དཔལ་ལྡན་འབྲུག་གཞུང་། གཞི་རྟེན་མཁོ་ཆས་དང་སྐྱེལ་འདེན་ལྷན་ཐག།

ROYAL GOVERNMENT OF BHUTAN

MINISTRY OF INFRASTRUCTURE AND TRANSPORT

DEPARTMENT OF INFRASTRUCTURE DEVELOPMENT

"Towards quality, cost effective, green and sustainable infrastructure"

BHUTAN SCHEDULE OF RATES - 2025

CIVIL

FOREWORD

The Bhutan Schedule of Rates (Civil) - 2025 is the revised edition of Bhutan Schedule of Rates (Civil) - 2024. This document is a guide for projecting the cost of construction works only and should not be used to fill tenders, evaluate tenders, award works, or make contractual payments. The Department of Infrastructure Development has incorporated as many items as possible that are used for construction works. However, due to the wide variety of construction materials available in the market, only the most commonly used materials have been included, along with their average market rates. BSR 2025 includes several new items, including a new guideline for the design of formwork. Many existing items have also been revised in line with the changing construction practices.

In this edition, rates for materials have been revised based on the market price collected from the four base towns of Gelephu, Phuentsholing, Samdrup Jongkhar, and Thimphu. These rates have been applied in conjunction with the coefficients from Labour and Materials Coefficients - 2025 to develop Built-up item rates. In addition, the following constants have been added:

a. A fixed 5% for hand tools & equipment on labour cost, lubrication & corrective maintenance on machinery cost, and wastages & unaccounted on materials cost.
b. A fixed 1 % for water charges (sanitation, mixing of mortar, drinking, curing, etc.)
c. 10% for contractor's profit and overhead charges for the rate analysis carried out by the procuring agencies. For rate analysis submitted by contractors for the tendered work, it can vary up to a maximum of 10%.

Besides the constants mentioned above, no other additions shall be permitted for rate analysis.

All the items of work prescribed in BSR - 2025 should be read and understood in conjunction with Specifications for Building and Road Works - 2025 and Specifications for Conservation Works in Heritage Sites- 2025.

The Department welcomes feedback and suggestions from users to continually improve the document. With the rapid advancement of materials, technologies, and construction methodologies, a more relevant and comprehensive schedule of rates can only be developed through the collective contributions of professionals and stakeholders in the construction industry.

(Karma Dupchuk)
Director General
Department of Infrastructure Development
Ministry of Infrastructure and Transport
Thimphu, Bhutan

DISCLAIMER

The Bhutan Schedule of Rates - 2025 is prepared and published primarily as a tool to assist in the estimation of project costs only. ***The users are advised to refrain from using it for the purpose of filling tenders, evaluating tenders, awarding works and/or making contractual payments***. This is due to the difficulty in obtaining comprehensive and accurate rates from base towns, as well as the associated complexity in their analysis, in addition to the dynamic nature of market rates for items. Hence, BSR reflects only suggestive averages and not accurate current market rates.

The publisher shall not be liable or responsible for any ambiguity, discrepancy, dispute, or financial losses arising directly or indirectly as a result of individuals or agencies using the rates in the BSR-2025 for filling out their tenders, evaluating tenders, awarding works, and/or making contractual payments.

***Note: The items under Chapter 23: Conservation works in Heritage sites apply only to heritage sites registered with the Department of Culture and Dzongkha Development.**

PREFACE

1. Bhutan Schedule of Rates - 2025 is the revised edition of Bhutan Schedule of Rates - 2024.
2. The rates for all the built - up items are for up to 10 Km radius and is inclusive of:
   a) A fixed 5% for hand tools & equipment on labour cost, lubrication & corrective maintenance on machinery cost, and wastages & unaccounted on materials cost.
   b) A fixed 1% for water charges (sanitation, mixing of mortar, drinking, curing, etc.)
   c) 10% for the contractor's profit and overhead charges.
3. The built-up item rates are based on "Labour and Material Coefficients - 2025" with the applicable percentages given above.
4. The schedule is designed primarily as a tool for estimation of construction projects only and not for payment to contractors or filling up tenders.
5. This Schedule shall be read along with the "Specifications for Building and Road Works - 2025", "Specifications for Conservation Works in Heritage Sites- 2025", and the "Labour and Materials Coefficients - 2025".
6. The following guidelines are provided:
   a) Guideline for Cost Indices with sample calculation,
   b) Guideline for Rate analysis,
   c) Guideline for Quick Cost,
   d) Guideline for Occupational Health and Safety Cost (OHS), and
   e) Guideline for Temporary Living Accommodation
   f) Guideline for Design of Formwork with sample calculation
7. Material Rates used in BSR - 2025 were collected during March, 2025. Users are advised to update rates accordingly with the prevailing market rates.
8. BSR contains the commonly used items only; for the items not covered in the BSR, the rates shall be analyzed and worked out by the engineers as may be relevant.
9. The following new items/changes have been incorporated:
   a) Mix Design Rates for M30, M35, M40 and M45 is incorporated under Chapter 8- Reinforced Concrete
   b) Glass Fiber Reinforced Concrete (GRC) Door cornices are incorporated under Chapter 11- Wood Work.
   c) Glass Fiber Reinforced Concrete (GRC) Windows are incorporated under Chapter 11- Wood Work.
   d) Mineral Fiber Board Ceiling is incorporated under Chapter 11- Wood Work.
   e) Wood Plastic Composite Door shutters and frames are incorporated under Chapter 11- Wood Work.
   f) Polyvinyl Chloride (PVC) Door shutters and frames are incorporated under Chapter 11- Wood Work.
   g) Tactile Floor Tiles are incorporated under Chapter 14-Tiling- Wall and Floor
   h) Ductile Iron Restrained Joint Pipes are incorporated under Chapter 17- Plumbing- Outdoor Work
   i) Non-woven Geotextile Fabric is incorporated under Chapter 21- Road Work.
   j) Traffic Signs are incorporated under Chapter 21- Road Work.

k) Road Studs are incorporated under Chapter 21- Road Work.

l) Delineators are incorporated under Chapter 21- Road Work.

10. This publication also includes the Guideline for Design of Formwork under Section 9, along with sample calculations.
11. All local materials used at the site should be BSB-certified. For the latest list of approved brands, please refer to the BSB website. (www.bsb.gov.bt)
12. For the supply of construction materials, the following void deductions shall be made to derive the net quantity:
    a) Sand and Binding Material: 5%
    b) Manure: 8%
    c) Stone Aggregates: 7.5%
    d) Stone Boulders: 15%
    e) Excavated Rock: 50%

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SECTION – 1

Basic Rates of Materials, Labour and Hire Charges of Plants and Equipments

Code	Description	Units	PL	GP	S/J	TH
1. BASIC RATES - LABOUR RATES						
Category 1						
LB0020	Auto-Mechanic Gd.1	**day**	632.50	632.50	632.50	632.50
LB0021	Carpenter Gd.1	**day**	632.50	632.50	632.50	632.50
LB0022	General Mechanic Gd.1	**day**	632.50	632.50	632.50	632.50
LB0023	Lharib	**day**	632.50	632.50	632.50	632.50
LB0024	Lineman Gd.1	**day**	632.50	632.50	632.50	632.50
LB0025	Plant Operator Gd.1	**day**	632.50	632.50	632.50	632.50
Category 2						
LB0030	Auto-Electrician Gd.1	**day**	632.50	632.50	632.50	632.50
LB0031	Auto-Mechanic Gd.2	**day**	632.50	632.50	632.50	632.50
LB0032	Blacksmith (metal-worker)	**day**	632.50	632.50	632.50	632.50
LB0033	Carpenter Gd.2	**day**	632.50	632.50	632.50	632.50
LB0034	General Mechanic Gd.2	**day**	632.50	632.50	632.50	632.50
LB0035	Lineman Gd.2	**day**	632.50	632.50	632.50	632.50
LB0036	Mason Gd.1	**day**	632.50	632.50	632.50	632.50
LB0037	Plant Operator Gd.2	**day**	632.50	632.50	632.50	632.50
LB0038	Plumber Gd.1	**day**	632.50	632.50	632.50	632.50
LB0039	Work Supervisor (Lajab)	**day**	632.50	632.50	632.50	632.50
Category 3						
LB0045	Auto-Electrician Gd.2	**day**	575.00	575.00	575.00	575.00
LB0046	Auto-Mechanic Gd.3	**day**	575.00	575.00	575.00	575.00
LB0047	Blaster	**day**	575.00	575.00	575.00	575.00
LB0048	Carpenter Gd.3	**day**	575.00	575.00	575.00	575.00
LB0049	General Mechanic Gd.3	**day**	575.00	575.00	575.00	575.00
LB0050	Lineman Gd.3	**day**	575.00	575.00	575.00	575.00
LB0051	Mason Gd.2	**day**	575.00	575.00	575.00	575.00
LB0052	Painter Gd.1	**day**	575.00	575.00	575.00	575.00
LB0053	Plant Operator Gd.3	**day**	575.00	575.00	575.00	575.00
LB0054	Plumber Gd.2	**day**	575.00	575.00	575.00	575.00
LB0055	Sawyer Gd.1	**day**	575.00	575.00	575.00	575.00
LB0056	Wireman Gd.1	**day**	575.00	575.00	575.00	575.00
Category 4						
LB0065	Cleaner	**day**	518.00	518.00	518.00	518.00
LB0066	Machine Operator	**day**	518.00	518.00	518.00	518.00
LB0067	Painter Gd. 2	**day**	518.00	518.00	518.00	518.00
LB0068	Sawyer Gd. 2	**day**	518.00	518.00	518.00	518.00
LB0069	Wireman Gd. 2	**day**	518.00	518.00	518.00	518.00
Category 5						
LB0075	Labourer (Male)	**day**	460.00	460.00	460.00	460.00
LB0076	Labourer (Female)	**day**	460.00	460.00	460.00	460.00
LB0077	Labour	**day**	460.00	460.00	460.00	460.00

Code	Description	Units	PL	GP	S/J	TH
LABOUR RATES FOR CONSERVATION WORKS IN HERITAGE SITES						
Category 10						
LB0100	Zopen	**day**	950.00	950.00	950.00	950.00
LB0101	Dozo Lopen	**day**	950.00	950.00	950.00	950.00
Category 11						
LB0102	Shingzop Gd.1	**day**	860.00	860.00	860.00	860.00
LB0103	Dozop Gd.1	**day**	860.00	860.00	860.00	860.00
LB0104	Bjizop Gd.1	**day**	860.00	860.00	860.00	860.00
LB0105	Pazop Gd.1	**day**	860.00	860.00	860.00	860.00
LB0106	Parp Gd.1	**day**	860.00	860.00	860.00	860.00
LB0107	Lhazo Gd.1	**day**	860.00	860.00	860.00	860.00
Category 12						
LB0108	Shingzop Gd.2	**day**	760.00	760.00	760.00	760.00
LB0109	Dozop Gd.2	**day**	760.00	760.00	760.00	760.00
LB0110	Bjizop Gd.2	**day**	760.00	760.00	760.00	760.00
LB0111	Pazop Gd.2	**day**	760.00	760.00	760.00	760.00
LB0112	Parp Gd.2	**day**	760.00	760.00	760.00	760.00
LB0113	Lhazo Gd.2	**day**	760.00	760.00	760.00	760.00
Category 13						
LB0114	Shingzop Gd.3	**day**	675.00	675.00	675.00	675.00
LB0115	Dozop Gd.3	**day**	675.00	675.00	675.00	675.00
LB0116	Bjizop Gd.3	**day**	675.00	675.00	675.00	675.00
LB0117	Pazop Gd.3	**day**	675.00	675.00	675.00	675.00
LB0118	Parp Gd.3	**day**	675.00	675.00	675.00	675.00
LB0119	Lhazo Gd.3	**day**	675.00	675.00	675.00	675.00
LB0120	Dampen Gd.3	**day**	675.00	675.00	675.00	675.00
Category 14						
LB0121	Shingzop Gd.4	**day**	620.00	620.00	620.00	620.00
LB0122	Dozop Gd.4	**day**	620.00	620.00	620.00	620.00
LB0123	Bjizop Gd.4	**day**	620.00	620.00	620.00	620.00
LB0124	Pazop Gd.4	**day**	620.00	620.00	620.00	620.00
LB0125	Parp Gd.4	**day**	620.00	620.00	620.00	620.00
LB0126	Lhazo Gd.4	**day**	620.00	620.00	620.00	620.00
Category 15						
LB0127	Unskilled	**day**	520.00	520.00	520.00	520.00

Code	Description	Units	PL	GP	S/J	TH
2. BASIC RATES - MATERIALS						
BITUMEN PRODUCTS, CHEMICALS & BLASTING MATERIALS						
Bitumen materials						
MT0001	Bitumen VG - 10	**tonne**	52000.00	55000.00	53317.65	54000.00
MT0002	Bitumen Emulsion	**tonne**	51050.00	55000.00	54500.00	54250.00
MT0003	Shredded Plastic	**tonne**	52000.00	55000.00	54500.00	54000.00
MT0004	Bitumen VG - 20 / VG - 30	**tonne**	53000.00	56000.00	55000.00	55000.00
Bitumen felt Type 3						
MT0005	Grade 1	**sq.m**	270.00	270.00	270.00	270.00
MT0006	Grade 2	**sq.m**	220.00	220.00	220.00	220.00
Sealing Compounds						
MT0010	Hot sealing compound Grade A	**kg**	59.50	59.50	59.50	67.25
MT0011	Bitumen Solution primer	**litre**	84.33	84.33	84.33	87.17
Joint-filler						
MT0015	Pre-moulded bitumen impregnated fibre board, 12mm thick (IS: 1838 or equivalent)	**sq.m**	223.96	223.96	223.96	223.96
Blasting materials						
MT0020	Super dyne / Gelatine	**kg**	148.20	148.20	148.20	148.20
MT0021	D cord	**m**	16.00	16.00	16.00	16.00
MT0022	Detonator	**each**	10.00	10.00	10.00	10.00
MT0023	Drill rod - 8' - 0"	**each**	2216.33	2216.33	2216.33	2216.33
MT0024	Silent Blaster	**kg**	241.10	241.10	241.10	241.10
MT0025	Drill rod - 5' - 0"	**each**	1421.89	1421.89	1421.89	1421.89
MT0026	Drill rod - 3' - 0"	**each**	1190.00	1190.00	1190.00	1190.00
Chemicals						
MT0030	Chlorpyriphos/ Lindane E. C 20% with 1% Concentration (Anti Termite Chemical)	**litre**	360.00	355.00	357.50	370.00
Fuels						
MT0035	Kerosene	**litre**	62.83	59.92	60.20	65.01
MT0036	Diesel	**litre**	59.13	60.90	60.24	61.35
MT0037	Petrol	**litre**	58.80	60.46	59.80	61.20
QUARRY & FOREST PRODUCTS						
MT0040	Firewood (stacked volume)	**cu.m**	1250.00	1250.00	1250.00	1250.00
MT0041	Royalty for earth, mud, boulder, sand & gravel	**truck**	100.00	100.00	100.00	100.00
MT0042	Mud dry	**cu.m**	437.50	437.50	437.50	437.50
MT0043	Sand	**cu.m**	475.46	507.74	821.90	1209.82
MT0044	Hay/husk	**kg**	69.00	69.00	69.00	73.00
MT0046	Cuttings	**each**	0.15	0.15	0.15	0.15
MT0047	Seedlings	**each**	5.00	5.00	5.00	6.00
MT0048	Grass Slips	**each**	0.10	0.10	0.10	0.10
MT0049	Natural Grass Turf	**Sq.m**	30.00	30.00	30.00	32.00
Stone						
MT0060	Boulder	**cu.m**	590.00	590.00	590.00	650.00
MT0061	Dolep (flat stone)	**Sq.m**	2743.80	2743.80	2743.80	2743.80

Code	Description	Units	PL	GP	S/J	TH
Crushed Rock						
MT0064	100mm	**cu.m**	718.42	718.42	718.42	718.42
MT0065	75mm	**cu.m**	718.42	718.42	718.42	718.42
MT0066	63mm	**cu.m**	718.42	718.42	718.42	718.42
MT0067	50mm	**cu.m**	718.42	718.42	718.42	718.42
MT0068	40mm	**cu.m**	788.98	788.98	788.98	788.98
MT0069	25mm	**cu.m**	868.36	868.36	868.36	868.36
MT0070	20mm	**cu.m**	953.60	1007.72	1209.46	1007.72
MT0071	12.5 - 6mm	**cu.m**	713.60	974.20	1192.70	974.20
Gravel/Shingles (river stone)						
MT0080	40mm to 20mm	**cu.m**	478.80	478.80	478.80	478.80
MT0081	20mm to 10mm	**cu.m**	446.88	446.88	446.88	446.88
M a r b l e I t e m s						
Marble Chips 6mm						
MT0085	Black or White	**tonne**	7400.00	7000.00	7750.00	10750.00
MT0086	Coloured	**tonne**	7400.00	7000.00	7750.00	11000.00
Marble Slab 20mm						
MT0090	Black	**sq.m**	1000.68	833.90	889.49	1226.64
MT0091	White	**sq.m**	1000.68	833.90	889.49	1226.64
MT0092	Black and White	**sq.m**	1000.68	833.90	889.49	1226.64
MT0093	Coloured	**sq.m**	1000.68	833.90	889.49	1162.08
Marble Slab 40mm						
MT0100	Black	**sq.m**	2367.20	2367.20	2367.20	2367.20
MT0101	White	**sq.m**	2259.60	2259.60	2259.60	2259.60
MT0102	Black and White	**sq.m**	2259.60	2259.60	2259.60	2259.60
MT0103	Coloured	**sq.m**	2367.20	2367.20	2367.20	2367.20
Kota Stone Slab						
MT0110	20mm	**sq.m**	753.20	753.20	753.20	788.17
MT0111	40mm	**sq.m**	807.00	807.00	807.00	903.84
Granite stone slab						
MT0114	Granite slab-18mm	**sq.m**	1111.87	1172.84	1151.52	1194.66
MT0115	Granite slab-20mm	**sq.m**	1362.93	1129.80	1183.60	1363.09
L i m e						
MT0120	Slaked lime	**kg**	31.00	27.50	29.00	33.30
MT0121	Unslaked lime	**kg**	37.00	37.00	37.00	37.50
Others						
MT0122	Sealed Bag	**each**	49.00	48.50	49.00	51.50

Code	Description	Units	PL	GP	S/J	TH
BRICK						
Brick materials						
MT0125	Bricks 2nd class	**1000#**	12233.33	12250.00	12750.00	15910.00
MT0126	Brick aggregate	**cu.m**	1862.50	1975.00	1977.50	1975.00
MT0127	Graded brick aggregate	**cu.m**	2150.00	2150.00	2150.00	2150.00
MT0128	Interlocking cement earth block	**1000#**	9500.00	10000.00	10000.00	10750.00
MT0129	Interlocking cement earth block	**1000#**	11000.00	11000.00	10250.00	11000.00
MT0130	Concrete block bricks - Hollow Block	**1000#**	46000.00	45000.00	44500.00	58700.00
MT0131	Concrete block bricks - Solid Brick	**1000#**	10000.00	10000.00	10000.00	11000.00
MT0132	Concrete block bricks - Porous brick	**1000#**	11500.00	11500.00	11500.00	11650.00
MT0133	Concrete block bricks - Partition Hollow Brick	**1000#**	41000.00	40750.00	41000.00	40700.00
AAC Block						
MT0140	Autoclaved aerated cement (AAC) blocks	**Cu.m**	4902.67	5200.00	5350.00	6025.00
CEMENT & CONCRETE MATERIALS						
Cement						
MT0145	Cement (OPC/PSC)	**tonne**	7700.00	7466.67	7360.00	8750.00
MT0146	White Cement	**tonne**	37666.67	41500.00	42500.00	50000.00
Additives & Ad-mixtures						
MT0150	Red Oxide Pigment/other pigments	**kg**	180.00	180.00	180.00	180.00
MT0151	Water proofing compound	**kg**	190.00	190.00	190.00	190.00
MT0152	Floor Hardener (metallic)	**kg**	50.00	50.00	50.00	50.00
MT0153	Polymer modified adhesive mortar	**kg**	60.00	60.00	60.00	60.00
MT0154	Concrete Super plasticizer	**kg**	105.00	105.00	105.00	105.00
Underlay for Slabs						
Plastic Sheet						
MT0155	200 micro-metre	**sq.m**	18.00	18.00	18.00	18.00
STEEL & OTHER METAL MATERIALS						
Aluminium Materials						
MT0160	Aluminium Fluted Strips 3.15mm thick 150mm wide	**m**	529.13	541.88	497.25	610.09
MT0161	Aluminium Strip 40x1.6mm	**m**	73.50	76.13	76.13	83.74
MT0162	Aluminium sheet	**kg**	395.00	425.00	335.00	478.00
Anodised Aluminium Section for doors, windows, partitions and false ceiling						
MT0165	Sliding, open able and pivoted windows	**kg**	395.37	425.00	390.00	478.69
MT0166	Sliding and openable doors	**kg**	395.37	425.00	390.00	478.69
MT0167	Partitions framing	**kg**	395.37	425.00	390.00	478.69
MT0168	False ceiling framing	**kg**	395.37	425.00	390.00	478.69
Aluminium Strip Edging						
MT0175	57mmx12mmx1.6mm	**m**	119.50	124.43	117.50	126.70
MT0176	38mmx12mmx1.6mm	**m**	85.70	90.03	87.50	95.27

Code	Description	Units	PL	GP	S/J	TH
Steel Materials						
Rolled sections (250 MPa)						
MT0180	Angles	**kg**	60.33	63.00	70.33	71.00
MT0181	Channels	**kg**	61.00	64.50	71.00	83.33
MT0182	Flats	**kg**	61.00	63.00	73.00	70.33
MT0183	Joists	**kg**	62.00	64.50	70.67	73.33
MT0184	Plates	**kg**	76.00	75.33	84.33	84.00
Sheet (250 MPa)						
MT0190	1mm	**kg**	70.00	80.00	78.00	84.50
MT0191	2mm	**kg**	68.00	80.00	78.00	84.50
MT0192	2.8mm	**kg**	67.00	80.00	78.00	84.50
MT0193	3.5mm	**kg**	67.00	80.00	78.00	84.50
Mild steel Strips						
MT0194	1830mm X 230mm X 3mm	**kg**	64.00	80.00	78.00	84.50
Welded Tube (250 MPa)						
MT0200	Welded Tube (250 MPa)	**kg**	61.67	64.00	67.50	70.00
Reinforcing Bars & Mesh						
MT0208	Thermo - Mechanically Treated (TMT) bars (yield strength 500 MPa)	**kg**	54.61	56.66	56.00	60.33
Welded Mesh						
MT0215	75mmx25mm	**sq.m**	288.89	288.89	300.00	311.11
MT0216	Expanded Metal (19mm x 3mm x 16 gauge)	**sq.m**	446.28	446.28	446.28	446.28
Fasteners						
MT0220	M.S. Rivets	**kg**	76.00	75.33	84.33	84.00
MT0221	M.S. Bolts & Nuts, Screws etc	**kg**	76.00	75.33	84.33	84.00
Crash Barrier W-metal beam						
MT0223	3mm W-metal beam (Length 4m, width 310mm and wave ht. 81-85mm)	**m**	2150.00	2150.00	2150.00	2365.00
Fencing Wire Products						
MT0225	Barbed Wire	**m**	12.08	14.44	13.89	15.28
G.I double knotted mesh						
MT0230	100 x 100 x 8-gauge	**sq.m**	303.00	305.87	292.50	435.00
MT0231	100 x 100 x 12-gauge	**sq.m**	269.00	269.00	257.50	395.00
MT0232	150 x 150 x 8-gauge	**sq.m**	235.00	260.70	235.00	345.00
MT0233	150 x 150 x 12-gauge	**sq.m**	195.25	240.70	230.00	330.00
G.I chain-link mesh						
MT0240	100 x 100 x 8-gauge	**sq.m**	230.00	230.00	250.00	350.00
MT0241	100 x 100 x 12-gauge	**sq.m**	197.50	197.50	230.00	315.00
MT0242	75 x 75 x 8-gauge	**sq.m**	234.50	355.00	290.00	366.67
MT0243	75 x 75 x 12-gauge	**sq.m**	226.67	256.67	270.00	350.00
MT0244	50 x 50 x 8-gauge	**sq.m**	408.50	371.39	350.00	469.00
MT0245	50 x 50 x 12-gauge	**sq.m**	255.00	331.68	320.00	352.33
Galvanised Iron						
Gbion Mesh						
MT0250	Woven GI wire mesh - 2.7 mm	**Sq.m**	159.12	220.90	220.90	252.72
MT0251	Woven GI wire mesh - 3.25 mm	**Sq.m**	229.84	319.07	319.07	365.04
MT0252	Welded GI wire mesh - 4 mm	**Sq.m**	364.21	505.61	505.61	578.45
Wires						
MT0256	GI wires (assorted diameters)	**kg**	97.50	118.33	118.33	135.00

Code	Description	Units	PL	GP	S/J	TH
Frame sections for False ceiling						
MT0265	Galvanised Steel T section of size 24mmX38mm	**m**	133.00	133.00	133.00	133.00
MT0266	Galvanised Steel perimeter wall Angle of size 24mm x 24mm	**m**	133.00	133.00	133.00	133.00
MT0267	Galvanised Iron hanger rod 6mm dia fully threaded	**m**	200.00	200.00	200.00	200.00
Stainless steel railings						
MT0259	Stainless steel (grade 304) Hollow section round/square tubes	**kg**	425.00	550.00	420.00	540.00
MT0260	Stainless steel bolts/square bar and plates	**kg**	300.00	310.00	320.00	350.00
Traffic Items						
MT0270	Cats Eye	**each**	167.00	167.00	167.00	167.00
MT0271	Round tube Delineator 48mm dia, 750mm length with 3 nos of ABS round body high reflective reflectors with duly powder coated anti-rust and anti theft steel	**each**	339.00	339.00	339.00	348.00
MT0272	Round tube Delineator 48mm dia, 1200mm length with 3 nos of ABS round body high reflective reflectors with duly powder coated anti-rust and anti theft steel	**each**	672.00	672.00	672.00	708.00
MT0273	Rectangular mild steel post delineators of 100mm width and 1100mm length with 3 nos of ABS high reflective reflectors	**each**	714.00	714.00	714.00	720.00
ROOFING MATERIALS						
MT0275	Corrugated Galvanised Iron Sheets - 24 g (0.63mm)	**sq.m**	472.83	410.00	463.71	475.15
MT0278	Pre - Painted Galvanised Iron (PPGI) Roofing Sheets - 25g (.50mm)	**sq.m**	341.67	351.23	348.50	369.00
MT0279	Pre Painted Galvalume Roofing Sheet(PPGL) - 25g (0.5	**sq.m**	355.33	360.80	355.33	369.00
MT0280	Polycarbonate transparent sheets - 2mm, corrugated	**sq.m**	882.83	924.78	832.83	1154.83
R o o f i n g S l a t e						
MT0285	600mm x 300mm	**each**	35.50	35.00	35.00	37.00
Steel Sheet - Hip/Ridge, 600mm						
MT0309	Corrugated Galvanised Iron (CGI) ridge 1.83m long 24g	**each**	650.00	656.67	580.00	675.00
MT0310	Pre - Painted Galvanised Iron (PPGI) ridge 3.048m long 25 g	**each**	1025.00	1075.00	1140.00	1050.00
MT0311	Pre-painted Galvalume (PPGL) ridge, 600 mm wide overall, 3.048 m long - 25 g (0.5 mm)	**each**	1025.00	1050.00	1140.00	1050.00
Steel Sheet - Gutter, 600mm						
MT0312	Corrugated Galvanised Iron (CGI) gutter 1.83m long 24g	**each**	612.50	612.50	615.00	633.33
MT0313	Pre - Painted Galvanised Iron (PPGI) gutter, 600 mm wide overall, 3.048 m long - 25 g (0.5 mm)	**each**	1025.00	1000.00	1150.00	1050.00
MT0314	Pre-painted Galvalume (PPGL) gutter, 600 mm wide overall, 3.048 m long - 25 g (0.5 mm)	**each**	1015.00	1050.00	1191.67	1050.00

Code	Description	Units	PL	GP	S/J	TH
Pvc - Gutter						
MT0320	Semi circular/half round Poly Vinyl Chloride (PVC) roof gutter of 140mm dia 3.04m long	each	800.00	800.00	750.00	750.00
MT0321	Semi circular/half round Poly Vinyl Chloride (PVC) roof gutter of 180mm dia 3.04m long	each	900.00	900.00	800.00	900.00
S h i n g l e p r o o f i n g						
MT0315	1500mm (approx.)	**pair**	63.67	63.67	63.67	63.67
CARPENTRY & JOINERY MATERIALS						
T i m b e r						
MT0325	Ballies 75 to 125mm dia	**m**	51.24	52.85	50.90	52.75
MT0326	Ballies 250 to 300mm dia	**m**	295.16	304.44	293.16	303.86
MT0327	Ballies 125 to 250mm dia	**m**	204.97	211.42	203.58	211.02
Rough-sawn timber (urban rate)						
MT0330	Class 'B', (conifer)	**cu.m**	12973.87	13843.13	14651.08	13498.83
MT0331	Class 'A', (conifer)	**cu.m**	13361.95	14231.59	15039.16	13886.91
MT0332	Class 'A', (Broad Leaf)	**cu.m**	12430.20	12090.09	12491.24	12063.29
MT0333	Class 'B', (Broad Leaf)	**cu.m**	11977.21	11637.00	12038.59	11610.30
Plywood						
MT0340	4mm, commercial ply	**sq.m**	174.12	142.40	141.46	183.62
MT0341	4mm, teak ply	**sq.m**	205.19	173.79	204.50	244.95
MT0342	6mm, commercial ply	**sq.m**	266.74	216.40	207.37	245.43
MT0343	12mm, commercial ply	**sq.m**	467.55	431.68	426.50	428.79
MT0344	12mm, shuttering ply	**sq.m**	454.11	442.89	454.11	457.30
Gypsum Wallboard						
MT0345	10mm	**sq.m**	248.00	250.00	255.00	288.81
MT0346	12mm	**sq.m**	293.00	285.31	279.50	348.75
MT0347	15mm	**sq.m**	367.50	385.00	365.00	395.54
Mineral Fiber Board						
MT0348	16mm	**sq.m**	1126.56	1126.56	1126.56	1126.56
MT0349	19mm	**sq.m**	1466.84	1067.56	1466.84	1466.84
Cement Bonded Particle board, Pre-laminated (both sides)						
MT0350	6mm	**sq.m**	220.85	214.43	259.43	252.43
MT0351	8mm	**sq.m**	294.44	252.53	333.10	298.10
MT0352	10mm	**sq.m**	393.75	307.24	410.98	419.35
MT0353	12mm	**sq.m**	441.60	434.34	497.17	495.24
MT0354	16mm	**sq.m**	601.01	680.13	680.13	788.07
MT0355	20mm	**sq.m**	735.69	848.48	848.48	926.71
MT0356	25mm	**sq.m**	904.04	983.16	983.16	1120.52
MT0357	30mm	**sq.m**	1005.05	1016.84	1016.84	1137.36
Plain Particle Board						
MT0365	6mm	**sq.m**	369.00	369.00	369.00	411.47
MT0366	10mm	**sq.m**	427.04	427.04	427.04	492.00
MT0367	12mm	**sq.m**	503.00	503.00	503.00	551.50
MT0368	18mm	**sq.m**	716.00	716.00	716.00	733.00
MT0369	25mm	**sq.m**	938.00	938.00	938.00	938.00
MT0370	35mm	**sq.m**	1236.00	1236.00	1236.00	1218.00

Code	Description	Units	PL	GP	S/J	TH
Pre-laminated Particle Board (one side)						
MT0375	8mm	**sq.m**	496.00	396.78	433.67	494.00
MT0376	10mm	**sq.m**	516.00	427.04	518.00	581.41
MT0377	12mm	**sq.m**	630.00	706.13	630.00	759.53
MT0378	18mm	**sq.m**	843.00	773.38	843.00	916.97
Skylight panel						
MT0385	Translucent polycarbonate diffuser panel, for skylights (6mm thk)	**sq.m**	464.24	487.88	462.40	531.00
Cane Products						
Bamboo						
MT0390	25 mm dia	**m**	18.44	18.44	18.44	27.50
MT0391	75 mm dia	**m**	19.81	19.81	19.81	38.33
MT0392	Mat	**sq.m**	331.78	325.00	319.78	345.00
MT0393	Cane basket	**each**	570.00	565.00	565.00	650.00
Prefab. Pannelling						
Flooring						
MT0395	25mm, Class 'B' (conifer)	**sq.m**	1076.40	1076.40	1076.40	1076.40
MT0396	38mm, Class 'B' (conifer)	**sq.m**	1606.50	1606.50	1606.50	1606.50
Wall panelling						
MT0400	19mm, Class 'A' (conifer)	**sq.m**	817.76	817.76	817.76	914.60
MT0401	15mm, Class 'A' (conifer)	**sq.m**	645.60	645.60	645.60	807.00
MT0402	12mm, Class 'A' (conifer)	**sq.m**	591.80	591.80	591.80	753.20
MT0403	19mm, Class 'B' (conifer)	**sq.m**	753.20	753.20	753.20	860.80
MT0404	12mm, Class 'B' (conifer)	**sq.m**	591.80	591.80	591.80	753.20
Wire Gauze						
MT0410	Galv. mild steel wire mesh, 85G (0.85mm average width of aperture), 0.56mm dia.	**sq.m**	231.34	235.00	230.00	236.72
DOORS, WINDOWS & HARDWARE						
Prefab. Timber Doors & Boards						
Flush Door, block board core, commercial ply veneer, U/F bonded						
MT0415	25mm	**sq.m**	1690.11	1694.70	2066.50	2174.10
MT0416	30mm	**sq.m**	1845.84	1739.69	2249.10	2282.73
MT0417	35mm	**sq.m**	2057.30	1909.53	2299.10	2299.10
MT0418	40mm	**sq.m**	2451.40	2226.29	2424.10	2424.10
Flush Door, block board core, teak ply veneer, U/F bonded						
MT0425	25mm	**sq.m**	2750.00	2750.00	2750.00	2750.00
MT0426	30mm	**sq.m**	2900.00	2900.00	2900.00	2900.00
MT0427	35mm	**sq.m**	3200.00	3200.00	3200.00	3200.00
MT0428	40mm	**sq.m**	3300.00	3300.00	3300.00	3300.00
Flush Door, block board core, ply veneer, chemically treated						
MT0435	25mm	**sq.m**	2252.30	2134.87	2890.00	2890.00
MT0436	30mm	**sq.m**	2468.75	2468.75	3000.00	3000.00
MT0437	35mm	**sq.m**	2834.04	2834.04	3300.00	3300.00
MT0438	40mm	**sq.m**	3118.59	3118.59	3600.00	3600.00

Code	Description	Units	PL	GP	S/J	TH
WPC (Wood Plastic Composite) Door Shutter and Door Frame						
MT0494	WPC Flush Door 30mm Thick Standard	**sq.m**	2421.00	2421.00	2421.00	2421.00
MT0495	WPC Moulded Panelled Door 30mm Thick Standard	**sq.m**	4142.60	4142.60	4142.60	4142.60
MT0496	WPC Door Frame (size 75mm x 50mm)	**sq.m**	611.49	611.49	611.49	611.49
MT0497	WPC Door Frame (size 100mm x 50mm)	**sq.m**	642.88	642.88	642.88	642.88
PVC (Polyvinyl Chloride) Door Shutter and Door Frame						
MT0498	PVC Flush Door 30mm Thick Standard	**sq.m**	1936.80	1936.80	1936.80	1936.80
MT0499	PVC Moulded Door 30mm Thick Standard	**sq.m**	2959.00	2959.00	2959.00	2959.00
MT0500	PVC Door Frame (size 75mm x 50mm)	**sq.m**	590.40	590.40	590.40	590.40
MT0501	PVC Door Frame (size 100mm x 50mm)	**sq.m**	626.48	626.48	626.48	626.48
Aluminium Rolling shutters						
MT0515	Aluminium Rolling shutters with all accessories	**sq.m**	5864.20	5810.40	5971.80	5918.00
A l u m i n i u m **Anodised Aluminium Fittings: Butt Hinges**						
MT0530	100mm	**each**	120.00	120.00	120.00	100.00
MT0531	75mm	**each**	100.00	100.00	100.00	80.00
MT0532	50mm	**each**	80.00	80.00	80.00	60.00
Anodised Aluminium Fittings: Handles						
MT0540	150mm	**each**	150.00	150.00	150.00	150.00
MT0541	125mm	**each**	135.00	135.00	135.00	135.00
MT0542	100mm	**each**	98.00	98.00	98.00	98.00
MT0543	75mm	**each**	65.00	65.00	65.00	65.00
Anodised Aluminium Fittings: Hooks and Eyes						
MT0550	300mm	**each**	55.00	55.00	55.00	65.00
MT0551	200mm	**each**	42.50	42.50	42.50	50.00
MT0552	150mm	**each**	37.50	37.50	37.50	40.00
MT0553	100mm	**each**	27.50	27.50	27.50	30.00
Anodised Aluminium Fittings: Kicking Plate						
MT0560	4mm thick	**sq.m**	465.00	465.00	465.00	432.00
Anodised Aluminium Fittings: Sliding Door Bolts						
MT0565	300mm	**each**	350.00	350.00	350.00	350.00
MT0566	250mm	**each**	300.00	300.00	300.00	300.00
MT0567	200mm	**each**	200.00	200.00	200.00	200.00
Anodised Aluminium Fittings: Tower Bolts (Barrel Type)						
MT0570	200mm	**each**	165.00	165.00	165.00	165.00
MT0571	150mm	**each**	142.00	142.00	142.00	142.00
MT0572	100mm	**each**	125.00	125.00	125.00	125.00
B r a s s **Bright finished brass: Butt Hinges**						
MT0575	100mm	**each**	165.00	165.00	165.00	160.00
MT0576	75mm	**each**	150.00	150.00	150.00	130.00
MT0577	50mm	**each**	90.00	90.00	90.00	90.00

Code	Description	Units	PL	GP	S/J	TH
Bright finished brass: Handles						
MT0580	150mm	**each**	132.50	132.50	132.50	145.00
MT0581	125mm	**each**	135.00	135.00	135.00	125.00
MT0582	100mm	**each**	87.50	87.50	87.50	80.00
MT0583	75mm	**each**	72.50	72.50	72.50	70.00
Bright finished brass: Hooks and Eyes						
MT0590	150mm	**each**	95.00	95.00	95.00	98.00
MT0591	100mm	**each**	80.00	80.00	80.00	80.00
Bright finished brass: Sliding Door Bolts						
MT0595	300mm	**each**	1150.00	1150.00	1150.00	1150.00
MT0596	250mm	**each**	750.00	750.00	750.00	750.00
MT0597	200mm	**each**	625.00	625.00	625.00	625.00
Bright finished brass: Tower Bolts (Barrel Type)						
MT0600	250mm	**each**	205.00	205.00	205.00	350.00
MT0601	150mm	**each**	192.50	192.50	192.50	250.00
MT0602	100mm	**each**	142.50	142.50	142.50	200.00
Door Closers/Stoppers						
MT0605	Bright finished brass: Door Stopper	**each**	371.00	371.00	371.00	380.00
MT0606	Bright finished brass: Mortise Latch 100mm	**each**	465.00	465.00	465.00	477.50
MT0607	brass, hinged, spring-loaded type	**each**	850.00	850.00	850.00	857.50
MT0608	brass, over-head, hydraulic type	**each**	1050.00	1050.00	1050.00	1056.67
M i l d S t e e l						
Mild Steel: Butt Hinges						
MT0615	100mm	**each**	33.33	33.33	33.33	52.50
MT0616	75mm	**each**	25.00	25.00	25.00	37.50
MT0617	50mm	**each**	15.00	15.00	15.00	27.50
Mild Steel: Handles						
MT0620	150mm	**each**	60.00	60.00	60.00	150.00
MT0621	125mm	**each**	68.00	68.00	68.00	130.00
MT0622	100mm	**each**	45.00	45.00	45.00	110.00
MT0623	75mm	**each**	45.00	45.00	45.00	90.00
Mild Steel: Hooks and Eyes						
MT0630	300mm	**each**	56.67	56.67	56.67	60.00
MT0631	200mm	**each**	52.50	52.50	52.50	55.00
MT0632	150mm	**each**	42.50	42.50	42.50	42.50
MT0633	100mm	**each**	32.50	32.50	32.50	30.00
Mild Steel: Sliding Door Bolts						
MT0640	300mm	**each**	297.50	297.50	297.50	297.50
MT0641	250mm	**each**	272.50	272.50	272.50	272.50
MT0642	200mm	**each**	235.00	235.00	235.00	235.00
Mild Steel: Tower Bolts (Barrel Type)						
MT0645	250mm	**each**	77.50	77.50	77.50	77.50
MT0646	150mm	**each**	57.50	57.50	57.50	60.00
MT0647	100mm	**each**	42.50	42.50	42.50	45.00
MS Door Stopper						
MT0650	Mild Steel: Door Stopper	**each**	150.00	150.00	150.00	165.00

Code	Description	Units	PL	GP	S/J	TH
TILES & GLASS MATERIALS						
Plain Glass						
MT0655	3mm thick	**sq.m**	538.00	538.00	510.00	538.10
MT0656	4mm thick	**sq.m**	672.50	672.50	625.00	699.40
MT0657	5mm thick	**sq.m**	753.20	753.20	753.33	807.10
Frosted Glass						
MT0660	3mm thick	**sq.m**	645.60	860.80	455.00	613.43
MT0661	5mm thick	**sq.m**	761.99	941.50	765.00	860.97
Tiles						
MT0665	Vitrified Wall Tiles	**sq.m**	484.47	543.33	507.74	507.74
MT0670	Vitrified Floor Tiles	**sq.m**	494.25	551.45	549.10	549.10
MT0672	Linoleum sheet, 2mm	**sq.m**	413.33	432.50	525.00	525.00
MT0671	Tactile floor tiles	**sq.m**	2207.87	2207.87	2207.87	2207.87
PAINT & WALL PAPER MATERIALS						
Distemper & Distemper Primers						
MT0690	Dry Distemper	**kg**	55.00	78.33	65.00	80.00
MT0691	Acrylic washable distemper	**kg**	65.00	83.33	67.50	87.50
MT0692	Water proofing Cement paint	**kg**	57.50	79.67	65.00	78.33
Bhutanese Painting Materials						
MT0695	Mud Paint for Bhutanese traditional painting	**kg**	83.33	90.00	87.50	83.33
MT0696	Animal glue	**kg**	231.67	108.33	200.00	231.67
MT0697	Cloth for Bhutanese painting	**sq.m**	42.50	36.00	35.67	42.50
MT0698	Paper for Bhutanese painting	**sq.m**	60.00	50.00	52.50	60.00
MT0699	Colour powder(excluding gold powder)	**kg**	265.00	383.33	365.00	265.00
MT0700	Gold powder	**kg**	1425.00	1266.67	1375.00	1425.00
Primers						
MT0710	Cement primer	**litre**	131.10	182.50	131.67	156.67
MT0711	Synthetic red lead primer	**litre**	197.50	241.67	186.67	223.33
MT0712	Red oxide primer, for metals	**litre**	159.27	241.67	223.33	206.67
MT0713	White primer, for wood	**litre**	202.25	288.33	230.00	246.67
MT0714	Pink primer, for wood	**litre**	206.33	291.67	233.33	266.67
Finishing coat						
MT0720	Aluminium paint	**litre**	367.00	423.33	343.33	386.67
MT0721	Red Corrugal paint	**litre**	242.00	300.00	253.33	275.40
MT0722	Synthetic enamel paint	**litre**	224.00	356.67	266.67	313.33
MT0723	High gloss synthetic enamel	**litre**	292.50	440.00	290.00	370.00
MT0724	Acrylic emulsion	**litre**	337.33	288.33	280.00	300.00
MT0725	Vinyl plastic emulsion paint (for cement plaster)	**litre**	260.00	350.00	340.00	350.00
MT0726	Black/White bitumen enamel	**litre**	259.90	250.00	272.50	350.00
Stains - Varnish - Polish						
MT0730	Wood Stain (various colours)	**litre**	506.67	506.67	400.00	500.00
MT0731	Clear synthetic varnish	**litre**	430.00	430.00	303.33	456.67
MT0732	French Polish	**litre**	188.33	188.33	180.00	230.00

Code	Description	Units	PL	GP	S/J	TH
Wood Preservative						
MT0735	Wood preservative -Brown	**litre**	400.00	400.00	400.00	350.00
MT0736	Crude Coal Tar	**litre**	227.50	230.00	225.00	230.00
Accessories						
MT0740	Putty for wood	**kg**	213.33	218.33	196.67	276.67
MT0741	Wall Putty	**kg**	40.00	52.50	42.50	36.67
Wall Paper						
Wall paper:						
MT0745	Standard	**sq.m**	203.67	215.00	210.00	262.50
MT0746	High Quality	**sq.m**	342.67	320.00	325.00	362.50
Retro Reflective Sheet						
MT0747	High Intensity Retro-reflective sheet	**sq.m**	1331.45	1331.45	1331.45	1331.45
Road Marking Paint						
MT1679	Thermoplastic road marking paint	**litre**	330.00	302.50	325.00	358.33
DRAINAGE MATERIALS						
C. I. Manhole Covers						
MT0750	Watertight C.I. Manhole Cover with frame, 300 x 300mm inside size Wt. of cover not less than 4.53 kg wt. of frame not less than 2.72 kg	**each**	1125.00	1062.50	1125.00	1218.75
MT0751	C.I. manhole cover with frame (light duty) internal dimension 455 x 610mm Total weight of Cover and frame not less than 38 kg. (Cover 23 kg. and frame 15 kg.)	**each**	4750.00	4657.50	4750.00	5700.00
MT0752	C.I. manhole cover and frame (medium duty) 500mm internal dia. Total weight of cover and frame not less than 116 kg. (cover 58 kg. and frame 58 kg)	**each**	14500.00	15950.00	14500.00	17400.00
MT0753	C.I.manhole cover 400mm dia. inside, mosquito proof with locking arrangement (Wt of cover not less than 7kg).	**each**	1057.00	1050.00	1057.00	1050.00
Rain-water Pipes & Fittings						
R.C Non - Pressure pipe						
NP2 class						
MT0768	100 mm dia	**m**	390.00	390.00	390.00	390.00
MT0769	150 mm dia	**m**	450.00	450.00	450.00	450.00
MT0770	225mm dia	**m**	656.00	656.00	656.00	656.00
MT0771	300mm dia	**m**	850.00	1075.00	850.00	850.00
MT0772	450mm dia	**m**	1126.40	1800.00	1126.40	1126.40
MT0773	600mm dia	**m**	1578.40	2200.00	1578.40	1578.40
MT0774	750mm dia	**m**	2700.00	2600.00	2700.00	2700.00
MT0775	900mm dia	**m**	3198.00	3000.00	3198.00	3198.00
MT0776	1050mm dia	**m**	4100.00	4120.00	4100.00	4100.00
MT0777	1200mm dia	**m**	4518.00	4720.00	4518.00	4518.00

Code	Description	Units	PL	GP	S/J	TH
NP2 Class Collar						
MT0783	100 mm dia	**each**	95.00	95.00	95.00	95.00
MT0784	150 mm dia	**each**	115.00	115.00	115.00	115.00
MT0785	225mm dia	**each**	135.00	135.00	135.00	135.00
MT0786	300mm dia	**each**	195.00	300.00	195.00	195.00
MT0787	450mm dia	**each**	390.00	450.00	390.00	390.00
MT0788	600mm dia	**each**	595.00	650.00	595.00	595.00
MT0789	750mm dia	**each**	895.00	750.00	895.00	895.00
MT0790	900mm dia	**each**	1395.00	850.00	1395.00	1395.00
MT0791	1050mm dia	**each**	1450.00	950.00	1450.00	1450.00
MT0792	1200mm dia	**each**	1795.00	1100.00	1795.00	1795.00
RCC PIPE NP-3 CLASS SPIGOT & SOCKET TYPE						
MT1900	RCC pipe 450 mm dia NP-3 spigot & socket	**m**	1640.00	1640.00	1640.00	1640.00
MT1901	RCC pipe 600 mm dia NP-3 spigot & socket	**m**	2600.00	2562.53	2600.00	2600.00
MT1902	RCC pipe 900 mm dia NP-3 spigot & socket	**m**	4200.00	4197.33	4200.00	4200.00
MT1903	RCC pipe 1050 mm dia NP-3 spigot & socket	**m**	6500.00	6481.67	6500.00	6500.00
MT1904	RCC pipe 1200 mm dia NP-3 spigot & socket	**m**	7250.00	7205.07	7250.00	7250.00
PLUMBING (PIPEWORK)						
W a t e r S u p p l y P i p e s						
G.I pipe						
MT0805	15mm	**m**	160.00	160.00	175.00	229.22
MT0806	20mm	**m**	209.00	209.00	231.00	275.28
MT0807	25mm	**m**	289.00	289.00	290.00	338.33
MT0808	32mm	**m**	378.00	378.00	460.00	456.39
MT0809	40mm	**m**	414.00	414.00	505.00	579.83
MT0810	50mm	**m**	596.00	596.00	603.00	674.11
MT0811	65mm	**m**	777.00	777.00	867.00	820.56
MT0812	80mm	**m**	955.00	955.00	1035.00	1148.06
MT0813	100mm	**m**	1386.00	1386.00	1585.00	1577.92
MT0814	150mm	**m**	2048.00	2048.00	2500.00	2196.00
H.D.P.E pressure class PN 12.5						
MT1685	20mm	**m**	26.66	26.66	31.50	32.03
MT1686	25mm	**m**	41.00	41.00	47.50	48.00
MT1687	32mm	**m**	57.85	57.85	68.00	75.00
MT1688	40mm	**m**	92.12	92.12	109.00	110.00
MT1689	50mm	**m**	143.54	143.54	166.00	170.00
MT1690	63mm	**m**	222.76	222.76	285.00	260.00
MT1691	75mm	**m**	316.87	316.87	410.00	410.00
MT1692	90mm	**m**	460.42	460.42	590.00	520.00
MT1693	110mm	**m**	681.05	681.05	880.00	880.00
MT1694	125mm	**m**	874.02	874.02	1230.00	1120.00
MT1695	140mm	**m**	1098.91	1098.91	1550.00	1280.00
MT1696	160mm	**m**	1432.80	1432.80	2020.00	1720.00
MT1697	180mm	**m**	1811.87	1811.87	2550.00	2250.00
MT1698	200mm	**m**	2233.99	2233.99	3145.00	2620.00
MT1699	225mm	**m**	2829.43	2829.43	3479.43	3200.00
MT1700	250mm	**m**	3480.69	3480.69	4282.19	3950.00
MT1701	280mm	**m**	4365.85	4365.85	4595.69	4825.00
MT1702	315mm	**m**	5526.95	5526.95	5817.90	6150.00
MT1703	355mm	**m**	7017.69	7017.69	7387.38	7750.00
MT1704	400mm	**m**	9095.87	9095.87	9574.73	9920.00

Code	Description	Units	PL	GP	S/J	TH
H.D.P.E pressure class PN 10						
MT0817	20mm	**m**	24.25	26.25	22.50	24.16
MT0818	25mm	**m**	34.86	36.23	41.00	39.76
MT0819	32mm	**m**	51.41	51.56	61.50	52.35
MT0820	40mm	**m**	77.09	69.09	91.50	95.00
MT0821	50mm	**m**	117.83	96.52	139.00	140.00
MT0822	63mm	**m**	188.70	140.72	222.50	220.00
MT0823	75mm	**m**	267.79	281.88	345.00	310.00
MT0824	90mm	**m**	381.32	401.39	490.00	445.00
MT0825	110mm	**m**	565.55	595.32	820.00	620.00
MT0826	140mm	**m**	910.46	958.38	1285.00	1100.00
MT0827	160mm	**m**	1188.95	1251.53	1675.00	1390.00
MT0828	225mm	**m**	2350.05	2473.74	3305.00	2750.00
MT1710	250mm	**m**	2894.18	3046.51	3560.76	3350.00
MT1711	280mm	**m**	3624.69	3815.46	3815.46	4220.00
MT1712	315mm	**m**	4592.98	4834.72	4834.72	5200.00
MT1713	355mm	**m**	5841.92	6149.39	6149.39	6500.00
MT1714	400mm	**m**	7566.43	7964.66	7964.66	8300.00
H.D.P.E Pipes of pressure class PN 6						
MT0830	32mm	**m**	44.06	45.50	51.00	42.57
MT0831	40mm	**m**	59.46	62.03	87.50	74.26
MT0832	50mm	**m**	92.27	97.12	136.00	125.00
MT0833	63mm	**m**	143.52	151.07	198.50	190.00
MT0834	75mm	**m**	202.98	213.66	258.00	260.00
MT0835	90mm	**m**	287.05	302.15	366.00	420.00
MT0836	110mm	**m**	359.90	406.92	507.00	490.00
MT0837	140mm	**m**	586.94	617.87	828.00	740.00
MT0838	160mm	**m**	764.52	834.02	1068.00	950.00
MT0839	225mm	**m**	1512.02	1592.03	1861.02	1750.00
MT1718	250mm	**m**	1857.05	1955.09	2285.05	2250.00
MT1719	280mm	**m**	2330.72	2453.44	2453.44	2750.00
MT1720	315mm	**m**	2949.57	3105.14	3105.14	3380.00
MT1721	355mm	**m**	3737.99	3934.98	3934.98	4320.00
MT1722	400mm	**m**	4835.07	5089.54	5089.54	5530.00
H.D.P.E Pipes of pressure class PN 4						
MT0841	40mm	**m**	54.25	56.00	65.00	68.00
MT0842	50mm	**m**	75.86	79.85	84.50	110.00
MT0843	63mm	**m**	102.46	107.91	121.00	150.00
MT0844	75mm	**m**	139.38	146.76	178.00	195.00
MT0845	90mm	**m**	202.83	213.66	259.00	280.00
MT0846	110mm	**m**	256.80	270.60	331.00	330.00
MT0847	140mm	**m**	428.00	451.00	552.00	570.00
MT0848	160mm	**m**	556.50	586.00	717.00	640.00
MT0849	225mm	**m**	1049.48	1104.95	1228.48	1320.00
MT1726	250mm	**m**	1285.00	1353.00	1504.50	1650.00
MT1727	280mm	**m**	1627.90	1713.80	1713.80	2050.00
MT1728	315mm	**m**	2035.13	2142.25	2142.25	2360.00
MT1729	355mm	**m**	2591.78	2728.55	2728.55	3100.00
MT1730	400mm	**m**	4129.84	4347.67	4347.67	4650.00
H.D.P.E Pipes of pressure class PN 2.5						
MT0852	110mm	**m**	194.78	205.03	226.52	310.00
MT0853	140mm	**m**	319.85	336.68	355.34	480.00
MT0854	160mm	**m**	414.16	435.95	481.98	620.00
MT0855	225mm	**m**	799.62	841.70	930.85	1050.00
PP-R Pipes (Pressure Normal 16)						
MT1760	PN-16 pipe,16mm OD	**m**	115.00	124.00	124.00	147.00
MT1761	PN-16 pipe,20mm OD	**m**	125.00	133.00	133.00	154.00
MT1762	PN-16 pipe,25mm OD	**m**	180.33	188.00	188.00	234.00
MT1763	PN-16 pipe,32mm OD	**m**	286.33	310.00	310.00	377.00
MT1764	PN-16 pipe,40mm OD	**m**	462.33	538.00	538.00	606.00
MT1765	PN-16 pipe,50mm OD	**m**	811.00	880.00	880.00	949.00
MT1766	PN-16 pipe,63mm OD	**m**	1263.00	1336.00	1336.00	1567.00
MT1767	PN-16 pipe,75mm OD	**m**	1790.00	1893.00	1893.00	2022.00

Code	Description	Units	PL	GP	S/J	TH
PP-R Pipes (Pressure Normal 10)						
MT1768	PN-10 pipe,90mm OD	**m**	1855.00	1962.00	1962.00	2301.00
MT1769	PN-10 pipe,110mm OD	**m**	2700.50	2856.00	2856.00	3349.00
MT1770	PN-10 pipe,160mm OD	**m**	5691.00	6018.00	6018.00	7058.00
Chlorinated Polyvinyl Chloride (CPVC)						
MT1800	15 mm nominal outer dia Pipes	**m**	69.27	74.89	93.00	159.33
MT1801	20 mm nominal outer dia Pipes	**m**	80.54	102.22	96.50	223.11
MT1802	25 mm nominal outer dia Pipes	**m**	124.87	152.55	137.50	346.56
MT1803	32 mm nominal outer dia Pipes	**m**	210.98	223.44	200.00	584.56
MT1804	40 mm nominal outer dia Pipes	**m**	289.54	331.77	252.50	806.78
MT1805	50 mm nominal outer dia Pipes	**m**	496.33	558.33	624.00	1380.78
Unplasticized Polyvinyl Chloride (uPVC)						
MT1820	110 mm	**m**	599.66	395.87	599.66	599.66
MT1821	160 mm	**m**	1159.66	1159.66	1159.66	1159.66
MT1822	180 mm	**m**	1060.00	1060.00	1060.00	1060.00
MT1823	200 mm	**m**	1277.00	1277.00	1277.00	1277.00
MT1824	225 mm	**m**	1693.00	1693.00	1693.00	1693.00
MT1825	250 mm	**m**	1995.00	1995.00	1995.00	1995.00
MT1826	280 mm	**m**	2527.00	2527.00	2527.00	2527.00
MT1827	315 mm	**m**	3269.00	3269.00	3269.00	3269.00
MT1828	400 mm	**m**	3724.00	3724.00	3724.00	3724.00
MT1829	450 mm	**m**	4753.00	4753.00	4753.00	4753.00
MT1830	560 mm	**m**	6200.00	6200.00	6200.00	6200.00
Ductile Iron Pipes with Push-on Joints - Class K9						
MT0856	80 mm	**m**	1345.00	1345.00	1345.00	1705.00
MT0857	100 mm	**m**	1490.00	1490.00	1490.00	1925.00
MT0858	150 mm	**m**	1960.00	1960.00	1960.00	2409.00
MT0859	200 mm	**m**	2705.00	2705.00	2705.00	3465.00
MT0860	250 mm	**m**	3375.00	3375.00	3375.00	4015.00
MT0861	300 mm	**m**	4205.00	4205.00	4205.00	5016.00
MT0862	350 mm	**m**	4620.00	4620.00	4620.00	5346.00
MT0863	400 mm	**m**	5395.00	5395.00	5395.00	6116.00
MT0864	450 mm	**m**	6170.00	6170.00	6170.00	6787.00
MT0865	500 mm	**m**	7170.00	7170.00	7170.00	7887.00
MT0866	600 mm	**m**	9800.00	9800.00	9800.00	10780.00
Ductile Iron Pipes with Push-on Joints - Class K7						
MT0871	100 mm	**m**	1375.00	1375.00	1375.00	1815.00
MT0872	150 mm	**m**	1755.00	1755.00	1755.00	2156.00
MT0873	200 mm	**m**	2410.00	2410.00	2410.00	3179.00
MT0874	250 mm	**m**	2905.00	2905.00	2905.00	3465.00
MT0875	300 mm	**m**	3530.00	3530.00	3530.00	4125.00
MT0876	350 mm	**m**	4090.00	4090.00	4090.00	4785.00
MT0877	400 mm	**m**	4765.00	4765.00	4765.00	5456.00
MT0878	450 mm	**m**	5350.00	5350.00	5350.00	5350.00
MT0879	500 mm	**m**	6250.00	6250.00	6250.00	6250.00
MT0880	600 mm	**m**	8570.00	8570.00	8570.00	8570.00
Ductile Iron Pipes with Double Flanged Joints -K 9						
MT0882	100 mm	**m**	1830.00	1830.00	1830.00	2080.00
MT0883	150 mm	**m**	2520.00	2520.00	2520.00	2820.00
MT0884	200 mm	**m**	3340.00	3340.00	3340.00	3880.00
MT0885	250 mm	**m**	4600.00	4600.00	4600.00	5380.00
MT0886	300 mm	**m**	5800.00	5800.00	5800.00	6900.00
MT0887	350 mm	**m**	6880.00	6880.00	6880.00	8900.00
MT0888	400 mm	**m**	8630.00	8630.00	8630.00	11480.00
MT0889	450 mm	**m**	10670.00	10670.00	10670.00	14600.00
MT0890	500 mm	**m**	12650.00	12650.00	12650.00	17480.00
MT0891	600 mm	**m**	16800.00	16800.00	16800.00	23280.00

