



COOP LIVE

Q50 - SITE/ STREET FURNITURE/ EQUIPMENT

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Co-op Live

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Tender 4B Update

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Q50 SITE/STREET FURNITURE/EQUIPMENT

GENERAL

110 WORKS INCLUDED

1. Scope of Works: This section of the Specification, when read in conjunction with the Design Drawings, provides particular requirements with respect to the works, which include the following:
 - a. Bollards.
 - b. Benches.
 - c. Bins.
 - d. Planters.
 - e. Security booths.
2. Particular Interfaces
 - a. Complete the Detailed Design of all interfaces with adjoining trades prior to commencement of manufacture.
 - b. Ensure that all interfaces are fully co-ordinated prior to commencement.
3. Related Documents and Sections: Examine the Drawings and the Contract Documents for requirements that directly affect or are affected by Work of this Section. Other Documents and Sections that directly relate to work of this Section include, but are not limited to:
 - a. The Preliminaries, general provisions of the Contract, including General and Supplementary Conditions, and Architectural General Requirements Specification Sections.

111 APPLICABLE DESIGN RESPONSIBILITY

1. Design & Build Procurement Routes
 - a. Appoint a specialist sub-contractor to complete the Detailed Design maintaining at all times the intent portrayed on the Design Drawings whereby the Architect's role post-novation or during subsequent design stages shall be limited to checking compliance with quality, design and visual intent only.

112 TENDER SUBMITTALS

1. Tender Response
 - a. Provide tender submittals in accordance with the requirements of SUBMITTALS clauses of the A Section of the Specification.
 - b. Submit a design response with the Tender proposal, to include all profiles of typical conditions, with dimensions.
 - c. The Tender design response shall include:
 - 1). Samples where specified.
 - 2). QA/ QC programme.
 - 3). Summary of deviations from the Specification.
 - 4). Outline technical specifications reflecting proposed materials/ systems, etc.

- 5). A list of proposed suppliers and sub-contractors intended to be used.

113 SAMPLES

1. Pre-contract Samples: Provide pre-contract in accordance with SUBMITTALS clauses of the A Section:
 - a. Not required.
2. Post Contract Samples: Provide post-contract samples in accordance with SUBMITTALS clauses of the A Section:
 - a. 300mm x 300mm sample of each type of proposed material and finishes.

114 MOCK-UPS, PROTOTYPES AND QUALITY BENCHMARKS

1. Mock-ups: Provide mock-ups in accordance with SUBMITTALS clauses of the A Section:
 - a. Not required.
2. Prototypes: Provide prototypes in accordance with SUBMITTALS clauses of the A Section:
 - a. Not required.
3. Benchmark Requirements: The following quality benchmarks shall be provided in accordance with SUBMITTALS clauses of the A Section:
 - a. The first delineated and fully completed site furniture as accepted by the Architect.

115 TESTING

1. Test Requirements: Provide details of all tests undertaken on materials supplied for use within the works and supply copies of test results to the Architect immediately they become available and not less than 10 days prior to commencement of the works.
2. Road equipment support items (not including vehicle restraint systems, noise barriers and transilluminated traffic bollards) required to have passive safety to reduce the severity of injury to the occupants of vehicles impacting with them shall be tested in accordance with BS EN 12767.

PRODUCTS

210 PERFORMANCE REQUIREMENTS

1. Comply with the general performance of PERFORMANCE REQUIREMENTS AND DATA clauses of the A Section and the following specific performance requirements.
2. Structural
 - a. Specific Movements
 - 1). The works shall be designed, fabricated and installed to withstand all movements of the building structure under all design loads or combination of loads without damage or any reduction in the performance of the works.
 - 2). The works shall not deflect under loading in any way that is detrimental to any elements of the works or adjacent structural or building elements.
 - 3). The works shall accommodate the following movements without any permanent deformation or reduction in the specified performance:

