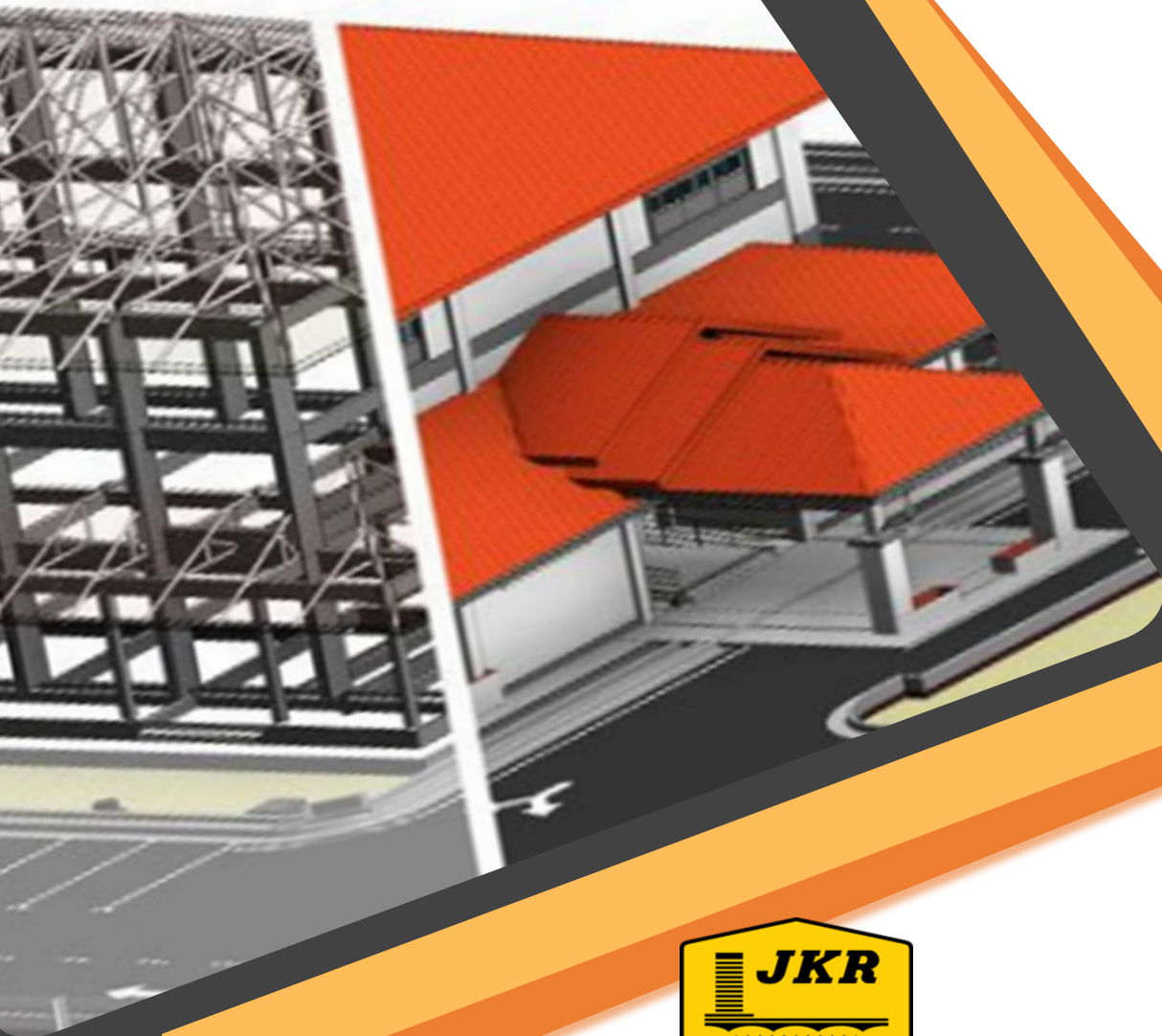


PANDUAN MEASUREMENT AMPLIFICATION AND PRICING FACTORS



**CAWANGAN KONTRAK DAN UKUR BAHAN
IBU PEJABAT JKR MALAYSIA**

PANDUAN MEASUREMENT AMPLIFICATION AND PRICING FACTORS (MAAPF)

**CAWANGAN KONTRAK DAN UKUR BAHAN
EDISI 2024**



**Bahagian Dokumentasi & ICT,
Cawangan Kontrak dan Ukur Bahan
Ibu Pejabat JKR Malaysia
Tingkat 19, Menara Tun Ismail Mohamed Ali,
No. 25, Jalan Raja Laut
50350 Kuala Lumpur**

RUJUKAN

Maklumat Dokumen

Tajuk Dokumen	PANDUAN MEASUREMENT AMPLIFICATION AND PRICING FACTORS (MAAPF)
Pemilik	Pengarah Kanan Cawangan Kontrak dan Ukur Bahan Ibu Pejabat JKR Malaysia

Kawalan Versi

No. Versi	No.Pindaan	Tarikh	Justifikasi
01	00	Mei 2024	Edisi pertama

Butiran Pejabat



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MAAPF CKUB 2024

PENDAHULUAN

1.0 TUJUAN

- 1.1 Panduan *Measurement Amplification and Pricing Factors* (MAAPF) ini adalah sebuah dokumen rujukan yang memperjelaskan kaedah pengukuran bagi penyediaan Senarai Kuantiti dan perkara-perkara yang diambilkira semasa menyediakan kadar harga bagi item kerja berkaitan projek bangunan JKR.
- 1.2 Dokumen ini adalah sebagai panduan dalam penyeragaman kaedah penyediaan Senarai Kuantiti di mana ianya telah diselaraskan dengan *Standard Phraseology* yang telah dibangunkan oleh Cawangan Kontrak dan Ukur Bahan (CKUB) berdasarkan *Malaysia Standard Method of Measurement of Building Works Second Edition (SMM 2)*.

