WESTERN CAPE GOVERNMENT
DEPARTMENT OF HEALTH & WELLNESS

FRAMEWORK FOR MAINTENANCE OF HEALTH FACILITIES FOR WCGHW FOR A PERIOD OF THREE (3) YEARS

Scope: Works Information

3. Specifications, standards & workmanship

The *works* and *service* are to be executed subject to these specifications, standards and workmanship requirements. Please note that compliance with all these specifications and standards, including requirements in terms of qualifications, accreditation (where applicable) and work experience of both the tendering entity and its key people will be material in the *Employer's* risk assessment for awarding this contract.

Any standards and regulations referred to in this document, will mean the latest revision thereof.

3.1 Standard Specifications

Where reference is made to the standard specifications in this contract, it means the latest edition of the documents which apply to the specific discipline involved in the *works*, as referenced under any of the headings below. The standard specifications may, due to their generality and completeness, also cover items not applicable to this particular contract.

3.2 Package Order specifications

Package Order specifications include amendments to the standard specifications as well as supplemental specifications applicable to work items not covered by the standard specifications. Package Order specifications, where applicable, may be found throughout the Works Information of this document, including *works* drawings. The *price list* may also contain references to standard specifications as well as Package Order specifications, for clarification in terms of pricing for certain items, where applicable.

In the event of any discrepancy between the Package Order specifications and a part of the standard specifications found in the Works Information, the Package Order specifications take precedence.

Where a WCGHW Technical Memoranda applies to the works included in the Package Order, the requirements of the Package Order specification shall take precedence.

3.3 Accreditation, qualifications and work experience

Minimum requirements for work experience, qualifications and accreditation (where applicable) as well as minimum personnel are as stated under the headings below. The tenderer must supply the relevant information in regard to accreditations, qualifications and work experience for both the enterprise and key people who will be working on this contract on the appropriate returnable schedule in the Works Information.

3.4 Building trades: Preambles

The Preambles is the Model Preambles for Trades (Latest Edition) as recommended and published by the Association of South African Quantity Surveyors.

3.5. Building trades: Supplementary preambles

The "Supplementary Preambles" following hereafter are incorporated to satisfy the requirements of the project and shall take precedence (where applicable) over the provisions of the said Model Preambles for Trades.

3.5.1 Demolitions and alterations

3.5.1.1 Handling of Asbestos containing materials

The Tenderer must provide costs for the appointment and delivery of services of a Registered and Licensed subcontractor to handle completely the demolition of Asbestos related products and safe carting and disposal of all Asbestos related products off site to a designated disposal area indicated by the Local Municipality and the Department of Water Affairs and Forestry.

For the removal of the existing Asbestos Cement Roof cover, the *Contractor* must strictly comply with the Occupational Health and Safety Legislation in terms of Section 20 of the Environmental Conservation Act, 1989 (Act 73 of 1989).

The section states that waste may only be disposed of on a site that is permitted by the Department of Water Affairs and Forestry.

Other applicable legislation includes the:

- Occupational Health and Safety Act (OHSA) (Act 85 of 1993)
- ASBESTOS ABATEMENT REGULATIONS 2020 as amended 2022
- Asbestos Regulations, 2001
- Mine and Safety Act (Act of 1996)
- National Environmental Management Act (Act107 of 1998)

In order to cost the handling of Asbestos containing material, please scrutinize the above legislation thoroughly.

3.5.1.2 View site, buildings and structures prior submission of procurement document

Most projects will at work package quotation require a compulsory briefing/clarification meeting on site which will give the Tenderer the opportunity to acquaint himself with the site, buildings, structures, facility, environment and scope of work to be done for a specific project.

Where no compulsory briefing/clarification meeting is required or where the compulsory briefing/clarification meeting is held off site, the Tenderer must arrange timeously with the Employer before submission of his tender to visit the site to acquaint himself with the site, buildings, structures, facility, environment and scope of work for the specific project.

3.5.1.3 General execution of work

All work must be carried out carefully and in the safest possible manner and the *Contractor* must make a thorough examination and take all necessary precautions before proceeding with work. The utmost care is to be observed to avoid structural or other damages in the remaining portions of the nearby existing buildings and/or structures.

The *Contractor* shall carry out the whole of the works with as little mess and noise as possible and with a minimum of disturbance to adjoining premises and their tenants. He/she shall provide proper protection and provide, erect and remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the Employer.

The *Contractor* must water the works by jet or spray from a hose to sufficiently prevent nuisance from dust.

The *Contractor* will be required to take all dimensions affecting the existing buildings on site and will be held solely responsible for the accuracy of all dimensions.

The contractor shall provide proper protection and provide, erect, and remove when directed, by the Employer, any temporary tar paulins that may be necessary during the execution of the works.

The *Contractor* will be held solely responsible for any damages to persons and property and for the safety of the structures and at the *Contractor's* expense must make good any damage that may occur.

3.5.1.4 Existing premises occupied and operational facilities

All work will be done at various premises, which are fully operational, unless otherwise indicated by the Employer, and therefore the *Contractor* must allow for the protection of occupants, visitors, etc. as not to endanger their activities and to provide the necessary cautioning signage and hoarding to protect them.

The Contractor must exercise special care not to interfere with any electrical, mechanical, gas, electronic and security installations, water infrastructure, sewer infrastructure, storm water infrastructure, furniture, equipment, fittings, etc. unless otherwise instructed by the Employer.

3.5.1.5 Existing services, equipment, fittings, etc.

The *Contractor* shall conduct a survey of electrical, mechanical, gas, electronic and security installations, water infrastructure, sewer infrastructure, storm water infrastructure, furniture, equipment, fittings, etc. in the vicinity of all buildings and structures to be demolished or which is affected by the scope of works and agree the exact method of dealing with these installations, services, equipment, fittings, etc. with the Employer **PRIOR** to commencing work.

The Contractor shall timeously notify the Employer, in writing, of any disconnections of installations, services, equipment, fittings, etc. **PRIOR** to commencing work.

The *Contractor* shall not remove or interfere with any or part of any existing services (electrical installations, mechanical installations, gas installations, electronic installations, security installations, water infrastructure, sewer infrastructure, storm water infrastructure), furniture, equipment, fittings, etc. not included in the scope of works.

Where the scope of works requires the removal of and/or interference with existing services, furniture, equipment, fittings, etc., the Contractor shall inform the Employer timeously to obtain approval for the removal of and/or interference with such items to ensure smooth operation of the facility

The water supply to each building and/or structure shall be shut off at the nearest isolating point, should it exist, which serves the building and/or structure to be demolished or affected by the scope of works. Should such an isolating point not exist then one shall be provided by the *Contractor* at a position agreed with the Employer. A brick chamber shall be constructed around each new isolating point.

Water pipes and services that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the Employer.

The nearest manhole(s) to each line serving each demolished part of the building and/or structure shall be identified and the incoming pipe(s) from that building/structure blanked off within that manhole.

The contractor shall carry out the works with as little mess and noise as possible and with minimum disturbance to the occupants, visitors, etc. of the building.

3.5.1.6 Damage and repair services

Should the *Contractor* damage any services which are to remain in operation or any other services which have not yet been disconnected prior to removal, then the *Contractor* will be held solely responsible for such damage and any further resultant damage.

The *Contractor* shall at the *Contractor's* expense make all necessary arrangements for disconnection and repairs with all relevant Authorities and shall pay fees and charges levied and the *Contractor* shall immediately notify the Employer and the Authorities concerned of any such occurrences.

3.5.1.7 Disposal of existing material removed, demolished, hacked up, etc.

All existing materials specified to be removed, demolished, hacked up, etc. becomes the property of the *Contractor,* unless otherwise specified. These materials and all debris, rubbish and earth must be left clean and unencumbered. The *Contractor* must make his own arrangements for dumping and shall pay fees and charges levied.

If any materials, specified as to be "removed", "demolished", "hacked-up", etc., are sound and considered suitable for any portion of the new work, they must be thoroughly cleaned off and stacked on site for inspection by the Employer. The approval of the Employer must be obtained before any such materials are re-used in the new work.

3.5.1.8 Re-use of existing material removed

All existing material specified as "REMOVE EXISTING WORK AND STORE FOR RE-USE" shall remain the property of the *Employer* and must be cleaned off, cleared of nails, etc. and neatly stacked and stored on site by the *Contractor* where directed and carefully handled during removal/taking down, storage and re-fixing. The Contractor shall thoroughly overhaul and service existing materials to be re-used **PRIOR** re-fixing/installation thereof.

Doors, fanlights, fittings, frames, linings, etc. which are to be re-used shall be thoroughly overhauled before re-fixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc., and easing, oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is measured separately.

The Contractor remains responsible for the quality of the works and therefore should the condition of any of the existing material be of such a nature that it is impossible to overhaul, service and re-use, the Contractor **MUST** inform the Employer timeously thereof in writing detailing the reason(s) why the particular materials cannot be re-used, where after the Employer shall make the appropriate decision and inform the Contractor.

Should the Contractor decide, for whatever reason and without the written approval of the Employer, not to re-use specified material, but rather replace it with new material, the Contractor shall carry all the costs related to the use of new material.

The *Contractor* will be held responsible for the safety of these materials and must take all necessary precautions and any damage or loss that may occur must be made good at the *Contractor*'s own expense.

3.5.1.9 Handing over of existing material removed to Employer

Where certain materials or articles from demolitions or alterations are described as to be handed over by the *Contractor* to the Employer, such materials or articles shall be properly stored by the *Contractor* until handing over thereof. The *Contractor* must obtain an official receipt listing the materials or articles and dates of handover. If the *Contractor* fails to submit the receipt when requested to do so, it shall be deemed that the materials or articles are still in his/her possession, and he/she will be held liable to the *Employer* for the full replacement value thereof which amount will be deducted from any monies due to the *Contractor*.

3.5.1.10 Work to existing roofs, eaves, verges and rainwater goods

Existing roof coverings, eaves, verges and rainwater goods must be comprehensively protected against damage. Walking directly on the roof coverings will NOT be allowed. Prices for any work related to existing roof coverings, eaves, verges and rainwater goods shall be deemed to include for protective timber board gangways or similar approved.

