

STRUCTURAL SPECIFICATIONS



NAIDU
CONSULTING
ENGINEERING DEVELOPMENT

Contract Number:

19/1/9/1/57 TB (22)

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Ntshongwe Police Station

Client

South African Police Services

Report Title

**Ntshongwe SAPS Police Station
Structural General Notes and
Specification**

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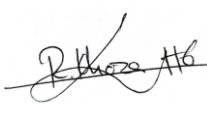
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LIST OF ABBREVIATIONS

CAD	-	Computer-aided design
C/C	-	Centre to Centre
CV	-	Curriculum Vitae
DL	-	Dead load
OH&S	-	Occupational Health and Safety
GR	-	Grade
HSFG	-	High Strength Friction Grip
ISO	-	International Organization for Standardization
Max.	-	Maximum
MPa	-	Megapascal
MPI	-	Magnetic Particle Inspection
NC	-	Naidu Consulting (Pty) Ltd
NDT	-	Non-destructive testing
OPC	-	Ordinary Portland Cement
Rwps	-	Rainwater pipes
SABS	-	South African Bureau of Standards
SANAS	-	South African National Accreditation System
SANS	-	South African National Standards
SAPS	-	South African Police Services

1 GENERAL

- 1.1 These notes to be read in conjunction with the drawings and project specifications.
- 1.2 All building work must comply to the Local and National Building Regulations.
- 1.3 All work shall be executed in strict accordance with the latest SANS 10400, SANS 1200, SANS 2001, SANS 10100 Part 2 or their latest SANS codes replacements, OH&S Act and the project specifications in the contract documentation.
- 1.4 All structural concrete and steel drawings to be read in conjunction with the relevant Architectural, Civil, Mechanical & Electrical Engineers' drawings and the specifications in the Bill of Quantities. Any errors, omissions & discrepancies to be brought to the attention of the Engineer immediately.
- 1.5 Where conflicting specifications between the drawings & Bill of Quantities occur, the drawing specifications will take preference over the specifications in the Bill of Quantities.
- 1.6 It remains the main Contractor's responsibility to compare drawings and notify the relevant parties of any discrepancies within a reasonable time frame.
- 1.7 The Contractor is to keep a full set of drawings on site.
- 1.8 The Contractor shall check all project dimensions on site beforehand. All dimensions are also to be checked against the Architect's drawings. Any discrepancies shall immediately be reported to the Engineer.
- 1.9 The Contractor is responsible for correct setting out of building on site with particular reference to boundary and building lines. Contractor is to provide the as-built co-ordinates of all bases and columns at each top of base and each successive top of floor level. Deviations in all direction (X, Y & Z) from the design dimensions to be indicated as well. The information is to be superimposed on the Engineer's drawings in CAD. The survey is to be performed by an independent registered surveyor.
- 1.10 Scaling off drawings is not allowed.
- 1.11 All notes are general unless otherwise shown on the drawing.
- 1.12 All SANS specifications mentioned in the notes, on the drawings and in the project specifications should be available on site, at all times.
- 1.13 Where new construction tie into existing structures, the Contractor shall cross check and confirm all critical dimensions and levels related to existing structures, before any construction or manufacturing commences.
- 1.14 An isolation joint must be provided between all new structures, unless indicated otherwise on drawings. Stability requirements of elements over joints must be met.
- 1.15 Unless otherwise indicated on drawings, all waterproofing is according to Architect's details and specifications. Contractor to provide a 10-year guarantee and the required maintenance to hold the guarantee.

- 1.16 The Contractor shall ensure that waterproofing materials are not damaged during backfilling operations, fixing of steel etc. Any repair work for the Contractor's account.
- 1.17 Products different to those specified may only be used with written approval from the Engineer. Such approval is to be requested in writing.
- 1.18 All brickwork to be set out according to the Architect's drawings.
- 1.19 All instructions from the Engineer shall be written in the site instruction book.
- 1.20 The Contractor is responsible for controlling storm water and dewatering on the site to prevent damage to the structure, banks, excavations, or any other works for the duration of the contract period.
- 1.21 No structural alterations may be done without the written approval of the Engineer.
- 1.22 Shop fronts, partitions and window frames are to allow for long-term deflection of span/250.