- a). Deflection under design loads.
 - b). The effects of internal/ external wind and pressure loadings.
 - c). Changes in dimension and shape of components arising from building movements, including settlement, creep, twisting and racking.
 - d). Movement of any joint whether designed to permit movement or not.
 - b. Specific Dead Loads
 - 1). The works shall be capable of accommodating the following dead loads without any reduction in performance:
 - a). The works' own dead load shall be accommodated locally without causing deflections or movements to the support structure and/ or interface elements.
 - b). The dead loads derived from permanent fixtures or services attached to the surfaces of the works.
 - 2). When calculating loads the worst combination shall be considered, taking account of the fact that the pressure coefficients at various locations may determine more than one design criterion.
 - c. Specific Live Loads
 - 1). The works shall be capable of accommodating the following live loads without any reduction in performance:
 - a). Loads applied through maintenance and cleaning operations.
 - b). Impact loads, or transferred impact loads, that occur during the service life of the works, without deterioration in performance and without sustaining non-repairable damage.
 - c). Loads imposed during replacement.
 - 2). When calculating loads the worst combination shall be considered, taking account of the fact that the pressure coefficients at various locations may determine more than one design criterion.
3. Environmental
- a. Thermal Movement
 - 1). The works shall be capable of accommodating changes in dimension and shape of their components resulting from varying surface temperatures between the outside and inside of the building, without any reduction in the specified performance and appearance.
 - 2). Thermal movements shall not result in audible noise.
 - b. Moisture Movement: The works shall withstand movement without permanent deformation or any reduction in the specified performance:
 - 1). Due to changes in the moisture content of their components, resulting from variations in the moisture content of the air.
 - 2). Due to the expansion of absorbed or retained moisture caused by freezing.
 - c. Thermal Performance Requirements

- 1). Design and install the works such that thermal bridging at the interface with the building is prevented.
- d. Weather and Water Penetration Resistance
 - 1). Where the works have been fixed to the building, it shall not cause water leakage onto the internal face of the building, and any other part of the system, which may adversely affect its function.
 - 2). Ensure that water does not migrate into the building or interstitially within the construction due to capillarity at joints.
 - 3). Leakage of water shall be defined as the sign of water, in any quantity on the inside face of the construction.
4. Durability
 - a. The works shall perform throughout its design life without failure resulting from defects in design, materials or workmanship. Failure shall be defined as breakage, disengagement of components, reduction in performance or unacceptable change in appearance.
 - b. Electro-chemical corrosion or staining resulting from water running from one material to another shall be prevented.
5. Sustainability
 - a. Refer to Section A.600 series SUSTAINABILITY clause, determine and evaluate the applicability of the specified requirements including BREEAM Credit Requirements to the works specified in this Section of the Specification. Comply with all relevant requirements.

211 SYSTEMS

1. Bollards and Hostile Vehicle Mitigation Overview
 - a. Uncontrolled vehicle access has been identified as a potential threat to the OVG Manchester development and its users and as such Vehicle Security Barriers (VSBs) are considered as an integral facet part of the layered security solution.
 - b. The bollards shall be categorised as either Passive VSB (static type) or Active VSB (deployable rising type), indicative references for which shall be defined hereunder.
 - c. Whilst the fulfilment of key criteria remains the responsibility of the Contractor, the indicative product references stated are understood to be of the type and source currently deployed around the greater Etihad demise and therefore for reasons of maintenance and visual consistency, unless there is an overriding life safety reason why an alternative bollard would be prudent, the manufacturer stated herein shall be adopted.
 - d. There exists 7 No. hostile routes which define potential impact velocity and impact energy for 6 No. vehicle categories and the bollard selection shall be informed by this information located within Chapter 1 of the Hostile Vehicle Mitigation which forms part of the OVG Security Report.
 - e. It shall be noted that the VDAs are based on a +/- 5kmph variance.
2. Type EXT-301 Fixed Bollards - Type 1
 - a. Description: Proprietary static stainless steel bollard.
 - b. Conformance: PAS 68 and 69.
 - c. Specific Performance:
 - 1). Security Rating: V/7,500(N2)/64/90:4.0/16.7 to PAS 68.