2.0 KAEDAH PENGGUNAAN

- 2.1 Dokumen ini adalah terpakai bagi tender berasaskan senarai kuantiti untuk projek-projek bangunan sahaja.
- 2.2 Panduan MAAPF ini antara lain memperjelaskan penyimpangan daripada kaedah pengukuran piawai yang ditetapkan dalam SMM2. Namun penggunaannya adalah tertakluk sekiranya Senarai Kuantiti tersebut disediakan berdasarkan *Standard Phraseology* yang telah dibangunkan oleh CKUB sebagai templat dalam perisian CostX.
- 2.3 *Preambles to All Trades* yang terkandung dalam dokumen ini hendaklah dibaca bersama dengan keseluruhan Senarai Kuantiti yang telah disediakan. Ianya bertujuan memperjelaskan perkara-perkara yang dianggap termasuk dalam kadar harga yang dihängakan oleh petender bagi item kerja yang berkaitan.
- 2.4 Dokumen ini adalah sebagai panduan sahaja dan pegawai masih perlu membuat semakan dan perlu menyelarasi isi kandungan MAAPF mengikut kaedah pengukuran yang digunakan dalam penyediaan Senarai Kuantiti projek bangunan yang dilaksanakan.

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Bahagian Bangunan Am 1
Bahagian Bangunan Am 2
Bahagian Bangunan Am 2
Bahagian Pendidikan 1
Bahagian Pendidikan 1
Bahagian Pendidikan 2
Bahagian Pendidikan 2
Bahagian Khidmat Kos Dan Inovasi
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Bahagian Keselamatan
Bahagian Pengurusan Portfolio
Bahagian Kontrak Dan Keurusetiaan
Bahagian Kejuruteraan Infrastruktur,
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MEASUREMENT AMPLIFICATION AND PRICING FACTORS (MAAPF)

1.0 PREAMBLE TO ALL TRADES

1.1 GENERALLY

- a) These preambles set out amplifications to methods of measurement, including those contrary to the Standard Method of Measurement of Building Works (Second Edition) (hereinafter referred to as the SMM), together with to be taken into account when pricing. They apply to the whole of the Works regardless of the headings under which they have been described.
- b) The description stated in the Bill of Quantities (hereinafter referred to as the BQ) are not comprehensive. Reference should be made to the latest version of JKR Standard Specification for Building Works and its Amendments in which it occurs and other related JKR Standard Specifications for details of types of material and quality of workmanship; to Part A : Preliminaries and General Conditions for any conditions affecting the whole of the Works and to these Preambles for method of measurement and pricing factors.
- c) The Contractor's rates and prices are deemed to include allowance for compliance with the above-mentioned documents.
- d) The requirements of all items contained in this section shall apply to the whole of the Works regardless of the trade headings under which they have been described and are to be taken into account when pricing these BQ.
- e) The prices entered against the items in the Bills of Quantities shall be the full inclusive values of the finished work shown on the Drawings and/or described or implied in the specifications and/or Bills of Quantities, and shall cover the costs for supply of materials including cutting and waste, unloading, storage, packing, carriage and cartage, hoisting, all labour for plant, supervision, fuel, establishment charges; duties, taxes, profit and any other expenses and everything else indispensable necessary for the due and proper completion of each item and fulfilment of all the Contractor's duties and obligations under the Contract.
- f) The Contractor shall be held to have fully understood all matters concerning the works to be carried out under this Contract. Any query should be settled with the Tendering Office prior to submission of the Tender.
- g) No consideration shall be given to any query raised by the Contractor indicating lack of comprehension of the works to be done or material to be supplied after acceptance of the tender.

1.0 PREAMBLE TO ALL TRADES (CONT'D)

1.2 GENERALLY (CONT'D)

- h) For any BIM project, the information for Area and Volume in the Revit parameters / Object Properties indicates the nett value which includes deductions for all voids/openings regardless of its sizes. These parameters are taken as indicative reference only. For the purpose of BQ preparation, the area and volume for the element(s) shown on the BIM Model /drawings generated from the model, are measured in accordance with the SMM and this MAAPF under its appropriate section.
- i) The term “approved” shall mean granting of approval from the Superintending Officer (S.O.) or its representative.
- j) The term “as specified” shall mean whatever reference in the JKR Standard Specification for Building Works and its Amendments in which it occurs and other related JKR Standard Specifications for the involved works.
- k) Unless otherwise specifically stated in the Bills, the following shall be deemed to be included with all items:
 - i. Labour and all costs in connection therewith, including supervision.
 - ii. Materials, goods and all costs in connection therewith, supply, transporting, delivery, unloading, storing and hoisting, return of packing, carriage and cartage, protection and returning crates, carton, duties levy, taxes and surtaxes.
 - iii. Fabricating, assembling, fitting, fixing and bedding materials and goods in position.
 - iv. Plant, machinery, equipment and all costs in connection therewith.
 - v. Temporary works and everything whether of a temporary or permanent nature.
 - vi. All necessary joints and laps.
 - vii. Preparing surfaces to receive work.
 - viii. Protection, making good and cleaning up.
 - ix. All cutting.
 - x. Waste of materials.
 - xi. Establishment charges, overhead charges and profit.
 - xii. Warranties as specified and/or as required by the S.O.

1.0 PREAMBLE TO ALL TRADES (CONT'D)

1.2 CONSTRUCTION PLANT, EQUIPMENT, VEHICLE AND MACHINERY

- a) The costs of providing constructional plant, equipment and machinery for use directly in connection with the construction and completion of the Works are to be priced in the Preliminaries and General Conditions of these BQ. However, the costs of operating the same are to be included in the prices and rates of the relevant items in the BQ.

1.3 CURVED OR CIRCULAR WORK

- a) Works described in these BQ as curved or circular shall be deemed to include all junctions between straight and curved or circular work.

1.4 NEW AND OLD WORK

- a) Unless otherwise specified, the cost of making good at junction between new and old works shall be included in the prices and rates of the new works.

1.5 WORKS MEASURED AS LUMP SUM ITEMS

- a) Items which are measured contrary to the SMM on a lump sum basis (referred as ITEM in the BQ) are deemed to include all works shown on the drawings and/or as specified in the latest JKR Standard Specification for Building Works and its Amendments and other related JKR Standard Specification including all works deemed necessary for the proper completion of the works. The Contractor is required to measure and ascertain for himself the quantum and extent of works required and allows all costs in connection therewith in the lump sum price.