2 FOUNDATIONS AND EARTHWORKS

- 2.1 All earthworks shall be in accordance with the latest SANS 1200 D specifications.
- 2.2 All excavations must be inspected and approved by the Engineer before placing of any concrete foundation, blinding, and waterproofing or geo-fabric membrane.
- 2.3 Where excavation levels have to be lowered, the top level of the base should be kept as shown and the blinding layer thickened, size and reinforcing may be altered by the Engineer if required.
- 2.4 Founding levels determined on site is to be forwarded to the Engineer.
- 2.5 The Contractor is to refer to the geotechnical investigation report for geotechnical information/profiles.
- 2.6 Construction of foundations to be in accordance with SANS 2001-CM2.
- 2.7 All foundation excavations shall be thoroughly prepared to the approval of the Engineer prior to placing of steel and casting of concrete.
- 2.8 The Contractor is to allow for equipment to keep excavations dry.
- 2.9 No foundation shall be cast on either non-engineered fill or backfill material. Portions that are over-excavated beyond the depth required by the Geotechnical Engineer, to be filled with mass concrete (10 MPa / 19 mm) at Contractor's expense.
- 2.10 All foundations are placed symmetrically below columns and brickwork unless otherwise shown.
- 2.11 All bases to be reinforced concrete.
- 2.12 Strip foundations are as shown on drawing D848-6000-001.
- 2.13 Retaining wall and column foundations shall be cast directly against the vertical faces of the excavation, unless indicated otherwise on drawings.

- 2.14 No backfilling behind retaining walls is to be done before the Engineer gives written approval.
- 2.15 Where applicable, backfilling shall be done simultaneously on both sides of walls to minimize the relative height difference in soil levels.
- 2.16 All backfilling to surface beds and behind retaining walls to be compacted to MOD AASHTO densities as indicated on drawings (sand compacted to 93% MOD AASHTO) in layers not exceeding 150 mm in thickness.
- 2.17 The maximum net allowable soil bearing capacity underneath foundations is 100 KPa.
- 2.18 Imported gravel to comply with SANS 1200 DM clause 3.2.4. It is to be approved. Backfill with no cohesion compacted to minimum 93% mod AASHTO or a minimum of four passes with a 10-ton vibratory roller, unless indicated otherwise.
- 2.19 The Contractor shall allow in his price for the removal of spoil and / or breaking up of boulders.

3 BRICKWORK & BLOCKWORK

- 3.1 Masonry units shall comply with the following specifications:
 - SANS 227 : Burnt clay masonry units
 - SANS 285 : Calcium silicate masonry units
 - SANS 1215 : Concrete masonry blocks
- 3.2 Brickwork and blockwork shall be built according to SANS 10164 and SANS 10400.
- 3.3 All brickwork, blockwork, anchors, wall ties and straps shall be in accordance with the latest SANS 10400 and SANS 10164 specifications.
- 3.4 The minimum crushing strength of all load bearing brickwork shall be 14 MPa unless noted otherwise. Water absorption less than 10% and irreversible moisture expansion 0.05% max.
- 3.5 The minimum crushing strength of all non-load bearing blockwork shall be 7 MPa unless noted otherwise. Water absorption less than 10% and irreversible moisture expansion 0.05% max.
- 3.6 The minimum crushing strength of mortar shall be as for Class II mortar in accordance with Table 1 of SANS 10164 Part I, unless indicated otherwise on drawings.
- 3.7 In addition, continuous brick force is required in every layer for the first four layers above foundations as well as windows and over door openings. Minimum laps to be 300 mm.
- 3.8 Refer to the Architect's drawings for general layout of brickwork / block work. All setting out to be done from the Architect's drawings.
- 3.9 All brick anchors, wall ties and straps shall be hot-dipped galvanized.
- 3.10 V-joints are to be made right through plasterwork where brickwork / blockwork and concrete join.
- 3.11 Wall joints must be repeated in all tiled finishes.