Code	Description	Units	PL	GP	S/J	TH
Ductile Iron Restrained Joint Pipes						
MT0980	80mm	**m**	1600.00	1600.00	1600.00	1680.00
MT0981	100mm	**m**	1800.00	1800.00	1800.00	1890.00
MT0982	150mm	**m**	2400.00	2400.00	2400.00	2520.00
MT0983	200mm	**m**	3100.00	3100.00	3100.00	3255.00
MT0984	250mm	**m**	4200.00	4200.00	4200.00	4410.00
MT0985	300mm	**m**	5100.00	5100.00	5100.00	5355.00
MT0986	350mm	**m**	5800.00	5800.00	5800.00	6090.00
MT0987	400mm	**m**	6900.00	6900.00	6900.00	7245.00
MT0988	450mm	**m**	8000.00	8000.00	8000.00	8400.00
MT0989	500mm	**m**	9200.00	9200.00	9200.00	9660.00
MT0990	600mm	**m**	12100.00	12100.00	12100.00	12705.00
P i p e F i t t i n g s						
H.D.P.E welded-type fittings						
MT0895	TEE, 20mm	**each**	68.75	68.75	68.75	68.75
MT0896	TEE, 25mm	**each**	93.75	93.75	93.75	93.75
MT0897	TEE, 32mm	**each**	112.50	112.50	112.50	112.50
MT0898	TEE, 50mm	**each**	131.00	131.00	131.00	131.00
MT0899	TEE, 63mm	**each**	300.00	300.00	300.00	300.00
MT0900	TEE, 90mm	**each**	700.00	700.00	700.00	700.00
MT0901	TEE, 110mm	**each**	812.00	812.00	812.00	812.00
MT0902	TEE, 160mm	**each**	1750.00	1750.00	1750.00	1750.00
MT0903	Elbow, 32mm	**each**	62.50	62.50	62.50	62.50
MT0904	Elbow, 50mm	**each**	118.75	118.75	118.75	118.75
MT0905	Elbow, 63mm	**each**	175.00	175.00	175.00	175.00
MT0906	Elbow, 90mm	**each**	337.50	337.50	337.50	337.50
MT0907	Elbow, 110mm	**each**	537.50	537.50	537.50	537.50
MT0908	Reducer, 90 x 50mm	**each**	268.75	268.75	268.75	268.75
MT0909	Reducer, 90 x 63mm	**each**	290.00	290.00	290.00	290.00
MT0910	Reducer, 110 x 63mm	**each**	306.25	306.25	306.25	306.25
MT0911	Reducer, 160 x 90mm	**each**	643.75	643.75	643.75	643.75
MT0912	Blank end, 50mm	**each**	68.75	68.75	68.75	68.75
MT0913	Blank end, 63mm	**each**	87.50	87.50	87.50	87.50
MT0914	Blank end, 90mm	**each**	205.00	205.00	205.00	205.00
MT0915	Blank end, 110mm	**each**	262.50	262.50	262.50	262.50
MT0916	Blank end, 160mm	**each**	462.50	462.50	462.50	462.50
G.I. Union						
MT0921	32mm	**each**	48.00	48.00	48.00	48.00
MT0922	40mm	**each**	50.00	50.00	50.00	50.00
Brass Bibcock						
MT0925	15mm	**each**	277.50	262.50	301.67	335.00
Brass Stopcock						
MT0930	15mm nom-bore	**each**	763.00	763.00	763.00	763.00
MT0931	20mm nom-bore	**each**	840.00	840.00	840.00	840.00
MT0932	25mm nom-bore	**each**	910.00	910.00	910.00	910.00
Brass - Wheel valve						
MT0940	32mm nom-bore	**each**	594.10	594.10	594.10	594.10
MT0941	40mm nom-bore	**each**	632.50	632.50	632.50	632.50
MT0942	50mm nom-bore	**each**	791.20	791.20	791.20	791.20
MT0943	65mm nom-bore	**each**	1366.20	1366.20	1366.20	1366.20
MT0944	80mm nom-bore	**each**	2056.20	2056.20	2056.20	2056.20
Brass Non return valve						
MT0951	50mm nom-bore	**each**	1201.20	1200.60	1201.20	1201.20
MT0952	65mm nom-bore	**each**	2181.40	2840.70	2181.40	2181.40
MT0953	80mm nom-bore	**each**	3289.00	4394.50	3289.00	3289.00

Code	Description	Units	PL	GP	S/J	TH
Rubber Gasket of S.B.R Quality						
MT0960	80 mm	**each**	41.67	45.00	42.00	45.00
MT0961	100 mm	**each**	55.00	57.50	47.50	58.33
MT0962	150 mm	**each**	97.50	97.50	97.50	122.50
MT0963	200 mm	**each**	152.50	152.50	141.50	168.00
MT0964	250 mm	**each**	212.50	212.50	175.00	212.50
MT0965	300 mm	**each**	255.00	255.00	212.00	255.00
MT0966	350 mm	**each**	282.50	282.50	275.00	282.50
MT0967	400 mm	**each**	300.00	300.00	295.00	300.00
MT0968	450 mm	**each**	310.00	310.00	310.00	310.00
MT0969	500 mm	**each**	320.00	320.00	320.00	320.00
MT0970	600 mm	**each**	380.00	380.00	380.00	380.00
W a s t e - w a t e r P i p e w o r k - PVC						
Pipes, Single Socketed 1.83 m long						
MT1150	75mm	**each**	342.82	342.82	342.82	342.82
MT1151	50mm	**each**	300.73	300.73	300.73	300.73
MT1152	110mm	**each**	615.49	615.49	615.49	615.49
Pipes, Single Socketed 3.00 m long						
MT1160	75mm	**each**	342.82	342.82	342.82	562.00
MT1161	50mm	**each**	300.73	300.73	300.73	493.00
MT1162	110mm	**each**	615.49	615.49	615.49	1009.00
Pipes, Doubled Socketed 1.83 m long						
MT1170	75mm	**each**	342.82	342.82	342.82	342.82
MT1171	50mm	**each**	300.73	300.73	300.73	300.73
MT1172	110mm	**each**	615.49	615.49	615.49	615.49
Pipes, Doubled Socketed 1.20 m long						
MT1180	75mm	**each**	224.80	224.80	224.80	224.80
MT1181	50mm	**each**	197.20	197.20	197.20	197.20
MT1182	110mm	**each**	403.60	403.60	403.60	403.60
Pipe Connector						
MT1190	110mm	**each**	112.50	110.00	115.00	137.50
Reducer						
MT1195	90x75mm	**each**	98.71	98.71	98.71	100.00
MT1196	110x75mm	**each**	107.00	107.00	107.00	126.67
MT1197	110x90mm	**each**	123.00	123.00	123.00	132.00
Coupler						
MT1205	75mm	**each**	58.50	73.33	70.00	73.33
MT1206	50mm	**each**	47.00	60.00	55.00	60.00
MT1207	110mm	**each**	102.00	95.00	115.00	124.00
Plain bend						
MT1215	75mm	**each**	76.50	83.33	95.00	102.00
MT1216	50mm	**each**	55.00	61.67	75.00	90.00
MT1217	110mm	**each**	136.00	146.67	150.00	160.67
Door bend						
MT1225	75mm	**each**	118.00	116.67	120.00	122.00
MT1226	50mm	**each**	86.67	78.33	85.00	88.00
MT1227	110mm	**each**	194.00	153.33	222.50	211.33
Long Arm Bend						
MT1235	75mm	**each**	185.00	188.00	188.00	200.00
MT1236	50mm	**each**	110.00	135.00	167.50	180.00
MT1237	110mm	**each**	400.00	372.50	397.50	450.00

Code	Description	Units	PL	GP	S/J	TH
Plain Shoe						
MT1239	75mm	**each**	132.00	120.00	132.00	145.00
MT1240	50mm	**each**	90.00	90.00	95.00	110.00
MT1241	110mm	**each**	190.00	150.00	190.00	200.00
Single Tee, Plain						
MT1245	75mm	**each**	117.67	125.00	102.50	132.67
MT1246	50mm	**each**	85.00	87.50	57.50	77.33
MT1247	110mm	**each**	211.33	207.50	185.00	234.67
Single Tee, With Door						
MT1255	75mm	**each**	114.00	116.33	125.00	136.00
MT1256	50mm	**each**	85.00	83.33	95.00	95.00
MT1257	110mm	**each**	214.50	195.00	225.00	271.33
Double Tee, Plain						
MT1265	75mm	**each**	180.00	195.00	180.00	257.50
MT1266	50mm	**each**	130.00	87.50	165.00	180.00
MT1267	110mm	**each**	320.00	380.00	320.00	495.00
Double Tee, With Door						
MT1275	75mm	**each**	271.67	230.00	250.00	330.00
MT1276	50mm	**each**	220.00	200.00	190.00	190.00
MT1277	110mm	**each**	480.00	387.50	450.00	547.50
Single Y, Plain						
MT1285	75mm	**each**	170.00	165.00	190.00	190.00
MT1286	50mm	**each**	120.00	110.00	125.00	155.00
MT1287	110mm	**each**	302.50	295.00	280.00	310.00
Single Y, With Door						
MT1295	75mm	**each**	168.67	151.67	215.00	252.50
MT1296	50mm	**each**	135.00	115.00	140.00	165.00
MT1297	110mm	**each**	261.67	254.67	285.00	385.00
Double Y, Plain						
MT1305	75mm	**each**	172.50	171.00	242.50	243.00
MT1306	50mm	**each**	122.50	137.50	190.00	186.67
MT1307	110mm	**each**	295.00	308.50	310.00	429.33
Double Y, With Door						
MT1315	75mm	**each**	203.50	235.00	220.00	269.50
MT1316	50mm	**each**	155.00	190.00	190.00	200.00
MT1317	110mm	**each**	350.50	410.00	380.00	487.00
Seal Ring						
MT1320	75 mm	**each**	32.50	45.00	35.00	40.00
MT1321	50 mm	**each**	27.50	35.00	22.50	40.00
MT1322	110 mm	**each**	55.00	60.00	50.00	60.00
75mm dia. offset						
MT1325	With 75mm projection	**each**	145.00	105.00	110.00	150.00
MT1326	With 150mm projection	**each**	180.00	147.50	150.00	170.00
90mm dia. offset						
MT1330	With 75mm projection	**each**	152.00	151.00	152.00	200.00
MT1331	With 150mm projection	**each**	253.00	251.50	253.00	350.00
110mm dia. offset						
MT1335	With 75mm projection	**each**	182.00	181.00	182.00	200.00
MT1336	With 150mm projection	**each**	265.00	262.50	265.00	270.00

Code	Description	Units	PL	GP	S/J	TH
Floor Trap						
MT1340	75mm	**each**	92.00	92.00	92.00	92.00
MT1341	50mm	**each**	65.00	75.00	75.00	75.00
MT1342	110mm	**each**	135.00	135.00	135.00	135.00
Nahani Trap						
MT1345	100mm inlet & 75mm outlet	**each**	170.33	146.67	147.50	152.00
P-Trap without air vent						
MT1350	Big	**each**	320.00	337.50	335.00	450.00
MT1351	Small	**each**	265.00	275.00	255.00	300.00
Ductile Iron Pipe fittings						
Double Socket Bend 90/45/22.5/11.25 deg						
MT2100	80 mm	**each**	1135.00	1135.00	1135.00	1135.00
MT2101	100 mm	**each**	1392.00	1392.00	1392.00	1392.00
MT2102	150 mm	**each**	2380.00	2380.00	2380.00	2380.00
MT2103	200 mm	**each**	3698.00	3698.00	3698.00	3698.00
MT2104	250 mm	**each**	5053.00	5053.00	5053.00	5053.00
MT2105	300 mm	**each**	6893.00	6893.00	6893.00	6893.00
MT2106	350 mm	**each**	8944.00	8944.00	8944.00	8944.00
MT2107	400 mm	**each**	11524.00	11524.00	11524.00	11524.00
MT2108	450 mm	**each**	14740.75	14740.75	14740.75	14740.75
MT2109	500 mm	**each**	17922.50	17922.50	17922.50	17922.50
MT2110	600 mm	**each**	21530.00	21530.00	21530.00	21530.00
Duckfoot Double Socket Bend						
MT2111	80 mm	**each**	1904.00	1904.00	1904.00	1904.00
MT2112	100 mm	**each**	2343.00	2343.00	2343.00	2343.00
MT2113	150 mm	**each**	4247.00	4247.00	4247.00	4247.00
MT2114	200 mm	**each**	6883.00	6883.00	6883.00	6883.00
MT2115	250 mm	**each**	10252.00	10252.00	10252.00	10252.00
MT2116	300 mm	**each**	14140.00	14140.00	14140.00	14140.00
MT2117	350 mm	**each**	19089.00	19089.00	19089.00	19089.00
MT2118	400 mm	**each**	25452.00	25452.00	25452.00	25452.00
MT2119	450 mm	**each**	32522.00	32522.00	32522.00	32522.00
MT2120	500 mm	**each**	41006.00	41006.00	41006.00	41006.00
All Socket Cross						
MT2122	All Socket Cross 80 mm x 80 mm	**each**	2343.00	2343.00	2343.00	2343.00
MT2123	All Socket Cross 100 mm x 100 mm	**each**	2929.00	2929.00	2929.00	2929.00
MT2124	All Socket Cross 150 mm x 150 mm	**each**	4979.00	4979.00	4979.00	4979.00
MT2125	All Socket Cross 200 mm x 200 mm	**each**	7615.00	7615.00	7615.00	7615.00
MT2126	All Socket Cross 250 mm x 250 mm	**each**	11130.00	11130.00	11130.00	11130.00
MT2127	All Socket Cross 300 mm x 300 mm	**each**	14706.00	14706.00	14706.00	14706.00
MT2128	All Socket Cross 350 mm x 350 mm	**each**	19230.00	19230.00	19230.00	19230.00
MT2129	All Socket Cross 400 mm x 400 mm	**each**	24321.00	24321.00	24321.00	24321.00
MT2130	All Socket Cross 450 mm x 450 mm	**each**	31674.00	31674.00	31674.00	31674.00
MT2131	All Socket Cross 500 mm x 500 mm	**each**	38461.00	38461.00	38461.00	38461.00

Code	Description	Units	PL	GP	S/J	TH
Double Socket Reducer						
MT2132	Double Socket Reducer 100 mm x 80 mm	**each**	1172.00	1172.00	1172.00	1172.00
MT2133	Double Socket Reducer 150 mm x 80 mm	**each**	1904.00	1904.00	1904.00	1904.00
MT2134	Double Socket Reducer 150 mm x 100 mm	**each**	2050.00	2050.00	2050.00	2050.00
MT2135	Double Socket Reducer 200 mm x 80 mm	**each**	2929.00	2929.00	2929.00	2929.00
MT2136	Double Socket Reducer 200 mm x 100 mm	**each**	2929.00	2929.00	2929.00	2929.00
MT2137	Double Socket Reducer 200 mm x 150 mm	**each**	3222.00	3222.00	3222.00	3222.00
MT2138	Double Socket Reducer 250 mm x 80 mm	**each**	2636.00	2636.00	2636.00	2636.00
MT2139	Double Socket Reducer 250 mm x 100 mm	**each**	4101.00	4101.00	4101.00	4101.00
MT2140	Double Socket Reducer 250 mm x 150 mm	**each**	4394.00	4394.00	4394.00	4394.00
MT2141	Double Socket Reducer 250 mm x 200 mm	**each**	4101.00	4101.00	4101.00	4101.00
MT2142	Double Socket Reducer 300 mm x 100 mm	**each**	5232.00	5232.00	5232.00	5232.00
MT2143	Double Socket Reducer 300 mm x 150 mm	**each**	5515.00	5515.00	5515.00	5515.00
MT2144	Double Socket Reducer 300 mm x 200 mm	**each**	5515.00	5515.00	5515.00	5515.00
MT2145	Double Socket Reducer 300 mm x 250 mm	**each**	5090.00	5090.00	5090.00	5090.00
MT2146	Double Socket Reducer 350 mm x 150 mm	**each**	7070.00	7070.00	7070.00	7070.00
MT2147	Double Socket Reducer 350 mm x 200 mm	**each**	7353.00	7353.00	7353.00	7353.00
MT2148	Double Socket Reducer 350 mm x 250 mm	**each**	7211.00	7211.00	7211.00	7211.00
MT2149	Double Socket Reducer 350 mm x 300 mm	**each**	7070.00	7070.00	7070.00	7070.00
MT2150	Double Socket Reducer 400 mm x 200 mm	**each**	9615.00	9615.00	9615.00	9615.00
MT2151	Double Socket Reducer 400 mm x 250 mm	**each**	8767.00	8767.00	8767.00	8767.00
MT2152	Double Socket Reducer 400 mm x 300 mm	**each**	8484.00	8484.00	8484.00	8484.00
MT2153	Double Socket Reducer 400 mm x 350 mm	**each**	7636.00	7636.00	7636.00	7636.00
All Socket Tee						
MT2154	All Socket Tee 100 mm x 80 mm	**each**	2050.00	2050.00	2050.00	2050.00
MT2155	All Socket Tee 100 mm x 100 mm	**each**	2197.00	2197.00	2197.00	2197.00
MT2156	All Socket Tee 150 mm x 80 mm	**each**	2929.00	2929.00	2929.00	2929.00
MT2157	All Socket Tee 150 mm x 100 mm	**each**	3222.00	3222.00	3222.00	3222.00
MT2158	All Socket Tee 150 mm x 150 mm	**each**	3808.00	3808.00	3808.00	3808.00
MT2159	All Socket Tee 200 mm x 80 mm	**each**	4247.00	4247.00	4247.00	4247.00
MT2160	All Socket Tee 200 mm x 100 mm	**each**	4540.00	4540.00	4540.00	4540.00
MT2161	All Socket Tee 200 mm x 150 mm	**each**	5272.00	5272.00	5272.00	5272.00
MT2162	All Socket Tee 200 mm x 200 mm	**each**	5858.00	5858.00	5858.00	5858.00
MT2163	All Socket Tee 250 mm x 80 mm	**each**	5419.00	5419.00	5419.00	5419.00
MT2164	All Socket Tee 250 mm x 100 mm	**each**	5858.00	5858.00	5858.00	5858.00
MT2165	All Socket Tee 250 mm x 150 mm	**each**	6590.00	6590.00	6590.00	6590.00
MT2166	All Socket Tee 250 mm x 200 mm	**each**	7323.00	7323.00	7323.00	7323.00
MT2167	All Socket Tee 250 mm x 250 mm	**each**	8348.00	8348.00	8348.00	8348.00
MT2168	All Socket Tee 300 mm x 80 mm	**each**	7070.00	7070.00	7070.00	7070.00
MT2169	All Socket Tee 300 mm x 100 mm	**each**	7211.00	7211.00	7211.00	7211.00
MT2170	All Socket Tee 300 mm x 150 mm	**each**	8201.00	8201.00	8201.00	8201.00
MT2171	All Socket Tee 300 mm x 200 mm	**each**	9050.00	9050.00	9050.00	9050.00
MT2172	All Socket Tee 300 mm x 250 mm	**each**	9898.00	9898.00	9898.00	9898.00
MT2173	All Socket Tee 300 mm x 300 mm	**each**	11029.00	11029.00	11029.00	11029.00
MT2174	All Socket Tee 350 mm x 80 mm	**each**	8201.00	8201.00	8201.00	8201.00
MT2175	All Socket Tee 350 mm x 100 mm	**each**	8343.00	8343.00	8343.00	8343.00
MT2176	All Socket Tee 350 mm x 150 mm	**each**	9615.00	9615.00	9615.00	9615.00
MT2177	All Socket Tee 350 mm x 200 mm	**each**	10605.00	10605.00	10605.00	10605.00
MT2178	All Socket Tee 350 mm x 250 mm	**each**	12726.00	12726.00	12726.00	12726.00
MT2179	All Socket Tee 350 mm x 300 mm	**each**	14140.00	14140.00	14140.00	14140.00
MT2180	All Socket Tee 350 mm x 350 mm	**each**	14423.00	14423.00	14423.00	14423.00

Code	Description	Units	PL	GP	S/J	TH
MT2181	All Socket Tee 400 mm x 80 mm	each	10322.00	10322.00	10322.00	10322.00
MT2182	All Socket Tee 400 mm x 100 mm	each	10181.00	10181.00	10181.00	10181.00
MT2183	All Socket Tee 400 mm x 150 mm	each	12726.00	12726.00	12726.00	12726.00
MT2184	All Socket Tee 400 mm x 200 mm	each	13009.00	13009.00	13009.00	13009.00
MT2185	All Socket Tee 400 mm x 250 mm	each	14847.00	14847.00	14847.00	14847.00
MT2186	All Socket Tee 400 mm x 300 mm	each	16968.00	16968.00	16968.00	16968.00
MT2187	All Socket Tee 400 mm x 350 mm	each	17816.00	17816.00	17816.00	17816.00
MT2188	All Socket Tee 400 mm x 400 mm	each	18382.00	18382.00	18382.00	18382.00
MT2189	All Socket Tee 450 mm x 80 mm	each	12443.00	12443.00	12443.00	12443.00
MT2190	All Socket Tee 450 mm x 100 mm	each	12726.00	12726.00	12726.00	12726.00
MT2191	All Socket Tee 450 mm x 150 mm	each	14847.00	14847.00	14847.00	14847.00
MT2192	All Socket Tee 450 mm x 200 mm	each	16261.00	16261.00	16261.00	16261.00
MT2193	All Socket Tee 450 mm x 250 mm	each	16968.00	16968.00	16968.00	16968.00
MT2194	All Socket Tee 450 mm x 300 mm	each	19796.00	19796.00	19796.00	19796.00
MT2195	All Socket Tee 450 mm x 350 mm	each	21210.00	21210.00	21210.00	21210.00
MT2196	All Socket Tee 450 mm x 400 mm	each	23331.00	23331.00	23331.00	23331.00
MT2197	All Socket Tee 450 mm x 450 mm	each	23755.00	23755.00	23755.00	23755.00
MT2198	All Socket Tee 500 mm x 80 mm	each	14847.00	14847.00	14847.00	14847.00
MT2199	All Socket Tee 500 mm x 100 mm	each	15130.00	15130.00	15130.00	15130.00
MT2200	All Socket Tee 500 mm x 150 mm	each	17675.00	17675.00	17675.00	17675.00
MT2201	All Socket Tee 500 mm x 200 mm	each	19089.00	19089.00	19089.00	19089.00
MT2202	All Socket Tee 500 mm x 250 mm	each	21210.00	21210.00	21210.00	21210.00
MT2203	All Socket Tee 500 mm x 300 mm	each	22624.00	22624.00	22624.00	22624.00
MT2204	All Socket Tee 500 mm x 350 mm	each	24745.00	24745.00	24745.00	24745.00
MT2205	All Socket Tee 500 mm x 400 mm	each	26159.00	26159.00	26159.00	26159.00
MT2206	All Socket Tee 500 mm x 450 mm	each	28280.00	28280.00	28280.00	28280.00
MT2207	All Socket Tee 500 mm x 500 mm	each	28987.00	28987.00	28987.00	28987.00
PLUMBING (Sanitary Installation, Fittings & accessories)						
B a t h s						
MT1355	Porcelain bath tub, white enamelled, 1700x740x440 mm	each	17500.00	18000.00	18000.00	21500.00
MT1356	Fibreglass bath tub	each	23900.00	23900.00	23900.00	24750.00
B a s i n s, S i n k s						
Flat-back wash basin, white vitreous						
MT1360	630 x 450mm	each	1151.00	1140.00	1151.00	2024.50
MT1361	550 x 400mm	each	2402.50	2402.50	2402.50	1286.00
Angle back wash basin						
MT1365	400mm x 400mm, white vitreous china	each	1670.00	1670.00	1670.00	1670.00
Pedestal for wash basin						
MT1370	white vitreous china	each	1162.00	1075.00	1275.00	1600.00
Sinks White glazed vitreous China						
MT1375	600 x 450 x 250	each	1875.00	1875.00	2066.67	2350.00

Code	Description	Units	PL	GP	S/J	TH
Stainless Steel Kitchen Sinks						
MT1380	single bowl, 450 x 400 x 150mm	**each**	1125.00	1025.00	1125.00	1550.00
MT1381	single bowl, 580 x 480 x 175mm	**each**	1500.00	1325.00	1225.00	1750.00
MT1382	single bowl & drain-board, 940 x 460 x 160mm	**each**	1950.00	1750.00	1750.00	2250.00
MT1383	single bowl & drain-board, 1080 x 520 x 175mm	**each**	1950.00	1750.00	1750.00	2550.00
MT1384	single bowl & drain-board, 1150 x 515 x 175mm	**each**	1600.00	1600.00	1600.00	3443.50
MT1385	single bowl & double drain-board, 1740 x 520 x 200mm	**each**	2100.00	2100.00	2100.00	3200.00
MT1386	double bowl, 940 x 460 x 160mm	**each**	2866.00	2866.00	2200.00	2866.00
MT1387	double bowl, 1150 x 520 x 150mm	**each**	2610.00	2610.00	2610.00	3760.00
MT1388	double bowl & single drain-board, 1740 x 520 x 200mm	**each**	3200.00	3200.00	3200.00	3945.00
MT1389	double bowl & double drain-board, 1740 x 520 x 165mm	**each**	3700.00	3700.00	3700.00	5250.00
MT1390	single drain-board, 610 x 460mm	**each**	1125.00	1125.00	1125.00	1230.00
W.C. P a n s						
MT1400	Vitreous China European - white	**each**	1250.00	1560.00	1366.67	1966.67
MT1401	Vitreous China European One piece Toilet with seat cov	**each**	12790.00	12790.00	12790.00	12790.00
MT1403	Vitreous China Indian type - 580mm Orissa, white	**each**	965.00	965.00	775.00	775.00
MT1405	Plastic seat & lid for European pan	**each**	513.33	586.67	520.00	563.33
C i s t e r n s						
PVC Cistern with fittings						
MT1421	10 litres	**each**	1050.00	1225.00	1166.67	1250.00
Vitreous China cistern - low level, incl. fittings & flush-bend						
MT1430	10 litres, white	**each**	1075.00	1100.00	1000.00	1560.00
F l o a t V a l v e						
MT1440	15mm ball valve with plastic float	**each**	750.00	755.00	699.33	823.00
U r i n a l s						
MT1445	White vitreous China flat-back lipped-front type urinals, 430 x 260 x 350mm	**each**	1590.00	1680.00	1590.00	1680.00
Flush fittings						
MT1450	c.p flush valve, 32mm	**each**	2842.00	2842.00	2842.00	3129.00
MT1451	c.p flush valve, 32mm, concealed	**each**	2842.00	2842.00	700.00	3129.00
MT1452	c.p flush bend, long	**each**	795.00	795.00	795.00	795.00
MT1453	c.p flush valve elbow	**each**	150.00	150.00	150.00	150.00
C.p Cocks & Spouts						
MT1460	15mm pillar cock	**each**	2023.33	2023.33	2023.33	2023.33
MT1461	15mm pillar cock, swan neck, c.p knob	**each**	2290.00	2290.00	2290.00	2290.00
MT1463	20mm pillar cock (for bath)	**each**	2765.00	2765.00	2765.00	2765.00
MT1464	15mm bib cock, vert, c.p knob	**each**	1190.00	1190.00	1190.00	1190.00
MT1465	15mm bib cock, inclined, c.p knob	**each**	1270.00	1270.00	1270.00	1270.00
MT1466	15mm bib cock, long nose, c.p knob	**each**	1436.67	1436.67	1436.67	1436.67
MT1467	15mm bib cock, long body, c.p knob	**each**	1135.00	1135.00	1135.00	1135.00
MT1468	15mm stop cock, c.p knob	**each**	1290.00	1290.00	1290.00	1290.00
MT1469	20mm stop cock, c.p knob	**each**	1050.00	1050.00	1050.00	1050.00
MT1470	15mm stop cock, concealed, c.p knob	**each**	825.00	825.00	825.00	825.00
MT1471	15mm stop cock, H/D concealed, c.p knob	**each**	940.00	940.00	940.00	940.00

Code	Description	Units	PL	GP	S/J	TH
MT1472	20mm stop cock, H/D concealed, c.p knob	**each**	1050.00	1050.00	1050.00	1050.00
MT1473	15mm angle stop cock, c.p knob	**each**	1193.33	1193.33	1193.33	1193.33
MT1474	Wall spout, std, 15mm	**each**	1426.67	1426.67	1426.67	1426.67
MT1475	Wall spout, w/o diverter, used with single-lever mixers	**each**	2380.00	2380.00	2380.00	2380.00
MT1476	Wall spout, with diverter, used with single-lever mixers	**each**	2700.00	2700.00	2700.00	2700.00
C.p Brass Shower fittings for 15 to 20mm inlet						
MT1510	rose, 100mm dia	**each**	850.00	850.00	850.00	850.00
MT1511	rose, 150mm dia	**each**	1200.00	1200.00	1200.00	1200.00
MT1512	shower, with flex tube	**each**	1280.00	1280.00	1280.00	1280.00
MT1513	shower, revolving joint	**each**	1090.00	1090.00	1090.00	1090.00
MT1514	shower, adjustable with locking key	**each**	1380.00	1380.00	1380.00	1380.00
MT1515	shower arm, 15mm	**each**	840.00	840.00	840.00	840.00
MT1516	shower arm, 15mm, heavy duty	**each**	1180.00	1180.00	1180.00	1180.00
C.p Mixers						
MT1530	basin, single-hole, casted spout, 15mm	**each**	4776.67	4776.67	4776.67	4776.67
MT1531	basin, close-hole, 15mm	**each**	3670.00	3670.00	3670.00	3670.00
MT1532	sink, with spout J pipe, 15mm	**each**	4500.00	4500.00	4500.00	4500.00
MT1533	sink, with casted spout swinging, 15mm	**each**	4890.00	4890.00	4890.00	4890.00
MT1534	wall, non-telephonic type, 15mm	**each**	4533.33	4533.33	4533.33	4533.33
MT1535	wall, telephonic type with crutch and tel. shower, 15mm	**each**	6695.00	6695.00	6695.00	6695.00
MT1536	wall, telephonic type without crutch and tel. shower, 15mm	**each**	5290.00	5290.00	5290.00	5290.00
MT1537	wall, telephonic type with crutch and without tel. shower, 15mm	**each**	6290.00	6290.00	6290.00	6290.00
MT1538	wall, telephonic type with C.P bend & flanges, 15mm	**each**	6253.33	6253.33	6253.33	6253.33
MT1539	Three hole mixer without pop-up, 15mm	**each**	4200.00	4200.00	4200.00	4200.00
MT1540	Three hole mixer with pop-up, 15mm	**each**	5000.00	5000.00	5000.00	5000.00
MT1541	basin, elbow action, surgical, 15mm	**each**	3450.00	3450.00	3450.00	3450.00
MT1542	basin, elbow action, surgical with shower, 15mm	**each**	4860.00	4860.00	4860.00	4860.00
MT1543	bath, with exposed adjustable legs with telephone shower arrangement with crutch,15mm	**each**	6919.00	6919.00	6919.00	6919.00
MT1544	wall, with telephonic shower arrangement with 115mm long bend pipe for over head shower connection, 15mm	**each**	7450.00	7450.00	7450.00	7450.00
MT1545	shower, three in one, with bend flexible tube, and shower & hook, 15mm	**each**	7450.00	7450.00	7450.00	7450.00
MT1546	sink, with swivel spout, 15mm	**each**	3800.00	3800.00	3800.00	3800.00
TRAPS						
MT1580	Traps, c.p 32mm	**each**	450.00	420.00	400.00	500.00
MT1581	PVC P - Traps - for bath, heavy duty	**each**	550.00	535.00	505.00	566.67
B a t h r o o m A c c e s s o r i e s						
Brackets						
MT1585	R.S. or C.I.Brackets	**pair**	170.00	172.00	165.00	172.50
C.p. brass waste (waste coupling)						
MT1590	32mm	**each**	150.00	165.00	175.00	192.50
MT1591	40mm	**each**	180.00	180.00	215.00	250.00
PVC waste						
MT1595	32mm	**each**	110.00	115.00	103.33	123.33

Code	Description	Units	PL	GP	S/J	TH
C.p. brass chain with plug						
MT1600	32mm	**each**	220.00	210.00	203.33	275.00
MT1601	40mm	**each**	280.00	250.00	223.33	265.00
Soap Containers						
MT1605	c.p brass with bracket	**each**	185.00	185.00	175.00	200.00
MT1606	c.p Liquid Soap Container	**each**	415.00	410.00	400.00	600.00
MT1607	Recessed ceramic, 200 x 100mm	**each**	430.00	450.00	467.50	467.50
MT1608	Recessed ceramic, 150 x 150mm	**each**	405.00	635.00	600.00	550.00
C.p Towel Rails						
MT1615	20mm x 450mm	**each**	416.67	433.33	400.00	425.00
MT1616	20mm x 600mm	**each**	500.00	526.67	466.67	533.33
MT1617	20mm x 750mm	**each**	550.00	570.00	583.33	660.00
MT1618	C.p Towel Ring	**each**	450.00	497.50	450.00	490.00
C.p Coat Hooks						
MT1625	single	**each**	95.00	100.00	110.00	87.50
MT1626	double	**each**	125.00	115.00	135.00	125.00
Glass self/Mirror						
MT1630	Glass Shelf	**each**	973.67	890.00	916.67	1050.00
MT1631	Mirror (Bevelled edge) 600mm x 450mm	**each**	1066.67	975.00	1100.00	1420.00
Toilet paper holders						
MT1635	C.P. brass	**each**	565.00	600.00	533.33	625.00
MT1636	recessed ceramic (white), 200 x 100mm	**each**	694.00	515.00	609.50	770.00
MT1637	recessed ceramic (coloured), 200 x 100mm	**each**	663.00	700.00	706.50	870.00
MT1638	recessed ceramic (roll-type), 150 x 150mm	**each**	799.00	850.00	824.50	950.00
Electric Water Heater						
MT1645	10 litres, vertical	**each**	7075.67	7075.67	6650.00	7048.00
MT1646	15 litres, vertical	**each**	8242.33	7950.00	7350.00	7037.00
MT1647	25 litres, vertical	**each**	10728.00	10600.00	9333.33	9605.00
MT1648	35 litres, vertical	**each**	13107.50	11825.00	11737.50	13311.00
MT1649	50 litres, vertical	**each**	15055.00	14850.00	13950.00	14500.00
MT1650	75 litres, vertical	**each**	16500.00	16500.00	16500.00	19942.50
MT1651	100 litres, vertical	**each**	35400.00	32500.00	32500.00	27000.00
Water Storage Tanks						
H.D.P.E water storage tank						
MT1665	300 litres	**each**	1975.00	1975.00	1845.00	2430.00
MT1666	500 litres	**each**	3208.00	3750.00	2766.67	3550.00
MT1667	1000 litres	**each**	6467.00	7366.67	6250.00	7006.67
MT1668	2000 litres	**each**	13401.00	14500.00	13000.00	14033.33
MT1669	3000 litres	**each**	19401.00	21875.00	19500.00	20966.67

Code	Description	Units	PL	GP	S/J	TH
STEEL FORMWORK						
Steel Formwork						
MT1670	Plates, angles and channels	**kg**	65.78	67.61	75.22	79.44
MT1671	Single Clip	**each**	64.00	64.00	64.00	64.00
MT1672	Double clip	**each**	80.00	80.00	80.00	80.00
MT1673	Adjustable span ESO+SI	**each**	1540.00	1540.00	1540.00	1540.00
MT1674	Adjustable telescopic prop(3m)	**each**	1051.00	1051.00	1051.00	1051.00
MT1675	Beam clamp	**each**	375.00	375.00	375.00	375.00
MT1676	Column clamp	**each**	1020.00	1020.00	1020.00	1020.00
MT1677	Prop 2 m	**each**	690.00	690.00	690.00	690.00
MT2400	Plastic Cone (Form Tie system)	**each**	12.00	12.00	12.00	12.00
MT2401	Rib Washer (Concrete Form Tie)	**each**	55.90	55.90	55.90	55.90
MT2402	Hex Nut	**each**	3.50	3.50	3.50	3.50
MT2403	Form Tie	**each**	38.70	38.70	38.70	38.70
MT2404	Inner Unit	**each**	75.68	75.68	75.68	75.68
uPVC WINDOWS						
MT1740	Window Frame Sash (Plain White)	**kg**	148.33	148.33	148.33	148.33
MT1741	Window Glass Sash	**kg**	201.67	201.67	201.67	201.67
MT1742	Wire mesh sash	**kg**	191.67	191.67	191.67	191.67
MT1743	Wire mesh	**sqm**	75.04	75.04	75.04	75.04
MT1744	EPDM Gasket	**m**	15.00	15.00	15.00	15.00
MT1745	Wool pile	**m**	10.00	10.00	10.00	10.00
MT1746	Glass Bead	**m**	166.67	166.67	166.67	166.67
MT1747	Interlock	**each**	166.67	166.67	166.67	166.67
MT1748	U-groove roller	**each**	53.33	53.33	53.33	53.33
MT1749	Touch lock	**each**	225.00	225.00	225.00	225.00
MT1750	Fastener Nut	**each**	3.50	3.50	3.50	3.50
MT1751	Aluminium Track	**each**	110.67	110.67	110.67	110.67
MT1752	Aluminium Reinforcement	**m**	101.67	101.67	101.67	101.67
MT1753	Window Frame Sash (Polished)	**kg**	360.00	360.00	360.00	360.00
MT1754	Window Frame Sash (Texture)	**kg**	393.33	393.33	393.33	393.33
GEOTEXTILE MATERIALS						
MT1780	Non Woven Geotextile	**Sqm**	43.00	43.00	42.50	46.50

Code	Description	Units	PL	GP	S/J	TH
INTERLOCKING PAVER BLOCKS						
Interlocking Paver Blocks, Tiles, Kerb						
MT2000	Interlocking Paver Block (Zig Zag) 80mm Thk. Colour	**Sq.m**	551.50	586.50	586.50	586.50
MT2001	Interlocking Paver Block (Zig Zag) 80mm thick Ash Grey	**Sq.m**	530.00	575.00	575.00	575.00
MT2002	Interlocking Paver Block (Zig Zag, Tri-Hex, Brook, Cosmic) 60mm Thk. Colour	**Sq.m**	519.00	585.00	585.00	585.00
MT2003	Interlocking Paver Block (Zig Zag, Tri-Hex, Brook, Cosmic) 60mm Thk. Ash Grey	**Sq.m**	493.50	511.50	511.50	511.50
MT2004	Interlocking Paver Block (Tri-Hex, Brook, Cosmic) 40mm Thk. Colour	**Sq.m**	414.00	542.00	542.00	542.00
MT2005	Interlocking Paver Block (Tri-Hex, Brook, Cosmic) 40mm Thk. Ash Grey	**Sq.m**	431.50	435.00	435.00	435.00
MT2006	Rectangular Paver Block 60mm Thk Colour	**Sq.m**	466.42	499.72	499.72	499.72
MT2007	Rectangular Paver Block 60mm Thk Ash Grey	**Sq.m**	443.31	477.51	477.51	477.51
MT2008	Rectangular Paver Block 40mm Thk Colour	**Sq.m**	416.20	444.20	444.20	444.20
MT2009	Rectangular Paver Block 40mm Thk Ash Grey	**Sq.m**	386.09	433.09	433.09	433.09
MT2010	Coral Stone Finished 60mm Thk. Colour	**Sq.m**	486.00	528.00	528.00	528.00
MT2011	Coral Stone Finished 60mm Thk. Ash Grey	**Sq.m**	462.00	516.00	516.00	516.00
MT2012	Coral Stone Finished 40mm Thk. Colour	**Sq.m**	434.00	480.00	480.00	480.00
MT2013	Coral Stone Finished 40mm Thk. Ash Grey	**Sq.m**	403.00	456.00	456.00	456.00
MT2014	Chequered tiles, Paver tiles. 25mm Thk. Colour	**Sq.m**	312.76	344.26	344.26	344.26
MT2015	Chequered tiles, Paver tiles. 25mm Thk. Ash Grey	**Sq.m**	291.65	322.05	322.05	322.05
MT2016	Kerb (Edging) Stone 100mm Thk.	**Sq.m**	805.18	916.18	916.18	916.18
FRP CORNICES						
MT2025	FRP cornices (Single bho, phana, pem and dhung)	**m**	4366.67	4500.00	4500.00	4500.00
MT2026	FRP cornices (Double bho, phana, pem and dhung)	**m**	6566.67	6500.00	6500.00	6500.00
MT2027	FRP cornices (Double bho, phana, choetse, pem and dhung)	**m**	6000.00	7500.00	7500.00	7000.00
MT2028	FRP cornices (Double bho, pem and dhung)	**m**	3833.33	5000.00	5000.00	4750.00
MT2029	FRP cornices (Tsechukhanyim)	**m**	3350.00	3000.00	3000.00	2750.00
GRC CORNICES						
MT2035	GRC cornices (Single bhog,phana,pem and dung)	**m**	5456.00	5608.00	6420.00	5356.00
MT2036	GRC cornices (Double bogh,phana,pem and dhung)	**m**	6804.00	6992.00	8004.00	6680.00
MT2037	GRC cornices (Double bogh,phana,choetse, pem and dhung)	**m**	8492.00	8728.00	9992.00	8336.00
MT2038	GRC cornices (Double bogh,pem and dhung)	**m**	4380.00	4588.00	5248.00	4256.00
MT2039	GRC cornices (Tsechukhanyim)	**m**	2388.00	2500.00	2860.00	2320.00
MT2040	GRC Door cornice-1000mmX425mm	**each**	4853.50	5083.00	5814.00	4713.25
MT2041	GRC Door cornice-1200mmX425mm	**each**	5486.75	5746.00	6574.75	5333.75
MT2042	GRC Door cornice-1410mmX425mm	**each**	6400.50	6702.25	7671.25	6103.00
MT2043	GRC Door cornice-1600mmX425mm	**each**	7293.00	7637.25	8738.00	7089.00
MT2044	GRC Door cornice-1800mmX425mm	**each**	8240.75	8627.50	9872.75	8007.00
MT2045	GRC Door cornice-2000mmX425mm	**each**	9154.50	9588.00	10969.25	8895.25

Code	Description	Units	PL	GP	S/J	TH
GRC WINDOW						
MT2050	GRC Window Frame -1 Bay with window size 853X1385mm full set	**each**	14866.50	15567.75	17811.75	14445.75
MT2051	GRC Window Frame -1 Bay with window size 780X1000mm full set	**each**	12363.25	12945.50	14811.25	12010.50
MT2052	GRC Window Frame -2 Bay with window size 1416X1385mm full set	**each**	18776.50	19664.75	22495.25	18245.25
MT2053	GRC Window Frame -3 Bay with window size 1979X1385mm full set	**each**	24029.50	25164.25	28789.50	23349.50
MT2054	GRC Window Frame -3 Bay with window size 1979X1140mm full set	**each**	20961.00	21951.25	25113.25	20370.25
MT2055	GRC Window Frame -4 Bay with window size 2542X1385mm full set	**each**	29125.25	30498.00	34896.75	28300.75
MT2056	GRC Window Frame for Rabsey -3 Bay with window size 1785x1600 (frame only)	**each**	21764.25	22792.75	34896.75	28300.75
MT2057	GRC Window Frame for Rabsey -4 Bay with window size 2350x1600 (frame only)	**each**	27514.50	28810.75	32963.00	26732.50
MATERIALS FOR CONSERVATION WORKS IN HERITAGE SITES						
MT2300	Paraloid B-72	**kg**	2800.00	2800.00	2800.00	2800.00
MT2301	Lens tissue	**each**	40.00	40.00	40.00	35.00
MT2302	Marking cloth thin	**m**	45.00	45.00	45.00	120.00
MT2303	Marking cloth thick	**m**	98.00	98.00	98.00	89.00
MT2304	Black foam-10mm	**Sq.m**	8.50	8.50	8.50	8.50
MT2305	Cargo Belt/Ratchet belt for packing	**m**	3800.00	3800.00	3800.00	3800.00
MT2306	Persimmon fermented liquid	**litre**	318.00	318.00	318.00	318.00
MT2307	Thinner	**litre**	350.00	350.00	350.00	335.00

Code	Description	Units	PL	GP	S/J	TH
3. MACHINERY AND PLANT HIRE CHARGES						
MP0101	Air Compressor(CPS - 325)	**day**	11784.00	11784.00	11784.00	11784.00
MP0102	Asphalt Paver, Hanta	**day**	13616.00	13616.00	13616.00	13616.00
MP0103	Asphalt/Bitumen heating Kettle, India Make	**day**	4357.50	4357.50	4357.50	4357.50
MP0104	Asphalt/Bitumen Sprayer (Hino)	**day**	8629.20	8629.20	8629.20	8629.20
MP0110	Compactor, Plate Type	**day**	2112.00	2112.00	2112.00	2112.00
MP0111	Concrete Mixer(7/10Cft)	**day**	3200.00	3200.00	3200.00	3200.00
MP0112	Concrete Vibrator(M/C5)	**day**	2112.00	2112.00	2112.00	2112.00
MP0113	Compressor (CPS300)	**day**	11784.00	11784.00	11784.00	11784.00
MP0120	Dozer or equivalent	**day**	20768.00	20768.00	20768.00	20768.00
MP0125	Excavator CAT 320 or equivalent	**day**	31208.00	31208.00	31208.00	31208.00
MP0126	Excavator with rock breaker	**day**	31793.00	31793.00	31793.00	31793.00
MP0130	Fuel Tanker (NISSAN)	**day**	7144.00	7144.00	7144.00	7144.00
MP0135	Jack Hammer	**day**	3464.00	3464.00	3464.00	3464.00
MP0140	Motor Grader (CAT 130G)	**day**	16976.00	16976.00	16976.00	16976.00
MP0145	Pay Loader (CAT 926E)	**day**	18528.00	18528.00	18528.00	18528.00
MP0146	Pay Loader (CAT 928F)	**day**	20728.00	20728.00	20728.00	20728.00
MP0147	Pay Loader (CAT -916)	**day**	14800.00	14800.00	14800.00	14800.00
MP0150	Road Roller (Pneumatic Tyre) TS -300	**day**	15120.00	15120.00	15120.00	15120.00
MP0151	Road Roller (SV91 Sakai)	**day**	15944.00	15944.00	15944.00	15944.00
MP0152	Road Roller, CAT - CS551	**day**	14616.00	14616.00	14616.00	14616.00
MP0153	Road Broom (TD96)	**day**	686.40	686.40	686.40	686.40
MP0154	Road marking machine	**day**	3456.00	3456.00	3456.00	3456.00
MP0160	Spot Mix Plant, 10/16 TPH	**day**	23760.00	23760.00	23760.00	23760.00
MP0165	TATA Truck, 1612 SE	**day**	7992.00	7992.00	7992.00	7992.00
MP0166	Truck/Tipper (Tata,1210SK32)	**day**	9144.00	9144.00	9144.00	9144.00
MP0167	Tractor	**day**	7184.00	7184.00	7184.00	7184.00
MP0170	Water Tanker (TATA)	**day**	7144.00	7144.00	7144.00	7144.00
MP0171	Water pump AVI Type	**day**	1440.00	1440.00	1440.00	1440.00
MP0172	Welder - Electric arc	**day**	5264.00	5264.00	5264.00	5264.00

SECTION 2
Mechanical Transportation Costs

CARRIAGE OF MATERIALS - MECHANICAL TRANSPORT INCLUDING LOADING, UNLOADING AND STACKING

1. HILL ROADS

Sl. No	Materials	Unit	Quantity payable	Rate (Per Km Per unit)							
				1 km	2km	3km	4 km	5 km	beyond 5 upto 10 km for every km	beyond 10 upto 20 km for every km	beyond 20 for every km
			1	3	4	5	6	7	8	9	10
1	Lime, moorum, building rubbish	cu.m	100%	151.03	163.45	175.62	187.23	198.32	11.58	10.47	8.92
2	Dry earth	cu.m	80%	188.79	204.32	219.52	234.03	247.90	14.48	13.09	11.16
3	Manure or Sludge	cu.m	95%	158.98	172.06	184.86	197.08	208.76	12.19	11.02	9.39
4	Excavated Rock	cu.m	50%	302.06	326.90	351.23	374.45	396.64	23.16	20.94	17.85
5	Sand, stone aggregates of less than 40 mm size	cu.m	100%	151.03	163.45	175.62	187.23	198.32	11.58	10.47	8.92
6	Stone aggregates of more than 40 mm size	cu.m	92.50%	163.28	176.71	189.86	202.41	214.40	12.52	11.32	9.65
7	Stone boulders	cu.m	85%	177.68	192.30	206.61	220.27	233.32	13.62	12.32	10.50
8	Bricks, Tiles & Timber	cu.m	100%	151.03	163.45	175.62	187.23	198.32	11.58	10.47	8.92
9	Cement, Concrete, Steel & Bitumen	tonne	100%	151.03	163.45	175.62	187.23	198.32	11.58	10.47	8.92

NOTE : For manual transportation, refer the LMC (CIVIL) - 2025 and SBRW

CARRIAGE OF MATERIALS - MECHANICAL TRANSPORT INCLUDING LOADING, UNLOADING AND STACKING

2. PLAIN ROADS

Sl. No	Materials	Unit	Quantity payable	Rate (Per Km Per unit)							
				1 km	2km	3km	4 km	5 km	beyond 5 upto 10 km for every km	beyond 10 upto 20 km for every km	beyond 20km for every km
			1	3	4	5	6	7	8	9	10
1	Lime, moorum, building rubbish	cu.m	100%	148.28	158.84	168.98	178.75	188.15	8.21	7.41	6.59
2	Dry earth	cu.m	80%	185.36	198.55	211.23	223.44	235.19	10.26	10.26	8.23
3	Manure or Sludge	cu.m	95%	156.09	167.20	177.88	188.16	198.05	8.64	7.80	6.93
4	Excavated Rock	cu.m	50%	296.57	317.67	337.97	357.50	376.30	16.42	14.82	13.17
5	Sand, stone aggregates of less than 40 mm size	cu.m	100%	148.28	158.84	168.98	178.75	188.15	8.21	7.41	6.59
6	Stone aggregates of more than 40 mm size	cu.m	92.50%	160.31	171.72	182.69	193.24	203.41	8.88	8.01	7.12
7	Stone boulders	cu.m	85%	174.45	186.87	198.81	210.29	221.36	9.66	8.72	7.75
8	Bricks, Tiles & Timber	1000 nos	100%	494.28	529.46	563.28	595.83	627.17	27.37	24.70	21.95
10	Cement, Concrete, Steel & Bitumen	tonne	100%	148.28	158.84	168.98	178.75	188.15	8.21	7.41	6.59

NOTE : For manual transportation, refer the LMC (CIVIL) - 2025 and SBRW

SECTION 3 - Built Up Rates

Code	Description	Units	PL	GP	SJ	TH
Chapter 1: DISMANTLING & DEMOLITION WORK						
C o n c r e t e						
DD0001	Demolishing cement concrete 1:3:6 & richer, including disposal of materials within 50m lead	cu.m	1088.67	1088.67	1088.67	1088.67
DD0002	Demolishing cement concrete 1:4:8 & leaner, including disposal of materials within 50m lead	cu.m	674.30	674.30	674.30	674.30
DD0003	Demolishing reinforced concrete, including stacking steel bars and disposal of rubbish within 50m lead	cu.m	1587.05	1587.05	1587.05	1587.05
Lime concrete						
DD0004	Demolishing lime concrete and disposal of rubbish within 50m lead	cu.m	286.29	286.29	286.29	286.29
Stone Masonry						
Demolishing stone rubble masonry including stacking useful materials & disposal of rubbish within 50m lead						
DD0005	In lime mortar	cu.m	414.37	414.37	414.37	414.37
DD0006	In cement mortar	cu.m	847.58	847.58	847.58	847.58
Dismantling dressed ashlar face stone work including stacking useful materials & disposal of rubbish within 50m lead						
DD0007	In lime mortar	cu.m	527.38	527.38	527.38	527.38
DD0008	In cement mortar	cu.m	1017.10	1017.10	1017.10	1017.10
Removing mortar from stones, cleaning stones and concrete articles, and arranging in stacks						
DD0009	In lime mortar	cu.m	436.70	436.70	436.70	436.70
DD0010	In cement mortar	cu.m	484.66	484.66	484.66	484.66
Brick & Hollow Block Masonry						
DD0011	Demolishing hollow block masonry including stacking useful materials & disposal of rubbish within 50m lead	cu.m	1538.83	1538.83	1538.83	1538.83
DD0012	Demolishing reinforced brickwork, including stacking steel bars and disposal of rubbish within 50m lead	cu.m	1422.05	1422.05	1422.05	1422.05
DD0013	Extra for scraping, cleaning, straightening reinforcement from R.C & reinforced brick work	kg	4.35	4.35	4.35	4.35
DD0014	Extra for cutting reinforcement bars in reinforced cement concrete and reinforced brickwork(payment to be made for the cross	sq.m	452.04	452.04	452.04	452.04
Demolishing brick work including stacking useful materials & disposal of rubbish within 50m lead						
DD0015	In mud mortar	cu.m	244.86	244.86	244.86	244.86
DD0016	In lime mortar	cu.m	290.06	290.06	290.06	290.06
DD0017	In cement mortar	cu.m	715.73	715.73	715.73	715.73
Removing Mortar from bricks and cleaning bricks including stacking useful materials within 50m lead						
DD0018	From BW in mud mortar	1000#	1649.21	1649.21	1649.21	1649.21
DD0019	From BW in lime mortar	1000#	1904.61	1904.61	1904.61	1904.61
DD0020	From BW in cement mortar	1000#	2392.93	2392.93	2392.93	2392.93

Code	Description	Units	PL	GP	SJ	TH
Steel Work						
Dismantling steelwork in single sections including dismembering and stacking within 50m lead						
DD0021	In RS joists	kg	1.28	1.28	1.28	1.28
DD0022	In channels, angles, tees and flats	kg	1.13	1.13	1.13	1.13
DD0023	Dismantling steelwork in built up sections in channels, angles, tees and flats in all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking within 50 m lead	kg	2.64	2.64	2.64	2.64
DD0024	Dismantling steelwork in built up sections without dismembering and stacking within 50 m lead	kg	2.26	2.26	2.26	2.26
Wood work						
DD0025	Dismantling wood work of sectional area 40 sq.cm and above in frames, trusses (<10m span) including stacking within 50m lead	cu.m	1168.65	1168.65	1168.65	1168.65
DD0026	Dismantling wood work of sectional area <40 sq.cm in frames, trusses including stacking within 50m lead	m	103.64	103.64	103.64	103.64
DD0027	Extra for dismantling trusses, rafters, purlins etc. of every additional span of 1 metre or part thereof for span >10m (sectional area > 40sq.cm)	cu.m	226.11	226.11	226.11	226.11
DD0028	Extra for dismantling trusses, rafters, purlins etc. every additional span of 1metre or part thereof >10m (sectional area < 40sq.cm)	m	1.04	1.04	1.04	1.04
DD0029	Dismantling doors, windows, and clerestory windows <3sq.m (steel, wood) including architrave, hold fasts, stacking within 50m lead	each	184.44	184.44	184.44	184.44
DD0030	Dismantling doors, windows and clerestory windows >3sq.m (steel/wood) including architrave, hold fasts, and stacking within 50m lead	each	251.38	251.38	251.38	251.38
DD0031	Taking out doors, windows and clerestory windows shutters <3sq.m (steel, wood) including stacking within 50m lead	each	69.83	69.83	69.83	69.83
DD0032	Taking out doors, windows and clerestory window shutters >3sq.m (steel or wood) including stacking within 50m lead	each	163.18	163.18	163.18	163.18
Flooring						
DD0040	Dismantling wooden flooring including stacking useful materials & disposal of rubbish within 50m lead	sq.m	73.88	73.88	73.88	73.88
DD0041	Dismantling dry brick patching in floors, drains etc including stacking useful materials & disposal of rubbish within 50m lead	cu.m	470.88	470.88	470.88	470.88
DD0042	Dismantling stone slab flooring laid in cement mortar including stacking useful materials & disposal of rubbish within 50m lead	sq.m	97.62	97.62	97.62	97.62
DD0043	Dismantling jack arch roofing and floors including stacking useful materials & disposal of rubbish within 50m lead	sq.m	94.18	94.18	94.18	94.18
Roofing						
DD0045	Dismantling G.I sheets including ridges, hips, valleys, gutters & stacking materials within 50m lead	sq.m	82.46	82.46	82.46	82.46
DD0046	Dismantling tiled roofing with batten boarding etc. complete including stacking useful materials & disposal of rubbish within 50m lead	sq.m	84.78	84.78	84.78	84.78
Metal work						
DD0050	Dismantling expanded metal, fabrics & battens, beading including stacking useful within 50m lead	sq.m	35.33	35.33	35.33	35.33

Code	Description	Units	PL	GP	SJ	TH
F e n c i n g						
DD0055	Dismantling barbed wire, flexible wire including making rolls & stacking within 50m lead	kg	16.57	16.57	16.57	16.57
DD0056	Dismantling steel fence posts, struts & earth work/demolishing of concrete and stacking within 50m lead	each	157.27	157.27	157.27	157.27
DD0057	Dismantling R.C.C fence posts, struts including earth work/demolishing concrete footings, stacking, 50m lead	each	187.18	187.18	187.18	187.18
DD0058	Cutting ballies/wooden posts at ground or projection above concrete & stacking within 50m lead	each	47.09	47.09	47.09	47.09
C e i l i n g & C l a d d i n g						
DD0065	Dismantling cement A.C, celotex, hardboard ceiling, partition, including stacking useful materials & disposal rubbish within 50m	sq.m	28.46	28.46	28.46	28.46
DD0066	Dismantling of ekra wall in cement mortar 1:6 or richer including stacking useful materials & disposal of rubbish within 50m lead	sq.m	49.18	49.18	49.18	49.18
DD0067	Dismantling old plaster or skirting, raking out joints and cleaning the surface for plaster including disposal of rubbish within 50m lead	sq.m	18.84	18.84	18.84	18.84
P i p e s						
Dismantling of old S.W pipes including breaking joints, bed concrete, stacking of useful materials & disposal of rubbish within 50m lead						
DD0075	100mm dia	m	40.31	40.31	40.31	40.31
DD0076	150mm dia	m	44.45	44.45	44.45	44.45
DD0077	200mm dia	m	47.46	47.46	47.46	47.46
Dismantling CI pipes including excavation and refilling trenches after taking out the pipes, breaking lead caulked joints, melting of lead and making into blocks, stacking of pies at site and disposal of rubbish within 50m lead						
DD0078	Up to 150 mm dia	m	109.49	109.46	109.47	109.52
DD0079	From 150 mm up to 300 mm	m	190.72	190.62	190.63	190.79
DD0080	Above 300 mm dia	m	426.79	424.87	425.06	428.22
DD0085	G.I Pipes	m	36.54	36.54	36.54	36.54
DD0086	H.D.P.E Pipes	m	48.22	48.22	48.22	48.22
Precast Walls						
Dismantling of precast concrete or stone slabs in walls, partition walls etc. including stacking of useful materials & disposal of rubbish within 50 m lead						
DD0090	Up to 40 mm thickness	sq.m	112.37	112.37	112.37	112.37
DD0091	Above 40 mm thickness and up to 74mm thickness	sq.m	166.16	166.16	166.16	166.16
Roads						
DD0095	Dismantling water bound macadam road including stacking of useful materials & disposal of rubbish within 50 m lead	sq.m	84.38	84.38	84.38	84.38
DD0096	Dismantling bituminous road including cutting, stacking of useful materials & disposal of rubbish within 50 m lead	sq.m	13.00	13.00	13.00	13.00
Cisterns						
DD0100	Dismantling of flushing cistern of any size including stacking of useful materials & disposal of rubbish within 50 m lead	no	349.58	349.58	349.58	349.58

