

METAL MATRIX ENGINEERING PRIVATE LIMITED

# WORKER ACCOMMODATION SOLUTIONS

Two G+2 LGS Blocks · 200 Workers · 45-Day Delivery  
100×50×15 Studs (1.5mm BMT) · Mineral Wool Insulation · Galvalume Cladding  
External LGS Stair · Block B: Canteen + 10 Showers + 10 WCs + 10 Basins  
4-Person Bunk Rooms · Demountable · SiteIQ Live Monitoring · IS 801:2015

For EPC Contractors · Project Developers · Dholera SIR · DICDL Registered

**45**

**Days**

*Factory to handover*

**200**

**Workers**

*2 × G+2 blocks*

**1.5mm**

**BMT Studs**

*100×50×15 G550*

**1:20**

**Shower ratio**

*10 showers for 200*

**80%**

**Reusable**

*At project end*

# THE TWO-BLOCK CONCEPT

Block A (Sleeping) + Block B (Sleeping + Welfare) · Why G+2 Beats G+3

Two G+2 blocks is the structurally optimal solution for 200 workers using the 100×50×15 LGS system. A single G+3 block would require back-to-back compound studs at ground floor level to handle the stacked axial load — adding complexity and cost. Two G+2 blocks keep every stud in single-section IS 801 compliance with a comfortable load reserve.

## ONE G+3 BLOCK — Not Recommended

- ✗ Ground floor studs need back-to-back — complex, heavier
- ✗ 40T crane needed for 3rd-floor lifts at 12m height
- ✗ 4-level scaffold throughout — higher cost and risk
- ✗ 100% wet services through 3 floors — complex drainage
- ✗ Single failure point for 200 workers

## TWO G+2 BLOCKS — Recommended

- ✓ Single 100×50×15 studs throughout — IS 801 axial 38–52 kN
- ✓ 25T crane sufficient — max panel height 9m
- ✓ 3-level scaffold only — simpler and faster
- ✓ Wet services in Block B GF only — clean, direct drainage
- ✓ Independent blocks — one maintained while other runs

## 100×50×15 Stud — Why 1.5mm BMT for G+2

| Property                         | 100×50×12<br>(1.2mm) | 100×50×15<br>(1.5mm)          | Benefit                                 |
|----------------------------------|----------------------|-------------------------------|-----------------------------------------|
| Axial capacity @ 3m height       | 26–35 kN             | 38–52 kN                      | +45–50% — critical for G+2 load stack   |
| G+2 ground floor worst-case load | 32–44 kN — MARGINAL  | 32–44 kN — COMFORTABLE        | Safe reserve without compound stud      |
| Bending capacity Mns             | ~1.95 kN·m           | ~2.45 kN·m                    | +26% — better wind/seismic              |
| SDS pull-out capacity            | Base                 | ~30% higher                   | Stronger at every connection            |
| Panel racking stiffness          | Good                 | Better                        | Safer crane lifts at 2nd floor          |
| Additional steel cost            | —                    | ~22% on studs;<br>~2–3% total | Small premium for large structural gain |

# THE BUILDINGS

Room-by-Room Schedule · Both Blocks

## Block A — Pure Sleeping Accommodation | 24m × 12m Footprint

| Floor                | Rooms / Use                                                               | Capacity                           | Net Floor Area       | Notes                                                      |
|----------------------|---------------------------------------------------------------------------|------------------------------------|----------------------|------------------------------------------------------------|
| Ground Floor         | 12 × four-person bunk rooms at 6×3m = 18 sqm each · central corridor 1.2m | 48 workers                         | 288 sqm              | No wet services in Block A — all ablutions in Block B      |
| First Floor          | 12 × four-person bunk rooms — identical layout to GF                      | 48 workers                         | 288 sqm              | External stair at each end serves all floors               |
| Second Floor         | 8 × four-person bunk rooms · 4 × supervisor single/twin rooms (6×4m)      | 40 workers + 4 supervisors         | 288 sqm              | Supervisors on top floor — quieter; twin room = 2 persons  |
| Roof                 | LGS pitched roof — Galvalume AZ150 sheet on Z150 purlins at 1.5m crs.     | —                                  | —                    | Ridge height ~10.5m from ground                            |
| External stairs      | 2 × LGS galvanised open-riser stair — one each end of block               | Fire escape + primary access       | External to building | M16 bolted connections to LGS rim joist; no internal stair |
| <b>BLOCK A TOTAL</b> | <b>36 rooms</b>                                                           | <b>136 workers + 4 supervisors</b> | <b>864 sqm GFA</b>   | <b>Pure sleeping; zero wet trades</b>                      |

## Block B — Sleeping + Welfare Ground Floor | 24m × 15m Footprint

| Floor                  | Rooms / Use                                                                                                                                                       | Capacity                               | Net Floor Area       | Notes                                              |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------|----------------------------------------------------|
| Ground Floor — Welfare | Canteen 60-seat (108 sqm) · Ablution block: 10 showers + 10 WCs + 10 basins (72 sqm) · Medical/first aid (24 sqm) · Laundry (18 sqm) · Entry/circulation (18 sqm) | Welfare for all 200 workers            | 360 sqm              | Ratio: 1 shower per 20 workers — exceeds BOCW 1:25 |
| First Floor            | 10 × four-person bunk rooms · 1 × supervisor twin room (6×4m)                                                                                                     | 42 workers                             | 288 sqm              | Stair access from external stair each end          |
| Second Floor           | 6 × four-person bunk rooms · prayer/quiet room (6×4m) · recreation room (6×4m)                                                                                    | 24 workers                             | 288 sqm              | Prayer + recreation on quietest floor              |
| Roof                   | LGS pitched roof — matching Block A                                                                                                                               | —                                      | —                    |                                                    |
| External stairs        | 2 × LGS galvanised open-riser stair — one each end                                                                                                                | Fire escape + primary access           | External to building | Same spec as Block A                               |
| <b>BLOCK B TOTAL</b>   | <b>16 rooms + full welfare floor</b>                                                                                                                              | <b>64 workers + 200-worker welfare</b> | <b>936 sqm GFA</b>   | <b>All wet services ground floor only</b>          |

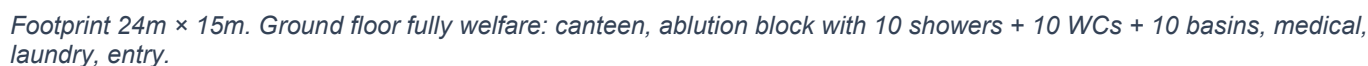
### COMBINED CAMP — KEY NUMBERS

Combined: 200 workers (136 Block A + 64 Block B) + 4 supervisors. Total GFA: ~1,800 sqm. Site footprint both blocks: ~720 sqm with 3m fire lane between blocks.