3.5.1.11 Form new openings or alter existing openings

Unless otherwise described, the wording "Form new openings" or "Alter existing openings" shall be deemed to include the breaking out of existing brickwork or blockwork, building up of new brickwork or blockwork, casting of new in-situ concrete, pre-stressed pre-cast concrete lintels, formwork, strutting, etc., the building up of reveals or portions of the opening as described with

brickwork or blockwork, toothing and bonding to existing work and making good of existing surfaces on both sides and reveals as described.

3.5.1.12 Building up of openings

Unless otherwise described, the wording "Build up existing openings" shall be deemed to include for preparing of existing surfaces, building up brickwork or blockwork, toothing and bonding to existing brickwork or blockwork, wedging up of existing work and repairing of existing surfaces on both sides as described. With regard to building up of openings in existing walls, cement screeds and paving, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork

3.5.1.13 Make/making good

Make/making good in the price list means to repair existing work damaged or disturbed by alterations and/or removal of existing fixed and/or non-fixed structures with materials to match existing work.

3.5.1.14 Service and repair

The purpose of service and repair an item is to leave such an item in a perfectly working order on completion of the works, therefore the term "service and repair" includes a thorough inspection of the current working order of the item, identifying any defects and defect components, preparation of the affected area before rectifying the defects, rectifying the defects and replacing defect components with new components.

3.5.1.15 Electrical Services

The *Contractor* shall comply with the specification issued by the Electrical/Mechanical Engineer. All services shall be deemed to be live and all necessary provisions shall be made.

3.5.1.16 Trees

No trees shall be removed or damaged, unless otherwise instructed by the Employer. The *Contractor* shall take adequate approved measures to protect all trees, not to be removed.

3.5.1.17 Prices

3.5.1.17.1 Demolitions

Prices for demolitions shall include for the demolition and removal of the defected part of the structures, i.e. roof, walls, windows, doors, floors, ceilings, all installations, fittings, sanitary ware and plumbing, including excavations for and grubbing up and removing all foundations, drainage pipes, etc. and filling in, compacting and levelling.

3.5.1.17.2 Work to existing roofs, eaves, verges and rainwater goods

Prices for the cleaning of the roofs and rainwater goods shall be deemed to include impact resistant transparent hood over high pressure spray, protection to prevent spillage from falling onto the ground when cleaning roof coverings and collection of all residue in drums/skips and disposal thereof.

3.5.1.17.3 Removal of existing doors and windows

Prices for taking out of doors, windows, etc. shall include for removal of all beads, architraves, ironmongery, etc. Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc. and making good floor and wall finishes to match existing.

3.5.1.17.4 Disconnection of geysers, sanitary fittings, taps, etc. from water supply, waste and electrical supply

The rates for disconnection of geysers, sanitary fittings, traps, taps, valves, etc. shall be deemed to include the supply and installation of appropriate fittings/material to end off and/or join the existing water supply, waste and electrical supply.

3.5.1.17.5 Connection of geysers, sanitary fittings, taps, etc. to water supply, waste and electrical supply

The rates for connection of geysers, sanitary fittings, traps, taps, valves, etc. shall be deemed to include the supply and installation of appropriate fittings/material for joining to the existing water supply, waste and electrical supply.

3.6 Earthworks

3.6.1 Nature of ground

The Tenderer shall acquaint him/herself by personal examination of the nature of the ground. Descriptions of excavations shall be deemed to include all ground conditions classifiable as "earth" and where conditions of a more difficult character are indicated these are separately measured. Generally, the nature of the ground is assumed to be gravel, therefore "earth", but possibly interspersed with "soft rock" or "hard rock".

3.6.2 Classification for excavation purposes

Method of classification – The Tenderer may use any method they choose to excavate any class of material, but their chosen method of excavation shall not determine the classification of the excavation. The Employer will decide on the classification of the materials, as reflected in SABS 1200 D-1988 cl 3.1.2.

3.6.3 Carting away of excavated material

Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stockpiles situated on the building site.

The quantities measured in the price list are nett, and do not allow for bulking; therefore the tenderer must make allowance in the pricing of the item for bulking of excavated material.

3.6.4 Filling

Notwithstanding the reference to prescribed multiple handling in the Standard System of Measuring Building Work, latest edition, prices for filling and backfilling shall include for all selection and any necessary multiple handling of material.

All material used as filling and/or backfilling must be free from vegetation, lumps and stones.

The quantities measured in the price list are nett, and do not allow for bulking; therefore the tenderer must make allowance in the pricing of the item for compaction factor of filling.

3.6.5 General

All trenches shall be backfilled with material selected from trench excavations and compacted to a minimum density of 90% Mod AASHTO, unless otherwise specified.

3.7 Concrete, formwork and reinforcement

3.7.1 Concrete

Concrete, formwork and reinforcement to be in accordance with SANS 1200 G. Reinforcement to conform to SANS 920, reinforcement detailing to conform to SANS 10144, and bending dimensions

to conform to SANS 282. Cement to comply with the requirements of SANS 50197-1. Use CEM I 42,5 or higher.

For exposed concrete, and concrete on or below ground, the total alkali content (ie. the product of the Na2O-equivalent of the cement and the cement content of the concrete) must be limited to a maximum of 2,1 kg/m3 of concrete, if such concrete is made with alkali-reactive aggregates.

a. Required minimum characteristic concrete strength at 28 days (unless noted otherwise):
   - Unreinforced concrete (e.g. blinding & strip footings)……..15 MPa/25 Agg.
   - Bases and foundation beams (Non-aggressive soil) ..... 5 MPa/25 Agg.
   - Bases and foundation beams (Aggressive soil)…… .....30 MPa/25 Agg.
   - Concrete surface beds…… .....30 MPa/19 Agg.
   - Columns…… .....30 MPa/19 Agg.
   - Walls…… .....30 MPa/19 Agg.
   - Suspended beams and slabs…… .....30 MPa/19 Agg.
   - No-fines concrete…… ...4,8 MPa/19 Agg.

b. In addition to the above strength requirements, the maximum free water/cement ratio shall, for durability purposes, be subject to the following limits:
   - Very severe exposure conditions (e.g. all elements exposed to seawater, seawater spray, salts, sulphates, chlorides, highly corrosive fumes, etc.)……..……0.43
   - Severe exposure conditions (e.g. all elements exposed to driving rain, alternate wetting and drying, fresh water, salt-laden air, and elements in or on aggressive soil)……..…0.48
   - Moderate exposure conditions (sheltered, buried in non-aggressive soil, etc.):
     Slabs laid on ground…… ……0.53
     All other elements……No limit, ratio based on strength & workability criteria only.
   - Ground slabs to be cast on selected clean cohesionless material, compacted to 100% Modified AASHTO density. Unreinforced slabs to be cast in approximately square panels with maximum side length not exceeding 30 times the slab thickness. All joints to be positioned and formed in accordance with detail drawings.
   - All movement joints to be 10mm wide, formed by gluing an approved closed cell expanded polyethylene joint filler to the 1st cast concrete. Joint sealing to Architect's specifications.
   - All bases are located centrally underneath columns unless otherwise specified.
   - All foundations are to be founded on competent material, and final founding levels are to be determined in consultation with the Project Manager.
   - Provide 50mm unreinforced concrete blinding under all bases, ground beams and pit floor slabs.
   - Minimum concrete cover to any reinforcing bar, including links, to be as tabulated below unless otherwise specified:
   - Concrete in contact with the ground 50mm
   - Slab top surfaces: External 40mm
   - Internal 30mm
   - Slab soffits..... 30mm
   - Beams, columns and walls: External 40mm
   - Internal 30mm
   - Provide all new exposed concrete corners with 25mm x 25mm chamfers, unless otherwise specified by the Project Manager. Where tying in to existing concrete member, chamfers to match unless otherwise specified.
   - Curing and protection of concrete shall be carried out strictly in accordance with Clause 5.5.8 of SANS 1200 G.
   - Shutter removal and propping procedures to be discussed with and approved by the Project Manager.

3.7.2 <u>Concrete: Testing and quality control</u>

- All mix designs to comply with SANS 10100-2:1992 and to be submitted to the Engineer for approval, prior to any concrete being cast.
- Testing of concrete to be in compliance with SANS 1200 G and SANS 10100-2:1992.
- All testing to be carried out by an approved independent laboratory.
- Frequency of testing: At least one sample (a sample being 3 concrete cubes) for 28 day testing shall be taken from each day's casting, and from at least every 50m3 of concrete of each mix design placed per day.
- Initially, for the first 3 pours of every mix design, an additional sample (a sample being 3 concrete cubes) to be taken and tested at 7 days.

- The Contractor may elect to continue taking additional 7 day test cubes for early strength testing, to his account. These shall not be used for assessment of strength as per the above testing procedures.
- A concrete control register to be kept on site recording the following for each cube result:
  a. Unique cube number
  b. Location placed
  c. Concrete mix description and source e.g. Readymix or site batch, to be clearly identified
  d. Date cast
  e. Date tested
  f. Age tested
- All cube test results to be submitted to the Engineer within 1 week of the test date.
- No-fines concrete blocks must be tested to confirm adequate permeability performance.

The costs of making, storing and testing of concrete test cubes as required under clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the Employer. The testing shall be undertaken by an independent firm or institution nominated by the *Contractor* to the approval of the Employer.

3.7.3 Formwork

Description of formwork shall be deemed to include use and waste only (except where described as "left in" or "permanent"), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for reconditioning as necessary before re-use.

The vertical strutting shall be carried down to such construction as is sufficiently strong to afford the required support without damage and shall remain in position until the newly constructed work is able to support itself.

Formwork to sides of bases, pile caps, ground beams, etc. will only be measured where it is prescribed by the Engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in "Earthworks".

Formworks to sides of walls and soffits of slabs shall be deemed to be for walls and slabs not exceeding 250mm thick unless otherwise described.

Shutter removal and propping procedures to be discussed with and approved by the Employer.

