APPENDIX E

CONSTRUCTING A STANDARD HEADING

Members

1. Each frame consists of:

Member	Size	Quantity
(a)	(b)	(C)
Groundsills	4 ft 6 in x 9 in x 3 in	1
Topsills	4 ft 6 in x 9 in x 3 in	1
Side trees	5 ft 0 in x 9 in x 3 in	2
Spreaders	4 ft 0 in x 9 in x 1 in	2

Starching Out a Heading from a Shaft (Fig 48E1-1)

2. a. Continue the shaft until the floor is about two feet below the calculated depth of the bomb.

b. Construct a frame of walings at or near floor level providing support for the walings where they do not rest on the ground.

c. Add a fresh frame of walings unless one is already conveniently positioned just over five foot six inches clear of the bottom frame.

d. Remove any frames between these two.

e. Construct the first heading frame resting it on the bottom waling and hard against the runners. This frame must be nailed together and chocked in position to hold it rigid until the next stage. For this frame only, the spreaders should be two inches thick.

f. Construct a frame of walings midway between the bottom two frames. For a standard 9 foot x 8 foot shaft, Figs 48E1-2 and 3 show the method to be used. Different procedures are required depending on the side of the shaft from which the heading is struck. In large or non-standard shafts, similar frames must be improvised. They must give support without cramping the working space in the shaft without cramping the working space in the shaft.