- 3.12 Non-load bearing brickwork / blockwork may not be built closer than 10 mm from the soffits and sides of beams and slabs unless otherwise shown. The joint shall be soft board or similar approved and sealed on both sides with 2-part polysulphide. Any specific waterproofing requirements to the Architect's details. Any specific fire requirements to fire consultant's detail.
- 3.13 Refer to the Architect's drawings for positions of expansion joints in brickwork / blockwork.
- 3.14 All brickwork shall be fixed to concrete & steel columns by means of 30 x 1.2 mm galvanized hoop iron ties every fourth course and blockwork every second course. Fix the ties to columns with 2 Hilti shot studs each. Minimum horizontal length of hoop iron to be 300 mm.
- 3.15 In cavity walls, wall ties shall join the leaves and shall be embedded in masonry joints at right angles to the leaves as the work progresses.
- 3.16 Wall ties in cavity walls and brick retaining walls shall be of the vertical twisted type as in SABS 0164 part 1 - 1980 Figure 1 or similar approved type. Galvanised butterfly ties should **not** be used.
- 3.17 The number of wall ties per m² of walling shall be:
- 100 mm ≥ Cavity: Placed every fourth layer vertically and at 660 c/c horizontally.
 - 100 mm < Cavity < 150 mm: Placed every fourth layer vertically and at 440 c/c horizontally.
- 3.18 Additional ties shall be provided at openings, discontinuities (for example control joints) spaced at intervals not exceeding 300 mm vertically, or, where deemed necessary or as shown on the drawings, such as at external angles.
- 3.19 For high-lift grouted walls, ties complying with the requirements of SANS 10164 Part 2 Annex A (14) shall be spaced at intervals not exceeding 900 mm horizontally and not exceeding 300 mm vertically, with each layer staggered by 450 mm.
- 3.20 Ensure that each tie is embedded to a depth of at least 50 mm in the mortar joint of each leaf.
- 3.21 For cavity widths not exceeding 75 mm. Ensure that the wall ties used comply with the relevant requirements of SANS 28 subject to the provision that ties of the single wire type shall not be used.
- 3.22 For cavity widths exceeding 75 mm but not exceeding 150 mm, ensure that wall ties used are of the vertical twist type, or any similar type having at least the equivalent strength and stiffness.
- 3.23 Tops of cavity walls to be ventilated for as long as possible.
- 3.24 Clay bricks to be wetted before being used.
- 3.25 Concrete bricks and blocks to be kept dry before being used.
- 3.26 All planters built in brickwork are to be provided with 25 mm diameter weep holes above finished paving levels and at @ 1000 c/c.
- 3.27 Provide horizontal slip sheets between all concrete and non-load bearing brickwork surfaces.

4 CONCRETE

- 4.1 All concrete work shall be carried out strictly in accordance with SANS 1200 G.
- 4.2 Curing of concrete shall be carried out strictly in accordance with SANS 1200 G and SANS 10100 Part 2. Contractor to provide a method statement, to be approved by Engineer, for the curing of the various elements concerned.
- Exposed concrete surfaces to be continually cured for a minimum of 10 days.
 - “High Temperature Accelerated Curing” shall not be permitted.
 - Specified Method:
Within a maximum of 2 hours after the formwork has been removed the concrete element shall be wet cured by covering with an inner hessian membrane and an outer puncture-free plastic membrane. The hessian membrane be kept continuously damp by an independent automatic sprinkler system. The hessian and plastic membranes are to be firmly secured and kept flush to the concrete surface for a minimum period of 10 days.
 - The Contractor must ensure that all materials required for the curing process are on hand before stripping any formwork, and that these measures are implemented immediately after the formwork has been removed.
 - Surfaces that have not been formed against formwork (e.g. top surface of columns, beams, slabs, etc.) shall be protected as soon as it is possible, to do so without causing damage to that surface.
 - Should the Contractor wish to submit any alternative proposal it shall contain full details of methods and procedures, the Specified Method must however be priced in the Schedule of Quantities.
 - Chemical-curing compounds shall not be allowed unless expressly authorised by the Engineer.
- 4.3 Stripping times of shuttering and propping shall be in accordance with SANS 1200 G, Clause 5.2.4 and Table 1.
- 4.4 The following elements or parts of the structure are to remain fully propped until the required design concrete strength has been reached:
- Beams
 - Cantilevers
 - Slabs supporting hanging structures (Note that the portions being suspended cannot support the floor directly above).
- 4.5 When full height concrete walls are cast on slabs or beams, they are to be fully propped until the wall and slab have reached their design strengths.
- 4.6 The main Contractor is to appoint a competent person to design all formwork.
- 4.7 Formwork layout drawings prepared by the competent person are to be kept on site for inspection at any time.
- 4.8 Typical back-propping information provided by the Engineer does not supersede formwork design.