3.8 Masonry

3.8.1 General

a) Masonry walls to be constructed in accordance with standards and tolerances of SANS 10164 and SANS 10145.
b) Masonry walls to be constructed using cement complying with the requirements of SANS 50413-1 type MC 5.
c) Masonry walls to be constructed using mortar Class II to SANS 10164 (1 part cement: 1 part lime : 6 parts sand) unless otherwise specified. Mortar testing to be carried out in accordance with Section 6 of SANS 10164.
d) Clay bricks to comply with SANS 227. They should have moisture expansion properties not exceeding Category II limitations and must not be laid earlier than six weeks after removal from the kiln.
e) Concrete masonry units to comply with SANS 1215. These units shall not be wetted prior to laying. All unfinished walls shall be protected against moisture entry during construction interruptions by providing effective covers over the tops of such walls.
f) The Employer may require that samples of masonry units be submitted for laboratory testing in accordance with SANS 10164.
g) Loadbearing walls:
   - Provide a slip layer comprising 1 layer of 3-ply malthoid on a smoothly troweled mortar bedding (with 2 layers of continuous brick reinforcement in the top 2 courses) at the wall/slab interface. This does not apply over reinforced masonry columns, or where specifically indicated otherwise.

- Loadbearing walls must not be chased either vertically or horizontally without the prior approval of the Engineer.

h) Required characteristic compressive strength of loadbearing masonry wall units:
- All foundation walls and loadbearing walls .....14 MPa
- All other walls..... 7 MPa

i) All metal ties/straps, brick reinforcement and closure plates to be galvanized.

j) DPC used in masonry walls to be rough-surfaced, e.g. "Brickgrip" or approved equivalent.

k) Brick reinforcement (2,8mm minimum diameter longitudinal wires):

Install with 250mm minimum lap lengths, properly tied in at corners and wall junctions.

Spacing as follows, unless otherwise specified:
- Walls generally:

TYPE OF MASONRY UNIT	APPROX. COURSE HEIGHT	REINFORCEMENT SPACING
Concrete masonry units	200mm	Every 2nd course
Metric sized units	125mm	Every 3rd course
Imperial sized units	85mm	Every 4th course

- Foundation walls: install in every course.
- Walls with door/window openings: install two layers of continuous brick reinforcement at door/window head and window cill levels.
- Cavity walls with beam filling (supporting trusses/rafters): install continuous brick reinforcement in the two courses immediately below truss/rafter unless otherwise specified.

l) Cavity wall ties:
- Walls generally: 5 No. Per square metre. Install as follows, unless otherwise specified:
  Cavities 75mm or less.....butterfly ties
  Cavities in excess of 75mm .....vertical twist type ties
- At door and window openings: at 150mm from edge of opening, at standard course spacings.

m) Cavity closure plates:
- Provide at the top of loadbearing masonry walls.

n) Hoop iron ties/straps (1,6mm thick x 32mm wide):
Install as shown in detail, 1 per skin, at:
- Junctions of masonry walls and RC columns/walls, unless otherwise specified.
- Junctions of masonry walls and steel columns, unless otherwise specified.
- Movement joints in masonry walls.
  Spacing as follows, unless otherwise specified:

TYPE OF MASONRY UNIT	APPROX. COURSE HEIGHT	SPACING OF TIES
Concrete masonry units	200mm	Every 2nd course
Metric sized units	125mm	Every 3rd course
Imperial sized units	85mm	Every 4th course

- Truss/rafter anchorage: build straps into beam filling for a minimum depth of 600mm unless otherwise specified.

o) Concrete infill in cavity walls (1 part cement: 3 $^{1}/_{3}$ parts sand : 2 parts 9mm stone):
- Foundation/retaining walls: construct walls in increments not exceeding 1 metre in height, and delay concrete infill work until the walls have achieved adequate strength.
- Roof anchorage beam filling: provide a cavity closure plate to allow for a minimum infill depth of 600mm + 1 course, unless otherwise specified.

p) Movement joint former (10mm thick closed cell expanded polyethylene strips, e.g. "Sondor Jointex"):
- At junctions of masonry walls and RC columns/walls, unless otherwise specified.
- At junctions of masonry walls and steel columns, unless otherwise specified.
- At movement joints in masonry walls.

Between top of non-loadbearing walls and soffits of slabs and/or beams over.

3.8.2 Sizes in descriptions

Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick.

3.8.3 Hollow walls, etc.

Descriptions of hollow walls shall be deemed to include leaving every fifth perpend of the bottom course of the external skin open as a weep hole.

3.8.4 Face bricks

Bricks shall be ordered timeously to obtain uniformity in size and colour.

3.8.5 Pointing

Descriptions of recessed pointing to fair face brickwork and face brickwork shall be deemed to include square recessed, hollow recessed, weathered pointing, etc.

3.8.6 Samples

Samples of all masonry building units, except those for walls described as "load bearing", shall consist of a minimum of 6 units. Samples of building units to be used in walls described as "load bearing" shall consist of 30 units from every 30 000 units delivered to site.

3.8.7 Stonework

Granite slabs used in worktops, etc. must be free from cracks and any other defects. Prices for granite tops, shall be deemed to include preparatory work, all labour work, mortices for bolts, hoisting and setting in position and cleaning at completion.

3.9 Waterproofing

3.9.1 Installation / Application of waterproofing products / systems by specialists

Where specified, waterproofing products / systems shall be installed / applied by an installer / applicator approved / accredited as an authorised installer / applicator of the relevant waterproofing product / system by the relevant manufacturer of the waterproofing products.

3.9.2 Transport, store and installation / application of waterproofing products

All waterproofing products shall be transported, stored and installed / applied in accordance with the manufacturer's instructions.

3.9.3 Preparation of substrates and surfaces

Substrates and surfaces must be smooth, clean, free of contaminants and dry. Substrates and surfaces must be prepared in accordance with manufacturer's instructions.

The *Contractor* must allow for the cost of substrate preparation in the rates for Waterproofing items.

PRIOR installation / application of the waterproofing system, the contractor shall obtain written confirmation from the relevant manufacturer that the surfaces / substrate has been prepared in accordance with the manufacturer's instructions.

3.9.4 Inspections and report by manufacturer

The contractor shall arrange with the relevant manufacturer for inspections of the prepared surfaces / substrates, during the installation / application of the waterproofing products / systems and on completion of the waterproofing system.

The contractor shall obtain a written report, for submission to the Employer, from the manufacturer after each inspection. Such report shall at least reflect the date of inspection of the works, work inspected, outcome of inspection and any rectifications to be done.

3.9.5 Combining products of different manufacturers in a single installation / application

The combining of products from different manufacturers in a single installation / application of a waterproofing system shall NOT BE ALLOWED, unless specified in writing by the relevant manufacturer(s), as the guarantee provided by the waterproofing manufacturers may be compromised.

3.9.6 Warranties & Guarantees

Waterproofing of roofs, basements, etc. shall adhere to the required warranties and guarantees specified in the Price List. Waterproofing to roofs shall be laid to even falls, to outlets, etc. with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs.

3.10 Roof coverings

3.10.1 Roof slates, tiles and shingles

Roof tiling must be fitted in accordance with SANS 10062 and comply with local regulations and the manufacturer's instructions, applicable to the locality and roof pitch, with all perimeter tiles mechanically fixed.

Roof tiling must be manufactured in accordance with SANS 542 code of practice, of approved colour, including matching fittings and accessories.

3.10.2 Profiled metal roof sheeting, cladding, linings, etc.

All metal roof sheeting, cladding, linings, etc. must have a minimum 25-year warranty.

Accessories (flashings, etc.) for metal sheet roof coverings, claddings, linings, etc. must be the appropriate accessories designed for and supplied with the specific profiled metal sheets, including the same coating (i.e. Colorbond, etc.)

Please note that the sheeting supplier / installer through the *Contractor* should timeously (before installation) inform the Employer of any aspect of the installation or the environment in which the sheeting is used or the application that could have a negative effect on the warrantees (e.g. bending the sheets, the fixings, etc.).

3.10.3 Profiled fibre cement roof sheeting, cladding, linings, etc.

All work dealing with fibre cement must be executed in accordance with the applicable Regulations.

All cutting or drilling of fibre cement products must be done in an isolated area.

All fibre cement sheets and accessories must have a minimum 5 (year) warranty.

Existing sheets and rainwater goods, eaves and verges must be comprehensively protected against damage. No walking directly on the roof sheets will be allowed and rates for all work must include for protective timber board gangways or similar approved or equivalent products.

3.10.4 Profiled polycarbonate roof sheeting, cladding, linings, etc.

All polycarbonate sheets must have a minimum 25-year warranty against hail and sun damage.

Colour chart as per "Modek"

Colour	% Light transmission	Solar heat gain coefficient
Clear	90	1.00
Diffused Opal	70	0.65
Opal 70%	70	0.60
Opal 50%	50	0.55
Bronze	50	0.75
Green	50	0.60
Blue	40	0.55
Heat stop	35	0.64

UV-protection chart

Category	Description
UV1	UV-protection one side only
UV2	UV-protection both sides

3.10.5 Damage and repairs to services

Should the *Contractor* damage any services which are to remain in operation or any services which have not yet been disconnected prior to removal, then the *Contractor* will be held solely responsible for such damage and any further resultant damage.

The *Contractor* shall immediately notify the Employer and the Authorities concerned and shall at his/her own cost make all necessary arrangements for disconnection and repairs with the relevant Authorities and shall pay all fees and charges levied.

3.10.6 Straight cutting

Descriptions of all roof coverings are deemed to include for all straight cutting.

3.10.7 Inspections and report by manufacturer

The contractor shall arrange with the relevant manufacturer of roof covering and cladding materials for inspections of the existing/new timber/steel purlins, battens, rails, etc. **PRIOR** the installation of the roof covering or cladding to confirm if the size and spacing of the existing/new timber/steel purlins, battens, etc. are in accordance with the manufacturer's instructions, during the installation on completion of the thereof to confirm that the installation was done in accordance with the manufacturer's instructions.

The contractor shall obtain a written report, for submission to the Employer, from the manufacturer after each inspection. Such report shall at least reflect the date of inspection of the works, work inspected, outcome of inspection and any rectifications to be done.

3.10.8 Combining products of different manufacturers in a single installation

The combining of products from different manufacturers in a single installation of a roof covering/cladding system shall NOT BE ALLOWED, unless specified in writing by the relevant manufacturer(s), as the guarantee provided by the roof covering manufacturers may be compromised.

