

METRIC FACT SHEET



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PLAN M-9011 REVISED 85:01

This 'Fact Sheet' is intended to provide a quick condensed reference for those concerned with the conversion to metric building practice and with the preparation of metric construction drawings.

The 'Fact Sheet' is not complete, but is updated periodically whenever new metric standards are published.

DEFINITIONS

HARD CONVERSION

Physical dimensions and mechanical properties have changed, products are converted to modular metric increments.

SOFT CONVERSION

Physical dimensions remain unchanged and products are converted to an appropriate degree of precision in metric designations.

LENGTH

imperial	metric
1/8"	3 mm
1/4"	6
3/8"	10
1/2"	13
5/8"	16
3/4"	19
1"	25
1'-0"	300
4'-0"	1 200
6'-0"	1 800
8'-0"	2 400
10'-0"	3 000

TEMPERATURE CONVERSIONS

$$\begin{aligned} ^\circ\text{K} &= ^\circ\text{C} + 273.15 \\ ^\circ\text{C} &= 5/9 (^\circ\text{F} - 32) \\ ^\circ\text{F} &= 9/5 (^\circ\text{C}) + 32 \end{aligned}$$

EXPRESSION OF SLOPE

(approximate conversion)

present ratio	metric ratio
Roof Slopes	
1:12	1:12
2:12	1:6
3:12	1:4
4:12	1:3
6:12	1:2
8:12	1:1.5
12:12	1:1
Floor Slopes	
1/16"/1'	1:200
1/8"/1'	1:100
1/4"/1'	1:50
1/2"/1'	1:25
5/8"/1'	1:20
1"/1'	1:10

GENERAL CONVERSIONS

$$\begin{aligned} \text{m} &= \text{ft} \times 0.3048 \\ \text{ft} &= \text{m} \times 3.281 \end{aligned}$$

$$\begin{aligned} \text{m}^2 &= \text{ft}^2 \times 0.0929 \\ \text{ft}^2 &= \text{m}^2 \times 10.764 \end{aligned}$$

$$\begin{aligned} \text{ha} &= \text{acres} \times 0.4047 \\ \text{acres} &= \text{ha} \times 2.471 \end{aligned}$$

$$\begin{aligned} \text{m}^3 &= \text{ft}^3 \times 0.02832 \\ \text{ft}^3 &= \text{m}^3 \times 35.31 \end{aligned}$$

$$\begin{aligned} \text{L} &= \text{gal (Can.)} \times 4.546 \\ \text{Gal (Can.)} &= \text{L} \times 0.220 \end{aligned}$$

$$\begin{aligned} \text{L} &= \text{gal (US)} \times 3.785 \\ \text{Gal (US)} &= \text{L} \times 0.2642 \end{aligned}$$

$$\begin{aligned} \text{L/s} &= \text{cfm} \times 0.472 \\ \text{cfm} &= \text{L/s} \times 2.12 \end{aligned}$$

$$\begin{aligned} \text{kg} &= \text{lb} \times 0.4536 \\ \text{lb} &= \text{kg} \times 2.205 \end{aligned}$$

$$\begin{aligned} \text{t} &= \text{ton} \times 0.9072 \\ \text{ton} &= \text{t} \times 1.102 \end{aligned}$$

$$\begin{aligned} \text{kg/m}^3 &= \text{lb/ft}^3 \times 16.01 \\ \text{lb/ft}^3 &= \text{kg/m}^3 \times 0.06245 \end{aligned}$$

$$\begin{aligned} \text{kN} &= \text{kg} \times 0.009807 \\ \text{N} &= \text{lbf} \times 4.448 \\ \text{lbf} &= \text{N} \times 0.2248 \end{aligned}$$

$$\begin{aligned} \text{MPa} &= \text{N/mm}^2 = \text{psi} \times 0.006895 \\ \text{psi} &= \text{MPa} \times 145.0 \end{aligned}$$

$$\begin{aligned} \text{J} &= \text{W} \cdot \text{s} = \text{N} \cdot \text{m} = \text{ft} \cdot \text{lb} \times 1.356 \\ \text{MJ} &= \text{kWh} \times 3.60 \\ \text{kWh} &= \text{MJ} \times 0.2778 \end{aligned}$$

$$\begin{aligned} \text{kWh} &= \text{BTU} \times 0.0002930 \\ \text{BTU} &= \text{kWh} \times 3413 \end{aligned}$$

$$\begin{aligned} \text{kW} &= \text{hp} \times 0.746 \\ \text{hp} &= \text{kW} \times 1.340 \end{aligned}$$

