylining as required.

MECHANICAL AND ELECTRICAL INSTALLATIONS

To be read alongside building regulations drawings and structural engineering drawings.

3.87. The Contractor is to allow for the supply and install of all electrical and mechanical installations as required, inclusive but not limited to:

- Lighting installations
- Electrical installations
- Kitchen installations
- Mechanical and heating installations
- Fire detection systems
- CCTV installations

3.88. Allow for downlight installations to be warm white low energy LEDs.

3.89. Allow for mechanical extraction ventilation over the hob to a minimum of 30L/s and 60L/s elsewhere.

3.92 All sockets and light fittings to be fitted between 450mm and 1200mm off of floor level.

3.90. All mechanical and electrical work to be designed and installed by a competent person and provide an associated completion certificate compliant with Part P of Building Regulations and BS7671.

3.91. The Contractor is to confirm the serviceability of the existing heating system after completion of the Works.

3.92. The Contractor is responsible for ensuring new heating installations are fully complaint and suitably sized. Radiator's locations to be agreed with the CA prior to commencement. Include for all associated work and connections.

EXTERNAL WORKS

To be read alongside building regulations drawings and structural engineering drawings.

3.93. Allow for making good to existing landscaping, if required, with grass seeding to a like for like standard of the external landscaping.

3.94. Allow for connections required to existing external drainage.

3.95. Allow for making good to any areas disturbed by the works.

3.96. Allow for a provisional sum of £2,500.00 the supply and installation of a covered cycle shelter inclusive of loops and stands.

MISCELLENEOUS

3.97. Allow for a Contingency Sum of 5% of the overall tender award, to be expended only at the sole discretion of the CA.

3.98. Building Control – Allow for the appointment of Building Control for all necessary works. Main Contractor to be responsible for liaison with Building Control to ensure their timely attendance to inspect pertinent stages of the works in order to provide their Certificate upon completion.

UPON COMPLETION

3.99. Upon completion commission a professional mastic company to undertake all colour matched or white (as directed by the CA) mastic application throughout to all junctures, fixtures and fittings throughout property. Mastic application to be professional and free from scag and blemish with areas fully prepared in advance and cleaned down of residual upon completion.

3.100. Allow for a full sparkle clean inside and out upon completion – inclusive of thorough recleaning of all surfaces, dust and vacuum of all areas, recleaning of all internal and external windows, frames and ledges. Polishing all fixtures and fittings, joinery, switchgear and the like throughout.

3.101. Allow for all test certificates, warranties and the like to be provided to the CA at Practical Completion. Allow for all contractor's debris and the like to be cleared from site and surrounding areas. The property is to be left fully reinstated and repaired commensurate with this schedule of works.

TOTAL (£)

The Contractors price shall be open for acceptance for a minimum period of 60 days and the Contractor is required to visit site prior to returning a Tender. No claim relating to a failure to ascertain the conditions of the site or in the existing building will be entertained.

APPENDIX A - FORM OF TENDER

FORM OF TENDER

To:	Winterbourne Parish Council
	FAO Sarah Lucy
Return before:	As per cover email
WBC Ref:	2241154
Appointed By:	-
Property Address:	The Pavillion at the Recreation Ground, BS36 1LU

Sirs

I/We, having read the Specification and Contract Proposal delivered to me/us and having examined the Drawings referred to therein, do hereby offer to execute and complete in accordance with the contract conditions set out therein the whole of the Works described for the FIXED PRICE sum of (exclusive of VAT):

Amount in words:

Amount in figures:

£		* inc./exc. VAT (* delete as appropriate)

The contract shall be the JCT MWD 2016 as amended by the specification, to include amendments herein.

I/We return a copy of the Specification with prices entered against each individual item. In the event of variations being required I/We agree that the prices shall be used to establish the reasonable cost of the additions/omissions. I/We understand that in the event I/We do not enclose a copy of the priced specification, our/my tender may be declared void.

I/We confirm appropriate Employer's Liability, Public Liability insurance cover for the works in accordance with the Contract requirements is in place and will be fully maintained throughout the currency of the project and beyond as detailed in the specification.

I/We require a lead time of no more than………….weeks between the acceptance of this Tender and the commencement of the Works on site and undertake to complete the Works within …………….weeks thereafter – final details and programme to be agreed prior to commencement. I/we note that general damages for non-completion is set at £250.00 per week or part thereof.

I/We undertake, in the event of your acceptance of our Tender, to execute with you a Form of Contract in the terms set out in Section 1 of the Specification and Contract Proposal.

I/We agree that, should any obvious pricing or arithmetical errors be discovered before acceptance of this offer, in the priced Specification submitted by me/us, these errors shall be corrected in accordance with Alternative 2. clause 47 within the JCT Practice Note 6 (series 2) Main Contract Tendering.

This Tender remains open for consideration for 4 weeks and I/we agree that no extras for pre-contract delays will be claimed after the contract has been signed.

CDM Declaration

I/We have read the specification and the attached CDM documentation, designers notes and risk assessments and confirm that we are competent to undertake the role of Principal Contractor as defined by CDM 2015 and that we attach/will submit when requested evidence of our competence and that of our designers.

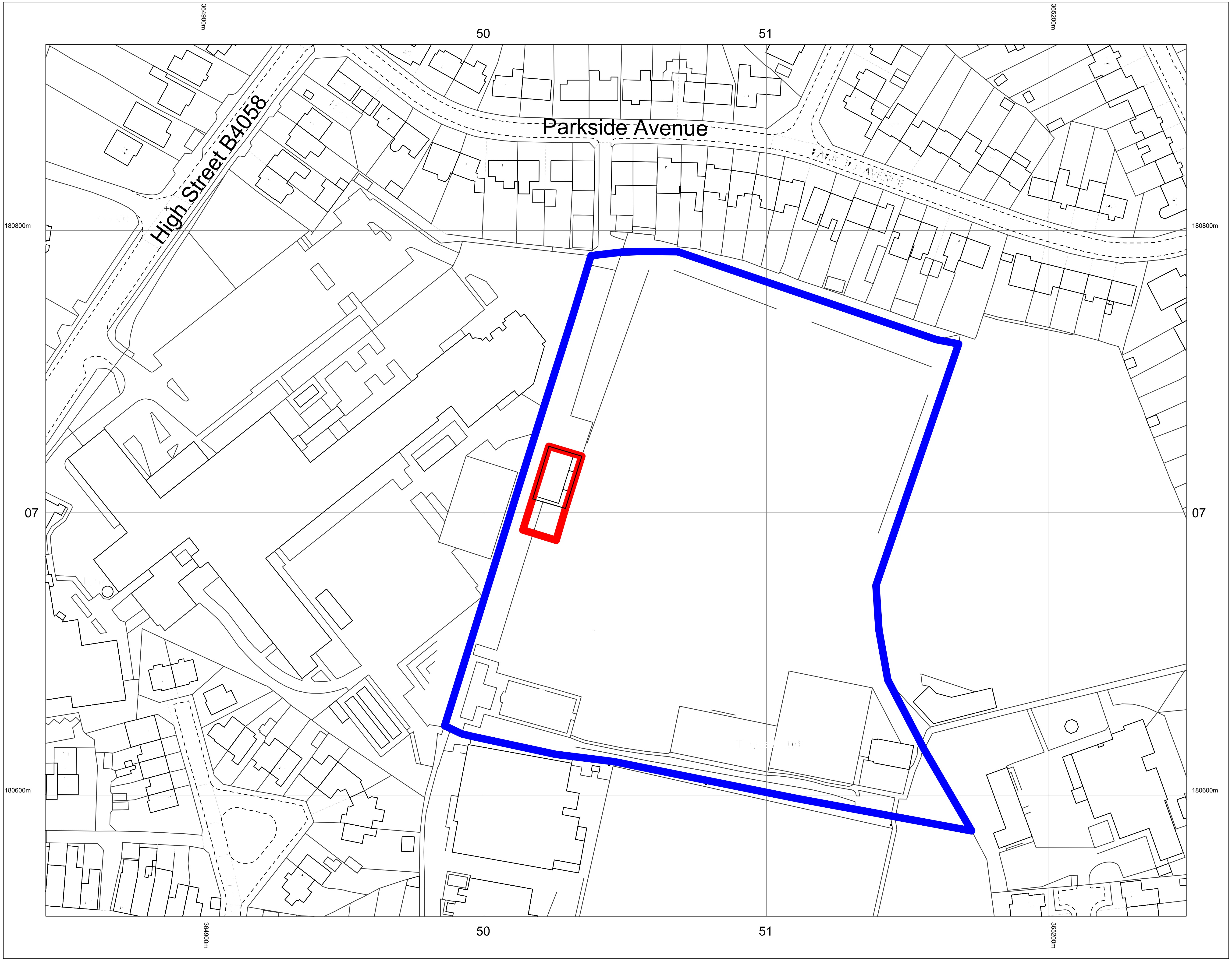
I/We undertake to provide a draft health and safety plan within seven days of a request for same and, in the event of your acceptance of our tender, to develop and provide a full health and safety plan [as required by the Construction (Design and Management) Regulations 2015] before any work commences on site, the time take to produce the plan being considered part of the lead time referred to in the previous paragraph.

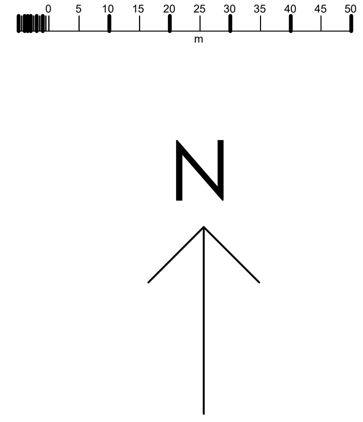
Signed	………………………………
Print Name	………………………………
Date	………………………………
Name of Contractor	………………………………
Address	………………………………
	………………………………
	………………………………
Telephone	………………………………
Email	………………………………

APPENDIX B - CDM PRECONSTRUCTION INFORMATION

(TO FOLLOW)

APPENDIX C – ARCHITECTURAL DRAWINGS





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RICS

Drawing:
(3)001
Proposed Location Plan

Project:
ThePavilion at the Recreation Ground
BS36 1LU

Scale: 1:1250 @ A3 | Job No : 1240340

Drawn By: MH | Checked By: JD

Date : 29/10/24

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BUILDING CONSULTANTS

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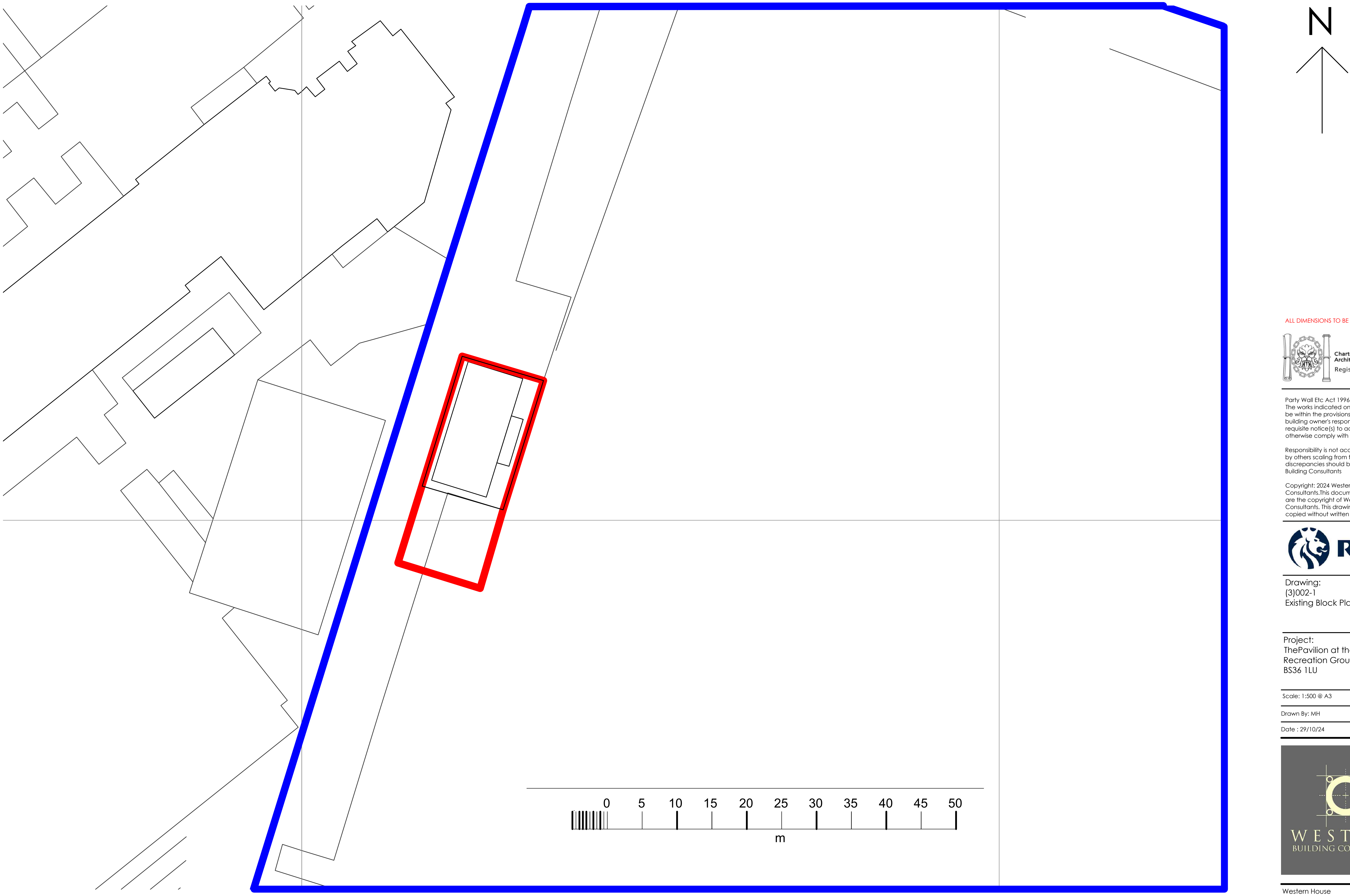
2 Rush Hill, Bath
BA2 2QH

01225 789 307

enquiries@westernbuildingconsultants.co.uk

Drawing No. : (3)001 | Revision : -



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RICS

Drawing:
(3)002-1
Existing Block Plan

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:500 @ A3	Job No : 1240340
Drawn By: MH	Checked By: JD
Date : 29/10/24	

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BUILDING CONSULTANTS

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BA2 2QH

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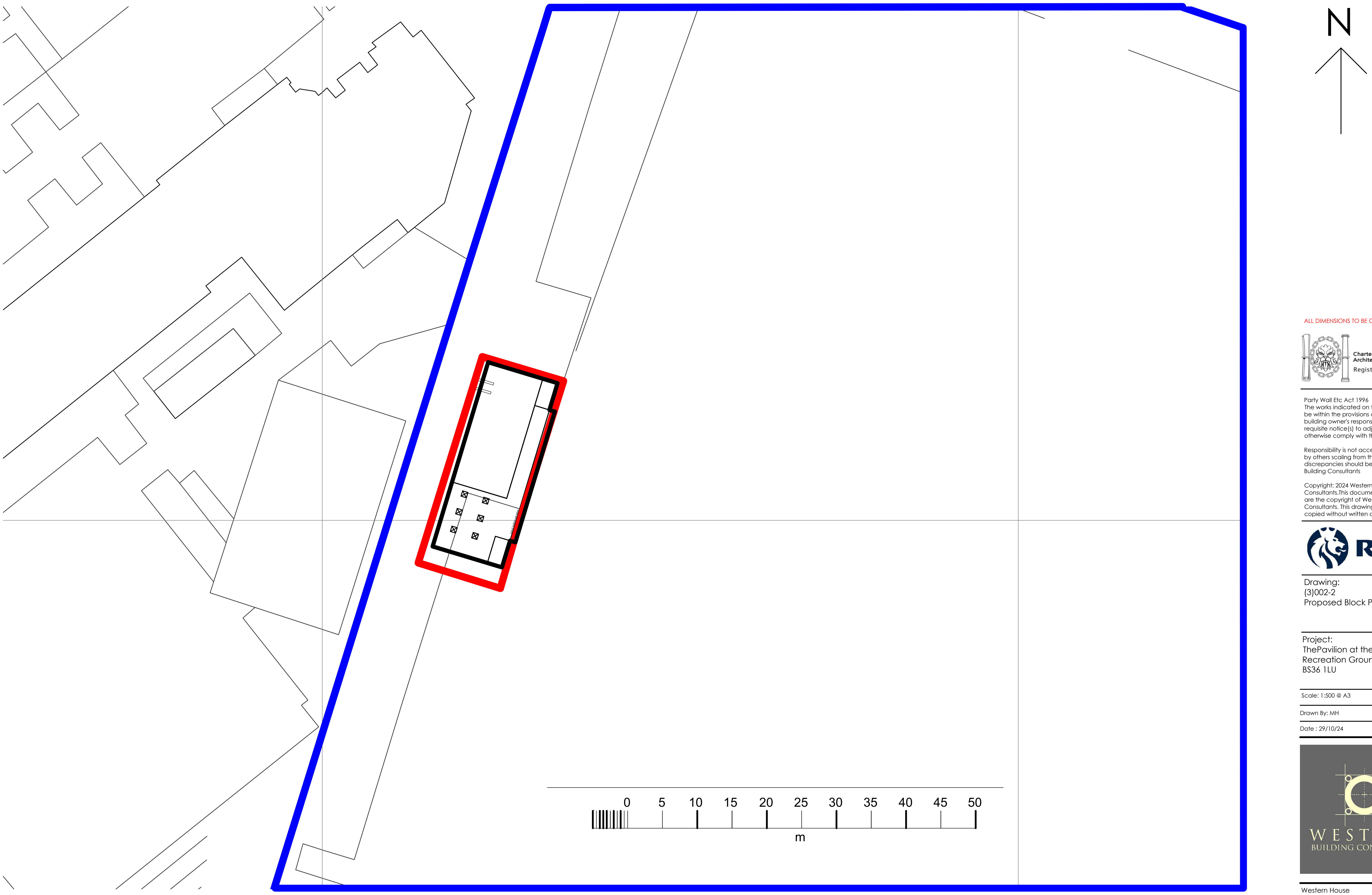
Drawing No. : (3)002-1 Revision : -



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RICS

Drawing:
(3)002-2
Proposed Block Plan

Project:
ThePavilion at the Recreation Ground
BS36 1LU

Scale: 1:500 @ A3 | Job No : 1240340

Drawn By: MH | Checked By: JD

Date : 29/10/24

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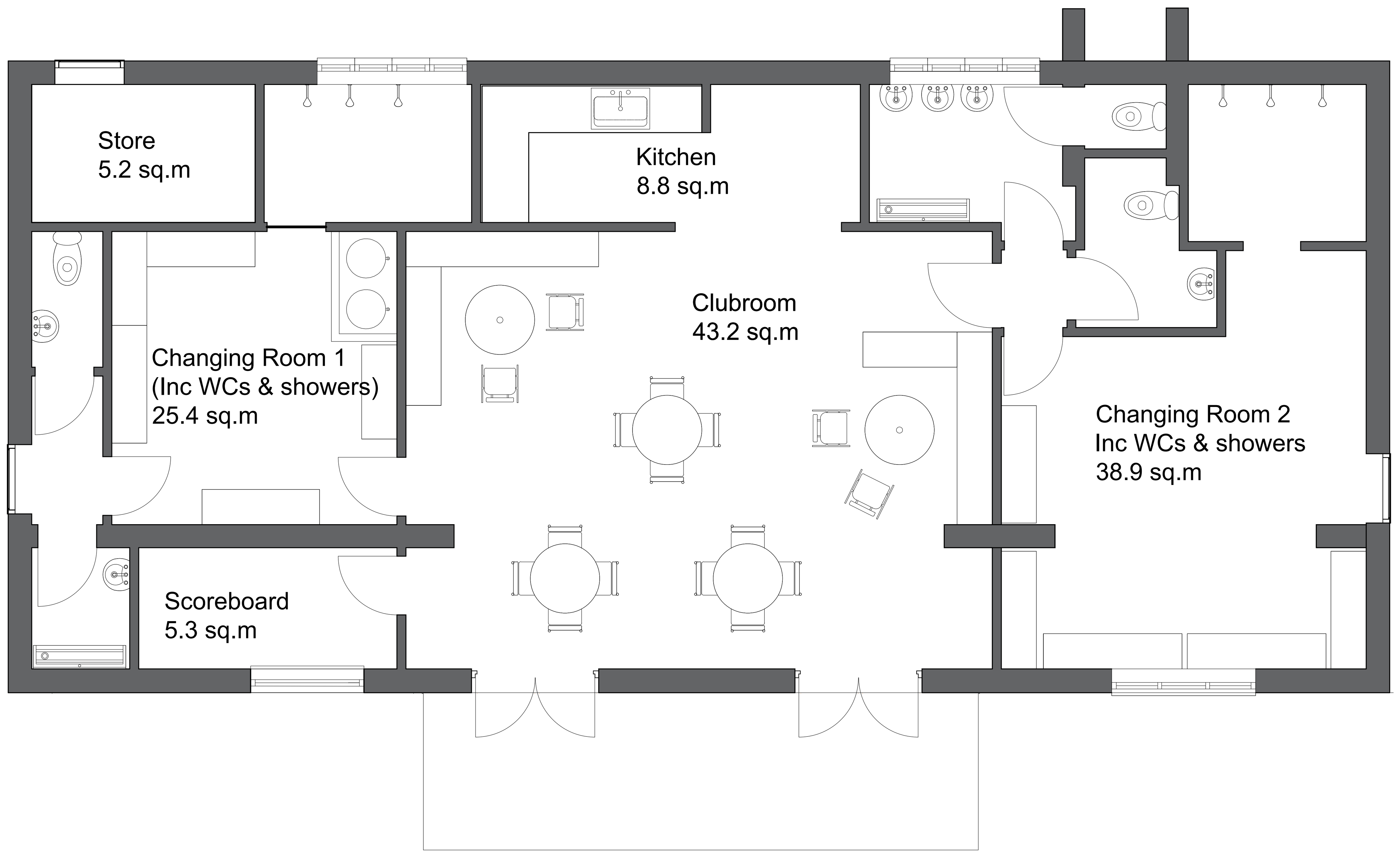
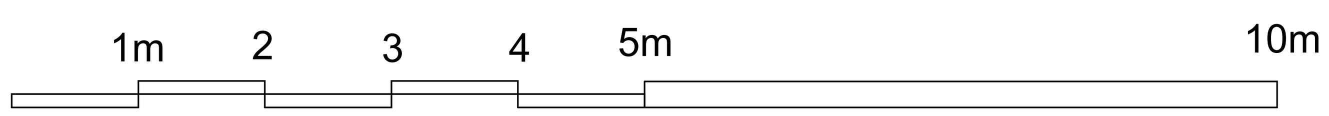
enquiries@westernbuildingconsultants.co.uk