3.10.9 Roof covering replacement

Replacement of roof coverings must be inspected and approved by a registered engineer/technologist prior to any work being executed. Approvals to align with the City of Cape Town By-laws.

3.10.10 Fixing

All roof coverings, claddings, accessories, flashings and the like shall be secured/fixed to timber and/or steel rafters, purlins, rails and the like in accordance with the manufacturer's instructions.

3.10.11 Pricing

Prices of roof coverings, claddings, accessories, flashing and the like shall be deemed to include fixing in accordance with the manufacturer's instructions.

3.11 Carpentry and joinery

3.11.1 Roofs, etc.

3.11.1.1 Timber roof construction: General

- Design of trusses must comply with SANS 10160, SANS 10163, SANS 10243 &
- SANS 1900.
- Handling, erection and bracing of trusses to comply with the standard set down by the Institute for Timber Construction (ITC) and the National Timber Research Institute (NTRI) of the C.S.I.R.
- Structural timber to comply with SANS 1783 and SANS 10149.
- Laminated timber beams to comply with SANS 1460.
- All elements shall be accurately cut and connected. No gap shall be allowed at butt jointed compression members.
- Trusses shall not be supported on inner walls without the Engineer's approval. A gap of 20mm shall be left between the truss bottom chord and inner walls.
- All timber built into brickwork must be wrapped in plastic sheeting or painted with an approved bituminous paint.
- The term "roof construction" refers to all elements used in the construction of a roof, such as roof ties, wall plates, roof trusses, jack rafters, ridge rafters, valley rafters, bracings, purlins/battens, edge purlins/battens, connectors, connection plates, bolts, nails, wire ties wrapped around purlins/battens at intersections with trusses, etc.
- Fascias, barge boards, gutters and eaves closing do not form part of the roof construction and are measured elsewhere in the price list.

3.11.1.2 Timber roof construction: Design and installation responsibility

The *Contractor* shall be responsible for the design of the timber roof construction and the approval thereof by a current registered engineer.
The *Contractor* will submit shop drawings, obtained from the truss fabricator, for information to the *Employer* within two weeks after the date of appointment. These designs must be approved by a current registered Engineer / Technologist, appointed by the Contractor (signed SANS 10400 Form 2 & 4). The *Contractor* shall commence manufacturing only after submission of approved shop drawings to the *Employer*. All timber roof installations must to be inspected during construction and signed off and approved by the registered Engineer / Technologist on completion thereof.

3.11.1.3 Timber roof construction: The following is applicable in respect of on-site and prefabricated timber roof truss construction

Truss and purlin spacing must adhere to the roof covering specifications and engineer's design.

Roof covering, ceilings and eaves closing as specified per project.

The dimensions in the descriptions of the roofs are scaled and are only a broad indication of the scope of the works. The *Contractor* must obtain actual measurements on the site before design or fabrication commences.

3.11.1.4 Site inspection and liaison with main *Contractor*

The truss subcontractor/manufacturer is advised to liaise with the main *Contractor* on site and confirm all the dimensions prior to design, fabrication and installation of the timber roof structures.

3.11.1.5 Prices

Rates for the roof construction must include the design, manufacture, transport and erection/fixing of roof ties, wall plates, roof trusses, jack rafters, ridge rafters, valley rafters, bracings, purlins/battens, edge purlins/battens, connectors, connection plates, bolts, nails, wire ties wrapped around purlins/battens at intersections with trusses, etc.

3.11.2 Decorative thermosetting plastic laminate covering

Laminate covering shall be glued under pressure and edge strips of same shall be butt jointed at junctions with adjacent similar finish.

3.11.3 Sizes

Sizes are nominal and the *Contractor* shall make allowance in his prices for minor variances in stated finished sizes of timber doors, door members, door frames, architraves, etc.

3.11.4 Particle board

Particle board shall comply with the following specifications:

a) SANS 50312-127 Particle board: exterior and flooring type; and
b) SANS 50312-127 Particle board: interior type.

3.11.5 Joinery

Descriptions of frames shall be deemed to include frames, transoms, mullions, rails, etc.

Unless otherwise specified all exposed timber to be planed and sanded smooth and to be in selected hardwood meranti, internal timber ceilings can be SA Pine.

3.11.6 Fixing

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or shot pins to brickwork or concrete.

Descriptions of hardwood joinery shall be deemed to include pelleting of bolt holes.

All sections of timber to be built into brickwork or concrete to be wrapped in 250-micron plastic sheeting and the cost is deemed to be included in the relevant item.

3.11.7 Sealants, etc.

Tenderers should include silicone sealant between skirting and finished surfaces of walls and floors in their price.

3.11.8 Prices

Prices for all joinery work are to include for general framing, housing and notching, arris rounded angles, gluing, blocking, planting on, screwing, adhesives, dowels, pellets, cross tongues, screws

and nails and setting up complete and also for all square cutting and waste. Tops shall be secured with metal or hardwood plugs.

3.12 Ceilings, partitions and access flooring

3.12.1 Descriptions

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete.

Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres, and where described as bolted the bolts have been given.

Boards must be stacked on a level surface in a dry place on a timber platform. Boards must be carried on edge.

Unless otherwise described ceilings shall be deemed to be horizontal.

All steel components for ceilings, partitions, etc. must be galvanized in accordance with SANS 121.

3.12.2 Proprietary suspended ceilings

Electrical light fittings, diffusers, panels, etc. generally are "lay in" units of the same dimensions as the suspension grid described and allowance must be made accordingly for their support inclusive of any flexibility in setting out that may be required (ceiling panels have not been deducted and pricing is to take cognizance thereof).

The ceiling tiles shall be manufactured of gypsum board with a tough washable vinyl finish bonded to the gypsum board. The ceiling tiles shall be non-combustible according to SANS 0400/14990 PAR TT57.2 (National Building Regulations - Non-combustible building material).

The ceiling tiles shall have the following technical data :

- dimensional tolerance : 0-5mm
- a fire index rating of 4 (SABS report no. 653/82916/94C)
- R-value of 0.075 square metre°C/w
- spread of flame : Class 1
- thermal conductivity : (K) 0.17W/mC

All ceiling tiles shall be hold firmly in position with and including hold down clips.

The suspension grid shall be an exposed grid system, comprising of and including main tees and cross tees with capping of aluminium pre-painted low satin sheen, 2.5mm diameter pre-stretched galvanised hanger wires, 19mm steel hanger straps, galvanised wall angles and hold down clips.

The suspended ceiling system shall be installed in accordance with the manufacturer's instructions.

3.13 Floor coverings, wall linings, etc.

All floor coverings, wall linings, etc. must be installed by an installer/contractor approved/accredited as an authorised installer of the specified product by the relevant manufacturer.

All floor coverings, wall linings, etc. must be supplied, stored and installed in accordance with the manufacturer's instructions.

Substrates and surfaces must be smooth, clean, free of contaminants and dry. Substrates and surfaces must be prepared in accordance with manufacturer's instructions. The contractor must

allow for the cost of substrate preparation in the rates for the floor covering, wall lining, etc. items.

PRIOR installation of the specified floor covering, wall lining, etc. the contractor shall obtain written confirmation from the relevant manufacturer that the floor/wall substrates are approved for the installation of the specified floor covering, wall lining, etc.

The contractor shall arrange with the relevant manufacturer for inspections during installation of the floor coverings, wall linings, etc., as well as on completion of the installations.

The contractor shall obtain a written report from the manufacturer after each inspection and submit it to the Employer. Such report shall at least reflect the date of inspection, work inspected, outcome of inspection, any rectifications to be done, etc.

The contract shall submit written confirmation obtained from manufacturers and test results to the Employer as proof that installation requirements have been adhered to.

Moisture barriers and self-levelling screeds are measured under the section "Plastering" in the Price List; therefore all costs related to moisture barriers and self-levelling screeds must be priced under "Plastering"

The floor coverings, wall linings, etc. must be supplied with a written guarantee from the manufacturer.

3.14 Ironmongery

3.14.1 Proprietary items

Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items. Prices must be based on the specific products/articles specified.

3.14.2 Locks

Descriptions of locks shall be deemed to include **two** (2) keys per lock.

3.14.3 Finishes to ironmongery, etc.

Where applicable, finishes to ironmongery are indicated by suffixes in accordance with the following list:

BS - Satin bronze lacquered

CH - Chromium plated

SC - Satin chromium plated

SE - Silver enameled

GE - Grey enameled

AS - Anodised silver

AB - Anodised bronze

AG - Anodised gold

ABL - Anodised black

PB - Polished brass

PL - Polished and lacquered

PT - Epoxy coated

SD – Sanded

All ironmongery is deemed to include fitment of screws that best match the finish of the item specified.

All ironmongery must be fitted as per manufacturer's instruction.

3.15 Structural steelwork

3.15.1 General

All steelwork to be manufactured in accordance with SANS 2001-CS1: 2005.

All relevant dimensions shall be checked by the *Contractor* on site before manufacturing and erection of structural steel commences.

Any discrepancies shall be brought to the attention of the Employer.

Grade of steel:

Unless otherwise specified on the design drawings, the following grades of steel shall be used:

- Hot-rolled sections (other than angles with leg lengths of 50mm or less), plates and tubular sections – S355JR
- Holding down bolts - 300WA minimum
- Cold formed purlins & girts, gutters, downpipes and angles with leg lengths of 50mm or less, and flats of 90mm width or less - Commercial Quality (minimum fy = 200 MPa)

Test certificates of all steel used for the works shall be submitted to the Employer on request.

Anchor bolts to be installed in accordance with the steel manufacturer's approved anchor bolt layout drawing.

Welds shall conform to SANS 10167 (2004) and SANS 10044-1 (2004).

All welding and surface preparation shall be discussed, inspected and approved by the Employer in conjunction with the SANS, or other approved inspection agency.

All fillet welds to be 6mm continuous fillet welds unless otherwise specified (use E7018 welding rods or similar).

All plates to be 6mm thick unless otherwise specified.

Site welding shall not be permitted without the written consent of the Employer.

Descriptions of bolts shall be deemed to include nuts and washers.

Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete.

Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete. Where anchor bolts are described as embedded in sides or soffits of concrete it shall be deemed to include holes through formwork.

