SAMPLE QUANTITIES REPORT

Grand Total quantities

Example house: G+1, 1,000 sq ft per floor

PREPARED FOR	LOCATION	REPORT ID	DATE
Example house (sample)	Lucknow, Uttar Pradesh	NS-GT-SAMPLE	29 October 2026

This is a sample report

It is a real report from the same calculations a paid report uses, made for an example house (G+1, 1,000 sq ft on each floor, Lucknow). It is not your project and nothing in it applies to your plot. Your own report uses your plot, floors and city, so its figures will differ.

What to order

The main totals across 5 phases. The line under each figure is the range the real number is likely to fall in.

CEMENT	STEEL BARS	SAND	BRICKS OR BLOCKS
729 bags of 50 kg	5,421 kg	65.5 m³	30,400 nos
635 to 997	4,879 to 8,674	54.9 to 87.8	24,928 to 36,480

How to use this report

This list adds the reports you already bought, phase by phase, into one buying list. Each figure is a code-based planning estimate worked out from the answers you gave, not a design for your drawings. Use it to plan, to check a contractor's quantities for gross errors and to order the first lots. Final quantities come from the drawings and the professional who signs them.

Before you rely on this list

PASS — The reports agree with each other

Same building in every report

All 5 reports are for 2 floors and about 186 m² built-up in Lucknow, Uttar Pradesh.

PASS — Whole building or part of it

Phases in this total

All five phases are in this total: frame, walls, wiring, plumbing and finishing.

PASS — Counted once

Lintels over doors and windows

The frame report already counts the lintels, and so does the walls report. The walls report's share (8 bags of cement, 0.43 m³ of sand, 0.86 m³ of stone, 95 kg of steel) is taken out of this list so the same concrete and steel are not ordered twice.

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What is in this total

Each row is one paid report. The quantities below come from these reports and nothing else.

PHASE	FLOORS	BUILT-UP AREA (M²)	ITEMS	WHAT IT COVERS
StructurePro · Frame	2	186	12	Footings, columns, beams, slabs and stairs: concrete, steel and shuttering
MasonryPro · Walls	2	186	3	Bricks or blocks, mortar, lintels and plaster
ElectricalPro · Wiring	2	186	44	Points, wire, conduit, boards and earthing
PlumbingPro · Plumbing	2	186	14	Pipes, tanks, pump, fittings and fixtures
InteriorPro · Finishing	2	186	29	Paint, tiles, ceilings, doors and carpentry

The big materials, added across phases

Cement, sand and stone are used by more than one phase. Here they are added into one figure to order.

MATERIAL	TOTAL	UNIT	FRAME	WALLS	FINISHING
Cement	729	bags of 50 kg	494	185	50
Sand	65.5	m³	26.7	34.2	4.60
Stone aggregate 20 mm	52.4	m³	52.4	–	–
Steel bars, all sizes	5,421	kg	5,421	–	–
Bricks or blocks	30,400	nos	–	30,400	–

Each phase rounds its own figures up to whole bags, bars and units, so the total can sit a little above the sum of unrounded figures. Steel is the sum of every bar size in the frame (and the lintel bars when no frame report is in the total).

Frame: StructurePro

Phase 1. Footings, columns, beams, slabs and stairs: concrete, steel and shuttering.

ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Fe500D bars, 6 mm	103	kg	Cut, bent and lapped, with the buying allowance
Fe500D bars, 8 mm	2,919	kg	Cut, bent and lapped, with the buying allowance
Fe500D bars, 10 mm	369	kg	Cut, bent and lapped, with the buying allowance
Fe500D bars, 12 mm	1,468	kg	Cut, bent and lapped, with the buying allowance
Fe500D bars, 16 mm	241	kg	Cut, bent and lapped, with the buying allowance
Fe500D bars, 20 mm	321	kg	Cut, bent and lapped, with the buying allowance
Binding wire	47	kg	Tying the bars
Shuttering, contact area	507	m²	Sides and soffits of every member
Excavation for footings and plinth	124.7	m³	Pits to the founding depth

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Walls: MasonryPro

Phase 2. Bricks or blocks, mortar, lintels and plaster.

ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Red clay brick 230 × 115 × 75 mm	30,400	nos	bricks, with 5% breakage

Wiring: ElectricalPro

Phase 3. Points, wire, conduit, boards and earthing.

ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Copper wire 1.5 mm², red	270	m	Whole coils of 90 m, 5% waste
Copper wire 1.5 mm², black	270	m	Whole coils of 90 m, 5% waste
Copper wire 1.5 mm², green-yellow	180	m	Whole coils of 90 m, 5% waste
Copper wire 2.5 mm², red	450	m	Whole coils of 90 m, 5% waste
Copper wire 2.5 mm², black	450	m	Whole coils of 90 m, 5% waste
Copper wire 2.5 mm², green-yellow	450	m	Whole coils of 90 m, 5% waste
Copper wire 4 mm², red	90	m	Whole coils of 90 m, 5% waste
Copper wire 4 mm², black	90	m	Whole coils of 90 m, 5% waste
Copper wire 4 mm², green-yellow	90	m	Whole coils of 90 m, 5% waste
Copper wire 6 mm², red	90	m	Whole coils of 90 m, 5% waste
Copper wire 6 mm², yellow	90	m	Whole coils of 90 m, 5% waste
Copper wire 6 mm², blue	90	m	Whole coils of 90 m, 5% waste
Copper wire 6 mm², black	90	m	Whole coils of 90 m, 5% waste
Copper wire 6 mm², green-yellow	90	m	Whole coils of 90 m, 5% waste
PVC conduit 20 mm	675	m	Whole 3 m lengths, 5% waste
PVC conduit 25 mm	9	m	Whole 3 m lengths, 5% waste
PVC conduit 32 mm	12	m	Whole 3 m lengths, 5% waste
MCB 6 A	9	nos	One-pole, one for each circuit
MCB 10 A	7	nos	One-pole, one for each circuit
MCB 16 A	11	nos	One-pole, one for each circuit
MCB 20 A	1	nos	One-pole, one for each circuit
Incomer MCB 4-pole 32 A	1	nos	One at the head of each board
Incomer MCB 2-pole 32 A	1	nos	One at the head of each board
RCCB 30 mA	2	nos	One on every board
Distribution board 24 way, three-phase (ground floor)	1	nos	Outgoing ways, with a spare
Distribution board 8 way, single-phase (first floor)	1	nos	Outgoing ways, with a spare

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ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Light, fan, exhaust and bell points	59	nos	Counted room by room
Socket outlets (6 A, 6/16 A, 20/25 A)	65	nos	Counted room by room, with the dedicated outlets
Earth electrode with pit	2	nos	One for a single-phase house, two for three-phase or flats
Modular switch, 6 A, one-way (lights, fans, exhaust fans)	57	nos	Counted
Electronic fan regulator, step type	6	nos	Counted
Modular socket with switch, 6 A, 3-pin	53	nos	Counted
Modular socket with switch, 6/16 A	11	nos	Counted
Socket, 20/25 A, for an air conditioner	1	nos	Counted
Isolator switch, double-pole, 32 A, with indicator (air conditioner, water heater)	4	nos	Counted
Call bell push	2	nos	Counted
Call bell	2	nos	Counted
TV outlet	4	nos	Counted
Data outlet (RJ45)	4	nos	Counted
Media box (TV and data cables meet here)	2	nos	Counted
Ceiling rose or connector	55	nos	Counted
Fan hook and box	6	nos	Counted
Junction box or ceiling box, 20 mm	102	nos	Counted
Switch box (GI or PVC) with cover plate, about 4 modules each	35	nos	Counted

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Plumbing: PlumbingPro

Phase 4. Pipes, tanks, pump, fittings and fixtures.

ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
CPVC pipe 15 mm	90	m	Whole 3 m lengths, 5% cutting waste
CPVC pipe 20 mm	24	m	Whole 3 m lengths, 5% cutting waste
CPVC pipe 25 mm	48	m	Whole 3 m lengths, 5% cutting waste
CPVC pipe 32 mm	15	m	Whole 3 m lengths, 5% cutting waste
uPVC SWR pipe 40 mm	6	m	Whole 3 m lengths, 5% cutting waste
uPVC SWR pipe 50 mm	24	m	Whole 3 m lengths, 5% cutting waste
uPVC SWR pipe 75 mm	45	m	Whole 3 m lengths, 5% cutting waste
uPVC SWR pipe 110 mm	39	m	Whole 3 m lengths, 5% cutting waste
Underground tank	1,000	L	ready-made tank
Overhead tank	500	L	ready-made tank

ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Transfer pump 0.5 HP	1	nos	One working, one standby for two or more homes
Water closets	3	nos	One per bathroom
Wash basins	4	nos	One per bathroom, one at the dining area
Inspection chambers	3	nos	At each stack foot, at the outlet, and every 30 m

Finishing: InteriorPro

Phase 5. Paint, tiles, ceilings, doors and carpentry.

ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Wall putty, cement based	360	kg	Inside walls and ceilings
Primer, inside	45	L	Inside walls and ceilings
Interior emulsion, 2 coats	54	L	Inside walls and ceilings
Primer, outside	38	L	Outside walls
Exterior acrylic emulsion	66	L	Outside walls
Primer for doors	3	L	Doors, both faces
Enamel for doors	4	L	Doors, both faces
Tile 600 × 600 mm	458	nos	165.8 m² with breakage
Tile 300 × 300 mm	264	nos	24.2 m² with breakage
Tile 300 × 600 mm	351	nos	63.7 m² with breakage
Tile grout	32	kg	All tile joints
Waterproofing coat, bathrooms	26.2	m²	Floor and 0.30 m up the walls
Kitchen counter, granite	2.8	m²	With 10% for cutting
Counter edge, moulded	4	m	Front edge
Door thresholds	5	m	5 thresholds
Main door, 10 DS 21	1	nos	Shutter and frame
Room door, 9 DS 21	4	nos	Shutter and frame
Bathroom door, 8 DS 21	3	nos	Shutter and frame
Door of the terrace stair room, 9 DS 21	1	nos	Shutter and frame
Door frame timber	0.31	m³	100 × 65 mm section
Door hinges	28	nos	By the width of the shutter
Lock sets	4	nos	Main door and bedrooms
Tower bolts	5	nos	Main and bathroom doors
Handle pairs	9	pairs	One for every door
Door stoppers	9	nos	One for every door
Window glass, 4 to 5.5 mm	16.4	m²	With 5% for cutting

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ITEM	QUANTITY	UNIT	HOW IT IS COUNTED
Window and sash sections	139	m	Aluminium or uPVC

When you need each phase

Follow the order the work follows on site, so material is not sitting on site (or running out) at the wrong time.

PHASE	WHEN
Phase 1 · Frame	First. Excavation and lean concrete, then steel and shuttering, then cement, sand and stone for each pour.
Phase 2 · Walls	After the frame has cured. Lintels are cast as the walls reach the height of the openings.
Phase 3 · Wiring	Conduit and boxes go in before the slab is poured and as the walls rise. Wire is pulled after plaster.
Phase 4 · Plumbing	Sleeves and pipes go in before the slab is poured and into the walls before plaster. Fixtures come last.
Phase 5 · Finishing	After plaster. Tiles and ceilings first, doors and paint last.

How far off can this be

- StructurePro: the widest range in that report: from 15% below to 60% above the figure shown.
- MasonryPro: the widest range in that report: from 30% below to 40% above the figure shown.
- ElectricalPro: the widest range in that report: from 30% below to 40% above the figure shown.
- PlumbingPro: the widest range in that report: from 30% below to 40% above the figure shown.
- InteriorPro: the widest range in that report: from 35% below to 40% above the figure shown.

How the reports were added

- Every figure comes from the paid report of its phase, as the customer received it. The Grand Total adds those reports; it does not recalculate them.
- Quantities are added by item. Cement, sand and stone from different phases go into one figure; every other item stays under its own phase.
- Where two reports count the same thing, it is counted once. The lintels over doors and windows are counted in the frame, so the walls report's lintel concrete and steel are taken out when both are present.
- The ranges beside the big totals add each phase's own range for that material. The phases are separate estimates, so they can be off in the same direction, and the combined range is never narrower than the widest of them.
- The assumptions behind every phase are listed under "The assumptions in each phase" below. Where a phase assumes a room size, a door size or a wastage, that assumption is in the total.

The assumptions in each phase

StructurePro

- Layout: regular grid of 3 x 2 bays of about 3.66 x 4.23 m, storey height 3 m, plinth 0.45 m. Your own drawing will differ.
- Seismic zone III. Zone III for Lucknow (IS 1893:2002 Annex E). IS 1893:2016 is the edition in force: confirm with a local structural engineer.
- Zone III and above: special moment-resisting frame, ductile detailing to IS 13920:1993 (closer stirrups at the ends and tie spacing to cl. 7.4.6, a strong-column weak-beam check at the tool's own factor of 1.1; the confining-steel area of cl. 7.4.8 is not checked).
- Concrete: M20 above ground and M25 for foundations, chosen from the exposure condition (IS 456 Table 5). Steel: Fe500D.

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- Foundation: isolated footings on ordinary firm soil, safe bearing capacity 150 kN/m2 assumed, founding depth 1.5 m. Replace with a soil test.
- Loads: floor finish 1.5 kN/m2, imposed 2.0 kN/m2 on floors and 1.5 kN/m2 on the roof (IS 875), brick walls 230 mm outside, 115 mm brick partitions on half the inner beams, 15 % off for openings.
- Slab 150 mm thick (span/depth, IS 456 cl 23.2); beams 230 mm wide with depth from bending, shear and deflection; columns sized by the biaxial check of IS 456 cl 39.6.
- Reinforcement is bought in 12 m bars (6 mm comes as a coil, cut and bent on site) with 5 % wastage (CPWD DAR 5.22.1). Binding wire is 9 kg per tonne.
- Lintels, sunshades, the terrace parapet band and the stair head-room roof are counted from the plan perimeter and floor area (37 lintels over doors and windows, 23 sunshades (chajjas), 1 terrace parapet coping band, 1 stair head-room (mumty) roof); their sizes are site practice, not code values.
- Cement, sand and aggregate: CPWD Delhi Analysis of Rates 2014 for M20 and below, IS 10262 mix design above that, plus 3 % site wastage.
- Wind to IS 875 (Part 3): basic speed 47 m/s for Lucknow, open terrain, roof-level pressure 1.33 kN/m2. Base shear 61 / 79 kN (along x / y) against 91 / 91 kN for the earthquake: the earthquake governs in both directions. The larger force sets the design, storey by storey; wind and earthquake are never added (IS 1893 cl 6.2).
- Soil-structure interaction and torsion are not analysed; the earthquake forces are IS 1893 equivalent static forces shared equally between frames. Wind pressures use the 1987 basis with no directionality factor and no hill or shielding effect. The wind speed for a town comes from a published city table: the engineer should confirm it against the wind map of IS 875 (Part 3).

MasonryPro

- Code: Red clay brick of 230 × 115 × 75 mm (The common field size of red bricks. It is not a BIS size, and it varies from kiln to kiln.); joints of 10 mm (IS 6041 cl 7.1 for AAC, IS 2572 cl 11.1.4 for concrete block, IS 2212 for brickwork). Walls are measured and openings deducted to IS 1200 (Part 3) and (Part 12).
- Derived: units per m² = the nominal thickness over the pitch of the unit in all three directions, so a one-brick wall of this brick holds 94.1 units a m². Joint mortar is the true volume of the joints, not the nominal one, which would run about a quarter high.
- Practice: plaster mortar per m² is the CPWD Delhi Analysis of Rates 2014 yield for each item (12 mm, 6 mm, 18 mm in two coats, 20 mm). Cement per m³ of mortar is calibrated to the CPWD figure of 513 kg for 1:3 and carried to the other mixes in the same ratio. The CPWD Volume 1 brickwork items were not used to check the joint mortar, and a published table based on them suggests the tool's joint mortar may be low, most of all in half-brick walls, so the masonry figures are the less certain ones.
- Assumed: the room plan. A bedroom is one share of the floor, a living room 1.3 shares plus 0.3 for each bedroom, a kitchen 0.75, a bathroom 0.33 and the passages about half a share; rooms are 1 to 1.3 in plan and passages 1 to 4. Walls between rooms are counted once.
- Assumed: outer wall length 4.08 × √(floor area), a plan of 1 to 1.5. Outer walls 2.55 m high (floor to beam, 0.45 m deep), inner walls 2.70 m. Floor to floor height 3.00 m, which matches the structure report.
- Assumed: door and window sizes in the schedule, one window in each bedroom and kitchen, two in a ground floor living room, a ventilator in each bathroom, a stair window on every floor above one storey.
- Assumed: lintels 0.15 m deep up to a 1.5 m span and 0.20 m above, resting 0.15 m or a tenth of the span on each side; the steel in them is two 10 mm bars, two 8 mm bars and 6 mm stirrups.
- Assumed: 5% breakage and cutting waste on bricks; 25% extra joint mortar. No standard gives either figure.
- Assumed: plinth masonry 0.6 m high; parapet and balcony edge walls 1.0 m high; a terrace stair room of 3 × 3 m and 2.4 m high; balconies 3.0 × 1.5 m with walls on three sides.
- Assumed: plaster of columns, beams and slab edges is measured with the wall at full height, so no separate plaster for them is counted; the ceiling plaster area is the floor area inside the walls.
- The free Brick Calculator uses the same brick sizes and joints as this report, for the one wall you describe. This report works from your rooms, so it also carries the room plan, the openings and the plaster, and its totals will not match a single wall.

ElectricalPro

- Code (draft): lights, fans and sockets for each room follow Tables 2 and 3 of the BIS draft revision of IS 4648 (September 2024). The draft is not published, and a few columns were read by position, so the room-wise counts are a guide. Counts rise in proportion to room area, one step for each 12 m², and are not rounded up to whole blocks (the draft says 10 to 12 m² or part, so the 12 m² and the proportional count are this tool's choice; read strictly, "or part" would round up).