1.6 PRICING OF BILLS OF QUANTITIES

- a) All items in these Bill of Quantities must be priced by the Contractor. If the Contractor fail to price any item, the value thereof shall be deemed to be included in the prices and rates of other items therein.

2.0 DEMOLITIONS AND ALTERATION

2.1 GENERALLY

- a) Unless otherwise stated, all materials arising from demolition and alteration shall become the property of the Contractor. Clearing away such materials shall be deemed to be included with the item.
- b) Demolitions are to be carried out in such a manner and sequence as to cause the minimum possible disturbance to occupants and including to those parts of the work which are to remain.
- c) The Contractor is responsible for the full protection of those parts of the building/structures which are to remain including the provision of temporary dust proof screens, tarpaulins, dust sheets and the like.
- d) All dimensions of the buildings and other structures to be demolished do not include any additional area required for working space etc.
- e) The rates under this section are deemed to include for:
 - i. Any temporary shoring, needling, strutting, scaffolding, screens and the like and other temporary works.
 - ii. Cleaning and stacking materials which the Contractor may require for making good works.
 - iii. Removing all debris from site.

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3.0 EXCAVATION AND EARTHWORKS

- a) Unless otherwise stated, the Contractor is to ascertain for himself the water levels, trial pits or bore holes, over and underground services.
- b) Unless otherwise stated, excavation shall be deemed to commence at existing ground level.
- c) Excavation for formation level/ platform level is to be measured as bulk excavation regardless of its depth and is given as cut and /or fill.
- d) Definition of rocks, hard materials and unsuitable material are to be based on what have been defined in the JKR Standard Specifications for Building Works.
- e) The measurement of excavation and disposal is measured as nett. No allowance is to be made for any extra space required to accommodate earthwork support, formwork and working space.
- f) The quantities of filling have been measured as equal to the void to be filled and no allowance has been made for any loss in consolidation. Thickness stated is those after compacting. Any extra filling materials required due to consolidation are deemed to be included.
- g) Cutting down trees, removing stumps and grubbing up their roots (irrespective of girth) including clearing of undergrowth, bushes, shrubs, cutting down hedges within such areas and grubbing up their roots shall be measured as an item stating the area (measured flat on plan). The prices shall include their disposal.
- h) The rates for bulk excavation for forming of platform/ formation level shall be deemed to include for :
 - i. Excavating in whatever depth and type of material / ground and strata except in rock as defined in the Standard Specifications for Building Works Specification, met with on the surface of or in the excavations.
 - ii. Excavation below the water table.
 - iii. Getting the material out of the excavations.
 - iv. Levelling bottoms of the excavations from vertical, battering or sloping faces.
 - v. Removing of loose boulders of size not exceeding 0.5m³
 - vi. Removing of hard mass as defined in the Standard Specifications for Building Works Specification.

3.0 EXCAVATION AND EARTHWORKS (CONT'D)

- vii. Upholding and maintaining sides of the excavations by whatever means necessary including the use of bentonite and any special shoring or sheet piling etc., as any be necessary but which do not form a permanent part of the Works to be executed, but excluding any planking and strutting to be left in or any sheet piling etc. which forms a permanent part of the Works to executed.
 - viii. Protection to all services encountered.
 - ix. All tribute, charges, royalties, fee payable to the relevant Local Authority or the Government Department/Agencies for removal of surplus spoil.
 - x. Complying with the S.O.'s instructions issued from time to time to ensure the safety of the excavation and adjoining structure.
 - xi. Reinstatement to original condition of existing ground or surface finish affected by the excavations.
- i) The rates for excavation other than bulk excavation shall be deemed to include for:
- i. Excavating in whatever type of material / ground and strata except in rock as defined in the Standard Specifications for Building Works Specification, met with on the surface of or in the excavations.
 - ii. Excavation below the water table.
 - iii. Getting the material out of the excavations.
 - iv. Levelling bottoms of the excavations from vertical, battering or sloping faces.
 - v. Removing of loose boulders of size not exceeding 0.5m³
 - vi. Removing of hard mass as defined in the Standard Specifications for Building Works Specification
 - vii. Upholding and maintaining sides of the excavations by whatever means necessary including the use of bentonite and any special shoring or sheet piling etc., as any be necessary but which do not form a permanent part of the Works to be executed, but excluding any planking and strutting to be left in or any sheet piling etc. which forms a permanent part of the Works to executed.
 - viii. Backfilling of selected excavated materials into the excavations and compacting the same methods and in the manners as specified in the Standard Specifications for Building Works.
 - ix. Disposal of surplus excavated materials.
 - x. Multiple handling and transporting about the sites.

3.0 EXCAVATION AND EARTHWORKS (CONT'D)

- xi. Deposit, spread and level in making up levels of surplus excavated materials within the site.
 - xii. Protection to all services encountered.
 - xiii. All tribute, charges, royalties, fee payable to the relevant Local Authority or the Government Department/Agencies for removal of surplus spoil.
 - xiv. Complying with the S.O's instructions issued from time to time to ensure the safety of the excavation and adjoining structure.
 - xv. Reinstatement to original condition of existing ground or surface finish affected by the excavations.
- j) Prices and rates for earth, sand, quarry dust and the like material in fillings, beds, and blinding, etc. shall include for leveling surfaces of the same on grading surfaces of the same to falls or cambers, trimming sides of the same to form vertical battering or sloping surfaces, and any temporary retaining boards as may be required.
- k) Prices and rates for hardcore, crusher run and the like material in fillings and beds etc. shall include for handpacking the same to form vertical, battering or sloping surface, and any temporary retaining boards as may be required.
- l) Prices and rates for hardcore, crusher run and the like material in fillings and beds etc. to receive concrete or pavings shall include for blinding the same with sand or quarry dust and levelling surfaces of the same or grading surfaces of the same to falls or cambers.
- m) Prices for filling shall be deemed to include for :
- i. Settlement or displacement of fill over soft areas.
 - ii. Levelling surfaces of the platform and forming necessary slopes.
 - iii. Keeping the platforms and slopes free from all sort of water, mud or damage by pumping, bailing or whatever other means necessary and providing temporary drains.
 - iv. Multiple handling and transporting about the sites.