Drawing No. : (3)002-2 Revision : -





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RICS

Drawing:
(4)003
Existing GA Floor Plan

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3
Job No : 1240340

Drawn By: MH
Checked By: LA

Date : 19/12/2024

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BA2 2QH

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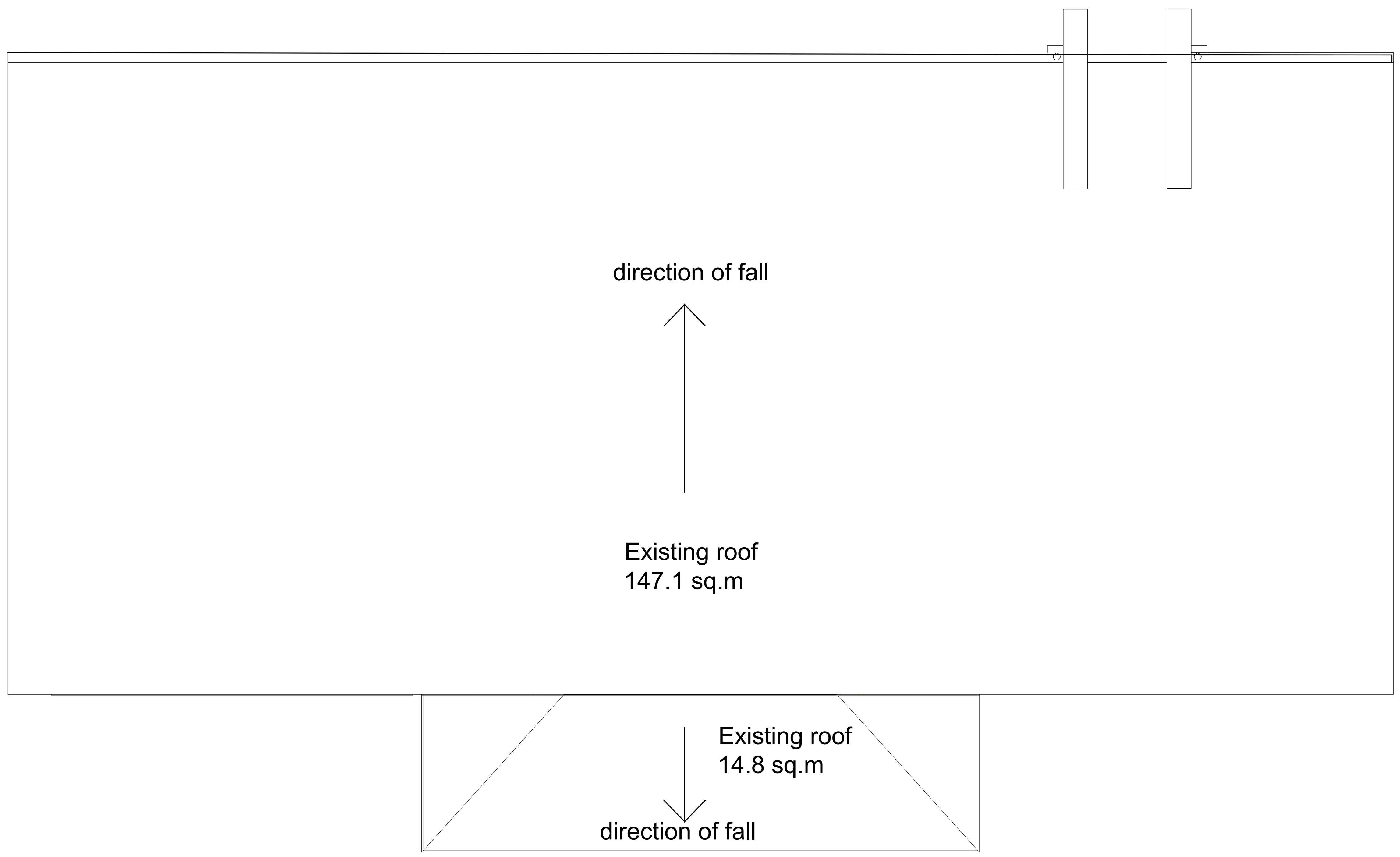
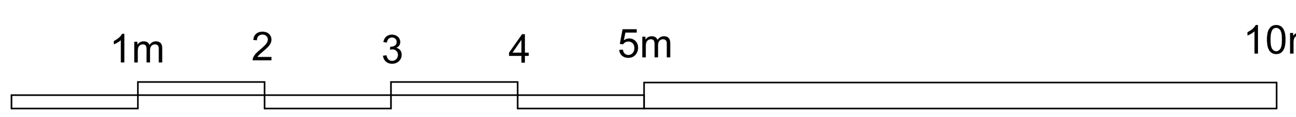
Drawing No. : (4)003
Revision : -





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RICS

Drawing:
(4)004
Existing GA Roof Plan

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3

Job No : 1240340

Drawn By: MH

Checked By: LA

Date : 19/12/2024

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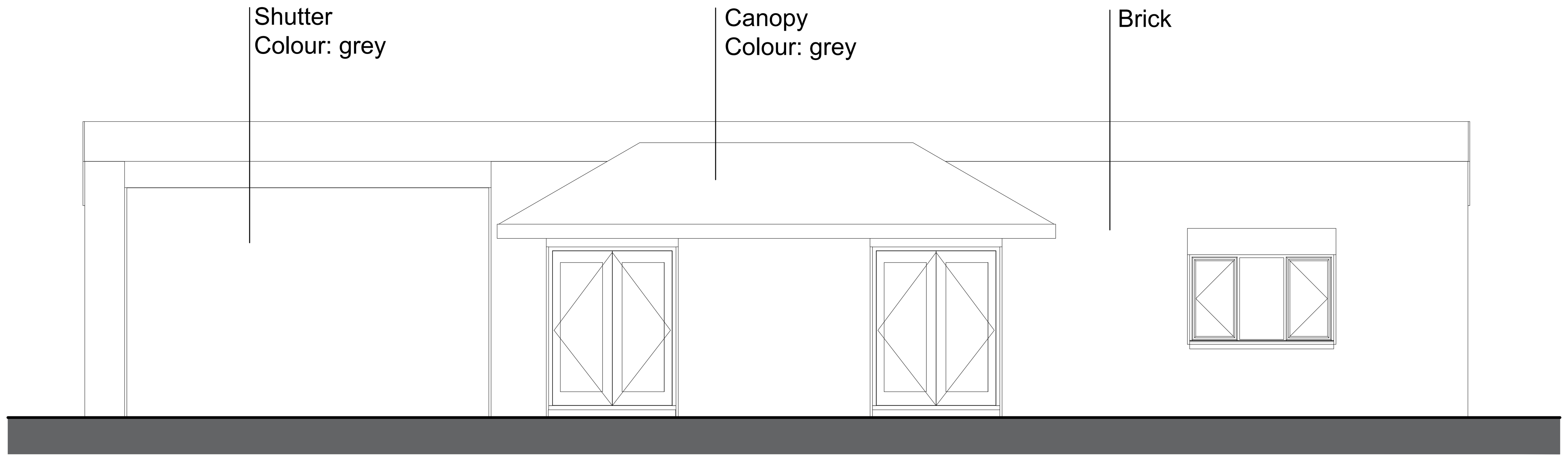
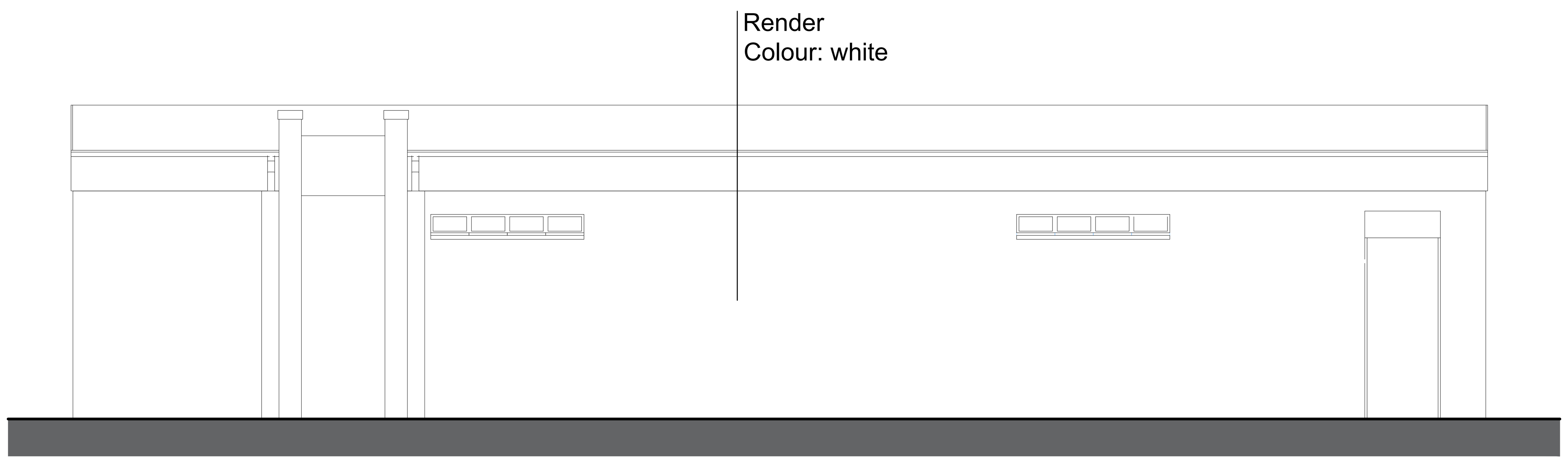
Drawing No. : (4)004

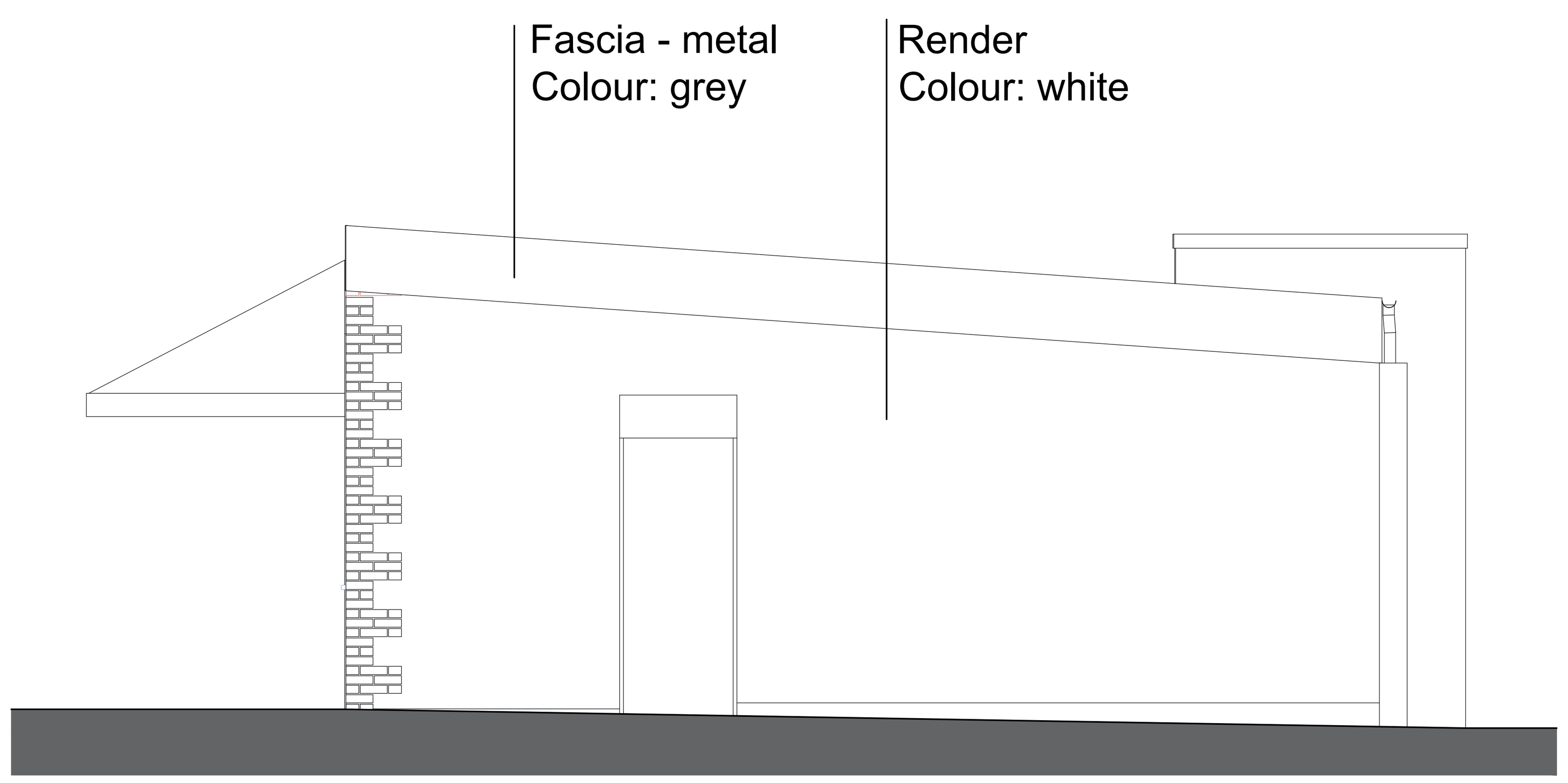
Revision : -



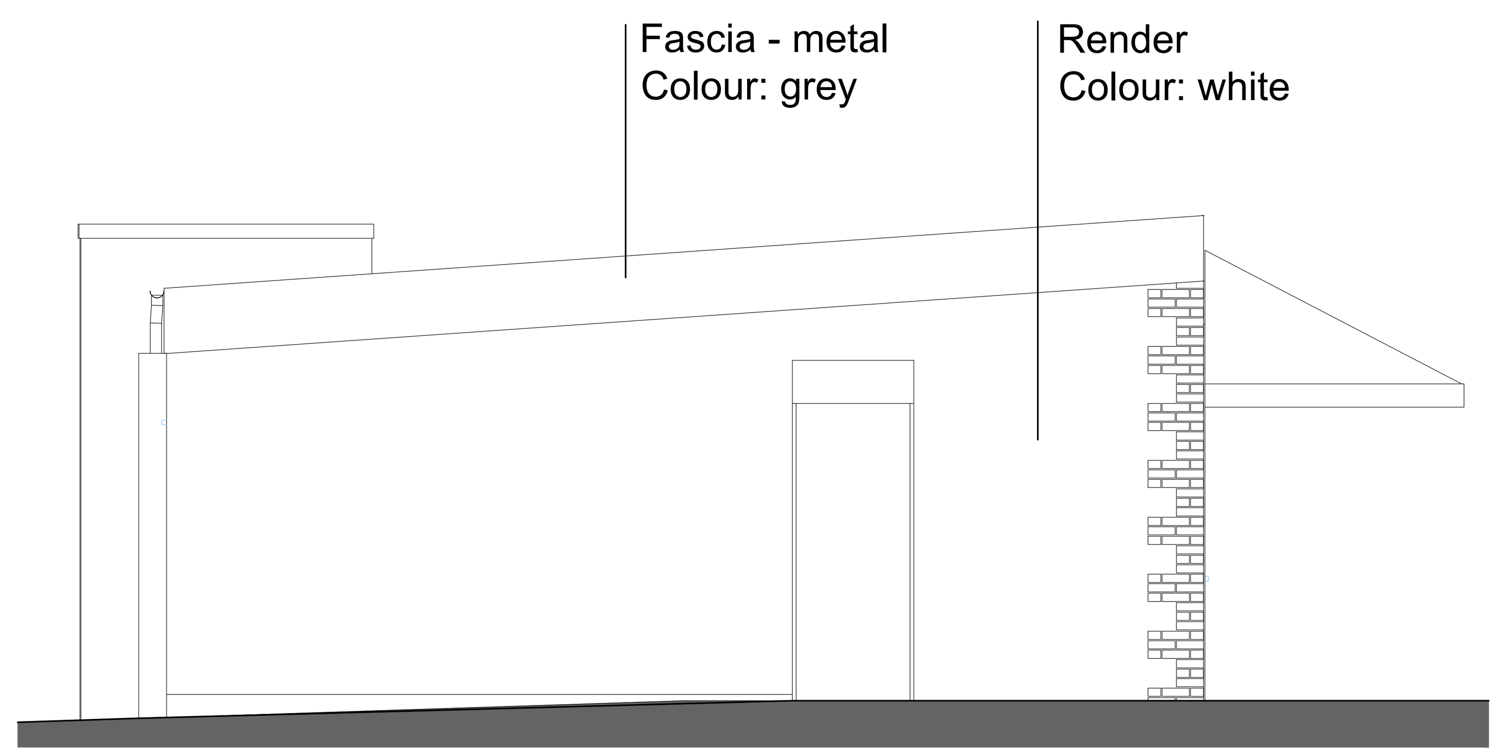
EXISTING FRONT ELEVATION



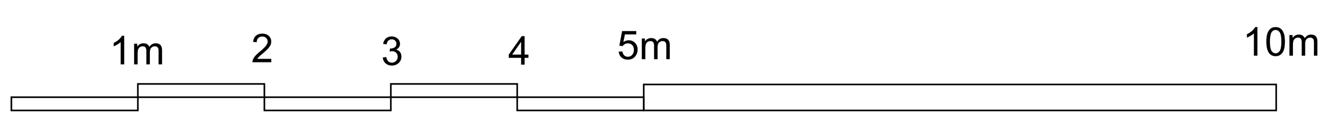
EXISTING BACK ELEVATION



EXISTING SIDE ELEVATION



EXISTING SIDE ELEVATION



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RICS

Drawing:
(4)005
Existing GA Elevations

Project:
ThePavilion at the Recreation Ground
BS36 1LU

Scale: 1:50 @ A1 1:100 @ A3	Job No : 1240340
Drawn By: MH	Checked By: LA
Date : 19/12/2024	

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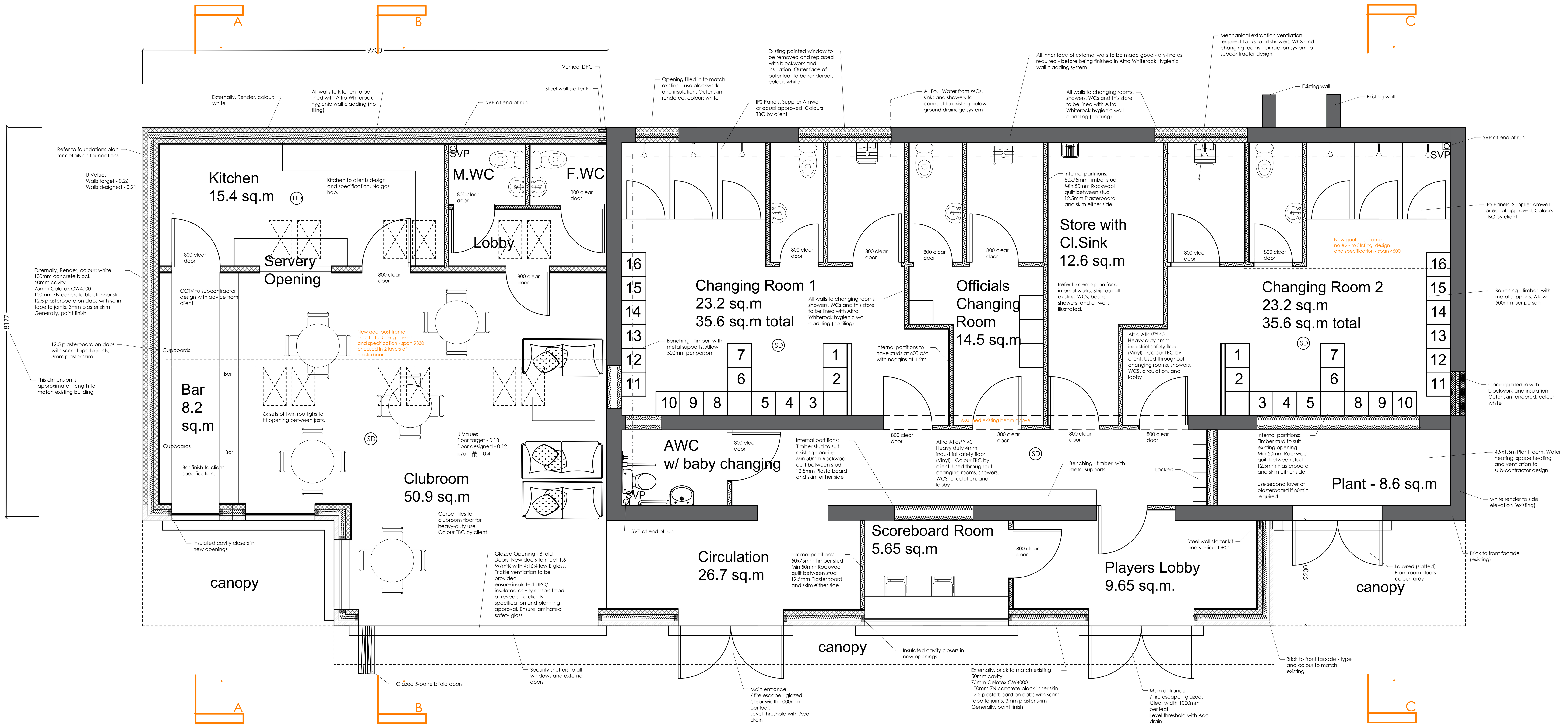
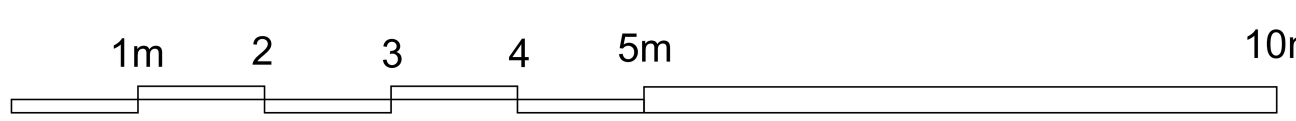
Drawing No. : (4)005 Revision : -





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Drawing:
(4)006
Proposed GA Floor Plan

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1 1:100 @ A3	Job No : 1240340
Drawn By: MH	Checked By: LA
Date : 19/12/2024	