All welfare in Block B ground floor: 10 showers + 10 WCs + 10 basins = 1:20 ratio — 25% above BOCW minimum of 1:25.

No wet services in Block A — entire block is dry LGS construction. Block A erects 2–3 days faster than Block B as a result.

Footprint 24m x 12m. 12 bunk rooms per floor arranged 6 each side of a central 1.2m corridor. External stair at each end — no internal stair. Block A has no wet services.



## Block B — First Floor (Sleeping)

First and second floor sleeping layouts are shown together. Second floor mirrors first floor with prayer/quiet room replacing one bunk room.

| BLOCK B — FIRST FLOOR — 24.0m × 15.0m             |                              |                              |                              |                              |                                           |
|---------------------------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------------------|
| BR-B101<br>6.0×3.0<br>4 bunk                      | BR-B102<br>6.0×3.0<br>4 bunk | BR-B103<br>6.0×3.0<br>4 bunk | BR-B104<br>6.0×3.0<br>4 bunk | BR-B105<br>6.0×3.0<br>4 bunk | SUPERVISOR<br>6.0×4.0m<br>Twin room 2p    |
| C O R R I D O R — 1.5m wide (Block B wider floor) |                              |                              |                              |                              |                                           |
| BR-B106<br>6.0×3.0<br>4 bunk                      | BR-B107<br>6.0×3.0<br>4 bunk | BR-B108<br>6.0×3.0<br>4 bunk | BR-B109<br>6.0×3.0<br>4 bunk | BR-B110<br>6.0×3.0<br>4 bunk | 2F: PRAYER /<br>RECREATION RM<br>6.0×4.0m |

▲ STAIR

STAIR ▲

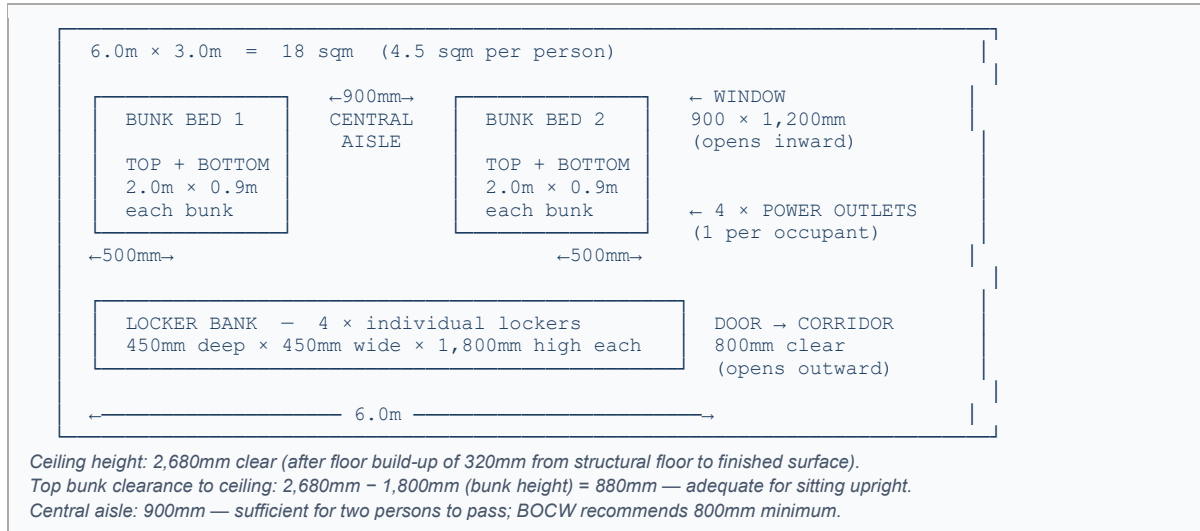
1F: 10 four-person rooms + 1 supervisor twin = 42 occupants. 2F: 10 four-person rooms + prayer/recreation = 40 occupants.

# BUNK ROOM LAYOUT

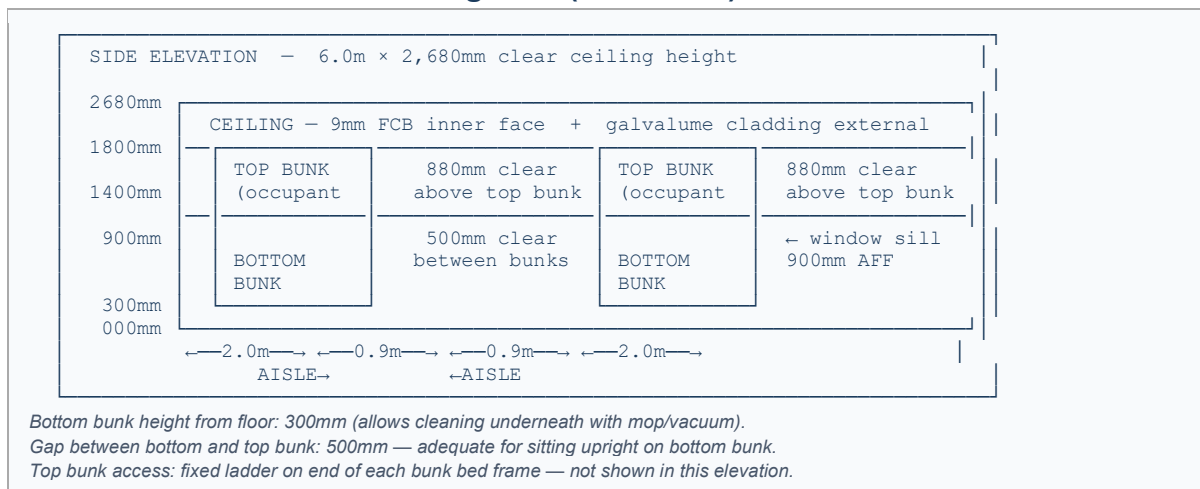
Four-Person Room — Internal Arrangement and Dimensions

Every four-person bunk room is 6.0m long × 3.0m wide = 18 sqm gross. Net area per person: 4.5 sqm — meets the BOCW Act 1996 minimum. The room accommodates two double bunk beds, four individual lockers, adequate circulation aisle, one window for natural ventilation, and four power outlets.