4.9 Minimum concrete strength at 28 days shall be as follows:

- Blinding - 15 MPa / 19 mm
- Mass Concrete - 15 MPa / 19 mm
- RC Foundations - 25 MPa / 19 mm
- Columns - 30 MPa / 19 mm
- Surface Bed - 25 MPa / 19 mm
- Beams - 30 MPa / 19 mm
- Suspended Slabs - 30 MPa / 19 mm
- Structural Screeds - 25 MPa / 13 mm

4.10 No sandstone aggregate will be allowed in slabs or surface beds, minimum Ordinary Portland cement (OPC) content 70% - mix designs to be submitted to Engineer for acceptance.

4.11 All concrete shall be manufactured on mix designs approved by the Engineer. Slagment or admixtures shall not be used without approval.

4.12 Concrete to be adequately compacted by means of a vibrator.

4.13 Concrete cube tests to be done in accordance with SANS 1200 G, Clause 7: Tests.

- All concrete testing to be done by an accredited laboratory.
- The laboratory should provide valid calibration certificates for concrete testing equipment every six months.
- Test results sheets to quote serial number of equipment used for all tests.

4.14 At least one set of six cubes shall be taken for each casting and from at least every 50m³ of concrete for each grade placed (or part thereof should the total cast be less than 50m³).

3 No. of the cubes shall be crushed at 7-day strength. 3 No. of the cubes shall be crushed at 28-day strength.

The results submitted to the Engineer must also contain the date on which the samples were taken and identification by which the results may be correlated with the section of work to which they pertain. Cubes shall be tested in a SANAS accredited testing laboratory.

Results shall be reported with statistical analyses to demonstrate their compliance with the acceptance criteria stated in SANS 1200 G, Clause 7.3.

As instructed by the Engineer, additional samples shall be randomly tested at an approved laboratory for correlation purposes.

4.15 All casting procedures, construction methods and positions of construction joints shall be submitted to the Engineer prior to the commencement of the project.

4.16 The Contractor must co-ordinate all services drawings for details and positions of openings and sleeves required for stormwater, sewerage, drainage, electrical, mechanical and other services. Discrepancies to be brought to the attention of Engineer and other relevant parties.

4.17 The Contractor must obtain permission from the Engineer before any openings or services, which are not indicated on the drawings, may be introduced through any structural element or close to any column.

4.18 Penetrations less than 150 mm in diameter or square will not be indicated on structural drawings. These penetrations are to be coordinated with the drawings showing the relevant services.