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- Code: a point is the whole wire run from the controlling switch to the outlet (CPWD GS 3.4). The wire, conduit, bends, couplers and clips in each point come from CPWD Delhi Analysis of Rates 2016, items 1.1 and 1.7: Group A is 7.5 m of wire and 2.5 m of conduit a point, Group B 10 m and 3.5 m, plus 5%.
- Assumed: homes up to 1,000 sq ft use Group A and homes of 2,500 sq ft or more use Group B, with a straight line between. The CPWD documents do not say where one group ends.
- Code: lighting circuits, power circuits and the one-circuit-for-each-big-appliance rule follow CPWD GS 3.10, IS 4648 cl 7 and the draft cl 6.2. Where they differ, the stricter limit is used (8 lighting points, two 16 A outlets).
- Assumed: up to 8 six-amp sockets share a circuit. The sources disagree (three sockets in CPWD GS 3.10, no clear limit in the draft), so the figure is a modern-practice value and the circuit count is the least certain part of this report.
- Derived: copper wire is 1.01 m for each metre of route (CPWD DAR), with 5% added for cutting waste, and bought in coils of 90 m for sizes up to 6 mm². The 90 m coil is the common pack; no standard fixes it.
- Assumed: the run from a board to the first point of a circuit is 0.6 × the side of the home plus 3 m for lights, 0.7 × plus 3 m for sockets and 0.8 × plus 3 m for large appliances. A socket is tapped from the nearest point over 2.5 to 4 m.
- Assumed: carpet area is 75% of built-up area, and room sizes are shared out of it (hall 1.6, bedroom 1.0, kitchen 0.8, bathroom 0.35 parts), held between sensible limits (a bedroom 9.5 to 20 m², a hall 9.5 to 30 m²). Floor area beyond those limits is taken to be rooms you did not list, which are not counted.
- Derived: design load is the larger of 75 W per m² of carpet area (draft IS 4648 cl 7) and 0.6 × the big appliances plus 1.5 kW. No standard gives a diversity factor for homes. Mains cables take their size from the steps of draft Table 4 applied to the design load; the draft applies that table to the connected load and, from 10 kW, asks for a size worked from the current ratings of IS 732:2019, which this tool does not read. Larger sizes are Assumed.
- Assumed: single-phase up to a design load of 10 kW and three-phase above it. Your electricity board decides this, and the wire and board sizes change if it differs.
- Assumed: 2 earth electrodes for the building and 10 m of earth strip from each. The number of pits depends on the soil.
- Assumed: one 7.4 kW EV charger circuit for every five parking spaces, at least one, when you ask for EV charging. The wire is 6 mm².
- Assumed: one switch for each point, one fan hook, one regulator and one ceiling rose for each fan; a switch box holds about four modules.

PlumbingPro

- Code: 135 litres per person a day (IS 1172:1993 cl 4.1 and its Note; 135 L is the lower of the figures given, and a town of over a lakh people may need 150 L or more). Tanks follow the NBC Part 9 Section 1 split of two-thirds of a day underground and one-third overhead.
- Code: fixture units, simultaneous demand, 2.4 m/s velocity limit (NBC Part 9 Section 1 draft); drain loads, stack and drain limits (IS 1742); venting above five storeys (IS 5329); septic tank and soak pit tables (IS 2470); down-pipe areas (IS 1742 Table 5).
- Derived: people per home = bedrooms plus three. The NBC draft gives this relation in two readings that differ by one person; the larger is used, so tanks lean generous.
- Assumed: floor to floor height of 3.0 m; 3 m of pipe from the header to each tap; 0.6 × the side of the home for the header run from the riser; 4 m from the stack foot to its chamber and 8 m to the plot edge. No standard fixes these, so the report treats them as the least certain part and the range below is wide.
- Assumed: bathrooms are stacked one above another and share a wet wall, kitchens likewise.
- Assumed: one washing machine point per home, one balcony tap per home on every floor, one terrace tap, and one wash basin at the dining area for homes with two or more bedrooms.
- Assumed: a transfer pump fills the overhead tank in 30 minutes, at a pump efficiency of 0.5, over the climb plus 10 m of pipe and 30% extra length for fittings.
- Assumed: roof area equals your largest floor. Rain of about 75 mm in an hour, because the standard gives no figure for each town.
- Assumed: tank sizes are rounded up to 500, 1,000, 1,500, 2,000, 3,000 or 5,000 litres, which are the common ready-made sizes (no standard lists them). A larger need is shown as equal tanks, or a built sump underground.
- Assumed: 5% cutting waste on all pipe, and whole lengths of 3 m (CPVC, IS 15778 allows 3, 5 or 6 m; SWR pipe is sold in 3 m lengths).

InteriorPro

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- Code: surfaces are measured following the rules of IS 1200 as the tool reads them, in the editions named under Standards and sources: (Part 11) floors, dado and skirting, (Part 12) plaster and (Part 13) paint. BIS lists 2024 revisions of Parts 11 and 13; the tool has not been checked against them. Openings to 0.5 m² are not taken out, from 0.5 to 3 m² one face is. Door shutters are the standard sizes of IS 1003 (Part 1). Plywood sheets are IS 303.
- Practice: the exterior paint spread is the CPWD Delhi Analysis of Rates 2016 coefficient (cement paint 0.384 kg, smooth acrylic 0.167 L, textured 0.328 L a m²) and the door paint is 0.075 L of primer and 0.090 L of paint a m². The DAR's exterior primer is 0.22 kg a m² in 2016 and 0.09 L in a later schedule; the maker's sheet (0.09 to 0.108 L) agrees with the later figure, so 0.095 L is used.
- Maker: the inside spread (putty, primer, emulsion, distemper) is from the data sheets of Asian Paints, Nerolac and Berger, because the DAR emulsion items could not be read. These vary widely between brands (an emulsion is 0.063 to 0.138 L a m² for two coats), so the range around the paint figure is wide.
- Derived: tiles a m² is one over (length + joint) times (width + joint). Grout is 1.6 kg a litre times the joint length, width and tile thickness. Panel areas for wardrobes and kitchen units are worked out from the box geometry. Board joint and hanger counts for the false ceiling follow the spacing of a public gypsum specification.
- Assumed: the room plan (shared with MasonryPro): a bedroom is one share of the floor, a living room 1.3 shares plus 0.3 for each bedroom, a kitchen 0.75, a bathroom 0.33, and the passages about half a share. Walls are taken as 230 mm outside and 115 mm inside.
- Assumed: clear height 2.85 m. Bathroom wall tiles stop at 2.1 m. The wall above the kitchen counter is tiled 0.6 m high. Kitchen runs are 3 m straight, 4.2 m in an L and 5.4 m in a U; wardrobes are 2.4 m (master) and 1.8 m (others).
- Assumed: wastage of 5% on paint, putty and primer; 5% to 15% on tiles by the layout and the size; 10% on grout; 8% on gypsum board; 12% on plywood and laminate; 10% on granite; 5% on glass. No standard or maker gives these.
- Assumed: door and window sizes and counts: a window in every bedroom and kitchen, two in a living room on the ground floor or in a flat, a ventilator in each bathroom, a stair window for each storey in a building of two floors or more, a glazed door to each balcony, and a stair room on the terrace of any building of two floors or more.
- Assumed: the false ceiling hangers are 0.45 m long, and the cove, if any, is not counted.
- Assumed: the tile bed (mortar or adhesive) covers every tiled area, with the floor bed at 11.0 kg of cement and 0.022 m³ of sand a m² and the wall bed at 9.2 kg and 0.0125 m³ a m². These come from CPWD item text quoted in public tenders; the DAR flooring pages could not be read.
- The plaster underneath, the cement and sand for it, and the walls are in MasonryPro. Putty starts where the plaster ends.

Not counted in this report

- Labour, contractors, equipment hire and transport. The site counts quantities only.
- Anything a phase report lists as not counted (listed under each phase).
- Site-specific items no questionnaire can see: a basement, a lift, a swimming pool, a compound wall, landscaping and soil treatment beyond what a phase lists.

StructurePro: not counted

- Brick or block masonry, plaster, flooring, doors, windows, painting, waterproofing
- Lift shaft, basement, water tank, sump, septic tank, compound wall, boundary gate
- Balconies, porticos, canopies and other cantilevers beyond the main grid
- Backfilling, plinth filling, anti-termite treatment, curing water, scaffolding hire
- Plumbing, electrical and finishing works

MasonryPro: not counted

- Dowel bars, ties, and any horizontal bands in tall walls (IS 4326 cl 8.2.6). Your engineer decides these.
- Stiffening columns and copings on parapets, and the stair, balcony and terrace slabs themselves (these are in the structure report).
- The compound wall, the steps of the staircase, chajjas, sunshades and the walls of tanks, septic tanks and chambers.
- Plinth protection, damp-proof course, waterproofing and terrace screed.
- Door and window frames, shutters, glass and grills (in InteriorPro).
- Putty, primer and paint, tiles and floors (in InteriorPro).
- Neat cement coats, textured finishes, rough cast and pebble dash.

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- Scaffolding, curing water and the carriage of materials.

ElectricalPro: not counted

- Rooms you did not list, such as a study, a family lounge or a guest room. Add them to the bedroom count if you want them wired.
- The electricity meter, the service connection and the board's own cable up to the meter.
- Lifts, generators, solar panels, battery banks, intercoms, CCTV, security alarms and home automation.
- Light fittings, fans, air conditioners, water heaters, the inverter and its batteries, and the pumps themselves.
- Lightning protection and surge protection devices (IS 2309; IS 732:2019 cl 5.3.5, the clause the BIS draft of IS 4648 gives for surge protection).
- A residual current device of up to 300 mA at the point of supply (draft IS 4648 cl 6.2.9), and the class (B or C) and the short-circuit rating of the breakers, which this report does not state.
- Chasing the walls and making good after the wiring.
- Screws, tape, glands, lugs, ferrules, cable ties and other small items.
- The make, model and finish of any switch, socket or board.