## Internal Plan — 6.0m × 3.0m (View from Above)



## Internal Elevation — 6.0m Long Wall (Side View)



## Bunk Room Furniture & Fittings Schedule

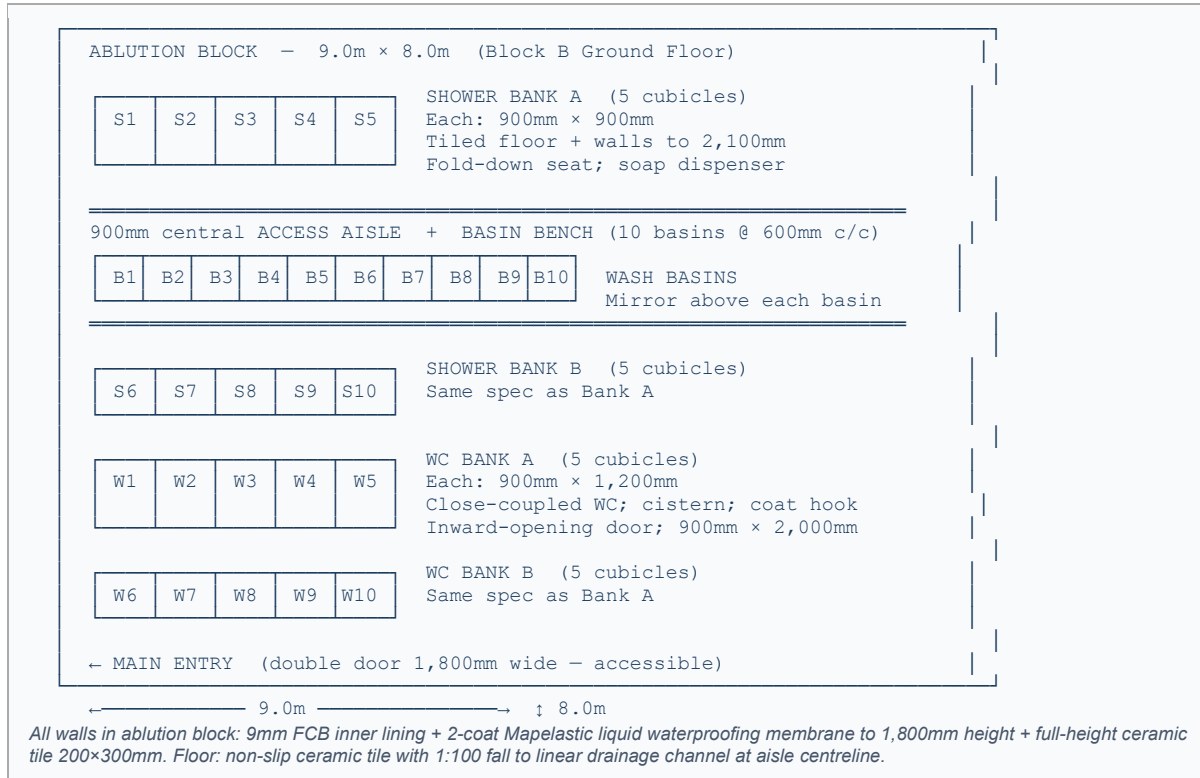
| Item                  | Quantity per Room  | Specification                                                                                                               | Notes                                                                  |
|-----------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Double bunk bed frame | 2                  | Steel tube frame — 2,000mm × 900mm × 1,800mm high; powder-coated; M8 bolts assembly; fixed ladder on end frame              | EPC contractor supply; MME provides AC sleeve and power points only    |
| Mattress              | 4 (1 per bunk)     | 75mm foam mattress; 1,900mm × 850mm; washable cover; density 28 kg/m <sup>3</sup> minimum                                   | EPC contractor supply                                                  |
| Individual locker     | 4 (1 per occupant) | Steel locker 450mm wide × 450mm deep × 1,800mm high; 2-compartment (upper: padlockable; lower: hanging rail); powder-coated | EPC contractor supply; MME pre-fits anchor brackets to wall panel stud |
| Window                | 1                  | 900mm wide × 1,200mm high aluminium single-hung; trickle vent at head; fly screen; safety restrictor (max 100mm opening)    | Supplied and installed by MME                                          |
| Door                  | 1                  | 800mm clear × 2,000mm high; flush solid-core; mortice deadlock; door closer; opens outward to corridor — fire egress        | Supplied and installed by MME                                          |
| Power outlets         | 4 (1 per occupant) | 13A BS 1363 + USB-A twin socket at 900mm AFF — 1 per bunk bed headboard position                                            | MME first-fix conduit; EPC electrician second-fix outlets              |
| AC sleeve             | 1                  | 300mm × 300mm sleeve through FCB + cladding at 2,100mm AFF; louvred cover external                                          | MME installs sleeve; EPC installs AC unit (1.0T split recommended)     |
| Coat hooks            | 4                  | Stainless steel projecting hooks at 1,600mm AFF on locker wall                                                              | MME installs                                                           |
| Room number sign      | 1                  | Laser-cut aluminium room number + QR code (links to room record in SiteIQ building log)                                     | MME installs at door                                                   |

# ABLUTION BLOCK

10 Showers + 10 WCs + 10 Basins — Block B Ground Floor

The entire welfare ablation provision for 200 workers is concentrated in Block B ground floor. Keeping all wet services in one location simplifies drainage design, makes maintenance easier, and allows Block A to be a fully dry building. The ablation block is sized to eliminate queuing at peak usage (shift change at 6:00 AM and 6:00 PM).