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- 4.19 Penetrations not indicated on drawings may not be introduced within a distance of 4 (four) times the slab depth from any column.
- 4.20 No chasing of services into concrete elements is allowed.
- 4.21 Defective concrete work shall be reported to the Engineer without delay. The Contractor may not proceed with any remedial work or patching unless approved by the Engineer in writing.
- 4.22 No brick or block walls are to be built on floor slabs before the slabs have reached their 14-day strengths. Propping underneath slabs and beams shall be completely removed before brickwork is built. All bricks required for brick walls on a specific slab panel should be stacked evenly onto that specific slab panel before walls are built. The Engineer is to approve the maximum stacking height.
- 4.23 75 mm kickers for columns and walls have been allowed for in the reinforcing lengths. They shall be cast with the same strength as the concrete elements below them and thoroughly compacted and cured.
- 4.24 Refer to the Architect's drawings for detail and positions of V-joints and drip joints in concrete.
- 4.25 For details of waterproofing of roof slabs and balconies, refer to the Architect's drawings. For details of waterproofing and services behind retaining walls and under surface beds, refer to the Architect's and Civil Engineer's drawings.
- 4.26 Refer to the Civil Engineering and Architect's drawings for detail and positions of rainwater pipes (rwp's) in concrete and other cast-in items.
- 4.27 All columns are to be placed symmetrically on grid lines unless otherwise shown.
- 4.28 Concrete tolerance to be as follows:
- Internal concrete - not exposed: Degree of accuracy No. II (SANS 1200 G)
 - External concrete - exposed: Degree of accuracy No. II (SANS 1200 G)
 - Fairface / Architectural concrete: Tolerance specified by Architect.
- 4.29 All exposed concrete work to be off shutter unless otherwise stated.
- 4.30 The surface bed and all suspended slabs are power floated except where otherwise indicated, e.g. core areas where a tamped finish is required.
- 4.31 All special concrete finishes including screeds, toppings, etching, coloring, hardening and inlays by others.
- 4.32 All concrete drawings to be read in conjunction with the relevant Architectural, Civil, Electrical, Mechanical and Structural Steel drawings and any discrepancy to be brought to the attention of the Engineer.
- 4.33 All cast-in items to be hot-dipped galvanized, clean and free of oil, dirt or any other material which may impair the bond with concrete. Tolerance for placing according to SANS 1200 GB.
- 4.34 Areas with congested cast-in items, such as electrical conduits, are to be approved by the Engineer prior to casting of concrete.

- 4.35 All grouts and epoxies to be used strictly in accordance with the manufacturer's specification.
- 4.36 All slabs to be propped through three floors during casting. Construction loads not to exceed design live loads.
- 4.37 Props on and below ribbed slabs shall be placed at rib positions.
- 4.38 Propping may only be removed once upstand beams have obtained their 28-day strength.

5 SURFACE BEDS

- 5.1 Provide 20 mm isolation joints around all concrete columns and 10 mm isolation joints against brick walls.
- 5.2 Saw-cut joints are to be done as soon as concrete is firm enough not to damage the edges. Usually between 6 to 16 hours. Joints to be repeated in finishes.
- 5.3 Refer to the relevant Structural drawings for standard details for specifications for saw-cut, isolation & construction joints.
- 5.4 All backfill to be compacted in layers not exceeding 150 mm and to MOD. AASHTO densities as indicated on the relevant drawings.
- 5.5 Method statement for pouring of surface bed panels to be submitted to the Engineer.
- 5.6 Joints in surface beds must be repeated in the finish.
- 5.7 Surface bed to be cast on 250 µm-plastic sheeting.

6 REINFORCEMENT

- 6.1 Reinforcement shall be manufactured and fixed to comply with the tolerances as specified in SANS 1200G and / or the project specification. All steel bars shall comply with the requirements of SANS 920 and welded steel fabric with the requirements of SANS 1024.
- 6.2 Bending of reinforcement shall be in accordance with SANS 282.
- 6.3 No reinforcement may be cut without written approval from the Engineer.
- 6.4 Starter bars that move during the preceding cast, they may not be bent back into position. The Engineer is to be informed in writing - the correspondence is to include sufficient digital photographs to show the problem.
- 6.5 No tie-wire shall encroach on the specified minimum cover by more than a strand thickness.
- 6.6 The Contractor shall inspect and approve the fixed reinforcement before the Engineer is notified of a required inspection. The Engineer is to be notified at least 24 hours in advance.
- 6.7 All reinforcement shall be inspected and approved in writing by the Engineer before casting of concrete may commence. Reasonable attempts shall be made in the storage of rebar to avoid contamination. Soiled/contaminated rebar shall be cleaned prior to fixing to position.