PlumbingPro: not counted

- Building the underground tank, the septic tank, the soak pit and the inspection chambers (concrete, bricks, plaster, covers).
- The borewell, its submersible pump and the cable to it.
- Hot-water solar systems, water meters, water softeners and filters.
- Fire-fighting water and pipework (NBC Part 4).
- Make, model or finish of any fixture or tap.
- Excavation and refilling for drains and pipes in the ground, except the tank and pit digging shown.
- Kitchen hot water, which is cold-only in this count.

InteriorPro: not counted

- Plaster, and the cement and sand for it (these are in MasonryPro).
- The flooring screed under tile adhesive, stairs (treads, risers and landings), and the terrace and parapet finish.
- Marble, granite, wood and laminate flooring apart from the thresholds and counter. No source read gives their quantities.
- Sanitary fittings, taps and bathroom accessories (these are in PlumbingPro) and the lights and fans (in ElectricalPro).
- Jointing tape and compound for the false ceiling, cove lighting, access panels, curtain boxes and any bulkhead.
- Drawers, channels, baskets, pull-outs, locks, handles on drawers, mirrors and shelf pins; loft cabinets above 2.1 m.
- Window grills, mosquito nets, sills, curtains and blinds, and timber windows.
- Inside of the terrace stair room, the compound wall and gate, and polishing of timber.
- Scaffolding, masking, putty sanding, curing water and the carriage of materials.

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Standards and sources used

- IS 456:2000 Plain and reinforced concrete: limit state design, cover, detailing, slabs, beams, columns and footings.
- IS 875 Parts 1 and 2: dead and imposed loads. IS 1893 Part 1: earthquake forces and zone factors. IS 13920:2016: ductile detailing.
- IS 1786:2008: Fe500D bars and mass per metre. IS 10262: concrete mix proportioning. IS 1904: foundations on soil.
- CPWD Delhi Analysis of Rates 2014: nominal-mix cement, sand and aggregate for M20 and below, and the 5% steel cutting waste.
- IS 1077:1992 Common burnt clay building bricks; IS 12894:2002 Fly ash lime bricks; IS 2212:1991 Brickwork
- IS 2185 (Part 1 to 3) Concrete masonry units; IS 6041:1985 AAC masonry; IS 2572:2005 Concrete masonry construction
- IS 1200 (Part 3):1976 and (Part 12):1976 Methods of measurement (1976 editions; BIS lists 2026 editions that supersede them, not checked here); IS 2250:1981 Masonry mortars; IS 2402:1963 External rendering
- IS 4326:1993 Earthquake-resistant construction; IS 1905:1987 Structural use of unreinforced masonry; IS 3362:1977 Natural ventilation
- CPWD Delhi Analysis of Rates 2014, Volume 1 (concrete, mortar) and Volume 2 (plaster)

- CPWD General Specifications for Electrical Works Part I (Internal) 2013, Sections 2 and 3
- CPWD Delhi Analysis of Rates for Electrical Works (E&M) 2016, items 1.1 to 1.17
- IS 4648:1968 Guide for electrical layout in residential buildings; BIS draft first revision, ETD 20, September 2024
- IS 732:2019 Code of practice for electrical wiring installations (named by the BIS draft of IS 4648; its text was not read)
- IS 3043:2018 Code of practice for earthing (not read in full; earthing counts are Assumed)
- NIMI Electrician trade theory, wiring of a dwelling (Table 1, the area yardstick)
- IS 1172:1993 Basic requirements for water supply, drainage and sanitation
- IS 2065:1983 Water supply in buildings; IS 12183 (Part 1):1987 Water storage and pumping
- IS 1742:1983 Building drainage; IS 5329:1983 Sanitary pipework above ground
- IS 2470 (Part 1 and 2):1985 Septic tanks and soak pits; IS 4111 (Part 1):1986 Manholes
- IS 15778:2007 CPVC pipes; IS 4985:2000 uPVC pressure pipes; SP 35:1987 Water supply and drainage handbook
- NBC 2016 Part 9 Section 1 and Section 2, read from the BIS preliminary drafts of November 2024
- IS 1200 (Part 11):1977, (Part 12):1976, (Part 13):1994 Methods of measurement of building and civil engineering works (BIS lists 2024 revisions of Parts 11 and 13; the tool has not been checked against them)
- IS 15622:2006 Pressed ceramic tiles; IS 2395 (Part 1):1994 Painting practice; IS 3067:1988 Damp-proofing and waterproofing
- IS 1003 (Part 1):2003 Timber panelled and glazed shutters; IS 2202 (Part 2):1983 Flush door shutters; IS 303:2024 Plywood
- CPWD Delhi Analysis of Rates 2016, Volume 2 sub-head 13 (finishing: plaster, paint, primers) and Volume 1 materials list
- Data sheets of paint, putty, adhesive, grout and tile makers (Asian Paints, Nerolac, Berger, Sika, Laticrete, Mapei, Kajaria); public CPWD-pattern tender documents for gypsum ceilings and tile beds

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APPENDIX A

Calculation sheet

Grand Total: how every figure in this report was worked out

What this sheet is

This sheet shows how the Grand Total was made from the 5 reports named in section 1. It shows how their lists were added, which quantities were counted by two reports and taken out once, how the totals were rounded to buying units, how the range beside each big total was built, and the final list. It does not repeat the working inside each phase: that is in the calculation sheet at the end of that phase's own report.

How to read it

Each row is one step. STEP says what is being found. FORMULA gives it in symbols. WORKING puts the numbers in. RESULT is the answer with its unit. SOURCE names the clause or table the step rests on. The columns take turns being a lighter and a darker cream, so each figure sits under its own heading. Amber rows are inputs: a figure you gave, or a value read from a code table. Green rows are figures that appear in the report. Every sum was carried out at full precision and is shown rounded, so re-keying the rounded numbers by hand may differ in the last digit.

Method in brief

1. Each phase report is read as a list of buying lines: a key, an item name, a quantity and a unit. The frame report's own figures are first turned into buying lines (cement up to whole bags, bars up to whole kilograms, sand and stone to 0.1 m³).
2. The reports are checked to be for the same building: the same number of floors, the same state, and total floor areas within 10% of each other (within 2% is a clean pass).
3. Lines with the same key and the same unit are one item and their quantities are added. A key in two different units is never merged.
4. Where two reports count the same thing (the lintels over doors and windows are in the frame report and in the walls report) and both reports are in the total, the walls report's share is taken out and the frame's is kept. The amount taken out is the smaller of the two figures.
5. Each total is then rounded to the unit it is bought in: whole units upwards, volumes to 0.01 m³, areas to 0.1 m².
6. Cement, sand, stone, steel bars and bricks or blocks are added across the phases to give the big totals at the top of the report.
7. A range is put beside each big total: each phase's quantity is multiplied by that phase's own low and high multipliers and the results are added end to end (not in quadrature). Each phase's widest range is also shown on its own, as a percentage below and above its figures.
8. The final list gives every item once, in the order of work on site, with the phases it came from.
9. Every step above is carried out again in this sheet and compared with the engine, and every figure in the report is compared with its counterpart here; the reconciliation at the end must read the same on both sides. If any figure had disagreed the sheet would have been left out; agreement shows that the sheet matches the report, not that the report is right.

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Read this before relying on the sheet

- The Grand Total adds the reports. It does not recalculate them. Every quantity carries the simplifications of its own phase (room plan, wall and door sizes, wastage, site practice); they are set out in that phase's calculation sheet and in the assumptions under "The assumptions in each phase".
- The test for "the same building" looks only at the number of floors, the state and the total floor area (within 10%). It does not compare the plan, the number of bedrooms, the wall material or the storey height, so two reports made with different answers to those questions can still be added.
- Only the lintels over doors and windows are known to be counted by two reports, and only they are taken out. If other overlaps exist they are not looked for. The frame and the walls report size the lintels by their own rules, so the figure that stays (the frame's) can differ from the one taken out.
- Each phase rounds its figures up to whole bags, bars and units before they are added, and the total is rounded up again, so the total can sit a little above a single unrounded calculation of the whole building. Cement is rounded up by every phase that supplies it.
- The range beside each total adds the phases' ends straight (as if all were wrong in the same direction at once). That is cautious, not statistical: the multipliers are judgement ranges set by the tool authors, not confidence limits, and no probability goes with them. Section 6 shows the narrower range that independent errors would give.
- A partial total (fewer than five phases) is a list for those phases only. Missing phases are not estimated, and the total does not change when a phase is added later: make a new Grand Total.
- The total is made from the phase reports as they were when it was made. If a phase report is run again with different answers, this Grand Total does not follow it.
- A total of "bricks or blocks" counts pieces. When the walls report uses two kinds (for example AAC blocks above the plinth and concrete blocks in the plinth) the two are added as pieces although they are different sizes.
- Each trade tool lays out rooms by its own rule, so a quantity in one phase report can differ from the "same" room in another. The Grand Total adds the buying lines; it does not reconcile room plans.
- Quantities only: no price, rate or labour figure. Nothing here is a design, a drawing or a certificate. Final quantities for ordering come from the signed drawings and from the site.

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1. The reports that were added

Which paid reports are in this total, which are not, and whether they pass a rough test for being the same building.

1.1 The reports in this total

Each row is one paid report. The quantities in the Grand Total come from these reports and from nothing else. The working of every figure INSIDE a phase (loads, sizes, bars, joints, pipe runs and so on) is in the calculation sheet at the end of that phase's own report, named by its report id. This sheet does not repeat it.