- d. Material: Mild steel.
 - e. Finish: Polyester powder coating to Qualicoat level 2 - RAL 9005.
 - f. Provide colour contrast reflective band, in colour to be agreed with the Architect.
 - g. Indicative Product:
 - 1). Manufacturer: ATG Access, or acceptable equivalent.
 - 2). Reference: SP 400 Fixed HVM Bollard (Flat Top).
 - h. Fixing: Manufacturer's shallow mounted method.
3. Type EXT-302 Fixed Bollards - Type 2
- a. Description: Proprietary automatic stainless steel bollard.
 - b. Conformance: PAS 68 and 69.
 - c. Specific Performance:
 - 1). Security Rating: V/7,500(N2)/64/90:4.0/16.7 to PAS 68.
 - d. Material: Mild steel.
 - e. Finish: Polyester powder coating to Qualicoat level 2 - RAL 9005.
 - f. Provide white-colour reflective band.
 - g. Indicative Product:
 - 1). Manufacturer: ATG Access, or acceptable equivalent.
 - 2). Reference: SP 1000 Static Bollard (Flat Top).
 - h. Fixing: Manufacturer's shallow mounted method.
4. Type EXT-303 Retractable Bollards - Type 1
- a. Description: Proprietary retractable steel bollard.
 - b. Conformance: PAS 68 and 69.
 - c. Specific Performance:
 - 1). Security Rating: V/7,500(N2)/64/90:4.0/16.7 to PAS 68.
 - d. Material: Mild steel.
 - e. Finish: Aesthetic sleeve with polyester powder coating to Qualicoat level 2 - RAL 9005 preferable or black rubber where the former is not possible.
 - f. Provide white-coloured reflective band.
 - g. Indicative Product:
 - 1). Manufacturer: ATG Access, or acceptable equivalent.
 - 2). Reference: SP 400 Retractable HVM Bollard.
 - h. Fixing: Manufacturer's shallow mounted method.
5. Type EXT-304 Retractable Bollards - Type 2
- a. Description: Proprietary retractable steel bollard.
 - b. Conformance: PAS 68 and 69.

- c. Specific Performance:
 - 1). Security Rating: V/7,500(N2)/64/90:4.0/16.7 to PAS 68.
 - d. Material: Mild steel.
 - e. Finish: Aesthetic sleeve with polyester powder coating to Qualicoat level 2 - RAL 9005 preferable or black rubber where the former is not possible.
 - f. Provide white-coloured reflective band.
 - g. Indicative Product:
 - 1). Manufacturer: ATG Access, or acceptable equivalent.
 - 2). Reference: SP 1000 Retractable Bollard.
 - h. Fixing: Manufacturer's shallow mounted method.
6. Type EXT-305 Removable Bollards
- a. Description: Proprietary removable steel bollard.
 - b. Conformance: PAS 68 and 69.
 - c. Specific Performance:
 - 1). Security Rating: V/7,500(N2)/64/90:4.0/16.7 to PAS 68.
 - d. Material: Mild steel.
 - e. Finish: Aesthetic sleeve with polyester powder coating to Qualicoat level 2 - RAL 9005 preferable or black rubber where the former is not possible.
 - f. Provide white-coloured reflective band.
 - g. Indicative Product:
 - 1). Manufacturer: ATG Access, or acceptable equivalent.
 - 2). Reference: SP 400 Removable HVM Bollard.
 - h. Fixing: Manufacturer's shallow mounted method.
7. Type EXT-307 Flexible Bollards
- a. Description: Proprietary self-righting plastic bollard for demarcation purposes only.
 - b. Specific Performance:
 - 1). Security Rating: Not applicable - self-righting after impact.
 - c. Material: Polyethylene (Anti Ageing).
 - 1). Sleeve: Silver glass beads adhesively applied to white flexible PVC substrate.
 - 2). Clear flexible PVC layer. High frequency welded to substrate to form waterproof protective cover.
 - d. Size: 100mm diameter, 1000mm height..
 - e. Indicative Product:
 - 1). Manufacturer: Traffic-Line, or acceptable equivalent.

