

5.1 ESTIMATING MATERIAL REQUIREMENTS

NUDURA® material requirements for any project can easily be determined manually or with use of the NUDURA® software. In both cases the estimator must collect the following information from the plan. Please note in the following calculations metric conversions are not provided within the formulae. They are based on imperial dimensions only.

LPPER	_____	linear footage of perimeter
IN90	_____	# of inside 90° corners
IN45	_____	# of inside 45° corners
#90	_____	total # of 90° corners
#45	_____	total # of 45° corners
#T ^s	_____	total # of T connections
LFTT	_____	linear footage of tapered top form
LFBLF	_____	linear footage of brick ledge form
LFBLE	_____	linear footage of brick ledge extension
HW	_____	height of the wall
#C	_____	total # of courses
LFHA	_____	linear footage of height adjusters
#CHA	_____	# of courses of height adjusters
LFWP	_____	linear footage to be waterproofed
HWP	_____	height to be waterproofed
LFPAR	_____	linear footage to be parged
HPAR	_____	height to be parged
OP	_____	sq ft of openings (width x height)
LFJH	_____	linear footage of jamb height
LFJW	_____	linear footage of jamb width
WC	_____	wall cavity thickness

Once the information above is collected, the estimator will need to substitute the values collected on to the calculation sheet and perform the mathematical operation. Alternately, the NUDURA® estimating formulas can be applied. (See Section 5.2)

To calculate the **STANDARD FORM UNITS**:

$$\text{STD} = \frac{\text{LPPER} + (2' \times \text{IN90}) + (1' \times \text{IN45}) - (\#90 \times 4) - (\#45 \times 3) - (\#T^s \times 4') \times \#C}{8}$$

This formula applies a correction to the linear footage of the perimeter, adding 2' (610mm) for each inside 90° corner, adding 1' (305mm) for each inside 45° corner, subtracting the footage of the 90° corner and subtracting the footage of the 45° corner. Dividing this value by 8 and multiplying the result by the number of courses.

Note: An adjustment to the total # of standard form units will be required for any openings, tapered top form units or extended brick ledge form units. (See summary sheet)

5.1 ESTIMATING MATERIAL REQUIREMENTS CON'T.

To calculate the number of 90° **CORNER FORMS**:

$$90^\circ \text{ form} = \#90 \times \#C$$

This formula multiplies the number of 90° turn by the number of courses.

To calculate the number of 45° **CORNER FORMS**:

$$45^\circ \text{ form} = \#45 \times \#C$$

This formula multiplies the number of 45° turn by the number of courses.

To calculate the number of **T FORMS**:

$$T \text{ form} = \#T^s \times \#C$$

This formula multiplies the T connection by the number of courses.

To calculate the number of **BRICK LEDGE FORMS**:

$$BLF = LFBLF \div 4$$

This formula divides the linear footage of brick ledge form units by 4.

Note: Additional brick ledge form units may be required for corners.

To calculate the number of **BRICK LEDGE EXTENSIONS**:

$$BLE = LFBLE \times .375$$

This formula multiplies the linear footage of brick ledge extension by .375

Note: Additional brick ledge extension may be required for corners

To calculate the number of **HEIGHT ADJUSTERS**:

$$HA = [LFHA + 2 \times IN90 + IN45] \times .75 \times \#CHA$$

This formula corrects the linear footage of perimeter of Height Adjuster required, divides by 2.67', multiplies by 2 and multiplies by the number of courses required.

5.1 ESTIMATING MATERIAL REQUIREMENTS CON'T.

To calculate the number of rolls of **WATERPROOFING**:

$$\frac{WP = LFWP \times HWP}{210}$$

A roll of waterproofing is 225 sq. ft. (20.9m²) but the effective coverage is 210 sq. ft (19.5m²) allowing for overlapping the edge of the membrane.

To calculate the number of bags of **PREPCOAT PARGING** mix:

$$\frac{PC = LFPAR \times HPAR}{75}$$

The surface area to be parged is divided by 75 which is the average coverage obtained per bag for two coat application.