PHASE	REPORT ID	PROJECT	FLOORS	BUILT-UP AREA (M²)	LINES IN ITS LIST	ITEMS IN THIS TOTAL
StructurePro · Frame	NS-SP-SAMPLE-S	Example house: G+1, 1,000 sq ft per floor	2	185.8	12	12
MasonryPro · Walls	NS-MA-SAMPLE-M	Example house: G+1, 1,000 sq ft per floor	2	185.8	5	3
ElectricalPro · Wiring	NS-EL-SAMPLE-E	Example house: G+1, 1,000 sq ft per floor	2	185.8	44	44
PlumbingPro · Plumbing	NS-PL-SAMPLE-P	Example house: G+1, 1,000 sq ft per floor	2	185.8	14	14
InteriorPro · Finishing	NS-IN-SAMPLE-I	Example house: G+1, 1,000 sq ft per floor	2	185.8	29	29

1.2 Phases not in this total

STEP	FORMULA	WORKING	RESULT	SOURCE
Phases not in this total	None: all five phases are in.			

1.3 Are the reports for the same building? (a rough test)

This is a rough test. It checks that the number of floors and the state agree and that the total floor areas are within 10% of each other, and nothing else: it does not compare room counts, wall materials, storey heights or the plan, which each phase takes from its own questions. Passing it does not prove that the reports describe the same house.

STEP	FORMULA	WORKING	RESULT	SOURCE
Average built-up area of the reports	A = round (sum of the areas ÷ n)	round ((185.8 + 185.8 + 185.8 + 185.8 + 185.8) ÷ 5)	**186 m²**	NirmanShastra rule
Smallest area	Amin	smallest of (185.8, 185.8, 185.8, 185.8, 185.8)	**185.8 m²**	
Largest area	Amax	largest of (185.8, 185.8, 185.8, 185.8, 185.8)	**185.8 m²**	
Spread between the reports	spread = (Amax − Amin) ÷ Amin × 100	(185.8 − 185.8) ÷ 185.8 × 100	**0.0 %**	NirmanShastra rule: same-building test
Same number of floors?	every report must have the same		**Yes (2)**	NirmanShastra rule: same-building test
Same state?	every report must have the same (spelling and capitals ignored)		**Yes (Uttar Pradesh)**	NirmanShastra rule: same-building test
Same city?	a different or differently written city is only a note		**Yes (Lucknow)**	NirmanShastra rule: same-building test
Spread within the limit?	refused if the spread is above 10%; a note if above 2%		**Yes**	NirmanShastra rule: same-building test
Result of the test	pass, pass with a note, or refuse		**Pass**	NirmanShastra rule: same-building test

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2. Adding the lists into one

Every phase report ends in a list of buying lines. The Grand Total adds those lists item by item.

2.1 The rule

STEP	FORMULA	WORKING	RESULT	SOURCE
Same item	Two lines are the same item when BOTH the key and the unit are the same (for example cement-bag-50kg in bags of 50 kg). Their quantities are added. The same key in two different units is not merged.			NirmanShastra rule: merge by key and unit
Name and group	The item name, group and "how it is counted" wording are taken from the first phase, in the order of work on site, that has the item.			NirmanShastra rule
Order of work	Frame, walls, wiring, plumbing, finishing. All five are in this total.			NirmanShastra rule
Lines in the reports added			**104 lines**	Phase reports named in section 1
Different items after merging (before the overlap is taken out) 96 items come from one report only and pass through unchanged; 3 come from more than one report. 1 item falls to zero when the overlap is taken out (section 3) and is not in the final list, which has 98 items (section 7).			**99 items**	Engine rule: key and unit

2.2 Items that more than one report supplies, before anything is taken out

Only these items need adding. Every other item has one source and is carried over as it stands. The last column is the plain sum; the next section takes out what two reports both count.

ITEM	UNIT	FRAME (NS-SP-SAMPLE-S)	WALLS (NS-MA-SAMPLE-M)	FINISHING (NS-IN-SAMPLE-I)	SUM
Cement	bags of 50 kg	494	193	50	737
Sand	m³	26.7	34.6	4.60	65.9
Stone aggregate 20 mm	m³	52.4	0.86	–	53.3

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3. Counted twice: taken out once

Two reports can count the same thing. On its own each report is complete, so each shows it; in a Grand Total it must be ordered once.

3.1 MasonryPro (NS-MA-SAMPLE-M): lintels over doors and windows

Both the frame report (NS-SP-SAMPLE-S) and the MasonryPro report count lintels over doors and windows. Each report is complete on its own, so each shows them, and each sizes them by its own rule, so the two figures are not the same. In the Grand Total the frame report's figure is kept. The MasonryPro report's own lintel share is taken out of its list, so the same concrete and steel are not ordered twice. For each item the table shows the MasonryPro report's total, the part of it that is lintels, and what is left; the amount taken out is the smaller of those two figures.

STEP	FORMULA	WORKING	RESULT	SOURCE
Cement: in the walls report			**193 bags of 50 kg**	NS-MA-SAMPLE-M, buying list
Cement: lintels inside the walls report The part of the walls report's own figure that is its lintels. The frame report counts lintels as well, by its own rules.			**8.06 bags of 50 kg**	NS-MA-SAMPLE-M, overlap list "Lintels over doors and windows"
Cement: taken out	cut = the smaller of the item in the report and the lintels inside it	smaller of 193.000 and 8.063	**8.06 bags of 50 kg**	NirmanShastra rule: take the overlap out once
Cement: left for the walls report	left = round (in the report − taken out), up to a whole number	round (193.000 − 8.063)	**185 bags of 50 kg**	NirmanShastra rule: rounded to the buying unit
Sand: in the walls report			**34.60 m³**	NS-MA-SAMPLE-M, buying list
Sand: lintels inside the walls report The part of the walls report's own figure that is its lintels. The frame report counts lintels as well, by its own rules.			**0.43 m³**	NS-MA-SAMPLE-M, overlap list "Lintels over doors and windows"
Sand: taken out	cut = the smaller of the item in the report and the lintels inside it	smaller of 34.600 and 0.428	**0.43 m³**	NirmanShastra rule: take the overlap out once
Sand: left for the walls report	left = round (in the report − taken out), to 0.01 m³	round (34.600 − 0.428)	**34.17 m³**	NirmanShastra rule: rounded to the buying unit
Stone aggregate 20 mm: in the walls report			**0.86 m³**	NS-MA-SAMPLE-M, buying list
Stone aggregate 20 mm: lintels inside the walls report The part of the walls report's own figure that is its lintels. The frame report counts lintels as well, by its own rules.			**0.86 m³**	NS-MA-SAMPLE-M, overlap list "Lintels over doors and windows"
Stone aggregate 20 mm: taken out	cut = the smaller of the item in the report and the lintels inside it	smaller of 0.860 and 0.857	**0.86 m³**	NirmanShastra rule: take the overlap out once
Stone aggregate 20 mm: left for the walls report	left = round (in the report − taken out), to 0.01 m³	round (0.860 − 0.857)	**0.00 m³**	NirmanShastra rule: rounded to the buying unit

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Steel for lintels (10, 8 and 6 mm): in the walls report			**95 kg**	NS-MA-SAMPLE-M, buying list
Steel for lintels (10, 8 and 6 mm): lintels inside the walls report The part of the walls report's own figure that is its lintels. The frame report counts lintels as well, by its own rules.			**95.00 kg**	NS-MA-SAMPLE-M, overlap list "Lintels over doors and windows"
Steel for lintels (10, 8 and 6 mm): taken out	cut = the smaller of the item in the report and the lintels inside it	smaller of 95.000 and 95.000	**95.00 kg**	NirmanShastra rule: take the overlap out once
Steel for lintels (10, 8 and 6 mm): left for the walls report	left = round (in the report − taken out), up to a whole number	round (95.000 − 95.000)	**0 kg**	NirmanShastra rule: rounded to the buying unit

ITEM	UNIT	IN THE WALLS REPORT	LINTELS INSIDE IT (WALLS REPORT)	TAKEN OUT	LEFT FOR WALLS
Cement	bags of 50 kg	193	8.06	8.06	185
Sand	m³	34.6	0.43	0.43	34.2
Stone aggregate 20 mm	m³	0.86	0.86	0.86	0.00
Steel for lintels (10, 8 and 6 mm)	kg	95	95.00	95.00	0

The frame report's own lintels, which stay in the total: 37 lintels, 1.61 m³ of concrete and 183 kg of steel (NS-SP-SAMPLE-S). The MasonryPro report's lintel steel, which is taken out of its list: 95 kg. The two reports size the lintels by their own rules, so the figures need not be equal. The frame report's figure is the one kept, whether it is larger or smaller than the MasonryPro report's.

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4. Buying units and rounding

4.1 How a total is rounded to a buying unit

After the lists are added and the overlap is taken out, each total is rounded to the unit it is bought in. Whole things (bags, kilograms, metres, litres, pieces) are rounded UP, because a part-bag cannot be bought. A total in m³ is held to 0.01 m³ and a total in m² to 0.1 m² (the frame report hands in its sand, stone and excavation already rounded to 0.1 m³). In the printed tables a volume shows to 0.01 m³ below 10 m³ and to 0.1 m³ from 10 m³ up, and an area shows to 0.1 m² below 100 m² and as a whole number from 100 m² up. Each phase has already rounded its own figures before they are added, so a total can sit a little above the sum of unrounded figures.