- 2). Reference: Flexible Post.
- f. Fixing: To manufacturer's recommendations.
8. Type EXT-308 Heavy Duty Bollards
- a. Description: Proprietary fixed, round profile security steel bollard.
 - b. Dimensions: 101mm diameter x height above ground in accordance with the Design Drawings.
 - c. Material: Mild steel.
 - d. Wall thickness: 5mm.
 - e. Finish: Hot dip galvanised with 2 No. yellow bands.
 - f. Indicative Product:
 - 1). Manufacturer: ATG Access, or acceptable equivalent.
 - 2). Reference: ATG 101/670 Round Bollard.
 - g. Fixing: Root fixed in accordance with the manufacturer's product data sheet.
9. Type EXT-309 Fold-Down Bollards
- a. Description: Proprietary lockable fold-down parallel shaft steel bollard.
 - b. Dimensions: 620mm x 60mm diameter.
 - c. Material: Mild steel shaft with cast aluminium base.
 - d. Locking: Keyed alike provided with 2 No. keys per post.
 - e. Finish: Standard yellow shaft with black baseplate and cap.
 - f. Indicative Product:
 - 1). Manufacturer: Broxap Ltd, or acceptable equivalent.
 - 2). Reference: Haslington Fold Down Bollard BX90 5501.
 - g. Fixing: Mechanically anchored in accordance with the manufacturer's product data sheet.
10. Type EXT-311 ~~Bespoke Natural Stone~~Precast Concrete Seating Wall
- a. Description: ~~Natural granite~~Precast concrete seating wall with integrated lighting.
 - b. ~~Conformance: BS EN 581 and BS EN 1341.~~
 - c. Configuration: Refer to the Design Drawings.
 - d. Facing:
 - 1). ~~Material: Granite.~~
 - 2). Colour: ~~Black~~Charcoal - To match (as closely as possible) concrete paving systems described within Section Q25 of the Specification.
 - 3). Nominal Size: Varying modularity - Refer to the Design Drawings.
 - 4). Finish: ~~Flamed~~Light acid etch finish.
 - 5). Treatment: Compatible external grade clear sealer.

- 6). ~~Indicative Product: To match that applied to granite paving systems described within Section Q25 of the Specification.~~
 - e. Jointing: 6mm pigmented mortar joints in black.
 - a). ~~Manufacturer: BBS Natural Stone Specialists, or acceptable equivalent.~~
 - b). ~~Reference: Magnolian Black.~~
 - f. Support: Subject to design intent, provide concealed support.
 - 1). Steel framing: Mild steel welded and/or bolted sections.
 - 2). Hot dip galvanising and then polyester powder coating to Qualicoat level 2.
 - 3). Colour: Black (RAL ~~to be confirmed by the Architect~~)[9005](#).
 - g. ~~Integrated Lighting: LED luminaire shall be fitted in manner that achieve the Architect's desired illumination and positioned as indicated on the Design Drawings.~~
 - h. Detailing:
 - 1). Recessed anti-skate slot.
 - 2). Front edge: Eased for comfort, 50mm radius.
 - 3). [All other edges: 25mm radius.](#)
 - 4). Where so indicated on the Design Drawings, the top shall be recessed to form zones with a timber seating top fixed by a concealed fixing rail. Refer to system Type EXT-312 described thereunder.
 - 5). The system shall also accommodate stainless steel flat strip armrests. Refer to system Type EXT-313.
 - i. [Indicative manufacturer: Bailey Streetscene.](#)
 - j. Fixing:
 - 1). Concealed mechanical fixing, anchored back to primary slab in accordance with the Structural Engineer's Documentation.
 - 2). Ensure waterproofing remains completely in tact when the unit is lowered into position.
 - k. Lifting eyes: Where lifting eyes become necessary they shall be in faces which are bed or otherwise concealed in the final works.
- 11. Type EXT-312 Bespoke Timber Seating Top
 - a. Description: Bespoke timber seating top fixed to seating wall.
 - b. Conformance: BS EN 581.
 - c. Configuration: Refer to the Design Drawings.
 - d. Seat Top:
 - 1). Material: ~~Chemically modified FSC-certified softwood timber~~[PEFC certified hardwood](#).
 - 2). ~~Species: Radiata Pine.~~