Code	Description	Units	PL	GP	SJ	TH
Chapter 2: CLEARING AND GRUBBING						
Clearing Grass						
CG0001	Clearing grass including removal of rubbish within 50m of site	sq.m	3.99	3.99	3.99	3.99
CG0002	Clearing jungle including uprooting of vegetation & trees of girth < 300mm & disposal within 50m of the site	sq.m	12.62	12.62	12.62	12.62
Felling Trees (Manually)						
Felling trees including cutting of trunks and branches, removal of roots, stacking of serviceable materials and disposal of rubbish within 50m lead						
CG0010	Girth 300 to 600mm	each	117.76	117.76	117.76	117.76
CG0011	Girth 600 to 1200m	each	531.15	531.15	531.15	531.15
CG0012	Girth 1200 to 2400	each	2472.11	2472.11	2472.11	2472.11
CG0013	Girth > 2400mm	each	4944.22	4944.22	4944.22	4944.22
Felling Trees (Dozer)						
Felling of trees including removal of roots and disposal of rubbish using bull dozer (excluding cutting of trunks, branches & stacking)						
CG0020	Girth 300 to 600mm	each	87.22	87.22	87.22	87.22
CG0021	Girth 600 to 1200m	each	373.52	373.52	373.52	373.52
CG0022	Girth 1200 to 2400	each	747.04	747.04	747.04	747.04
CG0023	Girth > 2400m	each	1344.94	1344.94	1344.94	1344.94
Landslide Debris						
CG0030	Clearing grass, removal of landslide debris & surface material including excavation & disposal within 50m lead	cu.m	85.13	85.13	85.13	85.13

Code	Description	Units	PL	GP	SJ	TH
Chapter 3: EARTH WORK						
Excavation (Manually)						
Surface dressing of ground, including removal of vegetations and inequalities < 150mm deep, disposal of rubbish within 50m lead and 1.5m lifts						
EW0002	All types of Soil	sq.m	17.93	17.93	17.93	17.93
Ploughing the existing ground to a depth 150mm to 250mm, and watering the same						
EW0011	All types of Soil	sq.m	11.30	11.30	11.30	11.30
Earth work in surface excavation, depth <300mm, width >1.5m, area >10 Sq.m in plan, including disposal of excavated earth within 50m lead & 1.5m lift and disposed soil to be neatly dressed						
EW0021	All types of Soil	sq.m	32.96	32.96	32.96	32.96
Earth work in excavation over areas, depth >300mm, width >1.5m, area >10 Sq.m on plan, including disposal of excavated earth within 50m lead and 1.5m lift & disposed soil to be neatly dressed						
EW0031	All types of soil	cu.m	209.56	209.56	209.56	209.56
EW0032	All types of rock with or without blasting	cu.m	665.61	665.61	665.61	665.61
EW0033	All types of rock requiring blasting	cu.m	898.46	898.46	898.46	898.46
EW0034	All types of rock requiring chiselling (where blasting is	cu.m	1393.71	1393.71	1393.71	1393.71
For transportation beyond 50m lead, follow **Section 2: Mechanical Transportion Costs**						
Mechanical Excavation						
Earth work in excavation over areas using Excavator, exceeding 300mm in depth, 1.5m in width as well as 10 sq.m in area on plan, including dressing, levelling and disposal of excavated earth, lead up to 50m and lift up to 1.5m						
EW0046	All types of soil	cu.m	129.29	129.29	129.29	129.29
EW0047	All types of rocks (blasted)	cu.m	136.57	136.57	136.57	136.57
Blasting Operation						
Blasting of rocks complete excluding the cost of collection and stacking of blasted rock						
EW0056	All types of rock	cu.m	250.87	250.87	250.87	250.87
Silent Blaster						
Breaking of rocks using non-explosive blaster (silent blaster) in over areas, depth >300mm, width >1.5m, area >10sq.m on plan including stacking of boulders or useful materials and disposal of rubbish etc. complete						
EW0066	All types of rock	cu.m	3912.12	3912.12	3912.12	3912.12
Breaking of rocks using non-explosive blaster (silent blaster) in foundation trenches width <1.5m, area <10sq.m on plan including stacking of boulders or useful materials and disposal of rubbish etc. complete						
EW0076	All types of rock	cu.m	4025.13	4025.13	4025.13	4025.13
Excavation & Banking						
Earth work in rough excavation & banking of excavated earth in layers < 200 mm in depth for road, flood/guide banks & depressions, including watering, power rolling, dressing, lead upto 50m & 1.5m lift						
EW0085	All types of soil	cu.m	247.08	247.08	247.08	247.08

Code	Description	Units	PL	GP	SJ	TH
Banking excavated earth for road, flood banks, guide banks & depressions, in layers <200mm depth, including watering, rolling & dressing up within 50m lead & 1.5m lift						
EW0096	All types of soil	cu.m	164.84	164.84	164.84	164.84
EW0097	Deduction - for not rolling with power roller in layered banking works	cu.m	34.48	34.48	34.48	34.48
EW0098	Deduction - for not watering in layered, banking works	cu.m	8.02	8.02	8.02	8.02
Trenches Excavation						
Excavation in foundation trenches or drains not exceeding 1.5m in width or area 10 sq.m on plan, including dressing & ramming, disposal of surplus soil within 50m lead & 1.5m lift						
EW0106	All types of Soil	cu.m	221.50	221.50	221.50	221.50
EW0107	All types of rock with or without blasting	cu.m	704.69	704.69	704.69	704.69
EW0108	All types of rock requiring blasting	cu.m	998.05	998.05	998.05	998.05
EW0109	All types of rock requiring chiselling (where blasting is prohibited)	cu.m	1410.50	1410.50	1410.50	1410.50
Extra for every additional lift of 1.5m or part thereof						
EW0115	All types of soils	cu.m	18.84	18.84	18.84	18.84
EW0116	All types of rocks	cu.m	33.53	33.53	33.53	33.53
		cu.m				
Extra for trench, pit works per cu.m per m depth						
EW0125	Under water	cu.m	61.10	61.10	61.10	61.10
EW0126	In foul conditions	cu.m	55.38	55.38	55.38	55.38
Excavation/Refilling for Pipes/Cables						
Hand excavation and refilling in layers < 200mm, of trenches for pipes & sockets, cables, including dressing of sides/ ramming of bottom, depth upto 1.5m, disposal of surplus material within lead of 50m: All types of soil						
EW0134	Pipes, cables etc. dia < 80mm	m	187.81	187.81	187.81	187.81
EW0135	Pipes, cables etc. 80mm < dia < 300mm	m	241.91	241.91	241.91	241.91
EW0136	Pipes, cables etc. dia.>300 mm	m	377.59	377.59	377.59	377.59
Hand excavation and refilling in layers < 200mm, of trenches for pipes & sockets, cables, including dressing of sides/ ramming of bottom, depth upto 1.5m, disposal of surplus material within lead of 50m: All type of rock with or without blasting						
EW0154	Pipes, cables etc. dia < 80mm	m	786.51	786.51	786.51	786.51
EW0155	Pipes, cables etc. 80mm < dia < 300mm	m	947.50	947.50	947.50	947.50
EW0156	Pipes, cables etc. dia.> 300mm	m	1088.85	1088.85	1088.85	1088.85
Hand excavation and refilling in layers < 200mm, of trenches for pipes & sockets, cables, including dressing of sides/ ramming of bottom, depth upto 1.5m, disposal of surplus material within lead of 50m: All type of rock requiring blasting						
EW0164	Pipes, cables etc. dia < 80mm	m	1129.75	1129.75	1129.75	1129.75
EW0165	Pipes, cables etc. 80mm < dia < 300mm	m	1290.73	1290.73	1290.73	1290.73
EW0166	Pipes, cables etc. dia.> 300mm	m	1483.89	1483.89	1483.89	1483.89
Hand excavation and refilling in layers < 200mm, of trenches for pipes & sockets, cables, including dressing of sides/ ramming of bottom, depth upto 1.5m, disposal of surplus material within lead of 50m:						
All type of rock requiring chiselling (where blasting is prohibited)						
EW0174	Pipes, cables etc. dia < 80mm	m	1521.41	1521.41	1521.41	1521.41
EW0175	Pipes, cables etc. 80mm < dia < 300mm	m	1796.72	1796.72	1796.72	1796.72
EW0176	Pipes, cables etc. dia.> 300mm	m	2067.65	2067.65	2067.65	2067.65

Code	Description	Units	PL	GP	SJ	TH
Extra for excavating trenches for pipes, cables etc., 1.5 < depth < 3m						
EW0185	All types of soils	m	501.30	501.30	501.30	501.30
EW0186	All types of rocks	m	2584.56	2584.56	2584.56	2584.56
Filling or bedding						
EW0195	Filling of trenches, sides of foundations etc. in layers <200mm using selected excavated earth, ramming etc. within lead 50 m & lift 1.5m	cu.m	111.32	111.32	111.32	111.32
EW0196	Providing &laying sand bedding, including watering, ramming, dressing	cu.m	663.44	701.10	1067.57	1520.11
EW0197	Providing &laying dry earth bedding, including consolidating each deposited layer by watering, ramming and dressing	cu.m	624.51	624.51	624.51	624.51
Timbering for Trenches & cuts						
Open timbering over areas including lagging & strutting of trenches, cuts (per sq.m face area timbered)						
EW0205	Depth not exceeding 1.5m	sq.m	153.07	162.43	169.98	158.90
EW0206	1.5m < depth < 3 m	sq.m	157.63	166.99	174.54	163.46
EW0207	Depth > 3 m	sq.m	165.66	175.02	182.57	171.49
Close timbering over areas including lagging & strutting of trenches, cuts (per sq.m face area timbered)						
EW0215	Depth not exceeding 1.5m	sq.m	415.04	441.63	465.21	431.27
EW0216	1.5m < depth < 3m	sq.m	426.92	453.51	477.09	443.16
EW0217	3m < depth < 4.5m	sq.m	438.76	465.36	488.93	455.00
Close timbering including lagging & strutting of shafts, wells, cess pits, manholes (per sq.m face area timbered						
EW0225	Depth not exceeding 1.5m	sq.m	383.87	407.52	427.50	398.47
EW0226	1.5m < Depth < 3m	sq.m	399.53	423.19	443.16	414.13
EW0227	3m < Depth < 4.5m	sq.m	416.36	440.02	459.99	430.96
De-Watering						
EW0235	Pumping out water caused by springs, river, seepage, broken water mains, drains, and alike	cu.m	144.09	144.09	144.09	144.09
Anti-Termite Treatment						
EW0240	Providing and injecting chemical emulsion for Pre-construction anti-termite treatment using Chlorpyriphos/ Lindane E. C 20% with 1% Concentration (Anti Termite Chemical)	sq.m	162.65	161.78	162.21	164.40
Providing and injecting chemical emulsion for Post-construction, using Chlorpyriphos/ Lindane E. C 20% with 1% Concentration (Anti Termite Chemical)						
EW0245	Along outside of foundation	m	390.61	389.73	390.17	392.36
EW0246	Along external walls below concrete / masonry apron	m	292.18	292.04	292.11	292.48
EW0247	Under existing floors including drilling & plugging 12mm holes with mortar 1:2	sq.m	512.15	511.96	512.05	512.53
EW0248	Voids in masonry including drilling holes at 45 degree & plugging with cement mortar 1:2)	m	321.03	320.94	320.99	321.22
EW0249	Woodwork (using chemical in oil or kerosene based solution) including drilling & plugging 6mm holes	m	316.33	316.30	316.31	316.38

Code	Description	Units	PL	GP	SJ	TH
Chapter 4: DRAINAGE						
Plinth Protection						
Providing and laying Plinth Protection and grouted with fine sand mix including well rammed, finishing the top smooth						
DR0001	With 50mm thick cement concrete 1:3:6, 20mm aggregates, laid over 75mm thick layer of compacted gravel (40mm)	sq.m	411.17	412.25	432.76	452.88
DR0002	With 50mm thick cement concrete 1:3:6, 20mm gravel or shingles laid over 75mm thick layer of compacted gravel (40mm)	sq.m	374.79	374.94	404.18	459.80
DR0003	With 50mm thick cement concrete 1:3:6, 20mm aggregate, laid over 75mm thick layer of compacted dry brick aggregate(40mm)	sq.m	537.02	547.96	569.05	589.30
DR0004	With 50mm thick cement concrete 1:3:6, 20mm gravel or shingles laid on 75mm thick layer of compacted dry brick aggregate(40mm)	sq.m	508.68	516.59	526.40	557.94
Open Surface Drains						
Constructing second class brick masonry open surface drain in cement mortar 1:4 including earth work in excavation 100 mm thick concrete bed 1:5:10, 40mm aggregate and 25mm thick cement concrete 1:2:4,12 mm aggregate for filling haunches including 12mm cement plastering 1:4 with a floating coat of neat cement and disposal of surplus earth etc. complete						
DR0010	100mm wide x 200mm average depth	m	668.44	666.78	690.64	795.01
DR0011	150mm wide x 200mm average depth	m	699.58	698.10	723.25	830.66
DR0012	250mm wide x 300mm average depth	m	970.72	968.94	1003.73	1156.13
DR0013	300mm wide x 450mm average depth	m	1465.23	1468.09	1523.38	1766.44
Extra for additional depth of brick masonry drain						
DR0020	100mm wide .....per metre additional depth	m	2113.30	2108.71	2182.82	2576.73
DR0021	150mm wide .....per metre additional depth	m	2122.18	2117.59	2191.70	2585.60
DR0022	250mm wide .....per metre additional depth	m	2139.23	2134.64	2208.75	2602.65
Constructing random rubble masonry open surface drain in cement mortar 1:6 including earth work in excavation, 100mm thick concrete base 1:5:10, 40 mm aggregate 25mm thick cement concrete 1:2:4, 12mm aggregate for filling haunches, including 20mm cement plaster with a floating coat of neat cement and disposal of surplus earth						
DR0030	100mm widex 200mm average depth	m	1007.49	1003.58	1037.12	1140.37
DR0031	150mm wide x 200mm average depth	m	1037.58	1033.81	1068.58	1174.77
DR0032	250mm wide x 300mm average depth	m	1371.50	1367.04	1412.85	1552.35
DR0033	300mm wide x 450mm average depth	m	2537.24	2535.11	2626.83	2890.74
Extra for additional depth of random rubble masonry drain						
DR0040	100mm wide .....per metre additional depth	m	2892.32	2881.59	2972.44	3263.94
DR0041	150mm wide .....per metre additional depth	m	2900.96	2890.23	2981.09	3272.58
DR0042	250mm wide .....per metre additional depth	m	2918.24	2907.51	2998.37	3289.86
R.C.C Pipes & Fittings						
Providing & laying NP2 class R.C.C pipes, including collars, jointing in cement mortar 1:2 including testing of joints etc. complete						
DR0088	100mm dia	m	600.07	598.82	598.47	606.39
DR0089	150mm dia	m	698.53	696.98	696.55	706.32
DR0090	225mm dia.	m	1007.16	1006.96	1007.28	1009.29
DR0091	300mm dia.	m	1237.26	1548.49	1237.43	1239.89
DR0092	450mm dia.	m	1707.12	2520.38	1707.50	1712.89
DR0093	600mm dia.	m	2376.01	3126.09	2376.47	2383.61
DR0094	750mm dia.	m	3834.71	3649.82	3835.13	3840.98
DR0095	900mm dia.	m	4763.48	4277.09	4764.17	4775.26
DR0096	1050mm dia.	m	5713.56	5445.14	5713.60	5714.69
DR0097	1200mm dia.	m	6564.58	6394.71	6564.66	6566.00

Code	Description	Units	PL	GP	SJ	TH
SPIGOT & SOCKET TYPE RCC PIPE (NP-3 CLASS)						
Providing and laying Non Pressure NP-3 class (Medium duty) R.C.C. PIPES, spigot & socket type with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete						
DR0220	450 mm dia NP-3 spigot & socket	m	2089.24	2088.98	2089.45	2092.16
DR0221	600 mm dia NP-3 spigot & socket	m	3195.96	3151.90	3196.22	3199.81
DR0222	900 mm dia NP-3 spigot & socket	m	5149.54	5145.87	5149.88	5155.43
DR0223	1000 mm dia NP-3 spigot & socket	m	7901.58	7879.57	7901.97	7908.18
DR0224	1200 mm dia NP-3 spigot & socket	m	8998.68	8945.51	8999.19	9006.78
M a n h o l e s						
Constructing Brick masonry manhole in cement mortar 1:5, R.C.C top slab with 1:2:4 20mm aggregates, foundation concrete 1:4:8 40mm aggregates, 12mm plaster in CM 1:3 finished with floating coat of neat cement and making channels in cement concrete 1:2:4 20mm aggregates, neatly finished complete						
DR0105	Inside dimension 900 x 800mm & 450mm deep including C.I. cover & frame (weight >38 kg)	each	12647.72	12554.36	12930.68	14961.64
DR0106	Inside dimension 900 x 800mm & 600mm deep including C.I. cover & frame (weight >38 kg)	each	13486.84	13389.23	13807.22	16059.63
DR0107	Inside dimension 1200 x 900mm & 900mm deep including C.I. cover & frame weight >116 kg)	each	31007.74	32739.83	31560.81	36999.15
Extra for additional depth of manholes						
DR0115	900 x 800mm	m	7297.55	7288.08	7576.90	9120.74
DR0116	1200 x 900mm	m	8723.81	8712.22	9056.73	10898.05

Chapter 5: MORTARS

Code	Description	Units	PL	GP	SJ	TH
Cement Mortar						
MR0001	Cement mortar 1:1 (1 cement : 1 sand)	cu.m	9981.06	9730.25	9864.45	11840.81
MR0002	Cement mortar 1:2 (1 cement : 2 sand)	cu.m	7058.76	6909.44	7172.98	8705.51
MR0003	Cement mortar 1:3 (1 cement : 3 sand)	cu.m	5598.31	5499.78	5828.45	7139.63
MR0004	Cement mortar 1:4 (1 cement : 4 sand)	cu.m	4430.59	4367.45	4712.29	5812.68
MR0005	Cement mortar 1:5 (1 cement : 5 sand)	cu.m	3801.82	3757.73	4111.29	5098.16
MR0006	Cement mortar 1:6 (1 cement : 6 sand)	cu.m	3262.87	3235.12	3596.14	4485.73
Lime Mortar						
MR0010	Lime mortar 1:2 (1 lime putty : 2 Brick Powder)	cu.m	12782.39	11680.00	12152.45	13506.81
MR0011	Lime Mortar 1:1 :1 (1 Lime putty : 1 Brick Powder : 1 Sand)	cu.m	14992.88	15010.77	15184.85	15575.37
Mud Mortar						
MR0015	Mud mortar	cu.m	1040.94	1040.94	1040.94	1040.94
White Cement Mortar						
MR0020	White Cement mortar 1:2 (1 white cement : 2 sand)	cu.m	30939.78	34034.24	35180.32	41594.63
MR0021	White Cement mortar 1:3 (1 white cement : 3 sand)	cu.m	23360.77	25681.66	26668.73	31615.00
MR0022	White Cement mortar 1:5 (1 white cement : 5 sand)	cu.m	14572.76	15999.30	16753.06	19949.50
Cement Lime Mortar						
MR0025	Cement lime mortar 1:1:3 (1 cement : 1 lime putty : 3 sand)	cu.m	12499.56	12420.35	12684.50	13844.07
MR0026	Cement lime mortar 1:1:6 (1 cement : 1 lime putty : 6 sand)	cu.m	8243.81	8216.05	8577.08	9532.57

Code	Description	Units	PL	GP	SJ	TH
Chapter 6: CONCRETE WORK						
Plain Cement Concrete						
Providing and laying in position plain cement concrete excluding the cost of centering and shuttering - All work upto plinth level.						
CW0001	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	7885.51	7847.43	8152.64	9129.20
CW0002	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6002.39	6018.09	6341.45	6982.60
CW0003	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5345.07	5391.26	5749.34	6257.20
CW0004	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 40 mm nominal size)	cu.m	5333.89	5317.65	5538.75	6183.60
CW0005	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 20 mm nominal size)	cu.m	4568.80	4646.65	5029.79	5373.22
CW0006	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 40 mm nominal size)	cu.m	4468.57	4443.49	4655.52	5170.07
CW0007	1:3:6 (1 cement : 3 sand : 6 graded gravel/shingles 40 mm nominal size)	cu.m	4070.54	4028.92	4179.29	4755.50
CW0008	1:4:8 (1 cement : 4 sand : 8 graded crushed stone 40 mm nominal size)	cu.m	3900.22	3890.14	4116.94	4554.14
CW0009	1:4:8 (1 cement : 4 sand : 8 graded crushed stone 50 mm nominal size)	cu.m	3843.57	3833.48	4060.29	4497.49
CW0010	1:4:8 (1 cement : 4 sand : 8 graded gravel/shingles 40 mm nominal size)	cu.m	3488.61	3461.16	3623.25	4125.17
CW0011	1:5:10 (1 cement : 5 sand : 10 graded crushed stone 40 mm nominal size)	cu.m	3493.53	3492.07	3710.63	4077.21
CW0012	1:5: 10 (1 cement : 5 sand : 10 graded crushed stone 50 mm nominal size)	cu.m	3418.36	3416.89	3635.46	4002.04
CW0013	1:5:10 (1 cement : 5 sand : 10 graded gravel/shingles 40 mm nominal size)	cu.m	3080.54	3062.77	3220.55	3647.92
Providing and laying in position plain cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. upto floor five level, excluding the cost of centering and shuttering						
CW0020	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	8382.59	8344.51	8649.73	9626.28
CW0021	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6500.44	6516.33	6839.93	7480.84
CW0022	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5842.15	5888.34	6246.42	6754.29
CW0023	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 40 mm nominal size)	cu.m	5735.11	5718.56	5939.41	6584.51
CW0024	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 20 mm nominal size)	cu.m	4970.85	5048.70	5431.84	5775.27
CW0025	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 40 mm nominal size)	cu.m	4870.62	4845.54	5057.57	5572.12
CW0026	1:3:6 (1 cement : 3 sand : 6 graded gravel/shingles 40 mm nominal size)	cu.m	4472.59	4430.97	4581.34	5157.55

Code	Description	Units	PL	GP	SJ	TH
Pre-cast Cement Concrete						
	Providing and fixing upto floor five level pre-cast cement concrete lacing courses, copings, bed plates, anchor blocks, plain window sills, shelves, louvers, steps, staircases etc. including hoisting and setting in position with cement mortar 1:3 (1 cement : 3 sand) cost of required formwork and finishing smooth with 6 mm thick cement plaster on exposed surface complete					
CW0050	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	7496.62	7528.22	7892.44	8512.10
CW0051	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 20 mm nominal size)	cu.m	6686.92	6753.20	7175.31	7673.37
	Providing and fixing at or near ground level pre-cast cement concrete in kerbs, edgings etc. as per approval pattern and setting in position with cement mortar 1:3 (1 cement : 3 sand) cost of required formwork and finishing smooth with 6 mm thick cement plaster on exposed surface complete					
CW0060	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	7149.35	7187.78	7573.12	8186.89
	Providing and fixing upto floor five level pre-cast cement concrete solid block including hoisting and setting in position with cement mortar 1:3 (1 cement : 3 sand) including the cost of required formwork and finishing smooth with 6 mm thick cement plaster on exposed surface complete					
CW0070	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	7900.88	7929.47	8347.71	9092.65
CW0071	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 20 mm nominal size)	cu.m	7041.26	7101.15	7544.29	8126.90
	Providing and fixing upto floor five level pre-cast cement concrete hollow block including hoisting and setting in position with cement mortar 1:3 (1 cement : 3 sand) including the cost of required formwork and finishing smooth with 6 mm thick cement plaster on exposed surface complete					
CW0080	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5360.94	5380.26	5623.99	6042.17
CW0081	1:3:6 (1 cement : 3 sand : 6 graded crushed rock 20 mm nominal size)	cu.m	4840.18	4877.93	5133.31	5450.02
Lime Concrete						
	Providing and laying lime concrete, with 40 % mortar comprising of 1:1:1 lime mortar, in footings and bases for columns excluding cost of formwork					
CW0090	With graded stone aggregate of 40 mm	cu.m	7955.02	7962.18	8031.81	8188.02
CW0091	with graded brick aggregate of 40 mm	cu.m	9447.46	9454.61	9524.24	9680.45
Plum Concrete						
	Providing and laying in position plum concrete (concrete M15- 60% and boulder - 40%) excluding the cost of centering and shuttering					
CW0095	All work upto plinth level	cu.m	3671.28	3698.99	3913.84	4246.55

Code	Description	Units	PL	GP	SJ	TH
E x t r a						
Extra for laying cement concrete work						
CW0135	Cement concrete work in super-structure above floor five level for each four floors or part thereof	cu.m	8% of the rates worked out for respective items			
CW0136	In or under water, mud, including the cost of pumping or bailing out water and removing slush etc. complete....per metre depth (concrete not leaner than 1:2:4)	cu.m	839.53	833.54	830.80	866.47
CW0137	Cement concrete work under foul conditions	cu.m	874.86	874.86	874.86	874.86
CW0140	Providing and mixing water-proofing materials in in the proportion 12 kg/cu.m or as prescribed by the manufacturer	cu.m	2676.96	2676.96	2676.96	2676.96

Code	Description	Units	PL	GP	SJ	TH
Chapter 7: DAMP-PROOFING						
Concrete Course						
Providing and laying damp-proof course with cement concrete 1:2:4, 12.5mm aggregate						
DP0001	25mm thick	sq.m	185.82	190.81	199.57	211.95
DP0002	40mm thick	sq.m	264.91	272.91	286.91	306.73
Providing and laying damp-proof course with cement concrete 1:2:4, 20mm aggregate						
DP0010	50mm thick	sq.m	330.08	329.35	345.98	371.62
Bituminous Coatings						
DP0015	Applying a coat of hot bitumen (maxphalt VG -10 or equivalent) using 1.7 kg per sq.m including the surface cleaning	sq.m	168.64	174.18	170.88	172.92
Moisture Barriers						
Providing and laying moisture barrier using plastic sheeting underlay						
DP0020	200 micro-metre	sq.m	34.78	34.78	34.78	34.78
Providing and laying Bitumen felt Type 3 in wall bases etc.						
DP0030	Grade 2	sq.m	284.54	284.54	284.54	284.54

Chapter 8: REINFORCED CONCRETE

Concreting Items

Code	Description	Units	PL	GP	SJ	TH
	Providing & laying in position reinforced cement concrete excluding the cost of centering, shuttering and reinforcement - all work upto plinth level					
RC0001	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	7941.20	7903.12	8208.34	9184.89
RC0002	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6058.08	6073.79	6397.14	7038.29
RC0003	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5400.76	5446.95	5805.03	6312.90
	Providing & laying in position reinforced cement concrete work in walls (any thickness) including attached pilasters buttresses, piers, abutments etc. upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0005	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	7930.93	7892.85	8198.06	9174.61
RC0006	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6047.81	6063.51	6386.86	7028.02
RC0007	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5350.24	5396.43	5754.51	6262.38
	Providing & laying in position reinforced cement concrete work in plinth and skirting courses, fillets, columns , pillars, posts and struts upto floor five level excluding the cost of centering, shuttering and reinforcement.					
RC0009	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	8019.47	7981.39	8286.60	9263.16
RC0010	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6136.35	6152.05	6475.41	7116.56
RC0011	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5479.03	5525.22	5883.30	6391.16
	Providing & laying in position reinforced cement concrete work in suspended floor, roofs having slope upto 15 Degree, landings, balconies, shelves and chajjas upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0013	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	8185.71	8147.63	8452.85	9429.40
RC0014	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6302.59	6318.29	6641.65	7282.80
RC0015	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5645.27	5691.46	6049.54	6557.40
	Providing & laying in position reinforced cement concrete work in beams, lintels, bands, plain window sills, staircases, spiral staircases upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0017	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	8014.57	7976.49	8281.71	9258.26
RC0018	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6131.45	6147.16	6470.51	7111.66
RC0019	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5474.13	5520.32	5878.40	6386.27

Code	Description	Units	PL	GP	SJ	TH
	Providing & laying in position reinforced cement concrete work in kerbs, steps and the like upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0020	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	8014.57	7976.49	8281.71	9258.26
RC0021	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6131.45	6147.16	6470.51	7111.66
RC0022	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	5474.13	5520.32	5878.40	6386.27
	Providing & laying in position reinforced cement concrete work in arches and arch ribs upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0023	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	9866.76	9828.68	10133.89	11110.45
RC0024	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	7983.64	7999.34	8322.70	8963.85
RC0025	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	7326.32	7372.51	7730.59	8238.45
	Providing & laying in position reinforced cement concrete work in domes, vaults, shells folded plates and roofs having more than 15° upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0026	1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	cu.m	9826.94	9797.21	10116.18	11104.62
RC0027	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	7879.88	7895.81	8225.31	8879.83
RC0028	1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	cu.m	7210.48	7257.60	7622.85	8140.83
	Providing & laying in position reinforced cement concrete work in vertical and horizontal fins individually or forming box louvers, fascias and eaves boards - upto floor five level excluding the cost of centering, shuttering and reinforcement					
RC0029	1:1.5:3 (1 cement : 1.5 sand : 3 graded crushed rock 20 mm nominal size)	cu.m	6853.04	6821.37	7169.71	7814.54
	T r a d i t i o n a l C o r n i c e s					
	Bhutan type Traditional Cornices in R.C.C 1:1.5:3, 20 mm aggregate including cost of formwork including finishing with 6mm thick plaster on the exposed surface with cement mortar 1:3 as per standrad design excluding cost of reinforcement & decorative painting .					
RC0030	Single Storied building, including Phana	m	2791.56	2797.99	2816.36	2836.63
RC0031	Multi-Storied building..at floor 2 level including the cost of lhanglag and at other floors where Lhanglag is provided	m	2822.88	2829.03	2847.00	2867.16
RC0032	Multi-Storied building.. at all middle floor levels (excluding the cost of phana)	m	3561.96	3571.65	3609.01	3657.48
RC0033	Phana	m	1659.61	1660.96	1665.28	1671.28
RC0034	Lintel Cornice (only cornice portion at external face)	m	1694.79	1698.15	1705.89	1712.74

Code	Description	Units	PL	GP	SJ	TH
	Bhutan type Traditional Cornices in R.C.C 1:2:4, 20 mm aggregate including cost of formwork including finishing with 6mm thick plaster on the exposed surface with cement mortar 1:3 as per standrad design excluding cost of reinforcement & decorative painting					
RC0040	Single Storied building, including Phana	m	2766.99	2774.35	2793.69	2809.15
RC0041	Multi-Storied building..at floor 2 level and at other floors where Lhanglag is provided including the cost of lhanglag	m	2798.64	2805.70	2824.64	2840.05
RC0042	Multi-Storied building.. at all middle floor levels (excluding the cost of phana)	m	3506.00	3517.80	3557.38	3594.89
RC0043	Phana	m	1655.04	1656.57	1661.06	1666.17
RC0044	Lintel cornice (only cornice portion at external face)	m	1684.99	1688.72	1696.86	1701.78
	Extra for R.C Works					
RC0050	Applying cement slurry on R.C.C slabs using 2.75 kg per sq.m for receiving C.C. floor including roughening, cleaning & dampen the surface	sq.m	37.18	36.43	36.09	40.55
RC0051	Extra for R.C.C work above floor 5 level for every four floors or part thereof, excluding cost of reinforcement	cu.m	8% of respective item rates			
RC0052	Extra for rendering in cement mortar 1:2, the top of suspended floors/landings/staircase treads and risers	sq.m	69.46	69.02	69.81	74.41
RC0053	Rendering smooth finishing of the exposed surface with 6mm thick C.M 1:3	sq.m	153.22	152.51	154.87	164.31
RC0054	Providing throating, plastering drip and moulding to R.C.C chajjas	m	46.81	46.81	46.81	46.81
	Precast Items					
	Providing & fixing, below & including floor 2 level, Precast R.C.C jali 1:2:4, 12.5mm aggregate, reinforced with mild steel wire 1.6mm dia., including roughening, cleaning, fixing, finishing in cement mortar 1:3, excluding plastering of the jambs, sills, soffits					
RC0060	50 mm thick	sq.m	1323.79	1333.78	1364.24	1401.97
RC0061	40 mm thick	sq.m	1172.05	1180.04	1207.00	1239.78
RC0062	25 mm thick	sq.m	1091.34	1096.34	1118.05	1143.40
	Providing & fixing, below & including floor 2 level, Precast R.C.C 1:2:4, 20mm aggregate including finishing, plastering with 6mm cement plaster 1:3 and formwork, but excluding reinforcement cost					
RC0070	String courses, copings, bed plates, anchor blocks, plain window sills	cu.m	13084.91	13232.51	13745.06	14205.97
RC0071	Small lintels & joists < 1.5m clear span, shelves	cu.m	11943.31	12080.48	12570.16	13001.44
RC0072	Joists, span > 1.5m, shelves	cu.m	9625.19	9625.72	10030.49	10700.71
	Steel Reinforcement					
RC0083	Providing & fixing Thermo-Mechanically Treated reinforcement bar (Yield Strength 500 MPa) for R.C.C work including cutting, bending, binding and placing in position complete	kg	81.44	83.96	83.15	88.46
	Form work					
	Providing & fixing centering and shuttering (formwork) using Timber, including strutting, propping etc. and removal of formwork - Foundations, Footings and all works upto Plinth Level, etc.					
RC0090	Foundations, Footings, all works upto Plinth Level, etc.	sq.m	476.92	496.06	508.23	511.40

Code	Description	Units	PL	GP	SJ	TH
	Providing & fixing centering and shuttering (formwork) using Shuttering Plywood, including Timber frame and timber strutting, propping with complete form tie system etc. and removal of formwork -					
RC0108	Foundations, Footings, all works upto Plinth Level, etc.	sq.m	685.69	699.76	714.95	699.30
RC0109	Walls (any thickness), pilasters, buttresses, string course etc.	sq.m	1174.97	1186.54	1199.28	1184.91
RC0110	Lintels, beams, griders, bresummers, cantilevers etc.	sq.m	1043.27	1063.06	1058.47	1062.07
RC0111	Columns, pillars, post, struts, etc.	sq.m	1098.55	1116.33	1133.65	1112.44
RC0112	Staircase (except spiral staircase)	sq.m	682.10	692.45	700.00	691.94
RC0113	Suspended floor, roof, landing, shelves and their supports, balconies, chajjas, etc.	sq.m	859.19	866.18	871.29	866.89
RC0114	Spiral stair case excluding landing	sq.m	802.46	810.28	812.11	811.30
RC0115	Arches, curved, Domes,vaults, shell roof etc.	sq.m	1740.27	1793.66	1796.83	1813.70
	Providing & fixing centering and shuttering (formwork) using Shuttering Plywood, including Timber frame and steel strutting, propping with complete form tie system etc. and removal of formwork -					
RC0141	Foundations, Footings, all works upto Plinth Level, etc.	sq.m	403.32	405.78	415.32	417.38
RC0142	Walls (any thickness), pilasters, buttresses, string course etc.	sq.m	1051.77	1052.33	1058.88	1058.34
RC0143	Lintels, beams, griders, bresummers, cantilevers etc.	sq.m	949.82	951.68	959.34	956.67
RC0144	Columns, pillars, post, struts, etc.	sq.m	1001.60	1013.57	1030.97	1016.40
RC0145	Staircase (except spiral staircase)	sq.m	812.65	814.79	822.08	816.38
RC0146	Suspended floor, roof, landing, shelves and their supports, balconies, chajjas, etc.	sq.m	831.88	834.69	842.60	836.01
RC0147	Spiral stair case excluding landing	sq.m	831.88	834.69	842.60	836.01
RC0148	Arches, curved, Domes,vaults, shell roof etc.	sq.m	1849.56	1902.93	1906.12	1922.97
	Expansion Joints					
	Providing & filling or fixing in position in expansion joints					
RC0105	Blown bitumen	cu.m	73578.17	77252.80	75192.13	76027.92
RC0106	Bitumen mix filler of proportion 80 kg of hot bitumen, 1 kg of cement and 0.25 cum of sand for expansion joints	cu.m	23127.19	24053.41	23843.19	24414.42
RC0107	12 mm bitumen impregnated fibre board	sq.m	596.62	596.62	596.62	633.33
	Providing and fixing sheet-covering over expansion joints with iron screws as per design to match the colour shade of the distemper or wall treatment					
RC0116	Aluminium fluted strip 3.15x150mm	m	726.35	741.97	687.31	825.52
	Design Mix Concrete					
	Providing & laying in position machine batched, machine mixed and machine vibrated M-30 design mix cement concrete for reinforced cement concrete structural elements, excluding the cost of centering, shuttering and reinforcement, Including admixtures in recommended proportions (as per IS 9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per the direction of the engineer. The mix design shall be carried out at site by a qualified engineer as per IS code 10262:2019.					
RC0160	All work upto plinth level	cu.m	6632.04	6654.13	7009.75	7669.41
RC0161	All work above plinth level	cu.m	6842.92	6865.01	7220.63	7880.29
	Providing & laying in position machine batched, machine mixed and machine vibrated M-35 design mix cement concrete for reinforced cement concrete structural elements, excluding the cost of centering, shuttering and reinforcement, Including admixtures in recommended proportions (as per IS 9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per the direction of the engineer. The mix design shall be carried out at site by a qualified engineer as per IS code 10262:2019.					
RC0166	All work upto plinth level	cu.m	7015.11	7024.65	7365.39	8080.38
RC0167	All work above plinth level	cu.m	7225.99	7235.54	7576.28	8291.26

Code	Description	Units	PL	GP	SJ	TH
	Providing & laying in position machine batched, machine mixed and machine vibrated M-40 design mix cement concrete for reinforced cement concrete structural elements, excluding the cost of centering, shuttering and reinforcement, Including admixtures in recommended proportions (as per IS 9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per the direction of the engineer. The mix design shall be carried out at site by a qualified engineer as per IS code 10262:2019.					
RC0170	All work upto plinth level	cu.m	7226.11	7228.79	7562.00	8308.81
RC0171	All work above plinth level	cu.m	7437.00	7439.68	7772.89	8519.69
	Providing & laying in position machine batched, machine mixed and machine vibrated M-45 design mix cement concrete for reinforced cement concrete structural elements, excluding the cost of centering, shuttering and reinforcement, Including admixtures in recommended proportions (as per IS 9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per the direction of the engineer. The mix design shall be carried out at site by a qualified engineer as per IS code 10262:2019.					
RC0175	All work upto plinth level	cu.m	7484.75	7479.15	7803.17	8588.49
RC0176	All work above plinth level	cu.m	7684.01	7677.62	7993.97	8769.81

Code	Description	Units	PL	GP	SJ	TH
Chapter 9: BRICK WORK						
One-Brick Masonry (250mm)						
Providing & laying Second-Class Brick work in Foundation & Plinth						
BW0001	In cement mortar 1:3	cu.m	8432.91	8416.19	8735.75	10563.87
BW0002	In cement mortar 1:4	cu.m	8140.98	8133.11	8456.71	10232.13
BW0003	In cement mortar 1:5	cu.m	7983.78	7980.68	8306.46	10053.50
BW0004	In cement mortar 1:6	cu.m	7849.05	7850.02	8177.67	9900.39
BW0005	In mud mortar	cu.m	7185.85	7193.76	7431.15	8931.48
Extras						
BW0010	Extra for brick work in square or rectangular pillars	cu.m	672.89	672.89	672.89	672.89
BW0011	Extra for brick in circular pillars	cu.m	3592.54	3595.30	3678.13	4201.58
BW0012	Extra for brick work in superstructure above plinth level, up to floor two level	cu.m	331.47	331.47	331.47	331.47
BW0013	Extra for brick work in superstructure above floor two level...per floor	cu.m	124.65	124.65	124.65	124.65
BW0014	Extra for providing hoop iron 25x1.6mm or equivalent reinforcement in masonry at every third course, embedded in cement mortar	sq.m	73.29	75.70	87.71	84.51
BW0015	Extra for mixing water-proofing compound in cement mortar	cu.m	449.61	449.61	449.61	449.61
Half-Brick Masonry (125mm)						
Providing & laying Second-Class Half-brick Masonry (125 mm) in superstructure below floor 2 level						
BW0020	In cement mortar 1:3	sq.m	1161.02	1159.56	1198.11	1422.58
BW0021	In cement mortar 1:4	sq.m	1131.82	1131.25	1170.21	1389.40
Extras for Half-Brick						
BW0030	Extra for half-brick masonry in superstructure above floor 2 level...per floor	sq.m	14.61	14.61	14.61	14.61
BW0031	Extra for mixing water-proofing compound in cement mortar	sq.m	50.65	50.65	50.65	50.65
Brick Masonry (75 mm)						
BW0032	75mm thick brick masonry (second class bricks) in cement mortar 1:3 in partitions etc. in superstructure below floor 2 level	sq.m	614.99	613.81	637.84	775.85
Extra for 75 mm Brick Masonry						
BW0033	Extra for 75mm brick masonry in cement mortar 1:3 in partitions etc. in superstructure above floor 2 level...Per floor	sq.m	14.61	14.61	14.61	14.61
Traditional Cornices						
Providing & laying second class brick work in Bhutan type Traditional Cornices in cement mortar 1:3, including 12mm plaster in cement mortar 1:5, but excluding decorative painting. (Measurement to be taken along the cornice and wall junction)						
BW0040	Floor one level including lhanglag	m	1766.86	1765.65	1779.45	1853.61
BW0041	Middle Floor levels excluding phana	m	2719.00	2716.94	2750.31	2928.65

Code	Description	Units	PL	GP	SJ	TH
P o i n t i n g						
Pointing on brickwork with cement mortar 1:3						
BW0050	Flush pointing	sq.m	111.65	111.35	112.34	116.27
BW0051	Ruled pointing	sq.m	122.19	121.89	122.88	126.81
BW0052	Cut, weather struck pointing	sq.m	168.06	167.76	168.75	172.68
BW0053	Raised & cut pointing	sq.m	221.93	221.47	222.98	229.02
Interlocking Cement Earth Block						
Providing & laying ICEB (300mmX150mmX100mm) in Foundation & Plinth						
BW0060	In cement mortar 1:3	cu.m	3976.20	4091.06	4149.41	4556.80
BW0061	In cement mortar 1:4	cu.m	3706.72	3829.02	3886.12	4240.18
BW0062	In cement mortar 1:5	cu.m	3632.75	3758.02	3821.12	4166.51
BW0063	In cement mortar 1:6	cu.m	3555.91	3683.51	3747.68	4079.19
BW0064	In mud mortar	cu.m	3227.81	3357.30	3357.30	3551.53
E x t r a s						
BW0070	Extra for ICEB work in square or rectangular pillars	cu.m	352.61	352.61	352.61	352.61
BW0071	Extra for ICEB work in superstructure above plinth level, up to floor two level	cu.m	175.83	175.83	175.83	175.83
BW0072	Extra for ICEB work in superstructure above floor two level...per floor	cu.m	64.99	64.99	64.99	64.99
Providing & laying ICEB(300mmX150mmX100mm) in superstructure below floor 2 level						
BW0080	In cement mortar 1:3	sq.m	598.63	617.15	620.56	662.63
BW0081	In cement mortar 1:4	sq.m	589.82	608.61	612.14	652.62
E x t r a s						
BW0090	Extra for ICEB work in superstructure above floor 2 level...per floor	sq.m	15.28	15.28	15.28	15.28
Providing & laying ICEB (250mmX125mmX100mm) in Foundation & Plinth						
BW0100	In cement mortar 1:3	cu.m	5644.04	5634.93	5397.24	5821.50
BW0101	In cement mortar 1:4	cu.m	5525.83	5520.30	5284.26	5687.17
BW0102	In cement mortar 1:5	cu.m	5411.93	5409.86	5175.39	5557.74
BW0103	In cement mortar 1:6	cu.m	5404.21	5402.37	5168.00	5548.96
BW0104	In mud mortar	cu.m	5196.30	5196.30	4916.33	5196.30
E x t r a s						
BW0110	Extra for ICEB work in square or rectangular pillars	cu.m	503.83	503.83	503.83	503.83
BW0111	Extra for ICEB work in superstructure above plinth level, up to floor two level	cu.m	251.22	251.22	251.22	251.22
BW0112	Extra for ICEB work in superstructure above floor two level...per floor	cu.m	92.84	92.84	92.84	92.84
Providing & laying ICEB(250mmX125mmX100mm) in superstructure below floor 2 level						
BW0120	In cement mortar 1:3	sq.m	791.17	790.06	759.19	809.84
BW0121	In cement mortar 1:4	sq.m	780.48	779.69	748.98	797.70
E x t r a s						
BW0130	Extra for ICEB work in superstructure above floor 2 level...per floor	sq.m	18.51	18.51	18.51	18.51

Code	Description	Units	PL	GP	SJ	TH
Concrete Hollow Block Brick						
Providing & laying locally manufactured concrete block brick in Foundation & Plinth						
BW0140	In cement mortar 1:3	cu.m	6436.26	6328.76	6369.50	7873.91
BW0141	In cement mortar 1:4	cu.m	6144.33	6045.68	6090.46	7542.17
BW0142	In cement mortar 1:5	cu.m	5987.13	5893.25	5940.21	7363.54
BW0143	In cement mortar 1:6	cu.m	5852.40	5762.60	5811.42	7210.43
Concrete Solid Brick						
Providing & laying locally manufactured concrete block brick in Foundation & Plinth						
BW0145	In cement mortar 1:3	cu.m	7907.98	7883.35	7965.52	8821.64
BW0146	In cement mortar 1:4	cu.m	7616.05	7600.27	7686.48	8489.90
BW0147	In cement mortar 1:5	cu.m	7458.86	7447.84	7536.23	8311.27
BW0148	In cement mortar 1:6	cu.m	7324.12	7317.18	7407.44	8158.17
Concrete Porous Brick						
Providing & laying locally manufactured concrete block brick in Foundation & Plinth						
BW0150	In cement mortar 1:3	cu.m	8700.47	8675.84	8758.01	9165.05
BW0151	In cement mortar 1:4	cu.m	8408.55	8392.76	8478.97	8833.32
BW0152	In cement mortar 1:5	cu.m	8251.35	8240.33	8328.72	8654.69
BW0153	In cement mortar 1:6	cu.m	8116.62	8109.68	8199.93	8501.58
E x t r a s						
BW0170	Extra for concrete block brick in square or rectangular pillars	cu.m	672.89	672.89	672.89	672.89
BW0171	Extra for concrete block brick in circular pillars	cu.m	2900.13	2871.13	2856.63	3268.45
BW0172	Extra for concrete block brick work in superstructure above plinth level, up to floor two level	cu.m	331.47	331.47	331.47	331.47
BW0173	Extra for concrete block brick work in superstructure above floor two level...per floor	cu.m	124.65	124.65	124.65	124.65
BW0174	Extra, for providing hoop iron 25x1.6mm or equivalent reinforcement in masonry at every third course, embedded in cement mortar	sq.m	73.29	75.70	87.71	84.51
BW0175	Extra, for mixing water-proofing compound in cement mortar	cu.m	449.61	449.61	449.61	449.61
Concrete Hollow Block Brick						
Providing & laying locally manufactured concrete Hollow block brick Masonry (190 mm) in superstructure below floor 2 level						
BW0190	In cement mortar 1:3	sq.m	1143.11	1124.90	1125.25	1381.58
BW0191	In cement mortar 1:4	sq.m	1113.91	1096.59	1097.34	1348.40
Concrete Partition Hollow Block						
Providing & laying locally manufactured Concrete Partition Hollow Block Masonry (90 mm) in superstructure below floor 2 level						
BW0194	In cement mortar 1:3	sq.m	1064.39	1057.99	1070.15	1098.20
BW0195	In cement mortar 1:4	sq.m	1035.20	1029.69	1042.24	1065.03
Concrete Solid Brick						
Providing & laying locally manufactured Concrete Solid Block Masonry (115 mm) in superstructure below floor 2 level						
BW0198	In cement mortar 1:3	sq.m	1026.51	1024.05	1032.27	1125.80
BW0199	In cement mortar 1:4	sq.m	997.32	995.74	1004.36	1092.63

Code	Description	Units	PL	GP	SJ	TH
Concrete Porous Brick						
Providing & laying locally manufactured Concrete Porous Brick Masonry (110 mm) in superstructure below floor 2 level						
BW0202	In cement mortar 1:3	sq.m	1252.18	1249.72	1257.94	1301.59
BW0203	In cement mortar 1:4	sq.m	1222.99	1221.41	1230.03	1268.41
E x t r a s						
BW0220	Extra, for concrete block half-brick masonry in superstructure above floor 2 level...per floor	sq.m	14.61	14.61	14.61	14.61
BW0221	Extra, for mixing water-proofing compound in cement mortar	sq.m	50.65	50.65	50.65	50.65
Pointing						
Pointing on concrete block brick work with cement mortar 1:3						
BW0230	Flush pointing	sq.m	111.65	111.35	112.34	116.27
BW0231	Ruled pointing	sq.m	122.19	121.89	122.88	126.81
BW0232	Cut, weather struck pointing	sq.m	168.06	167.76	168.75	172.68
BW0233	Raised & cut pointing	sq.m	221.93	221.47	222.98	229.02
AAC Block						
BW0240	Providing and laying locally manufactured autoclaved aerated cement blocks masonry (AAC blocks) in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made separately).	Cu.m	8972.13	9318.98	9493.97	10281.39

Code	Description	Units	PL	GP	SJ	TH
Chapter 10: STONE/MUD						
Rammed Mud Work						
SM0001	Constructing rammed mud walls in superstructure including the cost of form work	cu.m	1450.60	1455.98	1459.77	1454.04
Random Rubble Masonry						
Providing & laying Random Rubble Masonry with hard stone in foundation & plinth						
SM0005	In cement mortar 1:4	cu.m	4101.59	4080.75	4194.55	4627.67
SM0006	In cement mortar 1:5	cu.m	3894.10	3879.55	3996.22	4391.88
SM0007	In cement mortar 1:6	cu.m	3716.25	3707.09	3826.22	4189.78
SM0008	Hammer dressed, in mud mortar	cu.m	3097.99	3097.99	3097.99	3167.98
Extras						
SM0015	Extra for random rubble masonry with hard stone in superstructure above plinth, below & including floor 2 level	cu.m	402.80	402.80	402.80	402.80
SM0016	Extra for random rubble masonry with hard stone in superstructure above floor 2 level..per floor	cu.m	178.65	178.65	178.65	178.65
SM0017	Extra for random rubble masonry work with hard stone in square or rectangular pillars	cu.m	649.21	649.21	649.21	649.21
SM0018	Extra for random rubble masonry work with hard stone in circular pillars	cu.m	830.92	830.92	830.92	830.92
SM0019	Extra for random rubble masonry work with hard stone for mixing water-proofing materials in cement mortar	cu.m	430.18	430.18	430.18	430.18
Coursed Rubble Masonry						
Providing &laying Coursed Rubble Masonry with hard stone hammer-dressed in foundation & plinth						
SM0025	In cement mortar 1:3	cu.m	4782.67	4753.11	4851.71	5322.06
SM0026	In cement mortar 1:4	cu.m	4432.35	4413.41	4516.87	4923.97
SM0027	In cement mortar 1:5	cu.m	4243.72	4230.50	4336.56	4709.62
SM0028	In cement mortar 1:6	cu.m	4082.04	4073.71	4182.02	4525.89
Extras						
SM0035	Extra for C.R. masonry with hard stone in superstructure above plinth, below & including floor 2 level	cu.m	375.31	375.31	375.31	375.31
SM0036	Extra for C.R. masonry with hard stone in superstructure above floor 2 level	cu.m	178.65	178.65	178.65	178.65
SM0037	Extra for C.R masonry with hard stone in square or rectangular pillars	cu.m	474.83	474.83	474.83	474.83
SM0038	Extra for C.R masonry with hard stone in circular pillars	cu.m	1151.59	1151.59	1151.59	1173.99
SM0039	Extra for C.R masonry with hard stone chisel dressed in foundations and plinth	cu.m	99.99	99.99	99.99	99.99
SM0040	Extra for C.R masonry with hard stone chisel dressed in superstructure above plinth, below & including floor 2 level	cu.m	412.59	412.59	412.59	412.59
SM0041	Extra for C.R masonry with hard stone for mixing water-proofing materials	cu.m	518.84	518.84	518.84	518.84
Dry Hand Packed Rubble Masonry						
SM0050	Providing and laying dry hand packed rubble masonry with stone boulders >0.04Cu.m	cu.m	2113.53	2113.53	2113.53	2183.52
SM0051	Providing and laying dry hand packed rubble masonry hammer dressed (facing), with stone-boulder > 0.04 cu.m	cu.m	2273.97	2273.97	2273.97	2350.97
SM0052	Providing and laying dry hand packed rubble masonry chisel dressed (facing) with stone-boulder > 0.04 cu.m	cu.m	2495.26	2495.26	2495.26	2572.25

Code	Description	Units	PL	GP	SJ	TH
Stone Masonry in Concrete Mortar						
SM0060	Providing and laying with hard stone (average volume 0.008 Cu.m) hand packed stone masonry in cement concrete mortar 1:2:4, 20mm aggregates	cu.m	4149.18	4144.39	4254.14	4493.39
SM0061	Providing & laying with hard stone (average volume 0.008 Cu.m) hand packed stone masonry in cement concrete mortar 1:3:6, 20mm aggregates	cu.m	3816.39	3822.05	3942.86	4127.76
SM0062	Providing and laying hammer dressed stone masonry with hard stone (average volume 0.008 Cu.m) in cement concrete mortar 1:2:4 20mm aggregates	cu.m	4274.09	4269.30	4379.04	4625.30
SM0063	Providing and laying hammer dressed stone masonry with hard stone (average volume 0.008 Cu.m) in concrete mortar 1:3:6 20mm aggregates	cu.m	3996.74	4002.40	4123.21	4315.11
SM0064	Providing and laying rubble masonry chisel dressed (facing) with hard stone (average volume 0.008 cu.m) in concrete mortar 1:2:4 20mm aggregates	cu.m	5070.03	5065.24	5174.98	5421.23
SM0065	Providing and laying rubble masonry chisel dressed (facing) with hard stone (average volume 0.008 cu.m) in concrete mortar 1:3:6 20mm aggregates	cu.m	4792.67	4798.34	4919.15	5111.04
Stone Soling Filling & Edging						
SM0070	Providing and laying Hammer dressed dry stone soling	cu.m	1496.77	1496.77	1496.77	1573.76
SM0071	Providing and laying Chisel dressed dry stone soling	cu.m	1611.07	1611.07	1611.07	1688.06
SM0072	Providing and laying Hand packed stone filling or soling with stones	cu.m	1160.59	1160.59	1160.59	1230.58
SM0073	Providing and laying Hammer dressed stone edging 150 x 250 mm with stones including excavation, refilling and disposal of surplus earth within 30 m lead	m	96.38	96.38	96.38	99.60
Stone Pavement Hammer Dressed						
	Providing and laying hammer dressed 150mm thick flat stone pavement with hammer dressed stone edging 150mm wide & 250mm deep on both sides, including grouting joints					
SM0080	With cement concrete mortar 1:3:6, 12mm aggregate	sq.m	481.50	490.00	503.45	528.69
SM0081	With cement mortar 1:3	sq.m	413.84	413.61	414.37	430.93
SM0082	With sand or earth etc.	sq.m	445.39	445.46	446.19	464.19
Flat Stone (Dolep) Paving						
	Providing & laying hammer dressed flat stone paving in cement mortar 1:6 on prepared bedding (excluding the cost of bedding)					
SM0090	20mm	sq.m	3948.75	3948.73	3949.09	3949.98
SM0091	30mm	sq.m	4118.53	4118.50	4118.86	4119.75
SM0092	40mm	sq.m	4288.31	4288.28	4288.64	4289.53
	Providing and laying hammer dressed dry dolep paving including preparation of bed					
SM0093	30mm	sq.m	4115.27	4115.27	4115.27	4115.27
SM0094	40mm	sq.m	4285.05	4285.05	4285.05	4285.05
	Providing & laying all sides chisel dressed flat stone paving in cement mortar 1:6 on prepared bedding (excluding the cost of bedding)					
SM0100	20mm	sq.m	4118.53	4118.50	4118.86	4119.75
SM0101	30mm	sq.m	4288.31	4288.28	4288.64	4289.53
SM0102	40mm	sq.m	4514.68	4514.65	4515.01	4515.90

Code	Description	Units	PL	GP	SJ	TH
	Providing and laying chisel dressed dry dolep paving including preparation of bed					
SM0103	30mm	sq.m	4285.05	4285.05	4285.05	4285.05
SM0104	40mm	sq.m	4511.42	4511.42	4511.42	4511.42
	P o i n t i n g					
	Providing & laying pointing on stone work with cement mortar 1:3					
SM0110	Flush pointing	sq.m	113.25	113.02	113.78	116.79
SM0111	Ruled pointing	sq.m	120.86	120.64	121.39	124.40
SM0112	Raised and cut pointing	sq.m	224.99	224.61	225.86	230.85
	G a b i o n W o r k					
	Providing & filling hand-packed stone in G.I mesh 4mm (8swg)including supplying and weaving of mesh complete					
SM0120	Double-knotted mesh....100mm	cu.m	2973.75	2987.14	2924.76	3659.68
SM0121	Double-knotted mesh....150mm	cu.m	2656.45	2776.35	2656.45	3239.73
SM0122	Chain-link mesh....100mm	cu.m	2633.12	2633.12	2726.44	3263.06
	Providing & filling hand-packed stone in G.I mesh of wire 3.25mm (10swg) including supplying of machine woven mesh complete.					
SM0125	Doubly twisted hexagonal mesh 90mm x 100mm opening.	cu.m	3284.17	3652.61	3652.61	4017.35
SM0126	Doubly twisted hexagonal mesh 100mm x 120mm opening.	cu.m	3135.17	3471.77	3471.77	3811.04
	Providing & filling hand-packed stone in G.I mesh of wire 2.64mm (12swg) including supplying of machine woven mesh complete.					
SM0127	Doubly twisted hexagonal mesh 90mm x 100mm opening.	cu.m	2942.96	3238.48	3238.48	3544.90
SM0128	Doubly twisted hexagonal mesh 100mm x 120mm opening.	cu.m	2811.02	3078.35	3078.35	3362.21
	P r e c a s t S t o n e M a s o n r y					
	Providing & laying Precast Stone Masonry blocks (1:5:8) in cement mortar 1:6 in foundation and plinth					
SM0130	30 cms thick	sq.m	1376.38	1427.95	1515.95	1578.91
SM0131	20 cms thick	sq.m	920.96	957.23	1017.10	1057.00
	Providing & laying Precast Stone Masonry blocks (1:5:8) in cement mortar 1:6 in superstructure up to floor two level					
SM0140	20 cms thick	sq.m	925.59	961.86	1021.74	1061.63
SM0141	15 cms thick	sq.m	694.76	722.02	766.98	796.89
SM0142	10 cms thick	sq.m	470.71	488.99	519.07	538.91
	Extra for Precast Stone Masonry blocks					
SM0150	Extra for Precast Stone Masonry blocks in superstructure above floor two level...per floor	sq.m	109.24	109.24	109.24	109.24