## Ablution Block Internal Plan (9.0m × 8.0m = 72 sqm)



## Ablution Fittings Specification

| Item                 | Quantity                    | Specification                                                                                                                                                                                                                                                                                               | Standard        |
|----------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Shower cubicle       | 10                          | 900mm × 900mm; tiled walls to 2,100mm; tiled floor with 1:40 fall to gulley; stainless shower head (900mm AFF) + overhead (2,000mm AFF); thermostatic mixer valve; fold-down teak seat; recessed soap dish; shower curtain rail + curtain; door with 200mm gap at top and bottom (ventilation + visibility) | IS 12761        |
| WC cubicle           | 10                          | 900mm × 1,200mm; close-coupled WC pan IS 774; cistern; push-button dual flush; coat hook; toilet roll holder; privacy door 900×2,000mm closing to 150mm gap at foot; inward opening; thumb-turn lock + emergency outside release                                                                            | IS 774          |
| Wash basin           | 10                          | 550mm × 420mm wall-hung ceramic basin; IS 2556; single mixer tap + pop-up waste; 600mm mirror above; individual soap dispenser; paper towel dispenser or electric hand dryer                                                                                                                                | IS 2556         |
| Basin shelf/bench    | 1 continuous                | Solid surface material or ceramic tile bench at 850mm AFF across full width of basin run; shelf above at 1,400mm AFF for toiletries                                                                                                                                                                         | —               |
| Floor drainage       | 2 linear channels           | Stainless steel linear drain channel at centre aisle + at shower rows; 70mm × 70mm channel; removable grating; connects to Block B ground floor soil stack                                                                                                                                                  | —               |
| Ventilation          | Mechanical extract          | Extract fan at 15 air changes/hour minimum; humidity sensor controlled; discharge at roof level away from Block A                                                                                                                                                                                           | NBC 2016        |
| Hot water            | Electric storage heater × 2 | 150-litre electric immersion heater per shower bank; thermostat 55–60°C; mixing valve to deliver 42°C at shower head; insulated copper pipework; anti-legionella temperature maintained                                                                                                                     | IS 2608         |
| Accessible provision | 1 shower + 1 WC wider       | 1 × 1,200mm × 1,200mm accessible shower cubicle with fold-down seat + grab rails; 1 × 1,200mm × 1,800mm accessible WC with grab rail both sides                                                                                                                                                             | NBC 2016 Part 3 |

# STRUCTURAL SYSTEM

100×50×15 LGS · Mineral Wool · 9mm FCB · Galvalume Cladding

## Wall Build-Up — Inside to Outside (Total 200mm)

| Layer                            | Material                                                                    | Thickness      | U-value Contribution                       | Fire Class               |
|----------------------------------|-----------------------------------------------------------------------------|----------------|--------------------------------------------|--------------------------|
| 1 — Inner lining                 | 9mm compressed FCB — Everest or James Hardie; painted face                  | 9 mm           | —                                          | A1 non-combustible       |
| 2 — LGS stud cavity              | 100×50×15 G550 Z275 HDGI lipped C-section — 1.5mm BMT                       | 100 mm (web)   | Thermal bridge — corrected in U-value calc | Steel — non-combustible  |
| 3 — Mineral wool insulation      | 50mm rigid mineral wool slab — Rockwool RW3 or Isover; 60 kg/m <sup>3</sup> | 50 mm          | Primary insulation — dominates U-value     | A1 non-combustible       |
| 4 — Breather membrane            | Tyvek HouseWrap or equivalent — vapour-permeable, water-resistant           | 1 mm           | Negligible                                 | Class 1                  |
| 5 — Ventilated cavity + hat rail | 20×40mm galv. hat rail at 600mm vertical centres; 40mm cavity               | 40 mm          | Ventilated drainage path                   | —                        |
| 6 — Galvalume cladding           | 0.5mm Galvalume AZ150 pre-painted steel profile — horizontal concealed fix  | 0.5 mm         | Negligible                                 | A1 non-combustible       |
| <b>TOTAL WALL THICKNESS</b>      | <b>Inside FCB face to outside cladding face</b>                             | <b>~200 mm</b> | <b>U-value: 0.28–0.32 W/m<sup>2</sup>K</b> | <b>ALL A1 throughout</b> |

| Wall Performance              | Value                                      | Standard Requirement                        | Status      |
|-------------------------------|--------------------------------------------|---------------------------------------------|-------------|
| Thermal transmittance U-value | 0.28–0.32 W/m <sup>2</sup> K               | ECBC 2017: ≤ 0.44 W/m <sup>2</sup> K        | Exceeds ✓   |
| Airborne acoustic Rw          | 44–48 dB                                   | NBC 2016: Rw ≥ 45 dB for separating walls   | Meets ✓     |
| Fire resistance (FRL)         | 60-min — all A1 materials                  | IS 3809: 60-min for permanent accommodation | Meets ✓     |
| Seismic                       | IS 1893 Zone II–IV with hold-downs         | IS 1893:2016                                | Compliant ✓ |
| Wind load                     | IS 875 Zone III/IV — shear panels X-braced | IS 875 Pt.3:2015                            | Compliant ✓ |

## Floor Build-Up — Soffit to Finished Floor (Total 320mm)

| Layer                      | Material                                                          | Thickness      | Function                                             |
|----------------------------|-------------------------------------------------------------------|----------------|------------------------------------------------------|
| Soffit lining              | 9mm FCB — screwed to joist bottom flanges                         | 9 mm           | Ceiling finish; fire lining                          |
| Acoustic mineral wool      | 50mm MW batt between joists — Rockwool Floor Slab 50              | 50 mm          | Impact and airborne sound reduction between floors   |
| LGS floor joist            | 200×50×15 (standard span) or 200×50×20 (>4.2m span) at 600mm crs. | 200 mm         | Primary spanning structural member                   |
| 18mm structural OSB        | Face grain perpendicular to joists; joints over joists; staggered | 18 mm          | Structural diaphragm + construction platform         |
| Polythene separation layer | 250 micron PE — prevents screed bonding to OSB                    | 1 mm           | Differential movement isolation                      |
| 40mm sand/cement screed    | 1:4 mix; 40mm nominal; laser-screed for floor flatness ±3mm/3m    | 40 mm          | Mass layer; sound deadening; level floor base        |
| Floor finish               | Ceramic tile in welfare; vinyl/linoleum in sleeping rooms         | 10–12 mm       | Walking surface; hygiene                             |
| <b>TOTAL</b>               | <b>From FCB soffit to finished floor surface</b>                  | <b>~320 mm</b> | <b>Clear ceiling height: 3,000 – 320 = 2,680mm ✓</b> |