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4.0 PILING WORKS

4.1 GENERALLY

- a) Prices and rates for piling shall be deemed to include for works in whatever nature of site, water levels and soil strata through which the pile are to be driven or bored and any excavation required for working space.
- b) Unless otherwise stated, the piling works shall commence from platform/formation level.
- c) The rates shall include submission of reports, records and other documentation as specified and duly endorsed by the Certified Land Surveyor and/or Professional Engineer with Practicing Certificate (PEPC).

4.2 PRE-FORMED (PRECAST) CONCRETE PILES

- a) The rates for piles and piling are deemed to include for :
 - i. All labour and materials for complete pile installation inclusive of wastage.
 - ii. All necessary excavation works incidental to piling.
 - iii. Driving piles singly or in cluster.
 - iv. Re-driving of upheaved pile (if any).
 - v. Replacement of damaged pile and any pile which failed under tests.
 - vi. Filling up with approved fill materials any gap appearing between pile and ground due to displacement of ground on completion of piling.
 - vii. Normal wet weather delays.
 - viii. Standing time for equipment and labour due to all the foregoing circumstances.
- b) The prices for driving shall be deemed to include for :
 - i. Redriving of heaved piles.
 - ii. Marking the piles.
 - iii. Keeping and monitoring logs.
- c) Breaking pile head is deemed to include cutting, trimming, stripping, dressing for key, straightening and bending bars as necessary for pile cap connection and dispose surplus pile of varying length off site.

4.0 PILING WORKS (CONT'D)

4.3 BORED CAST IN PLACE CONCRETE PILES

- a) Removal of excavated materials arising from boring including surplus piles arising from piling operations shall be deemed to be included with the piling item.
- b) The rates for piles and piling are deemed to include for :
 - i. All labour and materials for complete pile installation inclusive of wastage.
 - ii. All necessary excavation works incidental to piling.
 - iii. Installing, coring, boring and all necessary works in all soil (excluding rock) to the given level including all labour, equipment, plant and tools.
 - iv. Temporary casing or lining, and its subsequent removal.
 - v. Empty bores and filling empty bores with sand or other suitable materials.
 - vi. Providing pile shoes or formation of enlarged bases.
 - vii. Normal wet weather delays
Standing time for equipment and labour due to all the foregoing circumstances.
 - viii. Breaking pile head is deemed to include cutting, trimming, stripping, dressing for key, straightening and bending bars as necessary for pile cap connection and dispose surplus pile of varying length off site.
 - ix. Staging and platform for the installation of piles on embankments and slopes.
- c) Piles shall be measured and paid for by linear metres measured from the tip of the shoe to the cut-off level of the piles. Fractions of a metre shall be measured to the nearest metre.

4.4 INTERLOCKING STEEL SHEET PILE

- a) Only steel sheet piling which form a permanent part of the works is allowed in this Bill of Quantities. The cost of providing steel sheet piling which do not form a permanent part of the work is deemed to be included in the prices and rates of the permanent part of the works for which the use of sheet piling is necessary.
- b) Piles supplied and delivered to site for the purposes of the work but which are subsequently not pitched and driven, shall not be paid.
- c) Prices and rates for supplying of the steel sheet piling shall be deemed to include for extra material at laps, welding along interlocks and coating with approved anti-rust paint.

4.0 PILING WORKS (CONT'D)

4.4 INTERLOCKING STEEL SHEET PILE (CONT'D)

- d) Unless otherwise stated, driving of piles is to be the length of piles measured from the shoe point of the pile when pitched to the shoe point when driven.
- e) The rates for piles and piling are deemed to include for :
 - i. All labour and materials for complete pile installation inclusive of wastage.
 - ii. All necessary excavation works incidental to piling.
 - iii. Driving piles singly or in cluster.
 - iv. Re-driving of upheaved pile (if any).
 - v. Replacement of damaged pile and any pile which failed under tests.
 - vi. Filling up with approved fill materials any gap appearing between pile and ground due to displacement of ground on completion of piling.
 - vii. Normal wet weather delays.
 - viii. Standing time for equipment and labour due to all the foregoing circumstances.
- f) The prices for handling, transporting, pitching and driving shall be deemed to include for :
 - i. Moving of pile frame about the site.
 - ii. Extra excavation, earth filling and ramming entailed in the movement/positioning of the pile frames.
 - iii. Handling, transporting, pitching and driving of initial or extension piles irrespective of lengths.
 - iv. Shaping of one end of initial pile (if any).
 - v. Preparing pile head and fitting the same with protective strap/helmet.
 - vi. Redriving of upheaved piles.
 - vii. Marking the piles.
 - viii. Keeping and monitoring logs.

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5.0 CONCRETE WORK

5.1 CONCRETE

a) The rates for concrete are deemed to include for:

- i. Providing preliminary trial mixes, tests on cement, aggregate, water and mixed concrete as specified.
- ii. Hoisting or pumping and placing in position.
- iii. Tamping and/or vibrating to give through compaction
- iv. Working between and around reinforcement.
- v. Laying on any type of sub-base and for preparing and leaving surfaces to receive structural toppings, screeds, pavings, rendering and the like.
- vi. Laying in bays including all labour associated with projecting reinforcement and all necessary formwork.
- vii. All construction joints to the S.O.'s approval.
- viii. Curing of concrete.
- ix. Continuous daily pours of large quantities
- x. Forming and cutting and subsequent making good of grooves, chases, rebates and the like; mortices, holes and the like; and opening in walls, floors, roof slabs and the like.

5.2 REINFORCEMENT

- a) All mild steel and high tensile steel bar reinforcement shall be in lengths not exceeding 12 metres unless otherwise stated.
- b) No allowance has been made for the weights of steel reinforcement for tying wire, chairs, spacers, weld metal and the like and rolling margin.
- c) The rates for bar reinforcement are deemed to include for:
 - i. Allowance for rolling margin and weight of welds.
 - ii. Cutting to lengths.
 - iii. Hooked ends and bends including to large radius.
 - iv. Brushing and cleaning.
 - v. Placing in position prior to casting.
 - vi. Providing and fixing annealed tying wire, spacer bar, chairs and distance blocks.
- d) Fabric reinforcement is to be measured as the area covered. No allowance is made for laps.