- 3). [Species: To be confirmed by the subcontractor.](#)
 - 4). [Durability class to BS EN 350: Part 2: Class 2.](#)
 - 5). Nominal Size: [As indicated on the Design Drawings.](#)
 - a). ~~Refer to the Design Drawings.~~
 - 6). Finish: Sanded/ Planed. To be confirmed.
 - 7). ~~Treatment: Compatible external grade fire-retarding hygienic clear coating agreed with the Architect.~~
 - 8). [Surface dressing: Non-flammable UV screening dressing of a type which is fully absorbed and non-staining.](#)
 - 9). ~~Indicative Product:~~
 - a). ~~Manufacturer: Kebony, or acceptable equivalent.~~
 - b). ~~Reference: Kebony Clear.~~
 - e. Support:
 - 1). Steel framing: Mild steel rail of welded and/or bolted sections.
 - 2). Hot dip galvanising and then polyester powder coating to Qualicoat level 2.
 - 3). Colour: Black (RAL to be confirmed by the Architect).
 - f. Fixing: Concealed mechanical fixing, coordinated with seating wall.
12. Type EXT-313 Bespoke Accessible Armrest
- a. Description: Bespoke DDA seating armrests.
 - b. Conformance: BS EN 581 and BS 8300.
 - c. Configuration: Refer to the Design Drawings.
 - d. Material: ~~Grade 1 Galvanised mild steel, single piece curved plate.~~ [4404 \(316L\) stainless steel single piece curved plate.](#)
 - e. Finish: ~~Brushed (dull polished) or Satin polished~~ [Polyester powder coated to Qualicoat 2, maximum 20% gloss level - Refer to Section Z31.](#) ~~To be confirmed.~~
 - f. [Colour: White Aluminium - RAL 9006.](#)
 - g. Fixing: Concealed mechanical fixing.
 - h. Indicative Product: [Bespoke fabrication - Contractor's determination.](#)
 - 1). ~~Manufacturer: Kent Stainless, or acceptable equivalent.~~
 - 2). ~~Reference: To be confirmed.~~
13. Type EXT-321 Litter Bins
- a. Description: Proprietary mild steel litter bin with lockable door and ashtray.
 - b. Nominal Size: 850 x 745 x 485mm.
 - c. Bin shall comprise main supporting frame with top-located integral cigarette extinguisher and ash tray, and liner compartment and lockable door face.

- d. Material: Mild steel sheet continuous with lightly-radiused corners.
- e. Finish: Hot dip galvanising and then polyester powder coating to Qualicoat level 2.
- f. Colour: Black - RAL 9005.
- g. Fixing: Base shall be mechanical and concealed.
- h. Indicative Product:
 - 1). Manufacturer: mmcité1, or acceptable equivalent.
 - 2). Reference: Radium.

14. Type EXT-331 Metal Planters

- a. Description: Mild steel vegetation planter.
- b. Material: Mild steel sheets and/or sections.
- c. Minimum gauge: 3mm.
- d. Finish:
 - 1). Hot dip galvanising and then polyester powder coating to Qualicoat level 2.
 - 2). Black PPC finish (RAL9005)
- e. Colour: Black (RAL to be confirmed by the Architect).
- f. Fabrication:
 - 1). 200mm deep top fold.
 - 2). Manufacturer preformed corner pieces.
 - 3). No joints on corners.
- g. Make provision for corrosion protected concealed soil containment and irrigation as agreed with the Architect.
- h. Fixing: Triangular planter support brackets to be fixed down with 120mm M10 through bolt.
- i. Indicative Product:
 - 1). Manufacturer: Kinley, or acceptable equivalent.
 - 2). Reference: Planterline Bespoke.

15. Type EXT-333 Concrete Planters

- a. Description: Precast concrete vegetation planter.
- b. Conformance: BS EN 13198 and BS EN 13369.
- c. Material: Precast reinforced concrete.
- d. Finish: Match adjacent façade precast concrete.
- e. Edge profile: 10mm fillet edge.
- f. Colour: Match adjacent façade precast concrete.
- g. Make provision for corrosion protected concealed soil containment and irrigation as agreed with the Architect.

- h. Anti-graffiti coating applied on completion.
 - i. Fixing: Base shall be mechanical and concealed.
16. Type EXT-335 Security Booth
- a. Description: Security booth, details as indicated on the Design Drawings.
17. Type EXT-601 Timber Cladding to Planter
- a. Description: Timber cladding to metal planter.
 - b. Configuration: Refer to the Design Drawings.
 - c. Cladding:
 - 1). Material: Chemically-modified FSC-certified softwood timber.
 - 2). Species: Radiata Pine.
 - 3). Nominal Size: As indicated/ agreed.
 - 4). Finish: Sanded/ Planed. To be confirmed.
 - 5). Treatment: Compatible external grade fire retarding hygienic clear coating agreed with the Architect.
 - 6). Joints: 5mm gap.
 - 7). Indicative Product:
 - a). Manufacturer: Kebony, or acceptable equivalent.
 - b). Reference: Kebony Clear.
 - d. Support: Minimal sized framing or bracketry.
 - e. Fixing: Concealed mechanical fixing, coordinated with planter.
18. [Type EXT-701 Bird Box](#)
- a. [Multi-species timber bird box.](#)
 - b. [Dimensions: 290mm x 140mm x 180mm.](#)
 - c. [Timber species: Western Red Cedar from demonstrably certified sustainable sources.](#)
 - d. [Indicative reference: SKU: NB-06 by Gardenature.](#)
19. [Type EXT-705 Bat Box](#)
- a. [Handmade, tapering-form, timber bat box.](#)
 - b. [Dimensions: 340mm x 135mm x 102-70mm.](#)
 - c. [Timber species: Western Red Cedar from demonstrably certified sustainable sources.](#)
 - d. [Indicative reference: Single Bat Box SKU: BAT-002 by Gardenature.](#)