# EXTERNAL LGS STAIR

Open-Riser Galvanised — No Internal Stair Core Required

Each block has two external LGS stairs — one at each end. External stairs remove the stair entirely from the internal floor plate: every square metre inside both blocks is sleeping or welfare. All connections are bolted — the stair disassembles in one day per stair at project end.

| Element                      | Specification                                                                             | Note                                                                                       |
|------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Main stringer × 2 per flight | 200×50×20 LGS lipped C-section or 150×75×5 RHS (SE to confirm per site wind loading)      | Bolted to LGS building rim joist — 4 × M16 Grade 8.8 bolts per bracket at each floor level |
| Tread carriers               | 100×50×15 LGS at 175mm rise centres — cantilever from stringer                            | Open riser — no riser board; self-draining; prevents debris accumulation                   |
| Tread surface                | 40×40×5mm galv. open-bar grating — anti-slip; hot-dip galvanised after fabrication        | 15 kg/m <sup>2</sup> ; self-cleaning; safe even when wet                                   |
| Landing (per floor)          | 1,200 × 1,200mm grating platform; SHS 75×75×4mm perimeter frame                           | Ground: post-supported on RC pad. Upper: bracket-bolted to LGS rim joist                   |
| Handrail + balustrade        | 40mm OD tube top rail @ 1,000mm; mid-rail @ 500mm; verticals @ max 100mm gap              | IS 1977 compliant; hot-dip galvanised throughout                                           |
| Connection to building       | M16 Grade 8.8 bolts through LGS rim joist + 150×100×10mm flat plate — 4 bolts per bracket | Holes pre-drilled at factory — bolt at site; no welding on site                            |
| Ground pad foundations       | 150mm thick × 600×600mm RC pad — M20 concrete; 2 × T16 HIT-RE 500 anchor bolt per post    | Designed by SE; pads cast before stair erection                                            |
| Stair width                  | 1,000mm clear between handrails                                                           | IS 1477 / NBC 2016 minimum 900mm — MME exceeds to 1,000mm                                  |
| Geometry                     | 17 risers @ 176mm = 2,992mm rise; 16 treads @ 250mm going                                 | IS 456 / NBC 2016: rise ≤190mm ✓; going ≥250mm ✓                                           |
| Erection time                | 2 days per stair; 4 stairs total = 8 days; overlap with upper floor panel erection        | Pre-fabricated at Sanand factory; bolt-together sequence takes 1 day; handrail day 2       |
| Fire escape compliance       | External stair within 15m of furthest room door in both blocks (max 12m actual)           | BOCW Act / NBC 2016: ≤18m travel distance to escape route ✓                                |

# ERECTION PROGRAMME

Site Programme — Both Blocks — 45 Days to Handover

| Day          | Activity                                                                                                                                  | Block(s) | Crane           | MME Team                                       |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|------------------------------------------------|
| Day -7 to -3 | Site hardstand / concrete slab; hold-down chemical anchors; track marking; SitelQ cameras + 4G router installed                           | Both     | No              | EPC civil + MME supervisor arrival Day -3      |
| Day 1        | Truck 1: Block A GF wall panels. SitelQ delivery scan. Stack in erection order.                                                           | A        | Half day unload | MME supervisor + forklift                      |
| Day 2        | Erect Block A GF wall panels — plumb, brace, connect, double top track. SitelQ installation scan every panel.                             | A        | Full day        | MME supervisor + 3 erection ops + crane driver |
| Day 3        | Truck 2: Block A 1F cassettes + Block B GF welfare panels. Install Block A 1F floor cassettes.                                            | A + B    | Full day        | Crane + 3 ops                                  |
| Day 4        | Erect Block B GF welfare wall panels. Block A 1F cassettes fixed.                                                                         | B        | Full day        | Crane + 3 ops                                  |
| Day 5        | Block A: erect 1F wall panels. Block B: 1F cassette delivery + install.                                                                   | A + B    | Full day        | Crane + 3 ops                                  |
| Day 6        | Block A: 2F cassettes installed. Block B: 1F wall panels erected.                                                                         | A + B    | Full day        | Crane + 3 ops                                  |
| Day 7        | Block A: 2F wall panels. Block B: 2F cassettes installed.                                                                                 | A + B    | Full day        | Crane + 3 ops                                  |
| Day 8        | Block A: roof purlins + Galvalume sheet. Block B: 2F wall panels. External stair erection begins.                                         | A + B    | Full day        | Crane + ops + stair crew                       |
| Day 9        | Block B: roof frame + sheet. All 4 stairs continue — stringers + treads + landings.                                                       | A + B    | Full day        | Crane + stair crew                             |
| Day 10       | All 4 stairs complete — handrails + balustrade. Windows + external door frames both blocks.                                               | Both     | Half day        | Stair crew + joiners                           |
| Day 11-14    | Mineral wool batts fitted in all stud cavities both blocks. OSB floor screed prep. SitelQ CV sweep confirms panel plumb + MW coverage.    | Both     | No              | MME ops + MW installers                        |
| Day 15-18    | External hat rails + Galvalume profile cladding both blocks. Window reveals. Roof flashings.                                              | Both     | No              | 2 cladding ops + supervisor                    |
| Day 19-22    | Block B GF ablution block wet trades: FCB tanking membrane; ceramic tiling; basin bench; drain channels. Floor screed poured both blocks. | B GF     | No              | Wet trades + screeding team                    |
| Day 23-27    | Internal painting both blocks (9mm FCB prime + 2 coats emulsion). Canteen counter + kitchen fit-out Block B. Laundry fixtures.            | Both     | No              | Painters + joiners                             |
| Day 28-33    | Services 2nd fix (EPC scope): sanitary ware; taps; showers; WC pans; hot water heaters; electrical fittings; split AC units.              | Both     | No              | EPC M&E trades                                 |

| Day                  | Activity                                                                                                                                          | Block(s) | Crane | MME Team          |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|-------------------|
| Day 34–38            | Furnishing (EPC scope): bunk beds; mattresses; lockers; seating; canteen tables + chairs. Ceramic tiles welfare areas.                            | Both     | No    | EPC finishing     |
| Day 39–43            | QC walk-through both blocks. SE structural sign-off. BOCW welfare inspection. SiteIQ Module 5 compliance documents generated.                     | Both     | No    | MME + SE + EPC PM |
| DAY 45 —<br>HANDOVER | Structural completion certificates issued — Block A + Block B. SiteIQ dashboard handed to EPC project manager. QR code hoarding at camp entrance. | Both     | —     | MME + EPC PM      |