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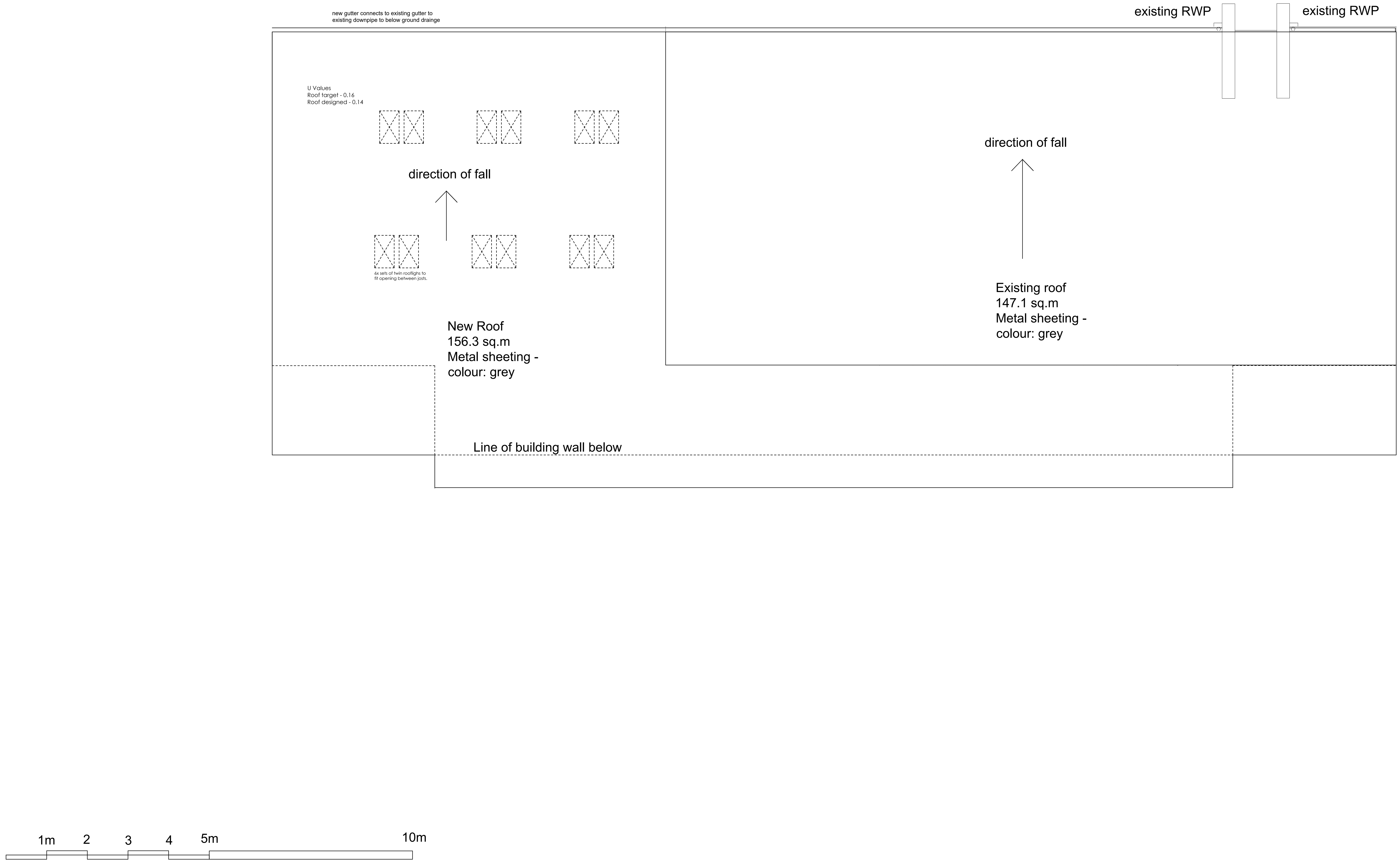
Drawing No. : (4)006 Revision : -



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Drawing:
(4)007
Proposed GA Roof Plan

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3
Job No : 1240340

Drawn By: MH
Checked By: LA

Date : 19/12/2024

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2 Rush Hill, Bath
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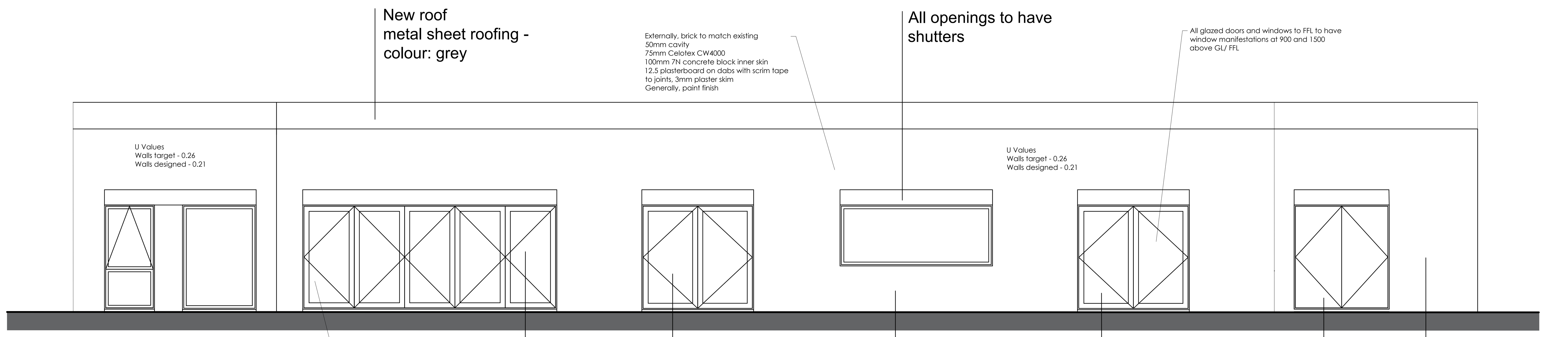
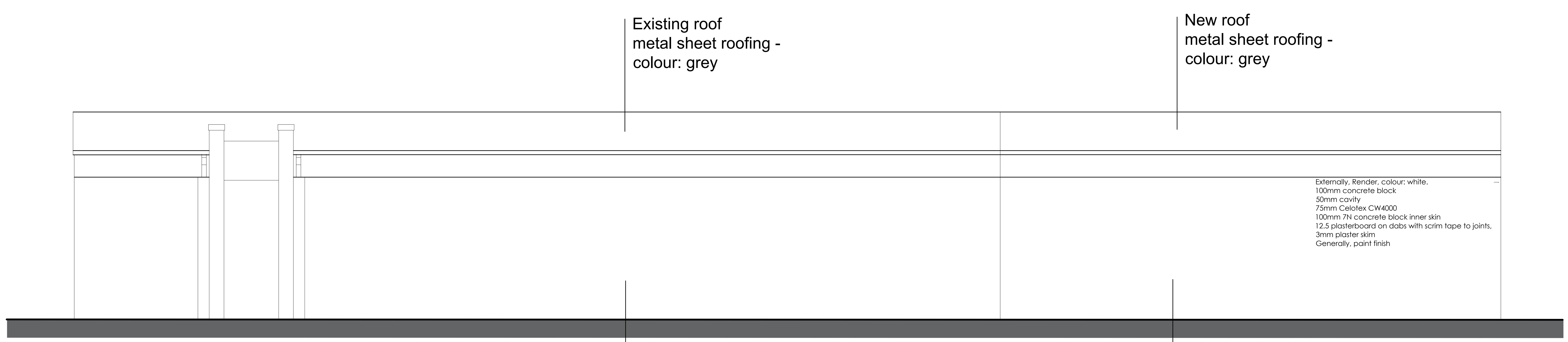
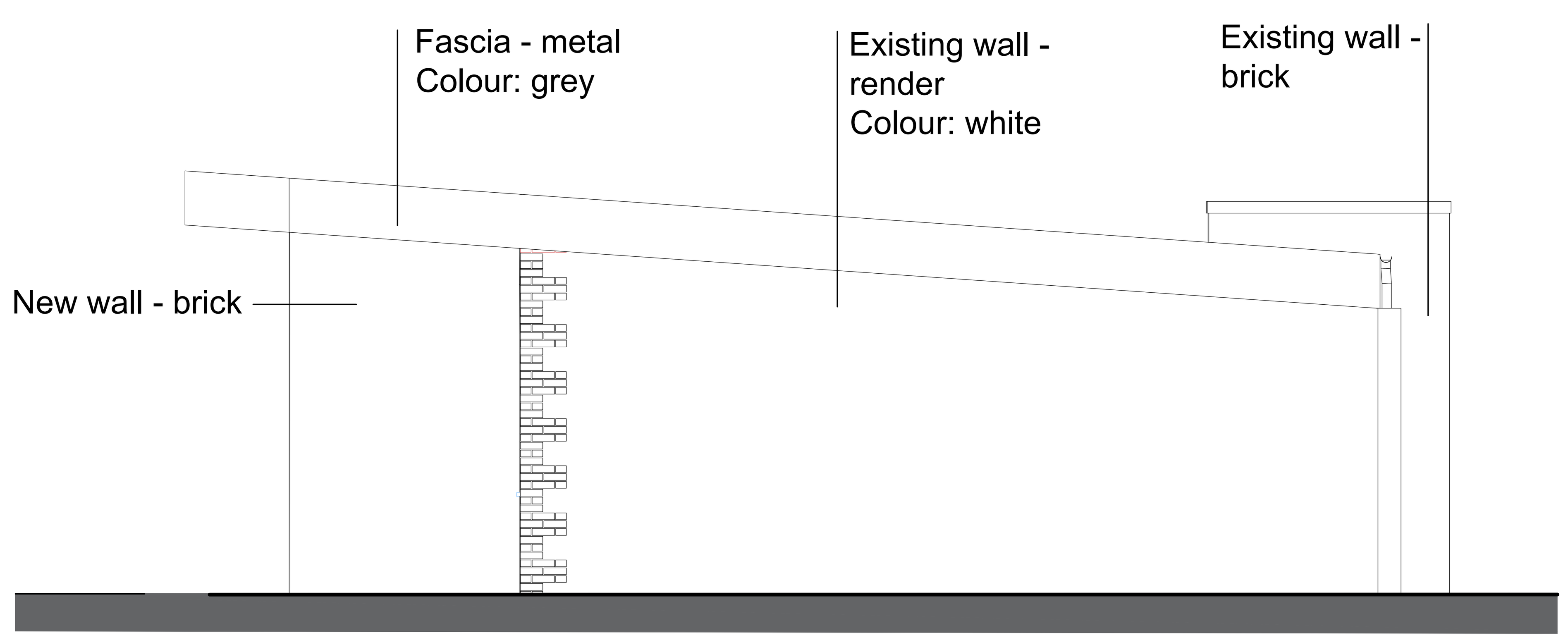
Drawing No. : (4)007
Revision : -



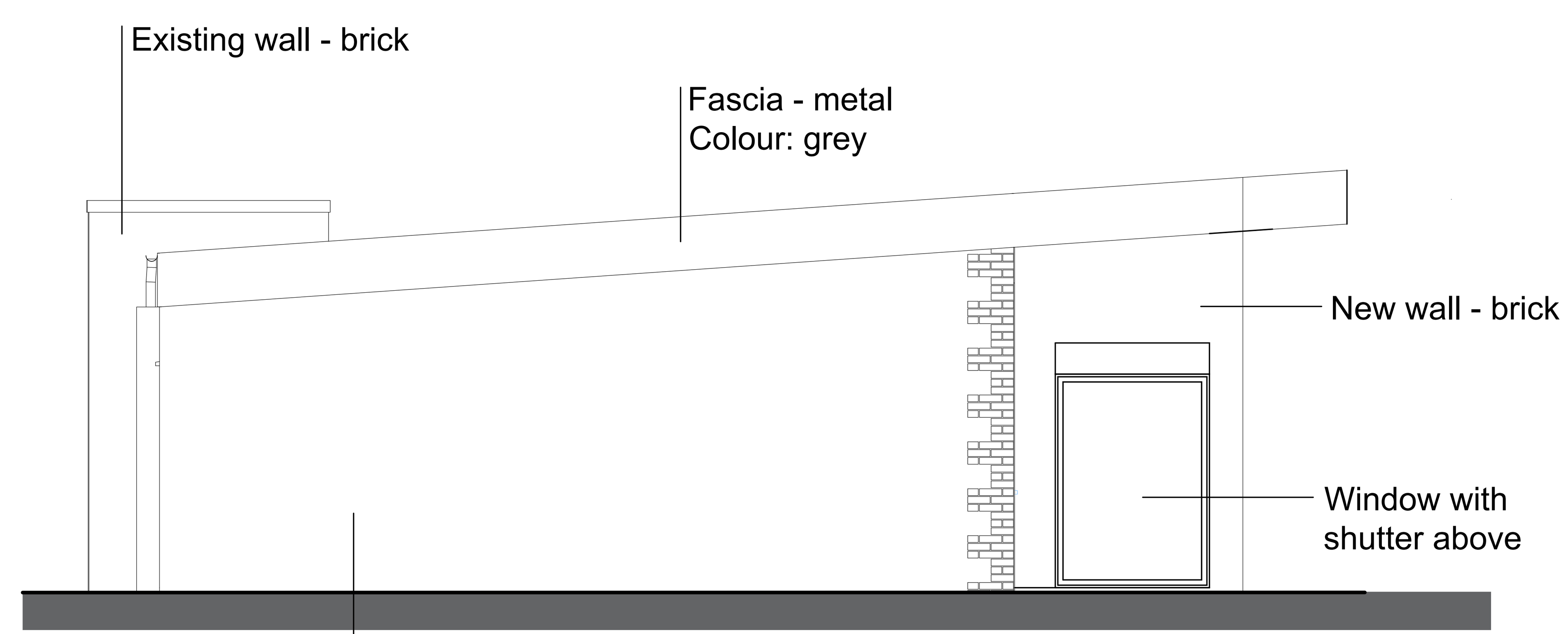
PROPOSED FRONT ELEVATION



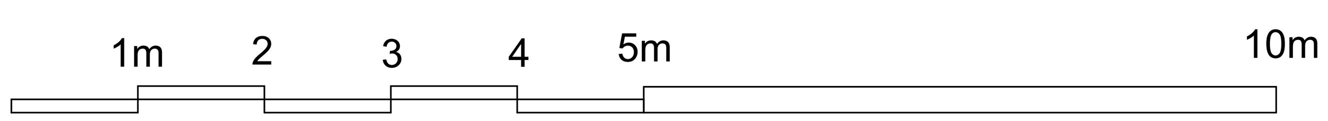
PROPOSED REAR ELEVATION



PROPOSED SIDE ELEVATION



PROPOSED SIDE ELEVATION



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RICS

Drawing:
(4)008
Proposed GA Elevations

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1 1:100 @ A3	Job No : 1240340
Drawn By: MH	Checked By: LA
Date : 19/12/2024	

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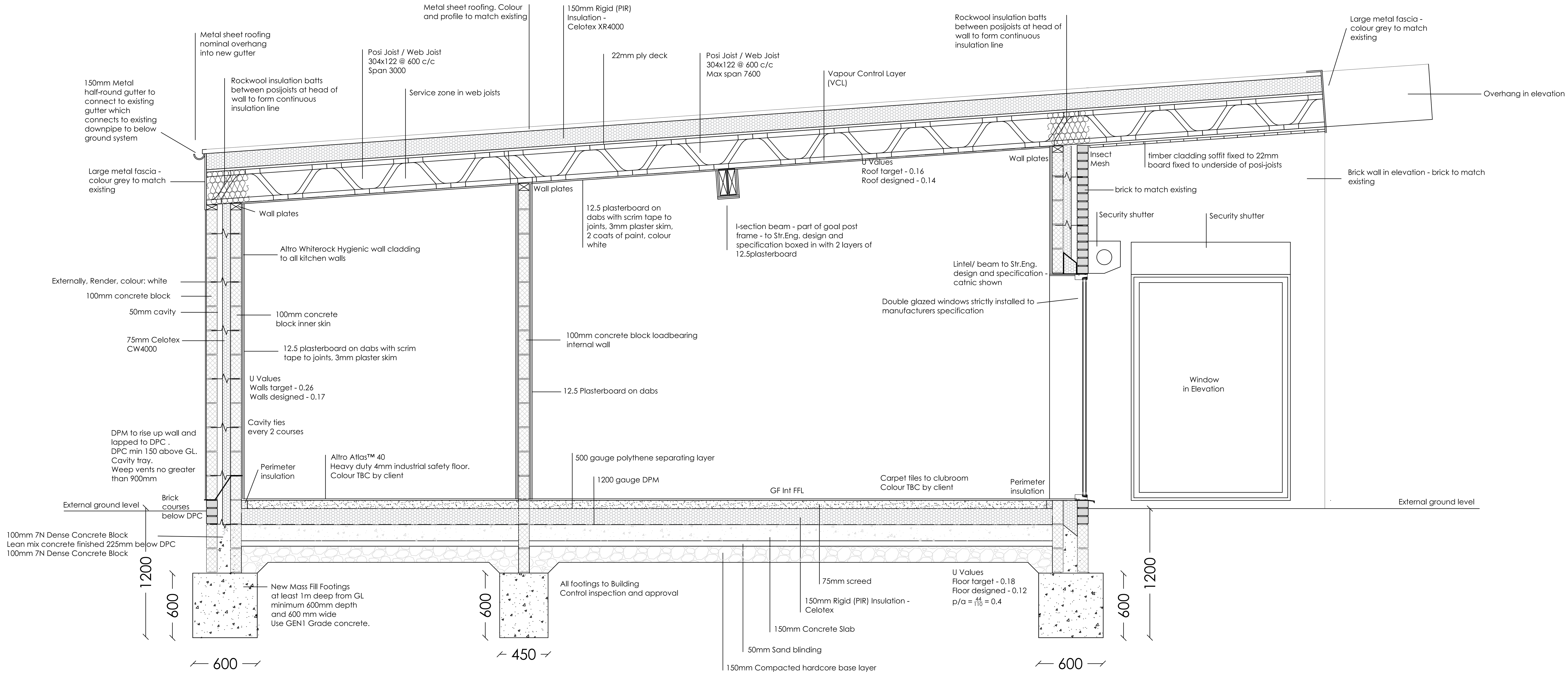
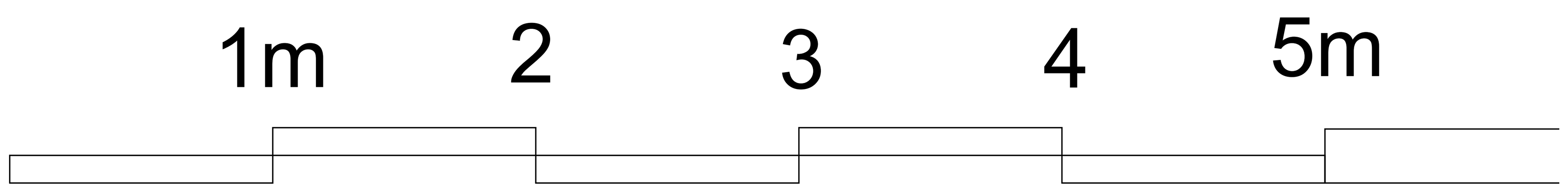
Drawing No. : (4)008 Revision : -





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RICS

Drawing:
(4)009
Section A

Project:
ThePavilion at the Recreation Ground
BS36 1LU

Scale: 1:20 @ A1 | Job No : 1240340

Drawn By: MH | Checked By: LA

Date : 19/12/2024

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BA2 2QH

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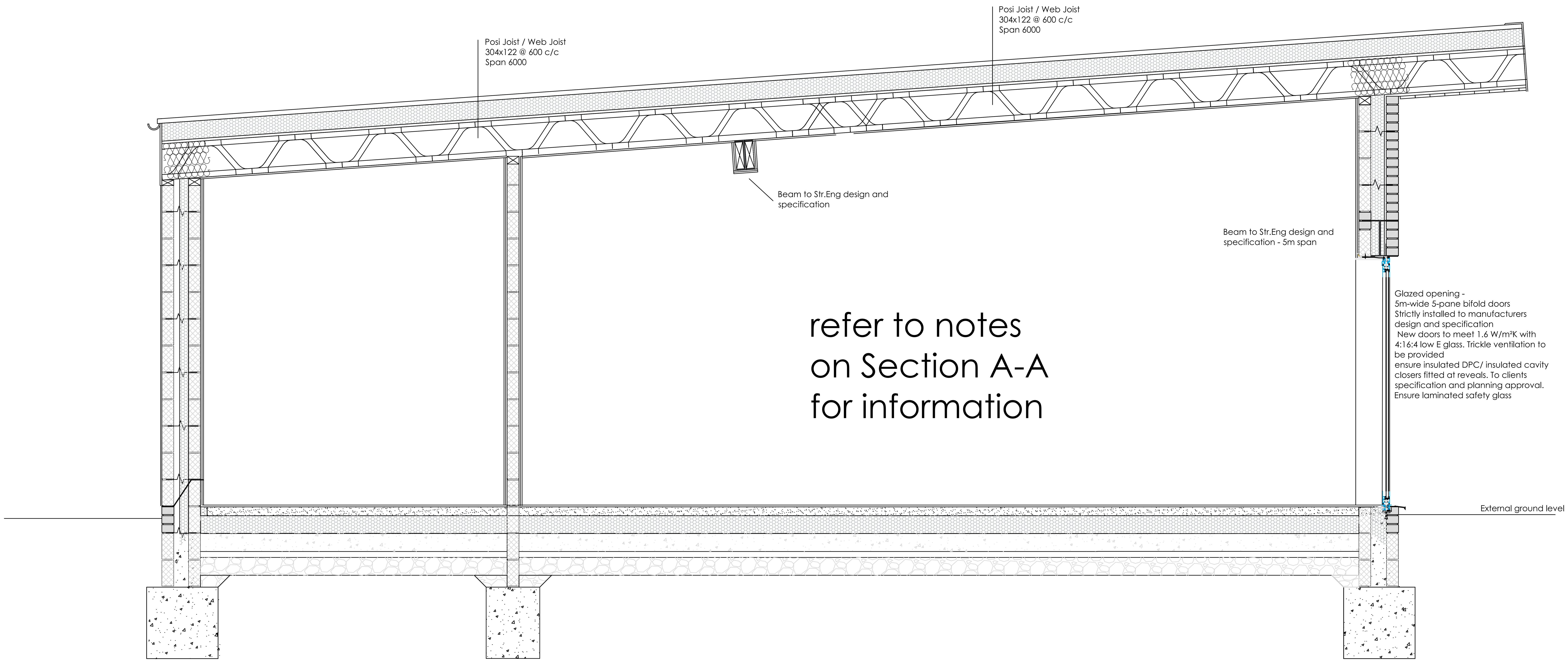
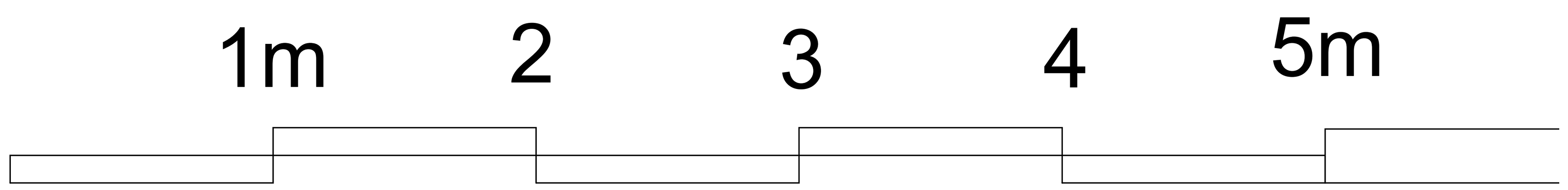
Drawing No. : (4)009 Revision : -