To calculate the number **FIBER MESH** rolls:

$$\frac{FM = LFPAR \times HPAR}{475}$$

A roll of fiber mesh is 475 sq. ft. (44.1m²) An allowance for overlap may be required depending on the application techniques.

To calculate the quantity of **WALL ALIGNMENT SYSTEM**:

$$\frac{WAS = LFPER + 1 \text{ per corners or tees}}{6}$$

The formula allows for one unit every 6' (1.83m) plus an additional unit for every corner and tee wall connection. Should a site have numerous openings with center of opening less than 6' (1.83m) apart, the quantity of WAS may need to be increased.

5.1 ESTIMATING MATERIAL REQUIREMENTS CON'T.

To calculate the amount of **REBAR**:

$$\text{REBAR} = \text{LPPER} \times \text{HW} \times 1.5$$

The linear footage of the wall is multiplied by the height of the wall and multiplied by 1.5 which is a constant. The result are in feet. This constant is for a rebar grid in the wall 18" x 16" (457mm x 406mm) horizontally and vertically respectively with an allowance for horizontal splices.

To calculate the volume of **CONCRETE**:

$$\text{CONCRETE FOR THE 6" WALL} = \text{LPPER} \times \text{HW} \times .015$$

The linear footage of the wall is multiplied by the height of the wall and multiplied by .015, which is a constant. The result is in m³. (for yd³ the constant is .019).

The constant represents the volume of concrete for a 6 1/4" (159mm) wall for 1.0 sq. ft. (.093m²) in the specified units. The volume of concrete ordered should be reduced for concrete not required in the openings of windows and doors. Also, if using a concrete pump as a method of placement, an allowance has to be included in the volume for wastage of 1 yd³ to 2 yd³ (1/2 m³ to 1 m³) depending on the pump unit.

Concrete multiplier for various wall thicknesses.

NOMINAL CORE	METRIC	IMPERIAL
4" (100mm)	0.010	0.013
6" (150mm)	0.015	0.019
8" (200mm)	0.020	0.026
10" (250mm)	0.025	0.032
12" (300mm)	0.030	0.038

5.2 FORMULAS

STANDARD:
$$\text{STD} = \frac{\text{LFPER} + (2' \times \text{IN90}) + (1' \times \text{IN45}) - (\#90 \times 4) - (\#45 \times 3) - (\#T \times 4') \times \#C}{8}$$

90° FORM UNIT:
$$90^\circ \text{ FORM} = \#90 \times \#C$$

45° FORM UNIT:
$$45^\circ \text{ FORM} = \#45 \times \#C$$

T FORM UNIT:
$$\text{T FORM} = \#T^S \times \#C$$

BRICK LEDGE FORM:
$$\text{BLF} = \text{LFBLF} \div 4$$

BRICK LEDGE EXTENSION:
$$\text{BLE} = \text{LFBLE} \times .375$$

HEIGHT ADJUSTER:
$$\text{HA} = [\text{LFHA} + 2 \times \text{IN90} + \text{IN45}] \times .75 \times \#CHA$$

WATERPROOFING:
$$\text{WP} = \frac{\text{LFWP} \times \text{HWP}}{210}$$

PARGING COAT:
$$\text{PC} = \frac{\text{LFPAR} \times \text{HPAR}}{75}$$

FIBER MESH:
$$\text{FM} = \frac{\text{LFPAR} \times \text{HPAR}}{475}$$

WALL ALIGNMENT SYSTEMS:
$$\text{WAS} = \frac{\text{LFPER} + 1 \text{ per corner or tees}}{6}$$

REBAR:
$$\text{REBAR} = \text{LFPER} \times \text{HW} \times 1.5$$

CONCRETE (IMPERIAL)
$$6" \text{ WALL} = \text{LFPER} \times \text{HW} \times .019$$

CONCRETE (METRIC)
$$6" \text{ WALL} = \text{LFPER} \times \text{HW} \times .015$$

Concrete multiplier for various wall thicknesses.