# WELFARE & COMPLIANCE

BOCW Act 1996 · Factories Act · Fire Safety

| Requirement                  | Regulation                                 | MME Provision                                                                                  | Ratio                    | Status                                               |
|------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------|
| Sleeping space               | BOCW 1996: 4.5 sqm/person minimum          | 18 sqm per 4-person room = 4.5 sqm/person                                                      | 4.5 sqm                  | Meets minimum ✓                                      |
| Shower / bathing             | BOCW: 1 per 25 workers minimum             | 10 showers for 200 workers                                                                     | 1:20                     | Exceeds by 25% ✓                                     |
| WC cubicles                  | BOCW: 1 per 25 workers (male)              | 10 WCs for 200 workers                                                                         | 1:20                     | Exceeds by 25% ✓                                     |
| Urinals                      | Additional to WC — good practice           | 4 wall-mounted urinals within ablution block                                                   | 1:50                     | Good practice met ✓                                  |
| Wash basins                  | Good practice: 1 per 25 workers            | 10 basins for 200 workers                                                                      | 1:20                     | Good practice exceeded ✓                             |
| Drinking water               | BOCW: potable; within 100m                 | Plumbed taps at each floor corridor both blocks; connected to mains by EPC                     | ~1:20                    | Compliant ✓                                          |
| Canteen                      | BOCW: required for >250; good practice 200 | 60-seat canteen Block B GF                                                                     | Exceeds good practice    | Good practice ✓                                      |
| First aid / medical          | BOCW: for >500; good practice 200          | Medical room Block B GF — 2 bays + pharmacy                                                    | Good practice            | Good practice ✓                                      |
| Laundry                      | Good practice                              | Laundry room 6 machines Block B GF                                                             | 1 machine per 33 workers | Good practice ✓                                      |
| Fire escape travel distance  | NBC 2016: ≤18m to escape route             | External stair each end both blocks — max travel 12m                                           | Well within limit        | Compliant ✓                                          |
| Fire extinguisher brackets   | IS 2190: 1 per 200 sqm                     | Pre-fitted brackets at each stair landing — 4 per block (8 total); EPC fits extinguishers      | 1 per ~225 sqm           | Bracket provided ✓                                   |
| Ventilation — sleeping rooms | NBC 2016: 10% of floor area                | 1 window per room: 900×1,200mm = 1.08 sqm = 6% floor area; supplement with door gap + top vent | 6%+ ventilation          | Near compliant — advise trickle vent in window frame |
| Block fire separation        | NBC 2016: 3m minimum                       | 3m clear fire lane between Block A and Block B maintained in site layout                       | 3m                       | Compliant ✓                                          |

# TECHNOLOGY

SiteIQ Live Monitoring + QR Traceability — See Your Camp Build in Real Time

Every LGS stud, track, joist, rim joist, panel, and cassette at MME carries a QR code label applied at the Sanand GIDC factory. Scan with any phone. SiteIQ gives your project manager live progress, live tilt sensor readings, and an automatic compliance record.

## QR Chain of Custody — 10 Events from Factory to SE Sign-Off

| Event #                  | Location                                     | Who Scans                     | SiteIQ Status Update                                |
|--------------------------|----------------------------------------------|-------------------------------|-----------------------------------------------------|
| 1 — ID assigned          | DesignAI Layer 3 — automatic                 | System                        | CREATED — grey on BIM progress map                  |
| 2 — Label printed        | Factory CNC machine — automatic              | System                        | LABELLED                                            |
| 3 — Operator verify scan | Factory production floor                     | Machine operator — Zebra TC26 | OPERATOR_VERIFIED                                   |
| 4 — Factory QC scan      | Factory QC station                           | QC inspector — Zebra TC26     | QC_PASS or HOLD                                     |
| 5 — Bundle packing scan  | Factory packing bay                          | Packing operator              | IN_BUNDLE                                           |
| 6 — Despatch gate scan   | Factory gate                                 | Despatch operator             | DESPATCHED — site supervisor notified automatically |
| 7 — Delivery scan        | Site delivery point                          | Site supervisor — BuildIQ app | DELIVERED — amber on BIM map                        |
| 8 — Installation scan    | Erection point — before crane releases panel | Site supervisor or crew lead  | INSTALLED — GREEN on BIM map within 5 seconds       |
| 9 — CV QC confirmation   | SiteIQ camera coverage — automatic           | SiteIQ AI (automatic)         | QC_PASS or ALERT raised                             |
| 10 — SE sign-off         | SE review via BuildIQ SE app                 | Licensed structural engineer  | SIGNED_OFF — structural completion record created   |

## SiteIQ Modules — Active for This Camp

| Module                 | What It Does                                                                                       | Alert Sent To                                        |
|------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------|
| 1 — CV Quality Control | AI cameras check panel plumb, cladding gap consistency, ablution tile coverage during construction | Site supervisor · MME engineer · EPC project manager |
| 2 — IoT Tilt Sensors   | 4 × wireless sensors per block (8 total) on shear wall panels — alert if panel moves >3mm/m        | Site supervisor · Structural engineer · MME remote   |
| 3 — FC Pour Monitoring | Not active — mineral wool system; no pour                                                          | N/A                                                  |
| 4 — Schedule Tracking  | Daily installation scan count vs Day-45 programme; predicted completion date updated daily         | EPC project manager · client                         |

| Module               | What It Does                                                                                    | Alert Sent To                                      |
|----------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 5 — Compliance Docs  | Auto-generates IS 801 structural cert, BOCW welfare checklist, panel QC log, SE sign-off record | SE · EPC compliance team · building inspector      |
| 6 — Client Dashboard | Live BIM map: every panel green on scan; browser access — no app                                | EPC project director · end client · safety officer |

### SITEIQ ACCESS + TECHNICAL NOTES

Dashboard URL: [https://siteiq.mme.build/p/\[PROJECT\\_ID\]](https://siteiq.mme.build/p/[PROJECT_ID]) · No app required for view-only access — standard web browser.