- 6.8 No slab will be inspected unless the reinforcing and cables (if present) have been fully fixed; all other services have been installed and the deck has been cleaned properly.
- 6.9 No heat treatment or cutting of steel without the written approval of the Engineer shall be allowed.
- 6.10 Bent-out bars at construction joints shall be bent out with a suitable pipe so that no kink is formed in the bar.
- 6.11 Unless noted otherwise, minimum concrete cover to reinforcing to be allowed for as indicated on drawings.
- 6.12 The permissible deviation for cover to reinforcement in the above-mentioned elements shall be - 0 +5mm irrespective of any Degree of Accuracy classification.
- 6.13 Concrete cover blocks shall be manufactured in accordance with the requirements of SANS 10100 Part 2 (8.4.1.2). The blocks shall be the same in strength as the specified strength of the element being cast. Fixing wire shall be fully galvanised, Class A in accordance with SANS 675. Blocks shall be fully cured in water for 14 days before use.

7 STRUCTURAL STEELWORK

- 7.1 All structural steel work shall be fabricated and erected in accordance with SANS 1200 H.
- 7.2 Welds shall conform to SANS 10167-1984 and 10044 specifications.
- 7.3 Where no weld sizes are shown, the minimum weld size shall be that of the thickest plate of the connecting plates / elements or 6 mm (whichever is higher). Unless otherwise shown, the intention of connections is to transfer the full force that can be developed in connecting members through the connection.
- 7.4 All gussets and cleats to be a minimum of 8 mm plate unless shown otherwise.
- 7.5 When using electric arc welding, all electrodes shall be E7018. For any other welding process to be used, the Contractor shall apply, in writing, for the approval from the Engineer for the electrodes to be used.
- 7.6 All butt welds shall develop the full strength of the elements joined.
- 7.7 All splices shall develop the full strength of the elements joined.
- 7.8 Welding shall only be performed by coded welders.
- 7.9 Suitably qualified and experienced welders using proper equipment in a good condition shall do all site welding. Welders to be certified and certificates with photos to be submitted to the Engineer.
- 7.10 The Contractor shall design all welds and, where necessary, gussets of sufficient strength shall be provided to obtain the required weld length to ensure the full strength of the connection.
- 7.11 All dimensions and levels shall be checked on site before shop drawings commence. Any discrepancies shall be brought to the attention of the Engineer.

- 7.12 A complete set of shop drawings shall be submitted to the Engineer for approval one month before fabrication commences. Shop drawings will only be checked for compliance with design intent. No dimensional checks, or checks on cleats, bolts, welds and gussets will be done.
- 7.13 All shop splices are to be indicated on drawings.
- 7.14 An erection method statement is to be submitted to the Engineer prior to commencement of construction.
- 7.15 Steel grades shall be as follows:
- Plates - GR S355JR
 - Hot rolled sections - GR S355JR
 - Hollow sections - GR S355JR
 - Cold formed sections - GR S355JR
- 7.16 Tensile strength testing results must be provided for each batch of steel from which cold-formed sections are sourced.
- 7.17 A certificate from the steel manufacturer in which the grade of the structural steel is verified shall be handed to the Engineer for approval.
- 7.18 All structural bolts shall be grade 8.8 hot-dipped-galvanized, unless otherwise noted.
- 7.19 Where temporary bracing or propping is required, the Contractor shall be responsible for the design, erection, maintenance and removal (where necessary) of such supports. If splices in trusses are required due to transport, proposals of this shall be submitted to the Engineer at an early stage for written approval.
- 7.20 Fabricator to ensure that centres of gravity/centroidal axes of members intersect at node points, except where eccentricities are specified on Engineer's drawings.
- 7.21 All structural steel drawings to be read in conjunction with the relevant Architectural, concrete drawings as well as the Bill of Quantities and any discrepancy to be brought to the attention of the Engineer.
- 7.22 Quality control on welding shall be as follows:
- 7.22.1 All welds shall be inspected using visual aids.
- 7.22.2 All butt welds: 100% ultrasonic NDT.
- 7.22.3 All fillet welds: 20% MPI.
- 7.22.4 Crane / crawl beams: 100% ultrasonic NT
- 7.23 Where applicable, cementitious non-shrink grout shall be provided under base plates before any primary loads are applied to the structure. Laminated finger shaped hot-dip galvanized packing to be provided under base plates.
- 7.24 Where HSFG bolts are specified, the following shall apply:
- 7.24.1 All contact surfaces at HSFG bolt splices shall be free from oil, grease, rust, scale, paint or any other impurities at the time of bolting.