NOMINAL CORE	METRIC	IMPERIAL
4" (100mm)	0.010	0.013
6" (150mm)	0.015	0.019
8" (200mm)	0.020	0.026
10" (250mm)	0.025	0.032
12" (300mm)	0.030	0.038

5.3 WALL HEIGHT CHART (IMPERIAL)

NO. OF COURSES	HEIGHT OF WALL		PLUS ONE 3" HEIGHT ADJUSTER		PLUS ONE 6" CUT STANDARD	
	inches	ft/in	inches	ft/in	inches	ft/in
1	18"	1' 6"	21"	1' 9"	24"	2' 0"
1½	27"	2' 3"	30"	2' 6"	33"	2' 9"
2	36"	3' 0"	39"	3' 3"	42"	3' 6"
2½	45"	3' 9"	48"	4' 0"	51"	4' 3"
3	54"	4' 6"	57"	4' 9"	60"	5' 0"
3½	63"	5' 3"	66"	5' 6"	69"	5' 9"
4.0	72"	6' 0"	75"	6' 3"	78"	6' 6"
4½	81"	6' 9"	84"	7' 0"	87"	7' 3"
5.0	90"	7' 6"	93"	7' 9"	96"	8' 0"
5½	99"	8' 3"	102"	8' 6"	105"	8' 9"
6	108"	9' 0"	111"	9' 3"	114"	9' 6"
6½	117"	9' 9"	120"	10' 0"	123"	10' 3"
7	126"	10' 6"	129"	10' 9"	132"	11' 0"
7½	135"	11' 3"	138"	11' 6"	141"	11' 9"
8	144"	12' 0"	147"	12' 3"	150"	12' 6"
8½	153"	12' 9"	156"	13' 0"	159"	13' 3"
9	162"	13' 6"	165"	13' 9"	168"	14' 0"
9½	171"	14' 3"	174"	14' 6"	177"	14' 9"
10	180"	15' 0"	183"	15' 3"	186"	15' 6"
10½	189"	15' 9"	192"	16' 0"	195"	16' 3"
11	198"	16' 6"	201"	16' 9"	204"	17' 0"
11½	207"	17' 3"	210"	17' 6"	213"	17' 9"
12	216"	18' 0"	219"	18' 3"	222"	18' 6"
12½	225"	18' 9"	228"	19' 0"	231"	19' 3"
13	234"	19' 6"	237"	19' 9"	240"	20' 0"
13½	243"	20' 3"	246"	20' 6"	249"	20' 9"
14	252"	21' 0"	255"	21' 3"	258"	21' 6"
14½	261"	21' 9"	264"	22' 0"	267"	22' 3"
15	270"	22' 6"	273"	22' 9"	276"	23' 0"
15½	279"	23' 3"	282"	23' 6"	285"	23' 9"
16	288"	24' 0"	291"	24' 3"	294"	24' 6"
16½	297"	24' 9"	300"	25' 0"	303"	25' 3"
17	306"	25' 6"	309"	25' 9"	312"	26' 0"
17½	315"	26' 3"	318"	26' 6"	321"	26' 9"
18	324"	27' 0"	327"	27' 3"	330"	27' 6"
18½	333"	27' 9"	336"	28' 0"	339"	28' 3"
19	342"	28' 6"	345"	28' 9"	348"	29' 0"
19½	351"	29' 3"	354"	29' 6"	357"	29' 9"
20	360"	30' 0"	363"	30' 3"	366"	30' 6"
20½	369"	30' 9"	372"	31' 0"	375"	31' 3"
21	378"	31' 6"	381"	31' 9"	384"	32' 0"
21½	387"	32' 3"	390"	32' 6"	393"	32' 9"
22	396"	33' 0"	399"	33' 3"	402"	33' 6"
22½	405"	33' 9"	408"	34' 0"	411"	34' 3"
23	414"	34' 6"	417"	34' 9"	420"	35' 0"
23½	423"	35' 3"	426"	35' 6"	429"	35' 9"
24	432"	36' 0"	435"	36' 3"	438"	36' 6"

NOTE: 6" cut standard can be either placed at the first course for the start of construction of the NUDURA wall or at the top of the complete wall height.