RULE	UNITS IT APPLIES TO	ITEMS IN THIS LIST
Rounded up to a whole number	bags of 50 kg, kg, nos, m, L, pairs	90
Rounded to 0.01 m³	m³	4
Rounded to 0.1 m²	m²	4

4.2 Square feet and square metres

STEP	FORMULA	WORKING	RESULT	SOURCE
One square foot in square metres	1 sq ft = 0.3048 m × 0.3048 m	0.3048 × 0.3048	**0.09290304 m²**	International yard and pound agreement, 1959 (1 ft = 0.3048 m exactly)
Where it is used	The trade reports take their floor areas in square feet and print the built-up area in square metres. The area in the table in section 1 is that figure, so a reader with the plan in square feet can check it as sq ft × 0.09290304.			Phase reports

4.3 The frame report's figures as buying lines (NS-SP-SAMPLE-S)

The frame report keeps its quantities at full precision. Before they are added to the other phases they are turned into buying lines: cement, bars, binding wire and shuttering are rounded up to whole bags, kilograms and square metres; sand, stone and excavation are rounded to 0.1 m³. Each figure below is worked from the frame report's own numbers and compared with the line the Grand Total used.

STEP	FORMULA	WORKING	RESULT	SOURCE
Cement	bags = round up (cement from the frame report)	round up 493.222	**494 bags of 50 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Sand	sand = rounded to 0.1 m³	round 26.746	**26.7 m³**	NirmanShastra rule: frame figure rounded to the buying unit
Stone aggregate 20 mm	stone = rounded to 0.1 m³	round 52.446	**52.4 m³**	NirmanShastra rule: frame figure rounded to the buying unit
Fe500D bars, 6 mm	bars = round up (kg from the frame report)	round up 102.424	**103 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Fe500D bars, 8 mm	bars = round up (kg from the frame report)	round up 2,918.556	**2,919 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Fe500D bars, 10 mm	bars = round up (kg from the frame report)	round up 368.762	**369 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Fe500D bars, 12 mm	bars = round up (kg from the frame report)	round up 1,467.162	**1,468 kg**	NirmanShastra rule: frame figure rounded to the buying unit

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Fe500D bars, 16 mm	bars = round up (kg from the frame report)	round up 240.627	**241 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Fe500D bars, 20 mm	bars = round up (kg from the frame report)	round up 320.049	**321 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Binding wire	wire = round up	round up 46.436	**47 kg**	NirmanShastra rule: frame figure rounded to the buying unit
Shuttering, contact area	area = round up to a whole m²	round up 506.698	**507 m²**	NirmanShastra rule: frame figure rounded to the buying unit
Excavation for footings and plinth	volume = rounded to 0.1 m³	round 124.710	**124.7 m³**	NirmanShastra rule: frame figure rounded to the buying unit

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5. The big materials, added across phases

Cement, sand and stone are used by more than one phase; steel bars and bricks or blocks are added across their lines. These are the totals shown as the big figures at the top of the report.

5.1 Cement

STEP	FORMULA	WORKING	RESULT	SOURCE
Cement to order, all phases	total = sum over the phases	Frame 494 + Walls 185 + Finishing 50	**729 bags of 50 kg**	NirmanShastra rule: big materials are added across phases

5.2 Sand

STEP	FORMULA	WORKING	RESULT	SOURCE
Sand to order, all phases	total = sum over the phases	Frame 26.70 + Walls 34.17 + Finishing 4.60	**65.47 m³**	NirmanShastra rule: big materials are added across phases

5.3 Stone aggregate 20 mm

STEP	FORMULA	WORKING	RESULT	SOURCE
Stone aggregate 20 mm to order, all phases	total = the one phase that supplies it	Frame 52.40	**52.40 m³**	NirmanShastra rule: big materials are added across phases

5.4 Steel bars, all sizes

STEP	FORMULA	WORKING	RESULT	SOURCE
Steel bars, all sizes: Frame, 6 lines Fe500D bars, 6 mm; Fe500D bars, 8 mm; Fe500D bars, 10 mm; Fe500D bars, 12 mm; Fe500D bars, 16 mm; Fe500D bars, 20 mm	sum of the parts	103 + 2,919 + 369 + 1,468 + 241 + 321	**5,421 kg**	NirmanShastra rule: lines added across bar sizes
Steel bars, all sizes to order, all phases	total = the one phase that supplies it	Frame 5,421	**5,421 kg**	NirmanShastra rule: big materials are added across phases

The walls report's lintel bars were taken out in section 3, so only the frame's bars are counted here.

5.5 Bricks or blocks

STEP	FORMULA	WORKING	RESULT	SOURCE
Bricks or blocks to order, all phases	total = the one phase that supplies it	Walls 30,400	**30,400 nos**	NirmanShastra rule: big materials are added across phases

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6. How far off can it be: the range beside each total

6.1 The rule

STEP	FORMULA	WORKING	RESULT	SOURCE
What the multipliers are	Every phase report carries, for each material it supplies, a low and a high multiplier: the quantity shown is multiplied by them to give the range the real figure is likely to fall in (a band of 0.92 and 1.40 means from 8% below to 40% above). The multipliers are the tool authors' judgement of how far each class of figure can be off. They are not measured standard deviations or confidence limits.			NirmanShastra assumption (phase reports)
How the ranges are added	Low end of a total = the sum over the phases of (quantity from that phase × its low multiplier). High end likewise with the high multiplier. The ends are added STRAIGHT, end to end. They are not combined in quadrature (the square root of the sum of squares).			Engine rule: ranges added end to end
What straight addition assumes	Adding the ends straight is what is right if the phases are all wrong in the same direction at the same time (errors fully correlated, correlation +1). If the errors were independent they would partly cancel and the true spread would be narrower: the comparison table below gives that narrower figure. The phases here share their drivers (the same floor areas, the same plan and the same rules of thumb), so independence is not safe to assume, and straight addition is the cautious choice. It is an upper envelope of the spread, not a statistical interval: the multipliers are judgement ranges, they are not symmetric about the figure shown, and the sheet does not claim any probability for them.			JCGM 100:2008 cl. 5.1.2 (independent) and cl. 5.2.2 Note 1 (fully correlated)
Where a phase has no band of its own	If a phase report gives no band for a material, the widest band of that report (its lowest low and its highest high) is used.			Engine rule

6.2 Cement

STEP	FORMULA	WORKING	RESULT	SOURCE
Cement: total	T = sum of the quantities	Frame 494 + Walls 185 + Finishing 50	**729 bags of 50 kg**	
Cement from Frame: low end Band from the frame report ("cement")	q × low multiplier	494 × 0.92	**454.5 bags of 50 kg**	Engine rule: quantity × band
Cement from Frame: high end	q × high multiplier	494 × 1.4	**691.6 bags of 50 kg**	Engine rule: quantity × band
Cement from Walls: low end Band from the walls report ("Cement")	q × low multiplier	185 × 0.8	**148.0 bags of 50 kg**	Engine rule: quantity × band
Cement from Walls: high end	q × high multiplier	185 × 1.3	**240.5 bags of 50 kg**	Engine rule: quantity × band
Cement from Finishing: low end Band from the finishing report ("Mortar, adhesive and grout")	q × low multiplier	50 × 0.65	**32.5 bags of 50 kg**	Engine rule: quantity × band
Cement from Finishing: high end	q × high multiplier	50 × 1.3	**65.0 bags of 50 kg**	Engine rule: quantity × band
Cement: range, low end	low = Σ (q × low multiplier)	454.5 + 148.0 + 32.5	**635.0 bags of 50 kg**	
Cement: range, high end	high = Σ (q × high multiplier)	691.6 + 240.5 + 65.0	**997.1 bags of 50 kg**	

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6.3 Steel bars

STEP	FORMULA	WORKING	RESULT	SOURCE
Steel bars: total	T = sum of the quantities	Frame 5,421	**5,421 kg**	
Steel bars from Frame: low end Band from the frame report ("steel")	q × low multiplier	5,421 × 0.9	**4,878.9 kg**	Engine rule: quantity × band
Steel bars from Frame: high end	q × high multiplier	5,421 × 1.6	**8,673.6 kg**	Engine rule: quantity × band
Steel bars: range, low end	low = Σ (q × low multiplier)	4,878.9	**4,878.9 kg**	
Steel bars: range, high end	high = Σ (q × high multiplier)	8,673.6	**8,673.6 kg**	

6.4 Sand

STEP	FORMULA	WORKING	RESULT	SOURCE
Sand: total	T = sum of the quantities	Frame 26.70 + Walls 34.17 + Finishing 4.60	**65.47 m³**	
Sand from Frame: low end Band from the frame report ("concrete")	q × low multiplier	26.70 × 0.92	**24.56 m³**	Engine rule: quantity × band
Sand from Frame: high end	q × high multiplier	26.70 × 1.4	**37.38 m³**	Engine rule: quantity × band
Sand from Walls: low end Band from the walls report ("Sand")	q × low multiplier	34.17 × 0.8	**27.34 m³**	Engine rule: quantity × band
Sand from Walls: high end	q × high multiplier	34.17 × 1.3	**44.42 m³**	Engine rule: quantity × band
Sand from Finishing: low end Band from the finishing report ("Mortar, adhesive and grout")	q × low multiplier	4.60 × 0.65	**2.99 m³**	Engine rule: quantity × band
Sand from Finishing: high end	q × high multiplier	4.60 × 1.3	**5.98 m³**	Engine rule: quantity × band
Sand: range, low end	low = Σ (q × low multiplier)	24.56 + 27.34 + 2.99	**54.89 m³**	
Sand: range, high end	high = Σ (q × high multiplier)	37.38 + 44.42 + 5.98	**87.78 m³**	