All base plates to be caulked with tightly rammed 1: 1 semi-dry sand: cement grout.

Purlins and sheeting rails to be continuous over a minimum of two bays unless otherwise specified.

The sequence of erection of the structure is the responsibility of the *Contractor*. The *Contractor* shall be responsible for and ensure stability of the structure during erection and until all elements have been erected and fixed in position. Where temporary bracing or propping is necessary, the *Contractor* shall be responsible for the design, erection, maintenance and removal (where necessary) of such supports.

A complete set of shop drawings must be submitted to, inspected and approved by the Employer before fabrication commences.

The *Contractor* shall design, where necessary, gussets of sufficient strength and size to obtain the required yield strength.

All structural steel bolts shall be grade 8.8 unless otherwise noted.

All structural steelwork to be fabricated and erected in accordance with SABS 1200H.

Anchor bolts to new concrete shall be cast into. Anchor bolts to existing concrete shall be drilled into existing concrete.

All structural steelwork to be galvanized.

3.15.2 Anti-corrosive treatment

a. Galvanizing

- All hot dip galvanising to be in accordance with SANS 121 (ISO 1461).
- All lipped channels to be hot dip galvanized.
- All gutters to be hot dip galvanized (see below for painting).

b. Painting of raw steel to be in accordance with SANS 1200-HC.

- All steel surfaces to be cleaned of unwanted materials and sand-blasted to Swedish Standard SIS 055900 of 1967 to Sa 2½. Blast profile 40 – 70 Microns.
- Apply a prime coat of zinc phosphate to a minimum dry film thickness (DFT) of 45 Microns.
- Apply a finishing coat of micaceous iron oxide by brush or airless spray to a DFT of 40 Microns.
- Apply a second finishing coat of Enamel by brush or airless spray to a DFT of 35 Microns, to colour as specified by the Employer.
- Erection bolts are to be degreased prior to erection and to be painted to the above specification after erection.
- All damaged paint areas to be touched up to the original specification after completion of erection.

c. Painting of hot dip galvanized gutters (paint only inside of gutters):

- Chemically clean steelwork with Galvanized Iron Cleaner.
- Water rinse and allow to dry.
- Apply two coats of approved bituminous paint to a total DFT of 100 Microns.

  Note: Welding of gutter joints is to be coated with "Zincfix" or other approved coating prior to painting.

d. Painting of hot dip galvanized steel, other than gutters (ISO 9223 exposure Class reference given):

Class C3:

- Chemically clean steelwork with Galvanized Iron Cleaner.
- Water rinse and allow to dry.
- Apply a primer (compatible with zinc) to a DFT of 75-150 Microns within 4 hours of cleaning.
- Apply a finishing coat of acrylic to a DFT of 40-60 Microns, to colour as specified by the Project Manager.

Class C4:

- Chemically clean steelwork with Galvanized Iron Cleaner.
- Water rinse and allow to dry.
- Apply an epoxy primer (compatible with zinc) to a DFT of 50-60 Microns within 4 hours of cleaning.
- Apply a finishing coat of polyurethane to a DFT of 60-90 Microns, to colour as specified by the Project Manager.

Class C5:

- Chemically clean steelwork with Galvanized Iron Cleaner.
- Water rinse and allow to dry.
- Apply an epoxy primer (compatible with zinc) to a DFT of 50-60 Microns within 4 hours of cleaning.
- Apply an intermediate coat of High Build MIO epoxy to a DFT of 100-150 Microns, to colour as specified by the Project Manager.
- Apply a finishing coat of polyurethane to a DFT of 60-90 Microns, to colour as specified by the Project Manager.

  Note: Preparation for a duplex system concerns the preparation of the hot dip galvanized surface suitable to accept the subsequent coatings. Two forms of surface preparation are recommended.

  i) Chemical cleaning with Galvanized Iron Cleaner.
  ii) SWEEP blasting (micro-blast), but not shot blasting.

e. All paint to be sourced from an approved paint manufacturer and to be applied in accordance with the manufacturer's specifications.

3.15.3 Pricing

The rates for structural steel shall be deemed to include for workshop drawings, temporary bracing and struts to improve ease of erection and positioning of any steel members, assembling of various components, transport, storing, erection, hot-dipped galvanizing, etc.

3.16 Metalwork

3.16.1 Descriptions

Descriptions of bolts shall be deemed to include nuts and washers.

Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete.

Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described.

3.16.2 Fixing

Unless otherwise described, descriptions of items shall be deemed to include for fixing to brickwork or concrete. Where items are described as "bolted", the bolts are measured separately in the Price List.

3.16.3 Intersections

All corner and T-intersections must be mitred and welded solid all round.

3.16.4 Welded and hot-dipped galvanized metalwork

Rates for welded and hot-dipped galvanized metalwork must include on-site touch up of on-site welded components with cold galvanizing in accordance with the manufacturers' instructions.

3.17 Plastering

3.17.1 Cement plaster

Unless otherwise described, cement plaster shall mean Class 1 cement plaster as noted in the Model Preambles.

3.17.2 Preparation of surfaces

Surfaces shall be dry and clean, free of dust, sand, grit and flaking particles, laitance and loose matter, contaminants such as oil, grease, etc. Surfaces shall have a moisture content not exceeding 4%. All free-standing water must be removed prior to application of primers or compounds. Absorbent surfaces must be thoroughly pre-soaked in fresh water. Oil, grease, animal fats, etc. must be removed with suitable 'Ivory Chemicals' products applied in accordance with the manufacturer's instructions. Once clean, surfaces must be profiled mechanically (scabbling, blasting, scarifying, chipping or grinding) or by means of acid etching, one part 'Ivory Concrete Etchant' thinned with two parts water applied at the rate of 2m²/1 litre in strict accordance with the manufacturer's instructions.

Generally, substrate surfaces must have good wood float, steel trowel or power floated finishes conforming in evenness and level to required tolerance with minimum compressive strength of 20MPa or above 25 N/mm² compressive strength. Screeded surfaces must be minimum 30mm thick.

Expansion joints in Granolithic screed finish must be approved polysulphide sealant, laid at 5m² apart in accordance with manufacturer's instructions.

Plastering rates must include for a suitable mesh over all chased areas.

3.17.3 Moisture tests

Before any finishes, coverings, etc. are applied to screeds, plastering, etc. or any other in-situ finishes, moisture tests must be carried out to the complete satisfaction of the Employer to ensure that these surfaces have the correct moisture content for the finish to be applied.

3.17.4 Moisture barriers and self-levelling screeds

The moisture barrier, primer, keying agent and self-levelling screed shall be products approved by the manufacturer of the vinyl floor sheeting.

Products from different manufacturers applied in a self-levelling system (moisture barrier to self-levelling screed) shall not be approved.

The moisture barrier, primer, keying agent and self-levelling products to be applied by an installer/contractor approved/accredited as an authorised installer/contractor of these products by the relevant manufacturer.

PRIOR application of the self-levelling screed system (moisture barrier to self-levelling screed) the contractor shall obtain written confirmation from the manufacturer of the self-levelling system products that the existing floor substrate are approved for the specified applications.

The Contractor shall test the moisture content of the existing exposed cementitious floors **PRIOR** application of any moisture barrier and self-levelling screed system.

The contractor shall submit test results and written confirmation obtained from manufacturers to the Employer as proof that installation requirements have been adhered to.

3.17.5 Epoxy and polyurethane floor and wall coatings

The installation/application of epoxy and polyurethane floor systems, including treatment of joints and cracks must be done by companies currently accredited with/approved by the relevant manufacturer/supplier of the product to be installed/applied. The contractor must obtain and submit proof of the installer's current accreditation with/approval by the relevant manufacturer/supplier of the product to be installed/applied.

The Tenderer must liaise with the manufacturer/supplier prior submission of tender to obtain a list of companies currently accredited/approved to install/apply the specified floor systems.

Preparation of the existing exposed concrete surface beds / slabs / cementitious screeds and reparation of cracks and joints in the existing exposed surfaces shall be in accordance with the manufacturer's and/or supplier's instructions.

The contractor shall arrange with the relevant manufacturer and/or supplier for inspections during preparation and application, as well as on completion of application.

The contractor shall obtain a written report from the manufacturer and/or supplier after each inspection and submit it to the Employer. Such report shall at least reflect the date of inspection, work inspected, outcome of inspection, any rectifications to be done, etc.

Combining different product brands in the application of a flooring system shall not be allowed, unless specified in writing by the manufacturer, as the guarantees provided by the manufacturers are compromised.

Contractor to submit a guarantee for a minimum of ten (10) years for the products and installation of the epoxy and polyurethane flooring systems effected from completion date of project

3.17.6 Labours, etc.:

Labours such as fair, rounded and chamfered edges, trowel cuts, throats, V-joints, angles, etc. shall be deemed to be included in the descriptions.

3.18 Tiling

3.18.1 Descriptions

Unless described as "fixed with adhesive to plaster (plaster elsewhere)" descriptions of tiling on brick or concrete walls, columns, etc. shall be deemed to include 1:4 cement plaster backing and descriptions of tiling on concrete floors, etc. shall be deemed to include 1:3 plaster bedding.

Tiling described as "fixed with adhesive on power floated concrete" shall be deemed to include for approved tiling key-coat. Ceramic, porcelain, marble and granite tiles are to be fixed and grouted with suitable adhesives and grouts from the "Tal Professional" ("Ceresit Tylon") range of products or similar approved as recommended by the manufacturer of the tiles.

3.18.2 Preparatory work to existing painted plastered surfaces

Preparation of all existing painted plastered surfaces must include the removing all loose and flaking material by wire brushing, thoroughly washing down and allowing to dry completely and applying one coat masonry bonding agent.

3.19 Plumbing and drainage

3.19.1 Pricing

The plumbing installation shall be undertaken by a Plumbing Industry Registration Board (PIRB) licensed registered plumber.

Allowance shall be made for a plumbing Certificate of Compliance from the plumbing professional body and shall be issued on completion of the works (as and when required).

3.19.2 'Polycop' polypropylene pipes

Polypropylene pipes will **NOT** be allowed.

3.19.3 uPVC pipes and fittings

Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings.

Soil, waste and vent pipes and fittings shall be solvent weld jointed.