212 MATERIALS

- 1. Metalwork

- a. Where possible, metalwork assembly shall take place in properly equipped workshops with Sitework restricted to fixing. Consult with the Architect regarding Sitework, deliveries and the storage of equipment or assembled units.
 - b. All metal frames shall have rubber protection strips on panel contact faces.
- 2. Mild Steel
 - a. Mild steel sheet shall be to BS EN 10346 and BS 1449: Part 1 in a grade and thickness suitable for composite construction and suitable for galvanising or other protective coating.
 - b. Panels, sheet and sections shall be of minimum thickness to comply with the performance requirements to provide flat, profiled and rigid surfaces to tolerances specified.
 - c. Refer also to Sections Z11 and Z30 of the Specification.
- 3. Stainless Steel
 - a. Stainless steel shall be made of corrosion resistant nickel chromium steel to BS EN 10085, PD 970, BS EN ISO 683: Part 1, BS EN ISO 683: Part 2, BS EN ISO 683: Part 3, BS EN ISO 683: Part 4, BS EN 10089, BS EN 10277, BS EN 10278, BS EN 10090, BS EN ISO 683: Part 3, BS EN ISO 683: Part 4, BS EN 10095 and BS EN 10250: Part 4, for solid bar and BS EN 10216: Part 5 for tube. Bead blasted finish to comply with grade 1.4401L to BS EN 10095, BS EN 10029, BS EN 10048, BS EN 10051, BS EN ISO 9445 and BS EN ISO 9445: Part 2.
 - b. Where Site or shop welding is required, it shall be by the process known as manual inert gas tungsten-arc welding and it shall be carried out by a procedure qualified to BS EN ISO 15614: Part 1 and by welders tested in accordance with BS EN ISO 9606: Part 1. Welds shall be continuous and of a material and technique suitable to the sections being assembled. Weld finish shall be smooth with all flux residues removed and no surface defects (e.g. undercut, porosity, deep ridges.)
 - c. Stainless steel shall be in accordance with Section Z11.
- 4. Aluminium
 - a. All extruded aluminium alloy members shall be fabricated from the appropriate grade of aluminium alloy complying with BS EN 754: Parts 3-5 and BS EN 755: Parts 1-9 unless otherwise specified.
 - b. Unless specified otherwise, aluminium sheeting shall be a minimum of 3mm thick and satisfy the requirements of BS EN 485: Parts 1-4, BS EN 515 and BS EN 573: Parts 1-4.
 - c. All aluminium fixing brackets and cleats shall be manufactured from the appropriate grade of alloy to the requirements of BS EN 515, BS EN 573: Parts 3 and 4, and BS EN 755: Parts 1-9. If visible, they shall be finished to match the metal panels and framing members.
 - d. Aluminium shall be in accordance with Section Z11.
- 5. Modified Timber
 - a. Key technical criterion:
 - 1). Full FSC certified.
 - 2). Boards shall be flat, unbowed and free of visually discernible twist.
 - b. Technical characteristics and performance:
 - 1). Density: Not less than 700 kg/m³ at 12% MC.

- 2). Brinell hardness: 4.5.
- 3). Bending strength: Circa 90 MPa,
- 4). Tensile strength perpendicular to the plane: 1.53 N/mm².
- 5). Point Load Bearing Test - Peak Load: Between the range 5.65-7.14 kN depending on board widths and span centres to BS EN ISO 14125.
- 6). Point Load Bearing Test - Peak Deflection: Between the range 11-19mm depending on board widths and span centres to BS EN ISO 14125.