6.5 Bricks or blocks

STEP	FORMULA	WORKING	RESULT	SOURCE
Bricks or blocks: total	T = sum of the quantities	Walls 30,400	**30,400 nos**	
Bricks or blocks from Walls: low end Band from the walls report ("Bricks (or Blocks)")	q × low multiplier	30,400 × 0.82	**24,928.0 nos**	Engine rule: quantity × band
Bricks or blocks from Walls: high end	q × high multiplier	30,400 × 1.2	**36,480.0 nos**	Engine rule: quantity × band
Bricks or blocks: range, low end	low = Σ (q × low multiplier)	24,928.0	**24,928.0 nos**	
Bricks or blocks: range, high end	high = Σ (q × high multiplier)	36,480.0	**36,480.0 nos**	

6.6 Straight addition against independent errors (for comparison only)

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The report uses the straight range (first range column). The second range is what the same multipliers would give if the phases' errors were independent: low = T − √Σ(q × (1 − low multiplier))², high = T + √Σ(q × (high multiplier − 1))². It is shown so that a reader can see how cautious the straight sum is. It is not used anywhere in the report.

MATERIAL	UNIT	TOTAL	RANGE IN THE REPORT (STRAIGHT)	RANGE IF INDEPENDENT	REPORT RANGE AS SHARE OF TOTAL
Cement	bags of 50 kg	729	635 to 997	672 to 935	87% to 137%
Steel bars	kg	5,421	4,879 to 8,674	4,879 to 8,674	90% to 160%
Sand	m³	65.5	54.9 to 87.8	58.1 to 80.3	84% to 134%
Bricks or blocks	nos	30,400	24,928 to 36,480	24,928 to 36,480	82% to 120%

6.7 Each phase's widest range

The report also prints, for each phase, the widest range found in that phase's own report: the lowest of its low multipliers and the highest of its high multipliers. Percent below = (1 − low) × 100; percent above = (high − 1) × 100, each rounded to a whole number.

PHASE	LOWEST LOW	HIGHEST HIGH	BELOW	ABOVE
StructurePro (NS-SP-SAMPLE-S)	0.85	1.60	15%	60%
MasonryPro (NS-MA-SAMPLE-M)	0.70	1.40	30%	40%
ElectricalPro (NS-EL-SAMPLE-E)	0.70	1.40	30%	40%
PlumbingPro (NS-PL-SAMPLE-P)	0.70	1.40	30%	40%
InteriorPro (NS-IN-SAMPLE-I)	0.65	1.40	35%	40%

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7. The final buying list

This is the list the report prints, with the working behind each quantity. Final quantities for ordering come from the signed drawings.

7.1 Every item to buy

One row per item, in the order of work on site. The quantity is the sum over the phases after the overlap is taken out, rounded to the buying unit (section 4). "Made up of" shows the phases it came from and what was taken out. Each quantity was worked as shown in sections 2 to 5 and compared with the report's merged list.

GROUP	ITEM	UNIT	QUANTITY	MADE UP OF
Concrete	Cement	bags of 50 kg	729	Frame 494 + Walls 185 + Finishing 50; 8.06 taken out of Walls
Concrete	Sand	m³	65.5	Frame 26.7 + Walls 34.2 + Finishing 4.60; 0.43 taken out of Walls
Concrete	Stone aggregate 20 mm	m³	52.4	Frame 52.4; 0.86 taken out of Walls
Steel	Fe500D bars, 6 mm	kg	103	Frame only
Steel	Fe500D bars, 8 mm	kg	2,919	Frame only
Steel	Fe500D bars, 10 mm	kg	369	Frame only
Steel	Fe500D bars, 12 mm	kg	1,468	Frame only
Steel	Fe500D bars, 16 mm	kg	241	Frame only
Steel	Fe500D bars, 20 mm	kg	321	Frame only
Steel	Binding wire	kg	47	Frame only
Shuttering and earthwork	Shuttering, contact area	m²	507	Frame only
Shuttering and earthwork	Excavation for footings and plinth	m³	124.7	Frame only
Masonry	Red clay brick 230 × 115 × 75 mm	nos	30,400	Walls only
Electrical	Copper wire 1.5 mm², red	m	270	Wiring only
Electrical	Copper wire 1.5 mm², black	m	270	Wiring only
Electrical	Copper wire 1.5 mm², green-yellow	m	180	Wiring only
Electrical	Copper wire 2.5 mm², red	m	450	Wiring only
Electrical	Copper wire 2.5 mm², black	m	450	Wiring only
Electrical	Copper wire 2.5 mm², green-yellow	m	450	Wiring only
Electrical	Copper wire 4 mm², red	m	90	Wiring only
Electrical	Copper wire 4 mm², black	m	90	Wiring only
Electrical	Copper wire 4 mm², green-yellow	m	90	Wiring only
Electrical	Copper wire 6 mm², red	m	90	Wiring only
Electrical	Copper wire 6 mm², yellow	m	90	Wiring only
Electrical	Copper wire 6 mm², blue	m	90	Wiring only
Electrical	Copper wire 6 mm², black	m	90	Wiring only
Electrical	Copper wire 6 mm², green-yellow	m	90	Wiring only
Electrical	PVC conduit 20 mm	m	675	Wiring only
Electrical	PVC conduit 25 mm	m	9	Wiring only

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Electrical	PVC conduit 32 mm	m	12	Wiring only
Electrical	MCB 6 A	nos	9	Wiring only
Electrical	MCB 10 A	nos	7	Wiring only
Electrical	MCB 16 A	nos	11	Wiring only
Electrical	MCB 20 A	nos	1	Wiring only
Electrical	Incomer MCB 4-pole 32 A	nos	1	Wiring only
Electrical	Incomer MCB 2-pole 32 A	nos	1	Wiring only
Electrical	RCCB 30 mA	nos	2	Wiring only
Electrical	Distribution board 24 way, three-phase (ground floor)	nos	1	Wiring only
Electrical	Distribution board 8 way, single-phase (first floor)	nos	1	Wiring only
Electrical	Light, fan, exhaust and bell points	nos	59	Wiring only
Electrical	Socket outlets (6 A, 6/16 A, 20/25 A)	nos	65	Wiring only
Electrical	Earth electrode with pit	nos	2	Wiring only
Electrical	Modular switch, 6 A, one-way (lights, fans, exhaust fans)	nos	57	Wiring only
Electrical	Electronic fan regulator, step type	nos	6	Wiring only
Electrical	Modular socket with switch, 6 A, 3-pin	nos	53	Wiring only
Electrical	Modular socket with switch, 6/16 A	nos	11	Wiring only
Electrical	Socket, 20/25 A, for an air conditioner	nos	1	Wiring only
Electrical	Isolator switch, double-pole, 32 A, with indicator (air conditioner, water heater)	nos	4	Wiring only
Electrical	Call bell push	nos	2	Wiring only
Electrical	Call bell	nos	2	Wiring only
Electrical	TV outlet	nos	4	Wiring only
Electrical	Data outlet (RJ45)	nos	4	Wiring only
Electrical	Media box (TV and data cables meet here)	nos	2	Wiring only
Electrical	Ceiling rose or connector	nos	55	Wiring only
Electrical	Fan hook and box	nos	6	Wiring only
Electrical	Junction box or ceiling box, 20 mm	nos	102	Wiring only
Electrical	Switch box (GI or PVC) with cover plate, about 4 modules each	nos	35	Wiring only
Plumbing	CPVC pipe 15 mm	m	90	Plumbing only
Plumbing	CPVC pipe 20 mm	m	24	Plumbing only
Plumbing	CPVC pipe 25 mm	m	48	Plumbing only
Plumbing	CPVC pipe 32 mm	m	15	Plumbing only
Plumbing	uPVC SWR pipe 40 mm	m	6	Plumbing only
Plumbing	uPVC SWR pipe 50 mm	m	24	Plumbing only
Plumbing	uPVC SWR pipe 75 mm	m	45	Plumbing only
Plumbing	uPVC SWR pipe 110 mm	m	39	Plumbing only
Plumbing	Underground tank	L	1,000	Plumbing only
Plumbing	Overhead tank	L	500	Plumbing only
Plumbing	Transfer pump 0.5 HP	nos	1	Plumbing only