7.24.2 The tightening of high strength friction-grip bolts shall be done according to the turn-of-the-nut method as specified in clause 5.3.1 (a) of SANS 1094-1982.

or

Where HSFG bolts have been specified, the Contractor shall use coronet-type load indicating washers in conjunction with such bolts.

7.25 The Contractor shall, at the commencement of the project, acquaint himself with the availability and delivery time of the products and steel profiles specified on the drawings so that such material can be ordered ahead of time.

7.26 Where slotted holes for bolts occur, the nut shall be hand tightened and a locknut be provided unless noted otherwise.

7.27 Gutters are to be water tested to ensure all joints are watertight.

7.28 Contractor to arrange with Engineer for inspection of structural steel work during fabrication.

7.29 Where applicable, non-shrink grout shall be provided under base plates before any primary loads are applied to the structure.

7.30 Surface protection for structural steelwork:

7.30.1 All structural steelwork to be cleaned and de-rusted in accordance with SANS 10064.

7.30.2 All structural steelwork to be hot dipped galvanized.

7.30.3 Hot dipped galvanized coating to be to ISO 1461:1999 on fabricated iron and steel articles.

7.30.4 Paint with intumescent paint to achieve 1 hour fire rating.

7.30.5 Final finish to the Architect's detail.

7.30.6 Epoxy sealant to cover all bolt ends, nuts and washers to prevent rust incursion.

7.31 Paint specification for the bolts:

- 3 days before the erection of the structural steelwork, all bolts are to be cleaned and degreased.
- Within 2 days of erection, all bolts are to be coated with 1 coat of Sigmadur Gloss or equivalent.

7.32 Contractor to submit method statement for paint repairs.

8 TIMBER ROOF STRUCTURE

8.1 Timber roof structures shall be design and supply.

8.2 All designs and drawings are to be submitted to and approved by the Engineer before construction of roof commences.

8.3 The Contractor will submit a final inspection certificate to the Engineer upon completion of the structure but prior to placing of any roof coverings.

9 PRECAST CONCRETE

- 9.1 All concrete notes apply to precast concrete members.
- 9.2 Precast concrete and precast concrete connections that form part of the in-situ cast structure will be to degree of accuracy I.
- 9.3 Concrete strength at 28 days will be 30 MPa unless noted otherwise.

10 DESIGN LOADS

- 10.1 Design loads given below are for concrete once 28-day strength has been achieved.
- 10.2 All loads during execution/construction that exceeds these specified loads or are applied prior to 28-day strength, will require back propping.
- 10.3 Design loads are:

Surface Beds

- Imposed Loads (Conference rooms)
(SANS 10160-2:2010, Edition 1, Table 1 – C2) - 4.0 kN/m²
- Imposed Loads (Storage areas)
(SANS 10160-2:2010, Edition 1, Table 1 – B5) - 5.0 kN/m²
- Own Weight reinforced concrete - 25.0 kN/m²
- Additional DL (max. 75 mm screeds or partitions) - 1.5 kN/m²
- Brickwork - As shown on the Architect's layouts.
- Plasters - As shown on the Architect's layouts.