5.0 CONCRETE WORK (CONT'D)

5.2 REINFORCEMENT (CONT'D)

e) The rates for fabric reinforcement are deemed to include for:

- i. Providing and fixing annealed tying wire, spacer bar, chairs and distance blocks.
- ii. Brushing, cleaning and fixing in position.
- iii. Temporary strutting (where exceeding 3.5m high)
- iv. Raking cutting and curved cutting.
- v. Bending fabric reinforcement and notching around obstructions.

f) The rates for fabric reinforcement are deemed to include for:

- i. Providing and fixing annealed tying wire, spacer bar, chairs and distance blocks.
- ii. Brushing, cleaning and fixing in position.
- iii. Temporary strutting (where exceeding 3.5m high)
- iv. Raking cutting and curved cutting.
- v. Bending fabric reinforcement and notching around obstructions.

5.3 FORMWORK

a) The rates for formwork are deemed to include for:

- i. Splayed edges.
- ii. Notching.
- iii. Allowance for laps and passing angles.
- iv. Battens.
- v. Strutting at any height when required to vertical surfaces and horizontal surfaces.
- vi. Bolting, wedging, easing, striking and removing.
- vii. Oiling or lime washing surfaces in contact with concrete
- viii. All works involved for producing fair faced concrete finish as specified.

b) Rates for formwork to pre-stressed concrete shall include for all temporary boxings, forming recesses for anchorages and temporary construction joints and temporary restraints.

5.0 CONCRETE WORK (CONT'D)

5.4 PRECAST CONCRETE

a) The rates for precast concrete are deemed to include for:

- i. All necessary moulds, rebates, notchings, mortices, fixing accessories and the like.
- ii. Finished fair on all faces.
- iii. Hoisting, centering and temporary supports irrespective of heights.
- iv. Bedding, jointing and pointing in waterproofed or mortar as specified.
- v. Lining the moulds with specified materials to produce fair face finished.
- vi. For precast concrete kerbs, channels etc., shall include for all angles, stop ends.
- vii. All assembly drawing produced by the manufacturer and verified by the PEPC to the S.O.

5.5 PRESTRESSED CONCRETE

a) The rates are deemed to include for:

- i. Providing, assembling, moving about the site and subsequently removing all necessary tensioning equipment, plant, tools and the like, including spare/standby units.
- ii. Submitting of method statements with calculations, preliminary drawings, specifications, shop drawings, manufacturer's mills certificate, related test certificates, laboratory test result and reports and other documents as required by the S.O.
- iii. Provision of jacks and other stressing equipment and cutting ends of tendons at both ends and extra material and waste, live and dead-end anchorage assemblies.
- iv. Filling jacking or anchor recess and shear keys with grout as specified including all necessary formwork to contain the grout.
- v. Providing suitable finish to exposed surfaces.
- vi. Degreasing, straightening, cutting to lengths.
- vii. Assembling, hoisting and fixing.
- viii. All extra materials such as cones, wedges, anchor plates, spacers including for curved sections and the like.
- ix. Identification marking to each cable.
- x. All testing and records as specified.
- xi. Any other equipment, material, tools required but not specifically mentioned above for the proper execution and completion of the works.

6.0 BRICKWORK AND BLOCKWORK

- a) No deduction is made for lintols and stiffeners for the measurement of wall.
- b) No allowance is made for laps for damp proof courses.
- c) The rates under this section are deemed to include for:
 - i. All rough and fair cutting.
 - ii. Oversailing and receding courses.
 - iii. Rough relieving and discharging courses.
 - iv. Wedging and pinning.
 - v. Raking out joints for flashings, roof coverings etc. and pointing with mortar.
 - vi. Bedding plates.
 - vii. Bedding and pointing frames.
 - viii. Parging and coring flues.
 - ix. Labour eaves filing.
 - x. Plumbing.
 - xi. Angles.
 - xii. Forming square and rebated reveals, cut squints or birdmouths and notches.
 - xiii. Forming, leaving or cutting chases, holes and mortices.
 - xiv. Cutting and pinning and/or building in.
 - xv. All making good.
 - xvi. Forming laps ends, angles for damp proof course.
 - xvii. Brick reinforcement at every fourth course (for half brick) and two courses for block walling.
 - xviii. Mild steel bonding ties hook.
 - xix. Sundry items of a like nature.
 - xx. Protection and cleaning up upon completion.
- d) Unless otherwise stated, cavity walls are measured in square metres. The description shall consist of the skin of hollow walls and forming the cavity in hollow walls which shall include closing cavities at ends of walls, at jambs or sills of opening and the like. The rates are to include the skin of hollow walls, forming cavity, cavity insulation, wall-ties, closing cavity at ends or openings, damp proof courses including ends, angles and intersections, weep and spout pipe (if applicable).
- e) Unless otherwise stated, precast concrete vent block and Concrete Masonry Units (CMU) are measured in square metre.
- f) Unless otherwise stated, centring are measured in numbers and the rates are to include raking cutting, curved cutting, scribed edges, splayed edges, notching centring for key blocks, strutting, shoring, bolting, wedging, easing, striking and removing.

7.0 MASONRY

a) The rates are deemed to include for:

- i. All rough and fair cutting.
- ii. Wedging and pinning.
- iii. Forming grooves or raking out for flashings, roof coverings etc. And pointing with mortar.
- iv. Bedding plates.
- v. Bedding and pointing frames.
- vi. Parging and coring flues.
- vii. Labour eaves filling
- viii. Salient angles, squints, quoins, birdsmouths, splays and rounded angles.
- ix. Forming reveals.
- x. Forming, leaving or cutting chases, holes and mortices.
- xi. Cutting and pinning.
- xii. All making good.
- xiii. Sundry items of a like nature.
- xiv. Protection and cleaning up upon completion.