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Plumbing	Water closets	nos	3	Plumbing only
Plumbing	Wash basins	nos	4	Plumbing only
Plumbing	Inspection chambers	nos	3	Plumbing only
Paint	Wall putty, cement based	kg	360	Finishing only
Paint	Primer, inside	L	45	Finishing only
Paint	Interior emulsion, 2 coats	L	54	Finishing only
Paint	Primer, outside	L	38	Finishing only
Paint	Exterior acrylic emulsion	L	66	Finishing only
Paint	Primer for doors	L	3	Finishing only
Paint	Enamel for doors	L	4	Finishing only
Tiles	Tile 600 × 600 mm	nos	458	Finishing only
Tiles	Tile 300 × 300 mm	nos	264	Finishing only
Tiles	Tile 300 × 600 mm	nos	351	Finishing only
Tiles	Tile grout	kg	32	Finishing only
Waterproofing	Waterproofing coat, bathrooms	m²	26.2	Finishing only
Stone	Kitchen counter, granite	m²	2.8	Finishing only
Stone	Counter edge, moulded	m	5	Finishing only
Stone	Door thresholds	m	5	Finishing only
Doors and windows	Main door, 10 DS 21	nos	1	Finishing only
Doors and windows	Room door, 9 DS 21	nos	4	Finishing only
Doors and windows	Bathroom door, 8 DS 21	nos	3	Finishing only
Doors and windows	Door of the terrace stair room, 9 DS 21	nos	1	Finishing only
Doors and windows	Door frame timber	m³	0.31	Finishing only
Doors and windows	Door hinges	nos	28	Finishing only
Doors and windows	Lock sets	nos	4	Finishing only
Doors and windows	Tower bolts	nos	5	Finishing only
Doors and windows	Handle pairs	pairs	9	Finishing only
Doors and windows	Door stoppers	nos	9	Finishing only
Doors and windows	Window glass, 4 to 5.5 mm	m²	16.4	Finishing only
Doors and windows	Window and sash sections	m	139	Finishing only
Items in the list			**98**	

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Reconciliation: the report against this sheet

The totals printed in the report, rebuilt from the working above. Every row must read the same on both sides. This shows that the report and this sheet agree with each other, which is a check of the arithmetic; it does not show that either one is right against a standard or against your site.

ITEM	IN THE REPORT	FROM THIS SHEET	MATCH
Phases in this total (results page and report)	5 phases	5 phases	Yes
Phases not in this total (results page)	none	none	Yes
Floors (results page)	2 floors	2 floors	Yes
Average built-up area (results page)	186 m²	186 m²	Yes
Check: same building in every report	pass	pass	Yes
Check: reports, floors and area quoted in the sentence	5 reports · 2 floors · 186 m²	5 reports · 2 floors · 186 m²	Yes
Check: whole building or part of it	pass	pass	Yes
Check: lintels counted once (shown or not)	shown	shown	Yes
Check: quantities taken out for the lintels	8 / 0.43 / 0.86 / 95	8 / 0.43 / 0.86 / 95	Yes
Warning: phases missing (shown or not)	not shown	not shown	Yes
Number of totals in "What to order"	4 totals	4 totals	Yes
Cement: total to order	729 bags of 50 kg	729 bags of 50 kg	Yes
Cement: range, low end	635 bags of 50 kg	635 bags of 50 kg	Yes
Cement: range, high end	997 bags of 50 kg	997 bags of 50 kg	Yes
Steel bars: total to order	5,421 kg	5,421 kg	Yes
Steel bars: range, low end	4,879 kg	4,879 kg	Yes
Steel bars: range, high end	8,674 kg	8,674 kg	Yes
Sand: total to order	65.5 m³	65.5 m³	Yes
Sand: range, low end	54.9 m³	54.9 m³	Yes
Sand: range, high end	87.8 m³	87.8 m³	Yes
Bricks or blocks: total to order	30,400 nos	30,400 nos	Yes
Bricks or blocks: range, low end	24,928 nos	24,928 nos	Yes
Bricks or blocks: range, high end	36,480 nos	36,480 nos	Yes
Frame: floors, area, items (table "What is in this total")	2 · 186 m² · 12 items	2 · 186 m² · 12 items	Yes
Walls: floors, area, items (table "What is in this total")	2 · 186 m² · 3 items	2 · 186 m² · 3 items	Yes
Wiring: floors, area, items (table "What is in this total")	2 · 186 m² · 44 items	2 · 186 m² · 44 items	Yes
Plumbing: floors, area, items (table "What is in this total")	2 · 186 m² · 14 items	2 · 186 m² · 14 items	Yes
Finishing: floors, area, items (table "What is in this total")	2 · 186 m² · 29 items	2 · 186 m² · 29 items	Yes
Cement: total (table "The big materials")	729 bags of 50 kg	729 bags of 50 kg	Yes
Cement: split by phase (Frame / Walls / Finishing)	494 / 185 / 50	494 / 185 / 50	Yes
Sand: total (table "The big materials")	65.5 m³	65.5 m³	Yes
Sand: split by phase (Frame / Walls / Finishing)	26.7 / 34.2 / 4.60	26.7 / 34.2 / 4.60	Yes
Stone aggregate 20 mm: total (table "The big materials")	52.4 m³	52.4 m³	Yes
Stone aggregate 20 mm: split by phase (Frame / Walls / Finishing)	52.4 / – / –	52.4 / – / –	Yes

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Steel bars, all sizes: total (table "The big materials")	5,421 kg	5,421 kg	Yes
Steel bars, all sizes: split by phase (Frame / Walls / Finishing)	5,421 / – / –	5,421 / – / –	Yes
Bricks or blocks: total (table "The big materials")	30,400 nos	30,400 nos	Yes
Bricks or blocks: split by phase (Frame / Walls / Finishing)	– / 30,400 / –	– / 30,400 / –	Yes
Frame: its own buying list (every row compared)	9 rows	9 rows	Yes
Walls: its own buying list (every row compared)	1 rows	1 rows	Yes
Wiring: its own buying list (every row compared)	44 rows	44 rows	Yes
Plumbing: its own buying list (every row compared)	14 rows	14 rows	Yes
Finishing: its own buying list (every row compared)	27 rows	27 rows	Yes
Order-of-work table (phase and wording)	5 phases	5 phases	Yes
Tables in the report	8 tables	8 tables	Yes
Items in the merged list	98 items	98 items	Yes
Merged list, group "Concrete" (every line compared)	3 lines	3 lines	Yes
Merged list, group "Steel" (every line compared)	7 lines	7 lines	Yes
Merged list, group "Shuttering and earthwork" (every line compared)	2 lines	2 lines	Yes
Merged list, group "Masonry" (every line compared)	1 lines	1 lines	Yes
Merged list, group "Electrical" (every line compared)	44 lines	44 lines	Yes
Merged list, group "Plumbing" (every line compared)	14 lines	14 lines	Yes
Merged list, group "Paint" (every line compared)	7 lines	7 lines	Yes
Merged list, group "Tiles" (every line compared)	4 lines	4 lines	Yes
Merged list, group "Waterproofing" (every line compared)	1 lines	1 lines	Yes
Merged list, group "Stone" (every line compared)	3 lines	3 lines	Yes
Merged list, group "Doors and windows" (every line compared)	12 lines	12 lines	Yes
Frame: its widest range ("How far off can this be")	0.85 to 1.60	0.85 to 1.60	Yes
Walls: its widest range ("How far off can this be")	0.70 to 1.40	0.70 to 1.40	Yes
Wiring: its widest range ("How far off can this be")	0.70 to 1.40	0.70 to 1.40	Yes
Plumbing: its widest range ("How far off can this be")	0.70 to 1.40	0.70 to 1.40	Yes
Finishing: its widest range ("How far off can this be")	0.65 to 1.40	0.65 to 1.40	Yes
Number of ranges listed	5 phases	5 phases	Yes
Assumptions and exclusions of each phase, carried over word for word	95 notes	95 notes	Yes
Standards and sources, joined from the phases	26 entries	26 entries	Yes
Not-counted list names the missing phases	not named	not named	Yes

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Standards and references used in this sheet

DOCUMENT	TITLE	USED FOR
NS-SP-SAMPLE-S	StructurePro quantities report (Phase 1)	The buying lines, bands and notes added in this total. The working behind them is in the calculation sheet at the end of that report. Project: Example house: G+1, 1,000 sq ft per floor.
NS-MA-SAMPLE-M	MasonryPro quantities report (Phase 2)	The buying lines, bands and notes added in this total. The working behind them is in the calculation sheet at the end of that report. Project: Example house: G+1, 1,000 sq ft per floor.

NS-EL-SAMPLE-E	ElectricalPro quantities report (Phase 3)	The buying lines, bands and notes added in this total. The working behind them is in the calculation sheet at the end of that report. Project: Example house: G+1, 1,000 sq ft per floor.
NS-PL-SAMPLE-P	PlumbingPro quantities report (Phase 4)	The buying lines, bands and notes added in this total. The working behind them is in the calculation sheet at the end of that report. Project: Example house: G+1, 1,000 sq ft per floor.
NS-IN-SAMPLE-I	InteriorPro quantities report (Phase 5)	The buying lines, bands and notes added in this total. The working behind them is in the calculation sheet at the end of that report. Project: Example house: G+1, 1,000 sq ft per floor.
JCGM 100:2008	Evaluation of measurement data: Guide to the expression of uncertainty in measurement (GUM)	Section 6: cl. 5.1.2 gives the combination for independent inputs (root of the sum of squares); cl. 5.2.2 and its Note 1 give the straight sum for fully correlated inputs. Quoted only to explain the choice; the report's ranges are not GUM uncertainties.
International yard and pound agreement, 1959	1 yard = 0.9144 m exactly, so 1 ft = 0.3048 m	Section 4.2: square feet to square metres.

This sheet shows the method and the arithmetic behind a planning-level quantity estimate. It lets a qualified person check the formulas and the working. It is not a structural design, a drawing or a certificate, and it does not replace the drawings and calculations that a licensed professional signs for your building.

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