Code	Description	Units	PL	GP	SJ	TH
Chapter 11:	**WOOD WORK**					
Dressed Timber Framing						
Providing & fixing in position dressed wood work in frames of doors, windows, clerestory windows and other frames, wrought and framed						
WW0001	Class 'A' (conifer)	cu.m	26354.88	27420.09	28409.26	26997.90
WW0003	Class 'B' (conifer)	cu.m	25879.53	26944.27	27933.91	26522.55
WW0004	Class 'A' (broad leaf)	cu.m	25213.61	24797.01	25288.37	24764.18
WW0005	Class 'B' (broad leaf)	cu.m	24658.74	24242.03	24733.93	24209.32
Providing & fixing Class 'A' (conifer) moulded beading to door, window frames with iron screws including plugs, priming coat on unexposed surfaces						
WW0010	50 x 12 mm	m	88.93	90.19	90.41	89.75
WW0011	50 x 20 mm	m	96.24	98.03	98.61	97.39
Providing & fixing joists, including hoisting, applying wood preservative on unexposed surfaces						
WW0020	Class 'A' (conifer)	cu.m	23098.69	24163.90	25153.07	23729.46
WW0021	Class 'B' (conifer)	cu.m	22623.34	23688.08	24677.72	23254.11
WW0022	Class 'A' (broad leaf)	cu.m	21957.42	21540.82	22032.18	21495.75
WW0023	Class 'B' (broad leaf)	cu.m	21402.55	20985.84	21477.75	20940.88
Providing & fixing Eaves board (225x25mm) with moulding fitted and fixed with necessary screws						
WW0030	Class 'B' (conifer)	m	176.42	182.60	188.35	180.15
Traditional Cornices						
Wooden Cornices						
Providing, making & fixing woodwork dressed in traditional cornices complete as per standard design in Class 'B' (conifer), including applying wood preservative on unexposed surfaces, excluding decorative painting (Measurement to be taken along the cornice and wall junction line)						
WW0035	At floor one level including lhanglag	m	2638.89	2707.23	2770.76	2668.50
WW0036	At all other floor levels (excluding phana)	m	3647.69	3747.67	3840.61	3690.57
WW0037	For single-storied structure including phana	m	3180.70	3279.98	3372.25	3221.41
WW0038	Phana	m	1577.08	1610.93	1642.38	1585.86
WW0039	Lintel level	m	2177.49	2254.56	2326.19	2224.04
Providing & fixing traditional wooden Tshegay for windows/railing etc. as per standard design						
WW0045	In Class 'B' (conifer)	sq.m	3738.90	3771.35	3801.51	3758.50
WW0046	In Class 'A' (conifer)	sq.m	3753.39	3785.85	3816.00	3772.98

Code	Description	Units	PL	GP	SJ	TH
FRP Cornices						
Providing & fixing FRP Bhutan type traditional cornices complete as per standard design including the cost of TMT re-bars and excluding decorative painting (Measurement to be taken along the cornice and wall junction line)						
WW0050	Single bho, phana, pem and dhung	m	5359.72	5515.26	5515.26	5515.26
WW0051	Double bho, phana, pem and dhung	m	7970.53	7892.76	7892.76	7892.76
WW0052	Double bho, phana, choetse, pem and dhung	m	7309.48	9059.31	9059.31	8476.03
WW0053	Double bho, pem and dhung	m	4774.64	6135.62	6135.62	5843.98
WW0054	Tsechukhanyim	m	4185.84	3777.55	3777.55	3485.91
GRC Cornices						
Providing & fixing GRC Bhutan type traditional cornices complete as per standard design including the cost of TMT re-bars, MS plates and angles, excluding decorative painting (Measurement to be taken along the cornice and wall junction line)						
WW0071	Single bho, phana, pem and dhung	m	6810.40	6987.72	7934.96	6693.75
WW0072	Double bho, phana, pem and dhung	m	8472.13	8691.44	9871.99	8327.48
WW0073	Double bho, phana, choetse, pem and dhung	m	10441.27	10716.58	12191.09	10259.29
WW0074	Double bho, pem and dhung	m	5555.19	5797.84	6567.76	5410.54
WW0075	Tsechukhanyim	m	3319.98	3450.64	3870.59	3240.66
Providing and fixing of Traditional Bhutanese style GRC door cornice as per the standard design and detailed drawing, including the cost of nuts, bolts, anchors, sealant, complete						
WW0730	1000mmX425mm	each	6006.60	6274.33	7127.08	5843.00
WW0731	1200mmX425mm	each	6745.32	7047.75	8014.53	6566.84
WW0732	1410mmX425mm	each	7811.26	8163.26	9293.65	7464.21
WW0733	1600mmX425mm	each	8852.40	9253.99	10538.07	8614.43
WW0734	1800mmX425mm	each	9958.00	10409.16	11861.81	9685.32
WW0735	2000mmX425mm	each	11023.94	11529.64	13140.93	10721.51
Undressed Timber Framing						
WW0055	Providing & fixing Class 'B' (conifer) (undressed) in wall-frames etc.	cu.m	22992.21	24056.95	25046.59	23635.23
WW0056	Providing & fixing Class 'B' (broad leaf) Wood (undressed) in wall - frames etc.	cu.m	21771.43	21354.71	21846.62	21322.00
Providing & fixing roof framing, in trusses, purlins, rafters, posts, post plates including hoisting, etc. (excluding steel items)						
WW0060	Class 'B' (conifer)	cu.m	28412.39	29477.13	30466.77	29055.41
WW0061	Class 'A' (conifer)	cu.m	28887.74	29952.95	30942.12	29530.76
WW0062	Class 'A' (broad leaf)	cu.m	27746.47	27329.87	27821.23	27297.05
WW0063	Class 'B' (broad leaf)	cu.m	27191.60	26774.89	27266.80	26742.18
Providing & fixing gussets for timber trusses including wood preservative (coal tar)						
WW0070	12mm phenolic plywood	sq.m	793.05	749.13	742.78	745.59

Code	Description	Units	PL	GP	SJ	TH
Wall and ceiling Linings						
Gypsum Board						
	Providing and fixing to frames (wall or ceiling) Gypsum plaster board including finishing of joints smooth complete (excluding cost of frame)					
WW0080	10 mm thick	sq.m	546.98	549.43	555.55	596.96
WW0081	12 mm thick	sq.m	602.10	592.68	585.56	670.38
WW0082	15 mm thick	sq.m	693.35	714.79	690.29	727.70
Mineral Fiber Board						
	Providing and fixing to frames mineral fibre board ceiling of size 595X595 mm of approved texture, design and pattern including Galvanized Steel interlocking grid frame of 24mmx38mm T sections and wall angle of 24mmx24mm with all accessories such as 6mm dia fully threaded hanger rod, anchor fasteners, and S.S. screws complete					
WW0086	16 mm thick	sq.m	2582.42	2582.42	2582.42	2582.42
WW0087	19 mm thick	sq.m	2999.21	2510.15	2999.21	2999.21
Wood						
	Providing & fixing to frames (wall or ceiling) Class 'A' (conifer) plain lining, tongued and grooved, including necessary fixtures, wooden plugs and priming coat on unexposed surfaces (excluding cost of frames)					
WW0090	12 mm thick	sq.m	403.70	424.56	431.89	417.06
WW0091	20 mm thick	sq.m	529.19	558.98	574.60	547.95
Particle Board						
	Providing & fixing to frames (wall or ceiling) Plain Particle Board Lining with necessary nails etc. complete (excluding cost of frames)					
WW0100	6 mm	sq.m	654.80	654.80	654.80	704.34
WW0101	10 mm	sq.m	722.51	722.51	722.51	798.29
WW0102	12 mm	sq.m	811.12	811.12	811.12	867.70
WW0103	18 mm	sq.m	1059.60	1059.60	1059.60	1079.43
	Providing & fixing Pre-laminated Particle Board Lining with necessary nails etc. complete (excluding cost of frame)					
WW0110	8 mm	sq.m	802.95	687.20	730.24	800.62
WW0111	10 mm	sq.m	826.29	722.51	828.62	902.58
WW0112	12 mm	sq.m	959.27	1048.08	959.27	1110.38
WW0113	18 mm	sq.m	1207.75	1126.53	1207.75	1294.04
	Providing & fixing Cement Bonded Particle board (pre-laminated both sides for wall/ceiling) lining with necessary nails/screws etc. complete, excluding the cost of frame					
WW0120	6 mm	sq.m	481.98	474.49	526.98	518.82
WW0121	8 mm	sq.m	567.82	518.93	612.92	572.09
WW0122	10 mm	sq.m	683.67	582.76	703.77	713.53
WW0123	12 mm	sq.m	739.49	731.02	804.32	802.07
WW0124	16 mm	sq.m	925.45	1017.75	1017.75	1143.66
WW0125	20 mm	sq.m	1082.56	1214.14	1214.14	1305.40

Code	Description	Units	PL	GP	SJ	TH
Plywood						
Providing & fixing Plywood lining with necessary nails etc. including beading complete (excluding cost of frame)						
WW0130	4 mm, commercial	sq.m	655.87	621.28	624.08	670.08
WW0131	4 mm, teak	sq.m	693.93	659.73	701.30	745.20
WW0132	6 mm, commercial	sq.m	769.32	711.92	704.82	745.80
Wall Lining						
Providing & fixing Pre-fabricated wall panelling profiles with necessary nails etc. complete but excluding the cost of frame)						
WW0140	19 mm, Class 'A' (conifer)	sq.m	1178.30	1178.30	1178.30	1291.27
WW0141	19 mm, Class 'B' (conifer)	sq.m	1102.99	1102.99	1102.99	1228.51
WW0142	15 mm, Class 'A' (conifer)	sq.m	977.47	977.47	977.47	1165.75
Skirting						
Providing & fixing wooden skirting in Class 'B' (conifer) with necessary nails or screws complete						
WW0150	20 mm	sq.m	1829.11	1857.87	1872.56	1847.25
WW0151	25 mm	sq.m	1909.32	1943.46	1963.14	1930.71
B a m b o o W a l l i n g						
WW0160	Providing & fixing 75mm thick split bamboo wall including grooving frames, 20mm plaster cement mortar 1:4 both sides (excluding cost of frame)	sq.m	893.80	890.98	906.43	1243.11
WW0161	Providing & fixing 75mm thick split bamboo wall including grooving frames, 20mm plaster cement mortar 1:5 both sides (excluding cost of frame)	sq.m	865.69	863.71	879.55	1211.16
WW0162	Providing & fixing 75mm thick split bamboo wall including grooving frames, 20mm plaster cement mortar 1:6 both sides (excluding cost of frame)	sq.m	841.53	840.28	856.46	1183.71
WW0163	Providing & fixing 75mm thick split bamboo wall including grooving frames, 20mm mud plaster both sides (excluding cost of frame)	sq.m	467.88	467.88	467.88	755.28
WW0164	Providing & fixing 150mm thick split bamboo wall including grooving frames, 60mm mud plaster both sides (excluding cost of frame)	sq.m	587.71	587.71	587.71	875.10
WW0165	Providing & fixing split Bamboo matting (excluding the cost of framing and beading)	sq.m	422.32	414.02	407.63	438.52
P a r t i t i o n s						
Providing & fixing Panelled or Panelled-&-Glazed partition, single-central-panelling including frame etc. complete						
WW0170	100mm framing, 38mm thick Class 'B' (conifer) panelling	sq.m	2671.62	2724.88	2761.26	2711.21
WW0171	75mm framing, 38mm thick Class 'B' (conifer) panelling	sq.m	2524.18	2571.38	2602.12	2560.11
WW0172	100mm framing, 38mm thick Class 'A' (conifer) or Class 'A' (conifer) panelling	sq.m	2695.40	2748.68	2785.04	2734.99
WW0173	75mm framing, 38mm thick Class 'A' (conifer) or Class 'A' (conifer) panelling	sq.m	2545.25	2592.47	2623.19	2581.18
Providing & fixing Plywood panelling from both sides including frame						
WW0180	100mm framing, 4mm Commercial Ply	sq.m	1418.80	1386.35	1389.09	1475.32
WW0181	75mm framing, 4mm Commercial Ply	sq.m	1287.82	1249.30	1246.41	1340.67
WW0182	100mm framing, 4mm Teak Ply	sq.m	1498.53	1466.92	1550.89	1632.72
WW0183	75mm framing, 4mm Teak Ply	sq.m	1357.04	1317.65	1397.16	1486.36

Code	Description	Units	PL	GP	SJ	TH
	Providing & fixing Panelled with Pre-fabricated profiles from both sides including the frame and prime coat on concealed face					
WW0190	100mm, 12mm Class 'A' (conifer)	sq.m	2362.08	2411.05	2416.21	2770.80
WW0191	75mm, 12mm Class 'A' (conifer)	sq.m	2220.60	2261.78	2262.48	2624.43
WW0192	100mm, 12mm Class 'B' (conifer)	sq.m	2362.08	2411.05	2416.21	2770.80
WW0193	75mm, 12mm Class 'B' (conifer)	sq.m	2220.60	2261.78	2262.48	2624.43
	D o o r & W i n d o w S h u t t e r s					
	Providing & fixing 25mm thick Panelled or glazed Shutters for cup-boards etc. complete including hinges					
WW0200	Class 'A' (conifer)	sq.m	2342.87	2367.21	2364.34	2302.01
WW0201	Class 'B' (conifer)	sq.m	1952.87	1977.20	1974.33	1912.01
	Providing & fixing 35mm thick Panelled or glazed doors and windows Shutters etc. complete including hinges					
WW0210	Class 'A' (conifer)	sq.m	2660.47	2692.93	2697.59	2601.18
WW0211	Class 'B' (conifer)	sq.m	2279.16	2311.61	2316.28	2219.86
	Providing & fixing 38mm thick Panelled or glazed doors and windows Shutters etc. complete including hinges					
WW0220	Class 'A' (conifer)	sq.m	2691.65	2726.14	2732.68	2633.58
WW0221	Class 'B' (conifer)	sq.m	2309.43	2343.90	2350.46	2251.36
	Providing & fixing 44mm thick Panelled or glazed doors and windows Shutters etc. complete including hinges					
WW0230	Class 'A' (conifer)	sq.m	2741.66	2779.30	2788.76	2685.50
WW0231	Class 'B' (conifer)	sq.m	2355.78	2393.40	2402.88	2299.61
	Providing & fixing 50mm thick Panelled or glazed doors and windows Shutters etc. complete including hinges					
WW0240	Class 'A' (conifer)	sq.m	2818.04	2860.65	2874.73	2764.87
WW0241	Class 'B' (conifer)	sq.m	2474.90	2517.49	2531.59	2421.73
	Providing & fixing Wire-mesh Shutters 25mm for doors & windows using galvanised M.S wire gauze 0.56mm dia wire including the cost of hinges					
WW0250	Class 'A' (conifer)	sq.m	1946.92	1968.00	1981.11	1892.10
WW0251	Class 'B' (conifer)	sq.m	1478.67	1499.74	1512.86	1423.85
	Providing & fixing Wire-mesh Shutters 35mm for doors & windows using galvanised M.S wire gauze 0.56mm dia wire including the cost of hinges					
WW0260	Class 'A' (conifer)	sq.m	2042.01	2069.27	2088.13	1990.91
WW0261	Class 'B' (conifer)	sq.m	1571.00	1598.25	1617.12	1519.90
	Providing & fixing Wire-mesh Shutters 38mm for doors & windows using galvanised M.S wire gauze 0.56mm dia wire including the cost of hinges					
WW0270	Class 'A' (conifer)	sq.m	2071.62	2100.82	2121.46	2021.69
WW0271	Class 'B' (conifer)	sq.m	1599.75	1628.93	1649.59	1549.82
	Providing & fixing Battened door & window shutters 20mm, with ledges and braces (25 mm), including the cost of hinges					
WW0280	Class 'A' (conifer)	sq.m	1566.84	1603.36	1637.28	1633.61
WW0281	Class 'A' (Broad Leaf)	sq.m	1527.71	1513.43	1530.28	1557.02
WW0282	Class 'B' (conifer)	sq.m	1550.54	1587.05	1620.98	1617.31
WW0283	Class 'B' (Broad Leaf)	sq.m	1508.69	1494.40	1511.27	1538.00

Code	Description	Units	PL	GP	SJ	TH
Providing & fixing battened garage door with ledges and braces (38mm) in Class 'B' (conifer), including mountings etc. complete						
WW0290	22 mm	sq.m	1516.01	1567.94	1633.59	1564.72
Providing & fixing battened and framed door shutters, Class 'B' (conifer) including the cost of hinges						
WW0295	38mm	sq.m	1412.66	1442.68	1470.58	1481.94
Venetian Works						
WW0300	Providing & fixing 38mm thick louvered shutters for windows, doors with fixed 12mm venetians, in Class 'B' (conifer) including the cost of hinges	sq.m	1516.61	1547.03	1575.30	1629.03
WW0301	Providing & fixing Class 'B' (conifer) venetians 50mm wide, 10mm thick at 45mm apart in ventilators above doors (excluding frame)	sq.m	620.27	625.44	630.24	623.39
Trellis						
WW0310	Providing & fixing plain trellis of 38x12mm laths with 38mm gap (excluding frames) including fixing beading 50x12mm with Class 'B' (conifer)	sq.m	966.41	983.65	999.68	976.82
WW0311	Providing & fixing Door & window shutters of plain trellis of 38x12mm laths with 38mm gap (excluding frame) including fixing beading 50x12mm with Class 'B' (conifer)	sq.m	1645.46	1675.88	1704.15	1757.16
Compound Gates						
WW0320	Providing & fixing Compound Gate including hinge-supports complete as per	sq.m	1706.80	1766.57	1900.27	1820.90
Window Accessories						
WW0325	Providing & fixing M.S. round or square bars in window frames	kg	101.76	104.39	103.54	109.10
WW0326	Providing & fixing M.S. round or square bars with M.S. flats in window frames	kg	89.92	92.57	94.20	98.18
WW0327	Providing & fixing ornamental steel grills in frames with M.S. flats & bars including round headed bolts and nuts etc.	kg	188.53	191.10	203.93	200.51
WW0328	Providing & fixing expanded metal 20x60mm strands 3.25x1.6mm including 60x20mm beading of Class 'B' (conifer)	sq.m	868.92	873.48	877.72	871.67
Pre-fabricated shutters						
Providing & fixing Flush Door shutters with pre-laminated Cement Bonded Particle board						
WW0335	25mm	sq.m	1076.01	1168.30	1168.30	1328.53
WW0336	30mm	sq.m	1193.84	1207.59	1207.59	1348.18
Providing & fixing Flush Door shutters (pre-fabricated), block-board core with commercial ply veneer						
WW0345	25mm	sq.m	1993.00	1998.35	2432.07	2557.59
WW0346	30mm	sq.m	2174.66	2050.84	2645.09	2684.32
WW0347	35mm	sq.m	2421.34	2248.96	2703.41	2703.41
WW0348	40mm	sq.m	2881.08	2618.47	2849.23	2849.23
Providing & fixing flush door shutters (pre-fabricated), block-board core with teak ply veneer						
WW0355	25mm	sq.m	3229.41	3229.41	3229.41	3229.41
WW0356	30mm	sq.m	3404.39	3404.39	3404.39	3404.39
WW0357	35mm	sq.m	3754.36	3754.36	3754.36	3754.36
WW0358	40mm	sq.m	3871.01	3871.01	3871.01	3871.01

Code	Description	Units	PL	GP	SJ	TH
Providing & fixing flush door shutters (pre-fabricated), block-board core with ply veneer, chemically treated						
WW0365	25mm	sq.m	2648.82	2511.83	3392.73	3392.73
WW0366	30mm	sq.m	2901.32	2901.32	3521.05	3521.05
WW0367	35mm	sq.m	3327.45	3327.45	3871.01	3871.01
WW0368	40mm	sq.m	3659.39	3659.39	4220.98	4220.98
WPC (Wood Plastic Composite) Door Shutter and Door Frame						
Providing & fixing 30mm Thick WPC (Wood Plastic Composite) flush door shutter complete including hinges - Standard						
WW0801	30mm	sq.m	2979.87	2979.87	2979.87	3024.59
Providing & fixing 30mm Thick WPC (Wood Plastic Composite) moulded door shutter complete including hinges - Standard						
WW0802	30 mm	sq.m	5028.37	5028.37	5028.37	5073.09
Providing & fixing WPC (Wood Plastic Composite) doors frame (size 75mm x 50mm thick) complete						
WW0803	75mm x 50mm Frame	m	749.00	749.00	749.00	749.00
Providing & fixing WPC (Wood Plastic Composite) doors frame (size 100mm x 50mm thick) complete						
WW0804	100mm x 50mm Frame	m	786.35	786.35	786.35	786.35
PVC (Polyvinyl Chloride) Door Shutter and Door Frame						
Providing & fixing 30mm Thick PVC (polyvinyl chloride) flush door shutter complete including hinges - Standard						
WW0810	30mm	sq.m	2403.73	2403.73	2403.73	2448.45
Providing & fixing 30mm Thick PVC (polyvinyl chloride) moulded door shutter complete including hinges - Standard						
WW0811	35mm	sq.m	3620.03	3620.03	3620.03	3664.74
Providing & fixing PVC (polyvinyl chloride) doors frame (size 75mm x 50mm thick) complete						
WW0812	75mm x 50mm Frame	m	723.90	723.90	723.90	723.90
Providing & fixing PVC (polyvinyl chloride) doors frame (size 100mm x 50mm thick) complete						
WW0813	100mm x 50mm Frame	m	766.83	766.83	766.83	766.83
S h e l v i n g & C u p b o a r d s						
Providing & fixing 38mm thick wooden shelves supported on 40x40x6mm `T' or `L' iron brackets fixed at suitable distance but not exceeding 75 cm apart in 7.5x7.5x15cm blocks of cement concrete 1:3:6, 20 mm aggregates						
WW0470	Class 'B' (conifer)	sq.m	1218.62	1260.28	1300.64	1247.16
Providing & fixing 25mm thick Cupboard (900x2000x450 mm...LxHxD) with glazed or panelled shutters, 25mm thick partitions and shelves supported on 25x25mm wooden runners, 50x20mm architraves and 25mm dia curtain rod mounted on wooden brackets, including with Anodised Aluminium Hinges and frame in Class 'B' (conifer)						
WW0475	Class 'B' (conifer)	each	8125.66	8252.55	8148.94	8131.96
WW0476	Class 'A' (conifer)	each	8749.66	8876.56	8772.94	8755.97

Code	Description	Units	PL	GP	SJ	TH
	Extras for Cupboards including frame of Class 'B' (conifer)					
WW0485	For additional depth of 50mm or part thereof	50mm	399.18	406.00	400.53	405.78
	R a i l i n g					
	Providing & fixing railing with 90x60mm top & bottom rails, trellis 60x45mm including 2 coats of paint etc. all complete					
WW0495	900 mm high, Class 'A' (conifer)	m	673.59	725.58	721.24	707.56
WW0496	900 mm high, Class 'B' (conifer)	m	664.99	716.97	712.64	698.96
WW0497	1000 mm high, Class 'A' (conifer)	m	776.49	836.91	831.24	816.00
WW0498	1000 mm high, Class 'B' (conifer)	m	766.66	827.08	821.42	806.18
WW0499	1200 mm high, Class 'A' (conifer)	m	918.12	989.58	982.77	964.85
WW0500	1200 mm high, Class 'B' (conifer)	m	906.53	977.98	971.18	953.27
	P e l m e t s					
	Providing & fixing 100x12mm, with 25mm dia. wooden curtain rod and brackets including M.S flats 25x3x100mm and plugs etc. complete					
WW0505	Class 'A' (conifer)	m	223.95	227.78	231.90	226.83
WW0506	Class 'B' (conifer)	m	222.31	226.13	230.25	225.19
	Providing & fixing 150x12mm, with 25mm dia. wooden curtain rod and brackets including M.S flats 25x3x100mm and plugs etc. complete					
WW0515	Class 'A' (conifer)	m	232.84	237.24	241.90	236.06
WW0516	Class 'B' (conifer)	m	228.80	233.13	237.44	231.70
	S h u t t e r s F i t t i n g s					
	Providing & fixing M.S. pressed butt hinges with necessary screws etc. complete					
WW0525	100mm	each	53.22	53.22	53.22	75.57
WW0526	75mm	each	43.49	43.49	43.49	58.08
WW0527	50mm	each	31.83	31.83	31.83	46.41
	Providing & fixing M.S tower bolt (barrel type) with necessary screws etc. complete					
WW0535	250mm	each	97.76	97.76	97.76	97.76
WW0536	150mm	each	75.75	75.75	75.75	78.67
WW0537	100mm	each	58.25	58.25	58.25	61.17
	Providing & fixing M.S. sliding door bolt, bright finished, enamelled with necessary screws etc. complete					
WW0545	300mm	each	373.46	373.38	374.43	374.39
WW0546	250mm	each	344.29	344.22	345.27	345.23
WW0547	200mm	each	300.55	300.47	301.52	301.48
	Providing & fixing M.S. handle with necessary screws etc. complete					
WW0555	150mm	each	74.52	74.52	74.52	179.51
WW0556	125mm	each	83.85	83.85	83.85	156.18
WW0557	100mm	each	57.02	57.02	57.02	132.85
WW0558	75mm	each	57.02	57.02	57.02	109.52
	Providing & fixing M.S. hook-and-eye with necessary screws etc. complete					
WW0565	300mm	each	70.63	70.63	70.63	74.52
WW0566	200mm	each	65.77	65.77	65.77	68.69
WW0567	150mm	each	54.11	54.11	54.11	54.11
WW0568	100mm	each	42.44	42.44	42.44	39.52

Code	Description	Units	PL	GP	SJ	TH
M.S door stopper						
WW0575	Providing & fixing M.S. door stopper with nuts and necessary screws complete	each	214.60	214.60	214.60	232.10
Providing & fixing anodised aluminium butt hinges with necessary aluminium screws etc. complete						
WW0580	100mm	each	150.17	150.17	150.17	126.84
WW0581	75mm	each	126.84	126.84	126.84	103.51
Providing & fixing anodised aluminium tower bolt (barrel type) with aluminium screws etc. complete						
WW0590	200mm	each	199.84	199.84	199.84	199.84
WW0591	150mm	each	171.31	171.31	171.31	171.31
WW0592	100mm	each	151.48	151.48	151.48	151.48
Providing & fixing anodised aluminium sliding door bolts with nuts and aluminium screws etc. complete						
WW0600	300mm	each	443.95	443.95	443.95	443.95
WW0601	250mm	each	385.62	385.62	385.62	385.62
WW0602	200mm	each	268.96	268.96	268.96	268.96
Providing & fixing anodised aluminium handle with necessary aluminium screws etc. complete						
WW0610	150mm	each	179.51	179.51	179.51	179.51
WW0611	125mm	each	162.01	162.01	162.01	162.01
WW0612	100mm	each	118.85	118.85	118.85	118.85
WW0613	75mm	each	80.35	80.35	80.35	80.35
Providing & fixing anodised aluminium hook-and-eye with necessary screws etc. complete						
WW0620	300mm	each	68.69	68.69	68.69	80.35
WW0621	200mm	each	54.11	54.11	54.11	62.85
WW0622	150mm	each	48.27	48.27	48.27	51.19
WW0623	100mm	each	36.61	36.61	36.61	39.52
Kicking plate						
WW0630	Providing & fixing anodised aluminium kicking plate, 4mm thick with necessary aluminium screws etc. complete	sq.m	689.14	689.14	689.14	650.64
Providing & fixing brass pressed butt hinges with necessary screws etc. complete						
WW0635	100mm	each	206.81	206.81	206.81	200.98
WW0636	75mm	each	189.31	189.31	189.31	165.98
WW0637	50mm	each	119.32	119.32	119.32	119.32
Providing & fixing brass tower bolt (barrel type) with necessary screws etc. complete						
WW0645	250mm	each	246.50	246.50	246.50	415.65
WW0646	150mm	each	230.22	230.22	230.22	297.30
WW0647	100mm	each	171.89	171.89	171.89	238.97
Providing & fixing brass sliding door bolt with nuts necessary screws etc. complete						
WW0655	300mm	each	1369.83	1369.83	1369.83	1369.83
WW0656	250mm	each	903.21	903.21	903.21	903.21
WW0657	200mm	each	757.39	757.39	757.39	757.39

Code	Description	Units	PL	GP	SJ	TH
Providing & fixing brass handle with necessary screws etc. complete						
WW0665	150mm	each	159.10	159.10	159.10	173.68
WW0666	125mm	each	162.01	162.01	162.01	150.35
WW0667	100mm	each	106.60	106.60	106.60	97.85
WW0668	75mm	each	89.10	89.10	89.10	86.19
Other fittings						
WW0675	Providing & fixing bright finish brass 100 mm mortise latch & pair of levers, handles with necessary screws etc. complete	each	554.33	554.33	554.33	568.91
WW0676	Providing & fixing bright finish brass spring-loaded, hinged door-closer with necessary screws etc. complete	each	1019.86	1019.86	1019.86	1028.61
WW0677	Providing & fixing bright finish brass hydraulic door-closer	each	1262.59	1262.59	1262.59	1270.37
WW0678	Providing & fixing bright finished brass door stopper with nuts and necessary screws etc. complete	each	437.77	437.77	437.77	448.27
Providing & fixing bright finished brass hook-and-eye with necessary screws etc. complete						
WW0685	150mm	each	115.35	115.35	115.35	118.85
WW0686	100mm	each	97.85	97.85	97.85	97.85
Fixing Accessories						
WW0695	P&f 40x3mm M.S. hold fast 400mm long, fixing to frame with 10mm bolts & nuts, plugs, concrete blocks 300x100x150mm with 1:3:6, 20mm aggregate	each	108.95	109.98	116.47	116.92
Ceiling Insulation						
WW0700	Providing & laying dry earth in ceilings in proportion 1:5 (1 straw: 5 dry earth) including plastic underlay	cu.m	931.21	931.21	931.21	931.21
Skylight						
WW0705	Providing & fixing polycarbonate skylight translucent diffuser panel of 6mm thickness including 50x12 beading etc. complete	sq.m	1011.23	1044.44	1017.20	1095.58
Timber Carving						
WW0710	Providing & fixing Decorative Traditional Timber Carving	sq.m	1697.78	1697.78	1697.78	1697.78
uPVC Window (with wire mesh)						
Providing, fixing and installation of 2.5-track, UPVC sliding windows including wire mesh, 88mm wide, 5mm clear glass with hardware fittings - EPDM gaskets, U- groove roller, Aluminium track, Fastner nut, interlock, touch lock and wool pile, complete.						
WW0715	Plain white window	sq.m	5747.16	5747.16	5747.31	5810.03
WW0716	Polished window	sq.m	6943.44	6943.44	6943.60	7006.31
WW0717	Textured Window	sq.m	7225.16	7225.16	7225.32	7288.03
uPVC Window (without wire mesh)						
Providing, fixing and installation of 2-track, UPVC sliding windows including 5mm clear glass with hardware fittings - EPDM gaskets, U- groove roller, Aluminium track, Fastner nut, interlock, touch lock and wool pile, complete.						
WW0718	Plain white window	sq.m	5507.51	5507.51	5507.67	5570.38
WW0719	Polished window	sq.m	6703.80	6703.80	6703.95	6766.67
WW0720	Textured Window	sq.m	6985.52	6985.52	6985.67	7048.39

Code	Description	Units	PL	GP	SJ	TH
GRC Window						
Providing and fixing of Traditional Bhutanese style GRC window frames with cornice, side borders, and sill as per the standard design and detailed drawing, including the cost of nuts, bolts, anchors, sealant, complete excluding decorative painting						
WW0750	1 Bay with window size 853X1385mm full set	each	18235.77	19053.82	21671.56	17744.95
WW0751	1 Bay with window size 780X1000mm full set	each	15315.61	15994.83	18171.32	14904.11
WW0752	2 Bay with window size 1416X1385mm full set	each	22938.12	23974.31	27276.23	22318.39
WW0753	3 Bay with window size 1979X1385mm full set	each	29203.31	30527.06	34756.09	28410.06
WW0754	3 Bay with window size 1979X1140mm full set	each	25623.76	26778.93	30467.56	24934.62
WW0755	4 Bay with window size 2542X1385mm full set	each	35287.76	36889.14	42020.50	34325.94
Providing and fixing of Traditional Bhutanese style GRC window frame for Rabsey as per the standard design and detailed drawing, including the cost of nuts, bolts, anchors, sealant, complete excluding cornice, side borders, sill and decorative painting						
WW0756	3 Bay Rabsey window size 1785x1600 (frame only)	each	25897	27097	41217	33522
WW0757	4 Bay Rabsey window size 2350x1600 (frame only)	each	32652	34164	39008	31740

Code	Description	Units	PL	GP	SJ	TH
Chapter 12: STEEL						
Single Sections						
Steel work in single section including cutting, hoisting, fixing and applying priming coat of red lead paint						
SW0001	In R.S. joists	kg	87.39	90.53	97.99	101.32
SW0002	In Flats	kg	87.68	90.21	102.35	99.16
SW0003	In Tees, angles and channels	kg	88.52	92.90	100.75	115.93
Fabricated & Buit-up Sections						
Steel work riveted or bolted, in built up sections, trusses, frame-works, including cutting, hoisting, fixing and appl. priming coat of red lead paint						
SW0010	In R.S. joists	kg	95.01	96.36	105.43	107.06
SW0011	In Tees, angles, flats and channels	kg	208.91	210.14	220.53	220.26
Steel work welded, in built up sections, trusses, frame-works including cutting, hoisting, fixing and appl. priming coat of red lead paint						
SW0020	In R.S. joists	kg	197.22	198.60	207.64	209.31
SW0021	In Tees, angles, flats and channels	kg	201.16	202.42	212.75	212.50
SW0022	In Tubular sections	kg	86.72	89.51	93.51	96.48
Doors/Windows &Accessories						
Providing & fixing in position with vertical channels 20x10x2mm and braced with flat iron, diagonals 20x5mm with top and bottom rails of T-iron 40x40x6mm with 38mm dia steel pulleys complete with bolts, nuts, locking arrangement, stoppers handles including applying a priming coat of red lead paint						
SW0030	Collapsible steel shutters	sq.m	5807.39	5925.99	6253.29	6423.65
SW0035	Providing & fixing in position Aluminium Rolling shutters of 0.57mm thickness, including all accessories complete	sq.m	7248.99	7186.23	7374.51	7311.75
Providing & fixing anodised Aluminium section for doors, windows, ventilators, partitions framing, false ceiling framing of specified sections including all accessories such as U-rubber gasket for fixing glass panes, weather strips or weather seals, roller, springs, etc complete (excluding the cost of glass panes or boards in case of partitions/doors/windows and ceiling boards in case of ceiling)						
SW0045	Sliding, open able and pivoted windows	kg	512.31	546.87	506.04	609.50
SW0046	Sliding and open able doors	kg	515.14	549.70	508.87	612.33
SW0047	Partition framing	kg	506.65	541.21	500.38	603.84
SW0048	False ceiling framing	kg	504.38	538.94	498.12	601.57
Extra for providing and fixing plain glass panes on aluminium section complete (excluding the cost of aluminium frame & accessories)						
SW0055	4mm thick plain glass	sq.m	929.75	929.75	874.34	961.13
SW0056	5mm thick, plain glass	sq.m	1023.89	1023.89	1024.05	1086.78
SW0057	5mm thick frosted glass	sq.m	1034.14	1243.56	1037.66	1149.61
Extra for Bhutan type Architraves						
SW0075	Extra for Providing & fixing Bhutan type architraves with 1mm steel sheet....per sq.m. of window area	sq.m	624.43	646.69	641.58	656.17

Code	Description	Units	PL	GP	SJ	TH
Steel Fasteners						
SW0080	Providing & fixing M.S. round hold-down bolts with nuts and washer plates	kg	97.53	96.76	107.25	106.87
SW0081	Providing & fixing bolts of various sizes including nuts & washers	kg	133.90	133.13	143.63	143.24
SW0082	Providing & fixing M.S. rivets of various sizes	kg	186.69	185.91	196.41	196.02
Plates						
SW0090	Providing, making and fixing M.S. straps, flats, sole plates etc.	kg	191.34	191.95	202.98	201.38
Fan Clamps						
SW0095	Providing & fixing M.S. fan clamps of 16 mm dia. in R.C. slabs, including painting with red lead paint	each	155.42	159.50	158.19	166.78
Steel Form Work						
SW0100	Providing and fixing steel form work in foundations, footings, bases of columns etc for mass concrete	sq.m	335.51	335.16	360.97	362.88
SW0101	Providing and fixing steel form work in suspended floors, roofs, landings, shelves and their support, balconies, chajjas etc	sq.m	677.78	678.90	711.00	716.38
SW0102	Providing and fixing steel form work in lintels, beams, girders, bresummers, cantilevers, etc.	sq.m	592.84	592.32	629.01	631.78
SW0103	Providing and fixing steel form work in columns, pillars, posts, struts etc.	sq.m	961.98	957.77	1024.56	1023.47
Stainless Steel (Grade 304) Railing						
SW0110	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc… including welding, grinding, buffing, polishing and making curvature (wherever required) and fittings the same with necessary stainless steel nuts and bolts complete, i/e fixing railing with necessary accessories and stainless steel dash fasteners, stainless steel bolts etc, of required size on the top of the floor or the side of waist slab with suitable arrangement as per approval of engineers in charge.	Kg	972.66	1144.73	989.58	1178.56

Code	Description	Units	PL	GP	SJ	TH
Chapter 13: FLOORING						
Concrete Flooring						
Providing & laying cement concrete flooring 1:2:4, finished with floating coat of neat cement						
FL0050	12mm aggregates, 25mm thick	sq.m	283.71	288.03	296.40	312.31
FL0051	20mm aggregates, 40mm thick	sq.m	384.20	383.01	396.04	420.14
FL0052	20mm aggregates, 50mm thick	sq.m	439.61	438.28	454.62	483.87
FL0053	20mm aggregates, 75mm thick	sq.m	571.88	570.33	595.07	636.30
FL0054	20mm river gravel, 40mm thick	sq.m	618.49	621.11	684.48	789.35
FL0055	20mm river gravel, 50mm thick	sq.m	732.09	735.49	814.59	944.56
Providing & laying cement concrete flooring 1:3:6, finished with a floating coat of neat cement						
FL0060	20mm aggregates, 50mm	sq.m	396.37	396.60	415.25	437.16
FL0061	20mm river gravel, 50mm	sq.m	367.58	364.74	371.92	405.30
Red Oxide Flooring						
Providing & laying 40mm red oxide flooring, finished with a floating coat of neat cement (red oxide mixed) including cement slurry etc. complete						
FL0070	Under layer of 30mm thick cement concrete 1:2:4, 12.5mm aggregates and top layer of 10mm thick plaster of cement red oxide mixed	sq.m	975.81	980.04	994.23	1028.36
Surface Hardening						
Providing & laying 62mm thick flooring with sub-layer cement concrete 1:2:4 20mm aggregates, top layer with metallic cement hardener consisting of mix 1:2 (1 cement hardener: 2 6mm stone aggregate), the metallic hardening compound is mixed by volume in the ratio 4 parts of cement & 1 part of metallic hardening compound including cement slurry						
FL0075	50mm thick sub-layer and 12mm topping	sq.m	760.54	763.20	781.68	820.75
Extra for Concrete flooring						
FL0080	Extra for making chequers on concrete floors, steps, landings, pavements etc.	sq.m	41.17	41.17	41.17	41.17
Terrazzo-Marble Chip Flooring						
Providing & laying 40mm thick marble chips flooring top layer 6mm thick with white, black or black and white marble chips of nominal size 1.5-3mm in proportion 1:2 (cement: chips), on 34mm thick concrete base in cement concrete 1:2:4, 12.5mm aggregate (cement and marble powder mix shall be of the ratio 3 part of cement to 1 part of marble powder)						
FL0085	In grey cement	sq.m	1110.08	1111.71	1130.71	1184.59
FL0086	In white cement	sq.m	1270.27	1292.01	1316.42	1402.74
Extra for coloured chips						
FL0095	Extra for coloured chips instead of black, white or black and white chips in top 6mm layer of marble chips flooring	sq.m	75.10	71.04	78.65	111.64
FL0096	Extra for coloured chips instead of black, white or black and white chips in top 10mm layer marble chips flooring	sq.m	120.85	114.32	126.57	179.65
Providing & laying 40mm thick marble chips flooring top layer 10mm thick with white, black or black and white marble chips of size 6mm in proportion 1:2 (cement : chips), on 30mm cement concrete 1:2:4 base, 12.5mm aggregate						
FL0105	In grey cement	sq.m	1162.11	1160.27	1182.77	1256.83
FL0106	In white cement	sq.m	1372.04	1398.66	1428.93	1545.83

Code	Description	Units	PL	GP	SJ	TH
Extra for Terrazzo Flooring						
FL0115	Extra for Providing & fixing glass strips in joints of terrazzo floors	m	61.13	61.13	59.56	61.13
FL0116	Extra for terrazzo flooring laid as floor borders, margins, bands, 75 < width > 300mm	sq.m	33.72	33.72	33.72	33.72
FL0117	Extra for laying terrazzo flooring on stair case treads, width < 300mm including forming nosing	sq.m	50.58	50.58	50.58	50.58
FL0118	Extra for laying terrazzo in narrow bands width <75mm	m	3.59	3.59	3.59	3.59
FL0119	Extra for making moulded nosing in terrazzo, including moulded returns, ends, angles	m	136.31	136.31	136.31	136.31
FL0120	Providing & fixing aluminium strip 40x1.6mm in joints of terrazzo floor	m	115.03	118.09	118.09	126.97
S k i r t i n g						
Providing & laying Cement plaster skirting < 300mm height with cement mortar 1:3 with a floating coat of neat cement including rounding off junctions with floor						
FL0130	20mm	sq.m	375.17	372.56	380.14	412.73
FL0131	22mm	sq.m	391.97	389.06	397.63	434.16
Providing & fixing Terrazzo or Marble chips skirting < 300mm height top layer 6mm thick with white or black, black and white marble chips size 4mm in proportion 1:2, laid on 12.5mm thick cement plaster 1:3 base						
FL0140	In grey cement	sq.m	1058.03	1051.08	1063.88	1124.11
FL0141	In white cement	sq.m	1208.35	1221.80	1240.15	1331.03
M a r b l e S t o n e F l o o r i n g						
Providing & laying marble stone flooring over 20mm thick base of cement mortar 1:4, jointed with grey cement slurry mixed with pigment where necessary, rubbing & polishing complete						
FL0150	20mm thick black marble	sq.m	1961.43	1734.91	1816.60	2301.64
FL0151	20mm thick white marble	sq.m	1961.43	1734.91	1816.60	2301.64
FL0152	20mm thick black and white marble	sq.m	1961.43	1734.91	1816.60	2301.64
FL0153	20mm thick coloured marble	sq.m	1961.43	1734.91	1816.60	2215.03
FL0154	40mm thick black marble	sq.m	3798.25	3795.37	3802.42	3835.82
FL0155	40mm thick white marble	sq.m	3653.90	3651.02	3658.07	3691.48
FL0156	40mm thick black and white marble	sq.m	3653.90	3651.02	3658.07	3691.48
FL0157	40mm thick coloured marble	sq.m	3794.66	3791.88	3798.99	3831.74
Providing & laying Kota stone flooring over 20mm thick base of cement mortar 1:4, jointed with grey cement slurry mixed with pigment where necessary, rubbing & polishing complete						
FL0160	20mm	sq.m	1497.49	1494.71	1501.82	1579.45
FL0161	40mm	sq.m	1566.53	1563.75	1570.85	1727.87
Extras for Marble stone flooring						
FL0170	Extra for marble stone flooring for laying in step-treads, width < 300 mm	sq.m	90.84	90.84	90.84	90.84
FL0171	Extra for marble stone flooring for nosing in step-treads	m	77.02	77.02	77.02	77.02

Code	Description	Units	PL	GP	SJ	TH
	Providing and laying Pre-Polished/ Polished Granite of approved quality and source in flooring using necessary cement bedding in C.M. 1:4 upto 20 mm thick average cement slurry for fixing the tiles with required slopes, curing, cleaning, filling the joints with pigments of similar colour and at all levels with all leads and lifts etc. complete as per directions of site in-charge and as per pattern required					
FL0175	18mm Thick granite stone flooring over 18mm thick base of cement mortar 1:4.	sq.m	2003.93	2082.95	2061.45	2152.07
FL0176	20mm Thick granite stone flooring over 20mm thick base of cement mortar 1:4.	sq.m	2340.74	2025.21	2104.49	2378.03
FL0177	Extra, for granite stone flooring for laying in step-tread, width <300 mm	sq.m	90.84	90.84	90.84	90.84
FL0178	Extra, for granite stone flooring for nosing in step-treads	m	77.02	77.02	77.02	77.02
	T i m b e r F l o o r i n g					
	Providing & fixing Cement Bonded Particle board flooring including nails/screws etc. complete excluding the cost of frame					
FL0180	25mm	sq.m	1331.68	1428.60	1428.60	1596.84
FL0181	30mm	sq.m	1455.41	1469.85	1469.85	1617.47
	Providing & fixing Plain Particle-Board Flooring fixing with necessary screws etc. complete, excluding cost of frame					
FL0190	25mm	sq.m	1318.57	1318.57	1318.57	1318.57
FL0191	35mm	sq.m	1666.20	1666.20	1666.20	1645.20
	Providing & fixing Class 'B' (conifer) Flooring including fixing with iron screws etc. complete, excluding the cost of frame					
FL0200	25mm thick, T&G	sq.m	654.82	685.05	713.14	673.07
FL0201	25mm thick, half-lapped	sq.m	611.45	641.67	669.77	629.70
FL0202	40mm thick, T&G	sq.m	914.18	960.83	1004.18	942.35
FL0203	40mm thick, half-lapped	sq.m	902.10	948.75	992.10	930.27
FL0204	45mm thick, T&G	sq.m	984.88	1035.07	1081.73	1015.19
FL0205	45mm thick, half-lapped	sq.m	966.01	1016.20	1062.86	996.32
	Parquet flooring					
	Providing & fixing Parquet (wood block) flooring including blown bitumen underlay and iron screws etc. complete, excluding cost of frame					
FL0210	38mm thick, Class 'A' (conifer) wood	sq.m	3997.80	4055.95	4086.50	4033.89
	Providing & fixing Pre-Fabricated Flooring Profiles in Class 'B' (conifer) including necessary screws etc. complete					
FL0215	25mm thick	sq.m	1480.02	1480.02	1480.02	1480.02
FL0216	38mm thick	sq.m	2098.41	2098.41	2098.41	2098.41
	V i n y l & L i n o l e u m F l o o r i n g					
	Providing & fixing 2mm thick Vinyl or Linoleum sheet laid with special adhesive, including 2 coat of bitumen applied over subfloor on prepared surface @ 1.5 kg/sq.m each coat including the cost of base concrete					
FL0225	Over base of 25mm thick cement concrete 1:2:4 , 12.5mm aggregate	sq.m	1097.22	1135.53	1244.88	1265.08
	M u d f l o o r i n g					
FL0230	Providing & laying rammed mud flooring complete	sq.m	131.88	131.88	131.88	135.61

Code	Description	Units	PL	GP	SJ	TH
Chapter 14: TILING - WALL & FLOOR						
GL0001	Providing and fixing vitrified tiles in skirting, step risers, dado and wall in different sizes (Sizes and thickness to be specified by the engineer/as per design) in all colours and shade, on 12 mm thick cement mortar 1:3 (1 cement:3 sand) finished with Tiles grout flush-pointing	sq.m	999.99	1068.09	1029.72	1053.43
GL0002	Providing and laying vitrified tiles in flooring, treads of steps and landings in different sizes (Sizes and thickness to be specified by the engineer/as per design) in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) finished with tiles grout flush pointing	sq.m	967.22	1033.28	1037.99	1068.57
GL0005	Providing and laying tactile floor tiles in different sizes (Sizes and thickness to be specified by the engineer/as per design) in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) finished with tiles grout flush pointing	sq.m	3016.22	3013.88	3021.41	3051.99
Extra for laying tiles						
GL0003	In treads of steps, width <300mm, skirting and risers of steps height <300mm	sq.m	169.99	169.99	169.99	169.99

Code	Description	Units	PL	GP	SJ	TH
Chapter 15: ROOFING						
C.G.I Sheeting						
Providing & fixing Corrugated Galvanised Iron (CGI) sheeting, including bolts, hooks and nuts 8mm dia. with bitumen and G.I limpet washers filled with white lead for connection, excluding the cost of purlins, rafter and trusses						
RF0001	24g	sq.m	710.81	630.18	699.10	713.78
Providing & fixing Pre - Painted Galvanised Iron (PPGI) sheets, including bolts, hooks and nuts 8mm dia. with bitumen and G.I limpet washers filled with white lead for connection, excluding the cost of purlins, rafter and trusses.						
RF0003	25g (0.50mm)	sq.m	542.50	554.77	551.27	577.57
Providing & fixing Pre Painted Galvalume (PPGL) sheeting, including necessary accessories for fixing sheet (excluding the cost of purlins, rafter and trusses) - 25g						
RF0004	25g (0.50mm)	sq.m	560.03	567.05	560.03	577.57
Providing & fixing 600 mm ridges or hips in plain G.I. including bolts, hooks and nuts 8mm dia G.I limpet and bitumen washers for connection						
RF0005	24g.	m	687.15	691.40	642.52	703.08
Providing & fixing 600 mm ridges or hips in Pre - Painted Galvanised Iron (PPGI) sheets, including bolts, hooks and nuts 8mm dia G.I limpet and bitumen washers for connection.						
RF0007	25g. (0.50mm)	m	904.23	935.04	975.08	919.63
Providing & fixing 600 mm ridges or hips in Pre-Painted Galvalume (PPGL) sheets, including necessary accessories for fixing sheet						
RF0008	25g. (0.50mm)	m	904.23	919.63	975.08	919.63
Providing & fixing 450 mm over all semi-circular plain G.I gutter, including brackets, bolts, nuts, washers & rain water pipes						
RF0010	24g sheet	m	669.27	671.21	682.48	691.59
Providing & fixing 600 mm overall width Pre - Painted Galvanised Iron (PPGI) gutter, including brackets, bolts, nuts, washers & rain water pipes connections, excluding the cost of pipes - 25 g sheet						
RF0011	25 g sheet	m	910.26	896.80	998.89	934.70
Providing & fixing 600 mm overall width Pre-Painted Galvalume (PPGL) gutter, including brackets, bolts, nuts, washers & rain water pipes connections, excluding the cost of pipes - 25 g sheet						
RF0012	25 g sheet	m	904.10	927.60	1024.56	934.70
Providing & fixing semi circular/half round Poly Vinyl Chloride (PVC) roof gutter of 140mm dia 3.04m long, including fittings (brackets, bolts, nuts, washer, end cap, tee end cap etc) excluding the cost of pipes.						
RF0013	Semi circular/half round Poly Vinyl Chloride (PVC) roof gutter of 140mm dia 3.04m long	m	461.10	461.10	441.92	441.92
Providing & fixing semi circular/half round Poly Vinyl Chloride (PVC) roof gutter of 180mm dia 3.04m long, including fittings (brackets, bolts, nuts, washer, end cap, tee end cap etc) excluding the cost of pipes.						
RF0014	Semi circular/half round Poly Vinyl Chloride (PVC) roof gutter of 180mm dia 3.04m long	m	499.48	499.48	461.10	499.48

Code	Description	Units	PL	GP	SJ	TH
Extra for Galvanised Iron/ Pre - Painted Galvanised Iron (PPGI)/Pre-Painted Galvalume (PPGL)/ sheets						
RF0015	Extra for Providing & fixing curved C.G.I/PPGI/PPGL sheet in roofing	sq.m	13.68	13.68	13.68	13.68
RF0016	Extra for Providing & fixing C.G.I/PPGI/PPGL sheets vertically or to a pitch > 60 degrees	sq.m	12.81	12.81	12.81	12.81
RF0017	Extra for making straight-cut openings for chimney, sky lights	Sq.m	64.50	64.50	64.50	64.50
Extra for making opening or recess in CGI/PPGI/PPGL roofing of girth < 1 metre						
RF0025	Area upto 0.01sq.m	each	41.21	41.21	41.21	41.21
RF0026	0.01 < Area < 0.04sq.m	each	98.03	98.03	98.03	98.03
RF0027	Area > 0.04sq.m	each	147.05	147.05	147.05	147.05
Wind Bracing						
RF0060	Providing & fixing wind tie of 40 x 6 mm flats	m	162.11	166.78	190.11	183.89
Slate Roofing						
RF0075	Providing & fixing single slate roofing including bitumen felt water-proofing etc complete, excluding the cost of wooden reapers, trusses	sq.m	1086.31	1080.47	1080.47	1103.81
Shinglep Roofing						
RF0130	Providing & fixing shinglep roofing with shinglep of size 1350x125x12mm in 3 layers including tying, uplift protection complete	sq.m	925.43	925.43	925.43	929.63
Corrugated Polycarbonate Sheeting						
RF0150	P&f 2mm Polycarbonate transparent sheet including 8mm G.I J or L hooks, bitumen & G.I limpet washers etc complete, excluding cost of frame	sq.m	1272.56	1323.94	1211.31	1605.72
Rain Water Pipe						
Providing and fixing on wall face single socketed rigid PVC (Working Pressure 4kgf per sq.cm) rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion- complete						
RF0190	75mm dia	m	494.70	499.56	495.67	582.84
RF0191	90mm dia	m	476.39	479.30	474.44	556.01
RF0192	110mmdia	m	609.47	611.42	607.53	764.43
Providing and fixing on wall face PVC coupler for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete						
RF0195	75 mm	each	191.20	237.67	210.45	226.00
RF0196	90 mm	each	166.12	198.78	163.79	210.45
RF0197	110 mm	each	294.44	297.94	297.94	331.77
Providing and fixing on wall face PVC Single tee with door for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete						
RF0200	75 mm	each	255.94	287.83	274.61	299.11
RF0201	90 mm	each	210.45	226.00	210.45	251.28
RF0202	110 mm	each	425.68	414.59	426.26	503.64

Code	Description	Units	PL	GP	SJ	TH
Providing and fixing on wall face PVC plain Single tee for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete						
RF0205	75 mm	each	260.22	297.94	248.36	295.22
RF0206	90 mm	each	210.45	230.86	166.70	230.67
RF0207	110 mm	each	421.98	429.18	379.60	460.87
Providing and fixing on wall face PVC bend for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete						
RF0210	75 mm	each	212.20	249.33	239.61	259.44
RF0211	90 mm	each	175.45	200.73	187.12	245.44
RF0212	110 mm	each	334.10	358.21	338.77	374.54
Providing and fixing on wall face PVC shoe for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete						
RF0215	75 mm	each	276.94	292.11	282.77	309.61
RF0216	90 mm	each	216.28	233.78	210.45	268.78
RF0217	110 mm	each	397.10	362.10	385.43	420.43

Code	Description	Units	PL	GP	SJ	TH
Chapter 16: PLUMBING - INDOOR WORK						
W a t e r S u p p l y						
Providing & fixing G.I. pipes including G.I. fittings & clamps & repair walls						
PI0001	15mm	m	294.61	294.61	312.98	379.40
PI0002	20mm	m	364.15	364.15	391.09	445.33
PI0003	25mm	m	472.68	472.68	473.91	533.11
PI0004	32mm	m	596.39	596.39	696.83	692.40
PI0005	40mm	m	677.02	677.02	788.49	880.15
PI0006	50mm	m	936.49	936.49	945.06	1032.16
Providing & fixing H.D.P.E pipes, PN 10, including clamps & repair walls etc. complete						
PI0010	20mm	m	137.85	140.30	135.71	137.74
PI0011	25mm	m	161.39	163.07	168.91	167.39
PI0012	32mm	m	276.56	276.74	288.92	277.71
PI0013	40mm	m	264.35	254.55	282.00	286.29
PI0014	50mm	m	350.79	324.68	376.72	377.94
Providing and fixing 3-layer PP-R (Polypropylene Random Copolymer) PN-16 pipes, SDR 7.4 UV Stabilized and anti microbial fusion welded, having thermal stability for hot and cold water supply including all PP-R plain and brass Threaded Polypropylene random fittings including fixing pipe with clamps at 1.0m spacing. This includes testing of joints, cutting chases and making good the wall complete as per direction of Engineer-in- Charge.						
PI0290	16mm	m	239.49	250.51	250.51	278.68
PI0291	20mm	m	261.26	271.05	271.05	296.78
PI0292	25mm	m	339.58	348.97	348.97	405.31
PI0293	32mm	m	564.31	593.30	593.30	675.37
PI0294	40mm	m	736.22	828.91	828.91	912.20
PI0295	50mm	m	1199.84	1284.35	1284.35	1368.87
CPVC Pipe						
Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes - class 1 (SDR11), having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall						
PI0300	15 mm nominal outer dia Pipes	m	170.57	177.45	199.64	280.89
PI0301	20 mm nominal outer dia Pipes	m	192.60	219.16	212.16	367.24
PI0302	25 mm nominal outer dia Pipes	m	246.90	280.82	262.38	518.44
PI0303	32 mm nominal outer dia Pipes	m	364.44	379.70	350.99	822.02
PI0304	40 mm nominal outer dia Pipes	m	490.07	541.80	444.70	1123.62
PI0305	50 mm nominal outer dia Pipes	m	743.37	819.31	899.74	1826.70
Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes - class 1 (SDR11), having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making the good walls etc.						
PI0315	15 mm nominal outer dia Pipes	m	243.04	249.68	273.24	358.89
PI0316	20 mm nominal outer dia Pipes	m	256.85	283.16	277.53	437.01
PI0317	25 mm nominal outer dia Pipes	m	311.15	344.81	327.75	588.22
PI0318	32 mm nominal outer dia Pipes	m	416.63	431.64	404.30	879.74

Code	Description	Units	PL	GP	SJ	TH
Storage Tanks						
Providing & fixing storage tank of M.S. sheet welded all round, including 40mm G.I scour pipe, 25mm G.I overflow , 15mm ball valve , pads for inlet and outlet pipes , red lead primer & two coats of bitumastic paint						
PI0020	270 litre capacity of 2mm steel sheet	each	36902.05	37548.50	37415.21	38042.26
PI0021	810 litre capacity of 2.8mm steel sheet	each	56910.39	58950.19	58608.61	59936.28
PI0022	1620 litre capacity of 3.15mm steel sheet	each	73391.05	76724.44	76181.93	78183.54
Providing & fixing plastic tank including all accessories complete						
PI0030	300 litre capacity	each	3390.17	3396.00	3179.41	4006.11
PI0031	500 litre capacity	each	4870.78	5508.88	4296.84	5354.90
PI0032	1000 litre capacity	each	8735.96	9791.30	8423.72	9450.67
PI0033	2000 litre capacity	each	16836.77	18124.64	16309.87	17659.57
PI0034	3000 litre capacity	each	23911.41	26803.28	23967.79	25822.99
Pans & Cisterns						
Providing & fixing Indian-type vitreous china w.c squatting pan with 10 litres vitreous china cistern including 100 mm P or S trap, fittings and repairing walls complete						
PI0041	580mm, white Orissa-model	each	4661.63	4713.54	4364.16	5160.33
Providing & fixing Indian-type vitreous china w.c squatting pan with 10 litres PVC cistern including 100 mm P or S trap, fittings and repairing walls complete						
PI0042	580mm, white Orissa-model	each	4632.46	4859.36	4558.58	4798.70
Providing & fixing European-type vitreous china w.c pedestal including seat and lid with c.p brass hinges, 15 lit white vitreous china low level cistern, fittings, brackets and repairing walls complete						
PI0050	white, with plastic seat & lid	each	5330.75	5809.43	5381.30	6793.80
Providing & fixing European-type vitreous china w.c One piece Toilet with seat cover, repairing walls complete						
PI0051	Vitreous China European One piece Toilet with seat cover	each	16741.56	16741.56	16741.56	16741.56
Urinals						
Providing & fixing white vitreous china flat back, lipped front urinal basin 430x260x350mm, including all fittings, painting, and repairing walls complete						
PI0065	One bowl	each	4006.36	4113.69	4000.53	4114.27
Baths						
PI0075	Providing and fixing Porcelain, white enamelled Bath Tub with fittings and accessories complete - CP mixer, 40mm C.P brass waste, 32mm C.P brass over flow, rubber plug, 40mm C.P trap etc.	each	25861.57	26409.85	26419.57	30591.93
PI0076	Providing and fixing Fibreglass Bath Tub white with fittings and accessories complete - CP mixer, 40mm C.P brass waste, 32mm C.P brass over flow, rubber plug, 40mm C.P trap etc.	each	33155.68	33120.68	33130.40	34211.41
PI0077	Providing and fixing PVC P-Trap, heavy duty, for bath-tub complete	each	698.20	680.70	645.70	717.64