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8.0 WATERPROOFING AND ASPHALT WORK

8.1 GENERALLY

- a) Works for waterproofing and asphalt work shall be classified in accordance with the kind of materials and method used.
- b) Unless otherwise stated, waterproofing system and covering is measured as the area in contact with the base and is measured flat in square metre irrespective of the width.
- c) Unless otherwise stated, no allowance is made for upturns, skirting and the likes for the area measured.
- d) The rates are deemed to include :
 - i. Cleaning surfaces and forming key on screeded surfaces.
 - ii. Laying to falls and/or currents.
 - iii. Laps.
 - iv. Sealing tapes and adhesive.
 - v. Square cutting, raking cutting, curved cutting, fair edges, turning into grooves, wedging and the like.
 - vi. Notching, bending, trimming and jointing to flashings and the like.
 - vii. Fair edges, rounded edges, drips and arris.
 - viii. Turning nibs of waterproofing into grooves.
 - ix. Working and forming collars around column, pipes, into outlet pipes, dishing to gullies and the like.
 - x. Cutting to line for jointing new to existing /jointing between sections.
 - xi. Working to metal or other hashing against frames of manhole-covers, duct-covers, mat-sinking and the like.
 - xii. Work and labours carried out over hand or in confined situations and narrow width.
 - xiii. Lining to gutters and valleys and the like.
 - xiv. Wastage.
 - xv. Guarantee and warranty
 - xvi. Protection, making good and cleaning up upon completion.

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9.0 ROOFING

9.1 GENERALLY

- a) Slate or tile roofing, corrugated or troughed roofing and roof decking are to be measured as the area finished surface covered.
- b) Felt, membranes and laminated sheet coverings to roofing are measured as the area in contact with the base.
- c) Rates for skirting, coverings to kerbs etc. shall include for all angles, fair ends and any other sundry items of a like nature.
- d) Rates for linings to gutters shall include for all angles, ends, outlets and any other sundry items of a like.

9.2 SLATE ROOFING AND TILE ROOFING

- a) The rates are deemed to include:
 - i. Laps.
 - ii. All straight, skew and circular cutting at eaves, verges, top edged, abutments, valleys, hips and the like.
 - iii. Holes for pipes, standard and the like.
 - iv. Nails, screws, clips, pellets, straps and the like.
 - v. Bedding, pointing, verge clipping and finishing with mortar.
 - vi. Plant, labour, equipment, scaffoldings, tools, appliances, materials and waste.
 - vii. Protection and cleaning up upon completion.
 - viii. One and half width slates or tiles wherever they occur.

9.3 METAL ROOF COVERING / METAL DECKING / PROFILED DECKING

- a) The rates are deemed to include:
 - i. Laps.
 - ii. All straight, skew and circular cutting at eaves, verges, top edged, abutments, valleys, hips and the like.
 - iii. Holes for pipes, standard and the like.
 - iv. Nails, screws, clips, pellets, straps and the like.
 - v. Bedding, pointing, verge clipping and finishing with mortar.
 - vi. Plant, labour, equipment, scaffoldings, tools, appliances, materials and waste.
 - vii. Ridge cappings, hip cappings, valleys, verges, verge cappings, hip ends cappings, vent cappings.
 - viii. Protection and cleaning up upon completion.

9.0 ROOFING (CONT'D)

9.4 INSULATION

a) The rates are deemed to include :

- i. Laps.
- ii. All straight, skew and circular cutting at eaves, verges, top edged, abutments, valleys, hips and the like.
- iii. Holes for pipes, standard and the like.
- iv. Plant, labour, equipment, scaffoldings, tools, appliances, materials and waste.

9.4 FLASHING, GUTTERS, VALLEYS AND KERBS

a) The rates are deemed to include:

- i. Laps.
- ii. All straight, skew and circular cutting at eaves, verges, top edged, abutments, valleys, hips and the like.
- iii. Holes for pipes, standard and the like.
- iv. Stepped, raking cutting, curved cutting, fair edges, turning into grooves, wedging, ends, angles and intersections.
- v. Plant, labour, equipment, tools, appliances, materials and waste.

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11.0 WOODWORK

11.1 GENERALLY

- a) All carpentry and joinery work shall include all necessary ends, angles, notching, halving, morticing and tenoning, wedging, scarfing, dovetailing, sinking for heads of bolts and nuts and trimming for opening.
- b) All carpentry work shall be deemed to be left with a sawn surface unless particularly described to be wrot.
- c) All items shall be deemed to be fixed with gang nails/screws/bolts and the likes.
- d) Unless otherwise stated on the drawings, all sizes of timber shall be the finished sizes. The sizes for carpentry and joinery shall be within the tolerance as specified in the JKR Standard Specification for Building Works and its Amendments in which it occurs.
- e) The rates are deemed to include :
 - i. Short lengths.
 - ii. Cutting, notching, boring, sinking, pelleting, fitting, trimming, mitering, halving, morticing, tenoning, scarfing and wedging.
 - iii. All ends.
 - iv. Splayed edges.
 - v. Temporary supports.
 - vi. Fixing with gang nails/screws/bolts and the likes.
 - vii. Sundry items of a like nature.
 - viii. Labours required in which they occurred.
 - ix. Cutting and wastage.

11.2 PREFABRICATED TIMBER ROOF TRUSS SYSTEM

- a) Unless otherwise stated, the roof truss system is described as an item and measured flat on plan.
- b) The rates are deemed to include for:
 - i. Design, fabricating and delivery to site.
 - ii. All necessary materials, tools, hoist, staging, temporary bracing etc.
 - iii. All ends.
 - iv. Splayed edges.
 - v. Temporary supports.
 - vi. Fixing with gang nails/screws/bolts and the likes.
 - vii. Sundry items of a like nature.
 - viii. Labours