3.19.4 uPVC pressure pipes and fittings

Pipes for water supply shall be of the class stated.

Pipes of 40mm diameter and smaller shall be plain ended with solvent welded uPVC loose sockets and fittings.

Pipes of 50mm diameter and greater shall have sockets and spigots with push-in type integral rubber ring joints. Bends shall be uPVC and all other fittings shall be cast iron, all with similar push-in type joints.

3.19.5 Copper pipes

Pipes shall be Class 2 (half-hard) and Class 3 (heavy walled half-hard) pipes. Class 0 (thin-walled hard drawn) and Class 1 (thin-walled half hard) pipes will NOT be allowed.

Class 2 and Class 3 pipes shall only be bent with benders with inner and outer formers.

Fittings to copper waste, vent and anti-syphon pipes, capillary solder fittings and compression fittings shall be "Cobra" or similar approved Capillary solder fittings shall comply with ISO 2016. Only compression fittings shall be used in walls or in ground.

Copper pipes must be installed in accordance with the latest revision of the Code of Practice for Copper Plumbing. All new piping shall be pressure tested to a pressure of 2400kPa for a period of 15 minutes.

3.19.6 Soldering techniques

Hard solder with flux, copper-to-copper to be strictly in accordance with the *Employer* specification.

3.19.7 Wirsbo-PEX pipes

"Wirsbo-Pex" pipes will **NOT** be allowed.

3.19.8 Geberit HDPE pipes

"Geberit" systems must be installed as per "Geberit HDPE - Pipes and fittings for Drainage Installations" (Ref. No. int.e.8262-2002/02) and in accordance with "Geberit HDPE - Application guide Ref. No. int.e.8262-2002/02.

3.19.9 Pex-al-pex and PPR pipes

Refer to Health Technical Memorandum 70.

3.19.10 Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include for fixing to walls, etc. casting in, building in or suspending not exceeding 1m below suspension level.

3.19.11 Reducing fittings

Where fittings have reducing ends or branches, they are described as 'reducing'. In the case of pipes with diameters not exceeding 60mm only the largest end or branch size is given. Should the *Contractor* wish to use other fittings and bushes or reducers he/she may do so on the understanding that no claim in this regard will be entertained. In the case of pipes with diameters exceeding 60mm all sizes are given and no claim for extra bushes, reducers, etc. will be entertained.

3.19.12 Wire gratings

Descriptions of gutter outlets, etc. shall be deemed to include wire balloon gratings.

3.19.13 Exposed concrete surfaces

Exposed surfaces of concrete stormwater channels, cover slabs, inspection eye marker slabs, gulley tops, cleaning eye tops, catch pits, inspection chambers, etc. shall be finished smooth with plaster.

3.19.14 Excavations

No claim for rock excavation will be entertained unless the *Contractor* has timeously notified the *Employer* thereof prior to backfilling.

'Soft rock' and 'hard rock' shall be as defined in 'Earthworks'.

3.19.15 Laying, backfilling, bedding, etc. of pipes

Pipes shall be laid and bedded and trenches shall be carefully backfilled in accordance with manufacturers' instructions.

Where no manufacturers' instructions exist, pipes shall be laid in accordance with clauses 5.1 and 5.2 of each of the following:

SANS 1200 L: Medium pressure pipelines

LD: Sewers

LE: Stormwater drainage

Pipe trenches, etc. shall be backfilled in accordance with clause 3, 5.5, 5.6, 5.7 and 7 of SANS 1200 DB: Earthworks (Pipe trenches).

Pipes shall be bedded in accordance with clauses 3.1 to 3.4.1, 5.1 to 5.3 and 7 of SANS 1200 LB: Bedding (Pipes).

Unless otherwise described, bedding of rigid pipes shall be class B bedding as described in clause 4.2.3.3 of SANS 2001 DP1.

3.19.16 Flush pans

Flush pans shall have straight or side outlets and 'P' or 'S' traps as necessary.

3.19.17 Stainless steel basins, sinks, wash troughs, urinals, etc.

Stainless steel for urinals, basins, quality sinks, wash troughs, institutional equipment, etc. shall be type 304 (18/8) stainless steel for laboratory sinks, photographic equipment, etc. shall be type 316 (18/8). Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable.

3.19.18 Waste unions, taping and wrapping of pipes, etc.

Descriptions of waste unions shall be deemed to include rubber or vulcanite plugs and chains fixed to fittings.

Pipes to be taped shall be coated with the appropriate primer and the tape shall be applied with minimum 15mm lap per spiral unless otherwise described.

Couplings and fittings to pipes shall be taped in strict accordance with the manufacturer's instructions including all mastic, tape, "Layflat" sheeting, securing of same, etc.

Prices for wrapping of pipes shall include for all work as described to couplings in the length.

Dependent on soil or environmental conditions laps may require to be increased to a maximum of 55% (which results in a double layer).

3.19.19 Valves, etc.

Descriptions of valves, etc. shall be deemed to include flanged or screwed connections to piping, reducers, supports, etc.

3.19.20 Sealing of edges

Outer edges of sinks, basins, urinals, etc. are must be sealed against adjacent surfaces with approved silicone.

3.19.21 General

All materials, standards and workmanship shall comply in all respects to the *Employer's* standards and the "General Technical Specification for Plumbing Installations". Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc. and

to steel pipes (adaptors for connections to copper pipes, etc. are given separately). Description of WC pan, slop hoppers, etc. shall be deemed to include for joints to soil pipes (pan connectors are separately measured) and shall have straight or side outlets and "P" or "S" traps as necessary. Description of waste unions shall be deemed to include rubber or vulcanite plugs and chains fixed to fittings.

3.19.22 Pricing

Where inclusive items are measured and priced, the *Contractor* must on request, supply full details of the components and prices making up the inclusive items. If the *Contractor* does not supply such details and prices within fourteen days after having been requested to do so, the *Employer* will determine such at his own discretion.

3.20 Glazing

3.20.1 Float glass

The term "float glass" is used for monolithic annealed glass.

3.20.2 Laminated glass

Laminated glass to have polyvinyl butyral (PVB) interlayer(s).

3.20.3 Certification of specified glass

The contractor shall obtain from the glass manufacturer/ supplier and submit to the Employer a certificate to confirm that the glass installed is of the specified type and thickness.

3.21 Paintwork

3.21.1 Manufacturer's specifications and instructions

All primers, undercoats, finishing coats etc., shall be transported, stored, mixed, applied, etc. in accordance with the manufacturer's specifications and instructions.

Preparation of all existing painted and unpainted surfaces shall be in accordance with the manufacturer's specifications and instructions.

3.21.2 Protection

Rates for painting shall be deemed to include for taking all measures necessary to protect and repair all surfaces i.e. stainless steel push plates to doors, etc. from paint and no claims in this regard will be entertained.

3.21.3 TVOC (Total Volatile Organic Components)

All paint products specified shall have a TVOC of less than 5 grams per liter for deep and deep base (tinted) and less than 16 grams per liter for deep and transparent bases (tinted).

3.21.4 SABS or BSI approved paint products

All paint to be used must either bear the South African Bureau of Standards (SABS) or British Standard Institution (BSI) certification of approval and the tenderer shall be deemed to have allowed for SABS or BSI approved paint products only.

The contractor shall submit proof of SABS or BSI certification of the paint products to be used BEFORE application to the Employer, failing which the contractor will not be remunerated for paintwork.

Mixing of product brands in the application of a paint system shall not be allowed, unless specified in writing by the manufacturer, as the guarantees provided by the paint manufacturers are compromised.

3.21.5 Paint systems

The products (i.e bonding liquids, primers, undercoats and top coats) applied in a single paint system must be of the same paint manufacturer and products applied for surface preparation (i.e cleaners, fillers, thinners, spot primers on existing painted surfaces, etc.) must be as recommended by the particular paint manufacturer.

The Tenderer is advised to obtain assistance from paint manufacturers to make sure that the products priced adhere to the required specifications in the Price List.

3.21.6 Type of paint on previously painted surfaces

Where existing painted surfaces must be painted by a different type of paint, rates shall be deemed to include for the preparation of such surfaces in accordance with manufacturer's instructions to allow existing painted surfaces to receive a new different type of paint (i.e. acrylic PVA on existing enamel painted surfaces).

3.21.7 Thickness of coats applied

The word "coat" in the descriptions of the Price List refers to the dry film thickness (DFT) per coat recommended by the paint manufacturer.

The dry film thickness (DFT) is the thickness, measured in micron, for one coat of dried paint.

The following is the required **minimum** DFT per coat

Item	**DFT** (µm)
Primers	
Alkali resistant plaster primer	45
Mild steel primer	25
Galvanised iron primer	25
Zinc phosphate universal alkyd metal primer	50
Waterborne anti-corrosive red oxide metal primer	50
Strontium chromate epoxy metal primer	20
Undercoats	
Universal undercoat	25
Waterproofing paint	
Acrylic emulsion waterproofing paint	80
Brick and slasto dressing	
Brick dressing	
Bituminous aluminium paint	
Exterior bitumen and alkyd based aluminium paint	20
Top coats	
Exterior acrylic emulsion water-based waterproofing paint	80
Exterior weather resistant acrylic emulsion paint	50
Exterior fungal and weather resistant acrylic emulsion paint	60

Exterior / Interior acrylic emulsion paint	35
Interior acrylic emulsion paint	25
Interior polyurethane alkyd enamel paint	25
Exterior / Interior polyurethane acrylic hybrid paint	30
Interior microbial growth resistant paint with silver technology	30
Water-based acrylic roof paint	35
Exterior / Interior solvent-based high gloss enamel paint	25
Exterior / Interior water-based high gloss enamel paint	27
High gloss stoep enamel paint	30
Exterior wood preservative	20
Exterior water-based deck coating	
Exterior UV-resistant modified alkyd varnish	15
Interior polyurethane varnish	15
Exterior UV-resistant modified alkyd varnish	15

3.21.8 Colours

Paint colours shall be classified in the different colour groups "White", "Pastel", "Deep" and "Transparent" (in accordance with the Natural Colour System (NCS) adopted by the SA National Standards. When staining timber, the resultant colour or shade must be to the complete satisfaction of the Employer before any overcoating or preservative is applied.