Suspended Roof Slabs

- Imposed Loads (for normal maintenance and repair)
(SANS 10160-2:2010, Edition 1, Table 5 – H2) - 0.5 kN/m²
- Own Weight reinforced concrete - 25.0 kN/m²
- Additional DL (max. 75 mm screeds or partitions) - 1.5 kN/m²

Timber Roofs

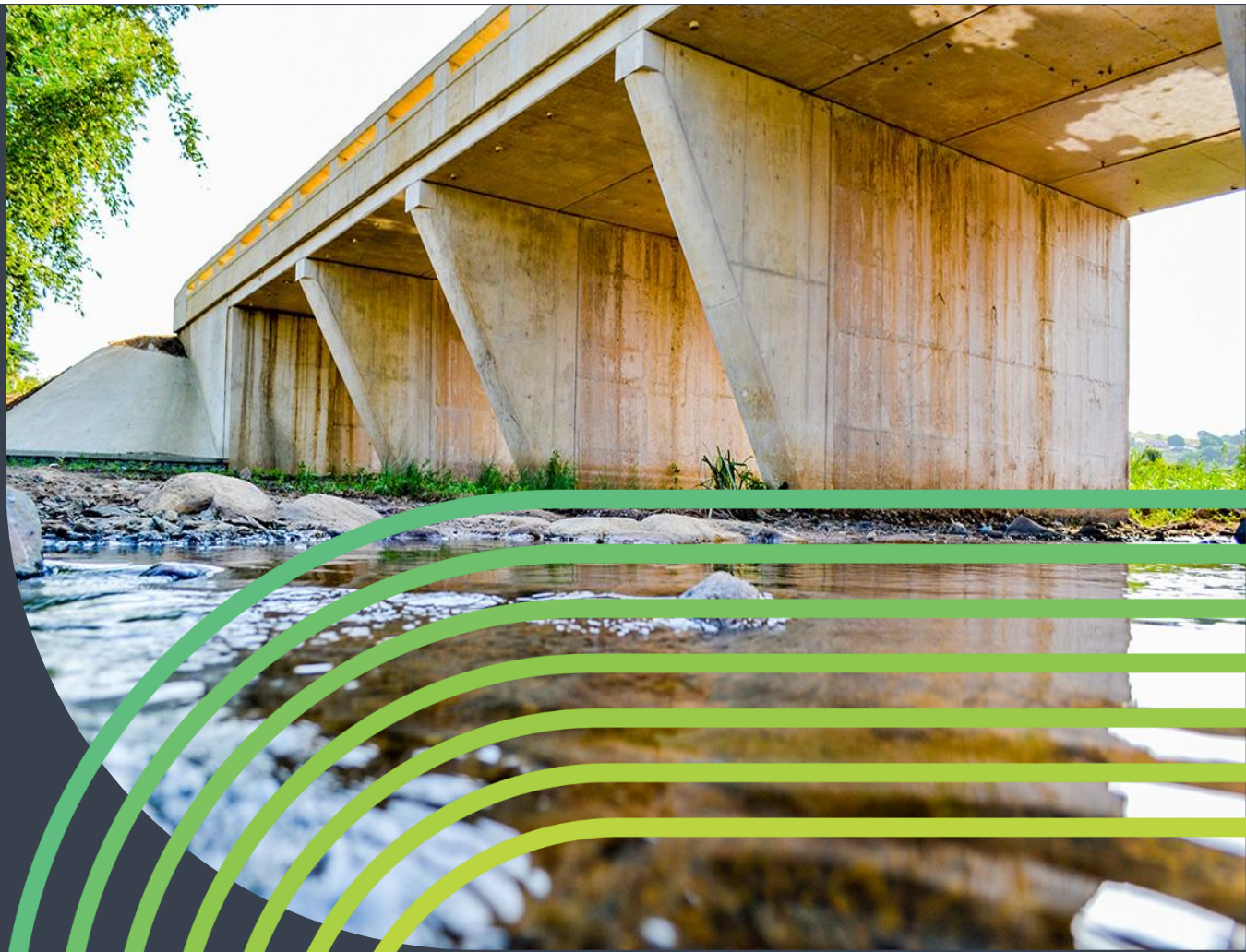
- Roof sheeting - 0.2 kN/m²
- Roof truss - 0.8 kN/m²
- Imposed load - 0.5 kN/m²
- Ceiling and services - 0.2 kN/m²

Ramps

- Imposed loads (Access areas in public buildings) - 5.0 kN/m²
(SANS 10160-2:2010, Edition 1, Table 1 – C5)

Steel Roofs

- Imposed loads - 0.5 kN/m²
- Wind loads - 1 kN/m²



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