Code	Description	Units	PL	GP	SJ	TH
B a s i n s & S i n k s						
Providing & fixing white vitreous china wash basin, including C.I brackets, 15mm C.P. brass pillar taps, c.p. chain & rubber plug, 32mm pvc waste, 32mm dia. trap & union, repair walls						
PI0085	Flat back wash basin 630x450mm with a pair of 15mm c.p. brass pillar taps	each	8054.71	8015.04	8000.27	9248.67
PI0086	Flat back wash basin 630x450mm with single 15mm c.p. brass pillar taps	each	5662.34	5622.68	5607.90	6856.30
PI0087	Flat back wash basin 550x400mm with a pair of 15mm c.p. brass pillar taps	each	9514.64	9487.81	9460.20	8387.17
PI0088	Flat back wash basin 550x400mm with single 15mm c.p. brass pillar tap	each	7122.28	7095.45	7067.84	5994.81
Providing & fixing white vitreous china angle back wash basin 400x400mm including brackets, 15mm c.p brass pillar taps, c.p brass chain & rubber plug, 32mm c.p brass waste, 32mm dia c.p brass trap and G.I union and repair walls						
PI0095	With single 15mm c.p. brass pillar tap	each	6267.78	6240.95	6213.34	6442.76
PI0096	With pair of 15mm c.p. brass pillar taps	each	8660.15	8633.31	8605.71	8835.13
Flush Valve & Bend						
PI0105	Providing & fixing c.p. flush valve, 32mm with 40mm outlet	each	3371.93	3371.93	3371.93	3706.73
PI0106	Providing & fixing c.p. concealed flush valve, 32mm with 40mm outlet	each	3371.93	3371.93	873.18	3706.73
PI0107	Providing & fixing c.p. flush bend, long	each	984.00	984.00	984.00	984.00
PI0108	Providing & fixing c.p. flush valve elbow	each	231.58	231.58	231.58	231.58
Pedestals & Kitchen Sinks						
PI0115	Providing & fixing pedestals for basins, white vitreous china, recessed back for pipes and necessary fittings	each	1383.83	1282.34	1515.65	1894.78
Providing & fixing Kitchen Sinks including all connections and fittings						
PI0120	White glazed vitreous china 600 x 450 x 250 mm including accessories and repairs to walls etc.	each	3354.74	3345.41	3553.06	3975.93
PI0121	Stainless steel, 450 x 400 x 150 mm, single bowl	each	1639.46	1522.80	1639.46	2135.24
PI0122	Stainless steel, 580 x 480 x 175 mm, single bowl	each	2076.92	1872.77	1756.11	2368.55
PI0123	Stainless steel, 940 x 460 x 160 mm, single bowl & drain-board	each	2765.41	2532.10	2532.10	3115.37
PI0124	Stainless steel, 1080 x 520 x 175 mm, single bowl & drain-board	each	2765.41	2532.10	2532.10	3465.34
PI0125	Stainless steel, 1150 x 515 x 175 mm, single bowl & drain-board	each	2357.12	2357.12	2357.12	4507.65
PI0126	Stainless steel, 1740 x 520 x 200 mm, single bowl & double drain-b	each	3103.94	3103.94	3103.94	4387.14
PI0127	Stainless steel, 940 x 460 x 160 mm, double bowl	each	3833.97	3833.97	3057.05	3833.97
PI0128	Stainless steel, 1150 x 520 x 160 mm, single bowl	each	3535.33	3535.33	3535.33	4876.86
PI0129	Stainless steel, 1740 x 520 x 200 mm, double bowl & single drain-b	each	4387.14	4387.14	4387.14	5256.22
PI0130	Stainless steel, 1740 x 520 x 200 mm, double bowl & double drain-board	each	4970.42	4970.42	4970.42	6778.57
Drain Board, Rubber plug						
PI0140	Providing & fixing stainless steel drain-board, 610 x 460 mm with all necessary fittings	each	1584.79	1584.79	1584.79	1707.28
PI0141	Providing & fixing c.p. brass chain & rubber plug for basin and sink	each	284.94	273.27	265.49	349.10
W a s t e s						
PI0150	Providing & fixing 32mm dia pvc. waste	each	156.62	162.45	148.84	172.17
PI0151	Providing & fixing 32mm c.p. brass waste	each	203.28	220.78	232.44	252.86
PI0152	Providing & fixing 40mm c.p. brass waste	each	238.28	238.28	279.10	319.93

Code	Description	Units	PL	GP	SJ	TH
Water Heaters						
Providing & fixing Electric water heater including necessary fittings						
PI0160	10 litres	each	8373.94	8372.83	7879.98	8359.08
PI0161	15 litres	each	9748.41	9406.04	8710.61	8363.45
PI0162	25 litres	each	12651.92	12501.19	11028.29	11364.08
PI0163	35 litres	each	15427.73	13930.21	13832.87	15687.31
PI0164	50 litres	each	17719.77	17478.86	16434.88	17100.08
PI0165	70 litres	each	19405.44	19403.66	19409.58	23449.03
PI0166	100 litres	each	41459.38	38074.51	38080.79	31689.80
Water Supply Fittings						
Providing & fixing C.P. Brass shower fittings						
PI0175	Shower with revolving joint, 15mm,	each	1328.13	1328.13	1328.13	1328.13
PI0176	Adjustable shower, with locking key, 15mm	each	1666.43	1666.43	1666.43	1666.43
PI0177	Shower arm, standard 15mm	each	1036.49	1036.49	1036.49	1036.49
PI0178	Shower arm, heavy duty 15mm	each	1433.12	1433.12	1433.12	1433.12
PI0179	Flexible shower tube & shower	each	1728.84	1728.84	1728.84	1728.84
Providing & fixing c.p. brass stop cock						
PI0185	15mm, standard, c.p knob	each	1561.44	1561.44	1561.44	1561.44
PI0186	20mm, standard, c.p knob	each	1281.47	1281.47	1281.47	1281.47
PI0187	20mm, heavy-duty, c.p knob	each	1281.47	1281.47	1281.47	1281.47
PI0188	15mm, concealed, c.p knob	each	1019.00	1019.00	1019.00	1019.00
PI0189	15mm, angle, c.p knob	each	1448.68	1448.68	1448.68	1448.68
Providing & fixing c.p. brass pillar-cock						
PI0195	15mm, standard, c.p knob	each	2416.91	2416.91	2416.91	2416.91
PI0196	15mm, swan neck, c.p knob	each	2727.99	2727.99	2727.99	2727.99
Providing & fixing c.p. brass bibcock						
PI0205	15mm, standard vertical, c.p knob	each	1444.79	1444.79	1444.79	1444.79
PI0206	15mm, inclined, c.p. knob	each	1538.11	1538.11	1538.11	1538.11
PI0207	15mm, long nose, c.p. knob	each	1732.54	1732.54	1732.54	1732.54
PI0208	15mm, long body, c.p. knob	each	1380.63	1380.63	1380.63	1380.63
Providing & fixing c.p. brass mixers, 15mm						
PI0215	For basin, single-hole, casted spout	each	5628.81	5628.81	5628.81	5628.81
PI0216	For basin, close-hole	each	4337.83	4337.83	4337.83	4337.83
PI0217	For basin, elbow action, surgical	each	4081.19	4081.19	4081.19	4081.19
PI0218	For basin, elbow action, surgical with shower	each	5726.03	5726.03	5726.03	5726.03
PI0219	For sink, with spout J pipe	each	5306.07	5306.07	5306.07	5306.07
PI0220	For sink, with casted spout swinging	each	5761.02	5761.02	5761.02	5761.02
PI0221	For sink, with swivel spout	each	4489.48	4489.48	4489.48	4489.48
PI0222	For wall, non-telephonic type	each	5344.95	5344.95	5344.95	5344.95
PI0223	For wall, telephonic type with crutch and tel. shower	each	7866.64	7866.64	7866.64	7866.64
PI0224	For wall, telephonic type without crutch and tel. shower	each	6227.64	6227.64	6227.64	6227.64
PI0225	For wall, telephonic type with crutch and without tel. shower	each	7394.19	7394.19	7394.19	7394.19
PI0226	For wall, telephonic type with C.P bend & flanges	each	7351.42	7351.42	7351.42	7351.42
PI0227	For wall, with telephonic shower arrangement with 115mm long bend pipe for over head shower connection	each	8747.39	8747.39	8747.39	8747.39
PI0228	Three hole mixer without pop-up	each	4956.10	4956.10	4956.10	4956.10
PI0229	Three hole mixer with pop-up	each	5889.34	5889.34	5889.34	5889.34
PI0230	For bath, with exposed adjustable legs with telephone shower arrangement with crutch	each	8127.95	8127.95	8127.95	8127.95
PI0231	For shower, three in one, with bend flexible tube, and shower & hook	each	8747.39	8747.39	8747.39	8747.39

Code	Description	Units	PL	GP	SJ	TH
Providing & fixing Wall Spouts						
PI0240	C.p., standard, 15mm	each	1692.57	1692.57	1692.57	1692.57
PI0241	With diverter, for use with single lever mixers	each	3177.98	3177.98	3177.98	3177.98
Bathroom Accessories						
PI0250	Providing & fixing 600x450mm bevelled edge mirror (superior glass) incl.4mm A.C sheet base fixed to wooden cleats	each	1640.22	1533.29	1679.11	2052.40
PI0251	Providing & fixing 450x120mm glass shelf, including c.p brass brackets fixed to wooden cleats	each	1437.47	1339.87	1370.98	1526.52
PI0252	Providing & fixing c.p. towel rail 750 x 20mm with c.p brass brackets fixed to wooden cleats	each	848.98	872.31	887.87	977.30
PI0253	Providing & fixing c.p. towel rail 600 x 20mm with c.p brass brackets fixed to wooden cleats	each	790.65	821.76	751.77	829.54
PI0254	Providing & fixing c.p. towel rail 450 x 20mm with c.p brass brackets fixed to wooden cleats	each	693.44	712.88	674.00	703.16
PI0255	Providing & fixing c.p. towel ring	each	628.64	684.05	628.64	675.30
Providing & fixing toilet paper holder						
PI0260	C.P. brass	each	800.49	841.32	763.55	870.49
PI0261	Recessed ceramic, 200 x 100 mm, coloured,	each	914.82	957.98	965.56	1156.29
PI0262	Recessed ceramic, 200 x 100 mm, white	each	866.18	657.37	767.60	954.84
PI0263	Recessed ceramic, roll-type, 150 x 150 mm	each	988.67	1048.16	1018.41	1164.82
Soap Container, Coat Hooks						
PI0270	Providing & fixing Liquid soap container, c.p, including c.p brass lid & brackets, wooden cleats, c.p brass screws	each	625.51	619.68	608.01	841.32
Providing & fixing soap dish						
PI0275	including brackets, wooden cleats, c.p. brass screws	each	357.21	357.21	345.54	374.70
PI0276	Recessed, ceramic, 150x150 mm	each	529.05	797.35	756.52	698.20
PI0277	Recessed, ceramic, 200x100 mm	each	558.21	581.54	601.95	601.95
Providing & fixing c.p coat hook						
PI0285	Single	each	214.51	220.34	232.01	205.76
PI0286	Double	each	249.51	237.84	261.17	249.51

Code	Description	Units	PL	GP	SJ	TH
Chapter 17: PLUMBING - OUTDOOR WORK						
External Water Supply Pipework						
Providing & laying G.I. pipes including G.I. fittings (excluding trenching, refilling & thrust block)						
PO0001	15mm	m	203.57	203.57	221.42	285.94
PO0002	20mm	m	261.88	261.88	288.06	340.74
PO0003	25mm	m	364.04	364.04	365.23	422.74
PO0004	32mm	m	471.83	471.83	569.40	565.10
PO0005	40mm	m	519.37	519.37	627.65	716.70
PO0006	50mm	m	735.93	735.93	744.26	828.88
PO0007	65mm	m	973.91	973.91	1081.00	1025.74
PO0008	80mm	m	1185.71	1185.71	1280.90	1415.43
PO0009	100mm	m	1713.40	1713.40	1950.19	1941.76
PO0010	150mm	m	2538.04	2538.04	3075.87	2714.14
Providing & laying H.D.P.E pipes, 12.5 PN, including H.D.P.E fittings (excluding trenching, refilling & thrust block)						
PO0640	20mm	m	51.88	51.88	57.65	58.28
PO0641	25mm	m	68.95	68.95	76.69	77.28
PO0642	32mm	m	90.88	90.88	102.96	111.29
PO0643	40mm	m	136.38	136.38	156.46	157.65
PO0644	50mm	m	197.55	197.55	224.28	229.04
PO0645	63mm	m	314.43	314.43	388.49	358.74
PO0646	75mm	m	426.41	426.41	537.23	537.23
PO0647	90mm	m	609.35	609.35	763.54	680.25
PO0648	110mm	m	878.10	878.10	1114.83	1114.83
PO0649	140mm	m	1408.74	1408.74	1945.48	1624.21
PO0650	160mm	m	1806.03	1806.03	2504.72	2147.76
PO0651	180mm	m	2257.07	2257.07	3135.36	2778.40
PO0652	200mm	m	2759.34	2759.34	3843.34	3218.65
PO0653	225mm	m	3467.85	3467.85	4241.27	3908.78
PO0654	250mm	m	4274.91	4274.91	5228.60	4833.34
PO0655	280mm	m	5342.55	5342.55	5616.03	5888.89
PO0656	315mm	m	6740.93	6740.93	7087.13	7482.29
PO0657	355mm	m	8533.95	8533.95	8973.83	9405.31
PO0658	400mm	m	11028.33	11028.33	11598.13	12008.96
Providing & laying H.D.P.E pipes, 10 PN, including H.D.P.E fittings (excluding trenching, refilling & thrust block)						
PO0015	25mm	m	61.64	63.28	68.95	67.48
PO0016	32mm	m	83.22	83.40	95.23	84.33
PO0017	40mm	m	118.49	108.97	135.64	139.80
PO0018	50mm	m	166.97	141.60	192.16	193.35
PO0019	63mm	m	273.91	216.82	314.12	311.15
PO0020	75mm	m	368.01	384.78	459.88	418.24
PO0021	90mm	m	515.24	539.12	644.55	591.01
PO0022	110mm	m	740.68	776.10	1043.44	805.46
PO0023	140mm	m	1184.50	1241.52	1630.16	1410.03
PO0024	160mm	m	1515.88	1590.34	2094.21	1755.10
PO0025	225mm	m	2897.45	3044.62	4033.72	3373.34
PO0665	250mm	m	3577.04	3758.29	4370.18	4119.41
PO0666	280mm	m	4460.65	4687.65	4687.65	5169.01
PO0667	315mm	m	5629.62	5917.26	5917.26	6351.90
PO0668	355mm	m	7134.92	7500.77	7500.77	7917.96
PO0669	400mm	m	9208.49	9682.34	9682.34	10081.35
Providing & laying H.D.P.E Pipes, 6 PN, including H.D.P.E fittings (excluding trenching, refilling & thrust block)						
PO0030	32mm	m	74.48	76.19	82.73	72.70
PO0031	40mm	m	97.51	100.58	130.88	115.12
PO0032	50mm	m	136.55	142.32	188.59	175.50
PO0033	63mm	m	220.14	229.13	285.57	275.45
PO0034	75mm	m	290.89	303.61	356.37	358.74
PO0035	90mm	m	403.06	421.03	497.01	561.26
PO0036	110mm	m	495.97	551.92	671.00	650.78

Code	Description	Units	PL	GP	SJ	TH
PO0037	140mm	m	799.55	836.36	1086.39	981.68
PO0038	160mm	m	1010.85	1093.55	1371.96	1231.55
PO0039	225mm	m	1900.28	1995.49	2315.55	2183.46
PO0675	250mm	m	2342.97	2459.63	2852.24	2810.54
PO0676	280mm	m	2920.99	3067.01	3067.01	3419.88
PO0677	315mm	m	3674.16	3859.27	3859.27	4186.32
PO0678	355mm	m	4631.49	4865.89	4865.89	5324.02
PO0679	400mm	m	5958.49	6261.28	6261.28	6785.38
	Providing & laying H.D.P.E Pipes, 4 PN, including H.D.P.E fittings (excluding trenching, refilling & thrust block)					
PO0045	40mm	m	91.31	93.40	104.11	107.68
PO0046	50mm	m	117.03	121.78	127.31	157.65
PO0047	63mm	m	171.29	177.78	193.35	227.86
PO0048	75mm	m	215.22	224.00	261.17	281.40
PO0049	90mm	m	302.85	315.74	369.69	394.68
PO0050	110mm	m	373.30	389.72	461.59	460.40
PO0051	140mm	m	610.43	637.80	757.98	779.40
PO0052	160mm	m	763.33	798.43	954.31	862.69
PO0053	225mm	m	1349.91	1415.92	1562.90	1671.81
PO0685	250mm	m	1662.30	1743.22	1923.48	2096.61
PO0686	280mm	m	2084.72	2186.93	2186.93	2586.97
PO0687	315mm	m	2586.08	2713.54	2713.54	2972.64
PO0688	355mm	m	3267.64	3430.38	3430.38	3872.36
PO0689	400mm	m	5119.35	5378.55	5378.55	5738.28
	Providing & laying H.D.P.E Pipes, 2.5 PN, including H.D.P.E fittings (excluding trenching, refilling & thrust block)					
PO0060	110mm	m	299.50	311.70	337.26	436.60
PO0061	140mm	m	481.74	501.77	523.98	672.31
PO0062	160mm	m	593.96	619.89	674.66	838.89
PO0063	225mm	m	1052.61	1102.69	1208.76	1350.54
	Providing and fixing 3-layer PP-R (Polypropylene Random Copolymer) PN 16 pipes, SDR 7.4 UV Stabilized and anti microbial fusion welded, having thermal stability for hot and cold water supply including all PP-R plain and brass Threaded Polypropylene random fittings excluding trenching, refilling but including testing of joints complete as per direction of Engineer-in- Charge.					
PO0700	16mm	m	150.03	160.74	160.74	188.11
PO0701	20mm	m	168.90	178.42	178.42	203.41
PO0702	25mm	m	234.74	243.86	243.86	298.60
PO0703	32mm	m	362.75	390.91	390.91	470.64
PO0704	40mm	m	576.88	666.92	666.92	747.83
PO0705	50mm	m	991.76	1073.86	1073.86	1155.96
PO0706	63mm	m	1552.20	1639.06	1639.06	1913.92
PO0707	75mm	m	2179.26	2301.82	2301.82	2455.32
	Providing and fixing 3-layer PP-R (Polypropylene Random Copolymer) PN 10 pipes, SDR 7.4 UV Stabilized and anti microbial fusion welded, having thermal stability for hot and cold water supply including all PP-R plain and brass Threaded Polypropylene random fittings excluding trenching, refilling but including testing of joints complete as per direction of Engineer-in- Charge.					
PO0708	90mm	m	2268.74	2396.06	2396.06	2799.43
PO0709	110mm	m	3281.01	3466.04	3466.04	4052.65
PO0710	160mm	m	6872.78	7261.87	7261.87	8499.34

Code	Description	Units	PL	GP	SJ	TH
Providing and Laying Ductile Iron K - 9 pipes with push-on joints including fittings (excluding trenching, refilling & thrust block)						
PO0065	80 mm	m	1627.80	1627.80	1627.80	2056.16
PO0066	100 mm	m	1800.33	1800.33	1800.33	2317.93
PO0067	150 mm	m	2375.86	2375.86	2375.86	2910.11
PO0068	200 mm	m	3273.03	3273.03	3273.03	4177.34
PO0069	250 mm	m	4086.53	4086.53	4086.53	4848.05
PO0070	300 mm	m	5093.41	5093.41	5093.41	6058.41
PO0071	350 mm	m	5604.68	5604.68	5604.68	6468.54
PO0072	400 mm	m	6560.73	6560.73	6560.73	7418.64
PO0073	450 mm	m	7508.62	7508.62	7508.62	8242.77
PO0074	500 mm	m	8726.69	8726.69	8726.69	9579.83
PO0075	600 mm	m	11915.57	11915.57	11915.57	13081.65
Providing and Laying Ductile Iron K - 7 pipes with push-on joints including fittings (excluding trenching, refilling & thrust block)						
PO0078	100 mm	m	1663.50	1663.50	1663.50	2187.04
PO0079	150 mm	m	2131.93	2131.93	2131.93	2609.07
PO0080	200 mm	m	2922.02	2922.02	2922.02	3837.04
PO0081	250 mm	m	3527.29	3527.29	3527.29	4193.62
PO0082	300 mm	m	4290.24	4290.24	4290.24	4998.22
PO0083	350 mm	m	4974.05	4974.05	4974.05	5801.01
PO0084	400 mm	m	5811.11	5811.11	5811.11	6633.32
PO0085	450 mm	m	6532.91	6532.91	6532.91	6532.91
PO0086	500 mm	m	7632.00	7632.00	7632.00	7632.00
PO0087	600 mm	m	10452.01	10452.01	10452.01	10452.01
Providing and Laying Double Flanged (Screwed or Welded) Centrifugally Spun Ductile Iron K-9 Pipes including fittings (excluding trenching, refilling & thrust block)						
PO0090	100 mm	m	2224.23	2224.23	2224.23	2521.70
PO0091	150 mm	m	3064.16	3064.16	3064.16	3421.13
PO0092	200 mm	m	4059.82	4059.82	4059.82	4702.36
PO0093	250 mm	m	5585.45	5585.45	5585.45	6513.56
PO0094	300 mm	m	7046.79	7046.79	7046.79	8355.66
PO0095	350 mm	m	8371.79	8371.79	8371.79	10775.35
PO0096	400 mm	m	10494.83	10494.83	10494.83	13885.99
PO0097	450 mm	m	13011.44	13011.44	13011.44	17687.68
PO0098	500 mm	m	15478.14	15478.14	15478.14	21225.27
PO0099	600 mm	m	20608.35	20608.35	20608.35	28318.78
Providing and Laying Ductile Iron K - 9 Restrained Joint Pipe including fittings with Locking Bar/Plate Device along with fixing of EPDM Rubber Gasket, excluding trenching, refilling & thrust block						
PO0750	80mm	m	2522.16	2522.16	2522.16	2617.35
PO0751	100mm	m	2760.13	2760.13	2760.13	2867.22
PO0752	150mm	m	3474.06	3474.06	3474.06	3616.85
PO0753	200mm	m	4306.98	4306.98	4306.98	4491.41
PO0754	250mm	m	5615.85	5615.85	5615.85	5865.72
PO0755	300mm	m	6686.74	6686.74	6686.74	6990.16
PO0756	350mm	m	7519.66	7519.66	7519.66	7864.72
PO0757	400mm	m	8828.53	8828.53	8828.53	9239.04
PO0758	450mm	m	10137.40	10137.40	10137.40	10613.35
PO0759	500mm	m	11565.25	11565.25	11565.25	12112.60
PO0760	600mm	m	15015.91	15015.91	15015.91	15735.79

Code	Description	Units	PL	GP	SJ	TH
Brass Fittings						
Providing & fixing brass stop cock						
PO0100	15mm	each	901.40	901.40	901.40	901.40
PO0101	20mm	each	991.22	991.22	991.22	991.22
PO0102	25mm	each	1072.88	1072.88	1072.88	1072.88
Providing & fixing brass full way valve with wheel						
PO0105	32mm	each	704.37	704.37	704.37	704.37
PO0106	40mm	each	749.16	749.16	749.16	749.16
PO0107	50mm	each	934.29	934.29	934.29	934.29
PO0108	65mm	each	1605.06	1605.06	1605.06	1605.06
PO0109	80mm	each	2409.98	2409.98	2409.98	2409.98
Providing & fixing non-return valve						
PO0110	50mm	each	1412.58	1411.88	1412.58	1412.58
PO0111	65mm	each	2556.03	3325.14	2556.03	2556.03
PO0112	80mm	each	3848.10	5137.72	3848.10	3848.10
Providing & fixing brass bibcock						
PO0114	15mm, brass	each	335.04	317.54	363.23	402.11
H.D.P.E Fittings (Butt-Welded-Type)						
Providing & fixing H.D.P.E, Equal Tee butt-welded-type fittings						
PO0115	20mm	each	91.52	91.52	91.52	91.52
PO0116	25mm	each	120.68	120.68	120.68	120.68
PO0117	32mm	each	142.56	142.56	142.56	142.56
PO0118	50mm	each	164.14	164.14	164.14	164.14
PO0119	63mm	each	361.28	361.28	361.28	361.28
PO0120	90mm	each	827.90	827.90	827.90	827.90
PO0121	110mm	each	958.56	958.56	958.56	958.56
PO0122	160mm	each	2052.78	2052.78	2052.78	2052.78
Providing & fixing H.D.P.E Elbow						
PO0125	32mm	each	84.23	84.23	84.23	84.23
PO0126	50mm	each	149.85	149.85	149.85	149.85
PO0127	63mm	each	215.46	215.46	215.46	215.46
PO0128	90mm	each	405.03	405.03	405.03	405.03
PO0129	110mm	each	638.34	638.34	638.34	638.34
Providing & fixing H.D.P.E Reducer						
PO0130	90 x 50mm	each	324.83	324.83	324.83	324.83
PO0131	90 x 63mm	each	349.62	349.62	349.62	349.62
PO0132	110 x 63mm	each	368.57	368.57	368.57	368.57
PO0133	110 x 90mm	each	762.29	762.29	762.29	762.29
Providing & fixing H.D.P.E Blank End (Cap)						
PO0140	50mm	each	91.52	91.52	91.52	91.52
PO0141	63mm	each	113.39	113.39	113.39	113.39
PO0142	90mm	each	250.46	250.46	250.46	250.46
PO0143	110mm	each	317.54	317.54	317.54	317.54
PO0144	160mm	each	550.85	550.85	550.85	550.85

Code	Description	Units	PL	GP	SJ	TH
Providing and fixing push on joints to Centrifugally Spun D.I pipes including the cost of rubber gaskets						
PO0150	80 mm	each	68.96	72.85	69.35	72.85
PO0151	100 mm	each	91.68	94.60	82.93	95.57
PO0152	150 mm	each	168.21	168.21	168.21	197.37
PO0153	200 mm	each	252.73	252.73	239.89	270.81
PO0154	250 mm	each	343.07	343.07	299.33	343.07
PO0155	300 mm	each	406.41	406.41	356.25	406.41
PO0156	350 mm	each	440.76	440.76	432.01	440.76
PO0157	400 mm	each	510.18	510.18	504.34	510.18
PO0158	450 mm	each	540.69	540.69	540.69	540.69
PO0159	500 mm	each	564.62	564.62	564.62	564.62
PO0160	600 mm	each	709.06	709.06	709.06	709.06
PVC pipes and Fittings						
Providing & fixing P.V.C soil waste and vent pipes, single or double socketed, including pipe clip complete (excluding the cost of PVC fittings)						
PO0370	75mm dia	m	256.80	256.80	256.80	256.80
PO0371	50mm dia	m	237.45	237.45	237.45	237.45
PO0372	110mm dia	m	451.21	451.21	451.21	451.21
Providing & fixing P.V.C Pipe connector						
PO0380	110mm dia	each	142.56	139.64	145.47	171.72
Providing & fixing P.V.C Coupler						
PO0385	75mm dia	each	79.56	96.87	92.98	96.87
PO0386	50mm dia	each	66.15	81.31	75.48	81.31
PO0387	110mm dia	each	130.31	122.14	145.47	155.97
Providing & fixing P.V.C Reducer						
PO0395	90x75mm	each	126.47	126.47	126.47	127.97
PO0396	110x75mm	each	136.14	136.14	136.14	159.08
PO0397	110x90mm	each	154.80	154.80	154.80	165.30
Providing & fixing P.V.C plain bend						
PO0405	75mm dia	each	100.56	108.53	122.14	130.31
PO0406	50mm dia	each	75.48	83.26	98.81	116.31
PO0407	110mm dia	each	169.97	182.41	186.30	198.74
Providing & fixing P.V.C door bend						
PO0415	75mm dia	each	148.97	147.42	151.30	153.64
PO0416	50mm dia	each	112.42	102.70	110.48	113.97
PO0417	110mm dia	each	237.63	190.19	270.88	257.85
Providing & fixing P.V.C Long arm bend with door						
PO0425	75mm dia	each	227.13	230.63	230.63	244.63
PO0426	50mm dia	each	139.64	168.80	206.72	221.30
PO0427	110mm dia	each	477.94	445.86	475.02	536.27
Providing & fixing P.V.C Single Tee plain						
PO0435	75mm dia	each	148.58	157.14	130.89	166.08
PO0436	50mm dia	each	110.48	113.39	78.40	101.53
PO0437	110mm dia	each	257.85	253.38	227.13	285.07

Code	Description	Units	PL	GP	SJ	TH
Providing & fixing P.V.C Single Tee with door						
PO0445	75mm dia	each	144.31	147.03	157.14	169.97
PO0446	50mm dia	each	110.48	108.53	122.14	122.14
PO0447	110mm dia	each	261.54	238.80	273.79	327.84
Providing & fixing P.V.C Double Tee plain						
PO0455	75mm dia	each	221.30	238.80	221.30	311.71
PO0456	50mm dia	each	162.97	113.39	203.80	221.30
PO0457	110mm dia	each	384.61	454.61	384.61	588.76
Providing & fixing P.V.C Double Tee with door						
PO0465	75mm dia	each	328.23	279.63	302.96	396.28
PO0466	50mm dia	each	267.96	244.63	232.96	232.96
PO0467	110mm dia	each	571.26	463.36	536.27	650.00
Providing & fixing P.V.C Single Y, plain						
PO0475	75mm dia	each	209.63	203.80	232.96	232.96
PO0476	50mm dia	each	151.30	139.64	157.14	192.13
PO0477	110mm dia	each	364.20	355.45	337.95	372.95
Providing & fixing P.V.C Single Y, with door						
PO0485	75mm dia	each	208.08	188.25	262.13	305.87
PO0486	50mm dia	each	168.80	145.47	174.64	203.80
PO0487	110mm dia	each	316.57	308.40	343.79	460.44
Providing & fixing P.V.C Double Y, plain						
PO0495	75mm dia	each	212.55	210.80	294.21	294.79
PO0496	50mm dia	each	154.22	171.72	232.96	229.07
PO0497	110mm dia	each	355.45	371.20	372.95	512.16
Providing & fixing P.V.C Double Y, with door						
PO0505	75mm dia	each	248.71	285.46	267.96	325.70
PO0506	50mm dia	each	192.13	232.96	232.96	244.63
PO0507	110mm dia	each	420.19	489.60	454.61	579.43
Providing & fixing P.V.C Offset, 75mm dia						
PO0515	With 75mm projection	each	180.47	133.81	139.64	186.30
PO0516	With 150mm projection	each	221.30	183.38	186.30	209.63
Providing & fixing P.V.C Offset, 90mm dia						
PO0525	With 75mm projection	each	188.63	187.47	188.63	244.63
PO0526	With 150mm projection	each	306.46	304.71	306.46	419.61
Providing & fixing P.V.C Offset, 110mm dia						
PO0535	With 75mm projection	each	223.63	222.46	223.63	244.63
PO0536	With 150mm projection	each	320.45	317.54	320.45	326.29
Providing & fixing P.V.C Floor Trap						
PO0545	75mm dia	each	118.64	118.64	118.64	118.64
PO0546	50mm dia	each	87.14	98.81	98.81	98.81
PO0547	110mm dia	each	168.80	168.80	168.80	168.80

Code	Description	Units	PL	GP	SJ	TH
	Providing & fixing P.V.C P-Trap, without air vent					
PO0555	Big	each	384.61	405.03	402.11	536.27
PO0556	Small	each	320.45	332.12	308.79	361.28
	Providing & fixing P.V.C Nahani Trap					
PO0565	110mm inlet & 75mm outlet	each	210.02	182.41	183.38	188.63
	uPVC pipes					
	Providing & laying uPVC soil waste Pipes including fittings pressure class 4 kg/sq.cm (excluding trenching, refilling & thrust block)					
PO0720	110 mm	m	769.05	526.56	769.05	769.05
PO0721	160 mm	m	1461.81	1461.81	1461.81	1461.81
PO0722	180 mm	m	1346.43	1346.43	1346.43	1346.43
PO0723	200 mm	m	1607.83	1607.83	1607.83	1607.83
PO0724	225 mm	m	2106.03	2106.03	2106.03	2106.03
PO0725	250 mm	m	2481.66	2481.66	2481.66	2481.66
PO0726	280 mm	m	3126.30	3126.30	3126.30	3126.30
PO0727	315 mm	m	4022.75	4022.75	4022.75	4022.75
PO0728	400 mm	m	4579.66	4579.66	4579.66	4579.66
PO0729	450 mm	m	5821.48	5821.48	5821.48	5821.48
PO0730	560 mm	m	7588.37	7588.37	7588.37	7588.37
	Painting Pipes & Fittings					
	Painting G.I pipes and fittings including primer & white coat, for new work					
PO0570	15mm dia pipe	m	6.32	7.53	6.49	6.97
PO0571	20mm dia pipe	m	8.47	10.09	8.70	9.34
PO0572	25mm dia pipe	m	10.49	12.50	10.78	11.57
PO0573	32mm dia pipe	m	13.44	16.03	13.81	14.83
	Soak - pits & Septic Tanks					
	Constructing Soak Pit					
PO0600	Size 1200x1200x1200mm, filled with brick bats including 110 dia H.D.P.E (PN 4) drain pipe X 1200mm long	each	5656.31	5903.83	6028.42	6243.16
PO0601	Size 2500 dia. x 3000mm depth including 450x450mm dry brick honeycomb shaft and 110 dia H.D.P.E (PN 4) drain pipe X 1800mm long	each	40736.06	42585.05	42898.67	43744.06
	Constructing Septic Tanks, in R.R Masonry in cement mortar 1:6, including fittings, C.I cover with frame, 40mm thick concrete flooring (40mm aggregates) cement plaster concrete base in C.C 1:4:8 etc. complete as per standard design					
PO0610	15 users	each	42604.05	42433.83	43731.19	48368.51
PO0611	25 users	each	50374.99	50199.45	51731.05	57045.64
PO0612	50 users	each	71302.44	71159.06	73494.19	80148.23
PO0613	75 users	each	81417.32	81274.95	83896.93	91350.68
PO0614	100 users	each	94213.21	94037.80	97059.93	105725.78
	Constructing Septic Tanks, in 2nd class brick masonry in cement mortar 1:4, including fittings, C.I cover with frame, 40mm thick concrete flooring (40mm aggregates) cement plaster concrete base in C.C 1:4:8 etc. complete as per standard design					
PO0620	15 users	each	44705.60	44520.16	45959.08	52735.31
PO0621	25 users	each	53899.79	53711.37	55469.88	63769.20
PO0622	50 users	each	74102.04	73966.74	76530.81	87360.61
PO0623	75 users	each	88197.89	88044.57	91172.47	104600.06
PO0624	100 users	each	102497.33	102332.21	105872.63	121264.06

Code	Description	Units	PL	GP	SJ	TH
Constructing Septic Tanks, in reinforced concrete 1:2:4 (20mm aggregates) including fittings, C.I cover with frame, 40mm thick concrete flooring (40mm aggregates) cement plaster concrete base in C.C 1:4:8 etc. complete as per standard design						
PO0630	15 users	each	50743.17	50979.92	52230.46	55747.50
PO0631	25 users	each	63447.94	63828.63	65361.10	69277.80
PO0632	50 users	each	90517.95	91214.73	93506.70	98036.68
PO0633	75 users	each	110988.71	111918.52	114669.13	119839.54
PO0634	100 users	each	133278.86	134504.66	137693.38	143246.93

Code	Description	Units	PL	GP	SJ	TH
Chapter 18: PLASTERING						
Mud Plaster						
Providing & laying mud plaster including neat finish						
PL0001	15mm	sq.m	138.37	138.37	138.37	138.37
PL0002	20mm	sq.m	149.28	149.28	149.28	149.28
Cement Plaster						
Providing & laying 6mm cement plaster (in ceilings)						
PL0010	C.M 1:3	sq.m	161.86	161.15	163.52	172.95
PL0011	C.M 1:4	sq.m	153.54	153.08	155.56	163.49
PL0012	Extra for plaster to ceiling height > 5m .....per additional metre. ht	sq.m	4.96	4.96	4.96	4.96
Providing & laying 12mm cement plaster						
PL0020	C.M 1:3	sq.m	213.13	211.71	216.44	235.32
PL0021	C.M 1:4	sq.m	196.33	195.42	200.39	216.23
PL0022	C.M 1:5	sq.m	187.26	186.62	191.72	205.92
PL0023	C.M 1:6	sq.m	179.53	179.13	184.33	197.14
Providing & laying 15mm cement plaster on rough side of single or half-brick wall						
PL0030	C.M 1:3	sq.m	251.07	249.37	255.03	277.57
PL0031	C.M 1:4	sq.m	231.04	229.95	235.88	254.81
PL0032	C.M 1:5	sq.m	220.17	219.41	225.49	242.46
PL0033	C.M 1:6	sq.m	210.92	210.44	216.65	231.95
Providing & laying 20mm cement plaster						
PL0040	C.M 1:3	sq.m	309.36	307.15	314.51	343.88
PL0041	C.M 1:4	sq.m	283.22	281.80	289.53	314.17
PL0042	C.M 1:5	sq.m	269.11	268.13	276.05	298.15
PL0043	C.M 1:6	sq.m	257.08	256.46	264.54	284.47
Plaster Band						
Providing & laying 12mm plain cement mortar band in C.M 1:4						
PL0050	Flush band	sq.m	456.19	455.30	460.13	475.54
PL0051	Sunk band	sq.m	495.40	494.52	499.34	514.75
PL0052	Raised band	sq.m	560.51	559.62	564.45	579.85
Providing & laying 20mm plain cement mortar band in C.M 1:4						
PL0060	Flush band	sq.m	562.27	561.01	567.91	589.92
PL0061	Sunk band	sq.m	608.66	607.40	614.29	636.30
PL0062	Raised band	sq.m	687.08	685.82	692.72	714.73
Cement Plaster with Floating Coat						
Providing & laying cement plaster, finished with floating coat of neat cement						
PL0070	12mm plaster in C.M 1:3	sq.m	265.75	263.73	268.19	290.64
PL0071	15mm plaster in C.M 1:3	sq.m	303.69	301.40	306.78	332.89
PL0072	20mm plaster in C.M 1:3	sq.m	361.98	359.17	366.26	399.20
PL0073	12mm plaster in C.M 1:4	sq.m	248.95	247.45	252.14	271.55
PL0074	15mm plaster in C.M 1:4	sq.m	283.66	281.97	287.63	310.13
PL0075	20mm plaster in C.M 1:4	sq.m	335.84	333.83	341.28	369.49
PL0076	6mm cement plaster in C.M 1:3, including lime wash on top of wall when dry for bearing R.C slabs and beams	sq.m	225.94	224.23	226.49	240.00

Code	Description	Units	PL	GP	SJ	TH
Decorative Plaster						
Rough cast plaster with a mixture of sand and gravel or crushed stone 2-12mm including plaster in 2 layers-12mm 1:4, & 10mm 1:3 hydrated lime cement						
PL0080	Grey cement	sq.m	485.42	482.58	495.66	529.35
PL0081	White cement	sq.m	709.52	729.48	748.51	826.82
Pebble dash plaster with a mixture of washed pebble or crushed stone 6mm to 12mm nominal size dashed over fresh plaster in the layers, under layer 12mm cement plaster 1:4 and top layer 10mm cement plaster mixed with finally ground hydrated lime by volume of cement						
PL0090	Grey cement	sq.m	492.79	489.95	503.03	536.72
Cement Plaster in 2 coats						
PL0091	18 mm cement plaster in two coats; under layer 12 mm C.P 1:5 (1 cement : 5 sand) and top layer 6 mm thick C.P 1:4 (1 cement :4 sand) finished even and smooth and curing etc. complete	sq.m	203.32	203.31	203.37	203.52
PL0092	18 mm cement plaster in two coats; under layer 12 mm C.P 1:5 (1 cement : 5 sand) and top layer 6 mm thick C.P 1:3 (1 cement : 3sand) finished even and smooth and curing etc. complete	sq.m	203.36	203.35	203.40	203.56
Cement Lime Plaster						
PL0095	12 mm cement lime plaster of mix on fair side of brick work - 1:1:6 (1 cement :1 lime : 6 sand) finished even and smooth and curing etc. complete	sq.m	291.03	290.63	295.82	309.58
PL0096	12 mm cement lime plaster of mix on rough side of brick work - 1:1:6 (1 cement :1 lime : 6 sand) finished even and smooth and curing etc. complete	sq.m	287.43	286.96	293.17	309.60
Extra for cement plastering						
Extra for providing and mixing water-proofing materials in proportion recommended by the manufacturers						
PL0100	12mm plaster in C.M 1:3	sq.m	39.01	39.01	39.01	39.01
PL0101	12mm plaster in C.M 1:4	sq.m	31.69	31.69	31.69	31.69
PL0102	15mm plaster in C.M 1:3	sq.m	42.66	42.66	42.66	42.66
PL0103	15mm plaster in C.M 1:4	sq.m	35.46	35.46	35.46	35.46
PL0104	20mm plaster in C.M 1:3	sq.m	51.49	51.49	51.49	51.49
PL0105	20mm plaster in C.M 1:4	sq.m	41.89	41.89	41.89	41.89
PL0110	Neat cement punning	sq.m	52.62	52.02	51.75	55.32
Putty finishes						
PL0125	Providing & applying putty of thickness 2mm or more over plastered surface to prepare the surface even and smooth complete.	sq.m	205.64	239.18	212.35	196.70

Code	Description	Units	PL	GP	SJ	TH
Chapter 19: PAINTING & WALL PAPER						
Surface Preparation						
Surface preparation removing by scraping, sand papering, including scratch repairs						
PT0001	White colour-wash	sq.m	8.02	8.02	8.02	8.02
PT0002	Dry oil bound distemper	sq.m	9.91	9.91	9.91	9.91
Painting Items						
Providing & applying one coat of primers						
PT0010	Cement primer	sq.m	41.01	45.20	41.05	43.09
PT0011	Metal work - synthetic red oxide primer	sq.m	36.77	41.96	40.80	39.75
PT0012	Wood work - pink primer	sq.m	45.68	53.14	48.04	50.96
PT0013	Wood work - white primer	sq.m	39.48	44.90	41.22	42.27
PT0014	Red lead primer	sq.m	39.18	41.96	38.49	40.80
Providing & applying white or colour washing						
PT0020	White washing with lime-new work-three coats	sq.m	32.27	32.27	32.27	32.45
PT0021	White washing with lime, old work, two coats	sq.m	18.15	17.34	17.69	18.69
PT0022	White washing with lime, old work, one coat	sq.m	10.34	9.93	10.10	10.61
PT0023	Colour washing/new work, two coats, including base coat of white-wash with lime	sq.m	30.17	28.95	29.47	30.98
PT0024	Colour washing with lime, old work, two coats	sq.m	18.15	17.34	17.69	18.69
PT0025	Colour washing with lime, old work, one coat	sq.m	10.34	9.93	10.10	10.61
Finishing wall with Water-Proof Cement Paint						
PT0030	New work, three coats	sq.m	81.25	95.39	86.04	94.54
PT0031	Old work, one coats	sq.m	39.71	45.40	41.63	45.06
Providing and applying finishing coats						
PT0040	Dry distemper, two coats on new work, including white priming coat	sq.m	72.06	75.73	73.57	76.70
PT0041	Dry distemper, one coat on old work	sq.m	31.37	34.09	32.54	34.29
PT0042	Acrylic washable distemper, two coats on new work, including cement primer coat	sq.m	96.94	104.34	97.42	102.96
PT0043	Acrylic washable distemper, one coat on old work	sq.m	32.54	34.67	32.83	35.16
PT0044	Bituminastic enamel, for steel work, two coats on new work	sq.m	89.40	88.31	90.80	99.39
PT0045	Bituminastic enamel, for steel work, one coat on old work	sq.m	57.38	56.73	58.22	63.38
PT0046	Synthetic enamel, for steel & wood work/one coat on old work	sq.m	59.70	71.31	63.43	67.52
PT0047	Synthetic enamel, for steel & wood work, two coats on new work	sq.m	93.71	113.05	99.93	106.74
PT0048	High gloss synthetic enamel/for steel & wood work, two coats on new work	sq.m	97.66	118.31	97.31	108.51
PT0049	High gloss synthetic enamel, for steel & wood work/one coat on old work	sq.m	65.11	78.87	64.87	72.34
PT0050	Red corrugal, ready mixed/on G.I. sheets, two coats on new work	sq.m	83.18	88.60	84.24	86.30
PT0051	Red corrugal, ready mixed, on G.I. sheets/one coat on old work	sq.m	53.09	56.20	53.70	54.88
PT0052	Vinyl plastic emulsion paint, for cement, masonry, plaster, two coats on new work	sq.m	96.85	109.56	108.15	109.56
PT0053	Acrylic emulsion, one coat	sq.m	62.17	57.54	56.76	58.65
PT0054	Aluminium paint, one coat on old work	sq.m	59.33	62.42	58.04	60.41
PT0055	Aluminium paint, two coats on new work	sq.m	94.85	100.11	92.64	96.69

Code	Description	Units	PL	GP	SJ	TH
	Providing and applying wood stains, varnishes & polishes					
PT0060	Wood stain (various colours), one coat	sq.m	101.97	101.97	93.26	101.43
PT0061	Synthetic varnish (clear) - one coat, on old work	sq.m	136.57	136.57	121.79	139.68
PT0062	Synthetic varnish (clear) - two coats, including coat of wood filler on new work	sq.m	245.77	245.77	221.69	250.84
PT0063	French polish - one coat, on old work	sq.m	108.38	108.38	107.40	113.24
PT0064	French polish - two coats, on new work	sq.m	199.82	199.82	198.24	207.74
	Wood Preservatives					
	Providing and applying wood preservatives					
PT0070	Brown, two coats on new work	sq.m	63.59	63.59	63.59	57.76
PT0071	Brown, one coat on old work	sq.m	50.27	50.27	50.27	45.55
PT0072	Coal tar, two coats on new work	sq.m	98.32	98.96	97.35	99.26
PT0073	Coal tar, one coat on old work	sq.m	48.80	49.15	48.45	49.15
	Wall Paper					
	Providing & fixing wall paper					
PT0080	Standard Quality	sq.m	287.27	301.16	295.03	359.34
PT0081	High Quality	sq.m	457.53	429.77	435.89	481.83
	T r a d i t i o n a l P a i n t i n g					
	Providing, preparing and applying Sumdang painting (Not washable)					
PT0090	Rab	sq.m	984.73	992.39	990.87	986.71
PT0091	Ding	sq.m	696.90	701.97	704.31	696.90
PT0092	Thamar	sq.m	502.42	507.50	509.84	502.42
	Providing, preparing and applying Dangtshon painting (Not washable)					
PT0100	Rab	sq.m	1373.67	1381.33	1379.81	1375.65
PT0101	Ding	sq.m	1021.02	1026.09	1028.44	1021.02
PT0102	Thamar	sq.m	696.90	701.97	704.31	696.90
	Providing, preparing and applying Sumdang washable painting					
PT0110	Rab	sq.m	1111.82	1121.82	1113.27	1117.99
PT0111	Ding	sq.m	843.43	850.85	846.17	847.62
PT0112	Thamar	sq.m	629.51	636.93	632.25	633.70
	Providing, preparing and applying Dangtshon washable painting					
PT0120	Rab	sq.m	1416.49	1426.49	1417.95	1422.66
PT0121	Ding	sq.m	1083.28	1090.70	1086.02	1087.47
PT0122	Thamar	sq.m	785.09	792.51	787.83	789.28
	Providing, preparing and applying Yutshon painting (plain)					
PT0130	Washable	sq.m	260.96	268.44	263.75	265.15
PT0131	Not Washable	sq.m	221.12	222.38	221.91	221.12
	Providing, preparing and applying flower natural painting for wall decoration design such as Tashitagey symbols, Tashi Zeegay, Za-Tshering, etc.					
PT0140	Dangtshon - Rab	sq.m	1317.35	1314.66	1311.04	1319.33
PT0141	Sumdang - Rab	sq.m	1041.56	1038.87	1035.25	1043.54

Code	Description	Units	PL	GP	SJ	TH
Chapter 20: ADDITIONS, ALTERATIONS & REPAIRS						
Repair to Plasters						
Repair to plaster including cutting to shape, surface preparation, proving and applying cement plaster to the surface, disposal rubbish within 50m lead						
AA0001	Patch area <2.5sq.m	sq.m	267.89	266.76	272.96	292.77
Glass Panes						
Providing & fixing glass panes with putty, nails including removal of broken glass panes						
AA0005	3mm thick plain	sq.m	1132.95	1136.92	1083.80	1183.32
AA0006	4mm thick plain	sq.m	1305.54	1309.51	1231.37	1390.30
AA0007	5mm thick plain	sq.m	1409.10	1413.07	1396.05	1528.51
AA0008	3mm thick frosted	sq.m	1271.03	1551.14	1013.23	1279.98
AA0009	5mm thick frosted	sq.m	1420.38	1654.69	1411.02	1597.62
Cutting Walls						
AA0015	Cutting holes < 300x300mm in brick walls including repair wall	each	330.23	329.91	336.30	370.60
AA0016	Cutting holes < 150x150mm in R.C floors or roof including making leak proofing with concrete 1:2:4, 20mm aggregates	each	203.25	203.22	203.95	205.08
AA0017	Making chases < 75x75mm in walls including repair after fixing G.I pipe etc.	m	98.59	98.65	100.04	101.37
Aluminium Strip Edging						
Providing & fixing Aluminium strip edging to staircases including rawl plugs and screws, a thin layer of cement mortar 1:3						
AA0025	57mm x 12mm x 3mm	m	265.63	271.67	263.18	274.45
AA0026	38mm x 12mm x 3mm	m	224.23	229.54	226.43	235.95

Code	Description	Units	PL	GP	SJ	TH
Chapter 21: ROAD WORKS						
Excavation						
Earthwork in excavation over areas, exceeding 300mm in depth, 1.5 m in width as well as 10 sq.m on plan including disposal of excavated earth (disposed earth to be levelled and neatly dressed)						
RW0007	All types of soil	cu.m	209.56	209.56	209.56	209.56
RW0008	All types of rock with or without blasting	cu.m	665.61	665.61	665.61	665.61
RW0009	All types of rock requiring blasting	cu.m	898.46	898.46	898.46	898.46
RW0010	All types of rock requiring chiselling (where blasting is prohibited)	cu.m	1393.71	1393.71	1393.71	1393.71
Excavation of road formation/trace/box cutting, with rock breaker including separate deposition of soil, rocks and stones within 50m for reuse - All types of rocks						
RW0011	All types of rock	cu.m	971.56	971.56	971.56	971.56
Excavation of road formation/trace/box cutting, with excavator including separate deposition of soil, rocks and stones within 50m for reuse						
RW0013	All types of soil	cu.m	127.42	127.42	127.42	127.42
RW0014	All types of rock (With or Without blasting)	cu.m	377.16	377.16	377.16	377.16
Earthwork in Excavation in foundation trenches or drains including dressing of sides and ramming of bottom, disposal of surplus excavated soil within 50m lead						
RW0016	All types of soil	cu.m	221.50	221.50	221.50	221.50
RW0017	All types of rock with or without blasting	cu.m	704.69	704.69	704.69	704.69
RW0018	All types of rock requiring blasting	cu.m	998.05	998.05	998.05	998.05
Transportation of Loose Soils						
Transport of loose spoil materials in designated locations including loading/unloading, dressing of dump sites and plantation of vegetation after completion of dumping						
RW0019	Beyond 50 m	cu.m	Analyse as per procedure in LMC- 2025			
Embankments						
RW0030	Construction of embankment by laying dry earth in horizontal layers not exceeding 200mm in depth(compacted), including watering,power rolling,dressing and preparation of site with selected excavated earth within 50mm lead	cu.m	164.84	164.84	164.84	164.84
Filling of Trenches						
RW0035	Providing and laying filter material (600mm wide) in trenches, sides of foundations, walls etc. with 100 to 200 mm stones wherever applicable.	cu.m	1160.59	1160.59	1160.59	1230.58
Supply and Stacking						
Supplying/collection and stacking of stone aggregate						
RW0044	100mm	cu.m	1045.26	1045.26	1045.26	1045.26
RW0045	75 mm	cu.m	969.92	969.92	969.92	969.92
RW0046	50 mm	cu.m	988.75	988.75	988.75	988.75
RW0047	63 - 40 mm	cu.m	1015.51	1015.51	1015.51	1015.51
RW0048	20 mm	cu.m	1281.94	1345.07	1580.41	1345.07
RW0049	12 - 6 mm	cu.m	1020.80	1324.80	1579.70	1324.80
RW0050	50 - 20 mm	cu.m	1112.72	1125.34	1172.41	1125.34

Code	Description	Units	PL	GP	SJ	TH
Extraction/collection and stacking at site						
RW0055	Blinding materials	cu.m	805.72	805.72	805.72	805.72
RW0056	Boulder	cu.m	1078.06	1078.06	1078.06	1078.06
RW0057	Gravel/Coarse sand	cu.m	582.29	582.29	582.29	582.29
Geo-Textile						
RW0060	Providing and laying Non-woven Geotextile filter on compacted surface that can sustain a load of not less than 10 kN/m with grab tensile strength of more than 0.4kN/m and a minimum tear resistance of 150N excluding earthwork and compaction.	sq.m	54.90	54.90	54.28	59.18
Gabion Walls						
Construction of gabion wall as per drawings with dry stone masonry (hammer dressed facing) including excavation of foundation in all types of soils , sides and backfilling, delivery of machine woven gabion mesh (Hexagonal mesh of size 100mm x 120mm with a minimum of doubly twisted) with GI wire 2.70mm dia, including diaphragm, fixing of selvedged, binding/lacing wire of 2.40 mm dia complete.						
RW0065	Height up to 1.0m	m	3984.31	4390.04	4389.22	4681.76
RW0066	Height up to 2.0m	m	9693.96	10748.27	10746.64	11495.31
RW0067	Height up to 3.0m	m	17295.19	19160.23	19157.78	20484.62
RW0068	Height up to 4.0m	m	26832.96	29742.93	29739.67	31803.82
RW0069	Height up to 5.0m	m	38231.13	42339.54	42335.46	45254.50
RW0070	Height up to 6.0m	m	51641.26	57200.34	57195.44	61137.80
RW0071	Height up to 7.0m	m	67156.89	74418.86	74413.14	79547.25
RW0072	Height up to 8.0m	m	84300.65	93418.28	93411.75	99854.81
RW0073	Height up to 9.0m	m	103725.58	114960.48	114953.13	122878.39
Construction of gabion wall as per drawings with dry stone masonry (hammer dressed facing) including excavation of foundation in all types of soils , sides and backfilling, delivery of machine woven gabion mesh (Hexagonal mesh of size 100mm x 120mm with a minimum of doubly twisted) with GI wire 3mm dia, including diaphragm, fixing of selvedged, binding/lacing wire of 2.40mm dia complete.						
RW0245	Height up to 1.0m	m	4448.78	5034.83	5034.01	5419.44
RW0246	Height up to 2.0m	m	10900.91	12423.80	12422.17	13412.24
RW0247	Height up to 3.0m	m	19430.25	22124.19	22121.74	23875.59
RW0248	Height up to 4.0m	m	30164.24	34367.54	34364.28	37094.69
RW0249	Height up to 5.0m	m	42934.36	48868.74	48864.65	52724.34
RW0250	Height up to 6.0m	m	58005.19	66034.97	66030.07	71245.22
RW0251	Height up to 7.0m	m	75470.25	85959.77	85954.05	92750.83
RW0252	Height up to 8.0m	m	94738.35	107908.27	107901.73	116432.33
RW0253	Height up to 9.0m	m	116587.08	132815.27	132807.92	143305.49
Construction of gabion wall as per drawing with dry stone masonry (hammer dressed facing) including excavation of foundation in all types of soils , sides and backfilling, delivery of welded wire gabion mesh conforming IS 16013(50mm x 100mm) with GI wire 4mm dia, including diaphragm, fixing of Spiral wire 3mm(minimum) dia, stiffner wire 4mm (minimum) dia, lacing wire 2.40 mm (minimum) dia complete.						
RW0270	Height up to 1.0m	m	5437.48	6407.38	6406.56	6989.73
RW0271	Height up to 2.0m	m	13300.34	15754.77	15753.14	17223.09
RW0272	Height up to 3.0m	m	23805.51	28198.08	28195.63	30824.54
RW0273	Height up to 4.0m	m	37024.77	43891.57	43888.30	47990.82
RW0274	Height up to 5.0m	m	52507.81	62158.93	62154.85	67929.23
RW0275	Height up to 6.0m	m	71052.60	84147.85	84142.95	91967.58
RW0276	Height up to 7.0m	m	92327.82	109362.03	109356.31	119524.60
RW0277	Height up to 8.0m	m	116057.01	137503.59	137497.05	150291.38
RW0278	Height up to 9.0m	m	142774.39	169169.42	169162.07	184897.09

Code	Description	Units	PL	GP	SJ	TH
Providing and Construction Light timber crib walls						
RW0075	With timber section of 100 to 150 mm diameter including excavation in all types of soil and back filling	sq.m	1712.14	1755.51	1705.89	1759.22
RW0076	With timber section of 250 to 300 mm diameter including excavation in all types of soil and back filling	sq.m	3075.37	3154.23	3064.80	3162.59
Barriers						
RW0081	Providing and constructing boulder barriers with maximum inclination of 20 deg. to the road alignment within 50m lead	cu.m	813.90	813.90	813.90	883.89
Drains						
Construction of French drain, including jungle clearance, earthwork in excavation, levelling of excavated earth to the sides, filling drain with 50-100 mm stones, complete as per design						
RW0095	Drain Size 0.6m X 1.0m	m	871.35	871.35	871.35	871.35
RW0096	Drain Size 1.0m X 1.5m	m	1691.35	1691.35	1691.35	1691.35
RW0100	Construction of foundation drains of minimum size 200 mm wide & 250 mm deep with stone fill of average size 50 - 100 mm as per drawing or as directed by the engineer including excavation and delivery of materials	m	303.99	303.99	303.99	303.99
V - shaped drain (stone pitched)						
Construction of V-shaped stone pitched drain including excavation, levelling and disposal of surplus earth within 50m						
RW0105	depth 300mm, width 600 mm	m	302.91	302.91	302.91	314.72
RW0106	depth 300 mm and width 450 mm	m	208.50	208.50	208.50	215.50
V - shaped drain (earthen drain)						
Construction of V-shaped earthen drain including excavation, levelling and disposal of surplus excavated earth within 50m						
RW0107	depth 500 mm and width 600 mm	m	25.48	25.48	25.48	25.48
V - shaped drain (Lined)						
RW0108	Construction of Lined V Shaped drain 600 X 300 with 50mm thick PCC 1:2:4, 150 mm thick stone soling, RRM in CM 1:5 on sides, finished with 20mm thick 1:4 cement plaster including excavation, levelling and disposal of surplus earth within 50m	m	668.63	668.61	690.32	748.36
Hammer dressed stone edging						
RW0120	Providing and laying Hammer dressed stone edging 150 x 250 mm with stones including excavation, refilling and disposal of surplus earth within 30 m lead	m	96.38	96.38	96.38	99.60
Subgrade (complete)						
Preparation of sub grade with proper camber by excavating earth to depth equal to pavement thickness, consolidation with roller, disposal of surplus earth up to 50m						
RW0121	All types of soil	cu.m	85.27	85.27	85.27	85.27
RW0122	Blasted Rock	cu.m	222.23	222.23	222.23	222.23