3.21.9 Inspections by paint manufacturer

The contractor shall arrange with the relevant manufacturer for inspections on completion of surface preparations (prior application of any paint), during applications and on completion of top (final) coats.

The contractor shall arrange with the relevant manufacturer to measure the dry film thickness (DFT) per coat applied.

The contractor shall obtain a written report from the manufacturer after each inspection and submit it to the Employer. Such report shall at least reflect the date of inspection, work inspected, outcome of inspection, any rectifications to be done, DFT measured, etc.

The contract shall submit written confirmation, obtained from manufacturers and test results to the Employer as proof that installation requirements have been adhered to.

3.21.10 Preparation of previously painted surfaces

3.21.10.1 Existing mould and fungal growth

Remove all mould, mildew, lichen fungus and other fungal growth from surfaces and wash down surfaces to be painted **prior** the application of any primers, undercoats and top coats.

3.21.10.2 Existing iron oxide residue

The iron oxide residue shall be removed shall be thoroughly removed from all surfaces to be painted. Care must be taken not to damage the existing surfaces when removing the iron oxide residue.

3.21.10.3 Previously painted brick surfaces

Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed to bare brick surfaces.

Cracks shall be opened, filled with a suitable filler and finished smooth.

The bare brick surfaces and repaired cracks shall be prepared for and treated with and including one coat brick primer and one universal undercoat.

Rates shall be deemed to include the removal of blistered or peeling paint; opening, filling and finishing smooth of cracks not exceeding 10mm wide, preparation of bare plastered surfaces and repaired cracks and appropriate primers and undercoats.

3.21.10.4 Previously painted plastered surfaces

Surfaces shall be thoroughly washed down, **removing all iron oxide residue** and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed to bare plastered surfaces.

Cracks shall be opened, filled with a suitable filler and finished smooth.

The bare plastered surfaces and repaired cracks shall be prepared for and treated with and including one coat plaster primer and one universal undercoat.

Rates shall be deemed to include the removal of blistered or peeling paint; opening, filling and finishing smooth of cracks not exceeding 10mm wide, preparation of bare plastered surfaces and repaired cracks and appropriate primers and undercoats.

3.21.10.5 Previously painted fibre cement surfaces

Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed and cracks and crevices shall be filled with a suitable filler and finished smooth.

The bare fibre cement surfaces shall be prepared for and treated with and including one coat plaster primer and one universal undercoat.

Rates shall be deemed to include the removal of blistered or peeling paint, filling and finishing smooth of cracks and crevices and the application of the required primers and under coats in these areas.

3.21.10.6 Previously painted uPVC surfaces

Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed.

The bare uPVC surfaces shall be prepared for and treated with and including one coat plaster primer and one universal undercoat.

Rates shall be deemed to include the removal of blistered or peeling paint and the application of the required primers and under coats in these areas.

3.21.10.7 Previously painted metal and cast iron surfaces

Inspect surfaces thoroughly. Use paint remover, scraping or other suitable means to remove all loose and defective paint. All corrosion products must be removed from the bare steel. Rusted areas must be wire-brushed, chipped or sanded until a bright metal condition is achieved. Edges of tightly bonded paint are the be "feathered"

with sand paper to smooth them off and provide an even surface. Clean bare steel patches with a solvent wash (rags dipped in lacquer thinner).

The bare metal surfaces shall be prepared for and treated with and including a anti-rust application, one coat metal primer and one universal undercoat.

Rates shall be deemed to include the removal of blistered, peeling, defective or damaged paint and the application of the required rust removers, anti-rust application, one coat primer and two under coats in these areas.

3.21.10.8 ZINCALUME coated metal surfaces

Inspection and cleaning of existing surfaces are measured in the trade "Alterations", unless otherwise described.

Apply paint system as specified.

Rusted areas shall be prepared for and treated with and including an anti-rust application.

Rates shall be deemed to include the removal of blistered, peeling, defective or damaged paint and the application of the required rust removers and an anti-rust application.

3.21.10.9 CHROMADEK coated metal surfaces

Inspection and cleaning of existing surfaces are measured in the trade "Alterations", unless otherwise described.

Apply paint system as specified.

Rusted areas shall be prepared for and treated with and including an anti-rust application.

Rates shall be deemed to include the removal of blistered, peeling, defective or damaged paint and the application of the required rust removers and an anti-rust application.

3.21.10.10 Previously powder coated aluminium surfaces

Inspect surfaces thoroughly and wash thoroughly with sugar soap solution and soft brush. Rinse thoroughly with clean water. Allow to dray and apply paint system as specified.

Rusted areas shall be prepared for and treated with and including an anti-rust application.

Rates shall be deemed to include the removal of blistered, peeling, defective or damaged paint and the application of the required rust removers and an anti-rust application.

3.21.10.11 Previously varnished wood surfaces

Surfaces shall be thoroughly cleaned down. Blistered or peeling varnish shall be completely removed and cracks and crevices shall be filled with suitable filler and finished smooth.

Rates shall be deemed to include the removal of blistered or peeling paint, opening, filling and finishing smooth of cracks and crevices and the application of the required primers and undercoats in these areas.

3.21.10.12 Previously painted wood surfaces

Surfaces shall be thoroughly cleaned down. Blistered or peeling paint shall be completely removed and cracks and crevices shall be primed, filled with suitable filler and finished smooth.

The bare wood surfaces and repaired cracks and crevices shall be prepared for and treated with and including one coat wood primer and one universal undercoat.

Rates shall be deemed to include the removal of blistered or peeling paint, opening, filling and finishing smooth of cracks and crevices and the application of the required primers and undercoats in these areas.

3.21.10.13 RATES

Rates for paint "**PAINTWORK TO PREVIOUSLY PAINTED SURFACES"** shall be deemed to include for the removal of mould, mildew, lichen fungus and other fungal growth, removal of bee hives, bird's nests, etc., the preparation of the previously painted surfaces in accordance with the aforementioned clauses and manufacturer's instructions as well as the application of any paint strippers, ant-rust applications, primers and undercoats where required before the application of the final coats specified in the relevant items.

Rates for paint "**PAINTWORK TO NEW WORK"** shall be deemed to include for the preparation of the relevant surfaces in accordance with the manufacturer's instructions before the application of the paint system specified in the relevant items.

Rates for paint shall be deemed to include the **CLEANING OF GLASS TO BOTH SIDES OF STEEL AND TIMBER FRAMED WINDOWS** on completion of paintwork.

3.22 Civil works, roads and structural specifications

3.22.1 Standard specifications and preambles

All works to be executed in accordance with SANS 1200 specifications as well as Preambles for Trades, latest edition. For rehabilitation of roads refer to the South African Pavement Engineering Manual as published by SANRAL.

All concrete paving priced in work packages, to comply with the standards set out in SANS 1058:2021 or any updated edition.

3.23 Electrical work

3.23.1 Standard specifications and preambles

For electrical works, refer to the Western Cape Government Transport & Public Works: General Technical Specification for Electrical Installation, Parts A – C and SANS 01042.

3.23.2 Method of measurement and Bills of Quantities:

This price list has been measured according to the Standard System of Measuring Building Work - (latest edition) and billed along the guidelines of ASAQS Model Bills of Quantities. Only measured items must be priced and no changes made by the tenderer will be recognized.

3.23.3 Model preambles for Trades

The General Preambles for Trades (latest edition) as published by the ASAQS shall be deemed to be incorporated in the Price List and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained. The "Supplementary Preambles"

following hereafter are incorporated to satisfy the requirements of the project and shall take precedence (where applicable) over the provisions of the said Model Preambles.

3.23.4 General Requirements

All material, standards and workmanship on this service shall comply in all respects to the *Employer's* standards and the General Technical Specification for Electrical Installations for the Provincial Administration Western Cape.

3.23.5 Standard specifications and preambles

See above

3.23.6 Accreditation, qualifications and work experience required

The electrical installation shall be undertaken by a qualified, licensed and registered electrician.

3.23.6.1 The three categories of a Registered Person shall be:

i. Electrical Tester, who can work on a Single-Phase installation. Basically a 'normal house' supplied with 220 Volt electrical supply.

ii. Installation Electrician who can work on a Three Phase installation. Normally buildings and factories supplied with 380 Volt three phase supply.

iii. Master Electrician for Hazardous Locations, basically petrol stations, mines, flammable areas.

3.23.6.2 Furthermore:

i. An Electrical Tester cannot issue a Certificate of Compliance (CoC) for a Three Phase installation.

ii. An Installation Electrician can issue a CoC for a Single-Phase installation but not a Hazardous Location.

iii. A Master Electrician can issue a CoC for any of the above installations.

3.23.7 Acceptability

All material, plant equipment, accessories and fittings installed or used in the execution of the *service* shall except where otherwise specified or specifically exempted by the *Employer* in writing, be new and shall comply with:

- The Specification.
- The Code of Practice for the Wiring of Premises as issued by the South African Bureau of Standards, as amended, SANS 10142.
- The appropriate South African National Standards.
- The appropriate British Standard, where no SABS specifications exists.
- Occupational Health and Safety Act.
- The requirements of the Local Electricity Supply Authority.
- The Local Fire Regulations and the Regulations of the Department of Posts and Telecommunications.
- The Regulations of the Atomic Energy Board.
- In the event of a discrepancy between any of the specifications, regulations and the Code of Practice, the SANS 10142 Code of Practice shall receive preference.

3.23.8 Everything necessary

The installation shall include everything necessary whether specified in detail or not and shall be carried out in the best possible way to ensure a complete and first class installation to the approval of the *Employer*.

Where required, the *Contractor* shall prepare an updated set of as-built drawings. At completion of the contract the *Contractor* shall hand these drawings to the Employer for reproducing onto the originals for handing over to the *Employer* (provision for allowance of as-built drawings elsewhere).

Allowance shall be made for an Electrical Certificate of Compliance from a qualified, licensed and registered electrician and shall be issued on completion of the works to the Employer's Agent (during work package) for handing over to the *Employer* (as and when required).

3.23.9 Uniformity

All items of the same type of equipment shall where at all possible - be of the same make and type for each item throughout the installation, to ensure interchange ability and ease of maintenance.