QR label spec: UV-resistant PET polyester 75×45mm; Level H error correction (30% damage tolerance); readable by any standard phone camera.

Offline mode: BuildIQ app caches component data; scans queue when 4G drops and sync automatically on reconnect.

# DEMOUNTABILITY

7 Days — Both Blocks. Mineral Wool System = Full Weight Recovery

The mineral wool system is the key advantage over CLC at demount. Without foam concrete in the stud cavities, every panel leaves site at exactly the weight it arrived — no added mass, no retained moisture. MW batts pull out of the stud cavities in under a minute per bay. The Galvalume cladding unclips from hat rails without any damage.

|                             |                                |                              |                          |                            |
|-----------------------------|--------------------------------|------------------------------|--------------------------|----------------------------|
| <b>7</b>                    | <b>=</b>                       | <b>100%</b>                  | <b>100%</b>              | <b>45–60%</b>              |
| <b>Days</b>                 | <b>Panel weight</b>            | <b>MW reusable</b>           | <b>Cladding</b>          | <b>Buyback</b>             |
| <i>Full 2-block demount</i> | <i>Same out as in — no CLC</i> | <i>Batts pull out intact</i> | <i>Unclips undamaged</i> | <i>MME pays on demount</i> |

| Stage                  | Days          | Activity                                                                                      | Material Condition at Next Site                                        |
|------------------------|---------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 1 — Services + AC      | Day 1         | Electrician and plumber disconnect. AC units removed. Windows removed.                        | AC units store for reuse. Services coil for reuse.                     |
| 2 — Galvalume cladding | Day 1–2       | Unclip metal profiles from hat rails. Stack flat on timber packers. Remove hat rails.         | Cladding 100% reusable. Rails reusable.                                |
| 3 — Floor screed       | Day 2         | Break up sand/cement screed (only waste element — ~1T per floor). Remove OSB sub-deck.        | OSB 80% reusable. Screed disposed as inert rubble.                     |
| 4 — Mineral wool batts | Day 2–3       | Pull MW batts from all stud cavities. Bag and label per spec. Stack for transport.            | MW 100% reusable — same thermal + acoustic performance at second site. |
| 5 — Floor cassettes    | Day 3–4       | Crane lifts each cassette. FCB soffit intact and undamaged. Stack on truck.                   | Cassettes 100% reusable.                                               |
| 6 — Wall panels        | Day 4–6       | Remove panel-to-panel screws and track fixings. Crane lifts each pre-FCB'd panel. Stack flat. | Panels 100% reusable. FCB inner face intact. No CLC weight.            |
| 7 — External stairs    | Day 6–7       | Unbolt in reverse: handrail → treads → stringers → landing → anchor bolts. One day per stair. | Stair 100% reusable.                                                   |
| 8 — Tracks + roof      | Day 7         | Remove all tracks, hold-down brackets, roof sheet, purlins.                                   | All reusable.                                                          |
| <b>TOTAL</b>           | <b>7 days</b> | <b>25T crane × 3 days. Labour × 7 days.</b>                                                   | <b>Site left clean — only screed rubble and chemical anchor stubs</b>  |

# PRICING

Fixed Price — Both Blocks — Supply and Erect Complete

| Cost Element                                                                                                                                             | Block A | Block B | Both Blocks |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| LGS sections — studs, tracks, joists, rim, noggins, stair stringers (all 1.5mm BMT studs)                                                                | ₹16–20L | ₹18–23L | ₹34–43L     |
| 9mm FCB inner lining (all walls, both faces)                                                                                                             | ₹9–12L  | ₹10–13L | ₹19–25L     |
| 9mm FCB soffit boards (floor cassettes)                                                                                                                  | ₹4–6L   | ₹4–6L   | ₹8–12L      |
| 50mm mineral wool slabs — wall insulation                                                                                                                | ₹5–7L   | ₹6–8L   | ₹11–15L     |
| 50mm mineral wool batts — floor acoustic                                                                                                                 | ₹3–4L   | ₹3–5L   | ₹6–9L       |
| Galvalume AZ150 profile cladding + hat rails + trims                                                                                                     | ₹11–15L | ₹13–17L | ₹24–32L     |
| 18mm structural OSB (floors) + 40mm sand/cement screed                                                                                                   | ₹7–9L   | ₹8–10L  | ₹15–19L     |
| SDS screws, hold-downs, chemical anchors, PAF pins                                                                                                       | ₹3–4L   | ₹3–4L   | ₹6–8L       |
| Windows (all rooms)                                                                                                                                      | ₹6–8L   | ₹7–9L   | ₹13–17L     |
| External door frames + fire doors to BOCW                                                                                                                | ₹3–4L   | ₹3–4L   | ₹6–8L       |
| Internal flush doors + ironmongery                                                                                                                       | ₹5–6L   | ₹5–6L   | ₹10–12L     |
| Internal paint — 9mm FCB face (prime + 2 coats emulsion)                                                                                                 | ₹3–4L   | ₹3–4L   | ₹6–8L       |
| Ablution block fit-out (Block B only): tanking, tiling, 10 shower sets, 10 WC pans, 10 basins, hot water heaters, drain channels, mechanical ventilation | —       | ₹18–24L | ₹18–24L     |
| Canteen fit-out (Block B only): serving counter, kitchen prep, extraction, LPG provision                                                                 | —       | ₹6–8L   | ₹6–8L       |
| Medical room fit-out (Block B only): fittings, pharmacy cabinet, treatment bay                                                                           | —       | ₹3–4L   | ₹3–4L       |
| Laundry room (Block B only): plumbing + drainage provisions for 6 machines                                                                               | —       | ₹2–3L   | ₹2–3L       |
| External LGS stairs (2 per block = 4 total)                                                                                                              | ₹6–7L   | ₹6–7L   | ₹12–14L     |