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Drawing:
(4)010
Section B

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:20 @ A1 | Job No : 1240340

Drawn By: MH | Checked By: LA

Date : 29/10/24

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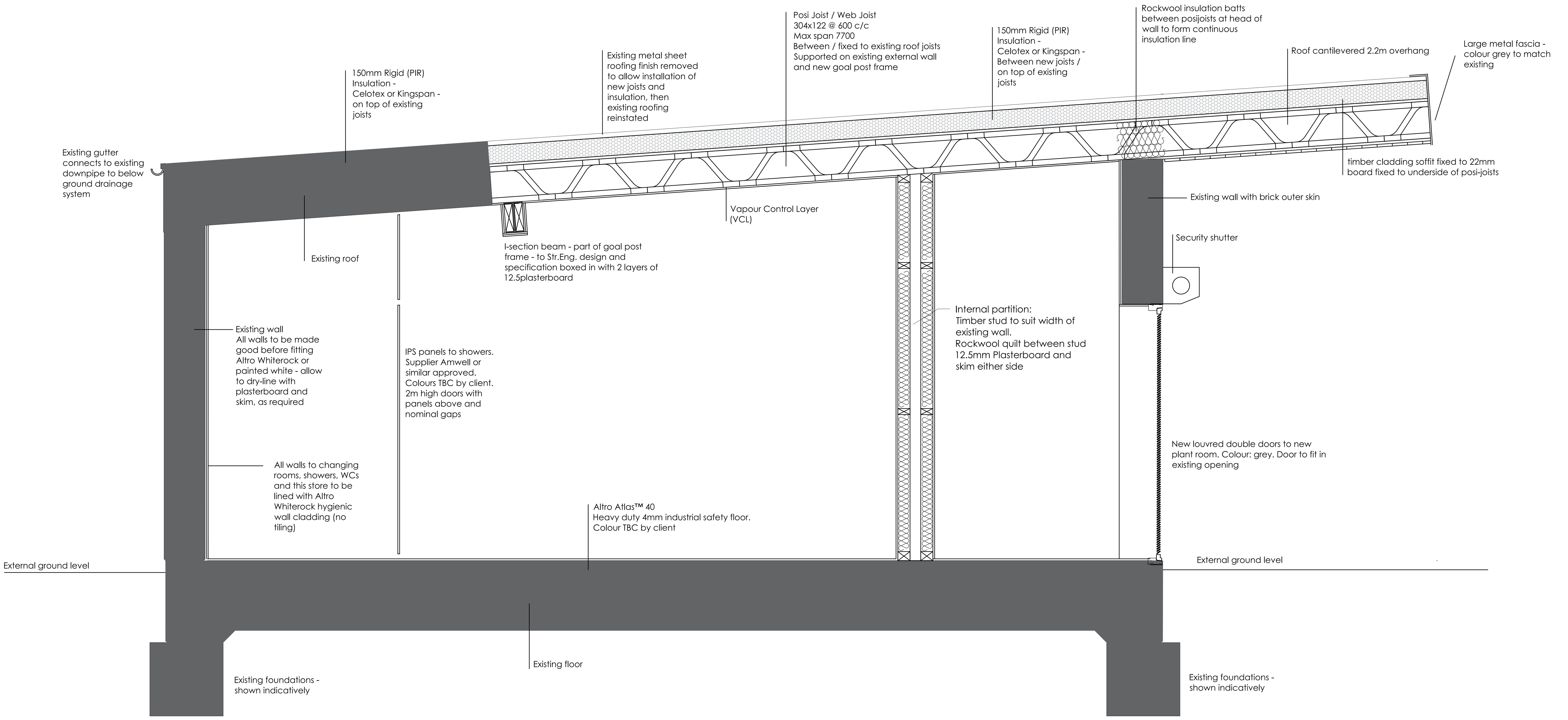
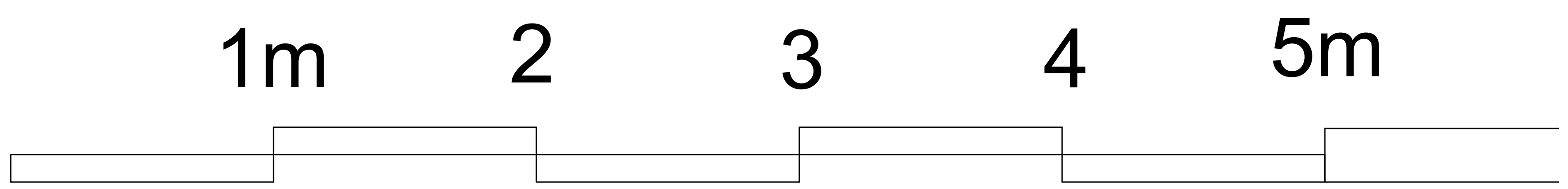
Drawing No. : (3)010 | Revision : -





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RICS

Drawing:
(4)011
Section C

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:20 @ A1	Job No : 1240340
Drawn By: MH	Checked By: LA
Date : 19/12/2024	

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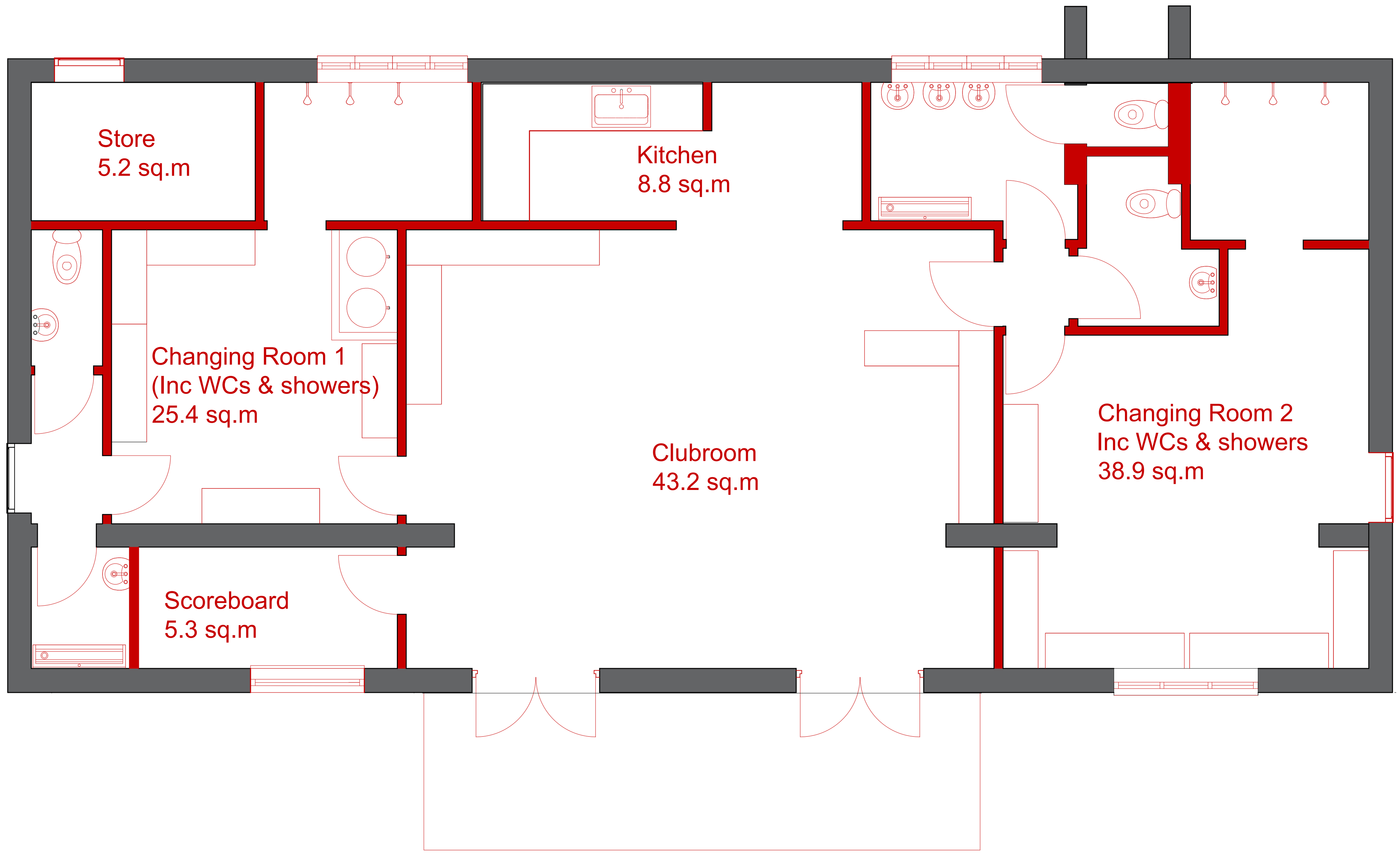
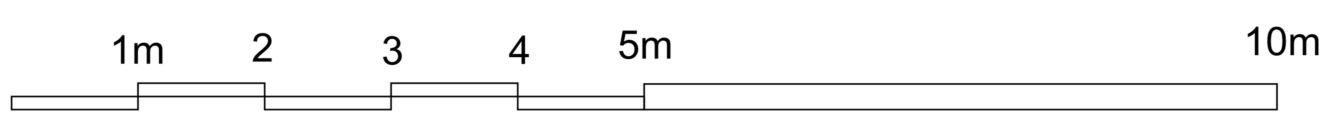
Drawing No. : (4)011 Revision : -





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RICS

Drawing:
(4)012
Demolition Plan

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3
Job No : 1240340

Drawn By: MH
Checked By: LA

Date : 19/12/2024

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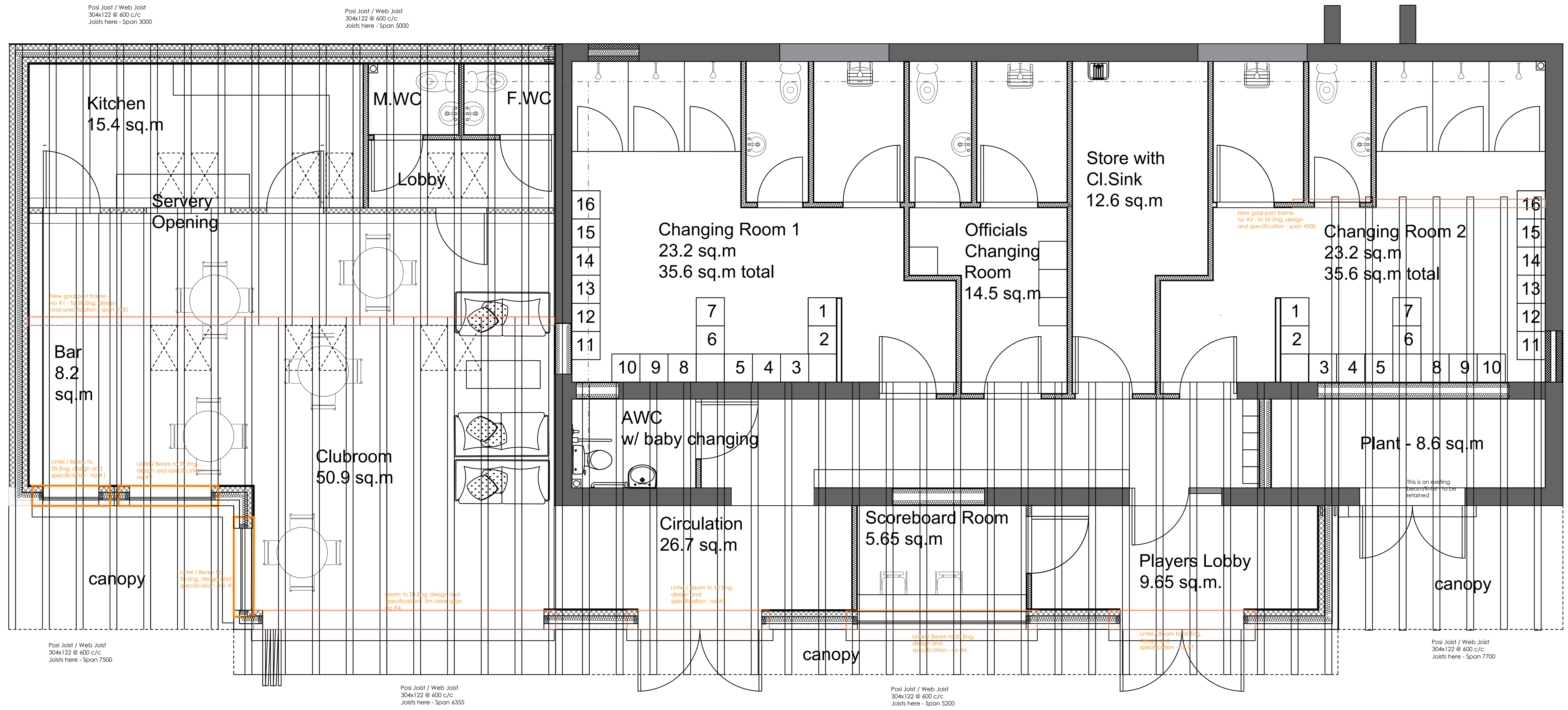
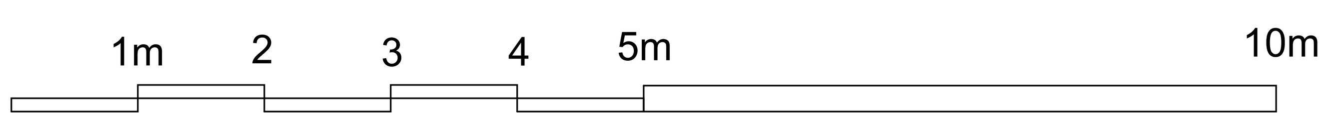
Drawing No. : (4)012
Revision : -





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RICS

Drawing:
(4)013
Roof Joists

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3
Job No : 1240340

Drawn By: MH
Checked By: LA

Date : 19/12/2024

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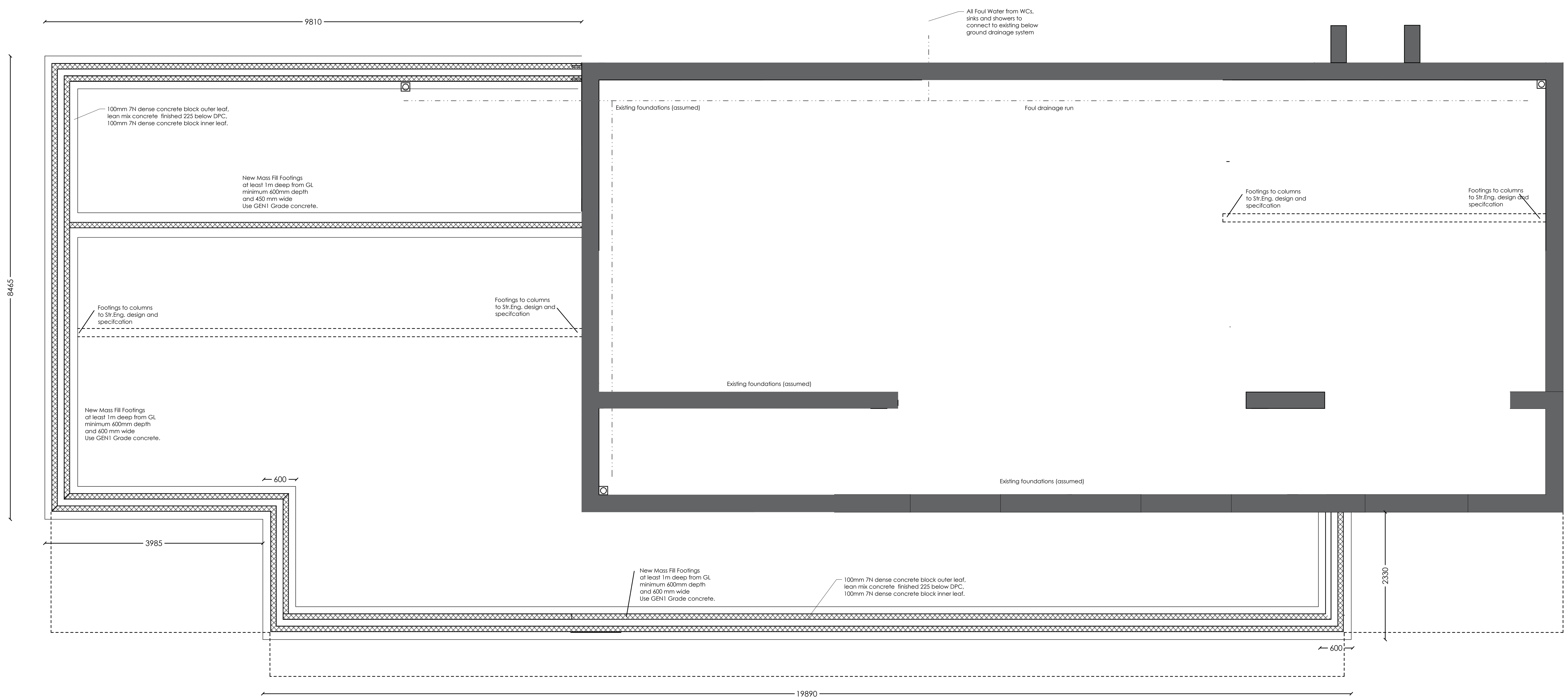
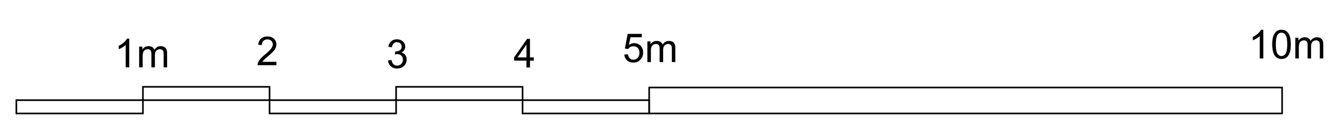
Drawing No. : (4)013
Revision : -





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RICS

Drawing:
(4)014
Foundations

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3
Job No : 1240340

Drawn By: MH
Checked By: LA

Date : 19/12/2024

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BA2 2QH

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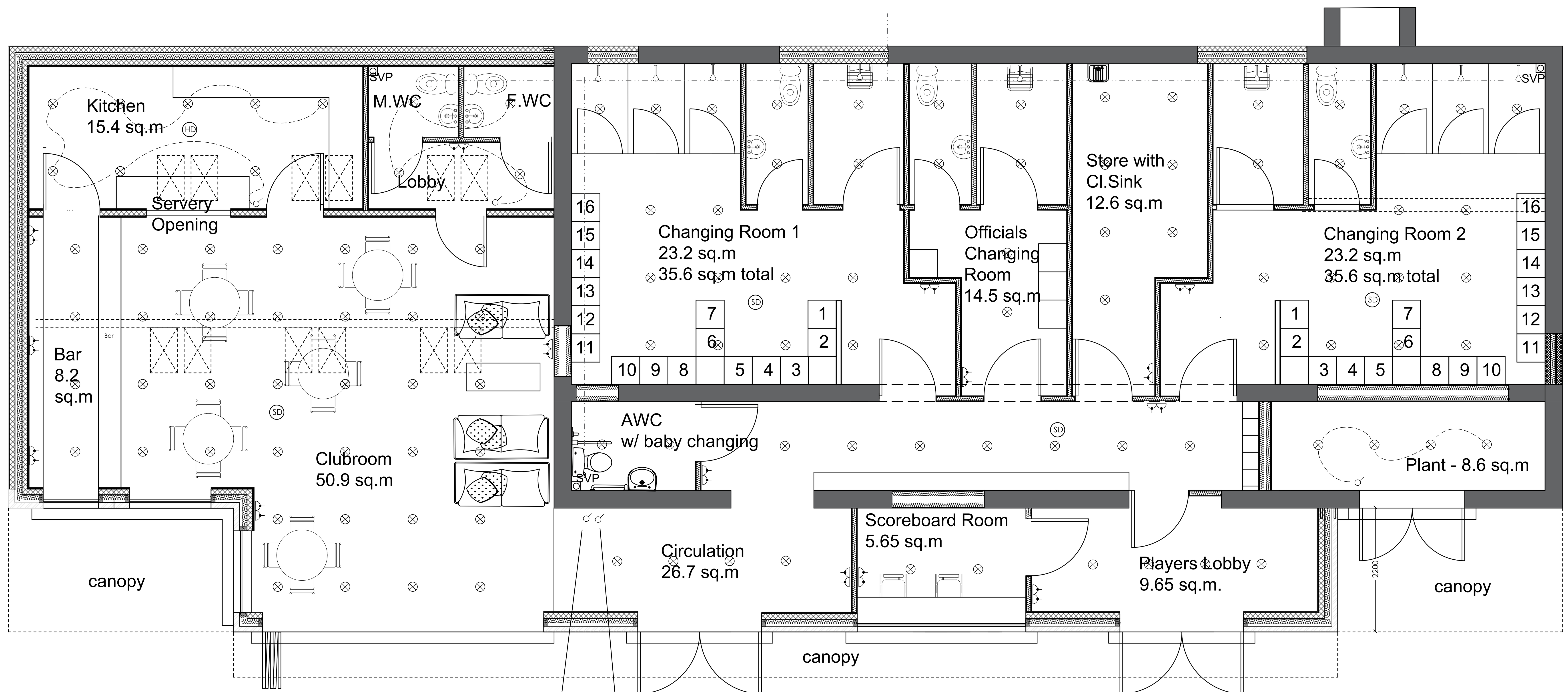
Drawing No. : (4)014
Revision : -

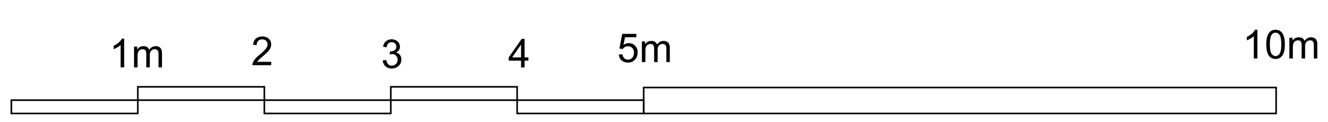


Switch for Clubroom

Switch's for
Circulation,
AWC,
Changing Room 01,
Officials CR,
Changing Room 2

ALL DOWN-LIGHTS TO BE WARM WHITE LOW ENERGY LED'S

All socket and switches positions to be
agreed by client before installation.
This is a schematic drawing for pricing only.



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Responsibility is not accepted for errors made by others scaling from this drawing. All discrepancies should be reported to Western Building Consultants

RICS

Drawing:
(4)015
LIGHTING AND SOCKETS

Project:
ThePavilion at the
Recreation Ground
BS36 1LU

Scale: 1:50 @ A1
1:100 @ A3
Job No : 1240340

Drawn By: MH
Checked By: LA

Date : 19/12/2024

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Drawing No. : (4)015
Revision : -

APPENDIX D – STRUCTURAL ENGINEERING DRAWINGS

CIVIL & STRUCTURAL CONSULTING ENGINEERS

The Pavilion

Structural Calculations

For

Winterbourne Parish Council

Date:

12/02/2025

Project Reference: M2-3168

Document Reference: SE-01_A1

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Document Issue History and Status

	Prepared By		Checked By		Approved By	
Revision	**Name**	**Date**	**Name**	**Date**	**Name**	**Date**
A1	**Matthieu Crosnier**	03.02.25	**Max Day**	12.02.25	**Matthieu Crosnier**	12.02.25

General Notes:

Calculations to be checked by Building Control Authority before work commences. Client to ensure all of contractors' works on site comply with and meet Approval of the relevant British Standards and the Local Authority including Building Control and Planning Departments. All temporary works to be the responsibility of the contractor and should be in accordance with BS 5975 to ensure temporary stability during the course of the works.