Code	Description	Units	PL	GP	SJ	TH
Subgrade (only consolidation)						
RW0123	Consolidation of sub-grade with roller, and making good the undulation with earth and re-rolling the sub grade	sq.m	9.41	9.41	9.41	9.41
Extra for compaction of earth in embankments						
RW0124	Extra for compaction of earth in embankments under suitable moisture conditions to give at least 95% of the proctor density	cu.m	21.85	21.85	21.85	21.85
Granular Sub-base						
RW0130	Providing and laying Granular sub-base course (GSB) to required degree of compaction with proper formation of cross fall using motor grader for laying and compacted to required density as per material gradation and aggregate quality specified	cu.m	1779.31	1792.87	1924.80	2087.71
Wet Mix Macadam						
RW0131	Providing and laying wet mix macadam graded aggregate base course to required degree of compaction with proper formation of cross fall by using well graded crushed aggregates premixed with OMC using suitable mixer, motor grader as per material gradation and a aggregates quality specified	cu.m	2556.31	2712.08	2876.17	2793.98
Prime coat & Tack coat						
RW0280	Providing and applying prime coat using bitumen emulsion conforming to IS: 8887, using asphalt/bitumen sprayer including preparing the surface and cleaning with road broom. On W.M.M @ 0.75kg/sqm	sq.m	51.14	54.60	54.16	53.94
RW0281	Providing and applying prime coat using bitumen emulsion conforming to IS: 8887, using asphalt/bitumen sprayer including preparing the surface and cleaning with road broom. On W.B.M @0.4kg/sqm	sq.m	30.30	32.14	31.91	31.79
RW0282	Providing and applying tack coat using bitumen emulsion conforming to IS: 8887, using asphalt/bitumen sprayer including preparing the surface and cleaning with road broom. On DBM/Prime coat @0.3 kg/sq.m	sq.m	24.34	25.72	25.55	25.46
RW0283	Providing and applying tack coat using bitumen emulsion conforming to IS: 8887, using asphalt/bitumen sprayer including preparing the surface and cleaning with road broom. On old bituminous surface (resurfacing work) @ 0.75kg/sq.m	sq.m	51.14	54.60	54.16	53.94
RW0284	Providing and applying tack coat using bitumen emulsion conforming to IS: 8887, including preparing the surface and cleaning with broom. On old bituminous surface (resurfacing work) @ 1.00kg/sq.m (Manually)	sq.m	70.28	74.89	74.31	74.02
Dense Bituminous Macadam (Using VG 10)						
Providing and Laying Dense Bituminous Macadam (DBM) to required degree of compaction based on job mixture design (job mix formula) approved by the supervising engineer, by mechanized method as per material gradation and materials quality specified using VG 10 complete						
RW0132	50 mm	sq.m	574.30	604.09	606.82	613.88
RW0133	60 mm	sq.m	672.67	708.41	711.68	720.16
RW0134	70 mm	sq.m	769.95	811.64	815.47	825.36
RW0135	75 mm	sq.m	818.99	863.67	867.76	878.36
RW0136	80 mm	sq.m	867.68	915.33	919.70	931.01

Code	Description	Units	PL	GP	SJ	TH
Dense Bituminous Macadam (Using VG 20 or VG 30)						
	Providing and Laying Dense Bituminous Macadam (DBM) to required degree of compaction based on job mixture design (job mix formula) approved by the supervising engineer, by mechanized method as per material gradation and materials quality specified using VG20/VG30 complete					
RW0400	50 mm	sq.m	582.00	611.79	619.77	621.58
RW0401	60 mm	sq.m	681.91	717.65	727.23	729.40
RW0402	70 mm	sq.m	780.73	822.42	833.60	836.14
RW0403	75 mm	sq.m	830.54	875.22	887.19	889.91
RW0404	80 mm	sq.m	880.00	927.65	940.42	943.32
Asphalt/Bituminous Concrete (Using VG 10)						
	Providing and Laying Asphalt/Bituminous Concrete to required degree of compaction based on the job mixture design (job mix formula) approved by the supervising engineer, by mechanized method as per material gradation and materials quality specified using VG 10 complete.					
RW0139	25 mm	sq.m	322.95	339.68	340.89	346.25
RW0140	30 mm	sq.m	379.47	399.86	401.13	407.64
RW0141	35 mm	sq.m	436.03	460.07	461.41	469.06
RW0142	40 mm	sq.m	492.01	519.71	521.11	529.91
RW0143	50 mm	sq.m	604.58	639.58	641.12	652.21
Asphalt/Bituminous Concrete (Using VG 20 OR VG 30)						
	Providing and Laying Asphalt/Bituminous Concrete to required degree of compaction based on the job mixture design (job mix formula) approved by the supervising engineer, by mechanized method as per material gradation and materials quality specified using VG20/VG30 complete					
RW0410	25 mm	sq.m	327.05	343.78	347.77	350.35
RW0411	30 mm	sq.m	384.49	404.88	409.57	412.66
RW0412	35 mm	sq.m	441.97	466.01	471.40	475.00
RW0413	40 mm	sq.m	498.87	526.57	532.65	536.77
RW0414	50 mm	sq.m	613.28	648.29	655.76	660.91
Plastic shredded Ashpalt/Bituminous concrete						
	Providing and Laying Asphalt/Bituminous Concrete with (6 to 8%) shredded plastic to required degree of compaction based on the job mixture design approved by the supervising engineer, as per material gradation and aggregate quality specified					
RW0290	25 mm	sq.m	340.05	357.76	358.80	364.00
RW0291	30 mm	sq.m	400.06	421.63	422.70	429.01
RW0292	35 mm	sq.m	461.02	486.49	487.59	495.01
RW0293	40 mm	sq.m	520.52	549.86	550.99	559.51
RW0294	50 mm	sq.m	640.98	678.08	679.27	690.00
Scarifying						
RW0145	Scarifying metalled (water bound) road surface disposal of rubbish up to 50m and consolidation of the aggregate received from scarifying	sq.m	43.34	43.34	43.34	43.34
Repair of Roads (WBM)						
	Cutting and repairing of roads, including supply of required quantities of aggregates complete					
RW0146	Water bound macadam road	cu.m	5115.28	5115.28	5115.28	5115.28

Code	Description	Units	PL	GP	SJ	TH
Wearing Course						
Laying wearing course including screening, sorting, spreading to template and consolidation (measurement of wearing course to be taken equal to the quantity of aggregate used, excluding blinding materials)- With stone aggregates and blinding materials						
RW0147	With stone aggregates and blinding materials	cu.m	948.03	948.03	948.03	948.03
Repair of Roads (U s i n g B i t u m e n E m u l s i o n)						
Cutting & repairing bituminous road including supply of required quantity of aggregate & bitumen emulsion						
RW0150	Manually	cu.m	34994.98	36126.06	36354.70	36345.95
Painting two coats with bitumen emulsion (coat 1 - 12 kg emulsion and 0.1 cu.m, 12 mm aggregates per 10 sq.m, coat 2 - 1.6 kg emulsion 0.06 cu.m, 10 mm aggregates per 10 sq.m) complete						
RW0152	Mechanized	sq.m	222.86	240.63	243.07	238.18
Repainting one coat with bitumen emulsion @ 2.3 kg of emulsion and 0.002 cu.m of 10 mm nominal size stone chips per sq.m of surface area complete						
RW0153	Mechanized	sq.m	170.87	182.08	181.24	180.06
Premix consolidated carpet surfacing including a tack coat @ 0.75 kg bitumen emulsion per sq.m of road surface						
RW0154	50mm thick with 6.0 cu.m of aggregate 10mm nominal size per 100 sq.m using 96 kg of emulsion of approved quality per cu.m of stone aggregate (Mechanized)	sq.m	450.72	494.37	504.68	489.20
RW0155	25 mm thick with 2.7 cu.m of stone aggregate, 10 mm nominal size per 100 sq.m using 149 kg of bitumen emulsion per cu.m of stone aggregate (Mechanized)	sq.m	342.06	373.16	378.03	368.99
RW0156	20 mm thick with 2.10 cu.m of stone aggregate, 10 mm nominal size per 100 sq.m using 147 kg of bitumen emulsion per cu.m of stone aggregate (Mechanized)	sq.m	281.09	306.03	309.92	302.68
Providing seal coat with bitumen emulsion						
RW0157	Using 1.3 kg of emulsion and 0.80 cu.m stone aggregate of 10mm per 10 sq.m of road surface complete	sq.m	111.10	119.52	120.80	118.39
Providing seal coat of premixed sand with bitumen emulsion						
RW0158	Using 5.3 kg of emulsion and 0.045 cu.m coarse sand per 10 sq.m of road surface complete	sq.m	61.17	63.78	65.12	67.00
Painting two coats of bitumen VG - 10 (coat 1 - 2 kg of bitumen, 0.015 cu.m, 12.5mm aggregate per sq.m; coat 2 - 1 kg of bitumen, 0.009 cu.m, 10 mm aggregates, per sq.m complete)						
RW0165	Mechanized	sq.m	235.16	252.96	253.19	249.46
RW0166	Manually	sq.m	291.44	309.24	309.47	305.74

Code	Description	Units	PL	GP	SJ	TH
	Premix carpet surfacing including a tack coat @ 0.75 kg bitumen per sq.m of road surface					
RW0167	50mm thick with 6 cu.m of aggregate 10mm nominal size per 100 sq.m using 51.5 kg of bitumen VG - 10 grade per cu.m of stone aggregate (Mechanized)	sq.m	359.59	391.27	399.03	386.79
RW0168	25mm thick with 3 cu.m of stone aggregate per 100 sq.m and 51.5 kg of bitumen VG - 10 grade per cu.m of stone aggregate (Mechanised)	sq.m	243.03	261.50	263.90	258.38
RW0169	20mm thick with 2.40 cu.m of stone aggregate 10mm nominal size per 100 sq.m and 51.5 kg of bitumen VG - 10 grade per cu.m of stone aggregate (Mechanized)	sq.m	199.51	206.51	202.58	204.17
	Premix Carpeting with 64 kg of bitumen VG - 10 per cu.m of aggregates including a tack coat with bitumen of same quality @ 0.75 kg per sq.m of road surface					
RW0170	20 mm thick with 2.4 cu.m, 10mm aggregate per 100 sq.m (Manually)	sq.m	230.89	246.24	247.84	243.55
RW0171	25 mm thick with 3.0 cu.m, 10mm aggregate per 100 sq.m (Manually)	sq.m	266.91	285.37	287.78	282.26
	Repainting, one coat of bitumen VG - 10 @ 1 kg of bitumen; 0.009 cu.m, 10mm aggregate per sq.m of road surface					
RW0175	Manually	sq.m	102.10	108.34	108.67	107.17
RW0176	Mechanised	sq.m	79.47	85.70	86.04	84.54
	Providing seal coat with bitumen VG - 10 grade of approved quality using 1.12 cu.m of stone aggregate 10mm size per 100 sq.m and 56 kg of bitumen VG - 10 grade per cu.m of stone aggregate with a tack coat of 0.75 kg of bitumen per sq.m of road surface complete					
RW0177	Mechanized	sq.m	120.64	128.87	129.02	127.26
	Providing seal coat with bitumen VG - 10 using 1.5 kg of bitumen per sq.m with 1.05 cu.m, 10mm aggregate per 100 sq.m of road surface					
RW0178	Manually	sq.m	135.12	143.57	143.30	141.82
	Providing seal coat of premixed sand with bitumen VG - 10 using 128 kg of bitumen per cu.m of sand and 0.75 cu.m of coarse sand per 100 sq.m of road surface					
RW0179	Manually	sq.m	93.15	96.79	97.65	101.81
	Providing & fixing RC name board including primer and white zinc paint					
RW0180	Rectangular with post	each	2555.00	2593.80	2610.67	2668.34
RW0181	Flat without post for one direction only	each	3717.89	3778.71	3832.55	3928.00
RW0182	Flat without post for two directions only	each	3964.79	4032.38	4090.01	4195.81
	Crash Barrier					
RW0260	Poviding and erecting "W" metal beam crash barrier (3mm thick w-metal beam of 4m length, width 310mm, wave height- 81-85mm, 1.8m long Channel post 150x75x5mm @ 2m c/c & 330mm long spacer 150x75x5mm) including excavation and PCC 1:1.5:3 for channel post, complete as per drawing.	m	3496.74	3505.67	3552.06	3875.38

Code	Description	Units	PL	GP	SJ	TH
Road Signs						
RW0183	Engraving letters on hard stone.....per letter per centimetre height	each	7.02	7.02	7.02	7.02
	Providing & fixing precast boundary stone of RC 1:2:4 (20mm aggregate) including finishing with mortar 1:3 (cost of excavation, refilling etc to be paid separately)					
RW0185	150mm dia x 900mm high	each	531.21	541.12	553.77	567.13
	Providing & fixing precast kilometre stone of RC 1:2:4 (20mm aggregate) including finishing with mortar 1:3 complete as per standard design (cost of excavation, concreting, painting etc. shall be paid separately)					
RW0186	35cm x 111cm x 25cm	each	1658.00	1683.39	1729.09	1801.08
RW0187	50cm x 152.5cm x 25cm	each	2886.24	2929.60	3011.48	3151.08
RW0188	35cm x 93.5cm x 18cm	each	1079.18	1096.47	1126.35	1169.30
Letterings						
RW0189	Lettering with paint of approved brand and manufacture.....per letter per centimetre ht	each	2.16	2.22	2.18	2.20
RW0190	Relettering with paint of approved brand and manufacture.....per letter per centimetre ht	each	1.64	1.69	1.66	1.67
Traffic Signs						
	Providing and fixing Mandatory/Regulatory sign boards of Circular shape made up of 2 mm thick aluminium sheet, fully covered with retro reflective sheeting in blue and silver white or other colour combination including subject matter, message, symbols and borders etc.with supporting post of approved size and length complete as per drawing, specification and direction of Engineer-in-charge excluding escavation and concreting for base.					
RW0360	750mm diameter with 75mmx40mmX4.7mm post of length 3000mm	each	6,332.72	6,522.04	6,424.53	7,185.50
RW0361	600mm diameter with 75mmx40mmX4.7mm post of length 3000mm	each	6,279.80	6,436.23	6,437.41	7,041.58
RW0362	450mm diameter with 50mm dia post of length 3000mm	each	4,700.31	4,791.44	4,779.45	4,993.10
RW0363	300mm diameter with 50mm dia post of length 3000mm	each	4,249.46	4,322.40	4,365.00	4,491.91
	Providing and fixing Mandatory/Regulatory sign boards of Hexagonal shape made up of 2 mm thick aluminium sheet, fully covered with retro reflective sheeting in blue and silver white or other colour combination including subject matter, message, symbols and borders etc.with supporting post of approved size and length complete as per drawing, specification and direction of Engineer-in-charge excluding escavation and concreting for base.					
RW0364	900mmX900mm with 75mmx40mmX4.7mm post of length 3000mm	each	7,168.70	7,376.57	7,223.42	8,072.80
RW0365	750mmX750mm with 75mmx40mmX4.7mm post of length 3000mm	each	6,348.24	6,522.87	6,469.45	7,160.36
RW0366	600mmX600mm diameter with 75mmx40mmX4.7mm post of length 3000mm	each	5,630.92	5,776.49	5,810.22	6,362.67
	Providing and fixing Cautionary/ Warning sign boards of Equilateral Triangular shape made up of 2 mm thick aluminium sheet, fully covered with retro reflective sheeting in blue and silver white or other colour combination including subject matter, message, symbols and borders etc.with supporting post of approved size and length complete as per drawing, specification and direction of Engineer-in-charge excluding escavation and concreting for base.					
RW0367	900mm with 75mmx40mmX4.7mm post of length 3000mm	each	6,245.11	6,415.53	6,374.72	7,045.61
RW0368	750mm with 75mmx40mmX4.7mm post of length 3000mm	each	5,527.78	5,669.16	5,715.49	6,247.92
RW0369	600mm with 75mmx40mmX4.7mm post of length 3000mm	each	5,269.95	5,400.83	5,478.65	5,961.04
RW0370	450mm with 50 dia mm post of length 3000mm	each	4,337.04	4,413.48	4,445.58	4,589.17

Code	Description	Units	PL	GP	SJ	TH
Road Stud						
RW0371	Providing and fixing Glow studs of size 100x20 mm made of heavy duty body and shall be moulded ASA (Acrylic styrene Acryloretrite) or HIP (High impact polystyrene) or ABS having electronically welded micro- prismatic lens with abrasion resistant coating with reflective panels on both sides with at least 12 cm of reflective area up each side. The studs shall be approved and fixed to the Road surface as per direction of Engineer incharge.	each	235.02	235.02	235.02	235.02
Delineators/Guide Posts						
	Providing and fixing 48mm dia. mild steel round pipe delineators of approved length as per drawing and specifications with 3 nos of ABS round body high reflective reflectors with duly powder coated anti-rust and anti theft steel complete excluding escavation & concreting for base.					
RW0372	750mm length	each	406.88	406.88	406.88	417.38
RW0373	1200mm length	each	795.34	795.34	795.34	837.34
RW0374	Providing and fixing 100mm rectangular mild steel post delineators of length 1100mm with 3 nos of ABS high reflective reflectors complete excluding escavation & concreting for base.	each	844.34	844.34	844.34	851.34
F e n c i n g						
	Supplying posts & struts					
RW0195	Local ballies, 250 mm min. girth	m	378.22	389.05	375.89	388.38
RW0196	Local ballies 250 mm min girth , 1.8m long	each	748.60	768.09	744.41	766.88
RW0197	Precast R.C posts, 1.8 m long,min. cross section 100x100	each	1100.76	1122.72	1142.71	1174.48
RW0198	Precast R.C struts 2.0 m long,min cross section 100x100	each	849.43	866.83	882.49	900.27
RW0199	RCC posts & struts, 1.8m long ,min. cross section 100x100	m	1468.72	1489.00	1523.54	1594.98
RW0200	RCC posts & struts, 2m long ,min. cross section 100x100	m	931.93	949.10	966.83	990.28
	Providing & fixing G.I barbed Wire Netting including fixing of post or struts, G.I staples, coal tarring in case of ballies complete (posts/struts, earthwork, concrete paid separately)					
RW0202	2.5mm , (12 SWG), 4 barbs form by twisting two point wires, each two turns, pitch of barbs 75mm	m	18.21	20.97	20.32	21.94
	Providing & fixing G.I double knotted mesh including fixing of post or struts, G.I staples, coal tarring in case of ballies complete (excluding the cost of posts/struts, earthwork, concrete)					
RW0205	4mm (8 SWG) x 100mm	sq.m	384.21	387.56	371.96	538.20
RW0206	2.5mm (12 SWG) x 100mm	sq.m	344.55	344.55	331.14	491.54
RW0207	4mm (8 SWG) x 150mm	sq.m	304.89	334.86	304.89	433.21
RW0208	2.5mm (12 SWG) x 150mm	sq.m	258.52	311.53	299.06	415.71
	Providing & fixing G.I chain-link mesh including fixing of post or struts, G.I staples (excluding the cost of posts/struts, earthwork, concrete etc.)					
RW0209	4mm (8 SWG) x 50mm	sq.m	507.28	463.99	439.04	577.86
RW0210	2.5mm (12 SWG) x 50mm	sq.m	328.22	417.67	404.04	441.76
RW0211	4mm (8 SWG) x 75mm	sq.m	304.30	444.87	369.05	458.48
RW0212	2.5mm (12 SWG) x 75mm	sq.m	295.16	330.16	345.72	439.04
RW0213	4mm (8 SWG) x 100mm	sq.m	299.06	299.06	322.39	439.04
RW0214	2.5mm (12 SWG) x 100mm	sq.m	344.55	344.55	331.14	491.54

Code	Description	Units	PL	GP	SJ	TH
Providing and Fixing Barbed Wire (Min. 10kg/100m) fencing						
RW0215	1.2 m high fencing with 1.8 m R.C.C posts of standard design placed every 3 m apart, embedded in cement concrete blocks, every 15th post, last but one end post and corner post shall be strutted on both sides and end post one side only, provided with nine horizontal lines and two diagonals of barbed wire between two posts fitted and fixed with GI staples on wooden plugs or GI binding wire tied to 6mm bars nibs fixed while casting the post (cost of RCC posts, struts, earthwork and concrete to be paid for separately)	m	185.58	216.34	209.10	227.20
RW0216	1.2 m high fencing with 1.8 m balli posts 250 mm girth (min) placed every 2.5 m apart, embedded in cement concrete blocks, every 15th post, last but one end post and corner post shall be strutted on both sides and end post one side only, provided with six horizontal lines and two diagonals of barbed wire between two posts fitted and fixed with GI staples driven into the posts complete (cost of RCC posts, struts, earthwork and concrete to be paid for separately)	m	171.68	194.30	188.60	202.31
RW0217	2.4 m high fencing with 3.3 m balli posts 250 mm girth (min) placed every 2.5 m apart, embedded in cement concrete blocks, every 15th post, last but one end post and corner post shall be strutted on both sides and end post one side only, provided with twelve horizontal lines and two diagonals of barbed wire between two post fitted and fixed with GI staples driven into the posts complete (cost of RCC posts, struts, earthwork and concrete to be paid for separately)	m	296.10	336.71	326.50	351.08
RW0218	1.3 m high concrete rail and pale fencing with 1.8 m R.C.C posts 2.2 m rails and 1.25 m pales placed every 2.5 m apart, embedded in cement concrete blocks (450 mm x 450 mm x 700 mm), of mix 1:5:10 (1 cement : 5 sand : 10 graded crushed rock 40 mm nominal size) (cost of earthwork in excavation, concrete work, posts, rails and pales to be paid for separately)	m	182.21	182.21	182.21	182.21
RW0219	1.2 m high fencing with 1.2 m angle posts (40mm x 40 mm x 6 mm) placed every 3 m apart, embedded in cement concrete blocks, every 15th post, last but one end post and corner post shall be strutted on both sides and end post one side only, provided with nine horizontal lines and two diagonals of barbed wire between two post fitted and fixed with GI staples, turn buckles complete (cost of , posts, struts, earthwork and concrete to be paid for separately)	m	182.11	212.68	205.49	223.47
RW0220	1.8 m high fencing with 1.8 m angle posts (50mm x 50 mm x 6 mm) placed every 3 m apart, embedded in cement concrete blocks, every 15th post, last but one end post and corner post shall be strutted on both sides and end post one side only, provided with nine horizontal lines and two diagonals of barbed wire between two post fitted and fixed with GI staples, turn buckles complete (cost of , posts, struts, earthwork and concrete to be paid for separately)	m	241.02	280.32	271.07	294.20

Code	Description	Units	PL	GP	SJ	TH
Bioengineering						
Seeds Collection, treatment and storage						
RW0230	Grass and pioneer plant seed collection, including separation, drying in the sun & storing	kg	520.50	519.92	520.50	523.42
Broadcasting						
RW0231	Broadcasting of grass/pioneer plants seeds on slopes; seeding rate 25 gm per m^2	sq.m	64.04	64.04	64.04	64.04
Direct Seeding						
RW0232	Direct seeding of shrubs or tree seeds at 30 cm spacing including digging holes up to 5cm depth and covering with soil, with two seeds per planting hole	sq.m	64.04	64.04	64.04	64.04
Live Stacking/Palisade						
RW0233	Collection and preparation of materials (woody cuttings 2-4 cm diameter and 50 cm length) and staking them ¾ of the cuttings in the soil	m	77.27	77.27	77.27	77.27
Brush layer/Hedge Brush Layer						
RW0234	Collection and preparation of materials (woody cuttings 2-4 cm diameter and 60 cm length) and staking them ¾ of the cuttings in the soil	m	89.87	89.87	89.87	89.87
Planting of seedlings/wildings						
RW0235	Planting of seedlings or wildlings (including the collection of wildlings from the wild) and planting them in a pit size 30 cm x 30 cm	no	182.64	182.64	182.64	194.30
Sodding/Turfing						
RW0236	Sodding of slopes with sods, eg lemon grass (30 cms centre to centre), titepati (1metre centre to centre) in contour lines. The sods should be placed even closer to each other if the slope is greater than 25 degree	sq.m	81.69	81.40	81.40	86.36
RW0237	Turfing of embankment with 30 x 30 cm, natural grass turfs and fixed to the ground with wooden pegs, if slope is greater than 25°	sq.m	110.34	110.34	110.34	112.67
Grass Slips Planting						
RW0238	Grass slips planting on slopes (random or in line) at 10 cm apart and 5 cm deep.	sq.m	30.50	30.50	30.50	30.50
Fog Sealing						
RW0239	Providing and laying fog sealing as per technical specification and drawing.	sq.m	37.99	40.86	41.55	42.65
Rock Anchorage						
RW0240	Providing and laying of Rock Anchorage including TMT rebar (25mm dia) and cement slurry to fill the gap. The hole diameter should at least be 32mm as provided in the drawing.	m	390.03	400.64	396.85	423.16

Code	Description	Units	PL	GP	SJ	TH
Road Marking						
RW0241	Providing and apply permanent road marking on the road surface as per technicial specification,(manually)	sq.m	93.71	113.05	99.93	106.74
RW0242	Providing and apply Road marking with hot applied thermoplastic compound with reflectorising glass beads on Bituminuous surface as per IRC:35 and technical specifications. The finished surface to be level and free from streaks and holes	sq.m	910.13	834.94	896.46	987.60
Paver Pavement with interlocking Paver Blocks, Blocks & Tiles						
	Providing and laying factory made Cement Concrete paver blocks in footpath, parks, lawns, drive ways or light traffic parking etc, of required strength, thickness & size/ shape, laid in required colour & pattern over 50mm thick compacted bed of sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding, filling the joints with sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand. complete all as per direction of Engineer-in-Charge.					
RW0300	Interlocking Paver Block (Zig Zag) 80mm Thk. Colour	Sq.m	790.65	833.93	857.75	887.16
RW0301	Interlocking Paver Block (Zig Zag) 80mm Thk. Ash Grey	Sq.m	765.57	820.51	844.33	873.75
RW0302	Interlocking Paver Block (Zig Zag, Tri-Hex, Brook, Cosmic)	Sq.m	752.74	832.18	856.00	885.41
RW0303	Interlocking Paver Block (Zig Zag, Tri-Hex, Brook, Cosmic)	Sq.m	722.99	746.44	770.26	799.67
RW0304	Interlocking Paver Block (Tri-Hex, Brook, Cosmic) 40mm Thk.	Sq.m	630.25	782.01	805.84	835.25
RW0305	Interlocking Paver Block (Tri-Hex, Brook, Cosmic) 40mm Thk.	Sq.m	650.66	657.19	681.02	710.43
RW0306	Rectangular Paver Block 60mm Thk Colour	Sq.m	691.40	732.69	756.51	785.93
RW0307	Rectangular Paver Block 60mm Thk Ash Grey	Sq.m	664.44	706.78	730.61	760.02
RW0308	Rectangular Paver Block 40mm Thk Colour	Sq.m	632.82	667.93	691.75	721.16
RW0309	Rectangular Paver Block 40mm Thk Ash Grey	Sq.m	597.69	654.97	678.79	708.20
RW0310	Coral Stone Finished 60mm Thk. Colour	Sq.m	714.24	765.68	789.50	818.92
RW0311	Coral Stone Finished 60mm Thk. Ash Grey	Sq.m	686.24	751.68	775.51	804.92
RW0312	Coral Stone Finished 40mm Thk. Colour	Sq.m	653.58	709.69	733.51	762.92
RW0313	Coral Stone Finished 40mm Thk. Ash Grey	Sq.m	617.42	681.69	705.51	734.93
	Providing and laying Chequered precast cement concrete tiles 25 mm thick in footpath & courtyard, jointed with neat cement slurry mixed with pigment to match the shade of tiles, including rubbing and cleaning etc. complete, on 20 mm thick bed of cement mortar 1:4 (1 cement: 4 coarse sand).					
RW0320	Chequered tiles, Paver tiles. 25mm Thk. Colour	Sq.m	703.59	742.62	750.21	774.41
RW0321	Chequered tiles, Paver tiles. 25mm Thk. Colour	Sq.m	676.50	714.12	721.71	745.91
	Providing and laying factory made kerb stone (Edging)in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (Length & Depth/height of finished kerb edging shall be measured for payment)					
RW0330	100mm thick	Sq.m	1001.50	1130.89	1131.21	1132.49

Code	Description	Units	PL	GP	SJ	TH
Chapter 22: Occupational Health and Safety (OHS)						
OHS at construction site						
OHS001	Incorporation of Occupational Health and Safety measures at construction sites, including Insurance, Personal Protective Equipment (PPE), First Aid kits, Boundary Fencing, Scaffolding, Safety nets, Traffic management, signage etc as listed in the specifications. The standards and specifications for the Insurance, OHS materials and (or) equipment shall comply with the Labour and Employment Act - 2007, Regulation on Occupational Health, Safety and Welfare - 2012, and other relevant national documents. All OHS items will remain the property of the bidder upon completion of the project.	L/S	Calculated as per the"Guideline for Occupational Health and Safety Cost"			
Temporary Living Accommodation						
OHS002	Providing temporary living accommodation which includes bed room, kitchen, and toilet cum bathroom including proper water supply and electricity as per the drawing and temporary living accommodation standards. The accommodation facilities must be dismantled and cleaned upon the completion of project. All reusable materials of the accommodation facilities will remain as the property of the bidder upon completion of the project.	L/S	Calculated as per the"Guideline for Estimating Cost of Temporary Living Accommodation"			

Code	Description	Units	PL	GP	SJ	TH
Chapter 23: Conservation Works in Heritage Sites						
Dismantling Works						
Demolishing rammed earth wall including disposal of unusable materials within 200m lead						
DD2001	Ground floor level	cum	2310.35	2310.35	2310.35	2310.35
DD2002	First floor level and above	cum	2541.39	2541.39	2541.39	2541.39
DD2003	Cutting, trimming, shaping, leveling etc. of rammed earth wall to insert timber components like Chams (Joists), doors/windows, Dhung, etc. including disposal of unusable materials within 200m lead (all floor levels)	cum	3138.59	3138.59	3138.59	3138.59
Dismantling stone masonry walls without any features such as Depri (mural paintings) including salvaging of usable materials and disposal of unusable materials within 200m lead						
DD2004	Ground floor level	cum	2248.13	2248.13	2248.13	2248.13
DD2005	First floor level and above	cum	2360.38	2360.38	2360.38	2360.38
Dismantling stone masonry walls with special features such as Depri (mural paintings) painted directly on mud-plaster along with detaching of Depri (mural paintings) including salvaging of usable materials and disposal of unusable materials within 200m lead						
DD2006	Ground floor level	cum	53891.23	54021.78	54175.96	53839.31
DD2007	First floor level and above	cum	56812.36	56947.74	57106.87	56816.72
Removal of doors, windows, and timber frame components from the existing stone masonry wall, while preserving the Salen (lintel), salvaging usable materials, and disposing of unusable materials within 200m lead						
DD2008	Ground floor level (< 3.0sq.m surface area)	each	691.18	691.18	691.18	691.18
DD2009	Ground floor level (3.0sq.m to 6.0sq.m surface area)	each	864.97	864.97	864.97	864.97
DD2010	Ground floor level (> 6.0sq.m surface area)	each	1036.77	1036.77	1036.77	1036.77
DD2011	First floor level and above (< 3.0sq.m surface area)	each	1064.48	1064.48	1064.48	1064.48
DD2012	First floor level and above (3.0sq.m to 6.0sq.m surface area)	each	1331.68	1331.68	1331.68	1331.68
DD2013	First floor level and above (> 6.0sq.m surface area)	each	1597.16	1597.16	1597.16	1597.16
Removal of doors, windows, and timber frame components along with the Salen (lintel) from the existing stone masonry wall, salvaging usable materials, and disposing of unusable materials within 200m lead						
DD2014	Ground floor level (< 3.0sq.m surface area)	each	877.83	877.83	877.83	877.83
DD2015	Ground floor level (3.0sq.m to 6.0sq.m surface area)	each	1097.91	1097.91	1097.91	1097.91
DD2016	Ground floor level (> 6.0sq.m surface area)	each	1317.49	1317.49	1317.49	1317.49
DD2017	First floor level and above (< 3.0sq.m surface area)	each	1313.83	1313.83	1313.83	1313.83
DD2018	First floor level and above (3.0sq.m to 6.0sq.m surface area)	each	1642.86	1642.86	1642.86	1642.86
DD2019	First floor level and above (> 6.0sq.m surface area)	each	1971.29	1971.29	1971.29	1971.29
Removal of Chams (joists)/Dhungs and its components from the existing stone masonry wall, salvaging usable materials and disposing of unusable materials within 200m lead						
DD2020	Ground floor level	cum	701.39	701.39	701.39	701.39
DD2021	First floor level and above	cum	808.02	808.02	808.02	808.02
DD2022	Dismantling Thinzhi enta (Timber flooring)/Nampa enta (Ceiling plank) including stacking useful materials and disposal of rubbish within 200m lead (thickness > 50mm)	sq.m	81.78	81.78	81.78	81.78
Removal of Satha (mud insulation) including disposal of rubbish within 200m lead						
DD2023	Ground floor level	cum	883.66	883.66	883.66	883.66
DD2024	First floor level and above	cum	1126.30	1126.30	1126.30	1126.30

Code	Description	Units	PL	GP	SJ	TH
Scaffolding and Propping Works						
Providing, preparing and installation of timber scaffoldings						
SF2001	Ground floor level	sq.m	1873.15	1965.63	2051.59	1929.00
SF2002	First floor level and above	sq.m	2158.23	2255.37	2345.67	2216.90
Providing, preparing and installation of bamboo scaffoldings						
SF2003	Upto second floor level (Dia > 50mm)	sq.m	814.68	832.94	849.90	998.57
SF2004	Above second floor level (Dia > 50mm)	sq.m	922.54	940.79	957.76	1106.43
Providing, hoisting/installation of double (two rows of vertical steel tubes or pipes) steel scaffoldings including all necessary steel fittings (clamps, brackets, nuts and bolts, etc.), working platform complete (>48mm dia, >2.5mm thickness)						
SF2005	Upto first floor level	sq.m	1145.95	1149.86	1155.54	1150.09
SF2006	First floor level and above	sq.m	1355.56	1359.47	1365.15	1359.71
Providing, hoisting/installation of single (single row of vertical steel tubes or pipes) steel scaffoldings including all necessary steel fittings (clamps, brackets, nuts and bolts, etc.), working platform complete (>48mm dia, >2.5mm thickness)						
SF2007	Upto first floor level	sq.m	573.33	575.29	578.13	575.41
SF2008	First floor level and above	sq.m	677.11	679.07	681.91	679.19
Providing, preparing and hoisting of timber props with bracing as per drawing and specification						
SF2009	Upto first floor level	m	18513.09	19679.23	20763.12	19217.35
SF2010	First floor level and above	m	18845.55	20011.69	21095.59	19549.81
Providing, preparing and hoisting of steel props with bracing/struts, etc. as per drawing and specification						
SF2011	Upto first floor level	m	311.71	311.59	313.27	313.21
SF2012	First floor level and above	m	365.93	365.80	367.48	367.42
Shamig-Dakcha(Ekra Wall)						
SD2001	Repair and maintenance of Shamig-Dakcha(ekra wall) by removing and replacing damaged bamboo splits including grooving frames and applying 20mm Bji (Mud plaster) on both sides excluding the cost of frames	sq.m	641.21	641.70	646.46	725.81
Stone/Mud Masonry						
Providing and laying of Course Rubble Masonry (CRM) in mud mortar						
SM2001	Below plinth level wall thickness < 600mm	cum	5922.43	5922.43	5922.43	6009.92
SM2002	Below plinth level wall thickness > 600mm	cum	8302.19	8302.19	8302.19	8389.68
SM2003	Above plinth and upto 1st floor level (wall thickness < 600mm)	cum	6062.41	6062.41	6062.41	6149.91
SM2004	Above plinth and upto 1st floor level (wall thickness > 600mm)	cum	9795.37	9795.37	9795.37	9882.87
SM2005	First floor and above (wall thickness < 600mm)	cum	6809.01	6809.01	6809.01	6896.50
SM2006	First floor and above (wall thickness > 600mm)	cum	11288.56	11288.56	11288.56	11376.05
Providing and Consolidation of Coursed Rubble Masonry (CRM) walls in mud mortar						
SM2007	Upto first floor level	cum	7532.27	7532.27	7532.27	7619.76
SM2008	Above first floor level	cum	9093.11	9093.11	9093.11	9180.60

Code	Description	Units	PL	GP	SJ	TH
	Providing and Consolidation of Random Rubble Masonry (RRM) walls in mud mortar					
SM2009	Upto first floor level	cum	6783.34	6783.34	6783.34	6870.83
SM2010	Above first floor level	cum	8119.51	8119.51	8119.51	8207.00
SM2011	Repair and stitching of existing stone masonry walls in mud mortar using local materials and traditional methods	cum	7158.97	7158.97	7158.97	7246.46
	Providing and constructing of rammed earth wall in superstructure including cost of Padom (formwork) and Zungshing, etc.					
SM2012	Upto first floor level	cum	2941.73	2974.04	3020.64	3002.94
SM2013	First floor level and above	cum	3328.38	3360.68	3407.28	3389.58
	Bji(Mud Plastering Work)					
PL2001	Providing and laying 3 layers (Bjidhen-Dacha-Zhungdah) of Bji (mud plaster) using traditional techniques with finished surface (thickness 25mm to 50 mm)	sq.m	691.84	692.14	695.07	698.69
PL2002	Providing, repairing and consolidation of damaged Bji(Mud plaster) on masonry wall including removal of damaged Bji and disposal of debris within 200m lead	sq.m	930.59	930.89	933.82	937.44
PL2003	Providing and repairing of damaged Bji(Mud plaster) on both sides of the Shamig-Dakcha(ekra wall) including removal of existing Bji and disposable of debris within 200m lead	sq.m	766.49	766.86	770.53	775.05
	Conservation of Timber Components					
	Providing, hoisting & fixing dressed wood work on Chams(joists), including applying wood preservative to unexposed surfaces embedded to the existing masonry wall					
WW2001	Class 'A', (conifer)	cu.m	25202.95	26369.61	27452.98	25894.96
WW2002	Class 'B', (conifer)	cu.m	25601.74	26767.88	27851.78	26293.76
WW2003	Class 'A', (broad leaf)	cu.m	25705.53	25249.26	25787.41	25201.05
WW2004	Class 'B', (broad leaf)	cu.m	25097.82	24641.42	25180.17	24593.35
	Repairing the damaged part of Chams(joists), including applying wood preservative to unexposed surfaces embedded to the existing masonry wall					
WW2005	Class 'A', (conifer)	cu.m	4162.59	4314.76	4456.07	4242.20
WW2006	Class 'B', (conifer)	cu.m	4181.01	4333.11	4474.49	4260.62
WW2007	Class 'A', (broad leaf)	cu.m	4177.38	4117.87	4188.06	4100.93
WW2008	Class 'B', (broad leaf)	cu.m	4098.11	4038.58	4108.86	4021.66
WW2009	Reinstallation of repaired Chams(joists) including hoisting to the existing masonry wall	cu.m	2972.60	2972.60	2972.60	2972.60
	Providing & fixing in position dressed wood works in frames of doors and windows in the existing masonry wall including applying wood preservatives					
WW2010	Class 'A', (conifer)	cu.m	31634.90	32852.28	33982.76	32357.53
WW2011	Class 'B', (conifer)	cu.m	32094.87	33311.71	34442.73	32817.50
WW2012	Class 'A', (broad leaf)	cu.m	32220.39	31744.28	32305.83	31694.52
WW2013	Class 'B', (broad leaf)	cu.m	31586.26	31110.02	31672.20	31060.39
WW2014	Refurbishment of doors and windows components including sanding, surfacing and patch-filling without disassembling	sq.m	2751.46	2727.65	2755.76	2667.45
	Repair of doors and windows components including sanding, surfacing, applying of wood preservative, etc. with disassembling complete					
WW2015	Class 'A', (conifer)	cu.m	27913.60	29130.98	30261.46	28636.23
WW2016	Class 'B', (conifer)	cu.m	27825.88	29042.72	30173.74	28548.51
WW2017	Class 'A', (broad leaf)	cu.m	27430.05	26953.94	27515.49	26904.18
WW2018	Class 'B', (broad leaf)	cu.m	26795.92	26319.68	26881.85	26270.05

Code	Description	Units	PL	GP	SJ	TH
	Reinstallation of timber doors and windows to the existing wall					
WW2019	Ground floor level (<3.0sq.m surface area)	each	729.09	729.09	729.09	729.09
WW2020	Ground floor level (3.0sq.m to 6.0sq.m surface area)	each	803.31	803.31	803.31	803.31
WW2021	Ground floor level (> 6.0sq.m surface area)	each	874.91	874.91	874.91	874.91
WW2022	First floor level and above (<3.0sqm surface area)	each	911.52	911.52	911.52	911.52
WW2023	First floor level and above (3.0sq.m to 6.0sq.m surface area)	each	1003.23	1003.23	1003.23	1003.23
WW2024	First floor level and above (> 6.0sq.m surface area)	each	1094.95	1094.95	1094.95	1094.95
	Providing & fixing in position dressed wood work for Kachen(column), Zhu(capital) and Phue including applying wood preservatives, decorative					
WW2025	Class 'A', (conifer)	cu.m	38741.17	40009.27	41186.85	39494.42
WW2026	Class 'B', (conifer)	cu.m	39039.69	40307.23	41485.37	39792.94
WW2027	Class 'A', (broad leaf)	cu.m	39154.92	38658.97	39243.92	38607.64
WW2028	Class 'B', (broad leaf)	cu.m	38494.36	37998.28	38583.88	37947.09
	Providing & fixing in position dressed wood work for Kachen(column), Zhu(capital) and Phue including applying wood preservatives, non decorative					
WW2029	Class 'A', (conifer)	cu.m	34805.69	36073.80	37251.38	35558.94
WW2030	Class 'B', (conifer)	cu.m	34945.56	36213.10	37391.25	35698.81
WW2031	Class 'A', (broad leaf)	cu.m	34894.35	34398.40	34983.35	34347.07
WW2032	Class 'B', (broad leaf)	cu.m	34233.80	33737.71	34323.31	33686.52
	Restoring the damaged part of the existing Kachen(column), Zhu(capital) and Phue, including sanding, surfacing and patch-filling in its original position					
WW2033	Non decorative	sq.m	4558.99	4609.72	4656.82	4589.61
WW2034	Decorative	sq.m	5481.26	5531.96	5579.09	5511.88
	Repair and replacement of the damaged part of Kachen(column) and its components including sanding, and surfacing, non decorative					
WW2035	Class 'A', (conifer)	cu.m	40598.78	41866.88	43044.47	41364.28
WW2036	Class 'B', (conifer)	cu.m	39034.79	40302.33	41480.47	39800.29
WW2037	Class 'A', (broad leaf)	cu.m	38738.50	38242.56	38827.50	38203.48
WW2038	Class 'B', (broad leaf)	cu.m	37581.47	37085.38	37670.98	37046.44
	Repair and replacement of the damaged part of Kachen(column) and its components including sanding, and surfacing, decorative					
WW2039	Class 'A', (conifer)	cu.m	42599.41	43867.52	45045.10	43364.91
WW2040	Class 'B', (conifer)	cu.m	40599.60	41867.14	43045.28	41365.10
WW2041	Class 'A', (broad leaf)	cu.m	41240.75	40744.81	41329.75	40705.73
WW2042	Class 'B', (broad leaf)	cu.m	39150.71	38654.62	39240.23	38615.69
WW2043	Restoration of damaged inner core portion of Kachen(column) including disassembling, refilling, surfacing & reinstallation	cu.m	42497.71	42001.76	42586.71	41962.69
WW2044	Realignment of Kachens(columns) components excluding the cost for propping	each	1064.48	1064.48	1064.48	1064.48
	Providing & fixing in position dressed wood work for Dhung and applying wood preservative to unexposed surfaces					
WW2045	Class 'A', (conifer)	cu.m	32557.35	33673.28	34709.56	33218.74
WW2046	Class 'B', (conifer)	cu.m	32817.22	33932.66	34969.43	33478.61
WW2047	Class 'A', (broad leaf)	cu.m	32913.58	32477.15	32991.90	32430.51
WW2048	Class 'B', (broad leaf)	cu.m	32332.30	31895.74	32411.07	31849.22

Code	Description	Units	PL	GP	SJ	TH
WW2049	Providing and repairing of Dhung, Norbu Horzhu, Bagam and Pem Choetse without removal from the original position (Patch work), including hoisting, applying wood preservative on unexposed surfaces	sq.m	6379.25	6554.68	6717.74	6472.95
	Providing, repairing & installation of Dhung with disassembly from the wall, including hoisting, applying wood preservative on unexposed surfaces					
WW2050	Class 'A', (conifer)	cu.m	34292.59	35408.53	36444.80	34953.99
WW2051	Class 'B', (conifer)	cu.m	34638.78	35754.22	36790.99	35300.17
WW2052	Class 'A', (broad leaf)	cu.m	34826.82	34390.39	34905.14	34343.75
WW2053	Class 'B', (broad leaf)	cu.m	34245.54			
	Providing & fixing in position dressed wood work for Pem Choetse including applying wood preservatives					
WW2054	Class 'A', (conifer)	m	1171.77	1200.18	1226.55	1176.67
WW2055	Class 'B', (conifer)	m	1185.32	1213.71	1240.10	1190.22
WW2056	Class 'A', (broad leaf)	m	1196.58	1185.47	1198.57	1172.34
WW2057	Class 'B', (broad leaf)	m	1181.78	1170.67	1183.79	1157.55
	Providing & fixing in position dressed wood work for Norbu Horzhu and Bagam including applying wood preservatives					
WW2058	Class 'A', (conifer)	m	2777.14	2853.23	2923.88	2798.58
WW2059	Class 'B', (conifer)	m	2810.89	2886.94	2957.63	2832.32
WW2060	Class 'A', (broad leaf)	m	2834.03	2804.28	2839.37	2777.44
WW2061	Class 'B', (broad leaf)	m	2794.40	2764.64	2799.77	2737.80
	Providing & fixing in position dressed wood work					
WW2062	Bogh single layer	m	2835.31	2986.40	3126.83	2926.55
WW2063	Bogh double layer	m	6037.27	6361.76	6663.36	6233.23
WW2064	Phana/Phuto boow including Phakhep complete	m	6136.94	6349.89	6547.82	6265.55
	Providing & fixing in position dressed wood work for Langna Drey Zhu complete including applying wood preservatives					
WW2065	Class 'A', (conifer)	cu.m	30730.87	31998.98	33176.56	31484.13
WW2066	Class 'B', (conifer)	cu.m	30675.95	31943.50	33121.64	31429.20
WW2067	Class 'A', (broad leaf)	cu.m	30418.49	29922.55	30507.49	29871.22
WW2068	Class 'B', (broad leaf)	cu.m	29757.94	29261.86	29847.46	29210.67
	Providing, making and fixing dressed wood work in traditional Tshegay 25mm to 75mm thick as per architectural drawing					
WW2069	In class 'A', (conifer)	sq.m	6794.10	6864.10	6929.10	6836.35
WW2070	In class 'B', (conifer)	sq.m	7048.92	7118.89	7183.92	7091.18
WW2071	In class 'A', (broad leaf)	sq.m	7304.92	7277.54	7309.83	7275.38
WW2072	In class 'B', (broad leaf)	sq.m	7268.45	7241.07	7273.40	7238.92
	Providing & fixing 50mm thick, half-lapped Thinzhi enta(Timber flooring)/Nampa enta (Ceiling plank) including fixing with iron screws etc. complete, excluding the cost of frame					
WW2073	Class 'A', (conifer)	sq.m	1566.05	1637.07	1703.01	1608.92
WW2074	Class 'B', (conifer)	sq.m	1553.77	1624.75	1690.73	1596.64
	Providing & fixing 75mm thick, half-lapped(wider) Thinzhi enta (Timber flooring)/Nampa enta (Ceiling plank) including fixing with iron screws etc. complete, excluding the cost of frame					
WW2075	Class 'A', (conifer)	sq.m	2188.72	2290.16	2384.37	2249.96
WW2076	Class 'B', (conifer)	sq.m	2171.22	2272.62	2366.87	2232.46
WW2077	Repairing and fixing of existing Thinzhi enta (Timber flooring)/Nampa enta (Ceiling plank) including cleaning, sanding, etc. complete	sq.m	273.44	273.44	273.44	273.44

Code	Description	Units	PL	GP	SJ	TH
Patra (Carving Works)						
Traditional Carving on the fabricated timber components, excluding the cost of timber						
CR2001	Rab (hard wood)	sq.m	12915.62	12915.62	12915.62	12915.62
CR2002	Ding (hard wood)	sq.m	12125.07	12125.07	12125.07	12125.07
CR2003	Thama (hard wood)	sq.m	8540.52	8540.52	8540.52	8540.52
CR2004	Rab (soft wood)	sq.m	11598.38	11598.38	11598.38	11598.38
CR2005	Ding (soft wood)	sq.m	11070.68	11070.68	11070.68	11070.68
CR2006	Thama (soft wood)	sq.m	7538.29	7538.29	7538.29	7538.29
Traditional 3D Carving (Drukim) complete, excluding the cost of timber						
CR2007	Rab	sq.m	38747.87	38747.87	38747.87	38747.87
CR2008	Ding	sq.m	30313.69	30313.69	30313.69	30313.69
CR2009	Thama	sq.m	12810.28	12810.28	12810.28	12810.28
Traditional 3D Carving (Masks; Meshang, Chuseng, Singye, etc.) complete, excluding the cost of timber						
CR2010	Size < 0.036sq.m c/s area	each	6859.10	6859.10	6859.10	6859.10
CR2011	Size 0.036sq.m to 0.058sq.m c/s area	each	7839.26	7839.26	7839.26	7839.26
CR2012	Size > 0.058sq.m c/s area	each	9798.58	9798.58	9798.58	9798.58

4. COST INDICES

4.1 GUIDELINE FOR COST INDICES

Bhutan Schedule of Rate (BSR) is a guiding document for projecting/estimating cost of construction. To derive the approximate rate at any location, the BSR rates of the base town shall be enhanced by the cost index.

Cost index (CI) will vary from project to project, based on distance, availability of local materials, road connectivity, etc. Therefore, every mega or complex project shall have unique cost index.

The sample Cost Indices in the BSR are for the purpose of guidance and applicable for similar nature of work at any location. However, engineers are encouraged to calculate cost indices on their own for the complex or any other important project which are not covered by these samples.

Cost index shall not be applicable for any works where only labour is involved such as dismantling & demolishing work and earth work. For such works actual labour requirement shall be worked out and additional amount added for any increase in labour rates.

Any rates calculated adding cost index shall not be used for making payment to contractors or parties. Payment to contractors shall be strictly as per the contract agreement only.

Table 4.1.1 Sample Calculation of Cost Index (CI)

Sl. No.	Description	Unit	Cost at base Town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Cement	MT	4770.00	5689.00	19.27	17.00	3.28	
2	Steel Reinforcement	MT	31500.00	33500.00	6.35	14.00	0.89	
3	Rolled Steel	MT	32300.00	34400.00	6.50	3.00	0.20	
4	C.G.I Sheet	MT	44000.00	50600.00	15.00	5.00	0.75	
5	Brick /ICEB	Nos	4650.00	6830.00	46.88	9.50	4.45	
6	Stone Boulders	cu.m	180.00	530.00	194.44	1.50	2.92	
7	Rough Sawn Timber	cu.m	7800.66	8122.45	4.13	17.00	0.70	
8	Stone Aggregates	cu.m	618.00	883.00	42.88	4.50	1.93	
9	Sand	cu.m	180.00	534.00	196.67	2.00	3.93	
10	Labour : Average							
	Cat. I to IV	each	350.00	350.00	0.00	11.50	0.00	
	Cat. V	each	215.00	215.00	0.00	15.00	0.00	
				Total		**100**	**19.04**	

Therefore, the cost index for this sample is **19.04%**

Note:

Col.(4) = Basic rates at base town

Col.(5) = Rates at the project location

Col.(6) = [{col.5/col.4} - 1]x100

Col.(7) = Weightage

Col.(8) = {Col.(6) x Col.(7)}/100

Procedure for calculation of cost Index:

a. Basic rates at base town:

Basic rates of base town should be same for the estimation and cost index calculation.

Table 4.1.2 Base town reference

Sl. No	Base Town	Dzongkhag
1	Phuentsholing (PL)	Chukha, Haa, Paro, Gasa, Punakha, Wangduephodrang and Samtse
2	Gelephu (GP)	Bumthang, Dagana, Tsirang, Trongsa, Sarpang and Zhemgang
3	Samdrupjongkahr (SJ)	Samdrupjongkahr, Pemagatshel, Tashigang, Tashiyangtse, Lhuntse and Mongar
4	Thimphu (TH)	Only Thimphu

b. Collection of Rates. (Rates at the project location)

- Identify the nearest source of materials.
- Collect the current market rates from agencies, production units, suppliers, hiring agents etc. (The rates at project location will include price at the source + transportation charge + handling charges up to construction site store)
- Tender committee should ascertain and approve the labour and material rates.

c. Weightage.

- Weightage used in the CI are value weights not quantity weights.
- Weightage of a particular material is the percentage of its cost from the total cost of the BML (basic labour, machineries and materials). Weightage shall remain fixed for the six samples given in BSR.
- In case of complex and mega project where BSR cost index samples are not applicable, the concerned agency may follow the sample below to calculate the weightage.