3.23.10 *Contractors' Staff*

The work shall be done by, or at all times be under the personal supervision of an installation electrician appointed in writing by the *Contractor* as the Responsible Person, in terms of the requirements of the Machinery and Occupational Safety Act. This person shall be available during working hours and shall be experienced in projects of the size of the service specified.

At all times while on the specified premises, all artisans, labourers and members of the *Contractor*'s staff shall wear clothing adequately marked with the *Contractor*'s name or acceptable identification.

3.23.11 Interrupted Power Supply

If the electrical work consists of additions and alterations to or renovations of an existing electrical installation, the tenderer shall arrange his work in such a manner that a minimum interruption of electrical power to the institution, or part thereof, will occur. The power supply may only be interrupted if such an interruption has been arranged in good time with the head of the relevant institution and the *Employer*.

3.23.12 Cable lengths

Cable lengths where scheduled are for tendering purposes only, any variation between scheduled and actual lengths will be allowed for at scheduled rates.

It is essential that the actual cable lengths required shall be checked on site before orders are placed, as no joints will be permitted. (Except where lengths exceed the drum length).

3.23.13 Labels

All labels shall be permanent, and be of white black, white plastic laminate engraved type and securely fixed by means of metal thread screws and nuts.

3.23.14 Quality control during the execution of the contract

Day by day inspections of the works will be expected to be carried out by the *Contractor* to ensure that all work is executed in accordance with the drawings and specifications. These inspections will be monitored by the *Employer*.

3.23.15 Finishes

All circuits and apparatus on switchboards shall be suitably and correctly labeled.

Covers for draw boxes, expansion boxes, etc. shall be finished to match the paintwork of the ceiling or wall surface, as requested by the *Employer*. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

3.23.16 Making good

The *Contractor* will be responsible for the making good in all trades of any damage to the buildings which he or his employees may have incurred during the construction of the new works.

3.23.17 Conduit

Conduit shall be given in meters, no distinction being made between conduit fixed vertically or horizontally, nor between conduits fixed to different elements, cast in, chased, built-in, etc. Description shall be deemed to include bending, threading, jointing, short lengths, draw boxes, couplings, bends, tees, saddles and the like.

3.23.18 Abbreviations

A	Amp
C/B	Circuit Breaker
DB	Distribution Board
DP	Double Pole
HWC	Hot Water Cylinder
Indus	Industrial
kA	Kilo Ampere
kW	Kilowatt
SDB	Sub Distribution Board
SP	Single Pole
SP + N	Single Pole + Neutral
SSO	Switch Socket Outlet
TP	Triple Pole
V	Volts
W	Watts
Q	Quantity

3.23.19 Distribution boards, etc.

Rates for distribution boards, etc. are to include for busbars, jumpers, neutral bars, internal wiring and connections, circuit identification markers, control gear labels, circuit legend cards and working drawings.

3.23.20 Switches, socket outlets, etc.

Rates for switches, socket outlets, etc. are to include for screwing to outlet boxes, connecting up and cover plates.

3.23.21 Light fittings

Rates for light fitting shall include for fixing or handling, connecting and shall include lamp holders and lamps of the type and wattage described.

3.23.22 Concurrent with Building Work

The electrical work in this service shall be carried out concurrently with the building work. The electrical *Contractor* shall liaise closely with the building *Contractor*.

3.23.23 Handing over existing materials

Where certain materials or articles are described as to be handed over by the *Contractor* to the Employer such materials or articles shall be properly stored by the *Contractor* until handing over thereof. The *Contractor* must obtain an official receipt listing the materials or articles and dates of handover. If the *Contractor* fails to submit the receipt when requested to do so it shall be deemed that the materials or articles are still in his/her possession and he/she will be held liable to the Department for the full replacement value thereof which amount will be deducted from any monies due to the *Contractor*.

3.24 Mechanical work / installation

3.24.1 Standard specifications and preambles

For mechanical works, refer to the:

a) Western Cape Standard Specification for medical gas;
b) Western Cape Provincial Administration: Standard Specification for Airconditioning Installations;
c) General Conditions for the Supply, Delivery, Installation and Commission of Mechanical Equipment.
d) Relevant Technical Memoranda

3.24.2 Method of measurement and Bills of Quantities

This bill has been measured according to the Standard System of Measuring Building Work - (latest edition) and billed along the guidelines of ASAQS Model Bills of Quantities. Only measured items must be priced and no changes made by the tenderer will be recognized.

3.24.3 Ductwork

Where transformations or reducers occur, the larger size ductwork has been measured through the fitting. Descriptions of ductwork shall be deemed to include stiffeners, hangers, jointing materials, sealants, couplers in the running length and access/inspection panels in accordance with the specification.

3.24.4 Dampers

Descriptions of smoke and fire dampers shall be deemed to include fusible links, sleeves, frames, supports and access openings in ducts.

3.24.5 Air Diffusion

Descriptions of air terminals, grilles, louvres and the like shall be deemed to include necks, frames, supports and flexible connections.

3.24.6 Fans

Descriptions of fan assemblies shall be deemed to include supports from the structure, flexible or other connections to ductwork, vibration isolation mountings and airtight inspection doors.

3.24.7 Sound attenuators

Descriptions of sound attenuators shall be deemed to include flanged or flexible connections to ductwork and supports from the structure.

3.24.8 Fan coil units, fan air terminals and fan heaters

Descriptions of fan coil units, fan air terminals and fan heaters shall be deemed to include connection points for water, air and electrical, air grilles, dust trays, condensate trays and vibration isolation mountings. Flexible ducting, flexible hose and connecting cables for connecting these units to each other or to water piping and electrical supply are separately measured.

3.24.9 Major equipment

Descriptions of major equipment such as chillers, air handling units and the like shall be deemed to include control panels, connections to water, air and electrical supply and/or discharge points, supports, bearers, vibration isolation mountings, filters, insulation, inspection ladders and gangways, access doors and panels, painting, etc. as specified.

3.24.10 Piping and pumps

3.24.10.1 Pricing

The plumbing installation shall be undertaken by a PIRB licensed registered plumber.

The tenderer must price each item in this bill individually and no changes made by the tenderer shall be recognized.

Where inclusive items are measured and priced, the *Contractor* must on request, supply full details of the components and prices making up the inclusive items. If the *Contractor* does not supply such details and prices within reply period after having been requested to do so, the Employer will determine such at his own discretion.

Allowance shall be made for a plumbing Certificate of Compliance from the plumbing professional body and shall be issued on completion of the works (as and when required).

3.24.10.2 Piping

All pipe diameters are nominal internal unless otherwise stated where fittings have reducing ends or branches, they are described as "reducing". In the case of pipes with diameters not exceeding 60mm only the largest end or branch size is given. Should the *Contractor* wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained. In the case of pipes with diameters exceeding 60mm all sizes are given and no claim for extra bushes, reducers, etc. will be entertained.

3.24.10.3 Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls, etc., casting in, building in or suspending not exceeding 1m below suspension level.

3.24.10.4 Pump sets

Descriptions of pumps shall be deemed to include connections to water and electrical supply and/or discharge points, vibration isolation mountings, inertia bases, insulation, drip trays with outlets, pressure gauges, etc.

3.24.10.5 Valves

Descriptions of valves shall be deemed to include flanged or screwed connections to piping, reducers, supports, etc.

3.24.10.6 Insulation

Descriptions of insulation shall be deemed to include priming the piping with zinc chromate primer before the insulation is applied, painting the insulation when completed and applying vapour barrier where specified.

3.24.10.7 Drawings

Where required, the *Contractor* shall prepare Workshop Drawings for approval by the Employer before commencement on site.

At completion of the contract the *Contractor* shall hand an updated set of as-built drawings to the Employer's Agent (during work package) for reproducing onto the originals for handing over to the *Employer* (provision for allowance of as-built drawings elsewhere).

Allowance shall be made for a plumbing Certificate of Compliance from the plumbing professional body and shall be issued on completion of the works to the Employer's Agent (during work package) for handing over to the *Employer* (as and when required).

3.24.11 Fire proofing / Fire stopping

3.24.11.1 General

Fire stopping, by a specialist *Contractor*, is required where the 2-hour fire separation cannot be achieved through caulking by the builder using a mortar mixture.

3.24.11.2 General Scope of Work

The scope of work is generally but not limited to the following:

3.24.11.2.1 Fireproof pointing of expansion gaps between the top of the fire rated walls and RC slab over.

3.24.11.2.2 The pointing of any vertical expansion joints in brick fire rated walls and / or between brick and RC columns / walls.

3.24.11.2.3 The fire stopping where structural steel roof members pass through a fire rated wall and the seal cannot be made in mortar to accommodate expansion / construction movement of the steel.

3.24.11.2.4 The fire stopping / pointing of the structural expansion joints in the RC slabs.

3.24.11.2.5 The pointing around any fire dampers that cannot be caulked using a plaster mix. Of specific reference here is the fire stopping along the top side of the damper, especially when it is tight against the RC slab over.

3.24.11.2.6 All structural steel and timber members penetrating a firewall are to be painted with intumescent paint 500mm each side of the penetration according to manufactures specification.

3.24.11.2.7 The fire stopping of all the plumbing shafts between the floors. This shall include the fire treating of the non-metallic pipes above and below the slab plus the fitting of fire collars or wraps to the drain pipes of 80mm diameter and larger.

3.24.11.2.8 The same treatment as above where the plumber's pipes pass horizontally through fire rated walls.

3.24.11.2.9 The fire proofing of insulated pipes (hot water plus chilled water flow and return pipes) passing through floors and fire rated walls.

3.24.11.2.10 The fire stopping of the electrical ducts, be they a set of small sleeves through which the cables pass, slots in the RC slabs or larger

openings in the shafts. Here the conduits or cables need to be further protected for 500mm above and below the slabs.

3.24.11.2.11 The same treatment as above for the horizontal electrical penetrations through fire separating walls.

3.24.11.2.12 The same as above shall take place for electrical cable tray penetrations, horizontal or vertical.

3.24.11.2.13 The fire rating of emergency power cables crossing through the building that do not have the secure power supply protected in any other way.

3.24.11.2.14 The fire proofing of any electrical cable trenches.

- **End of specifications, standards and workmanship**