Dimensions: Note that all dimensions shown on the calculations are indicative and have been used for calculation purposes only. All dimensions should be checked prior to start of the works on site. It is the responsibility of the client to notify the Engineer of any discrepancies. The same applies to the alignment of walls and general layouts. All existing foundations and lintels to be exposed to verify suitability and to be checked for adequacy and/or replaced or surrounded in 150mm concrete cover if necessary. Prior to commencement a trial hole and /or soil report/investigation and an inspection of any trees in the areas may be required.

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Introduction:

The following design calculations are for the single storey extension at the sport Pavilion in Winterbourne, Bristol.

Design Codes - Eurocodes:

BS EN 1990:	Eurocode 0:	“Basis of Structural Design”
BS EN 1991:	Eurocode 1:	“Actions on Structures”
BS EN 1992:	Eurocode 2:	“Design of Concrete Structures”
BS EN 1993:	Eurocode 3:	“Design of Steel Structures”
BS EN 1994:	Eurocode 4:	“Design of Composite Steel and Concrete Structures”
BS EN 1995:	Eurocode 5:	“Design of Timber Structures”
BS EN 1996:	Eurocode 6:	“Design of Masonry Structures”
BS EN 1997:	Eurocode 7:	“Geotechnical Design”
BS EN 1998:	Eurocode 8:	“Design of Structures for Earthquake Resistance”
BS EN 1999:	Eurocode 9:	“Design of Aluminium Structures”

Loadings

Roof Loading (Pitched Roof)

Roof slope; A = **5°**

Dead Load

Metal sheeting;	$Roof_{D1}$	=	**0.15** kN/m²
Felt & Boarding;	$Roof_{D2}$	=	**0.05** kN/m²
Rafters;	$Roof_{D3}$	=	**0.12** kN/m²
Insulation;	$Roof_{D4}$	=	**0.05** kN/m²
Services;	$Roof_{D5}$	=	**0.05** kN/m²
Plasterboard & Skim;	$Roof_{D6}$	=	**0.15** kN/m²
Dead Load on slope;	$Roof_{DL\_sroof}$ = sum($Roof_{D1}$,$Roof_{D2}$,$Roof_{D3}$,$Roof_{D4}$,$Roof_{D5}$,$Roof_{D6}$)	=	**0.570** kN/m²
Total Dead Load (on plan);	$Roof_{DL}$ = $Roof_{DL\_sroof}$ / cos(A)	=	**0.572** kN/m²

Imposed Load

Roof Imposed Load (on plan);	$Roof_{IL1}$	=	**0.60** kN/m²

Cavity Wall Loading

Dead Load

Masonry (Outer Leaf);	CW_{D1}	=	**2.20** kN/m²
Insulation;	CW_{D2}	=	**0.05** kN/m²
Masonry (Inner Leaf);	CW_{D3}	=	**1.80** kN/m²
Plasterboard & Skim;	CW_{D4}	=	**0.15** kN/m²
Total Dead Load;	CW_{DL} = sum(CW_{D1},CW_{D2},CW_{D3},CW_{D4})	=	**4.20** kN/m²

Internal Blockwork Wall Loading

Dead Load

Masonry;	IW_{D1}	=	**1.80** kN/m²
Plasterboard & Skim (both sides);	IW_{D2}	=	**0.30** kN/m²
Total Dead Load;	IW_{DL} = sum(IW_{D1},IW_{D2})	=	**2.10** kN/m²

Stud Wall Loading

Dead Load

Stud;	SW_{D1}	=	**0.20** kN/m²
Plasterboard & Skim (both sides);	SW_{D2}	=	**0.30** kN/m²
Total Dead Load;	SW_{DL} = sum(SW_{D1},SW_{D2})	=	**0.50** kN/m²

Beam B1 Design:

Loadings

UDL from Pitched Roof

Width of roof being carried;	x_1 = **3.7** m		
Dead Load;	$DL_1 = 0.572$ kN/m$^2 \times x_1$	=	**2.116** kN/m
Imposed Load;	$IL_1 = 0.60$ kN/m$^2 \times x_1$	=	**2.220** kN/m

B1 STEEL MASONRY SUPPORT (EN1993)

STEEL MASONRY SUPPORT

In accordance with EN1993-1-1:2005 incorporating Corrigenda February 2006 and April 2009 and the UK national annex

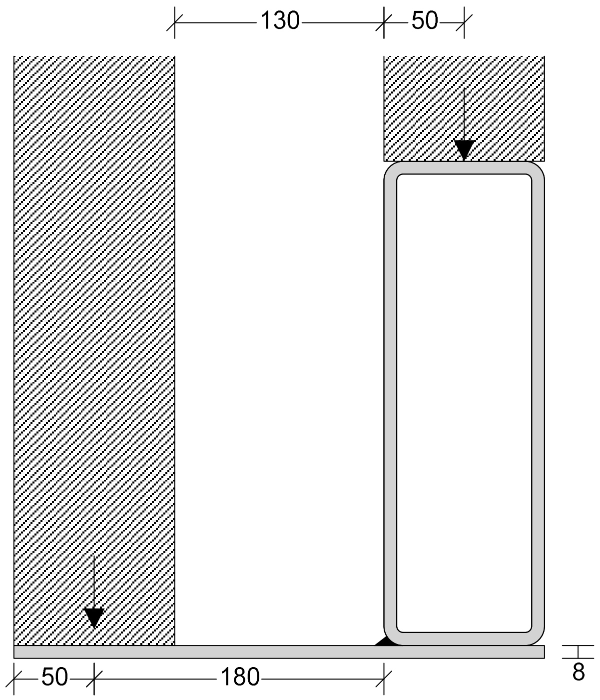
Tedds calculation version 1.0.05

Design summary

Overall design status; PASS

Overall design utilisation; 0.763

Description	Unit	Allowable	Applied	Utilisation	Result
Heel moment	kNm/m	2.933	0.680	0.232	PASS
Deflection	mm	1.8	0.9	0.486	PASS
Weld capacity	kN/m	803.4	296.7	0.369	PASS
Shear force (major axis)	kN	695.9	38.1	0.055	PASS
Bending (major axis)	kNm	150.1	49.5	0.330	PASS
Bending (minor axis)	kNm	67.5	0.1	0.001	PASS
Torsion resistance	kNm	61.4	2.3	0.038	PASS
Plastic interaction				0.159	PASS
Torsion beam rotation	deg	3.00	0.05	0.017	PASS
Torsion beam deflection	mm	10.0	7.6	0.763	PASS



Partial factors - Section 6.1

Resistance of cross-sections; γ_{M0} = **1**

Resist. of members to instability; γ_{M1} = **1**

Resistance of joints; γ_{M2} = **1.25**

Partial factor for permanent action; γ_G = **1.35**

Partial factor for variable action; γ_Q = **1.50**

Steel beam section details

Torsion beam section type; RHS 300x100x8.0

Nominal yield strength $f_y = f_{y,tb}$ = **275** N/mm^2

Nominal ultimate tensile strength $f_u = f_{u,tb}$ = **410** N/mm^2

Masonry support section details

Section type; Plate 330x8(230)

Steel grade; User defined

Nominal thickness; $t_{nom,sb} = t_{plate}$ = **8** mm

Nominal yield strength; $f_{y,sb}$ = **275** N/mm^2

Nominal ultimate tensile strength; $f_{u,sb}$ = **410** N/mm^2

Modulus of elasticity; E_{sb} = **210000** N/mm^2

Total length of plate; l_{plate} = **330** mm

Length of plate beyond outer edge of torsion beam; l_h = **230** mm

Supported materials detail

Density of masonry on torsion beam; $\rho_{m,tb}$ = **20.0** kN/m^3

Width of masonry on torsion beam; $b_{m,tb}$ = **100** mm

Height of masonry on torsion beam; $h_{m,tb}$ = **1400** mm

Eccentricity of torsion beam masonry; $e_{load,tb}$ = **50** mm

Eccentricity of torsion beam material; e_{tb} = **0** mm

Add perm. force torsion beam (not masonry); $G_{k,add,tb}$ = **2.1** kN/m

Add var. force torsion beam (not masonry); $Q_{k,add,tb}$ = **2.2** kN/m

Density of masonry on support beam; $\rho_{m,sb}$ = **20.0** kN/m^3

Width of masonry on support beam; $b_{m,sb}$ = **100** mm

Height of masonry on support beam; $h_{m,sb}$ = **1400** mm

Eccentricity of support beam masonry; $e_{load,sb}$ = **180** mm

Geometry

Cavity width; b_{cavity} = **130** mm

Supported width of masonry; $d_m = l_h + t_{shim} + e_{tb} - b_{cavity}$ = **100** mm

Biaxial stress effects in the plate (SCI-P-110)

Maximum overall bending moment; $M_{y,Ed}$ = **49.5** kNm

Dist to NA combined section (CoG torsion beam); $z_{na,all} = (h_{tb} + t_{plate}) \times A_{pl} / (2 \times (A_{tb} + A_{pl}))$ = **47** mm

Second moment of area of combined section; $I_{y,all} = (I_{ytb} + A_{tb} \times z_{na,all}^2) + A_{pl} \times (h_{tb} / 2 + t_{plate} / 2 - z_{na,all})^2$ = **10670** cm^4

Elastic section modulus of combined section; $Z_{y,all} = I_{y,all} / (h_{tb} / 2 + t_{plate} - z_{na,all})$ = **958.21** cm^3

Section modulus of plate; $Z_{y,plate} = 1m \times t_{plate}^2 / (6 \times 1m)$ = **10.67** cm^3/m

Force of masonry on support plate; $F_1 = (b_{m,sb} \times h_{m,sb} \times \rho_{m,sb} + G_{k,add,sb}) \times \gamma_G + Q_{k,add,sb} \times \gamma_Q$ = **3.8** kN/m

Bending at heel; $M_{y,Ed,plate} = F_1 \times e_{load,sb}$ = **0.7** kNm/m

Moment capacity of plate; $M_{y,Rd,plate} = Z_{y,plate} \times f_{y,sb} / \gamma_{M0}$ = **2.9** kNm/m

PASS - Moment capacity of plate exceeds applied moment

Longitudinal stress due to overall bending; $\sigma_1 = M_{y,Ed} / Z_{y,all}$ = **51.7** N/mm^2

Constant relating to Von Mises curve; $c_{fp} = (4 \times f_{y,sb}^2 - 3 \times \sigma_1^2)^{0.5}$ = **542.7** N/mm^2

Transverse bending stress ratio limit; $\alpha_{ts} = (c_{fp}^2 - \sigma_1^2) / (2 \times c_{fp} \times f_{y,sb})$ = **0.978**

Transverse bending stress ratio; $\alpha_{ls} = M_{y,Ed,plate} / M_{y,Rd,plate}$ = **0.232**

PASS - Transverse bending stress ratio less than allowable limit

Deflection of plate

Unfactored force on support angle; $F_{1ser} = (b_{m,sb} \times h_{m,sb} \times \rho_{m,sb} + G_{k,add,sb}) + Q_{k,add,sb}$ = **2.8** kN/m

Distance from weld to load position; $a_m = e_{load,sb}$ = **180** mm

Length of load resultant to edge of plate; $b_m = l_h - e_{load,sb}$ = **50** mm

Dist from weld to load position as ratio of length; $a_l = a_m / (a_m + b_m)$ = **0.783**

Effective second moment of area; $I_{eff\_def} = t_{plate}^3 / 12$ = **42667** mm^4/m

Deflection at end of plate; $\delta = (a_l^2 \times (3 - a_l) / 6) \times (F_{1ser} \times (a_m + b_m)^3) / (E_{sb} \times I_{eff\_def})$ = **0.86** mm

Deflection limit; $\delta_{lim} = \min((1 + d_m / b_{cavity}) \times 1mm, 2mm)$ = **1.77** mm

PASS - Deflection is within specified criteria

Weld details - assume a full length weld and that the plate acts as a propped cantilever with the prop at the weld position and the fixed end at the centre of the torsion beam

Shear force at weld position; $F_A = F_1 \times \max((1 + (3 \times e_{load,sb}) / (2 \times b_{tb} / 2)), 1.4)$ = **24.2** kN/m

Maximum possible force in plate; $F_p = (l_h + \min(b_{tb}, l_{plate} - l_h)) \times t_{plate} \times f_{y,sb}$ = **726.0** kN

Longitudinal shear between beam and plate; $F_l = 2 \times F_p / L =$ **279.2** kN/m

Horizontal shear between beam and plate; $F_h = F_1 \times e_{load,sb} / (s_{weld} / 2 + t_{plate} / 2) =$ **97.2** kN/m

Resultant weld force; $F_{w,Ed} = (F_A^2 + F_l^2 + F_h^2)^{0.5} =$ **296.7** kN/m

Leg length of weld; $s_{weld} =$ **6.00** mm

Throat thickness of weld; $a_{weld} = 1 / \sqrt{(2)} \times s_{weld} =$ **4.24** mm

Length of weld per metre run; $l_{weld} =$ **1000** mm/m

Ultimate tensile strength used for weld; $f_{u,weld} = \min(f_{u,sb}, f_{u,tb}) =$ **410.0** N/mm^2

Correlation factor (table 4.1); $\beta_w =$ **1.00**

Design shear strength; $f_{vw,d} = f_{u,weld} / (\sqrt{(3)} \times \beta_w \times \gamma_{M2}) =$ **189.4** N/mm^2

Design resistance of weld; $F_{w,Rd} = f_{vw,d} \times a_{weld} =$ **803.4** kN/m

PASS - weld capacity exceeds applied force

Eccentricities

Distance to shear centre of torsion beam; $e_{0,tb} =$ **0** mm

Eccentricity of support beam masonry; $e_{m,sb} = e_{load,sb} + b_{tb} / 2 =$ **230** mm

Eccentricity of torsion beam masonry; $e_{m,tb} = b_{tb} / 2 - e_{load,tb} =$ **0** mm

Eccentricity of support beam; $e_{b,sb} = c_{zsb} + b_{tb} / 2 =$ **115** mm

Eccentricity of torsion beam; $e_{b,tb} =$ **0** mm

Torsional loading ULS

Loading of support beam masonry; $w_{sb} = (h_{m,sb} \times b_{m,sb} \times \rho_{m,sb}) \times \gamma_G =$ **3.78** kN/m

Loading of torsion beam masonry; $w_{tb} = (h_{m,tb} \times b_{m,tb} \times \rho_{m,tb} + G_{k,add,tb}) \times \gamma_G + Q_{k,add,tb} \times \gamma_Q =$ **9.97** kN/m

Self weight of support beam; $w_{sw,sb} = A_{pl} \times \rho_{SEC3} \times g_{acc} \times \gamma_G =$ **0.27** kN/m

Self weight of torsion beam; $w_{sw,tb} = A_{tb} \times \rho_{SEC3} \times g_{acc} \times \gamma_G =$ **0.63** kN/m

Torsional loading SLS

Loading of support beam masonry; $w_{sb,ser} = h_{m,sb} \times b_{m,sb} \times \rho_{m,sb} =$ **2.80** kN/m

Loading of torsion beam masonry; $w_{tb,ser} = h_{m,tb} \times b_{m,tb} \times \rho_{m,tb} + G_{k,add,tb} + Q_{k,add,tb} =$ **7.14** kN/m

Self weight of support beam; $w_{sw,sb,ser} = A_{pl} \times \rho_{SEC3} \times g_{acc} =$ **0.20** kN/m

Self weight of torsion beam; $w_{sw,tb,ser} = A_{tb} \times \rho_{SEC3} \times g_{acc} =$ **0.47** kN/m

Torsional effects

Applied torque (ULS); $T_{d,w} = \mathrm{abs}(w_{sb} \times e_{m,sb} + w_{tb} \times e_{m,tb} + w_{sw,sb} \times e_{b,sb} + w_{sw,tb} \times e_{b,tb}) =$ **0.90** kNm/m

Total torque (ULS); $T_d = T_{d,w} \times L =$ **4.68** kNm

Applied torque (SLS); $T_{d,w,ser} = \mathrm{abs}(w_{sb,ser} \times e_{m,sb} + w_{tb,ser} \times e_{m,tb} + w_{sw,sb,ser} \times e_{b,sb} + w_{sw,tb,ser} \times e_{b,tb}) =$ **0.67** kNm/m

Total torque (SLS); $T_{d,ser} = T_{d,w,ser} \times L =$ **3.47** kNm

STEEL BEAM TORSION DESIGN (EN1993)

In accordance with EN1993-1-1:2005 incorporating Corrigenda February 2006 and April 2009 and the UK national annex

Tedds calculation version 1.0.05

Partial factors - Section 6.1

Resistance of cross-sections; $\gamma_{M0} =$ **1**

Resistance of members to instability; $\gamma_{M1} =$ **1**

Section details

Section type; RHS 300x100x8.0 (Tata Steel Celsius (Gr355 Gr420 Gr460))

Steel grade; User defined

Nominal thickness of element; $t_{nom} = t = \mathbf{8}$ mm

Nominal yield strength; $f_y = \mathbf{275}$ N/mm^2

Nominal ultimate tensile strength; $f_u = \mathbf{410}$ N/mm^2

Modulus of elasticity; $E = \mathbf{210000}$ N/mm^2

Shear centre

Distance between flange shear centres $h_s = h - t = \mathbf{292.0}$ mm

Shear centre (above bottom flange centroid); $e_{s,bf} = h_s / 2 = \mathbf{146.0}$ mm

Torsional section modulus

Perimeter length; $p = 2 \times ((h - t) + (b - t)) - 2 \times 1.25 \times t \times (4 - \pi) = \mathbf{751}$ mm

Area enclosed by mean perimeter; $A_p = (h - t) \times (b - t) - (1.25 \times t)^2 \times (4 - \pi) = \mathbf{26778}$ mm^2

Torsional section modulus; $W_t = I_t / (t + 2 \times A_p / p) = \mathbf{387}$ cm^3

Analysis results

Design bending moment - major axis; $M_{y,Ed} = \mathbf{49.5}$ kNm

Design shear force - major axis; $V_{y,Ed} = \mathbf{38.1}$ kN

Classification

Internal compression parts subject to bending - Table 5.2 (sheet 1 of 3)

Width of section; $c = h - 3 \times t = \mathbf{276}$ mm

$c / t = 34.5 = 37.3 \times \varepsilon <= 72 \times \varepsilon$; Class 1

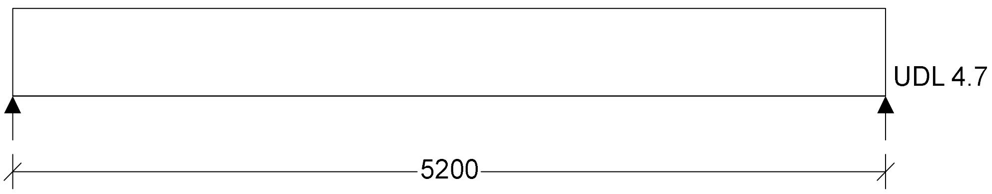
Internal compression parts subject to compression - Table 5.2 (sheet 1 of 3)

Width of section; $c = b - 3 \times t = \mathbf{76}$ mm

$c / t = 9.5 = 10.3 \times \varepsilon <= 33 \times \varepsilon$; Class 1

Section is class 1

Torsional loads



Torsional loading

Load No.	Load type	Load (kNm)	Distance along beam (mm)
1	UDL	4.7	-

Design torque at LHS support; $T_A = T_{d\_1} / 2 = \mathbf{2.34}$ kNm

Design torque at RHS support; $T_B = T_{d\_1} / 2 = \mathbf{2.34}$ kNm

Average torque over haf the beam; $T_{av,t,Ed} = - T_{d\_1} / 4 = \mathbf{-1.17}$ kNm

Maximum St Venant torsion design moment; $T_{t,Ed}$ = max(abs(T_A), abs(T_B)) = **2.34** kNm

Rotation at mid-span; ϕ = abs($T_{avt,Ed}$) × L / (2 × G_{SEC3} × I_t) = **0.00123**

Additional minor axis moment;$M_{z,add,Ed}$ = ϕ × $M_{y,Ed}$ = **0.06** kNm

Check shear - Section 6.2.6

Height of web; h_w = h - 2 × t = **284** mm

η = **1.000**

h_w / t = 35.5 = 38.4 × ε / η < 72 × ε / η

Shear buckling resistance can be ignored

Design shear force; $V_{y,Ed}$ = **38.10** kN

Shear area - cl 6.2.6(3); A_v = A × h / (b + h) = **4556** mm^2

Design shear resistance - cl 6.2.6(2); $V_{pl,y,Rd}$ = A_v × (f_y / √(3)) / γ_{M0} = **723.4** kN

Shear stress due to St Venant torsion; $\tau_{t,Ed}$ = $T_{t,Ed}$ / W_t = **6.06** N/mm^2

Reduced shear resistance due to torsion - eq 6.26; $V_{c,y,Rd}$ = $V_{pl,T,y,Rd}$ = (1 - $\tau_{t,Ed}$ / ((f_y / √(3)) / γ_{M0})) × $V_{pl,y,Rd}$ = **695.9** kN

$V_{y,Ed}$ / $V_{pl,T,y,Rd}$ = **0.055**

PASS - Design shear resistance exceeds design shear force

Check bending moment - Section 6.2.5

Design bending moment; $M_{y,Ed}$ = **49.5** kNm

Design bending resistance moment - eq 6.13; $M_{c,y,Rd}$ = $M_{pl,y,Rd}$ = $W_{pl.y}$ × f_y / γ_{M0} = **150.1** kNm

$M_{y,Ed}$ / $M_{pl,y,Rd}$ = **0.33**

PASS - Design bending resistance moment exceeds design bending moment

Check bending moment - Section 6.2.5

Design bending moment; $M_{z,Ed,total}$ = $M_{z,Ed}$ + $M_{z,add,Ed}$ = **0.1** kNm

Design bending resistance moment - eq 6.13; $M_{c,z,Rd}$ = $M_{pl,z,Rd}$ = $W_{pl.z}$ × f_y / γ_{M0} = **67.5** kNm

$M_{z,Ed,total}$ / $M_{pl,z,Rd}$ = **0.001**

PASS - Design bending resistance moment exceeds design bending moment

Torsional resistance

Design resistance to St. Venant torsion; T_{Rd} = C × f_y / (√(3) × γ_{M0}) = **61.42** kNm

$T_{t,Ed}$ / T_{Rd} = **0.038**

PASS - Design torsional resistance exceeds applied St Venants torsion

Plastic verification - cl.6.2.9.1(6)

αbi = **1.66**

βbi = **1.66**

$[M_{y,Ed} / M_{pl,y,Rd}]^{\alpha bi} + [M_{z,Ed,total} / M_{pl,z,Rd}]^{\beta bi}$ = **0.159**

PASS - Plastic interaction criterion is less than 1.0

Serviceability limit checks

Rotation limit; $\phi_{ser,lim}$ = **3.00** deg

Rotation of torsion beam; ϕ_{ser} = $M_{z,add,Ed}$ × 180 / ($M_{y,Ed}$ × γ_G × π) = **0.05** deg

PASS - Rotation limit exceeds rotation in torsion beam

Vertical deflection limit; $\delta_{v,lim}$ = **10.0** mm

SLS loading on beam; $f_{d,ser} = w_{sb,ser} + w_{tb,ser} + w_{sw,sb,ser} + w_{sw,tb,ser}$ = **10.61** kN/m

Vertical deflection of torsion beam; $\delta_v = 5 \times f_{d,ser} \times L^4 / (384 \times E_{sb} \times I_{ytb})$ = **7.6** mm

PASS - Vertical deflection limit exceeds vertical deflection in torsion beam

B1 MASONRY BEARING DESIGN (EN1996)

MASONRY BEARING DESIGN

In accordance with EN1996-1-1:2005 + A1:2012, incorporating Corrigenda February 2006 and July 2009 and the UK National Annex.