5.3 WALL HEIGHT CHART (METRIC)

NO. OF COURSES	HEIGHT OF WALL		PLUS ONE 76.2 mm HEIGHT ADJUSTER		PLUS ONE 152.4mm CUT STANDARD	
	mm	meters	mm	meters	mm	meters
1	457.2	0.4572	530.4	0.5304	609.6	0.6096
1½	685.8	0.6858	759.0	0.7590	838.2	0.8382
2	914.4	0.9144	987.6	0.9876	1066.8	1.0668
2½	1143.0	1.1430	1216.2	1.2162	1295.4	1.2954
3	1371.6	1.3716	1444.8	1.4448	1524.0	1.5240
3½	1600.2	1.6002	1673.4	1.6734	1752.6	1.7526
4.0	1828.8	1.8288	1902.0	1.9020	1981.2	1.9812
4½	2057.4	2.0574	2130.6	2.1306	2209.8	2.2098
5.0	2286.0	2.2860	2359.2	2.3592	2438.4	2.4384
5½	2514.6	2.5146	2587.8	2.5878	2667.0	2.6670
6	2743.2	2.7432	2816.4	2.8164	2895.6	2.8956
6½	2971.8	2.9718	3045.0	3.0450	3124.2	3.1242
7	3200.4	3.2004	3273.6	3.2736	3352.8	3.3528
7½	3429.0	3.4290	3502.2	3.5022	3581.4	3.5814
8	3657.6	3.6576	3730.8	3.7308	3810.0	3.8100
8½	3886.2	3.8862	3959.4	3.9594	4038.6	4.0386
9	4114.8	4.1148	4188.0	4.1880	4267.2	4.2672
9½	4343.4	4.3434	4416.6	4.4166	4495.8	4.4958
10	4572.0	4.5720	4645.2	4.6452	4724.4	4.7244
10½	4800.6	4.8006	4873.8	4.8738	4953.0	4.9530
11	5029.2	5.0292	5102.4	5.1024	5181.6	5.1816
11½	5257.8	5.2578	5331.0	5.3310	5410.2	5.4102
12	5486.4	5.4864	5559.6	5.5596	5638.8	5.6388
12½	5715.0	5.7150	5788.2	5.7882	5867.4	5.8674
13	5943.6	5.9436	6016.8	6.0168	6096.0	6.0960
13½	6172.2	6.1722	6245.4	6.2454	6324.6	6.3246
14	6400.8	6.4008	6474.0	6.4740	6553.2	6.5532
14½	6629.4	6.6294	6702.6	6.7026	6781.8	6.7818
15	6858.0	6.8580	6931.2	6.9312	7010.4	7.0104
15½	7086.6	7.0866	7159.8	7.1598	7239.0	7.2390
16	7315.2	7.3152	7388.4	7.3884	7467.6	7.4676
16½	7543.8	7.5438	7617.0	7.6170	7696.2	7.6962
17	7772.4	7.7724	7845.6	7.8456	7924.8	7.9248
17½	8001.0	8.0010	8074.2	8.0742	8153.4	8.1534
18	8229.6	8.2296	8302.8	8.3028	8382.0	8.3820
18½	8458.2	8.4582	8531.4	8.5314	8610.6	8.6106
19	8686.8	8.6868	8760.0	8.7600	8839.2	8.8392
19½	8915.4	8.9154	8988.6	8.9886	9067.8	9.0678
20	9144.0	9.1440	9217.2	9.2172	9296.4	9.2964
20½	9372.6	9.3726	9445.8	9.4458	9525.0	9.5250
21	9601.2	9.6012	9674.4	9.6744	9753.6	9.7536
21½	9829.8	9.8298	9903.0	9.9030	9982.2	9.9822
22	10058.4	10.0584	10131.6	10.1316	10210.8	10.2108
22½	10287.0	10.2870	10360.2	10.3602	10439.4	10.4394
23	10515.6	10.5156	10588.8	10.5888	10668.0	10.6680
23½	10744.2	10.7442	10817.4	10.8174	10896.6	10.8966
24	10972.8	10.9728	11046.0	11.0460	11125.2	11.1252

NOTE: 152.4mm cut standard can be either placed at the first course for the start of construction of the NUDURA wall or at the top of the complete wall height.