| Cost Element                                              | Block A          | Block B          | Both Blocks                        |
|-----------------------------------------------------------|------------------|------------------|------------------------------------|
| Roof — Galvalume sheet + Z150 purlins + ridge + flashings | ₹8–10L           | ₹9–11L           | ₹17–21L                            |
| Transport — Sanand GIDC to site (adjust for distance)     | ₹3–4L            | ₹3–4L            | ₹6–8L                              |
| Crane hire — 25T × 10 days both blocks                    | ₹5–6L            | ₹5–6L            | ₹10–12L                            |
| Scaffold — 3-level external both blocks                   | ₹4–5L            | ₹5–6L            | ₹9–11L                             |
| MME site supervisor — 45 days                             | ₹2.5–3L          | ₹2.5–3L          | ₹5–6L                              |
| SE calculations + IS 801 stamp + QR labels + SiteIQ setup | ₹2–3L            | ₹2–3L            | ₹4–6L                              |
| <b>TOTAL — SUPPLY AND ERECT</b>                           | <b>₹105–146L</b> | <b>₹133–179L</b> | <b>₹238–325L</b>                   |
| <b>SUMMARY — MID-POINT ESTIMATE</b>                       | <b>~₹126L</b>    | <b>~₹156L</b>    | <b>~₹282 Lakhs = ₹2.82 Crores</b>  |
| <b>PER WORKER (200 workers)</b>                           |                  |                  | <b>₹1.19–1.63 Lakhs per worker</b> |

#### INCLUDED / EXCLUDED / PAYMENT TERMS

Included: Full LGS structure; FCB lining both faces; mineral wool insulation; Galvalume cladding; OSB floors + screed; all windows and door frames; internal painting; external LGS stairs; ablution block complete (Block B); canteen + medical + laundry fit-out (Block B); roof; SiteIQ + QR setup; SE calculations; MME site supervisor 45 days; crane; transport; scaffold.

Excluded: Site preparation and hardstand; electricity and water connections; furniture (bunk beds, mattresses, lockers, canteen tables/chairs); split AC units; fire extinguishers (brackets pre-fitted); camp management; external security fencing and lighting; any geotechnical foundation upgrade.

Payment: 40% advance (triggers factory) · 40% on truck delivery · 20% on structural completion certificate.

## WHY MME

Seven Reasons India's Leading EPC Contractors Choose Us



### 45-Day Delivery — Written into Every Contract

Our Sanand GIDC factory starts production on Day 1 after advance receipt. If we miss the 45-day clock through our own fault, 0.5% per day penalty applies on the outstanding balance — our commitment in writing. No other Indian LGS supplier makes this guarantee.



### 100×50×15 Studs — 1.5mm BMT Throughout

We specify 1.5mm BMT studs (not the 1.2mm some competitors use). For G+2, the additional 45–50% axial capacity means single-section IS 801 compliance at every floor level — no back-to-back compound studs, no exceptions. Every IS 801 calculation is SE-stamped.



### 32–36°C Inside at 45°C Ambient — Before AC

50mm mineral wool in 100mm stud cavities gives U-value 0.28–0.32 W/m²K. Interior temperature at 45°C ambient: 32–36°C with AC off. A 1.0T split runs 7–9 hrs/day — versus 18+ hrs for a sheet metal cabin. Annual electricity saving per 200-worker camp: ₹24–32 Lakhs.



### 1:20 Shower and WC Ratio — 25% Above BOCW Minimum

10 showers and 10 WCs for 200 workers = 1:20 ratio. BOCW minimum is 1:25. We include this in the standard block B ground floor at no extra cost — because camps that meet the minimum get queues, and queues cause labour disputes.



### Full Weight Recovery at Demount — No CLC Mass

Mineral wool batts pull out of stud cavities in seconds. Every panel leaves site at the same weight it arrived. Cladding unclips from rails undamaged. MME buyback at 45–60% of supply price — your camp has real residual value at project end.



### SiteIQ — Your Project Director Sees Every Lift

Live cameras, IoT tilt sensors, and a BIM progress map updated every time a QR code is scanned. Every panel turns green on the map the moment it is installed and scanned. Share the browser URL with your project director, safety officer, or client — no app required.



### Made in India — Sanand GIDC, Gujarat

Steel from JSW Salem or RINL. Cement from ACC or Ultratech. FCB from Everest. Mineral wool from Rockwool India or Saint-Gobain Gyproc. Cladding from Tata BlueScope or equivalent. DPIIT-recognised Indian startup. Full MSME preference applicable.

# HOW TO ORDER

Four Steps from Site Plan to Occupied Camp

1

## Send us your site plan — 48-hour DesignAI layout

Email a PDF site plan (or a sketch with dimensions and worker count). DesignAI generates a full camp layout, panel schedule, and fixed-price quote within 48 hours. No charge.

2

## Review quote and sign contract

Fixed price — no variations. Review IS 801 summary + BOCW welfare checklist with the quote. Approve layout. Sign and pay 40% advance.

3

## Factory production at Sanand GIDC

Production starts Day 1 after advance. SiteIQ shows progress from Day 1. QR labels printed at the roll-former as each section is produced.

4

## Delivery, erection, and handover in 45 days

Trucks arrive at your site. MME site supervisor manages erection. SiteIQ live. You receive structural completion certificates for both blocks + BOCW welfare sign-off + SiteIQ compliance documents at handover on Day 45.

## CONTACT US — GET YOUR QUOTE IN 48 HOURS

Gujarat (Sanand GIDC factory — direct): +91 79 XXXX XXXX

Tamil Nadu (SIPCOT Sriperumbudur head office): +91 44 XXXX XXXX

Email (general): lgs@mme.build · Email (accommodation): camps@mme.build

DesignAI camp configurator: designai.mme.build · SiteIQ monitoring: siteiq.mme.build

Factory: MME Gujarat · Sanand GIDC Industrial Estate · Sanand · Ahmedabad · Gujarat 382110

Head office: MME Pvt. Ltd. · SIPCOT Industrial Estate · Sriperumbudur · Kanchipuram · Tamil Nadu 602105

METAL MATRIX ENGINEERING PRIVATE LIMITED

# 200 Workers. Two G+2 Blocks. 45 Days.

**100×50×15 LGS Studs · Mineral Wool · Galvalume Cladding · External Stair**

10 Showers + 10 WCs + 10 Basins (1:20 ratio) · 60-seat Canteen · Medical Room

4-Person Bunk Rooms · 4.5 sqm/person · 2,680mm Clear Ceiling Height

IS 801:2015 · IS 811:2014 · IS 3809 · BOCW Act 1996 · IS 875 · IS 1893

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