Tedds calculation version 1.0.14

Summary table

Load	Local concentration		Spreader		Utilisation	
	Design force	Resistance	Design stress	Resistance		
1	35.7 kN	35.8 kN	N/A	N/A	0.997	Pass

Masonry panel details

Panel length; L = **1500** mm

Panel height; h = **2500** mm

Thickness of load bearing leaf; t = **100** mm

Effective height; h_{ef} = **2500** mm

Effective thickness; t_{ef} = **100** mm

Masonry material details

Unit type; **Aggregate concrete - Group 1**

Compressive strength of masonry unit; f_c = **7.3** N/mm^2

Height of unit; h_u = **215** mm

Width of unit; w_u = **100** mm

Conditioning factor; k = **1.0**

- Conditioning to the air dry condition in accordance with cl.7.3.2

Shape factor - Table A.1; d_{sf} = **1.38**

Mean compressive strength of masonry unit; $f_b = f_c \times k \times d_{sf}$ = **10.07** N/mm^2

Specific weight of units; γ = **18** kN/m^3

Mortar type; **M4 - General Purpose**

Compressive strength of mortar; f_m = **4.0** N/mm^2

Compressive strength factor - Tbl. NA 4; K = **0.75**

Characteristic compressive strength - eq. 3.1; $f_k = K \times f_b^{0.7} \times f_m^{0.3}$ = **5.73** N/mm^2

Short term secant modulus of elasticity factor; K_E = **1000**

Modulus of elasticity - cl.3.7.2; $E_w = K_E \times f_k$ = **5727** N/mm^2

Design compressive strength of masonry

Category of manufacturing control; **Category II**

Class of execution control; **Class 2**

Partial factor for compressive strength; γ_M = **3.00**

Cross-sectional area of wall; A = L × t = **0.15** m^2;

Design compressive strength of masonry; $f_d = f_k / \gamma_M$ = **1.91** N/mm^2

Partial safety factors for design loads

Partial safety factor for permanent load; γ_{fG} = **1.35**

Partial safety factor for variable load; γ_{fQ} = **1.50**

Superimposed vertical loading details

Permanent UDL at top of wall; g_k = **0.00** kN/m

Variable UDL at top of wall; q_k = **0.00** kN/m

Eccentricity of permanent UDL load; e_{gu} = **0** mm

Eccentricity of variable UDL load; e_{qu} = **0** mm

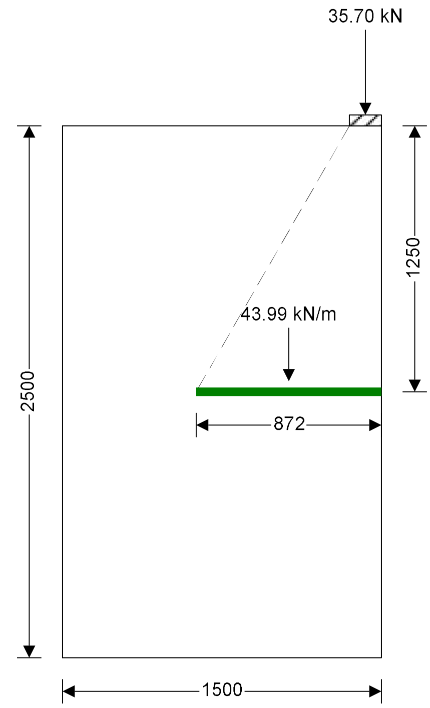
Slenderness ratio of masonry wall - Section 5.5.1.4

Slenderness ratio limit; λ_{lim} = **27**

Slenderness ratio; $\lambda = h_{ef} / t_{ef}$ = **25.0**

PASS - Slenderness ratio is less than slenderness limit

Concentrated Load 1 details - B1 point load



Permanent concentrated load; G_{kc1} = **20.00** kN

Variable concentrated load; Q_{kc1} = **5.80** kN

Eccentricity of concentrated load; e_{c1} = **0** mm

Length of concentrated load; L_{c1} = **150** mm
Width of concentrated load; w_{c1} = **100** mm
Height of concentrated load; h_{c1} = **2500** mm
Distance of load to right vertical edge; r_{11} = **0** mm
Distance of load to nearest vertical edge; a_{11} = **0** mm

Walls subjected to concentrated loads - Section 6.1.3

Eccentricity check; $e_{c1} <= t / 4$

PASS - Eccentricity of load is less than t/4

Area of bearing; $A_{b1} = L_{c1} \times w_{c1}$ = **15000** mm^2
Effective length of bearing at mid-height; $l_{efm1} = L_{c1} + h_{c1} / 2 \times \tan(30) + r_{11}$ = **872** mm
Effective bearing area; $A_{ef1} = l_{efm1} \times t$ = **87169** mm^2
Bearing area ratio check; $A_{ratio1} = Min(A_{b1} / A_{ef1}, 0.45)$ = **0.17**
Initial enhancement factor; $\beta_{init1} = Max((1 + 0.3 \times a_{11} / h_{c1}) \times (1.5 - 1.1 \times A_{ratio1}), 1.0)$ = **1.31**
Maximum enhancement factor; $\beta_{max1} = Min(1.25 + a_{11} / (2 \times h_{c1}), 1.5)$ = **1.25**
Enhancement factor for concentrated loads; $\beta_1 = Min(\beta_{init1}, \beta_{max1})$ = **1.25**
Design value of the concentrated load; $N_{Edc1} = G_{kc1} \times \gamma_{fG} + Q_{kc1} \times \gamma_{fQ}$ = **35.70** kN
Design value concentrated load resistance; $N_{Rdc1} = \beta_1 \times A_{b1} \times f_d$ = **35.79** kN

PASS - Design resistance exceeds applied concentrated load

Walls subjected to mainly vertical loading - Section6.1.2

Eccentricity of permanent UDL at mid-height below concentrated load

$e_{gmu1} = e_{gu} \times h_{c1} / (2 \times h)$ = **0.0** mm

Eccentricity of variable UDL at mid-height below concentrated load

$e_{qmu1} = e_{qu} \times h_{c1} / (2 \times h)$ = **0.0** mm

Eccentricity of concentrated load at mid-height; $e_{mc1} = e_{c1} / 2$ = **0.0** mm
Initial eccentricity - cl.5.5.1.1(4); $e_{init} = h_{ef} / 450$ = **5.6** mm
Concentrated load at mid-height as UDL; $N_{mc1} = N_{Edc1} / l_{efm1}$ = **40.96** kN/m
Vertical load at mid-height; $N_{Ed1} = (g_k + \gamma \times t \times (h - h_{c1} / 2)) \times \gamma_{fG} + q_k \times \gamma_{fQ} + N_{mc1}$ = **43.99** kN/m
Design moment at mid-height; $M_{Ed1} = g_k \times \gamma_{fG} \times e_{gmu1} + q_k \times \gamma_{fQ} \times e_{qmu1} + N_{mc1} \times e_{mc1}$ = **0.00** kNm/m
Eccentricities due to loads - eq. 6.7; $e_{m1} = Abs(M_{Ed1}) / N_{Ed1} + e_{init}$ = **5.6** mm
Slenderness ratio limit for creep eccentricity; λ_c = **27**
Eccentricity due to creep; e_{k1} = **0.0** mm
Eccentricity at mid-height - eq. 6.6; $e_{mk1} = Max(e_{m1} + e_{k1}, 0.05 \times t)$ = **5.6** mm
From eq. G2; $A_{11} = 1 - 2 \times e_{mk1} / t$ = **0.89**
From eq. G3; $u_1 = (h_{ef} / t_{ef} \times (1 / K_E)^{1/2} - 0.063) / (0.73 - 1.17 \times e_{mk1} / t)$ = **1.09**
Capacity reduction factor - eq. G1; $\Phi_{m1} = A_{11} \times \exp(-(u_1^2) / 2)$ = **0.49**
Design vertical resistance of panel - eq.6.2; $N_{Rd1} = \Phi_{m1} \times t \times f_d$ = **93.26** kN/m

PASS - Design value of vertical resistance exceeds applied vertical load

<u>Provide 300x100x8.0 RHS S.355 with 8mm thick plate welded to underside. 150mm bearing length on 215lg x 215dp x 100thk concrete padstone.</u>

	Project		Sheet no./rev.
	The Pavilion		14
	Job Ref. M2-3168	Calc. by MC	Date 05/02/2025
	Doc. Ref SE-01_A1	Chk'd by MD	Date 12/02/2025

Beam B2 Design:

Loadings

UDL from Pitched Roof

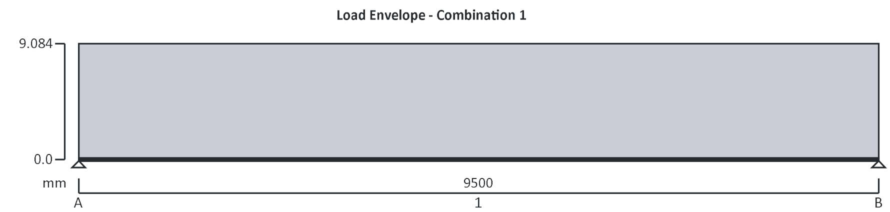
Width of roof being carried;	x_1 = **4.9** m		
Dead Load;	$DL_1 = 0.572\ kN/m^2 \times x_1$	=	**2.803** kN/m
Imposed Load;	$IL_1 = 0.60\ kN/m^2 \times x_1$	=	**2.940** kN/m

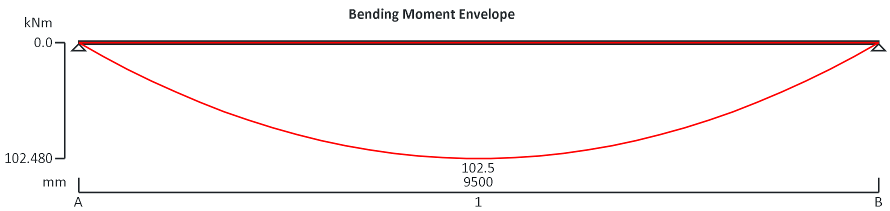
STEEL BEAM B2 ANALYSIS & DESIGN (EN1993)

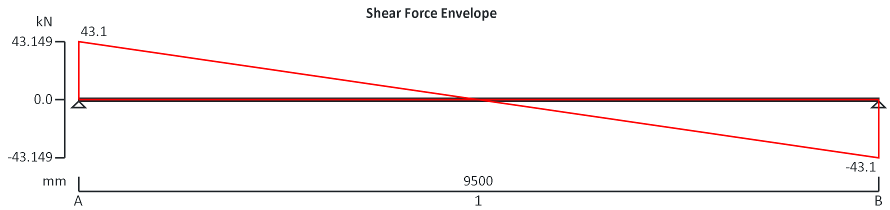
STEEL BEAM ANALYSIS & DESIGN (EN1993-1-1:2005)

In accordance with EN1993-1-1:2005 incorporating Corrigenda February 2006 and April 2009 and the UK national annex

TEDDS calculation version 3.0.14







Support conditions

Support A	Vertically restrained
	Rotationally free
Support B	Vertically restrained
	Rotationally free

Applied loading

Beam loads Permanent self weight of beam × 1

Permanent full UDL 2.8 kN/m

Variable full UDL 2.94 kN/m

Load combinations

Load combination 1	Support A	Permanent × 1.35
		Variable × 1.50
		Permanent × 1.35
		Variable × 1.50
	Support B	Permanent × 1.35
		Variable × 1.50

Analysis results

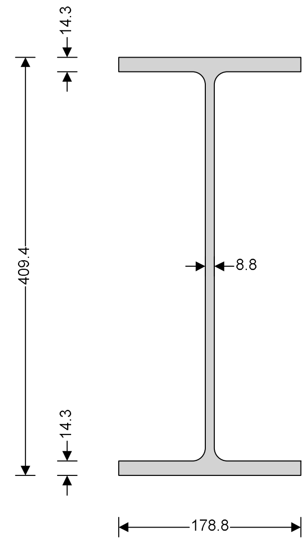
Maximum moment;	M_{max} = **102.5** kNm;	M_{min} = **0** kNm
Maximum shear;	V_{max} = **43.1** kN;	V_{min} = **-43.1** kN
Deflection;	δ_{max} = **13.2** mm;	δ_{min} = **0** mm
Maximum reaction at support A;	R_{A_max} = **43.1** kN;	R_{A_min} = **43.1** kN
Unfactored permanent load reaction at support A;	$R_{A\_Permanent}$ = **16.4** kN	
Unfactored variable load reaction at support A;	$R_{A\_Variable}$ = **14** kN	
Maximum reaction at support B;	R_{B_max} = **43.1** kN;	R_{B_min} = **43.1** kN
Unfactored permanent load reaction at support B;	$R_{B\_Permanent}$ = **16.4** kN	
Unfactored variable load reaction at support B;	$R_{B\_Variable}$ = **14** kN	

Section details

Section type;	**UB 406x178x67 (British Steel Section Range 2022 (BS4-1))**
Steel grade;	**S275**

EN 10025-2:2004 - Hot rolled products of structural steels

Nominal thickness of element;	$t = \max(t_f, t_w)$ = **14.3** mm
Nominal yield strength;	f_y = **275** N/mm^2
Nominal ultimate tensile strength;	f_u = **410** N/mm^2
Modulus of elasticity;	E = **210000** N/mm^2



Partial factors - Section 6.1

Resistance of cross-sections; γ_{M0} = **1.00**

Resistance of members to instability; γ_{M1} = **1.00**

Resistance of tensile members to fracture; γ_{M2} = **1.10**

Lateral restraint

Span 1 has lateral restraint at supports only

Effective length factors

Effective length factor in major axis; K_y = **1.000**

Effective length factor in minor axis; K_z = **1.000**

Effective length factor for torsion; $K_{LT.A}$ = **1.000**;

$K_{LT.B}$ = **1.000**;

Classification of cross sections - Section 5.5

$\varepsilon = \sqrt{[235 \text{ N/mm}^2 / f_y]}$ = **0.92**

Internal compression parts subject to bending - Table 5.2 (sheet 1 of 3)

Width of section; c = d = **355.4** mm

$c / t_w = 43.7 \times \varepsilon <= 72 \times \varepsilon$; Class 1

Outstand flanges - Table 5.2 (sheet 2 of 3)

Width of section; $c = (b - t_w - 2 \times r) / 2$ = **72.3** mm

$c / t_f = 5.5 \times \varepsilon <= 9 \times \varepsilon$; Class 1

Section is class 1

Check shear - Section 6.2.6

Height of web; $h_w = h - 2 \times t_f$ = **380.8** mm

Shear area factor; η = **1.000**

$h_w / t_w < 72 \times \varepsilon / \eta$

Shear buckling resistance can be ignored

Design shear force; $V_{Ed} = \max(\text{abs}(V_{max}), \text{abs}(V_{min}))$ = **43.1** kN

Shear area - cl 6.2.6(3); $A_v = \max(A - 2 \times b \times t_f + (t_w + 2 \times r) \times t_f, \eta \times h_w \times t_w)$ = **3979** mm^2

Design shear resistance - cl 6.2.6(2); $V_{c,Rd} = V_{pl,Rd} = A_v \times (f_y / \sqrt{[3]}) / \gamma_{M0}$ = **631.7** kN

PASS - Design shear resistance exceeds design shear force

Check bending moment major (y-y) axis - Section 6.2.5

Design bending moment; $M_{Ed} = \max(\mathrm{abs}(M_{s1\_max}), \mathrm{abs}(M_{s1\_min}))$ = **102.5** kNm

Design bending resistance moment - eq 6.13; $M_{c,Rd} = M_{pl,Rd} = W_{pl.y} \times f_y / \gamma_{M0}$ = **372.7** kNm

Slenderness ratio for lateral torsional buckling

Correction factor - Table 6.6; k_c = **0.94**

$C_1 = 1 / k_c^2$ = **1.132**

Curvature factor; $g = \sqrt{[1 - (I_z / I_y)]}$ = **0.972**

Poissons ratio; ν = **0.3**

Shear modulus; $G = E / [2 \times (1 + \nu)]$ = **80769** N/mm^2

Unrestrained length; $L = 1.0 \times L_{s1}$ = **9500** mm

Elastic critical buckling moment; $M_{cr} = C_1 \times \pi^2 \times E \times I_z / (L^2 \times g) \times \sqrt{[I_w / I_z + L^2 \times G \times I_t / (\pi^2 \times E \times I_z)]}$ = **147.2** kNm

Slenderness ratio for lateral torsional buckling; $\bar{\lambda}_{LT} = \sqrt{(W_{pl.y} \times f_y / M_{cr})}$ = **1.591**

Limiting slenderness ratio; $\bar{\lambda}_{LT,0}$ = **0.4**

$\bar{\lambda}_{LT}$ > $\bar{\lambda}_{LT,0}$ - Lateral torsional buckling cannot be ignored

Design resistance for buckling - Section 6.3.2.1

Buckling curve - Table 6.5; c

Imperfection factor - Table 6.3; α_{LT} = **0.49**

Correction factor for rolled sections; β = **0.75**

LTB reduction determination factor; $\phi_{LT} = 0.5 \times [1 + \alpha_{LT} \times (\bar{\lambda}_{LT} - \bar{\lambda}_{LT,0}) + \beta \times \bar{\lambda}_{LT}^2]$ = **1.742**

LTB reduction factor - eq 6.57; $\chi_{LT} = \min(1 / [\phi_{LT} + \sqrt{(\phi_{LT}^2 - \beta \times \bar{\lambda}_{LT}^2)}], 1, 1 / \bar{\lambda}_{LT}^2)$ = **0.356**

Modification factor; $f = \min(1 - 0.5 \times (1 - k_c) \times [1 - 2 \times (\bar{\lambda}_{LT} - 0.8)^2], 1)$ = **1.000**

Modified LTB reduction factor - eq 6.58; $\chi_{LT,mod} = \min(\chi_{LT} / f, 1)$ = **0.356**

Design buckling resistance moment - eq 6.55; $M_{b,Rd} = \chi_{LT,mod} \times W_{pl.y} \times f_y / \gamma_{M1}$ = **132.8** kNm

PASS - Design buckling resistance moment exceeds design bending moment

Check vertical deflection - Section 7.2.1

Consider deflection due to permanent and variable loads

Limiting deflection; $\delta_{lim} = L_{s1} / 360$ = **26.4** mm

Maximum deflection span 1; $\delta = \max(\mathrm{abs}(\delta_{max}), \mathrm{abs}(\delta_{min}))$ = **13.196** mm

PASS - Maximum deflection does not exceed deflection limit

B2 MASONRY BEARING DESIGN (EN1996)

MASONRY BEARING DESIGN

In accordance with EN1996-1-1:2005 + A1:2012, incorporating Corrigenda February 2006 and July 2009 and the UK National Annex.