12.0 STRUCTURAL STEELWORKS

- a) Unless otherwise stated, all steelwork are subject to fabrication processes including steelwork components to be assembled on site.
- b) Unless otherwise stated, no distinction is made between single members and built-up members.
- c) Length of members is measured as overall lengths with no deduction for splay cut or mitred ends.
- d) No allowance has been made in measurement for:
 - i. The weight of steel for rolling margin.
 - ii. The mass of welds, bolts, nuts, washers, rivets and protective coating
- e) The mass of framing is deemed to include all components including all necessary fittings, connections, fixing and anchorages.
- f) Unless otherwise specified, the weight per cubic metre for mild steel shall be assumed for the purposes of calculation to be 7.85 tonnes per m³.
- g) All works related to the structural steelwork has been described in the Notes and at the Heading and measured in tonnes.
- h) The rates for all structural steelwork are deemed to include for:
 - i. Rolling margin and weight of weld metal.
 - ii. Welding materials.
 - iii. Fittings, connections, fixing and anchorages.
 - iv. Wastage.
 - v. All straight, raking, bevel and splayed cutting and notching.
 - vi. All shop drilling holes and openings off-site or on-site,
 - vii. Packing, marking, supply, unloading, handling, stacking, hoisting, erecting and the like including temporary braces and support.
 - viii. Setting out and levelling.
 - ix. All testing as specified.
 - x. Preparation of work for protective coating as specified including priming with appropriate primer coating as specified before delivery and after erection.
 - xi. Painting in which to include painting to the necessary fittings.

13.0 METALWORK

13.1 GENERALLY

a) The rates for metalworks are deemed to include for:

- i. Rolling margin and weight of weld metal.
- ii. All straight, raking, bevel and splay cut and notches.
- iii. Drilling, holes and openings.
- iv. Marking, hoisting, erecting and all necessary supports.
- v. Welding.
- vi. Making good parts.
- vii. All necessary accessories, fixing cramps, dowel, etc.
- viii. Sealants and grouting to fill up voids and gaps.

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14.0 PLUMBING AND MECHANICAL ENGINEERING INSTALLATION

14.1 GENERALLY

- a) The rates for pipework are deemed to include for :
 - i. Cutting to lengths, all short lengths and joints in the running length and joints to all bends, junctions, tees and other pipe fittings and accessories.
 - ii. all cutting to form holes and chases in brickwork, blockwork, concrete, etc. and for all making good for the work disturbed.
 - iii. All expansion joints which are not shown on the drawings.
 - iv. Bracket, supports and the like.
 - v. Fixing, anchorages and the like.
 - vi. All necessary fittings (bends, elbows, branches, tees, caps and the like including reducers).
 - vii. Connections between pipes works of different materials, grades.
 - viii. Insulation to pipework including its necessary fittings and working around.
 - ix. Painting to pipes and fittings.
 - x. Sleeves and the like for pipes passing through structural framing, wall, roofs etc.
 - xi. All testing as specified.
 - xii. Making good all connection.
 - xiii. The appointment of Qualified Personnel certified by SPAN to carry out works strictly in accordance to appropriate by-laws, technical guides and requirements of relevant authorities

- c) Unless otherwise stated, Internal Cold/Hot Water System includes works and items from and including first stopcock from mains incoming to water storage tanks and first stopcock from water storage tanks to sanitary appliances and scour and overflow pipes from water storage tanks. The rates for items covered under this Heading shall include the appointment of Qualified Personnel certified by SPAN to carry out works strictly in accordance to appropriate by-laws, technical guides and requirements of relevant authorities.

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14.0 PLUMBING AND MECHANICAL ENGINEERING INSTALLATION (CONT'D)

14.1 GENERALLY (CONT'D)

d) The rates for sanitary fittings are deemed to include for:

- i. Rolling margin and weight of weld metal.
- ii. Welding materials.
- iii. Fittings, connections, fixing and anchorages.
- iv. Wastage.
- v. All straight, raking, bevel and splayed cutting and notching.
- vi. All shop drilling holes and openings off-site or on-site,
- vii. Packing, marking, supply, unloading, handling, stacking, hoisting, erecting and the like including temporary braces and support.
- viii. Setting out and levelling.
- ix. All testing as specified.
- x. Preparation of work for protective coating as specified including priming with appropriate primer coating as specified before delivery and after installation.
- xi. Painting as specified.
- xii. All necessary fixing and making good all connections

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15.0 FLOOR, WALL AND CEILING FINISHES

15.1 GENERALLY

- a) Work is measured as area in contact with the base and is given in square metres.
- b) The rates for each item of finishes are deemed to include:
 - i. Protection of surfaces from weather and damage.
 - ii. Hacking or slurring sub-base to form key.
 - iii. Wetting surfaces or soaking before laying.
 - iv. Narrow widths and small quantities.
 - v. Temporary rules, temporary screeds, temporary support and template.
 - vi. Joints between new and old including treatment of joints.
 - vii. Nature of surface treatment.
 - viii. Arrises, quirks, groin points and other intersections of curved surfaces.
 - ix. Rounded coves and internal and external angles and mitres, stops, ends etc.
 - x. On cornices, mouldings, enrichments, coves, skirtings, gutters and strings.
 - xi. All making good.
 - xii. Any other sundry items of a like nature.

15.3 IN-SITU FINISHINGS

- a) Work to floor shall be classified in accordance with clause S.6.1. but no distinction is made to work to floors :
 - i. In boiler rooms, machine rooms and similar locations where the surfaces are interrupted by seatings, channels, ducts and the like.
 - ii. Laid in bays.
 - iii. Laid in one operation with the base.

15.4 TILE, SLAB AND BLOCK FINISHING

- a) Rates for each item of tile, slab and block finishing are deemed to include :
 - i. Temporary moulds for precast tile, slabs and block units.
 - ii. All cutting to angles, boundaries and junctions.
 - iii. Rounded edges for projecting tile, slab, block units.
 - iv. Protecting , cleaning off and polishing on completion.

15.0 FLOOR, WALL AND CEILING FINISHES (CONT'D)

15.5 DRY LININGS AND PARTITIONS

- a) Unless otherwise stated, dry linings and partitions are to be measured in square metres and the rates are to include the sole plates, head, abutments to other finishings, intersections and framings to openings.

15.6 FITTED CARPETING

- a) Unless otherwise stated, carpeting to staircase areas are measured in square metres which include carpeting to landings, treads and risers, winders, strings, returned ends, quadrants ends and curtail ends.
- b) Unless otherwise stated, the rates for fitted carpeting to staircase area are to include stair rods, carpet holders, carpet clips and the like where applicable.