LENGTH

AREA

AREA

VOLUME

VOLUME

VOLUME

FLUID FLOW

MASS

MASS

DENSITY

FORCE

PRESSURE, STRESS

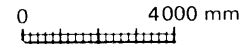
ENERGY

ENERGY

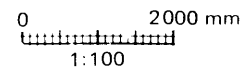
POWER

RECOMMENDED RATIO SCALES

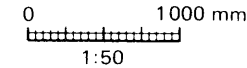
General Location Drawings



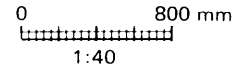
Floor Plans



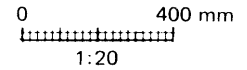
Floor Plans & Sections



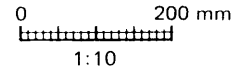
Floor Plans & Sections



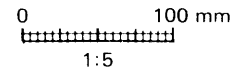
Construction Detail



Construction Details



Construction Details



TOTAL ROOF LOADS

(approximate conversion)

imperial	metric
20 psf	1 kN/m ²
40	2
60	3
80	4
100	5
120	6
kN/m ² = psf x .04788	
psf = kN/m ² x 20.89	

ROLLED STEEL SHAPES

- most structural rolled steel shapes now available in metric sizes, refer to appropriate manufacturers literature for new sizes.

STEEL YIELD STRENGTH
(hard conversion)

imperial psi	metric MPa	designated as
40 000	300	Grade 300
50 000	350	Grade 350
60 000	400	Grade 400

REBAR SIZES
(hard conversion)

imperial	metric	area of section mm ²
3	10M	100
4		
5	15M	200
6	20M	300
7	25M	500
8		
9	30M	700
10	35M	1000
11		
14	45M/55	1500/2500
18		

WELDED WIRE FABRIC SIZES
(soft conversion)

imperial	metric
2"	51 mm
3"	76
4"	102
6"	152
8"	203
12"	305

wire size	cross-sectional area mm ²
ga	
0	47.6
2	34.9
4	25.8
6	18.7
8	13.3
9	11.1
10	9.1
12	5.6
14	3.2

- metric designation of wire size signifies the nominal cross-sectional area (mm²) of the longitudinal and transverse wires
MW - denotes smooth wire
MD - denotes deformed wire
eg.

6 x 6 6/6
becomes
152 x 152 MW18.7 x MW18.7

VAPOR BARRIERS

imperial	metric
2 mil	50 µm
4 mil	100 µm
6 mil	150 µm
10 mil	250 µm

SHEET METAL THICKNESSES
(base steel thickness)

imperial	metric
12 ga.	2.67 mm
14	1.91
16	1.52
18	1.22
20	0.91
22	0.76
24	0.61
26	0.46
28	0.34
30	0.31

- for galvanized sheet metal, add 0.04 mm to above figures

BOLT SIZES

(hard conversion)

imperial	metric
1/4"	M6
5/16"	M8
3/8"	M10
1/2"	M12
9/16"	M14
5/8"	M16
11/16"	M18
3/4"	M20

Diameter

imperial	metric
1/2"	12 mm
3/4"	20
1"	25
1 3/8"	35
1 3/4"	45
2"	50
2 3/4"	70
3"	75
3 1/4"	80
3 1/2"	90
4"	100

Length

NOMINAL SIZES OF NON METALLIC PIPES AND TUBES
(hard conversion)

imperial	metric
3"	75 mm
4"	100
5"	125
6"	150
8"	200
10"	250
12"	300
14"	350
16"	400

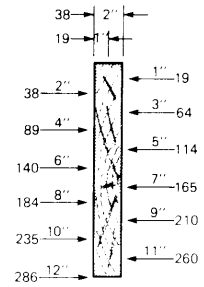
CONCRETE STRENGTH

(hard conversion)

imperial	metric
2 000 psi	15 MPa
3 000	20
3 500	25
4 000	30
5 000	35
6 000	40
7 000	50

For soft conversion the relationship is:
MPa = psi x 0.006895

SAWN LUMBER SIZES
(soft conversion)



POLE SIZES

Sawn imperial (nom.)	metric (actual)	Round imperial	metric
4" x 4" ...	89 x 89 mm	4"	100 mm
4" x 6" ...	89 x 140	5"	125
6" x 6" ...	140x140	6"	150
6" x 8" ...	140x184	7"	175
8" x 8" ...	184x184	8"	200
		9"	225

CONSTRUCTION PLYWOOD

Modular size of a sheet 1200 x2400 mm

imperial (nom.)	metric (actual)
	sanded sheathing
1/4"	6mm
5/16"	-
3/8"	8
1/2"	11
5/8"	14
3/4"	17

WAFERBOARD THICKNESS

(soft conversion)

imperial	metric
1 4"	6.35 mm
5 16"	7.9
3 8"	9.5
7 16"	11.1
1 2"	12.7
5 8"	15.9
3 4"	19.0

R - VALUES

(fibreglass insulation)

imperial	metric
R8	RSI 1.4
R12	RSI 2.1
R14	RSI 2.5
R20	RSI 3.5
R26	RSI 4.5
R28	RSI 4.9

RSI = R x 0.176