Tedds calculation version 1.0.14

Summary table

Load	Local concentration		Spreader		Utilisation	
	Design force	Resistance	Design stress	Resistance		
1	**43.1 kN**	**26.6 kN**	**1.31 N/mm²**	**1.48 N/mm²**	**0.885**	**Pass**

Masonry panel details

Panel length; $L = \mathbf{4000}$ mm

Panel height; $h = \mathbf{2500}$ mm

Thickness of load bearing leaf; $t = \mathbf{100}$ mm

Effective height; $h_{ef} = \mathbf{2500}$ mm

Effective thickness; $t_{ef} = \mathbf{100}$ mm

Masonry material details

Unit type; **Aggregate concrete - Group 1**

Compressive strength of masonry unit; $f_c = \mathbf{3.6}$ N/mm^2

Height of unit; $h_u = \mathbf{215}$ mm

Width of unit; $w_u = \mathbf{100}$ mm

Conditioning factor; $k = \mathbf{1.0}$

- Conditioning to the air dry condition in accordance with cl.7.3.2

Shape factor - Table A.1; $d_{sf} = \mathbf{1.38}$

Mean compressive strength of masonry unit; $f_b = f_c \times k \times d_{sf} = \mathbf{4.97}$ N/mm^2

Specific weight of units; $\gamma = \mathbf{18}$ kN/m^3

Mortar type; **M4 - General Purpose**

Compressive strength of mortar; $f_m = \mathbf{4.0}$ N/mm^2

Compressive strength factor - Tbl. NA 4; $K = \mathbf{0.75}$

Characteristic compressive strength - eq. 3.1; $f_k = K \times f_b^{0.7} \times f_m^{0.3} = \mathbf{3.49}$ N/mm^2

Short term secant modulus of elasticity factor; $K_E = \mathbf{1000}$

Modulus of elasticity - cl.3.7.2; $E_w = K_E \times f_k = \mathbf{3491}$ N/mm^2

Design compressive strength of masonry

Category of manufacturing control; **Category II**

Class of execution control; **Class 2**

Partial factor for compressive strength; γ_M = **3.00**

Cross-sectional area of wall; $A = L \times t$ = **0.40** m^2;

Design compressive strength of masonry; $f_d = f_k / \gamma_M$ = **1.16** N/mm^2

Partial safety factors for design loads

Partial safety factor for permanent load; γ_{fG} = **1.35**

Partial safety factor for variable load; γ_{fQ} = **1.50**

Superimposed vertical loading details

Permanent UDL at top of wall; g_k = **0.00** kN/m

Variable UDL at top of wall; q_k = **0.00** kN/m

Eccentricity of permanent UDL load; e_{gu} = **0** mm

Eccentricity of variable UDL load; e_{qu} = **0** mm

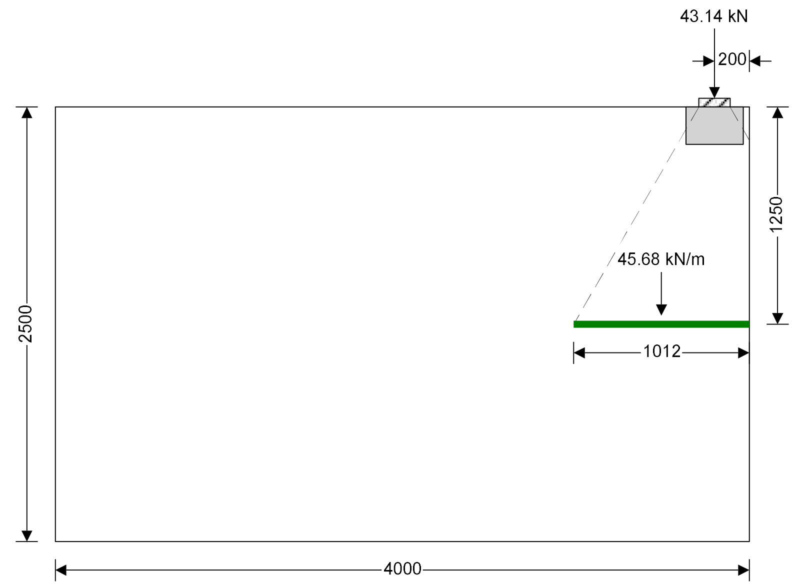
Slenderness ratio of masonry wall - Section 5.5.1.4

Slenderness ratio limit; λ_{lim} = **27**

Slenderness ratio; $\lambda = h_{ef} / t_{ef}$ = **25.0**

PASS - Slenderness ratio is less than slenderness limit

Concentrated Load 1 details - B2 point load



Permanent concentrated load; G_{kc1} = **16.40** kN

Variable concentrated load; Q_{kc1} = **14.00** kN

Eccentricity of concentrated load; e_{c1} = **0** mm

Length of concentrated load; L_{c1} = **180** mm

Width of concentrated load; w_{c1} = **100** mm

Height of concentrated load; h_{c1} = **2500** mm

Distance of load to right vertical edge; r_{11} = **110** mm

Distance of load to nearest vertical edge; a_{11} = **110** mm

Walls subjected to concentrated loads - Section 6.1.3

Eccentricity check; $e_{c1} <= t / 4$

PASS - Eccentricity of load is less than t/4

Area of bearing; $A_{b1} = L_{c1} \times w_{c1}$ = **18000** mm^2

Effective length of bearing at mid-height; $l_{efm1} = L_{c1} + h_{c1} / 2 \times \tan(30) + r_{11}$ = **1012** mm

Effective bearing area; $A_{ef1} = l_{efm1} \times t$ = **101169** mm^2

Bearing area ratio check; $A_{ratio1} = \mathrm{Min}(A_{b1} / A_{ef1}, 0.45)$ = **0.18**

Initial enhancement factor; $\beta_{init1} = \mathrm{Max}((1 + 0.3 \times a_{11} / h_{c1}) \times (1.5 - 1.1 \times A_{ratio1}), 1.0)$ = **1.32**

Maximum enhancement factor; $\beta_{max1} = \mathrm{Min}(1.25 + a_{11} / (2 \times h_{c1}), 1.5)$ = **1.27**

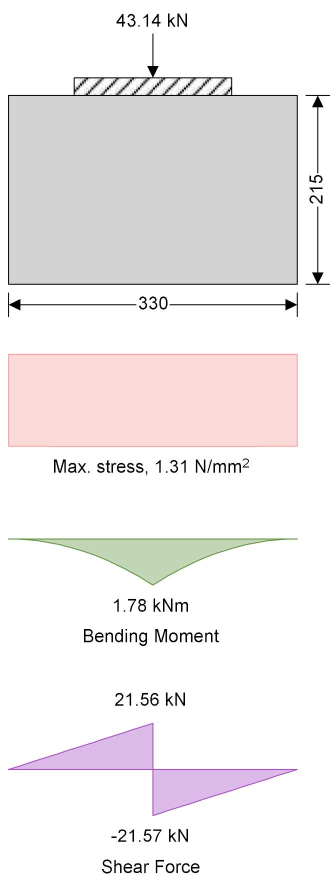
Enhancement factor for concentrated loads; $\beta_1 = \mathrm{Min}(\beta_{init1}, \beta_{max1})$ = **1.27**

Design value of the concentrated load; $N_{Edc1} = G_{kc1} \times \gamma_{fG} + Q_{kc1} \times \gamma_{fQ}$ = **43.14** kN

Design value concentrated load resistance; $N_{Rdc1} = \beta_1 \times A_{b1} \times f_d$ = **26.65** kN

Applied concentrated load exceeds design resistance, spreader required!

Design of spreader beam



Type of spreader; **Concrete padstone**

Type of bearing onto spreader; **Point load**

Location of load from RHS of spreader; P_{11} = **165** mm

Length of spreader; L_{sp1} = **330** mm

Height of spreader; h_{sp1} = **215** mm

Width of spreader; w_{sp1} = **100** mm

Eccentricity of load on spreader; e_{sp1} = **0** mm

Modulus of elasticity; E_{sp1} = **29962** N/mm^2

Second moment of area; $I_{sp1} = 1/12 \times w_{sp1} \times h_{sp1}^3$ = **82819792** mm^4

Modulus of the wall; $k_0 = E_w / h$ = **1.40** N/mm^2/mm

Winkler's constant; $K_{c1} = k_0 \times w_{sp1}$ = **139.66** N/mm/mm

Characteristic of the system; $\alpha_1 = (K_{c1} / (4 \times E_{sp1} \times I_{sp1}))^{1/4}$ = **0.00194** mm^{-1}

Classification of spreader; $\alpha L_1 = \alpha_1 \times L_{sp1}$ = **0.64**; **Medium**

Krilov's functions for the spreader length; $B_{\alpha l1} = 1/2 \times (\cosh(\alpha L_1) \times \sin(180 \times \alpha L_1 / \pi) + \sinh(\alpha L_1) \times \cos(180 \times \alpha L_1 / \pi))$ = **0.64**

$C_{\alpha l1} = 1/2 \times \sinh(\alpha L_1) \times \sin(180 \times \alpha L_1 / \pi)$ = **0.20**

$D_{\alpha l1} = 1/4 \times (\cosh(\alpha L_1) \times \sin(180 \times \alpha L_1 / \pi) - \sinh(\alpha L_1) \times \cos(180 \times \alpha L_1 / \pi))$ = **0.04**

Krilov's functions at the point load; $A_{\alpha P11} = \cosh(\alpha_1 \times P_{11}) \times \cos(180 \times \alpha_1 \times P_{11} / \pi)$ = **1.00**

$B_{\alpha P11} = 1/2 \times (\cosh(\alpha_1 \times P_{11}) \times \sin(180 \times \alpha_1 \times P_{11} / \pi) + \sinh(\alpha_1 \times P_{11}) \times \cos(180 \times \alpha_1 \times P_{11} / \pi))$ = **0.32**

Using method of initial conditions

Initial moment of LH edge; M_{01} = **0** kNm

Initial shear of LH edge; V_{01} = **0** kN

Which gives; $(4 \times \alpha_1^2 \times C_{\alpha l1} \times \delta_{01} + 4 \times \alpha_1 \times D_{\alpha l1} \times \Phi_{01}) \times E_{sp1} \times I_{sp1} - B_{\alpha P11} / \alpha_1 \times N_{Edc1}$ = **0.00** kNm

and; $(4 \times \alpha_1^3 \times B_{\alpha l1} \times \delta_{01} + 4 \times \alpha_1^2 \times C_{\alpha l1} \times \Phi_{01}) \times E_{sp1} \times I_{sp1} - A_{\alpha P11} \times N_{Edc1}$ = **0.00** kN

Therefore,

Initial deflection of LH edge; δ_{01} = **0.93313** mm

Initial rotationof LH edge; Φ_{01} = **0.000039**

Location of maximum deflection; x_{def1} = **165** mm

Krilov's functions at the spreader length; $A_{\alpha xdef1} = \cosh(\alpha_1 \times x_{def1}) \times \cos(180 \times \alpha_1 \times x_{def1} / \pi)$ = **1.00**

$B_{\alpha xdef1} = 1/2 \times (\cosh(\alpha_1 \times x_{def1}) \times \sin(180 \times \alpha_1 \times x_{def1} / \pi) + \sinh(\alpha_1 \times x_{def1}) \times \cos(180 \times \alpha_1 \times x_{def1} / \pi))$ = **0.32**

Distance of point load right of loaction; p_{1def1} = **0** mm

Krilov's functions at the spreader length; $D_{\alpha p1def1} = 1/4 \times (\cosh(\alpha_1 \times p_{1def1}) \times \sin(180 \times \alpha_1 \times p_{1def1} / \pi) - \sinh(\alpha_1 \times p_{1def1}) \times \cos(180 \times \alpha_1 \times p_{1def1} / \pi))$ = **0.00**

Particular integral due to load; $\delta'_1 = D_{\alpha p1def1} / \alpha_1^3 \times N_{Edc1} / (I_{sp1} \times E_{sp1})$ = **0.000** mm

Maximum deflection; $\delta_{max1} = A_{\alpha xdef1} \times \delta_{01} + B_{\alpha xdef1} \times \Phi_{01} / \alpha_1 + \delta'_1$ = **0.938** mm

Location of maximum moment; x_{M1} = **165** mm

Krilov's functions at the spreader length; $C_{\alpha xM1} = 1/2 \times \sinh(\alpha_1 \times x_{M1}) \times \sin(180 \times \alpha_1 \times x_{M1} / \pi)$ = **0.05**

$D_{\alpha xM1} = 1/4 \times (\cosh(\alpha_1 \times x_{M1}) \times \sin(180 \times \alpha_1 \times x_{M1} / \pi) - \sinh(\alpha_1 \times x_{M1}) \times \cos(180 \times \alpha_1 \times x_{M1} / \pi))$ = **0.01**

Distance of point load right of loaction; p_{1M1} = **0** mm

Krilov's functions at the spreader length; $B_{\alpha p1M1} = 1/2 \times (\cosh(\alpha_1 \times p_{1M1}) \times \sin(180 \times \alpha_1 \times p_{1M1} / \pi) + \sinh(\alpha_1 \times p_{1M1}) \times \cos(180 \times \alpha_1 \times p_{1M1} / \pi))$ = **0.00**

Particular integral due to load; $M'_1 = -B_{\alpha p1M1} / \alpha_1 \times N_{Edc1}$ = **0.00** kNm

Maximum moment; $M_{Edsp1} = (4 \times \alpha_1^2 \times C_{\alpha xM1} \times \delta_{01} + 4 \times \alpha_1 \times D_{\alpha xM1} \times \Phi_{01}) \times (I_{sp1} \times E_{sp1}) + M'_1$ = **1.78** kNm

Location of maximum shear; x_{V1} = **165** mm

Krilov's functions at the spreader length; $B_{\alpha xV1} = 1/2 \times (\cosh(\alpha_1 \times x_{V1}) \times \sin(180 \times \alpha_1 \times x_{V1} / \pi) + \sinh(\alpha_1 \times x_{V1}) \times \cos(180 \times \alpha_1 \times x_{V1} / \pi))$ = **0.32**

$C_{\alpha xV1} = 1/2 \times \sinh(\alpha_1 \times x_{V1}) \times \sin(180 \times \alpha_1 \times x_{V1} / \pi)$ = **0.05**

Distance of point load right of loaction; p_{1V1} = **0** mm

Krilov's functions at the spreader length; $A_{\alpha p1V1} = \cosh(\alpha_1 \times p_{1V1}) \times \cos(180 \times \alpha_1 \times p_{1V1} / \pi)$ = **1.00**

Particular integral due to load; $V'_1 = -A_{\alpha p1V1} \times N_{Edc1}$ = **-43.14** kN

Shear at concentrated point load; $V_1 = (4 \times \alpha_1^3 \times B_{\alpha xV1} \times \delta_{01} + 4 \times \alpha_1^2 \times C_{\alpha xV1} \times \Phi_{01}) \times (I_{sp1} \times E_{sp1}) + V'_1$ = **-21.57** kN

Maximum shear; $V_{Edsp1} = \mathrm{Max}(\mathrm{Abs}(V_1), N_{Edc1} - \mathrm{Abs}(V_1))$ = **21.57** kN

Maximum allowable stress under spreader; $\sigma_{Rdsp1} = \beta_1 \times f_d$ = **1.48** N/mm^2

Maximum reaction; $N_{Edsp1} = K_{c1} \times \delta_{max1}$ = **131.00** kN/m

Design stress; $\sigma_{Edsp1} = N_{Edsp1} / w_{sp1}$ = **1.31** N/mm^2

PASS - Design stress under spreader is less than the allowable bearing stress

Walls subjected to mainly vertical loading - Section6.1.2

Eccentricity of permanent UDL at mid-height below concentrated load

$e_{gmu1} = e_{gu} \times h_{c1} / (2 \times h)$ = **0.0** mm

Eccentricity of variable UDL at mid-height below concentrated load

$e_{qmu1} = e_{qu} \times h_{c1} / (2 \times h)$ = **0.0** mm

Eccentricity of concentrated load at mid-height; $e_{mc1} = e_{c1} / 2$ = **0.0** mm

Initial eccentricity - cl.5.5.1.1(4); $e_{init} = h_{ef} / 450$ = **5.6** mm

Concentrated load at mid-height as UDL; $N_{mc1} = N_{Edc1} / l_{efm1}$ = **42.64** kN/m

Vertical load at mid-height; $N_{Ed1} = (g_k + \gamma \times t \times (h - h_{c1} / 2)) \times \gamma_{fG} + q_k \times \gamma_{fQ} + N_{mc1}$ = **45.68** kN/m

Design moment at mid-height; $M_{Ed1} = g_k \times \gamma_{fG} \times e_{gmu1} + q_k \times \gamma_{fQ} \times e_{qmu1} + N_{mc1} \times e_{mc1}$ = **0.00** kNm/m

Eccentricities due to loads - eq. 6.7; $e_{m1} = \mathrm{Abs}(M_{Ed1}) / N_{Ed1} + e_{init}$ = **5.6** mm

Slenderness ratio limit for creep eccentricity; λ_c = **27**

Eccentricity due to creep; e_{k1} = **0.0** mm

Eccentricity at mid-height - eq. 6.6; $e_{mk1} = \mathrm{Max}(e_{m1} + e_{k1}, 0.05 \times t)$ = **5.6** mm

From eq. G2; $A_{11} = 1 - 2 \times e_{mk1} / t =$ **0.89**

From eq. G3; $u_1 = (h_{ef} / t_{ef} \times (1 / K_E)^{1/2} - 0.063) / (0.73 - 1.17 \times e_{mk1} / t) =$ **1.09**

Capacity reduction factor - eq. G1; $\Phi_{m1} = A_{11} \times \exp(-(u_1^2) / 2) =$ **0.49**

Design vertical resistance of panel - eq.6.2; $N_{Rd1} = \Phi_{m1} \times t \times f_d =$ **56.86** kN/m

PASS - Design value of vertical resistance exceeds applied vertical load

<u>Provide 406x178x67 UB S.275 on 330lg x 215dp x 100thk concrete padstones.</u>

	Project		Sheet no./rev.
	The Pavilion		24
	Job Ref. M2-3168	Calc. by MC	Date 05/02/2025
	Doc. Ref SE-01_A1	Chk'd by MD	Date 12/02/2025

Beam TB1 Design:

Loadings

UDL from Pitched Roof

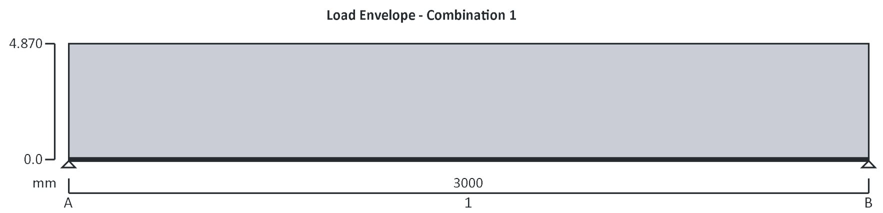
Width of roof being carried;	x_1 = **2.85** m		
Dead Load;	$DL_1 = 0.572\ kN/m^2 \times x_1$	=	**1.630** kN/m
Imposed Load;	$IL_1 = 0.60\ kN/m^2 \times x_1$	=	**1.710** kN/m

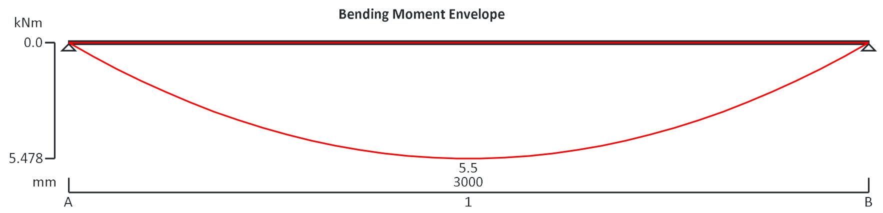
TIMBER BEAM TB1 ANALYSIS & DESIGN (EN1995)

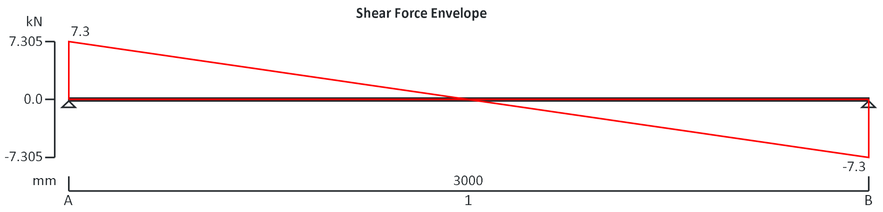
TIMBER BEAM ANALYSIS & DESIGN TO EN1995-1-1:2004

In accordance with EN1995-1-1:2004 + A2:2014 and Corrigendum No.1 and the UK National Annex incorporating National Amendment No.1

Tedds calculation version 1.7.05







Applied loading

Beam loads

Permanent self weight of beam × 1

Permanent full UDL 1.630 kN/m

Variable full UDL 1.710 kN/m

Load combinations

Load combination 1 — Support A: Permanent × 1.35; Variable × 1.50

Span 1: Permanent × 1.35; Variable × 1.50

Support B: Permanent × 1.35; Variable × 1.50

Analysis results

Maximum moment; M_{max} = **5.478** kNm; M_{min} = **0.000** kNm

Design moment; M = max(abs(M_{max}),abs(M_{min})) = **5.478** kNm

Maximum shear; F_{max} = **7.305** kN; F_{min} = **-7.305** kN

Design shear; F = max(abs(F_{max}),abs(F_{min})) = **7.305** kN

Total load on beam; W_{tot} = **14.609** kN

Reactions at support A; R_{A_max} = **7.305** kN; R_{A_min} = **7.305** kN

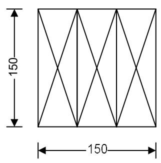
Unfactored permanent load reaction at support A; $R_{A\_Permanent}$ = **2.561** kN

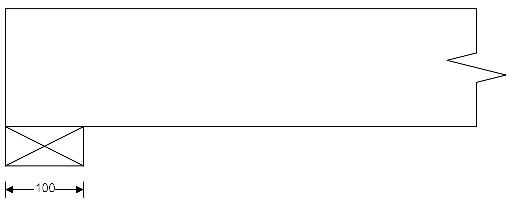
Unfactored variable load reaction at support A; $R_{A\_Variable}$ = **2.565** kN

Reactions at support B; R_{B_max} = **7.305** kN; R_{B_min} = **7.305** kN

Unfactored permanent load reaction at support B; $R_{B\_Permanent}$ = **2.561** kN

Unfactored variable load reaction at support B; $R_{B\_Variable}$ = **2.565** kN





Timber section details

Breadth of timber sections; b = **50** mm

Depth of timber sections; h = **150** mm

Number of timber sections in member; N = **3**

Overall breadth of timber member; b_b = N × b = **150** mm

Timber strength class - EN 338:2016 Table 1; **C24**

Member details

Load duration - cl.2.3.1.2; **Medium-term**

Service class of timber - cl.2.3.1.3; **1**

Length of span; L_{s1} = **3000** mm

Length of bearing; L_b = **100** mm

Section properties

Cross sectional area of member; A = N × b × h = **22500** mm^2

Section modulus; $W_y = N \times b \times h^2 / 6$ = **562500** mm^3

$W_z = h \times (N \times b)^2 / 6$ = **562500** mm^3

Second moment of area; $I_y = N \times b \times h^3 / 12 =$ **42187500** mm^4

$I_z = h \times (N \times b)^3 / 12 =$ **42187500** mm^4

Radius of gyration; $r_y = \sqrt{(I_y / A)} =$ **43.3** mm

$r_z = \sqrt{(I_z / A)} =$ **43.3** mm

Partial factor for material properties and resistances

Partial factor for material properties - Table 2.3; $\gamma_M =$ **1.300**

Modification factors

Modification factor for load duration and moisture content - Table 3.1

$k_{mod} =$ **0.800**

Deformation factor for service classes - Table 3.2; $k_{def} =$ **0.600**

Depth factor for bending - exp.3.1; $k_{h.m} =$ **1.000**

Depth factor for tension - exp.3.1; $k_{h.t} =$ **1.000**

Bending stress re-distribution factor - cl.6.1.6(2); $k_m =$ **0.700**

Crack factor for shear resistance - cl.6.1.7(2); $k_{cr} =$ **0.670**

Load configuration factor - exp.6.4; $k_{c.90} =$ **1.000**

System strength factor - cl.6.6; $k_{sys} =$ **1.000**

Lateral buckling factor - cl.6.3.3(5); $k_{crit} =$ **1.000**

Compression perpendicular to the grain - cl.6.1.5

Design compressive stress; $\sigma_{c.90.d} = R_{A\_max} / (N \times b \times L_b) =$ **0.487** N/mm^2

Design compressive strength; $f_{c.90.d} = k_{mod} \times k_{sys} \times k_{c.90} \times f_{c.90.k} / \gamma_M =$ **1.538** N/mm^2

$\sigma_{c.90.d} / f_{c.90.d} =$ **0.317**

PASS - Design compressive strength exceeds design compressive stress at bearing

Bending - cl 6.1.6

Design bending stress; $\sigma_{m.d} = M / W_y =$ **9.740** N/mm^2

Design bending strength; $f_{m.d} = k_{h.m} \times k_{mod} \times k_{sys} \times k_{crit} \times f_{m.k} / \gamma_M =$ **14.769** N/mm^2

$\sigma_{m.d} / f_{m.d} =$ **0.659**

PASS - Design bending strength exceeds design bending stress

Shear - cl.6.1.7

Applied shear stress; $\tau_d = 3 \times F / (2 \times k_{cr} \times A) =$ **0.727** N/mm^2

Permissible shear stress; $f_{v.d} = k_{mod} \times k_{sys} \times f_{v.k} / \gamma_M =$ **2.462** N/mm^2

$\tau_d / f_{v.d} =$ **0.295**

PASS - Design shear strength exceeds design shear stress

Deflection - cl.7.2

Deflection limit; $\delta_{lim} = \min(14\ mm, 0.004 \times L_{s1}) =$ **12.000** mm

Instantaneous deflection due to permanent load; $\delta_{instG} =$ **4.029** mm

Final deflection due to permanent load; $\delta_{finG} = \delta_{instG} \times (1 + k_{def}) =$ **6.446** mm