6. Natural Hardwoods

- a. Hardwood shall be to BS 1186: Part 1, BS 1186: Part 2, BS 1186: Part 3, BS EN 942 and BS EN 350: Part 2.
- b. Hardwood shall be of first stock, namely FAS and Selects or Better.
- c. Moisture content at time of installation shall be in accordance with recommendations defined within BS EN 942.
- d. External durability class: Class 2.
- e. Milling: All elements shall be cut from quarter sawn timber.
- f. Sapwood to visible elements shall not be acceptable.
- g. Resin pockets are not acceptable in any event on any exposed surface. No making good will be allowed.
- h. Exposed pith is not acceptable.
- i. Hardwoods and hardwood boards shall be obtained from sources fully participating in the specified third party certification scheme which shall include the provision of uninterrupted Chain of Custody Certification throughout the supply chain or as demanded otherwise by the applicable certifying scheme.

7. Mortar

- a. Masonry mortar to BS EN 998: Part 2.
- b. Mortar pigment: To BS EN 12878.

8. Fixings Generally

- a. Fixings shall be fit for their intended purpose.
- b. All bolts, screws, nuts and anchors shall be of adequate strength for their intended purpose and be manufactured from the specified grade of material.
- c. All necessary fixings shall be installed for the works.
- d. All fixings shall conform to all statutory requirements in respect of strength and type.
- e. Adequate measures shall be taken to prevent bi-metallic corrosion between dissimilar metals and to isolate aluminium components from cementitious surfaces. To this end, attention is drawn to publication PD 6484 'Commentary on corrosion at bi-metallic contacts and its alleviation'.
- f. Direct contact between aluminium or aluminium alloys and treated timber shall be avoided, unless with the prior acceptance of the Architect.
- g. Visible fixings shall comprise round-headed bolts.
- h. Unless otherwise specified, the following basic requirements shall be adhered to:

- 1). Rigidity: Only fixings which are suited to the likely stresses, movements and vibrations in use without allowing any wobble, creaks or deflection of any fixtures or fittings shall be used.
 - 2). Removability: Items that require accessibility or removal shall be fixed with bolts.
9. Concrete Footing
- a. Concrete shall be in accordance with BS 8500: Parts 1 and 2 and BS EN 206.
 - b. Designated mix shall be not less than GEN 4 or Standard mix not less than ST5.

213 FABRICATION

1. Tolerances: It shall be ensured that in addition to the general requirements of the Specification:
 - a. A high degree of accuracy shall be employed in the fabrication of the works and their support structure.
 - b. The works shall be fabricated within the following tolerances:
 - 1). Length: +/-1mm.
 - 2). Width: +/-1mm.
 - 3). Squareness: Deviation of the perpendicular to the longest side shall not exceed +/- 1:1000.
 - 4). Flatness: +/-1mm under a 600mm straightedge.
 - 5). The twist and warping shall not cause any point of the panel to be more than 0.5mm out of plane.
 - 6). The twist and warping shall not cause any point of the support frame to be more than 2mm out of plane.

EXECUTION

310 LOADING

1. Site Activities
 - a. Restrict, to ensure that design loads are not exceeded, or submit proposals for temporary supports.

311 INSTALLATION GENERALLY

1. General Requirements
 - a. Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on the Design Drawings or Structural Engineer's Drawings.
 - b. Fasteners and methods of fixing: As Section Z20.
 - c. Heading joints: Maintain to a minimum, and formed only as butt joints situated over joists.
 - d. Length: Each board must span not less than two bays between joists with joints in adjacent boards staggered.
 - e. Root-fixed posts:

- 1). Excavate holes neatly and with vertical sides.
 - 2). Position the post/strut and fill the hole with concrete to not less than the specified depth, well rammed as filling proceeds and consolidated.
 - 3). Ensure that holes not completely filled with concrete are backfilled with excavated material, well rammed and consolidated.
- f. Posts shall be aligned plumb and true and maintained as such as the concrete is introduced..

312 ACCURACY

1. Allowable deviation:
 - a. Board alignment (height): $\pm 2\text{mm}$ under a 1m straight edge.
 - b. Joint width: $\pm 1.5\text{mm}$.
 - c. Ensure consistency of plan alignment on the intermittent short joint of not greater than a 2mm offset.

END OF SECTION