Table 4.1.3 Sample Calculation of Materials weightage (Building Work –Framed Building)

1	2	3	4	5	6	7	8	9	10
Sl. No	**BML Code**	**Description**	**Quantity**	**Unit**	**Basic Rate (Nu.)**	**Amount (Nu.) (Col 4 x Col 6)**	**BML % (Col 7/Total Cost)**	**Main BMLs**	**Convert to 100%**
1	LB0021	Carpenter Gd.1	109.15	day	350.47	38,253.80	1.21	1.21	
2	LB0032	Blacksmith (metal-worker)	188.31	day	309.82	58,342.20	1.84	1.84	
3	LB0033	Carpenter Gd.2	423.77	day	309.82	131,292.42	4.14	4.14	
4	LB0036	Mason Gd.1	267.78	day	309.82	82,963.60	2.62	2.62	
5	LB0038	Plumber Gd.1	10.68	day	309.82	3,308.88	0.10		
6	LB0039	Work Supervisor (Lajab)	53.59	day	309.82	16,603.25	0.52		
7	LB0051	Mason Gd.2	161.01	day	275.64	44,380.80	1.40	1.40	
8	LB0052	Painter Gd.1	154.50	day	275.64	42,586.38	1.34	1.34	
9	LB0053	Plant Operator Gd.3	7.44	day	275.64	2,050.76	0.06		
10	LB0054	Plumber Gd.2	1.24	day	275.64	341.79	0.01		
11	LB0067	Painter Gd.2	87.46	day	254.29	22,240.20	0.70		
12	LB0076	Labourer (Female)	125.86	day	232.93	29,316.57	0.92		
13	LB0077	Labour	1568.38	day	232.93	365,322.75	11.52	11.52	
14	MP0202	Welder - Electric arc	16.26	day	183.75	2,987.78	0.09		
		Total Amount (Labour)				839,991.19	26.48	24.07	28.00
							-		
1	MP0205	Concrete Mixer(7/10Cft)	7.44	day	1,280.00	9,523.20	0.30		
2	MP0206	Concrete Vibrator(M/C5)	7.44	day	800.00	5,952.00	0.19		
					Total Amount (Machinery)	**15,475.20**			

Sl. No	**BML Code**	**Description**	**Qty**	**Unit**	**Rate (Nu.)**	**Amount (Nu.)**			-
1	MT0042	Mud dry	23.67	cu.m	86.39	2,044.85	0.06		-
2	MT0043	Sand	93.19	cu.m	337.03	31,407.83	0.99		-
3	MT0060	Boulder	93.44	cu.m	861.81	80,527.53	2.54	2.54	3.00
4	MT0068	Crushed Rock-40mm	17.22	cu.m	952.56	16,403.08	0.52		-
5	MT0070	Crushed Rock-20mm	61.82	cu.m	1,058.40	65,430.29	2.06	2.06	2.00
6	MT0071	Crushed Rock-12.5 - 6mm	16.92	cu.m	1,023.12	17,311.19	0.55		-
7	MT0125	Bricks 2nd class	0.39	1000#	11,075.00	4,319.25	0.14		-
8	MT0126	Brick aggregate	1.73	cu.m	2,051.60	3,549.27	0.11		-
9	MT0131	Concrete block bricks - Solid Brick 240	28.39	1000#	12,000.00	340,680.00	10.74	10.74	13.00

		x 115 x 80mm							
10	MT0145	Cement (OPC/PSC)	51.99	tonne	5,800.00	301,542.00	9.50	9.50	11.00
11	MT0156	Plastic Sheet -100 micro-metre	44.48	sq.m	29.00	1,289.92	0.04		-
12	MT0157	Plastic Sheet -200 micro-metre	28.05	sq.m	67.00	1,879.35	0.06		-
13	MT0180	Steel Materials (Rolled sections (250 MPa))- Angles	280.04	kg	56.50	15,822.26	0.50		-
14	MT0181	Steel Materials(Rolled sections (250 MPa)) -Channels	554.40	kg	56.50	31,323.60	0.99		-
15	MT0182	Steel Materials(Rolled sections (250 MPa)) -Flats	325.97	kg	54.00	17,602.38	0.55		-
16	MT0184	Steel Materials(Rolled sections (250 MPa)) -Plates	496.35	kg	60.00	29,781.00	0.94		-
17	MT0200	Welded Tube (250 MPa) - 50mm dia	170.76	m	273.00	46,617.48	1.47	1.47	2.00
18	MT0201	Welded Tube (250 MPa) - 40mm dia	98.24	m	179.00	17,584.96	0.55		-
19	MT0208	(Reinforcing Bars)Thermo - Mechanically Treated (TMT) bars (yield strength 500 MPa)	10328.87	kg	40.88	422,244.21	13.31	13.31	16.00
20	MT0220	Fasteners - M.S. Rivets	2.69	kg	100.57	270.53	0.01		-
21	MT0221	Fasteners - M.S. Bolts & Nuts, Screws etc	9.22	kg	97.00	894.34	0.03		-
22	MT0250	Plain G.I Sheet, 24-gauge (0.63mm)	0.16	tonne	68,750.00	11,000.00	0.35		-
23	MT0252	Pre Painted Steel sheets 25g (0.50mm)	0.16	tonne	95,295.84	15,247.33	0.48		-
24	MT0278	Pre Painted Steel Corrugated Roofing Sheets 25g	1.19	tonne	102,430.02	121,891.72	3.84	3.84	5.00
25	MT0325	Timber-Ballies 75 to 125mm dia	983.72	m	30.43	29,934.60	0.94		-
26	MT0330	Rough-sawn timber (urban rate)-Class 'B', (Mixed Conifer)	32.99	cu.m	10,826.37	357,161.95	11.26	11.26	13.00
27	MT0342	Plywood-6mm, commercial ply	115.71	sq.m	208.00	24,067.68	0.76		-
28	MT0685	Plaster of Paris	5873.54	kg	22.03	129,394.09	4.08	4.08	5.00
29	MT0691	Acrylic washable distemper	129.93	kg	50.50	6,561.47	0.21		-
30	MT0695	Mud Paint for Bhutanese traditional painting	15.17	kg	33.50	508.20	0.02		-
31	MT0697	Cloth for Bhutanese painting	0.11	sq.m	35.00	3.85	0.00		-
32	MT0698	Paper for Bhutanese painting	0.45	sq.m	20.00	9.00	0.00		-
33	MT0710	Cement primer	67.19	litre	106.33	7,144.31	0.23		-
34	MT0711	Synthetic red lead primer	3.05	litre	132.00	402.60	0.01		-
35	MT0714	Pink primer, for wood	11.33	litre	151.00	1,710.83	0.05		-

36	MT0722	Synthetic enamel paint	3.77	litre	172.50	650.33	0.02		-
37	MT0723	High gloss synthetic enamel	29.60	litre	255.00	7,548.00	0.24		-
38	MT0735	Wood preservative -Brown	7.25	litre	248.12	1,798.87	0.06		-
39	MT0751	C.I. manhole covers with frame (light duty) internal dimension 455 x 610mm Total weight of Cover and frame not less than 38 kg.	4.00	each	2,390.12	9,560.48	0.30		-
40	MT0795	Stoneware pipes 60 cm long - 100mm dia	2.00	each	132.18	264.36	0.01		-
41	MT0796	Stoneware pipes 60 cm long - 150mm dia	5.01	each	294.40	1,474.94	0.05		-
42	MT0940	Wheel valve - 32mm nom-bore	1.00	each	620.00	620.00	0.02		-
43	MT0977	Cast Iron Pipes, Single Socketted, 1.83m long - 100mm	1.24	each	926.07	1,148.33	0.04		-
44	MT1033	Single equal junction, door - 150mm	2.00	each	344.12	688.24	0.02		-
45	MT1132	Terminal Guard - 100mm	1.00	each	333.19	333.19	0.01		-
46	MT1151	Pipes, Single Socketed 1.83 m long - 90mm	13.38	each	357.00	4,776.66	0.15		-
47	MT1152	Pipes, Single Socketed 1.83 m long - 110mm	14.00	each	441.00	6,174.00	0.19		-
48	MT1216	Plain bend - 90mm	12.00	each	84.00	1,008.00	0.03		-
49	MT1217	Plain bend - 110mm	8.00	each	90.00	720.00	0.02		-
50	MT1226	Door bend - 90mm	6.00	each	113.00	678.00	0.02		-
51	MT1227	Door bend - 110mm	4.00	each	122.00	488.00	0.02		-
52	MT1246	Single Tee, Plain - 90mm	3.00	each	116.00	348.00	0.01		-
53	MT1247	Single Tee, Plain - 110mm	2.00	each	129.00	258.00	0.01		-
54	MT1335	110mm dia. Offset With 75mm projection	4.00	each	465.00	1,860.00	0.06		-
55	MT1342	Terminal Guard -110mm	1.00	each	98.84	98.84	0.00		-
56	MT1345	Nahani Trap - 100mm inlet & 75mm outlet	6.00	each	190.40	1,142.40	0.04		-
57	MT1382	Stainless Steel Kitchen Sinks - single bowl & drain-board, 940 x 460 x 160mm	2.00	each	1,703.40	3,406.80	0.11		-
58	MT1400	W.C. P a n s - Vitreous China European - white	4.00	each	1,100.00	4,400.00	0.14		-
59	MT1405	W.C. P a n s - Plastic seat & lid for European pan	4.00	each	753.53	3,014.12	0.10		-
60	MT1430	Vitreous China cistern - low level, incl.	4.00	each	1,586.10	6,344.40	0.20		-

		fittings & flush-bend - 10 litres, white							
61	MT1440	15mm ball valve with plastic float	2.00	each	344.25	688.50	0.02		-
62	MT1464	15mm bib cock, vert, c.p knob	4.00	each	445.40	1,781.60	0.06		-
63	MT1469	20mm stop cock, c.p knob	6.00	each	459.00	2,754.00	0.09		-
64	MT1513	C.p Brass Shower fittings for 15 to 20mm inlet - shower, revolving joint	4.00	each	572.22	2,288.88	0.07		-
65	MT1530	basin, single-hole, casted spout, 15mm	6.00	each	1,976.76	11,860.56	0.37		-
66	MT1534	wall, non-telephonic type, 15mm	4.00	each	2,225.07	8,900.28	0.28		-
67	MT1585	R.S. or C.I.Brackets	4.00	pair	114.44	457.76	0.01		-
68	MT1605	Soap Containers - c.p brass with bracket	4.00	each	371.59	1,486.36	0.05		-
69	MT1615	C.p Towel Rails - 20mm x 450mm	4.00	each	456.45	1,825.80	0.06		-
70	MT1631	Mirror (Bevelled edge) 600mm x 450mm	4.00	each	475.00	1,900.00	0.06		-
71	MT1635	Toilet paper holders - C.P. brass	4.00	each	423.02	1,692.08	0.05		-
72	MT1649	Electric Water Heaters -50 litres, vertical	4.00	each	12,780.00	51,120.00	1.61	1.61	2.00
73	MT1667	H.D.P.E water storage tank - 1000 litres	2.00	each	8,953.38	17,906.76	0.56		-
Total Amount (Materials)						2,317,029.47			
Total Amount of Basic Labour, Machineries, Materials Nu.						**3,172,495.86**			
Total weightage of the major BML								84.48	100.00

Table 4.1.4 Example: Cost Index tabulation and calculation based on above sample

Sl. No.	Description	Unit	Cost at base Town	Cost at Project Location	% Increase	Weightage	Cost Index
1	Stone Boulders	cu.m	861.81	530.00	-38.50	3.00	-1.16
2	Crushed Rock-20mm	cu.m	1,058.40	950.00	-10.24	2.00	-0.20
3	Concrete block bricks - Solid Brick 240 x 115 x 80mm	1000#	12,000.00	11000.00	-8.33	13.00	-1.08
4	Cement	MT	5,800.00	6100.00	5.17	11.00	0.57
5	Welded Tube (250 MPa) - 50mm dia	M	273.00	280.00	2.56	2.00	0.05
6	(Reinforcing Bars & Mesh) Thermo - Mechanically Treated (TMT) bars (yield strength 500 MPa)	kg	40.88	41.00	0.29	16.00	0.05
7	Pre-Painted Galvanised Steel Corrugated Roofing Sheets 24g	MT	102,430.02	105000.00	2.51	5.00	0.13
8	Rough-sawn timber (urban rate)-Class 'B', (Mixed Conifer)	cu.m	10,826.37	9500.00	-12.25	13.00	-1.59
9	Plaster of Paris	kg	22.03	25.00	13.48	5.00	0.67
10	Electric Water Heaters -50 litres, vertical	each	12,780.00	15000.00	17.37	2.00	0.35
11	Labour: Average						
	Cat. I to V	each	262.60	262.60	0.00	28.00	0.00
						100.00	
						Cost Index	2.22 %

Table 4.1.5 Procedure for calculation of BML weightage:

Column 1	Basic Material, Machinery and Labour Code. (Based on detailed Estimate)
Column 2	BML Description
Column 3	BML Quantities for that particular project (with the institution of Construction Manager Software, BML quantity can easily quantified from the estimates)
Column 4	BML Unit
Column 5	BML rates of Base town (Based on Estimates)
Column 6	Individual BML cost for that particular project
Column 7	BML % based on its cost (Particular Item cost divided by the Total cost of BML multiply by 100) * {BML Cost/Total BML Cost) x 100}
Column 8	Choose Main BMLs. Select the BML which holds major (2 % and higher) or with greater weightage The total weightage of the major BML should be equal to or greater than 80%. In case the total weightage is less than 80%, other BML should be considered in the order of their contribution to the total cost.
Column 9	Convert the weightage of main BML in Column 8 to 100%

Note:

1. *The Dzongkhag/Dungkhag could have one cost index for the nearby projects or Gewogs. However, for the Gewogs which are located far away, the Dzongkhag/Dungkhag could have individual cost index.*

4.2 Sample Calculation of Cost Indices

4.2.1 Building works with brick infill walls and steel trusses

Sl. No.	Description	Unit	Cost at a base Town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Cement	MT	4770.00	5689.00	19.27	15.81	3.05	
2	Steel Reinforcement	MT	31500.00	33500.00	6.35	12.90	0.82	
3	Rolled Steel	MT	32300.00	34400.00	6.50	2.42	0.16	
4	C.G.I Sheet	MT	44000.00	50600.00	15.00	4.55	0.68	
5	Brick /ICEB	Nos	4650.00	6830.00	46.88	8.44	3.96	
6	Stone Boulders	cu.m	180.00	530.00	194.44	1.30	2.52	
7	Rough Sawn Timber	cu.m	7800.66	8122.45	4.13	18.03	0.74	
8	Stone Aggregates (20mm)	cu.m	618.00	883.00	42.88	3.89	1.67	
9	Sand	cu.m	180.00	534.00	196.67	1.93	3.80	
10	Labour : Average							
	Cat. I to IV	each	616.96	616.96	0.00	14.16	0.00	
	Cat. V	each	460.00	460.00	0.00	16.58	0.00	
						100.00		

Cost Index =17.39%

4.2.2 Building works with brick infill walls and timber trusses

Sl.No.	Description	Unit	Cost at a base Town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Cement	MT	4770.00	5689.00	19.27	15.71	3.03	
2	Steel Reinforcement	MT	31500.00	33500.00	6.35	12.82	0.81	
3	C.G.I Sheet	MT	46000.00	50600.00	10.00	4.52	0.45	
4	Brick /ICEB	Nos	4630.00	6830.00	47.52	9.27	4.41	
5	Stone Boulders	cu.m	180.00	530.00	194.44	1.29	2.51	
6	Rough SawnTimber	cu.m	7800.66	8122.45	4.13	20.04	0.83	
7	Stone Aggregates (20mm)	cu.m	618.00	883.00	42.88	3.86	1.66	
8	Sand	cu.m	180.00	534.00	196.67	1.92	3.77	
9	Labour : Average							
	Cat. I to IV	each	616.96	616.96	0.00	14.08	0.00	
	Cat. V	each	460.00	460.00	0.00	16.49	0.00	
						100		

Cost Index =17.46 %

4.2.3 Building works with stone masonry wall

Sl.No.	Description	Unit	Cost at base town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Cement	MT	4770.00	5689.00	19.27	15.18	2.92	
2	Steel Reinforcement	MT	31500.00	33500.00	6.35	4.35	0.28	
3	C.G.I Sheet	MT	46000.00	50600.00	10.00	6.99	0.70	
4	Stone boulders	cu.m	180.00	534.00	196.67	4.98	9.79	
5	Bricks/ICEB	1000#	4650.00	6830.00	46.88	0.85	0.40	
6	Rough SawnTimber	cu.m	7800.66	8122.45	4.13	22.80	0.94	
7	Stone Aggregates (20mm)	cu.m	618.00	883.00	42.88	2.49	1.07	
8	Sand	cu.m	180.00	530.00	194.44	2.78	5.41	
9	Labour : Average							
	Cat. I to IV	each	616.96	616.96	0.00	23.65	0.00	
	Cat. V	each	460.00	460.00	0.00	15.93	0.00	
						100.00		

Cost Index = 21.51%

4.2.4 Bitumen sealing works

Sl. No	Description	Unit	Cost at a base town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Bitumen***	MT	32189.00	34389.00	6.83	58.76	4.02	
2	Road Roller (8-10T)	day	3928.00	3928.00	0.00	9.24	0.00	
3	Fire wood**	cu.m	535.00	650.00	21.50	3.10	0.67	
3	Stone Aggregates - 20mm	cu.m	618.00	635.70	2.86	14.37	0.41	
4	Labour : Average							
	Cat. I to IV	each	616.96	616.96	0.00	0.73	0.00	
	Cat. V	each	460.00	460.00	0.00	13.80	0.00	
						100.00		

Cost Index = 5.09%

*** *Bitumen 80/100 or Emulsion as appropriate*

** *Fire wood measured in stacked volume*

4.2.5 Road permanent works – retaining walls, culvert and other similar works

Sl.No.	Description	Unit	Cost at a base town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Cement	MT	4770.00	5689.00	19.27	27.61	5.32	
2	Stone boulder	cu.m	180.00	205.00	13.89	17.10	2.38	
3	Stone Aggregates (20mm)	cu.m	618.00	700.00	13.27	2.56	0.34	
4	Sand	cu.m	180.00	534.00	196.67	4.78	9.39	
5	Labour : Average							
	Cat. I to IV	each	616.96	616.96	0.00	19.50	0.00	
	Cat. V	each	460.00	460.00	0.00	28.45	0.00	
						100.00		

Cost Index = 17.43%

4.2.6 Road works – Base course

Sl. No.	Description	Unit	Cost at a base town	Cost at Project Location	% Increase	Weightage	Cost Index	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Stone Boulder	cu.m	180.00	205.00	13.89	4.77	0.66	
2	Road Roller (8-10T)	day	3440.00	3440.00	0.00	30.52	0.00	
3	Blinding materials	cu.m	70.00	70.00	0.00	3.58	0.00	
4	Stone Aggregates 20 mm	cu.m	618.00	700.00	13.27	40.05	5.31	
5	Labour : Average							
	Cat. I to IV	each	616.96	616.96	0.00	0.34	0.00	
	Cat. V	each	460.00	460.00	0.00	20.75	0.00	
						100.00		

Cost Index = 5.98%

Note:

1. *The Procuring agencies are encouraged to compute separate cost index for each project. However, when **'Sample Calculation of Cost Indices'** in tables in **4.2** are used, the cost indices have to be calculated and revised on quarterly basis.*

5. RATE ANALYSIS GUIDELINE

5. GUIDELINE FOR RATE ANALYSIS

Bhutan Schedule of Rates (BSR) is the guiding document for projecting the approximate cost of construction. For estimating costs of the construction works, items' rate in BSR, enhanced with or without cost index can be applied.

For the purpose of payment and filling of tenders, the individual agencies/engineers should analyse the item rate using basic labour, machinery &material coefficients with current market rate. This is because market rates fluctuate frequently and by the time the BSR is published; many rates would have already changed.

5.1 Procedure for Rate Analysis

5.1.1 Identify BML code and description

i. Obtain BML coefficients for the appropriate item code from the LMC Book.

ii. The BML coefficients should not be changed for the items reflected in the BSR.

iii. For new materials or items that are not covered in the BSR, refer any other relevant national, regional or international standards/practices/codes.

5.1.2 Collection of Rates.

i. Identify the most appropriate source of materials.

ii. Collect the current market rates from relevant agencies/production units/suppliers/ hiring agents etc. (The rates at project location will include price at source + transportation charges + handling charges up to construction site store)

iii. Tender committee should ascertain and approve the labour and material rates.

5.1.3 Constants:

i. A fixed 5% for hand tools & equipment on labour cost, lubrication & corrective maintenance on machinery cost and wastages & unaccounted on materials cost.

ii. A fixed 1 % for water charges (sanitation, mixing of mortar, drinking, curing, etc.)

iii. 10% for contractor's profit and overhead charges when rate analysis is carried out by the procuring agencies. For rate analysis submitted by contractors for the tendered work, it can vary up to a maximum of 10%.

5.1.4 Total/Item Rate

i. Rate for the particular item is derived by adding the above constants cumulatively on total of BML rates as given in the example.

Table 5.1 Rate Analysis Sample

RC0001 - Providing & laying in position reinforced cement concrete 1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size) excluding the cost of centering, shuttering and reinforcement - all work up to plinth level

Code	Coefficient for per cu.m				Total Amount	
	Description	Quantity	Units	Rate		
LB0036	Mason Gd.1	0.07583	day	632.50000	47.96	
LB0039	Work Supervisor (Lajab)	0.07077	day	632.50000	44.76	
LB0051	Mason Gd.2	0.07583	day	575.00000	43.60	
LB0053	Plant Operator Gd.3	0.07077	day	575.00000	40.69	
LB0077	Labour	1.18125	day	460.00000	543.38	
MP0111	Concrete Mixer(7/5 cu.ft)	0.07000	day	3224.00000	225.68	
MP0112	Concrete Vibrator(M/C5)	0.07000	day	2512.00000	175.84	
MT0043	Sand	0.45000	cu.m	1007.27667	453.27	
MT0070	Crushed Rock - 20mm	0.67500	cu.m	990.07600	668.30	
MT0071	Crushed Rock - 12.5mm - 6 mm	0.22500	cu.m	956.56000	215.23	
MT0145	Cement (OPC / PSC)	0.61000	tonne	9733.33333	5937.33	
	Total (A)				8396.04	(A)
	Add 5% on Total A				419.80	
	Total (B)				8815.85	(B)
	Add 1% on Total B				88.16	
	Total (C)				8904.00	(C)
	Add 10% on Total C				890.40	
	Item Rate per unit (Nu.)				9794.40	

6. QUICK COST GUIDE

6.1 QUICK COST GUIDE

Explanatory Notes:

1. The rates listed are in units of square meter of plinth per meter clear height of floor to ceiling.
2. Rates do not include major site development, or special items
3. Tabulated rates should be adjusted by the room size factor
4. Average Room Size (Av) shall be calculated from the expression:

$$\mathbf{Av}=\sqrt[3]{\{(\boldsymbol{pa} * \boldsymbol{h})/\mathbf{r}\}}$$

Where: Av= Average room size (m)
Pa= Plinth area (sq.m)
h= clear height of floor to ceiling (m)
r=No. of rooms

5. The rates and room size factors are based on detailed estimates for the various projects described
6. They are approximations for projects of similar description
7. Any intermediate values of room size factors may be worked out by interpolation
8. Calculation of Average room size and rate adjustment factors floor wise shall give better results
9. The cost of building can be calculated from following expression:

$$Building\ Cost = Pa\ x\ h\ x\ room\ size\ factor\ x\ plinth\ area\ rate$$

Average Room Size (m)	Room Size Factor
2.500	1.180
2.540	1.170
2.570	1.160
2.600	1.150
2.650	1.140
2.670	1.130
2.720	1.120
2.740	1.110
2.790	1.100
2.820	1.090
2.860	1.080
2.900	1.070
2.970	1.060
3.000	1.055
3.050	1.050
3.125	1.040
3.210	1.030
3.320	1.020
3.430	1.010
3.500	1.000
3.680	0.990
3.860	0.980
4.000	0.970
4.220	0.960

Average Room Size (m)	Room Size Factor
4.430	0.950
4.500	0.947
4.720	0.940
5.000	0.930
5.380	0.920
5.500	0.917
5.780	0.910
6.000	0.904
6.200	0.900
6.500	0.894
6.710	0.890
7.000	0.885
7.380	0.880
8.000	0.872
8.200	0.870
8.750	0.860
9.000	0.858
10.000	0.850
11.000	0.838
12.000	0.832
13.000	0.825
14.000	0.820
15.000	0.810

6.2 QUICK COST RATES (Nu)

Sl. No	Description	PL	GP	SJ	TH
	Non-Residential				
1	Class room G+1, **RCC framed** structure,bricks wall in super structure with cement mortar, terrozo/ marbles /tiles/timber flooring, timber doors / windows frames/ shutters and ceilings , celings, PPGI sheet roofing on steel truss, RCC cornices, standard electrical works, plumbling & sanitation, drainage and plinth protection	6468.08	6511.41	6575.72	6983.42
2	Kitchen block, single storey **RCC framed** structure, RRM wall foundation and brick walls in super structure with cement mortar , terrazzo/marbles /tiles/ timber flooring, timber doors / windows frames/ shutters and ceilings, PPGI/CGI sheet roofing on steel truss, RCC cornices, standard electrical works, plumbling & sanitation, drainage and plinth protection.	6481.81	6509.74	6631.36	7044.16
3	Office Block - 2 storey **RCC framed** structure, RRM wall foundation and bricks wall in super structure with cement mortar. Terrazzo/marble/ tiles/timber flooring. timber windows, and doors, PPGI sheet roofing on steel truss, RCC cornices, standard eletrical works, plumbling & sanitation, drainage and plinth protection.	6625.72	6698.42	6788.13	7146.18
4	Auditorium block single storey **Load bearing** structure, RRM wall foundation and wall,terrazzo/granite/timber flooring. Brick wall partition with cement mortar, aluminium windows,timber doors, CGI/PPGI sheet roofing on steel truss, RCC cornices, detail eletrical works, drainage and plinth protection, standard plumbing and sanitation	6444.65	6620.56	6873.79	7476.86
5	Hall/classroom - Single storey **Load bearing** structure, RRM wall foundation in mud mortar,RRM wall in super structure in mud mortar,timber doors and windows, cement concrete/ timber flooring , wooden truss over CGI sheets/shinglep roofing , drainage and plinth protection	5014.36	4947.69	5001.39	5308.92
6	Hostel 2 storey, **RCC framed** structure, RRM wall foundation and brick walls in super structure with cement mortar. Terrazzo/marble /tiles/timber flooring. timber windows, doors, PPGI sheet roofing on steel truss, GRC cornices, standard eletrical works, plumbling & sanitation, drainage and plinth protection.	6695.74	6770.45	6839.48	7181.94

Sl. No	Description	PL	GP	SJ	TH
	Residential				
7	Residential-single storey **Load bearing** structure,RRM wall in foundation, bricks wall in superstructure with cement mortar,terrazzo/marbles /tiles/ timber flooring. timber windows & doors, CGI sheet roofing on timber truss, RCC cornices, standard electrical works, plumbling & sanitation, drainage and plinth protection.	6986.16	6976.62	7173.48	7675.87
8	Residential-single storey **Load bearing** structure RMM in foundation & ekra wall in superstructure with mud Plaster both sides, timber/ mud flooring. timber windows & doors, CGI sheet roofing on timber truss, standard eletrical works, drainage and plinth protection, standard plumbing and sanitation	5931.63	5991.09	6098.93	6400.08
9	Residential-single storey **Load bearing** structure, RRM wall in foundation, Rammed Earth wall in superstructure, timber flooring, windows & doors, CGI sheet roofing on timber truss, standard eletrical works, drainage, plumbing and sanitation.	5839.43	5824.32	5953.13	6108.95
10	Residential-double storey **Load bearing** structure, RRM wall in foundation, Rammed Earth wall in superstructure, timber flooring, windows & doors, CGI sheet roofing on timber truss, standard eletrical works, drainage, plumbing and sanitation.	4650.26	4685.53	4801.77	4817.64
11	Residential- single storey **Load bearing** structure,RRM wall in foundation, RRM wall in super structure with mud mortar, wooden/mud flooring. timber windows & doors, CGI sheet roofing on timber truss/shinglep roofing, standard eletrical works, drainage and plinth protection, standard plumbing and sanitation.	7537.20	7500.61	7620.96	8023.69
12	Residential-single storey **Load bearing** structure,RRM wall in foundation, RRM wall in superstructure with cement mortar, concrete /tiles/ timber flooring. Timbers windows and doors. CGI sheet roofing on timber truss, standard eletrical works, plumbing and sanitation.	8548.80	8534.78	8700.14	9263.82
13	Residential-double storey L**oad bearing** structure,RRM wall in foundation, RRM wall in superstructure with cement mortar,concrete /tiles/ timber flooring. windows,timber doors, CGI sheet roofing on timber truss, standard eletrical works, drainage and plinth protection, standard plumbing and sanitation	6461.86	6482.93	6602.60	7017.99

Sl. No	Description	PL	GP	SJ	TH
14	Residential-single story **RCC framed** structure, RRM wall foundation and brick walls in super structure with cement mortar , terrazzo/marbles /tiles/ timber flooring, timber windows, doors & ceiling, PPGI sheet roofing on steel truss,GRC cornices, standard electrical works, plumbling & sanitation, drainage and plinth protection.	8931.32	8983.79	9098.53	9556.47
15	Residential-double storey, **RCC framed** structure, Brick walls in super structure with cement mortar, terrozo/ marbles /tiles/timber flooring, timber windows, doors and celings,PPGI sheet roofing on steel truss, RCC cornices, standard electrical works, plumbling & sanitation, drainage and plinth protection.	8442.08	8516.36	8639.90	9265.59
16	Residential-double storey, **RCC framed** structure, RRM walls in super structure with cement mortar, terrozo/ marbles /tiles/timber flooring, timber windows, doors and celings,PPGI sheet roofing on steel truss, RCC cornices, standard electrical works, plumbling & sanitation, drainage and plinth protection.	8867.36	8937.87	9048.09	9633.71
17	Residential multistorey, **RCC Framed** structure, RRM Wall Footing & RC Column & Footing, Bricks in Wall & Partition with cement mortar. Floor - RCC Slab with Terrazo/timber/marble/Tiles Finishing. Timber Doors/Windows Frames/Shutter. PPGI Sheet Roofing on Timber/Steel Truss. RC Cornice, Standard Plumbing/Electrical & Finishings, drainage and plinth protection.	7568.11	7746.28	7753.67	8355.85

7. OCCUPATIONAL HEALTH AND SAFETY

7. GUIDELINE FOR OCCUPATIONAL HEALTH AND SAFETY COST

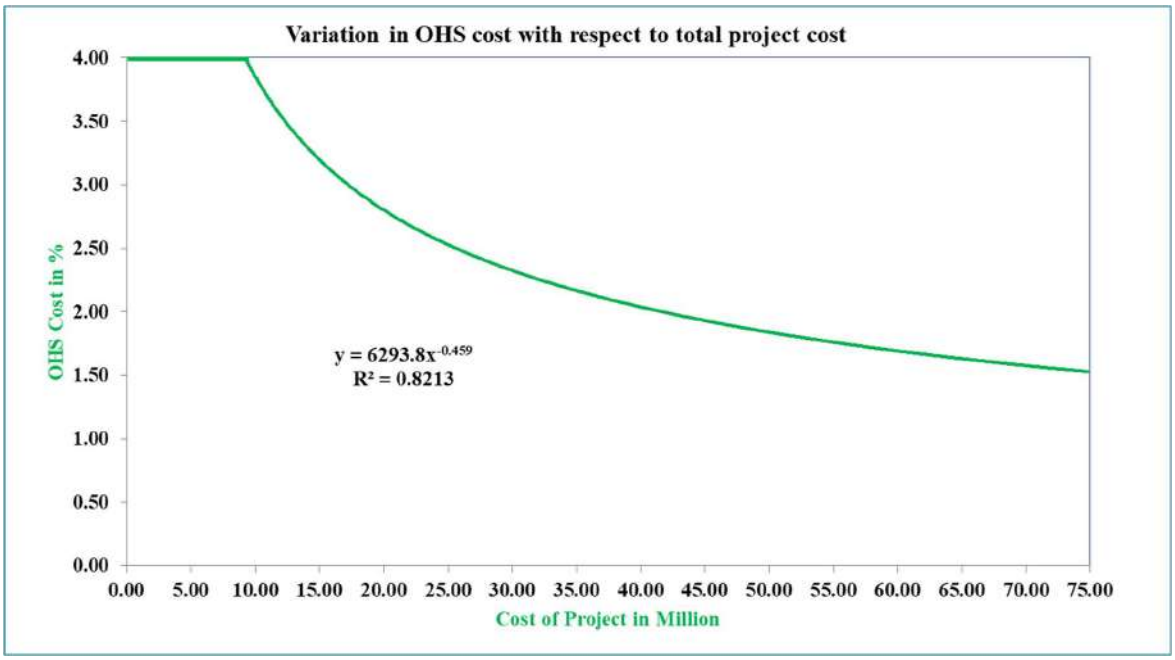
For the purpose of estimation of overall project cost, the cost for Occupational Health and Safety (OHS) may be derived using one of the two equations below, generated from the line of best fit plotted for cost of project versus the percentage of OHS cost. The OHS cost shall be calculated as the percentage of the estimated project cost.

7.1 Selection of the Best Fit Curve

Given the varying nature of the work, it is very challenging to get a best fit curve for every type of construction work. The following curves have been developed for the most common type of construction works in the country. For types of work not covered, the procuring agency may select the curve most suitable to their work from the two curves.

However, the procuring agencies are encouraged to design and analyze their OHS cost depending on the complexity of their project and also if their project requires additional OHS inputs beyond the minimal mandatory requirements specified in Section 2 of this guideline.

7.2 For Buildings and Bridges



$$y = 6293.8\ x^{-0.459}$$ [1] **(Up to a maximum of 4 percent)**

Where; y = OHS Cost in %

[1] ***Important Note****: For projects where the equation yields a percentage of OHS cost higher than 4 percent, the procuring agencies should limit the OHS cost to a maximum of 4 percent.*

x = estimated project cost

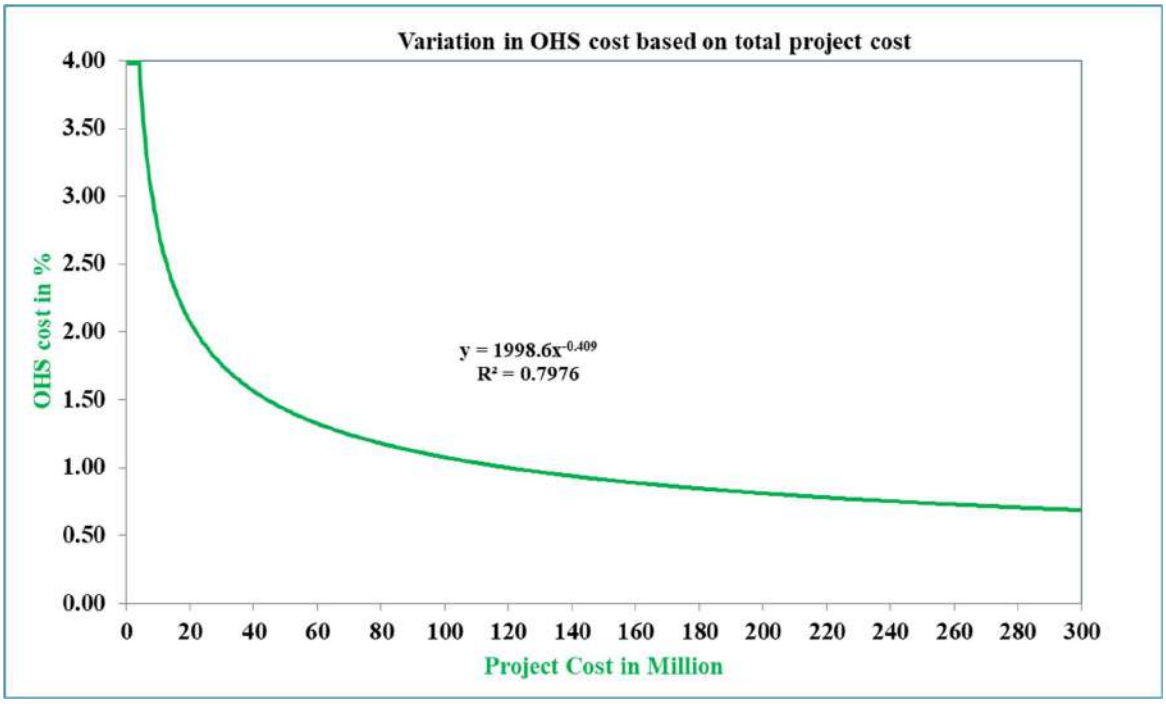
For example, if the estimated project cost is Nu. 30 Million, the cost of OHS would be:

OHS Cost in % = $6293.8*(30{,}000{,}000)^{-0.459}$

= 2.33 %

Therefore, the OHS cost will be: 2.33 % * 30,000,000 = Nu. 699,000.00

7.3 For Road and Irrigation Works



$y = 1998.6\ x^{-0.409}$ [2] **(Up to a maximum of 4%)**

Where; y = OHS Cost in %

x = estimated project cost

For example, if the estimated project cost is Nu.100 Million, the cost of OHS would be:

OHS Cost in % = $1998.6 * (100{,}000{,}000)^{-0.409}$

= 1.07 %

Therefore, the OHS cost will be: 1.07 % * 100,000,000.00 = Nu. 1,070,000.00

[2] ***Important Note****: For projects where the equation yields a percentage of OHS cost higher than 4 percent, the procuring agencies should limit the OHS cost to a maximum of 4 percent.*

8. TEMPORARY LIVING ACCOMMODATION

8.1 GUIDELINE FOR ESTIMATING COST OF TEMPORARY LIVING ACCOMMODATION

For the estimation purpose, the project estimator can use table – I. However, the payment for the same shall be made based on the contractor's bid. The following steps shall be followed for estimating the cost of accommodation facility for a project.

8.1.1 Although a proper accommodation is encouraged to be provided, its need for a particular project shall be decided by the procuring agency. Some works such as minor maintenance, community contracting, projects with very short project duration, etc., may not require the provision of accommodation. Therefore, the decision on this shall be taken by the procuring agencies diligently.

8.1.2 If it is decided to provide accommodation, then the project estimator shall firstly estimate the average daily number of workers that will be engaged for the project. It is preferred that the daily number of workers be worked out using methods of project planning and management. However, in the absence of required skills and competency to compute the number of workers, project estimators can use the approximate number of workers with practical experience of similar projects. Locate the estimated number of workers for the project in the table - I.

8.1.3 Locate the project duration in the table - I.

8.1.4 The cell corresponding to the number of workers and the project duration will be the cost of accommodation for the particular project.

For example;

Let the number of workers be: $8 < N \leq 12$ & The project duration be: **12 months**

Then the cost of accommodation will be: **Nu. 107,799.00**

8.1.5 If the project duration is in between consecutive project durations in the table, the cost of accommodation can be computed by interpolating the value ahead of and the following value of the particular project duration.

For example;

Let the number of workers be: $8 < N \leq 12$ & The project duration be: **14 months** (*this lies between 12 and 18 months*)

Then the cost of accommodation (AC) will be:

$$AC = \left[\frac{AC1 - ACo}{T1 - To}\right] \text{ x } (T\text{-}To) + AC_o$$

Where, AC: Accommodation cost for 14 months

AC_o: Accommodation cost for 12 months

AC_1: Accommodation cost for 18 months

T: Project duration for AC (*14 in this case*)

To: Project duration for ACo (*12 in this case*)

T_1: Project duration for AC_1(*18 in this case*)

Therefore, the cost of accommodation with number of workers $8 < N \leq 12$ and project duration of 14 months will be:

$$AC = [\frac{123{,}198 - 107{,}799}{18-12}] \times (14\text{-}12) + 107{,}799$$

$$AC = \textbf{Nu. 112,932.00}$$

8.1.6 Use the same description as specified in OHS 002 of Bhutan schedule of Rates. It is recommended to clearly state in the description that after the completion of the project, the facilities provided for the accommodation be dismantled and the site be cleaned. The materials used for the temporary accommodation shall be the property of the contractor. This is to enable the bidders to quote conscientiously.

*A drawing with details, and the **'temporary living accommodation standards'** for accommodation facility shall be attached with the BoQ. The drawing should be prepared as per this standard and the prototype drawing. However, the sizes shall be determined depending on the number of labours estimated in 8.1.2.*

8.1.7 In case the contractor fails to provide specified temporary accommodation, then the procuring agencies can construct accommodation facilities as specified in 'temporary living accommodation standards'. The actual cost of construction can be recovered from the first running bill with the condition that the useful materials of the accommodation facilities can be taken ownership by the contractor. A clause on this may be specified in the Special Conditions of Contract (GCC 16.1) of the bidding document.

8.1.8 No additional payment for accommodation shall be made for variations (Change of rate, time extension, deviation, price adjustment, additional works, etc.).

8.1.9 In case of works executed departmentally, the agencies have to construct accommodation facilities if decided as per step – 1 of this guide. The items must be properly stored for future use and inventory of the same must be maintained.

Note:

If the procuring agencies need additional facilities other than the ones specified, then the procuring agencies can analyse the cost for estimating. The payment shall be based on the bidders quoted rate.

TABLE 8.1.1 COST OF ACCOMMODATION FOR CONSTRUCTION PROJECTS

No of Labours (N)	Project Duration, T (months)					
	T≤6	**12**	**18**	**24**	**30**	**T ≥ 36**
N ≤ 4	46,984	52,857	60,408	70,476	84,571	105,714
4 < N ≤ 8	63,438	71,367	81,563	95,156	114,188	142,734
8 < N ≤ 12	91,966	103,462	118,242	137,949	165,539	206,924
12 < N ≤ 16	120,494	135,556	154,921	180,742	216,890	271,113
16 < N ≤ 20	149,023	167,651	191,601	223,534	268,241	335,302
20 < N ≤ 24	183,932	206,924	236,484	275,898	331,078	413,847
24 < N ≤ 28	212,460	239,018	273,163	318,691	382,429	478,036
28 < N ≤ 32	240,989	271,113	309,843	361,483	433,780	542,225
32 < N ≤ 36	257,442	289,623	330,997	386,164	463,396	579,246
36 < N ≤ 40	285,971	321,717	367,677	428,956	514,748	643,435
40 < N ≤ 44	332,955	374,574	428,085	499,432	599,319	749,149
44 < N ≤ 48	349,408	393,085	449,239	524,113	628,935	786,169
48 < N ≤ 52	377,937	425,179	485,919	566,905	680,286	850,358
52 < N ≤ 56	394,390	443,689	507,073	591,586	709,903	887,379
56 < N ≤ 60	422,919	475,784	543,753	634,378	761,254	951,568
60 ≤ N	For increase in every 4 - labours, add the following values for respective project duration, T (months)					
	28,194.60	31,719	36,250	42,292	50,750	63,438

8.2 Temporary Living Accommodation Standards

When providing living accommodation to workers at construction sites, the objective should be to ensure adequate and decent accommodation and a suitable living environment for workers. The provision of accommodation to workers shall align with the objectives of Occupational Health and Safety. Therefore, it shall meet certain minimum specifications in respect of the nature and standard of the accommodation, and facilities to be made available.

The following specifications are drawn for the provision of accommodation to workers in Bhutanese construction industry based on international labour standards.

8.2.1 Location

The temporary living accommodation for employees should be constructed at the safest place where there is no risk of flooding, landslide, collapse hazards, falling boulders and other elements.

8.2.2 Accommodation

a) A gender friendly living accommodation should be provided.

b) Accommodation should be constructed where workers are protected against the elements (such as wind, cold, rain, heat, etc.)

c) There should be one room for every 4 employees. Adequate headroom and movement space shall be provided. The size of the room shall be at least 3.5 square meter per person (*refer drawing*).

d) A separate kitchen shall be provided if employees cook by themselves. However, if the meals are provided by the employer, a common dining room, canteen or mess room, located away from the sleeping areas should be provided.

e) A separate pour-flush toilet cum bathroom, washing facilities for male and female shall be provided. There shall be one toilet cum bathroom for every six users. The size of the toilet shall comply with the Building Code of Bhutan/ the attached drawing.

f) The floors of each room shall be constructed of wood or concrete. Floor shall be provided with good finishes. All wooden floors shall be elevated not less than 1 foot above the ground level at all points to prevent dampness and to permit free circulation of air beneath.

g) The walls of the bed room and the kitchen must be constructed preferably with ply boards of at least 10 mm thickness (or equivalent) and CGI/ PPI Sheet for roofing. For toilets, both walls and roof shall be constructed with CGI/ PPI sheets (or equivalent).

h) There should be adequate natural light during the daytime and adequate artificial light (*refer drawing*).

i) Adequate ventilation to ensure sufficient movement of air in all conditions of weather and climate.

8.2.3 Health and Hygiene

a) An adequate and convenient water supply shall be provided for drinking, cooking, bathing, and laundry purposes.

b) The accommodation should maintain good sanitation and hygiene (proper drainage system, proper waste management, good housekeeping, etc.).

c) Measures should be taken to prevent the spread of diseases, especially communicable diseases.

8.2.4 Safety at temporary accommodation site

a) Any electricity supplied for the accommodation should abide by the Electricity Act of Bhutan, 2001.

b) There should not be any exposed live wire or unattended electrical switches & sockets in the living accommodation.

c) Every cable used for any purpose should have a plug at one end.

d) Combustible, explosive, and highly flammable materials should not be stored in the living accommodation.

e) Fire safety measures should be taken, including installing and maintaining fire equipment.

f) As far as possible, floors, walls, ceilings and equipment should be constructed to minimize health risks.

The accommodation shall be provided and maintained for the entire contract period including the time extension if any or the delays. The complete work of providing temporary living accommodation to workers at construction sites shall be treated as an item of work under Occupational Health and Safety.

The construction shall be durable taking into account local conditions, such as liability to earthquakes, flood and landslide. The materials used for accommodation will remain as the property of the bidder upon completion of the project. The reuse of the materials may be permitted as long as these reused items serve the intended purpose or as approved by the procuring agency.

Notes:

1. *In case the contractor fails to provide specified temporary living accommodation, then the procuring agencies will construct accommodation facilities as specified above. The actual cost of construction will be recovered from the first running bill with the condition that the useful materials of the accommodation facilities can be taken ownership by the contractor.*
2. *No additional payment for accommodation shall be made for variations (Change of rate, time extension, deviation, price adjustment, additional works, etc.).*
3. *The quoted rate shall be inclusive of shifting and rebuilding cost of the accommodation facilities if required.*

9. FORMWORK DESIGN GUIDELINE

9. FORMWORK DESIGN GUIDELINE

9.1. Scope

9.1.1 This standard provides guidelines for the design, construction, and use of formwork systems for cast-in-place concrete structures.

9.1.2 It covers sheathing, secondary member/Studs/joists, primary member/waler, props, tie rods, and all structural components associated with formwork, including permissible stresses and load estimation.

9.2 Standard Design Assumptions for Formwork Systems

The following assumptions are to be considered as standard guidelines for the structural design of formwork systems for reinforced concrete slabs and their supporting components, unless modified by specific project requirements.

9.2.1 Slab Thickness and Material Density

- The slab thickness is assumed to be uniform throughout the structural bay.
- The unit weight of freshly placed concrete shall be considered as 26 kN/m³, in accordance with standard concrete density values.

9.2.2 Formwork shall be designed to safely support all loads imposed during construction, including:

- Self-weight of formwork
- Fresh concrete load (wet load)
- Construction live load (workers, tools)
- Lateral pressure
- Impact/vibration loads

9.2.3 Loading type

The load types to be considered shall include:

- Dead Load: As per IS 875 (Part 1)
- Live Load: As per IS 875 (Part 2)
- Lateral Concrete Pressure: As per IS 14687:1999, CIRIA method or ACI 347 method, based on concrete rate of pour and temperature.

9.2.4 Live Load Consideration

A temporary live load due to construction activities is assumed to be 20% of the calculated dead load, unless otherwise specified by the client or governing standards.

9.2.5 Formwork Self-Weight

A uniformly distributed load of 0.5 to 1 kN/m² shall be considered to account for the weight of formwork components including sheathing, supports, and ties.

9.2.6 Load Distribution

All loads acting on formwork components shall be considered as uniformly distributed, unless specific local concentrations are identified through structural analysis.

9.2.7 Material Properties

The mechanical properties of construction materials (e.g., Modulus of Elasticity, permissible bending and shear stresses, and moment of inertia) shall be adopted from relevant Indian Standards:

- IS 4990 and IS 10701:2012 for plywood
- IS 883 for timber members
- IS 1161:1998 for structural steel tubes
- IS 456 and IS 800 for concrete and structural steel provisions, respectively.

9.2.8 Load Path Assumption

- It is assumed that the applied loads are transferred sequentially from:
    - Sheathing → Secondary beams → Primary beams → Props → Ground or permanent support system.

9.3 Formwork Design Guidelines

This section provides a formal methodology to guide the structural design of various formwork elements including sheathing (plywood), secondary member (studs), primary member (walers), tie rods and props. The guidelines ensure that the formwork system meets safety and serviceability requirements under applied loads.

9.3.1 Load Calculation

The total design load (W) acting on the formwork surface shall be determined using the following components:

9.3.1.1 For vertical design load

- Dead Load (DL) = Slab thickness × Unit weight of concrete
- Calculating dead load per unit area:
    - DL (kN/m²) = Unit weight of material (kN/m³) × Thickness (m)
- Calculating dead load per unit length:
    - DL (kN/m) = Unit weight of material (kN/m³) × Cross-sectional area (m²)

- Live Load (LL) = 20% of Dead Load (or as specified)
- Formwork Load (FWL) = 0.5 kN/m² (default value, unless specified)

Total Load = DL + LL + FWL

Total vertical Design Load (W) = 1.5 × Total Load (using Load Factor 1.5 for limit state method)

9.3.1.2 For Lateral design Load

According to CIRIA method,

- $P_{max} = D [C_1\sqrt{R}+C_2K\sqrt{(H-C_1\sqrt{R})}]$

OR

- $P_{max} = DH$,

Where;

- P_{max} is the maximum concrete pressure(kN/m^2)
- D is the density of concrete
- H is the height of vertical formwork
- C_1 is the co-efficient, dependent on the size and shape of the formwork (wall = 1, column = 1.5)
- C_2 is the co-efficient, dependent on the constituent material of the concrete
    - OPC without admixture = 0.30
    - OPC with admixture (without retarder) = 0.30
    - OPC with retarder = 0.45
- h is the vertical pour (m)
- R is rate of rise of concrete(m/h)
- T is temperature of the concrete (˚c)
- K is temperature co-efficient= $\left(\frac{36}{T+1}\right)^2$

9.3.2 Design of Sheathing (Plywood)

Sheathing shall be designed as a continuous member between secondary supports using formwork-grade plywood or steel plates. It shall be checked for bending, shear, and deflection in accordance with relevant standards to ensure structural safety and serviceability.

9.3.2.1 Material properties

f_b: allowable bending stress (N/mm²)

f_v: allowable shear stress (N/mm²)

E: modulus of elasticity (N/mm²)

9.3.2.2 Section properties

- $Section\ Modulus(Z) = \frac{bh^2}{6}$
- $Effective\ Shear\ Area\ A_{eff} = \left(\frac{5}{6}\right) * A$
- $Moment\ of\ Inertia\ \ I = \frac{bh^3}{12}$
- $EI(Flexural\ Rigidity) = E * I$

9.3.2.3 Allowable Value:

- $BM_{allow} = f_b * Z$
- $SF_{allow} = f_v * A_{eff}$
- $\Delta_{permissible} = \frac{L}{360}\ \ (or\ as\ specified)$

9.3.2.4 Trial Span (L)

- $BM_{allow} = \frac{WL^2}{10}$
- $SF_{allow} = 0.6 * W * L$
- $\Delta_{allow} = \frac{WL^4}{145EI}$

Choose the smallest L from above formula and check if,

$BM_{actual} < BM_{allow,}$ $SF_{actual} < SF_{allow}$ and $\Delta_{actual} < \Delta_{allow}$

Adopt L as the spacing for secondary member.

9.3.3 Design of Secondary member (Studs)

Secondary members shall be designed as continuous supports for sheathing, using materials compliant with IS 883:2016 (timber) or IS 1161:1998 (steel). They shall be checked for bending, shear, and deflection to meet strength and serviceability requirements.

9. 3.3.1 Load on Secondary member

$W_s = W \times L$

L: spacing of secondary member

9.3.3.2 Section Properties and Material properties

- $Section\ Modulus(Z) = \frac{bh^2}{6}, for\ rectangular\ section.\ Z = \frac{\pi(D_o^4 - D_i^4)}{32}, for\ MS\ pipe$
- $Effective\ Shear\ Area\ A_{eff} = \left(\frac{5}{6}\right) * A$

- $Moment\ of\ Inertia\ \ I = \frac{bh^3}{12}, for\ rectangular\ section.\ Z = \frac{\pi(D_o^4 - D_i^4)}{64}, for\ MS\ pipe$
- $EI(Flexural\ Rigidity) = E * I$
- $E = 2 * 10^5 \frac{N}{mm^2}, for\ steel$
- $For\ mild\ steel, f_y = 250 \frac{N}{mm^2}$
- $Permissible\ bending\ stress\ for\ mild\ steel,\ \ f_b = 0.66 f_y$
- $Permissible\ shear\ stress\ for\ mild\ steel, f_v = 0.44 f_y$

9.3.3.3 Allowable Values

- $BM_{allow} = f_b * Z$
- $SF_{allow} = f_v * A_{eff}$
- $\Delta_{permissible} = \frac{L}{360}\ \ (or\ as\ specified)$

9.3.3.4 Trial Spacing (L)

- $BM_{allow} = \frac{WL^2}{10}$
- $SF_{allow} = 0.6 * W * L$
- $\Delta_{allow} = \frac{WL^4}{145EI}$

Choose the minimum L from above formula and check if,

$BM_{actual} < BM_{allow,}$ $SF_{actual} < SF_{allow}$ and $\Delta_{actual} < \Delta_{allow}$

Adopt L as the spacing for primary member.

9.3.4 Design of primary member (Waler)

Primary members shall act as continuous load-bearing elements supporting secondary members, using materials compliance with IS 883:2016 (timber) or IS 1161:1998 (steel)

Material: Used timber batten or MS pipe

Checks: Bending, shear, and deflection

9.3.4.1 Load on primary Beam

$W_p = W_s \times L$

L: Spacing of primary member

9.3.4.2 Section Properties and Material properties

Same as secondary member steps

9.3.4.3 Allowable Values

- $BM_{allow} = f_b * Z$

- $SF_{allow} = f_v * A_{eff}$
- $\Delta_{permissible} = \frac{L}{360}$ $(or\ as\ specified)$

9.3.4.4 Trial Spacing (L)

- $BM_{allow} = \frac{WL^2}{10}$
- $SF_{allow} = 0.6 * W * L$
- $\Delta_{allow} = \frac{WL^4}{145EI}$

Choose the minimum L from above formula and check if,

$BM_{actual} < BM_{allow,}$ $SF_{actual} < SF_{allow}$ and $\Delta_{actual} < \Delta_{allow}$

If the above conditions are satisfied, the spacing L may be adopted based on the design load considered, vertical design load for props (e.g., slabs or beams) and lateral design pressure for tie rods (e.g., walls, columns, or beams).

9.3.5 Design of tie rods

Tie rods shall be designed to safely resist the specified lateral pressure from freshly placed concrete. Proper spacing and anchorage shall be provided to prevent formwork displacement or bulging. Removable cones shall be used to allow easy extraction and reuse without damaging the form surface.

- Use the spacing of tie rods (equal to the span of the primary members) and the spacing of walers (equal to the span of the secondary members) as input parameters.
- Calculate the design load acting on a single tie rod using the formula:

$$Load\ on\ each\ tie\ rods = lateral\ pressure * Influence\ area$$

9.3.6 Design of props

Props shall be designed as compression members to safely support specified vertical loads, in accordance with relevant material standards and stability requirements.

- Use the spacing of props (equal to primary members) and the spacing of waler (span of the secondary members) as an input parameter.
- Calculate the maximum load acting on each prop:

$$Load\ on\ each\ prop = Total\ vertical\ design\ load * Influence\ area$$

❖ Remarks: Detailed formwork design calculations are provided below for typical structural elements, including slabs, walls, beams, and columns. Each example includes step-by-step calculations along with typical 3D views and sectional diagrams to illustrate formwork configuration and component layout.

Appendix A: Illustrative Formwork Design Examples

A.1 Overview

This appendix provides detailed examples of formwork design calculations for common structural elements, including slabs, walls, beams, and columns.

A.2 Content Description

Each example includes:

- Step-by-step design calculations based on relevant loads and standards
- Typical 3D views illustrating the formwork layout
- Sectional diagrams showing key components

A.3 Purpose

These examples serve as guidance for proper formwork design and can be referenced during planning, verification, and site implementation to ensure compliance with structural and safety requirements.

1. Design of Slab formwork

Shuttering Details;

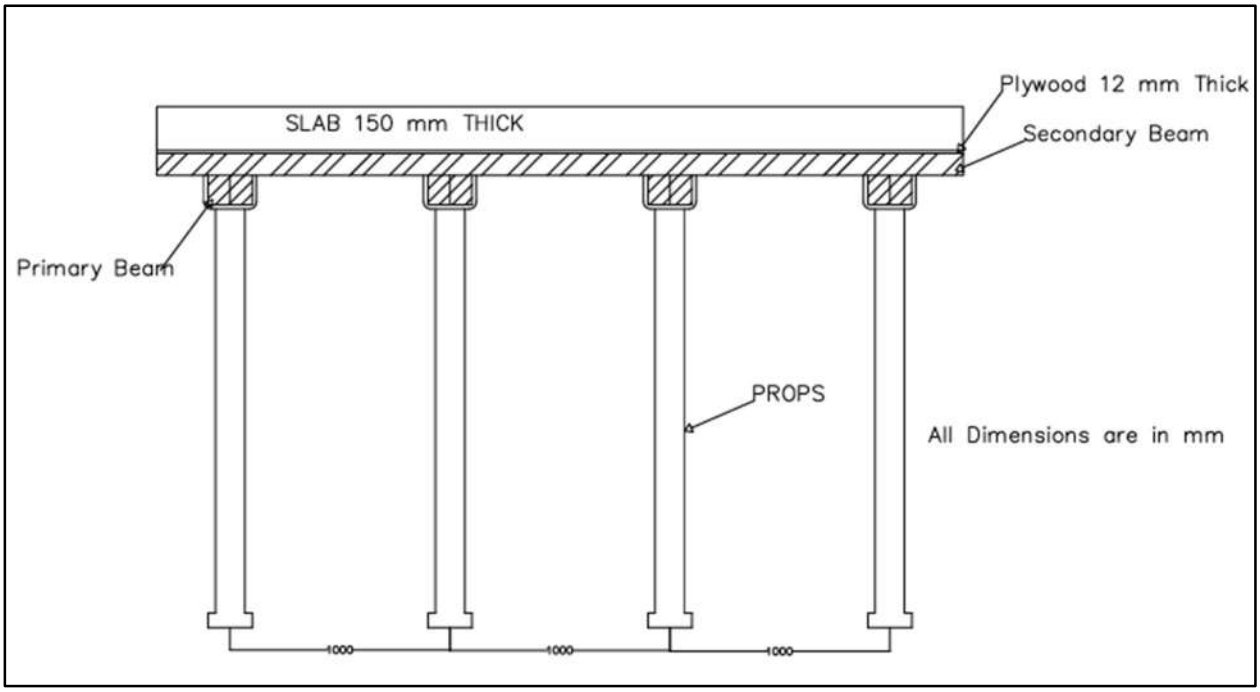


Figure 1: Shuttering details of slab formwork

1.1 Load calculation (For 150 mm thick slab)

1. Dead Load (LL) = 0.15 *26 = 3.9 kN/m^2
2. Live Load (20% of DL) = 0.2 * 3.9 = 0.78 kN/m^2
3. Formwork Load = 0.5 kN/m^2

Total Load = 3.9+0.78+0.5 = 5.18 kN/m^2

Total Design Load (W) = 1.5 * 5.18 = 7.77 kN/m^2

1.2 Design of sheathing member (Plywood)

Material used: Plywood = 12 mm

Allowable bending stress (f_b)= 14 N/mm^2

Allowable shear stress (f_v) = 6.16 N/mm^2

Section modulus of rectangular section

$Z = \frac{bh^2}{6} = 1 * \frac{0.012^2}{6} = 2.4 * 10^{-5}\ m^3 = 24 * 10^3\ mm^3$

Effective shear area (A_{eff}) $= \frac{5}{6} * A = \frac{5}{6} * (1 * 0.012) = 0.01\ m^2 = 10000\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 14 * 24 * 10^3 = 336000\ Nmm = 0.336\ kNm$

Allowable Shear Force (SF) $= f_v * A_{eff} = 6.16 * 10000 = 61600N = 61.6\ kN$

Permissible Deflection = L/360 or 6 mm

Total Design Load (W) = 7.77 kN/m^2

From BM,

$BM = \frac{wL^2}{10} = 0.336$

L = 0.66 m = 660 mm ----------1

From SF,

$SF = 5 * W * \frac{L}{8} = 6.16$

L = 1.270 m = 1270 mm--------2

From Deflection,

Deflection =$w * \frac{L^4}{145EI} = \frac{L}{360}$

E = 3.6 * 10^3 N/mm^2 = 3.6*10^6 kN/m^2

$I = \frac{bd^3}{12} = 1 * \frac{0.012^3}{12} = 1.44 * 10^{-7} m^4 = 144000\ mm^4$

EI = 0.5184 kNm^2

L = 0.3 m = 300 mm------3

Comparing 1,2 and 3. The spacing of secondary member is between 300 – 660 mm. So, take 460 mm as spacing for secondary member.

Actual bending moment;

$$BM = \frac{wL^2}{10} = 7.77 * \frac{0.46^2}{10} = 0.1644\ kNm$$

Actual shear force;

$$SF = \ 0.6 * W * L = 0.6 * 7.77 * 0.46 = 2.144\ kN$$

Actual deflection;

$$Deflection = \ w * \frac{L^4}{145EI} = 7.77 * \frac{0.46^4}{145 * 0.5184} = 4\ mm$$

Therefore, actual < allowable BM, SF, Deflection. Hence, it is safe.

1.3 Design of secondary member (Studs)

Sawn timber (50 mm * 75 mm) of class C

Allowable bending stress (f_b) = 7.6 N/mm^2

Allowable shear stress (f_v) = 0.7 N/mm^2

Permissible Deflection = L/360 or 6 mm

Section modulus of rectangular section(Z) $= \frac{bh^2}{6} = 50 * \frac{75^2}{6} = 46875\ mm^3$

Effective shear area (A_{eff}) $= \frac{5}{6} * A = \frac{5}{6} * (50 * 60) = 2500\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 7.6 * 46875 = 356250\ Nmm = 0.357\ kNm$

Allowable Shear Force (SF) = $f_v * A_{eff} = 0.7 * 2500 = 1750\ N = 1.750\ kN$

Spacing of secondary member (L) = 460 mm

The New load will be (W1) = 7.116 *0.46 = 3.27336 kN/m

From BM,

$$\text{BM} = W1 * \frac{L^2}{10} = 3.27336 * \frac{L^2}{10} = 0.357$$

L=1.044 m = 1044 mm-----4

From SF,

$$SF = 0.6 * W1 * L = 1.75$$

L = 0.89 m= 890 mm --------5

From Deflection,

$$Deflection = W1 * \frac{L^4}{145EI} = \frac{L}{360}$$

E= $84.1*10^3$ N/mm^2

$$Moment\ of\ inertia(I) = \frac{bd^3}{12} = 0.05 * \frac{0.075^3}{12} = 1.76 * 10^{-6} m^4$$

EI = $84.1*10^3*1000*1.76*10^{-6}$=148.016 kNm^2

L=2.63 m = 2630 mm-------6

Comparing equ, 4,5 and 6, take spacing of primary member between 800 mm to 1500 mm. So, take 800 mm as spacing for primary member.

Actual BM;

$$BM = \frac{wL^2}{10} = 3.27336 * \frac{0.8^2}{10} = 0.209 kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 3.27336 * 0.8 = 1.57\ kN$$

Actual Deflection;

$$Deflection = \frac{w * L^4}{145EI} = \frac{3.27336 * 0.8^4}{384 * 148.016} = 0.02358\ mm$$

Therefore, actual BM, SF and Deflection is less than the allowable BM, SF and deflection, hence it is safe.