Instantaneous deflection due to variable load; $\delta_{instQ} =$ **4.035** mm

Factor for quasi-permanent variable action; $\psi_2 =$ **0.3**

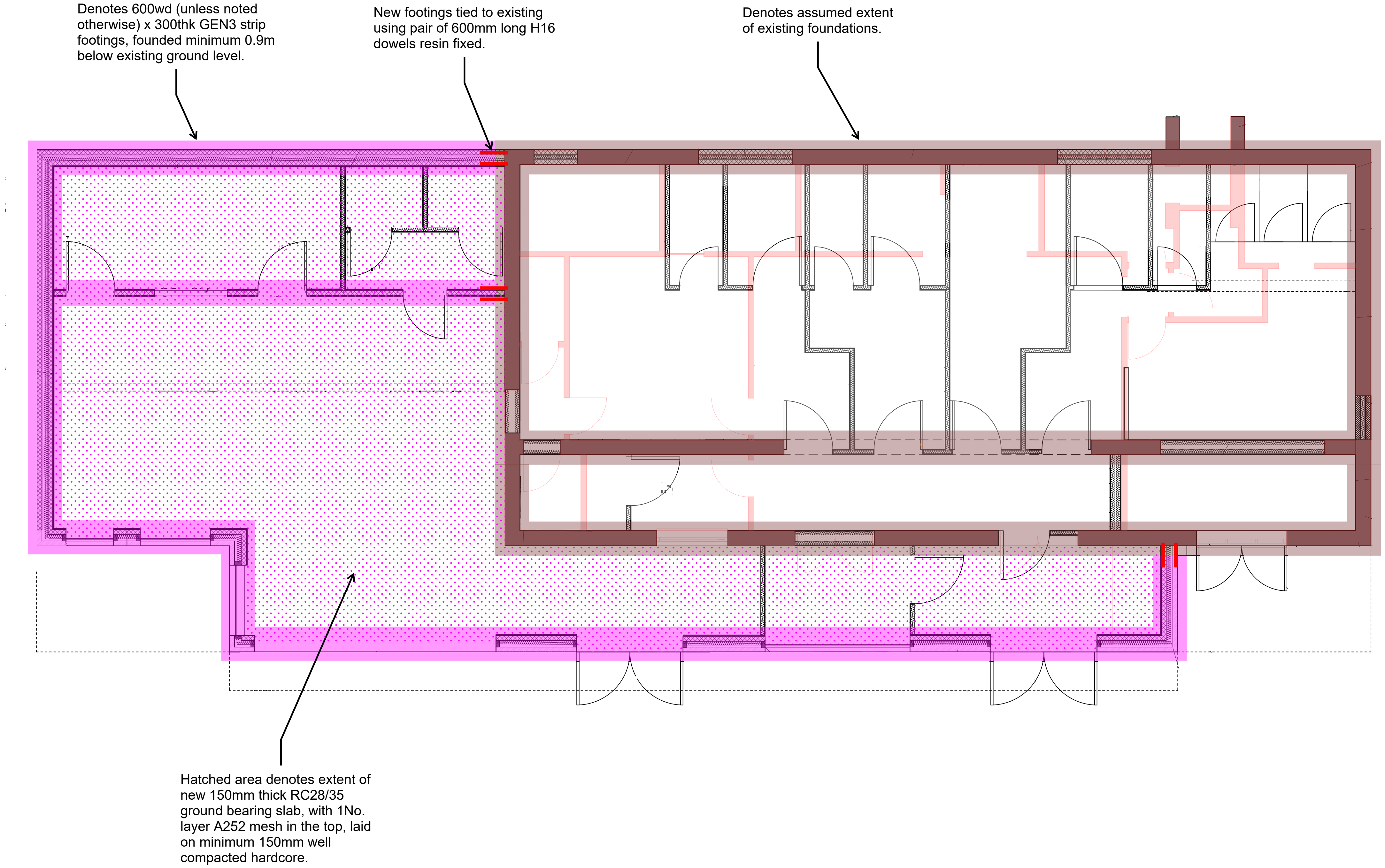
Final deflection due to variable load; $\delta_{finQ} = \delta_{instQ} \times (1 + \psi_2 \times k_{def})$ = **4.761** mm

Total final deflection; $\delta_{fin} = \delta_{finG} + \delta_{finQ}$ = **11.207** mm

$\delta_{fin} / \delta_{lim}$ = **0.934**

PASS - Total final deflection is less than the deflection limit

Provide 3No. 50x150 C24 bolted together with M12 at 400c/c.



REV	DESCRIPTION	DRAWN	CHK'BY	DATE
A1	Building Control Approval	MC	MD	12.02.25

CLIENT:
Winterbourne Parish Council

PROJECT TITLE:
The Pavilion

PROJECT REF:	FILE:	DRG NO.:	REV:
M2-3168	SK	01	A1

SCALE (A3):	DRAWN:	CHECKED:	DATE:
1:100	MC	MD	Jan 2025

DRAWING TITLE:
Proposed substructure

M2 CIVIL & STRUCTURAL CONSULTING ENGINEERS

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Denotes span of existing roof structure. Assumed to consist of timber rafters supported on masonry walls / steel beams.

Denotes span of new metal webbed joists (assumed depth = 304mm) to be designed and detailed by specialist.

B1 - 300x100x8.0 RHS S.355 with 8mm thick plate welded to underside, to support outer leaf.

B2 - 406x178x67 UB S.275.

C1 - 90x90x5.0 SHS S.355.

WP - 90x90x5.0 SHS S.355 wind post.

PS1 - 150mm bearing length on 215lg x 215dp x 100thk concrete padstone.

PS2 - 330lg x 215dp x 100thk concrete padstone.

L1 - Standard duty cavity wall lintel.

L2 - Heavy duty cavity wall lintel.

L3 - 140dp PCC lintel.

TB1 - 3No. 50x150 C24 bolted together with M12 at 400c/c.

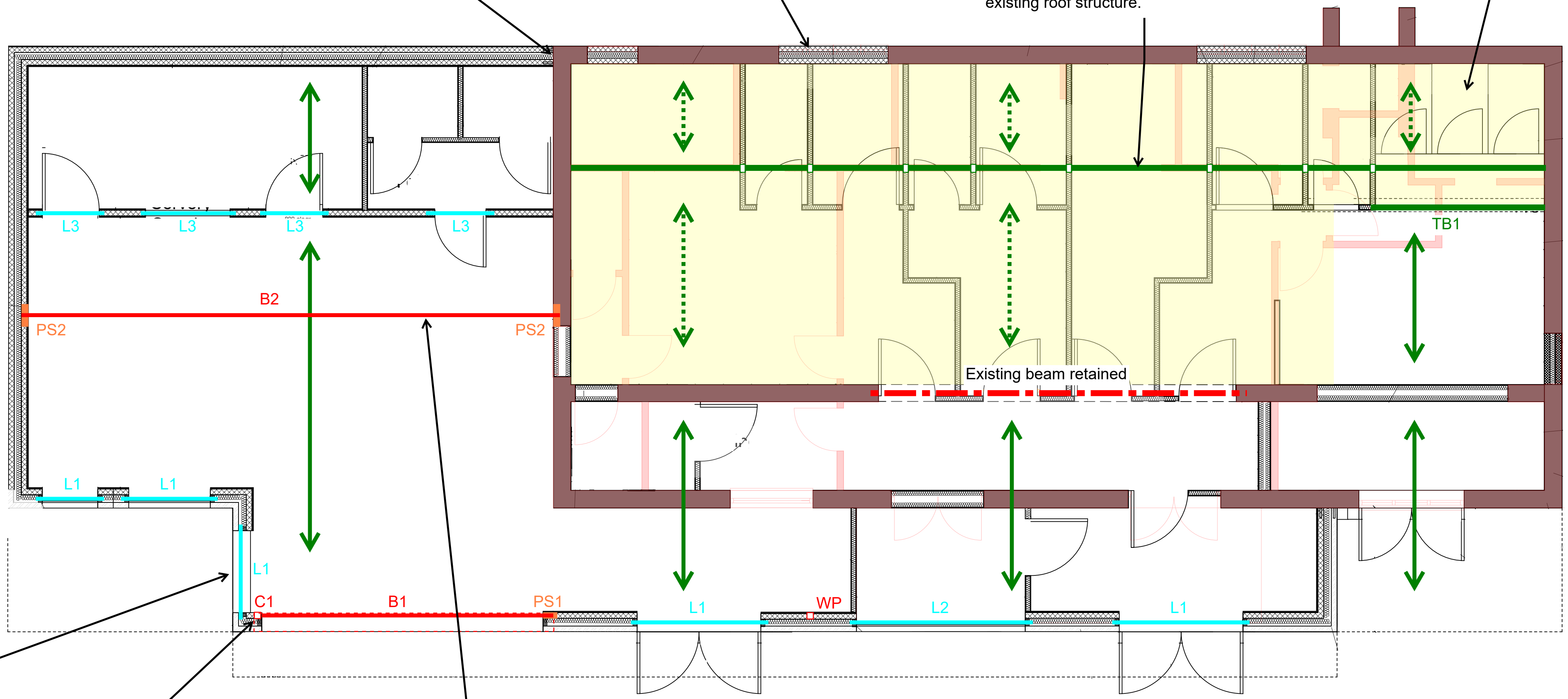
TR1 - 3No. 50x150 C24 bolted together with M12 at 400c/c.

Typical - all new masonry to be tied to existing using Staifix wall starter system or similar approved.

For masonry infills, all blockwork to be tied to existing.

Existing blockwork wall on this line is to be removed and is currently assumed to provide intermediate support to roof structure above. Contractor to expose to confirm. Allow for providing timber TR1 trimmers as shown, supported on tripled up studs within new partitions as shown, to re-support existing roof structure.

Hatched area denotes extent of existing roof structure to be retained.



Lintel to have minimum 150mm bearing at both ends.

Provide 10thk cap plate to C1. Bolt through underside of B1 with 2No. M16 blind bolts.

Contractor to liaise with metal webbed joist designer to confirm B2 is required. Internal blockwork wall could be used as intermediate support to joists if the joists can span without the need for B2.

REV	DESCRIPTION	DRAWN	CHK'BY	DATE
A1	Building Control Approval	MC	MD	12.02.25

CLIENT:
Winterbourne Parish Council

PROJECT TITLE:
The Pavilion

PROJECT REF:	FILE:	DRG NO.:	REV:
M2-3168	SK	02	A1

SCALE (A3):	DRAWN:	CHECKED:	DATE:
1:100	MC	MD	Jan 2025

DRAWING TITLE:
Proposed superstructure

M2 CIVIL & STRUCTURAL CONSULTING ENGINEERS

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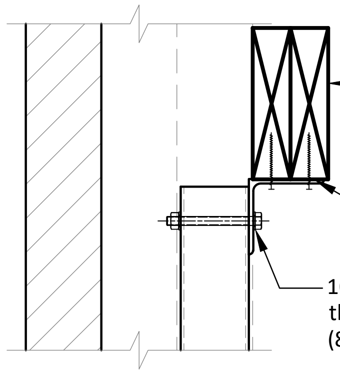
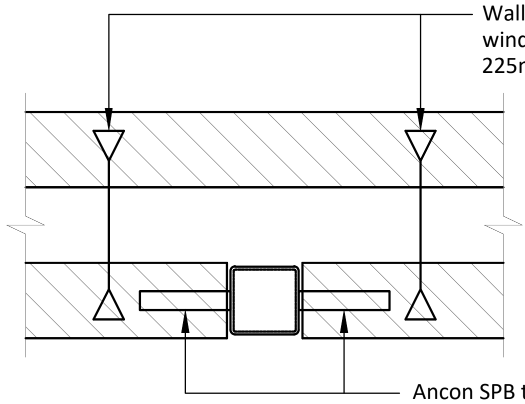


Additional noggin fixed beside wall plate.

100x100x6 RSA fixed to nogins with 4No. No. 10 woodscrews.

100x100x6 RSA bolted through SHS with 2No. M12 (8.8) in slotted holes.

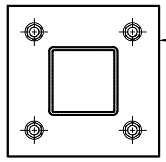
WP HEAD DETAIL



Wall ties either side of windposts to be at max. 225mm vertical centres.

Ancon SPB ties (or similar) Tek screwed to post at max. 450mm vertical centres.

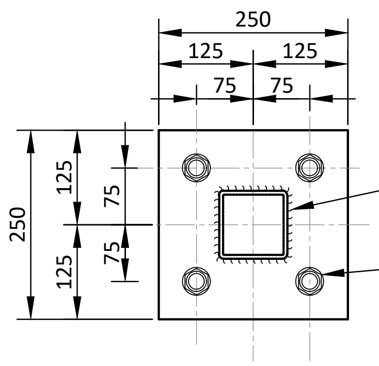
WP PLAN DETAIL



250x250x12 baseplate with 4No. M12 resin anchors into foundation, min. 150mm embedment.

NOTE:
Steel below ground to be painted with 2 coats bitumastic paint, RIW or similar.

WP BASEPLATE



90x90SHS posts fully welded to 250x250x15mm baseplate.

4No M20 grade 8.8 resin fixings, min 150mm embedment.

BASEPLATE DETAIL
90x90 SHS

REV	DESCRIPTION	DRAWN	CHK'BY	DATE
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Winterbourne Parish Council

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PROJECT REF:	FILE:	DRG NO.:	REV:
M2-3168	SK	03	A1

SCALE (A3):	DRAWN:	CHECKED:	DATE:
1:10	MC	MD	Jan 2025

DRAWING TITLE:
Details

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GENERAL

DO NOT SCALE THIS DRAWING, USE ONLY WRITTEN DIMENSIONS. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEERS. IF IN DOUBT ASK.

SETTING OUT TO ARCHITECT'S DRAWINGS.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTS, ENGINEERS, AND SPECIALISTS DRAWINGS, AND WITH THE SPECIFICATIONS.

WORKS TO COMPLY WITH ALL RELEVANT BRITISH STANDARDS, CODES OF PRACTICES, EURO CODES AND THE BUILDING REGULATIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURAL INTEGRITY OF THE WORKS AT ALL TIMES BY THE PROVISION OF ADEQUATE TEMPORARY WORKS.

ALL DIMENSIONS IN MILLIMETERS (mm),
ALL LEVELS IN METRES (m).

FOUNDATIONS

FOUNDATIONS TO BE CENTRAL UNDER WALLS AND 600mm. WIDE EXCEPT WHERE NOTED OTHERWISE ON THE DRAWING. FOUNDATION WIDTH HAS BEEN BASED ON AN ALLOWABLE GROUND BEARING PRESSURE OF 75kN/m² AT A DEPTH OF 0.9m. SUBJECT TO LOCAL AUTHORITY APPROVAL.

BLINDING AND MASS CONCRETE FILL TO BE GEN1 WITH A CONSISTENCE CLASS S3.

MASS CONCRETE FOOTINGS TO BE GEN 3 TO B.S 8500 Pt.1. ALL WITH 20mm AGGREGATE AND S3 CONSISTENCY CLASS, AND TO BE IN ACCORDANCE WITH BSEN 206 PART 1 AND BS 8500 PART 1.

CONCRETE TO SATISFY DESIGN SULPHATE CLASS DS1 AND ACEC CLASS AC-1 TO BRE SPECIAL DIGEST 1, WITH A RECOMMENDED BASIC DESIGN CHEMICAL CLASS DC 1/0.

ALL FOUNDATIONS TO HAVE A MINIMUM PROJECTION OF 75mm TO BOTH SIDES OF WALL SUPPORTED.

FOUNDATION DEPTHS AS SPECIFIED ARE MINIMUM. DEPTH TO BE INCREASED TO SUIT LOCAL BEARING STRATA AND 'SOFT SPOTS'.

BLOCKWORK

MASONRY BELOW GROUND LEVEL TO BE EITHER NON FROST SUSCEPTIBLE BLOCKWORK WITH A MINIMUM COMPRESSIVE STRENGTH OF 7N/mm², OR CLASS B ENGINEERING BRICKWORK, BOTH IN CLASS (ii) M6 MORTAR.

215 WIDE WALL CONSTRUCTION, BELOW SLAB, TO BE EITHER:
2x100 WIDE BLOCK COLLAR JOINTED, WITH ALL JOINTS FILLED & WALL TIES AT 450 CRS.
OR,
BLOCKS LAID FLAT (NO ONE BLOCK UNIT TO WEIGH MORE THAN 20kg)
BLOCKWORK ABOVE GROUND LEVEL TO BE MIN 7N/mm², EITHER MEDIUM DENSITY BLOCKWORK OR LIGHTWEIGHT (TARMAC TOPLITE 7 OR EQUIVALENT) IN 1:1.5:6 MORTAR.

ALL MOVEMENT JOINTS TO BE FORMED WITH 10mm. LOW DENSITY CLOSED CELL POLYTHENE FILLER WITH FLAT TIES, FITTED WITH PLASTIC DEBONDING SLEEVES, AT 225mm. VERTICAL CENTRES, SEALED WITH POLYSULPHATE SEALANT TO ARCHITECT'S REQUIREMENTS.

ALL WALL TIES ARE TO BE STAINLESS STEEL AND COMPLY WITH BS.1243 AND MEET THE PERFORMANCE REQUIREMENTS OF STANDARD DD140. CLASS 1, AND ARE TO BE INSTALLED IN FULL ACCORDANCE WITH BS 5628 - PART 3 : 2001.

VERTICAL RESTRAINT STRAPS TO BE 30 x 2.5mm. THICK SECTION GALVANIZED MILD STEEL IN ACCORDANCE WITH BUILDING REGULATIONS U.N.O. (STRAP LEGS 100 & 900mm. Lg). 100mm. LEG NAILED TWICE TO WALL PLATE, 900mm. LEG PLUGGED AND SCREWED TO THE WALL A MINIMUM OF 3 TIMES USING 50mm. LONG No.10 SCREWS. (LAST FIXING 150mm. MAXIMUM FROM END OF STRAP).

ALL STEEL LINTELS TO BE HOT DIPPED GALVANIZED TO B.S EN ISO 1461 (85µm).

PADSTONES TO BE GRADE C20 CONCRETE WITH A MINIMUM CEMENT CONTENT OF 220kg/m³ AND A FREE WATER/CEMENT RATIO OF 0.8, OR ALTERNATIVE APPROVED.

TIMBER ROOF

TIMBER TO BE GRADE AS FOLLOWS: GRADE C24 TO BS 5628-2:2002 MINIMUM.

ALL TIMBER FLOORS ARE TO BE DESIGNED IN ACCORDANCE WITH BUILDING REGULATIONS.

JOISTS PARALLEL TO MASONRY WALLS TO HAVE 30mm.x 5mm. GALVANIZED M.S. RESTRAINT STRAPS AT 1200m. Ctrs. FIXED TO MIN. 3 JOISTS & AND BUILT INTO WALL. PROVIDE SOLID PACKING BETWEEN JOIST AND WALL AND NOGGINS UNDER STRAPS.

VERTICAL RESTRAINT STRAPS TO BE 30mm. x 2.5mm. THICK GALVANIZED M.S. AT 2000mm. Ctrs. (STRAP LEGS 100 x 900Lg). 100mm. LEG NAILED TWICE TO WALL PLATE AND PLUGGED AND SCREWED TO WALL A MINIMUM OF 3 TIMES USING 50mm. LONG No.10 SCREWS. (LAST FIXING 150mm. MAXIMUM FROM END OF STRAP).

HORIZONTAL RESTRAINT STRAPS TO BE PROVIDED AT RAFTER AND CEILING JOIST LEVEL AT 2000mm. Ctrs. STRAPS TO BE 30mm. x 5.0mm THICK GALVANIZED MILD STEEL. 100mm. LEG OF STRAP TO BE BUILT INTO WALL. STRAPS TO EXTEND OVER 3 No. RAFTERS / CEILING JOISTS AND TO BE NAILED TWICE TO EACH USING 50mm. LONG 8 SWG NAILS. SOLID NOGGINS ARE TO BE PROVIDED AT STRAP LOCATIONS BETWEEN RAFTER/CEILING JOIST POSITIONS AND BETWEEN RAFTER/CEILING JOIST AND WALL.

STEELWORK

ALL STEELWORK TO BE GRADE S275 TO BS EN 10025 UNLESS NOTED OTHERWISE ON THE DRAWINGS. FABRICATION AND ERECTION OF STEELWORK TO COMPLY WITH THE RELEVANT SECTIONS OF BS 5950 AND "THE NATIONAL STRUCTURAL STEELWORK SPECIFICATION".

ALL DIMENSIONS ARE TO BE CHECKED ON SITE PRIOR TO ANY FABRICATION WORKS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.

ALL STEELWORK WITHIN CAVITY WALLS, OR TOTALLY ENCASED, TO BE BLAST CLEANED TO SA 2½ AND PAINTED WITH 1 COAT OF ZINC PHOSPHATE EPOXY PRIMER TO A MINIMUM 80µm. DFT.

ALL EXPOSED INTERNAL STEELWORK TO BE BLAST CLEANED TO SA 2½ AND PAINTED WITH 1 COAT OF HIGH BUILD ZINC PHOSPHATE EPOXY PRIMER TO A MINIMUM 80µm. DFT WITH A SITE APPLIED ALKYD FINISH TO A MINIMUM 60µm. DFT, COLOUR TO ARCHITECTS SPECIFICATION.

ALL EXTERNAL STEELWORK TO BE HOT DIPPED GALVANIZED TO BS5950/ EN ISO 1461 TO 85µm. IF COLOURED FINISH IS REQUIRED A MORDANT WASH OR PRIMER SPECIFICALLY FORMULATED FOR USE ON FRESH GALVANIZED SURFACES TO BE APPLIED FOLLOWED BY 40µm. VINYL PRIMER AND 60µm. VINYL FINISH TO ARCHITECTS SPECIFICATION.

ALL BOLTS TO BE SHERADIZED/BZP

ALL BOLTS TO BE GRADE 8.8 U.N.O.

ON SITE WELDING SHALL COMPLY WITH NATIONAL STRUCTURAL SPECIFICATION FOR BUILDING CONSTRUCTION BCSA_52-10 SECTION 5.

PADSTONES TO BE GRADE C20 CONCRETE WITH A MINIMUM CEMENT CONTENT OF 220kg/m³ AND A FREE WATER/CEMENT RATIO OF 0.8, OR ALTERNATIVE APPROVED.

ALL TEMPORARY WORKS TO BE DESIGNED BY CONTRACTOR.

ALL EXISTING EXTERNAL WALLS ASSUMED TO BE SOLID MASONRY CONSTRUCTION - INFORM ENGINEER OF ANY DISCREPANCIES.

EXISTING STRUCTURAL ELEMENTS INDICATED ON THIS DRAWING ARE ASSUMED ONLY. TO BE CHECKED ON SITE BY THE CONTRACTOR.

REV	DESCRIPTION	DRAWN	CHK'BY	DATE
A1	Building Control Approval	MC	MD	12.02.25

CLIENT:
Winterbourne Parish Council

PROJECT TITLE:
The Pavilion

PROJECT REF:	FILE:	DRG NO.:	REV:
M2-3168	SK	04	A1

SCALE (A3):	DRAWN:	CHECKED:	DATE:
NTS	MC	MD	Jan 2025

DRAWING TITLE:
Structural drawing notes

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