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16.0 GLAZING

- a) Unless otherwise stated, each panes of glass is measured the nett dimension stating its thickness.
- b) The rates for glazing work are deemed to include for:
 - i. Raking, curved and circular cutting.
 - ii. All polished and bevelled edges.
 - iii. Internal and external mitres, scallops and other shapings.
 - iv. Work to edges of glass louvres.
 - v. Slotting the panes into frame
 - vi. Aligning patterned and wired glass.
 - vii. Grinding, sandblasting and embossing where applicable.
 - viii. All sealing, gasket and glazing sealant.
 - ix. Drilling holes through glass/panes
 - x. Brilliant cut panes and panes with other decorative works.
 - xi. Bent panes.
 - xii. Cleaning off and applying protection wax to all glass.
 - xiii. Blocks, setting blocks, locating blocks, distance pieces and the likes accessories for fixing.
 - xiv. Any additional cost involved in using sheets which are larger than the manufacturer's standard stock sizes.
- c) Patent glazing for roofs, skylights, lantern light, vertical surfaces are measured over bars in square metres. The rates for patent glazing shall include for:
 - i. Opening gear and its method of fixing.
 - ii. Raking cutting and curved cutting.
 - iii. Opening portions of patent glazing in which they occur.

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17.0 PAINTING AND DECORATING

17.1 GENERALLY

- a) The rates for all painting works are deemed to include for:
 - i. Preparation and protection of surfaces for painting as specified.
 - ii. The use of different colours on different surfaces (including mixing of paints to derive any tint or colour required).
 - iii. Making good painting including removing splash and spray marks.
 - iv. All necessary scaffolding or temporary platform.
 - v. Rubbing down between coats.
 - vi. Any particulars or special treatment required for the related works.
 - vii. Painting to windows, doors, grilles and the like is measured on both sides including painting to the edges.

17.2 RAILINGS, FENCES AND GATES

- a) Unless otherwise stated:
 - i. Painting to fencing and gates has been grouped together and measured net overall.
 - ii. Posts, rails, balusters and the like are measured net overall stating the dimension.
 - iii. Ornamental railings, gates and the like has been grouped together and measured overall regardless of voids.

17.3 PIPES, DUCTS, ETC.

- a) Unless otherwise stated, painting to pipes and conduits, lagged pipes, cables, ducting and trunking, straps, standards, bars and the like has been grouped together.
- b) The rates for painting works are deemed to include for painting on fittings, clips, brackets, saddles, pipehooks, holderbats, conduit boxes, other components for fixing and the like.

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18.0 DRAINAGE

- a) Unless otherwise stated, the Contractor is to ascertain for himself the water levels.
- b) Unless otherwise stated, depths of excavation are measured from the general formation levels to the bottom of the excavations.
- c) Definition of rocks, hard materials and unsuitable material are to be based on what have been defined in the JKR Standard Specifications for Building Works.
- d) Prices for excavation in trenches shall be deemed to include for:
 - i. Excavating in whatever type of material / ground and strata except in rock as defined in the JKR Standard Specifications for Building Works Specification, met with on the surface of or in the excavations.
 - ii. Excavation below the water table.
 - iii. Getting the material out of the excavations.
 - iv. Levelling bottoms of the excavations from vertical, battering or sloping faces.
 - xii. Removing of loose boulders of size not exceeding 0.5m³.
 - xiii. Removing of hard mass as defined in the Standard Specifications for Building Works Specification
 - v. Upholding and maintaining sides of the excavations by whatever means necessary including the use of bentonite and any special shoring or sheet piling etc., as any be necessary but which do not form a permanent part of the Works to be executed, but excluding any planking and strutting to be left in or any sheet piling etc. which forms a permanent part of the Works to executed.
 - vi. Backfilling of selected excavated materials into the excavations and compacting the same methods and in the manners as specified in the Standard Specifications for Building Works.
 - vii. Disposal of surplus excavated materials.
 - viii. Multiple handling and transporting about the sites.
 - ix. Deposit, spread and level in making up levels of surplus excavated materials within the site.
 - x. Protection to all services encountered.
 - xi. All tribute, charges, royalties, fee payable to the relevant Local Authority or the Government Department/Agencies for removal of surplus spoil.
 - xii. Complying with the S.O.'s instructions issued from time to time to ensure the safety of the excavation and adjoining structure.
 - xiii. Reinstatement to original condition of existing ground or surface finish affected by the excavations.

- e) Unless otherwise stated, for work which may only be carried out by Utility/Service Providers or Local Authorities are to be priced under Provisional Sum.

19.0 FENCING, TURFING AND PLANTING

19.1 GENERALLY

- a) Fencing is measured overall over posts and other supports. The height of fencing is measured from the surface of the ground (or other base) to the top of the posts.
- b) The rates for all turfing and planting are deemed to include for:
 - i. Carrying out of the Works in such sequence or section as specified or as S.O. may direct.
 - ii. Preparatory work in forking and loosening ground surface.
 - iii. Dressing with fertilizer, tending, watering, covering with wet sacking, moving and protection of newly turfed areas.

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20.0 ROADWORKS

20.1 GENERALLY

a) The rates for roadworks are deemed to include for:

- i. All necessary disposal of material off site.
- ii. Protecting mixed material in transit and while awaiting tipping.
- iii. Laying, rolling and consolidating sub-base, base course, binder and wearing course in layers or sequence as required.
- iv. Laying by hand of narrow strips remaining alongside machine work.
- v. Making joints, working around manhole covers and other like projections.
- vi. Finishing surfaces to gradient and falls.
- vii. Added fillers to bituminous mixture.
- viii. Maintenance of surfaces as work progresses.

b) The rates for all road signage are deemed to include for:

- i. Excavation, concreting, formwork, reinforcement, necessary protection and disposal of excavated materials off site.
- ii. Fabricating, supplying, hoisting, installing at specified locations.
- iii. All labour, plant, materials and other necessary plant and equipment.
- iv. Cutting, smooth finishing and wastages of plastic lettering, diagrams and sheets.
- v. Painting to mild steel posts.

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