1.4 Design of the primary member (Waler)

Sawn timber (50 mm * 75 mm) of class C

Allowable bending stress (f_b) = 7.6 N/mm^2

Allowable shear stress (f_v) = 0.7 N/mm^2

Permissible Deflection = L/360 or 6 mm

Section modulus of rectangular section(Z) $= \frac{bh^2}{6} = 50 * \frac{75^2}{6} = 46875\ mm^3$

Effective shear area (A_{eff}) $= \frac{5}{6} * A = \frac{5}{6} * (50 * 60) = 2500\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 7.6 * 46875 = 356250\ Nmm = 0.357\ kNm$

Allowable Shear Force (SF) $= f_v * A_{eff} = 0.7 * 2500 = 1750\ N = 1.750\ kN$

Spacing of primary member (L) = 800 mm

The New load will be (W1) = 3.27336 * 0.8 = 2.6187 kN/m

From BM,

$$BM = W1 * \frac{L^2}{10} = 2.6187 * \frac{L^2}{10} = 0.357$$

L=1.167 m = 1167 mm-----4

From SF,

$SF = 0.6 * W1 * L = 1.75$

L = 1.114 m= 1114 mm --------5

From Deflection,

Deflection = $W1 * \frac{L^4}{145EI} = \frac{L}{360}$

E= 84.1*10^3 N/mm^2

Moment of inertia (I) =$\frac{bd^3}{12} = 0.05 * \frac{0.075^3}{12} = 1.76 * 10^{-6} m^4$

EI = 84.1*10^3*1000*1.76*10^{-6} = 148.016 kNm^2

L = 2.83 m = 2830 mm-------6

Comparing equ, 4,5 and 6, take spacing of prop between 1000 mm to 1500 mm. So, take 1000 mm as spacing for prop.

Actual BM;

$$BM = \frac{wL^2}{10} = 2.6187 * \frac{1^2}{10} = 0.262 kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 2.6187 * 1 = 1.57\ kN$$

Actual Deflection;

$$Deflection = \frac{w * L^4}{145EI} = \frac{2.6187 * 1^4}{145 * 148.016} = 0.122\ mm$$

Therefore, Actual BM, SF and Deflection is less than the allowable BM, SF and deflection, hence it is safe.

1.5 Design of props

Spacing of prop along primary member = 1000 mm

Spacing of prop along secondary member = 800 mm

Influence area on prop P = (500+500) mm*(400+400) mm = 0.8 sq.m

As per our Load calculation, Total load = 7.77 kN/m^2

Load on prop p = 7.77 kN/m^2 *0.8 m^2 = 6.216 kN ≈ 7 kN

Therefore, we have to choose prop having capacity greater than 7 kN.

Table 1: Summary table of slab formwork

Component	Function	Material	Span (mm)	Size/Section	Capacity Check	Deflection Check
Sheathing	Load transfer surface	12 mm plywood	460 mm (btw joists)	12 mm thick plywood	ok	ok
Secondary Member	Supports sheathing	Timber batten	460 mm	50 × 75 mm timber	ok	ok
Primary Member	Supports joists	Timber batten	800 mm	50 × 75 mm timber	ok	ok
Props	Resists vertical Load	Telescopic steel prop	1000 mm	1000 mm c/c	Must select the props having capacity more than 7 kN	

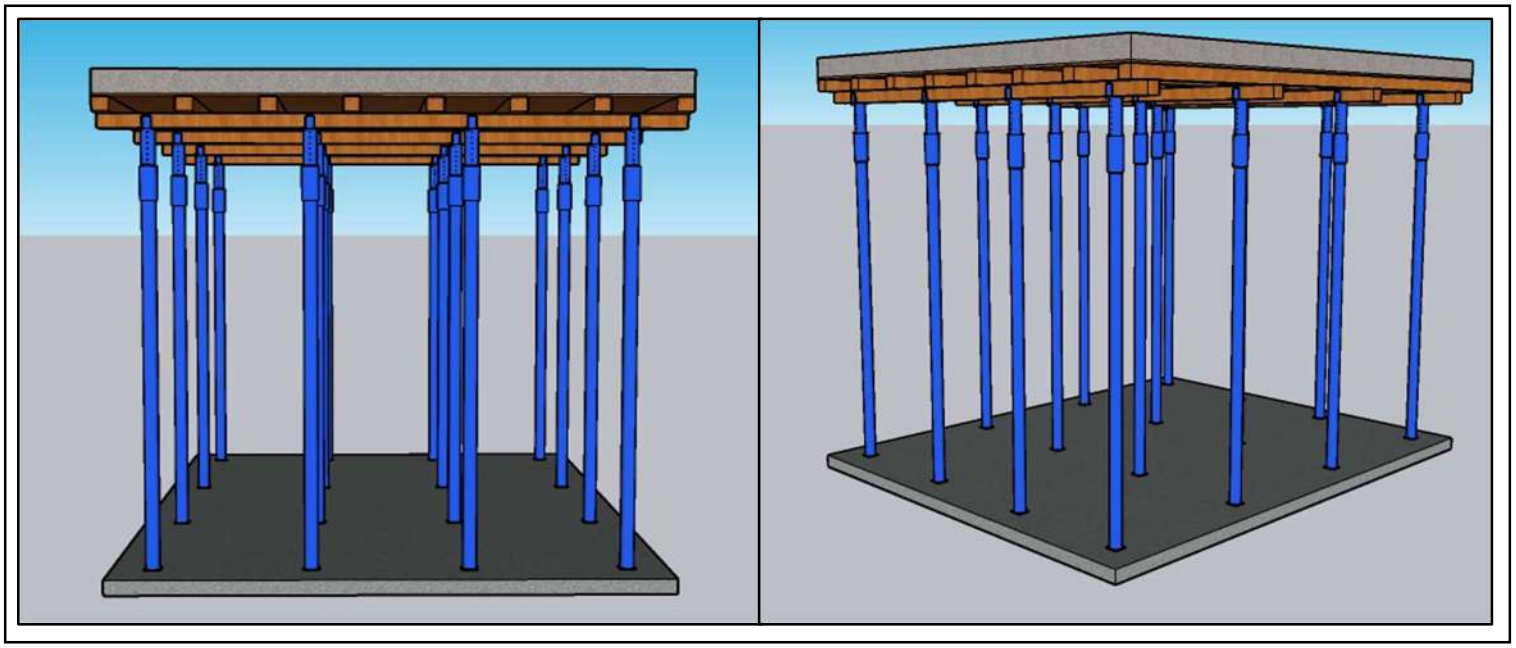


Figure 2: 3-D view of slab formwork

2. Design of wall formwork: Based on Construction Industry Research and information Association **(CIRIA)** method

2.1 Data for Design calculation

- Density of concrete (D) = 26 kN/m^3
- Rate of Rise (R) = 1 m/hr
- T = 25 ˚C
- Form height (H) = 3.6 m
- Pour height (h) = 3.6 m
- Sheathing member = 12 mm (thick plywood)
- Secondary member = Sawn timber (50 mm * 75 mm)
- Primary member = Steel waler
- Tie Rod = 15 mm Diameter Tie Rod,assume
- Shape constant (C_1) = 1; Rectangular or square sections,
- Concrete constituent Factor (C_2) = 0.45; Ordinary Portland cement (OPC) with standard constituents and no extreme admixtures.
- Temperature co-efficient (k) = $\left(\frac{36}{T+16}\right)^2 = 0.77$

2.2 Load calculation

P_{max} = D [$C_1\sqrt{R}+C_2K\sqrt{(H-C_1\sqrt{R})}$]

= 40.55 kN/m^2

When $C_1\sqrt{R} > H$

P_{max} = Dh = 26* 3.6 = 93.60 kN/m^2

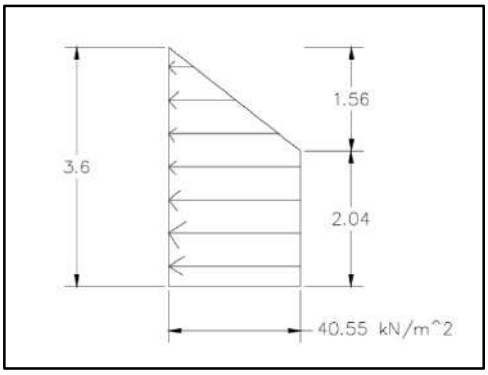


Figure 3: Pressure diagram of wall formwork

2.3 Design of Sheathing member

Material used: Plywood = 12 mm

Allowable bending stress (f_b)= 14 N/mm^2

Allowable shear stress (f_v) = 6.16 N/mm^2

Section modulus of rectangular section

$Z = \frac{bh^2}{6} = 1 * \frac{0.012^2}{6} = 2.4 * 10^{-5}\ m^3 = 24 * 10^3\ mm^3$

Effective shear area (A_{eff}) $= \frac{5}{6} * A = \frac{5}{6} * (1 * 0.012) = 0.01\ m^2 = 10000\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 14 * 24 * 10^3 = 336000\ Nmm = 0.336\ kNm$

Allowable Shear Force (SF) = $f_v * A_{eff} = 6.16 * 10000 = 61600N = 61.6\ kN$

Permissible Deflection = L/360 or 6 mm

Total Design Load (W) = 40.55 kN/m^2

From BM,

$BM = \frac{wL^2}{10} = 0.336$

L = 0.29 m = 290 mm ----------1

From SF,

$SF = 0.6 * W * L = 6.16$

L = 0.26 m = 260 mm--------2

From Deflection,

$Defelction = w * \frac{L^4}{145EI} = \frac{L}{360}$

E = 3.6 * 10^3 N/mm^2 = 3.6*10^6 kN/m^2

$I = \frac{bd^3}{12} = 1 * \frac{0.012^3}{12} = 1.44 * 10^{-7} m^4 = 144000\ mm^4$

EI = 0.5184 kNm^2

L = 0.18 m = 180 mm------3

Comparing 1,2 and 3. The spacing of secondary member is between 180 mm to 300 mm. So, take 250 mm as spacing for secondary member.

Actual bending moment

$BM = \frac{wL^2}{10} = 40.55 * \frac{0.25^2}{10} = 0.253\ kNm$

Actual shear force

$SF = 0.6 * W * L = 0.6 * 40.55 * 0.25 = 6.0825\ kN$

Actual deflection

$Deflection = w * \frac{L^4}{145EI} = 40.55 * \frac{0.25^4}{145 * 0.5184} = 2.1\ mm$

Therefore, Actual < Allowable BM, SF, Deflection. So, it is safe.

2.4 Design of Secondary member

Sawn timber (75 mm * 100 mm) of Class C

Allowable bending stress (f_b) = 7.6 N/mm^2

Allowable shear stress (f_v) = 0.7 N/mm^2

Permissible Deflection = L/360 or 6 mm

Section modulus of rectangular section (Z) = $\frac{bh^2}{6} = 75 * \frac{100^2}{6} = 125000\ mm^3$

Effective shear area (A_{eff}) = $\frac{5}{6} * A = \frac{5}{6} * (75 * 100) = 6250\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 7.6 * 125000 = 950000\ Nmm = 0.95\ kNm$

Allowable Shear Force (SF) $= f_v * A_{eff} = 0.7 * 6250 = 4375\ N = 4.375\ kN$

Spacing of secondary member (L) = 250 mm

The New load will be (W1) = 40.55 * 0.25 = 10.1375 kN/m

From BM,

BM $= W1 * \frac{L^2}{10} = 10.1375 * \frac{L^2}{10} = 0.95$

L= 0.97 m = 970 mm-----4

From SF,

$SF = 0.6 * W1 * L = 4.375$

L = 0.719 m = 719 mm --------5

From Deflection,

$$Deflection = W1 * \frac{L^4}{145EI} = \frac{L}{360}$$

E= 84.1*10^3 N/mm^2

$$Moment\ of\ inertia(I) = \frac{bd^3}{12} = 0.075 * \frac{0.1^3}{12} = 6.25 * 10^{-6} m^4$$

EI = 84.1*10^3*1000*6.25*10^{-6} = 525.625 kNm^2

L=2.75 m = 2750 mm-------6

Comparing equ, 4,5 and 6, take spacing of primary member between 700 mm to 1000 mm. So, take 710 mm as spacing for primary member.

Actual BM;

$$BM = \frac{wL^2}{10} = 10.1375 * \frac{0.71^2}{10} = 0.511\ kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 10.1375 * 0.71 = 4.31\ kN$$

Actual Deflection;

$$Deflection = \frac{w * L^4}{145EI} = \frac{10.1375 * 0.71^4}{145 * 525.625} = 0.0338\ mm$$

Therefore, actual BM, SF and Deflection is less than the allowable BM, SF and deflection, hence it is safe.

2.5 Design of primary member (Steel Waler)

Material: MS pipe (tubular steel)

From IS 1161.1998

Size and properties of MS pipe (Steel tubes)

D_o= 42.4 mm = 4.24 cm

D_i = 32 mm = 3.2 cm

Thickness heavy (t)= 4 mm = 0.4 cm

Across-section = 4.82 cm^2

Moment of inertia (I) = 8.99 cm^4

E = 2* 10^5 N/mm^2

EI = 17980 kNm^2

Formula to calculate Moment of inertia(I);

$$I = \frac{\pi(Do^4 - Di^4)}{64}$$

Moment of section (Z) = 4.24 cm^3

Formula to calculate Moment of section (Z)

$$Z = \frac{\pi(Do^4 - Di^4)}{32}$$

Spacing of primary member = 710 mm

The New load will be (W) = 10.1375 * 0.71 = 7.198 kN/m

Allowable Bending moment

For mild steel pipe F_y = 250 N/mm^2

Permissible bending stress (F_b)

F_b = 0.66 F_y = 0.66*250 = 165 N/mm^2

$BM_{allowable}$ = F_b *Z = 165 *4.24*1000 = 1683000 Nmm = 0.7 kNm

Allowable Shear Force

A_v = 4.82 cm^2

$$A_v = \frac{2}{3} * A = \frac{2}{3} * 4.82 = 3.213\ cm^2$$

Permissible shear stress (IS800:2007)

$\tau_v = 0.40\ F_y = 0.40*250 = 100\ N/mm^2$

$V_{allowable} = \tau_v * A_v = 100*3.213*100 = 32130\ N = 32.130\ kN$

Defection limit

$\Delta_{limit} = \frac{L}{250} = \frac{710}{250} = 2.84\ mm$

From BM,

$BM = W * \frac{L^2}{10} = 7.198 * \frac{L^2}{10} = 0.7$

L= 0.99 m = 990 mm

Take spacing of Tie rod as 900 mm.

Actual BM,

$\text{BM} = W * \frac{L^2}{10} = 7.198\ * \frac{0.9^2}{10} = 0.58\ kNm$

Actual SF,

$SF = 0.6 * W * L = 0.6 * 7.198 * 0.9 = 3.8869\ kN$

Actual Deflection,

$\Delta_{actual} = W * \frac{L^4}{145EI} = 7.198 * \frac{900^4}{145*2*10^5*8.99*10^4} = 1.8\ mm$

Therefore, actual < allowable BM, SF, deflection. Hence safe.

2.6 Design of Tie Rod

Spacing of Tie (Span of primary member) = 900 mm

Spacing of waler (Span of secondary member) = 710 mm

Load on Tie rod = 40.55 *0.71*0.9=25.91 kN

Maximum Force on each horizontal tie = 26 kN

So, we have to choose the tie rod having greater capacity than 26 kN.

Table 2: Summary table of wall formwork

Component	Function	Material	Spacing	Size/Section	Capacity Check	Deflection Check
Sheathing	Load transfer surface	12 mm plywood	250 mm (btw joists)	12 mm thick plywood	ok	ok
Secondary Member	Supports sheathing	Timber batten	250 mm	75 × 100 mm timber	ok	ok
Primary Member	Supports joists	MS pipe	710 mm	Hollow MS pipe (D_o=42.4 mm, D_i=32 mm)	ok	ok
Tie Rod	Resists lateral pressure	Steel rod	900 mm	15 mm dia rod @ 900 mm c/c	Must select the tie rod having capacity more than 26 kN	

3. Design of Beam formwork

Dimension of beam

B = 0.3 m=300 mm

D = 0.4 m=400 mm

3.1 **Vertical Load calculation (0.3 m * 0.4 m)**

1. Dead Load = 0.3*0.4 *26 = 3.12 kN/m
2. Live Load (20% of DL) = 0.2 * 3.12 = 0.624 kN/m
3. Formwork Load = 0.5 kN/m

Total Load = 3.12+0.624+1 = 4.744 kN/m

Total Design Load (W) = 1.5 * 4.744 = 7.116 kN/m

3.2 Lateral Load calculation

P_{max} = D * h

- D is the density of the concrete
- h is the liquid head (height of unset concrete)

P_{max} = 26 * 0.4 = 10.4 kN/m^2

3.3 Design of sheathing member (Plywood)

3.3.1. Sheathing member for Vertical Design Load

Material used

Plywood = 12 mm

Allowable bending stress (f_b)= 14 N/mm^2

Allowable shear stress (f_v) = 6.16 N/mm^2

Section modulus of rectangular section

$Z = \frac{bh^2}{6} = 1 * \frac{0.012^2}{6} = 2.4 * 10^{-5}\ m^3 = 24 * 10^3\ mm^3$

Effective shear area (A_{eff}) $= \frac{5}{6} * A = \frac{5}{6} * (1 * 0.012) = 0.01\ m^2 = 10000\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 14 * 24 * 10^3 = 336000\ Nmm = 0.336\ kNm$

Allowable Shear Force (SF) = $f_v * A_{eff} = 6.16 * 10000 = 61600N = 61.6\ kN$

Permissible Deflection = L/360 or 6 mm

E = 3.6 * 10^3 N/mm^2 = 3.6*10^6 kN/m^2

$I = \frac{bd^3}{12} = 1 * \frac{0.012^3}{12} = 1.44 * 10^{-7} m^4 = 144000\ mm^4$

EI = 0.5184 kNm^2

Total Design Load (W) = 7.116 kN/m

From BM,

$$BM = \frac{wL^2}{10} = 0.336$$

L = 0.687 m = 687 mm ----------1

From SF,

$$SF = 0.6 * W * L = 6.16$$

L =1.44 m = 1440 mm--------2

From Deflection,

Deflection =$w * \frac{L^4}{145EI} = \frac{L}{360}$

L = 0.308 m = 308 mm----------3

Comparing 1,2 and 3. The Maximum spacing of secondary member is 300 mm c/c. So, take 150 mm as spacing for secondary member.

Actual BM;

$$BM = \frac{wL^2}{10} = 7.116 * \frac{0.15^2}{10} = 0.02\ kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 7.116 * 0.15 = 0.64\ kN$$

Actual Deflection;

$$Deflection = \frac{L}{360} = \frac{150}{360} = 0.416\ mm$$

Actual BM, SF, deflection < Allowable BM, SF, deflection. Hence, safe.

3.3.2 Sheathing member for Lateral Design Load

Maximum Lateral pressure

P_{max} = 10.4 kN/m^2

Material used: Plywood = 12 mm

Allowable bending stress (f_b)= 14 N/mm^2

Allowable shear stress (f_v) = 6.16 N/mm^2

Section modulus of rectangular section

$$Z = \frac{bh^2}{6} = 1 * \frac{0.012^2}{6} = 2.4 * 10^{-5}\ m^3 = 24 * 10^3\ mm^3$$

$$\text{Effective shear area (Aeff)} = \frac{5}{6} * A = \frac{5}{6} * (1 * 0.012) = 0.01\ m^2 = 10000\ mm^2$$

Allowable Bending Moment (BM) = $f_b * Z = 14 * 24 * 10^3 = 336000\ Nmm = 0.336\ kNm$

Allowable Shear Force (SF) = $f_v * A_{eff} = 6.16 * 10000 = 61600N = 61.6\ kN$

Permissible Deflection = L/360 or 6 mm

E = 3.6 * 10^3 N/mm^2 = 3.6*10^6 kN/m^2

$$I = \frac{bd^3}{12} = 1 * \frac{0.012^3}{12} = 1.44 * 10^{-7} m^4 = 144000\ mm^4$$

EI = 0.5184 kNm^2

Total Design Load (W) = 10.4 kN/m

From BM,

$$BM = \frac{wL^2}{10} = 0.336$$

L = 0.323m = 323 mm ----------1

From SF,

$$SF = 0.6 * W * L = 6.16$$

L =0.98 mm= 980 mm--------2

From Deflection,

Deflection $= w * \frac{L^4}{145EI} = \frac{L}{360}$

L = 0.272 m = 272 mm----------3

Comparing 1,2 and 3. The spacing of secondary member is 250 – 400 mm c/c. So, take 320 mm as spacing for secondary member.

Actual BM;

$$BM = \frac{wL^2}{10} = 10.4 * \frac{0.32^2}{10} = 0.106\ kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 10.4 * 0.32 = 1.99\ kN$$

Actual Deflection;

$$Deflection = \frac{L}{360} = \frac{320}{360} = 0.888\ mm$$

Therefore, Actual BM, SF and Deflection < Allowable BM, SF and Deflection, safe.

3.4 Design of secondary member (Studs)

3.4.1 Secondary member for Vertical Design Load

Sawn timber (50 mm * 75 mm) of Class C

Allowable bending stress (f_b) = 7.6 N/mm^2

Allowable shear stress (f_v) = 0.7 N/mm^2

Permissible Deflection = L/360 or 6 mm

Section modulus of rectangular section(Z) $= \frac{bh^2}{6} = 50 * \frac{75^2}{6} = 46875\ mm^3$

Effective shear area (Aeff) $= \frac{5}{6} * A = \frac{5}{6} * (50 * 60) = 2500\ mm^2$

Allowable Bending Moment (BM) $= f_b * Z = 7.6 * 46875 = 356250\ Nmm = 0.357\ kNm$

Allowable Shear Force (SF) $= f_v * A_{eff} = 0.7 * 2500 = 1750\ N = 1.750\ kN$

Spacing of secondary member = 150 mm

The New load will be (W) = 7.116 *0.15 = 1.0674 kN/m

Actual BM;

$$BM = \frac{wL^2}{10} = 1.0674 * \frac{0.15^2}{10} = 0.003kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 1.0674 * 0.15 = 0.096\ kN$$

Actual Deflection;

$$Deflection = \frac{w * L^4}{145 * EI} = \frac{1.0674 * 0.15^4}{145 * 148.016} = 0.000025\ mm$$

Therefore, actual BM, SF and Deflection is less than the allowable BM, SF and deflection, hence it is safe.

From BM,

$$\text{BM } = W * \frac{L^2}{10} = 1.0674 * \frac{L^2}{10} = 0.003$$

L= 0.168 m = 168 mm-----4

From SF,

$$SF = 0.6 * W * L = 0.097$$

L = 0.151 m = 151 mm --------5

From Deflection,

$$\text{Deflection } = W * \frac{L^4}{145 * EI} = \frac{L}{360}$$

E= 84.1*10^3 N/mm^2

$$\text{Moment of inertia (I)} = \frac{bd^3}{12} = 0.05 * \frac{0.075^3}{12} = 1.76 * 10^{-6} m^4$$

EI = 84.1*10^3*1000*1.76*10^{-6}=148.016 kNm^2

L=2.7 m = 2700 mm-------6

Comparing equ, 4,5 and 6, take spacing of primary member between 150 mm to 300 mm. So, take 300 mm as spacing for primary member.

3.4.2 Secondary member for Lateral Design Load

Sawn timber (50 mm * 75 mm) of class C

Allowable bending stress (f_b) = 7.6 N/mm^2

Allowable shear stress (f_v) = 0.7 N/mm^2

Permissible Deflection = L/360 or 6 mm

Section modulus of rectangular section(Z) $= \frac{bh^2}{6} = 50 * \frac{75^2}{6} = 46875\ mm^3$

Effective shear area (A_{eff}) = $= \frac{5}{6} * A = \frac{5}{6} * (50 * 60) = 2500\ mm^2$

Allowable Bending Moment (BM) = $f_b * Z = 7.6 * 46875 = 356250\ Nmm = 0.357\ kNm$

Allowable Shear Force (SF) $= f_v * A_{eff} = 0.7 * 2500 = 1750\ N = 1.750\ kN$

E= 84.1*10^3 N/mm^2

Moment of inertia (I) $=\frac{bd^2}{12} = 0.05 * \frac{0.075^3}{12} = 1.76 * 10^{-6} m^3$

EI = 84.1*1000*1000*1.76*10^{-6}=148 kNm

Spacing of secondary member = 320 mm

The New load will be (W) = 10.4 *0.32 = 3.328 kN/m

Actual BM;

$$BM = \frac{wL^2}{10} = 3.328 * \frac{0.32^2}{10} = 0.034\ kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 3.328 * 0.32 = 0.638\ kN$$

Actual Deflection;

$$Deflection = \frac{w * L^4}{145 * EI} = \frac{3.328 * 0.32^4}{145 * 148} = 0.0016\ mm$$

Therefore, Actual BM, SF and Deflection is less than the allowable BM, SF and deflection, hence it is safe.

From BM,

$$BM = W * \frac{L^2}{10} = 3.328 * \frac{L^2}{10} = 0.034$$

L=0.32 m = 320 mm-----4

From SF,

$$SF = 0.6 * W * L = 0.638$$

L = 0.319 m = 350 mm --------5

From Deflection,

$$Deflection = W * \frac{L^4}{145 * EI} = \frac{L}{360}$$

L=2.6 m = 2600mm-------6

Comparing equ, 4,5 and 6, take spacing of primary member between 300 mm to 400 mm. So, spacing of primary member shall be taken as 350 mm

3.5 Primary member (Waler) calculation

3.5.1 Primary member for Vertical Design Load

Material: MS pipe

Size and properties of MS pipe (Steel tubes)

From IS 1161.1998

D_o= 42.4 mm = 4.24 cm

D_i = 32 mm = 3.2 cm

Thickness heavy (t)= 4 mm = 0.4 cm

Across-section = 4.82 cm^2

Moment of inertia (I) = 8.99 cm^4

Formula to calculate Moment of inertia(I);

$$I = \frac{\pi(Do^4 - Di^4)}{64}$$

Moment of section (Z) = 4.24 cm^3 = 4240 mm^3

Formula to calculate Moment of section (Z)

$$Z = \frac{\pi(Do^4 - Di^4)}{32}$$

E = 200000 N/mm^2

EI = $2*10^5*8.99*10^4 = 1.798 *10^{10}$ Nmm^2

Spacing of primary member (L) = 300 mm

The New load will be (W) = 1.0674 * 0.3 = 0.321 kN/m

Allowable Bending moment;

For mild steel pipe F_y = 250 N/mm^2

$F_b = 0.66\ F_y = 0.66*250 = 165$ N/mm^2

$BM_{allowable} = F_b *Z = 165 *4240 = 699600$ Nmm = 0.7 kNm

Allowable Shear Force;

A = 4.82 cm^2

$$A_v = \frac{2}{3} * A = \frac{2}{3} * 4.82 = 3.21\ cm^2$$

Permissible shear stress

$\tau_v = 0.40\ F_y = 0.40*250 = 100\ N/mm^2$

$V_{allowable} = \tau_v * A_v = 100*3.21*100 = 32100\ N = 32.1\ kN$

Defection limit;

$$\Delta limit\ = \frac{L}{250} = \frac{150}{250} = 0.6\ mm$$

Actual BM;

$$BM = W * \frac{L^2}{10} = 0.321 * \frac{0.3^2}{10} = 0.0029\ kNm$$

Actual SF;

$$SF = 0.6 * W * L = 0.6 * 0.321 * 0.3 = 0.0963\ kN$$

Actual Deflection;

$$\Delta actual = W * \frac{L^4}{145*EI} = 0.321 * \frac{0.3^4}{145*17980} = 9.97 * 10^{-7} mm$$

Actual < Allowable BM, SF, Deflection. Hence, safe.

From BM,

$$BM = W * \frac{L^2}{10} = 0.321\ * \frac{L^2}{10} = 0.0029$$

L= 0.3 m = 300 mm---------7

From SF,

$$SF = 0.6 * W * L = 0.0963$$

L = 0.5 m = 500 mm --------8

From Deflection,

$$Deflection = W * \frac{L^4}{145*EI} = \frac{L}{360}$$

L= 0.29 m = 290 mm-------9

Comparing equ, 7,8 and 9, take spacing of prop between 150 mm to 450 mm. So, take 400 mm as a spacing of prop.

3.5.2 Primary member for Lateral Design Load

Material: MS pipe

Size and properties of MS pipe (Steel tubes)

From IS 1161.1998

D_o= 42.4 mm = 4.24 cm

D_i = 32 mm = 3.2 cm

Thickness heavy (t)= 4 mm = 0.4 cm

Across-section = 4.82 cm^2

Moment of inertia (I) = 8.99 cm^4

Formula to calculate Moment of inertia(I);

$$I = \frac{\pi(Do^4 - Di^4)}{64}$$

Moment of section (Z) = 4.24 cm^3 = 4240 mm^3

Formula to calculate Moment of section (Z)

$$Z = \frac{\pi(Do^4 - Di^4)}{32}$$

Radius of gyration (r) = 1.98 cm

E = 200000 N/mm^2

EI = 17980 kNm^2

Spacing of primary member(L) = 350 mm

The New load will be (W) = 3.328*0.35 = 1.1648 kN/m

Allowable Bending moment;

For mild steel pipe F_y = 250 N/mm^2

F_b = 0.66 F_y = 0.66*250 = 165 N/mm^2

$BM_{allowable}$ = F_b *Z = 165 *4240= 699600 Nmm = 0.7 kNm

Allowable Shear Force;

A = 4.82 cm^2

$$A_v = \frac{2}{3} * A = \frac{2}{3} * 4.82 = 3.21\ cm^2$$

Permissible shear stress (IS800:2007)

$\tau_v = 0.40\ F_y = 0.40*250 = 100\ N/mm^2$

$V_{allowable} = \tau_v * A_v = 100*3.21*100 = 32100\ N = 32.1\ kN$

Actual BM

$$BM = W * \frac{L^2}{10} = 1.1648 * \frac{0.35^2}{10} = 0.0143\ kNm$$

Actual SF

$$SF = 0.6 * W * L = 0.6 * 1.1648 * 0.35 = 0.245\ kN$$

Actual Deflection

$$\Delta\text{actual} = W * \frac{L^4}{145 * EI} = 1.1648 * \frac{0.35^4}{145 * 17980} = 6.7 * 10^{-6} mm$$

Therefore, actual < allowable BM, SF, deflection. So, it is safe.

From BM,

$$BM = W * \frac{L^2}{10} = 1.1648 * \frac{L^2}{10} = 0.0143$$

L= 0.35 m = 350 mm-----7

From SF,

$$SF = 0.6 * W * L = 0.245$$

L = 0.354 m = 354 mm --------8

From Deflection,

$$Deflection = W * \frac{L^4}{145 * EI} = \frac{L}{360}$$

L=0.28 m = 280 mm-------9

Comparing equ, 7,8 and 9, take spacing of tie rod between 200 mm to 400 mm. So, take 300 mm as a spacing of tie rod.

3.6 Design of vertical loads on props

Spacing of prop (Along length) = 400 mm

Spacing of prop (Along width) = 150 mm

Influence area on prop P = (200+200) mm*(75+75) mm = 0.06 sq.m

As per our Load calculation, Total load =7.116 kN/m

Load on prop p = 7.116 * 0.06 = 0. 46 kN ≈ 1kN

Therefore, we have to choose prop having capacity greater than 1kN.

3.7 Tie rod calculation

Spacing of tie rod (Along length) = 300 mm

Spacing of tie rod (Along depth of beam) = 350 mm

Load on each Tie rod = 10.4* (0.3 *0.35) = 1.092kN ≈ 2 kN

Therefore, we have to choose tie rod having capacity greater than 2 kN.

Table 3: Summary table of beam formwork

Component	Loading type	Function	Material	Spacing	Size/Section	Capacity Check	Deflection Check
Sheathing	Vertical Design Load	Load transfer surface	Plywood	320 mm (btw joists)	12 mm thick plywood	ok	ok
	Lateral Design load		Plywood	320 mm (btw joists)	12 mm thick plywood	ok	ok
Secondary Member	Vertical Design Load	Supports sheathing member	Timber batten (Class C)	150 mm	50 × 75 mm timber	ok	ok
	Lateral Design load		Timber batten (Class C)	320 mm	50 × 75 mm timber	ok	ok
Primary Member	Vertical Design Load	Supports secondary member/joists (Studs)	MS pipe	300 mm	Hollow MS pipe (D_o=42.4 mm, D_i=32 mm)	ok	ok
	Lateral Design load		MS pipe	350 mm	Hollow MS pipe (D_o=42.4 mm, D_i=32 mm)	ok	ok
Tie Rod	Lateral Design load	Resists lateral pressure	Steel rod	300 mm	10 mm dia rod @ 300 mm c/c	Must select the tie rod having capacity more than 2 kN	
Props	Vertical Design Load	Resists vertical load	Steel rod	400 mm	60 mm dia rod @ 400 mm c/c	Must select the props having capacity more than 1 kN	

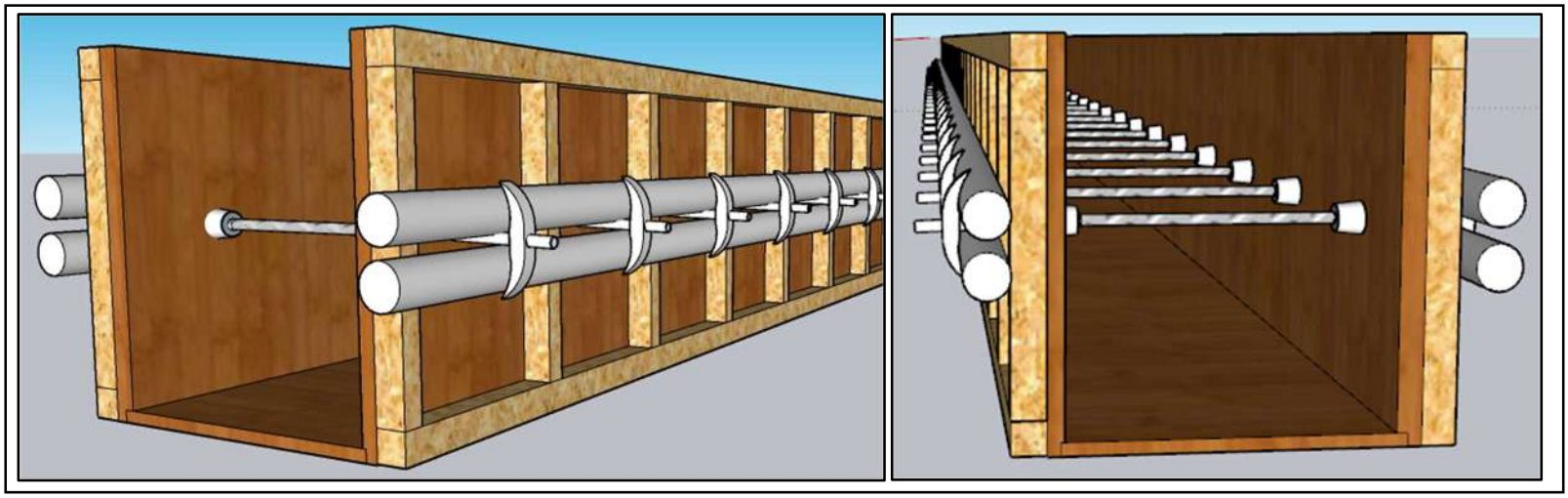


Figure 4: 3-D view of beam formwork

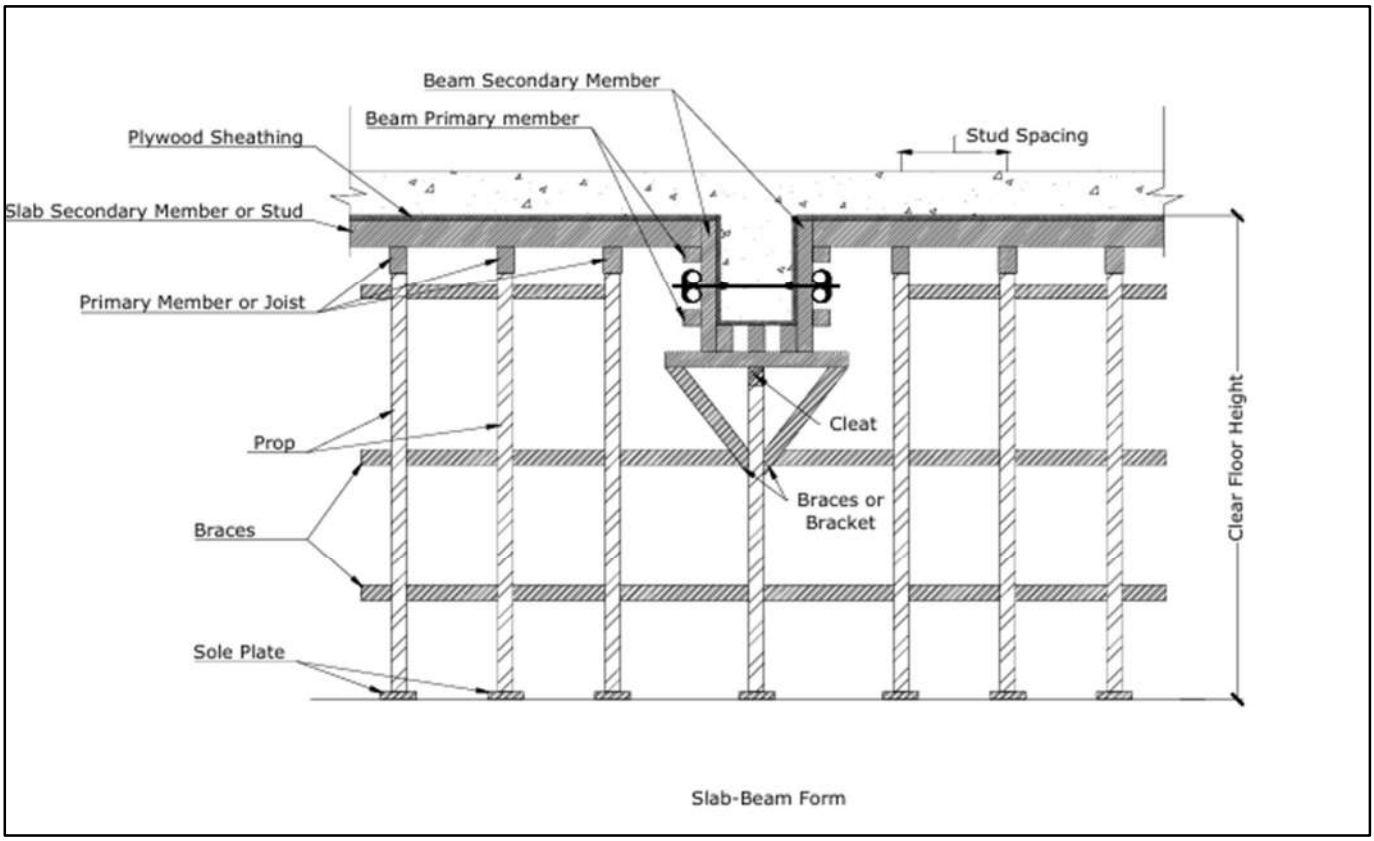


Figure 5: Slab-Beam formwork diagram

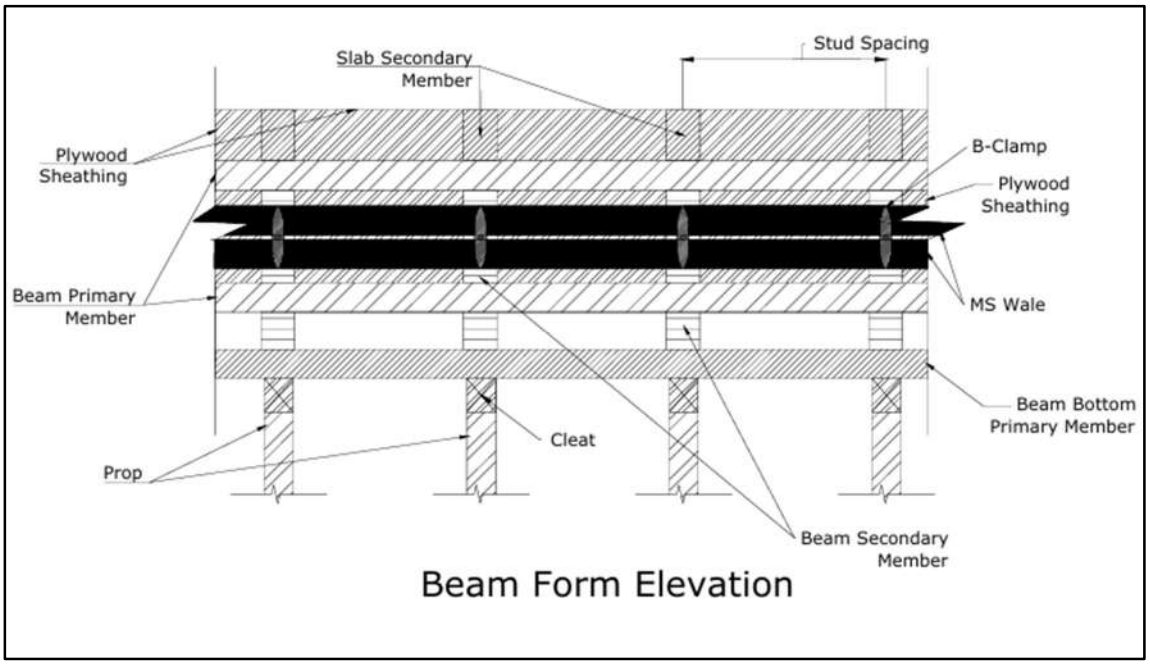


Figure 6: Beam formwork elevation

4. Design of Column

Column Formwork Design as per IS: 14687:1999

Table 4: Requirement parameters

Parameter	Value
Column Section	0.4 x 0.4 m
Column height (H)	3.15 m
Rate of placement (R)	1 m/h
Workability	Medium
Cement content	350 kg/m³, OPC 43
Concrete density (d)	26 kN/m³
Temperature	Normal (25°C)
Admixture	None

Table 5: Material properties

Material	Section	E (10^3) N/mm²	Minimum allowable Stress, N/mm²		
			Bending	Shear	Deflection
Plywood Sheathing	12 mm thick	3.600	14	6.16	l/270
Batten Stud (Group C)	75 x 100 mm	84.1	7.6	0.7	l/360
MS pipe	CHS 42.4 mm Dia	200	165	0.57fy	l/360

4.1 Lateral Pressure

From Figure 3 Curve, the Max Lateral Pressure (P): 29 kN/m^2

Apply correction factor for medium workability ($P_{Corrected}$): 1 x 29 = 29 kN/m^2

Adjust for Actual Concrete Density ($P_{Adjusted}$):

$P_{Corrected}$ x (Actual Concrete density/24) = 29 x (26/24) = 31.4 kN/m^2

Since OPC 43 sets faster than OPC 33, the concrete begins to stiffen and stop exerting fluid pressure earlier. This means the maximum lateral pressure doesn't persist as long, and the effective pressure on the formwork is slightly less.

However, IS 14687 does not prescribe exact numerical correction factors, so we apply engineering judgment.

A typical reduction of 5–10% is justifiable for OPC 43, especially at normal temperatures (25 °C).

Apply 10% reduction to be conservative:

$P = 31.4 \times 0.9 = 28.26$kN/$m^2$

The maximum pressure may occur at a height h, below the top

$h = P_{max}/d$

h = 28.26/ 26 = 1.08 m

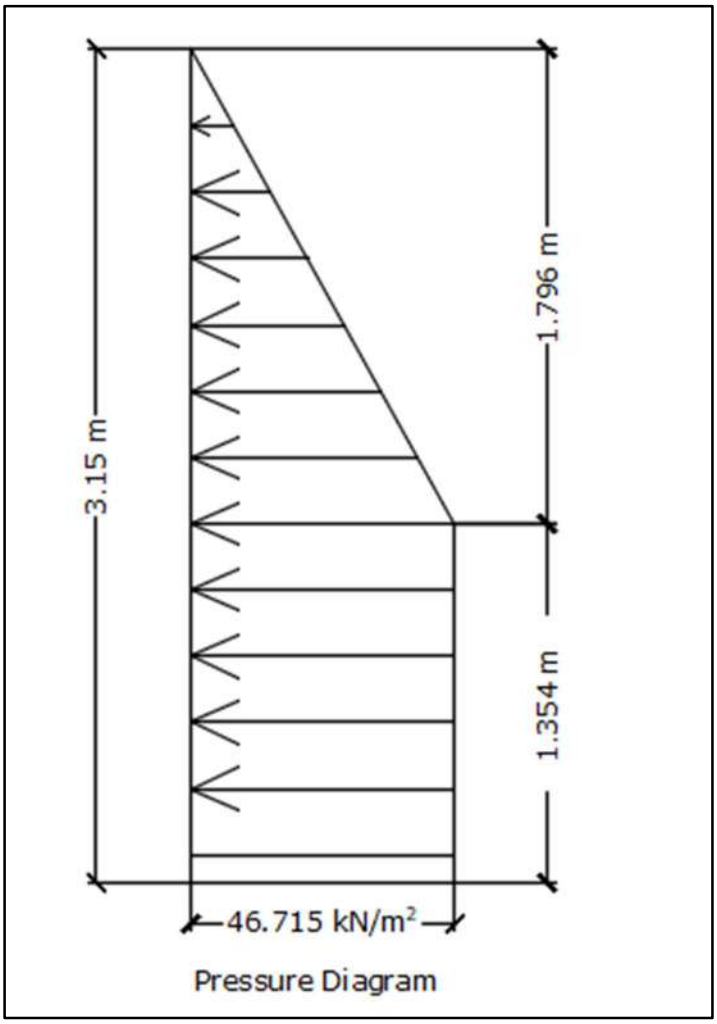


Figure 7: pressure diagram of column formwork

4.2 Check 12 mm Plywood Sheathing

To find the support spacing for plywood sheathing, assume the sheets of plywood are oriented in the form panel with the face grain across the supports (strong direction).

Max Bending Moment for more than 3 span:

$$M = \frac{wxl^2}{10}$$

The allowable bending stress, F_b, gives the allowable bending moment when multiplied by the section modulus, Z.

$$\frac{M}{I} = \frac{f}{y}$$

$$M = \frac{wxl^2}{10} = fZ ----1$$

Solving for l:

$$l = \sqrt[2]{\frac{10fZ}{w}}$$

$$Z = \frac{bxd^2}{6}$$

Assuming unit width of Plywood

$$Z = \frac{1x0.012^2}{6}$$

$$Z = 24x10^{-6}\ \text{m}^3$$

$$l = \sqrt[2]{\frac{10fZ}{w}} = \sqrt[2]{\frac{10x14000x24x10^{-6}}{28.26}} = 345\ mm$$

Take 200 mm Spacing

$M(Allowable) = fZ = 14000x24x10^{-6} = 0.336\ kNm$

4.2.1 Check for Bending

$$M = \frac{28.26x0.2^2}{10}$$

$M = 0.113$ kNm < 0.336 kNm (Allowable BM of 12 mm plywood)

4.2.2 Check for Deflection

$$I = \frac{bxd^3}{12} = \frac{1x0.012^3}{12} = 1.44\ x10^5\ mm^4$$

For simply support:

$$\delta = \frac{5wl^4}{384EI} \leq \frac{l}{270}$$

$$\delta = \frac{5x(28.26x0.2)x200^4}{384x3.6x10^3x1.44\ x10^5} \leq \frac{200}{270}$$

$$\delta = 0.23\ mm \leq 0.74\ mm\ \ hence\ OK$$

Check for loading: IS 4990: 2011, Annex E

Loading the maximum load permitted for 300 mm spacing and unit length is 19.13 kN/m^2

$$\delta = \frac{5wl^4}{384EI} \leq \frac{l}{270}$$

$$\frac{5wl^4}{384EI} = \frac{l}{270}$$

$$w = \frac{384EI}{5x270l^3}$$

$$w = \frac{384x3.6x10^3x1.44\ x10^5}{5x270x200^3}$$

$w = 18.432\ < 19.13\ , hence\ ok$

4.2.3 Check for shear

$$SF = 0.6wL$$

$$SF = 0.6x28.26x.2$$

$$SF = 3.4\ kN$$

$$\tau = \frac{F}{Area} = \frac{V}{bd} = \frac{3400}{(12x1000)}$$

$$\tau = 0.283 < 6.16, hence\ ok$$

4.3 Stud Check 75 x 100 mm Battens

To determine the wale spacing: with a 200 mm stud spacing, the load on each stud will be 28.26 kN/m. The studs must be supported by the wales so that the bending stress, the shear stress, and the deflection in the studs do not exceed allowable levels.

The maximum bending moment can be approximated from:

$$M = \frac{wl^2}{10}$$

Solving for *L* gives

$$l = \sqrt[2]{\frac{10M}{w}}$$

The allowable bending stress, *Fb*, gives the allowable bending moment when multiplied by the section modulus, Z.

$$\frac{M}{I} = \frac{f}{y}$$

$$M(Allowable) = fZ = 7.6x1000x125000x10^{-9} = 0.95\ kNm$$

$$l = \sqrt[2]{\frac{10fZ}{w}}$$

$$Z = \frac{bxd^2}{6}$$

$$Z = \frac{75x100^2}{6}$$

$$Z = 125{,}000\ \text{mm}^3$$

$$l = \sqrt[2]{\frac{10x7.6x1000x125000x10^{-9}}{28.26}} = 0.58m$$

Take 350 mm spacing, to account for deflection and shear.

4.3.1 Check for Bending Moment

$$M = \frac{28.26x0.35^2}{10}$$

$M = 0.35$ kNm < 0.95 kNm (Allowable BM of Timber Batten)

4.3.2 Check for Deflection

To determine deflection, assume the specifications limit deflections to l/360:

$$I = \frac{75x100^3}{12} = 6.25\ x\ 10^6\ \ mm^4$$

$$\delta = \frac{wxl^4}{145EI} \leq \frac{l}{360}$$

$$\delta = \frac{28.26x350^4}{145x84.1x10^3x6.25\ x\ 10^6} \leq \frac{350}{360}$$

$$\delta = 0.006\ mm \leq 0.97\ mm\ \ hence\ OK$$

4.3.3 Check for Shear Force

Allowable shear force = permissible stress x effective Area

$$SF\ (Allowbale) = 0.7x\ \frac{5}{6}x75x100 = 4.38\ N$$

$$SF = 0.6wl$$

Reduce the shear at beam ends by assuming the load over a short distance d. d from each end doesn't contribute to the shear. This adjustment gives a more accurate (less conservative) shear value.

$$SF\ = 0.6w(l - 2d)$$

$$SF\ = 0.6x28.26(0.35 - 2x0.1)$$

$$= 2.54\ kN < 4.38\ kN\ hence\ OK$$

$$\tau = \frac{F}{Area} = \frac{VQ}{It} = \frac{3V}{2bd} = \frac{3x2540}{2x(75x100)} = 0.508\ N/mm^2$$

IS Code recommend applying factor of (5/6) to Permissible stress:

(5/6) x 0.7 = 0.584 N/mm^2

$\tau = 0.508 < 0.584, hence\ okay$

4.4 Waler or primary member

For wales, determine tie spacing and size of tie required. Loads on wale are actually point loads from studs but are often treated as distributed loads. For a 350 mm wale spacing, the equivalent distributed wale load, w, is

$$\mathrm{w} = 28.26\mathrm{x}.35 = 9.891\ \mathrm{kN/m}$$

For wales, the section properties are:

$Z = 4.24\ x\ 10^3\ \text{mm}^3$

$I = 8.99\ x\ 10^4\ \text{mm}^4$

$E = 200x\ 10^3\ \text{N/mm}^2$

4.4.1 Bending Moment:

Allowable Bending Stress (f) = 0.66 x f_y

= 0.66 x 250 = 165 MPa

The maximum bending moment can be approximated from:

$M = \frac{wl^2}{10}$

$M = \frac{9.891\text{x}\ 0.35^2}{10} = 0.12\ \ kNm$

$M(Allowable) = fZ = 165x4.24x10^3 = 0.7\ kNm$

$0.12\ \ kNm < 0.7\ kNm, hence\ OK$

4.4.2 Check for Deflection

To determine deflection, assume the specifications limit deflections to l/360:

$\delta = \frac{wxl^4}{145EI} \leq \frac{l}{360}$

$\delta = \frac{9.891x350^4}{145x200x\ 10^3x8.99x\ 10^4} \leq \frac{350}{360}$

$\delta = 0.06\ mm \leq 0.97\ mm\ \ hence\ OK$

4.4.3 Check for Shear Force

Allowable Shear force = Area Resisting Shear x Allowable shear stress

$SF = (2t(D - t)x0.57\ f_y$

$SF = (2x0.004(0.0424 - 0.004)x0.57\text{x}\ 250$

$SF = (3.072x10^4)x142.5$

$SF = 44.7\ kN$

Maximum $SF = 0.6wl$

$SF\ = 0.6x9.891x0.2$

$SF\ = 1.19\ kN$

$= 1.19\ kN < 44.7\ kN\ hence\ OK$

$\tau = \frac{F}{Area} = \frac{1.190}{307.2} = 3.87\ N/mm^2$

Permissible shear stress:

$\tau = 3.877 < 142.5, hence\ okay$

4.5 Check for Tie

Each tie resists the total horizontal force acting on the wale, based on its tributary length (tie spacing). The force in each tie is equal to the reaction force from the uniformly distributed load on the wale between adjacent ties.

4.5.1 Loading on tie

There are 2 Wales

$W = wl$

$W = 9.891x0.2 = 2\ kN$

Or

$W = Total\ pressure\ x\ Influence\ area$

$W = 28.26x0.35x0.2 = 2\ kN$

Tie Capacity: 5 kN

Table 6: Summary table of column formwork

Component	Function	Material	Spacing	Size/Section	Capacity Check	Deflection Check
Sheathing	Load transfer surface	12 mm plywood	200 mm (btw joists)	12 mm thick plywood	ok	ok
Secondary Member	Supports sheathing	Timber batten	200 mm	75 × 100 mm timber	ok	ok
Primary Member	Supports joists	MS pipe	350 mm	Hollow MS pipe (D_o=42.4 mm, D_i=32 mm)	ok	ok
Tie Rod	Resists lateral pressure	Steel rod	350 mm	15 mm dia rod @ 350 mm c/c	Must select the tie rod having capacity more than 5 kN	

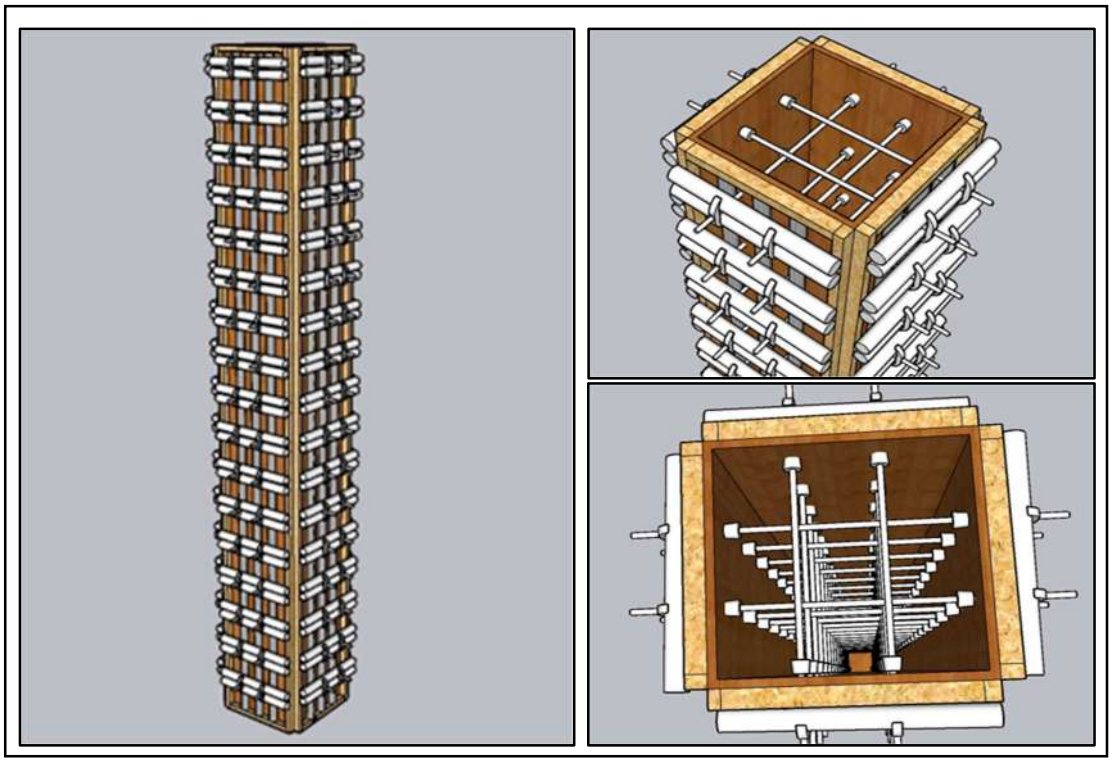


Figure 8: 3-D view of column formwork

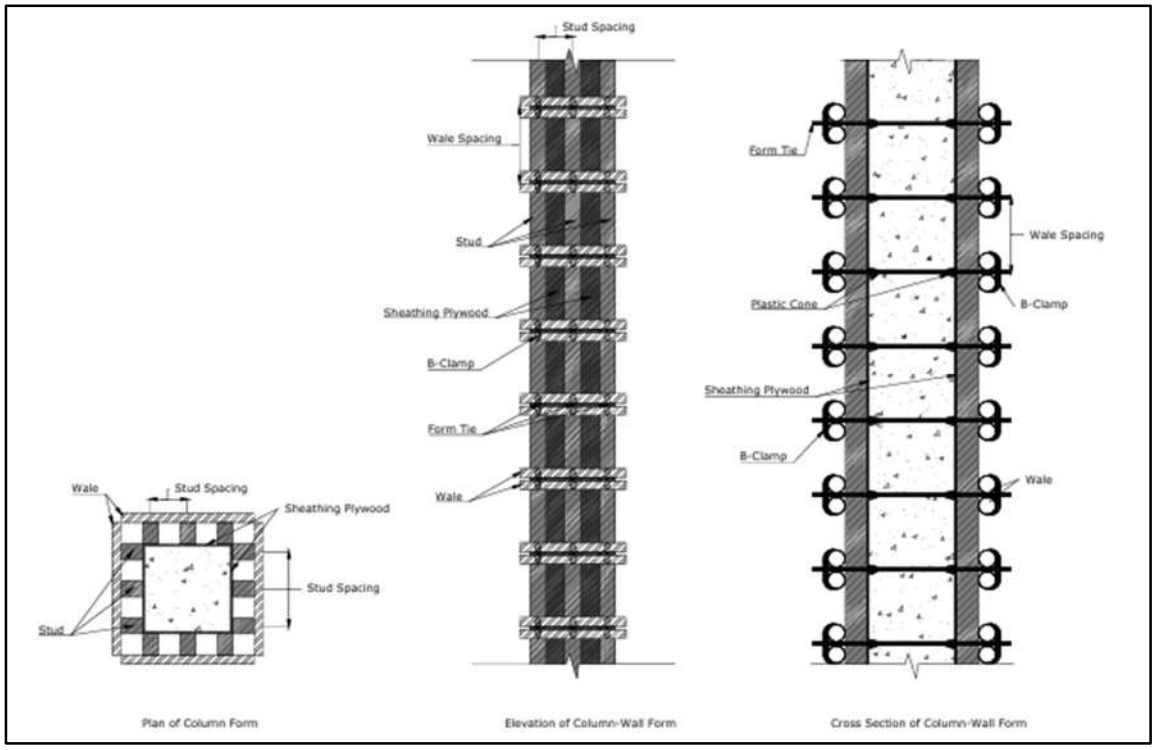


Figure 9: Section and plan view of column formwork

Ministry of Infrastructure and Transport
Department of Infrastructure Development
Thimphu, Bhutan
Tel: +975-2-326793/321571/327451
TeleFax: +975-2-324337
Website: www.moit.gov.bt