Note: *Stages (e) and (f) may be omitted if the ground is very good.*

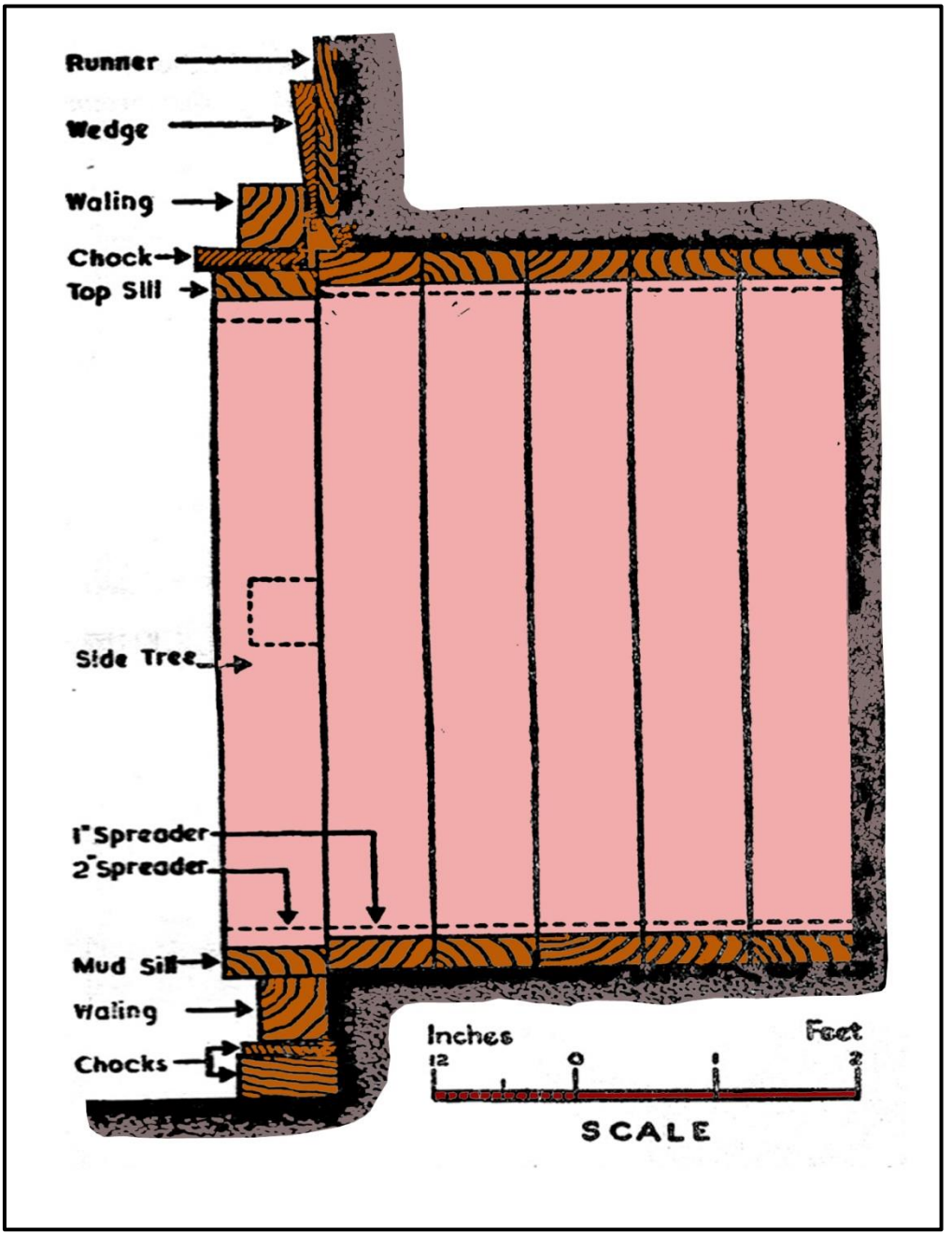

Fig 48E1-1: Breaking Out a Standard Heading from a 9 ft x 8 ft Shaft
(Side Elevation)

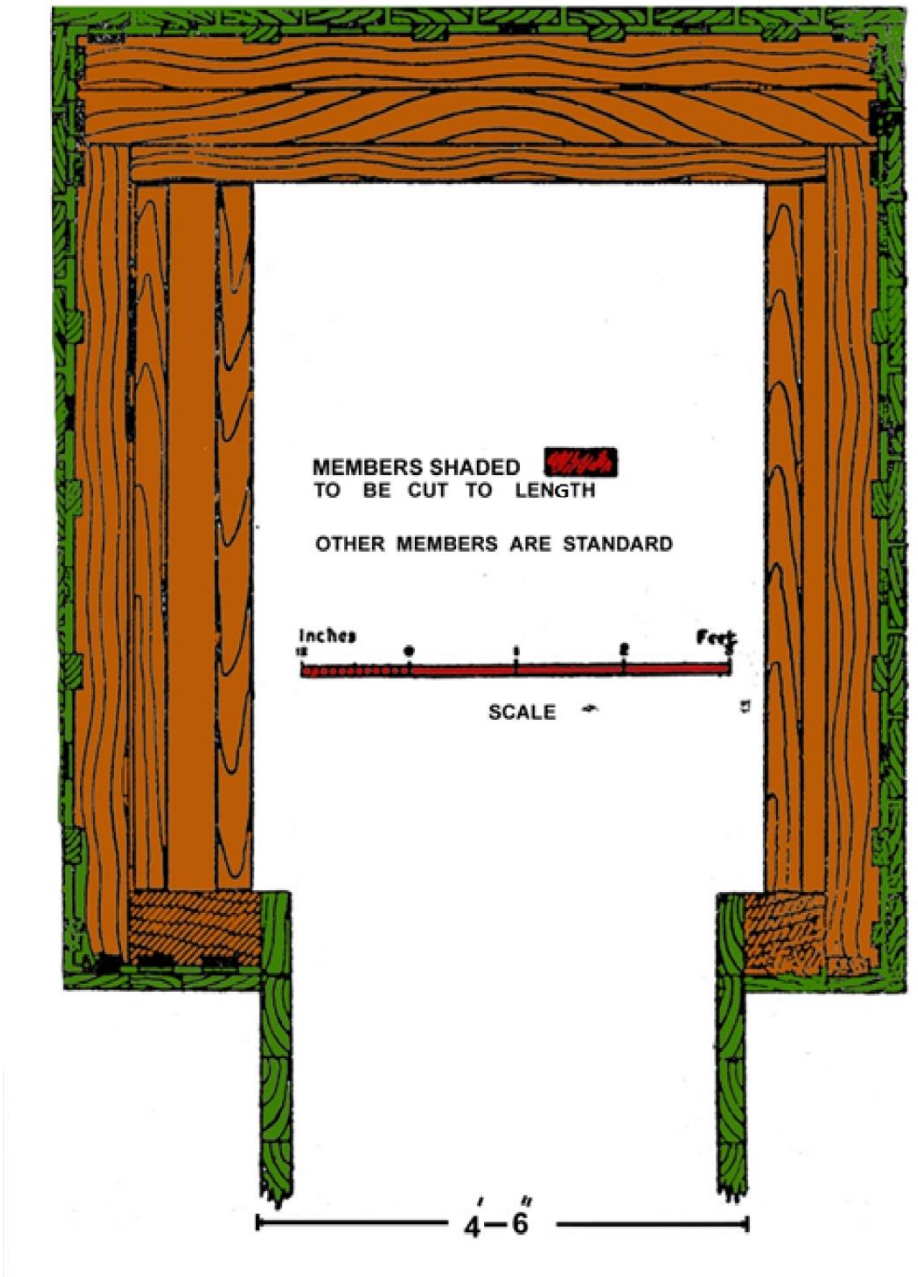

Fig 48E1-2: Breaking Out a Heading from the Long Side of a 9 ft x 8 ft Shaft.

Plan View Showing Special Frame

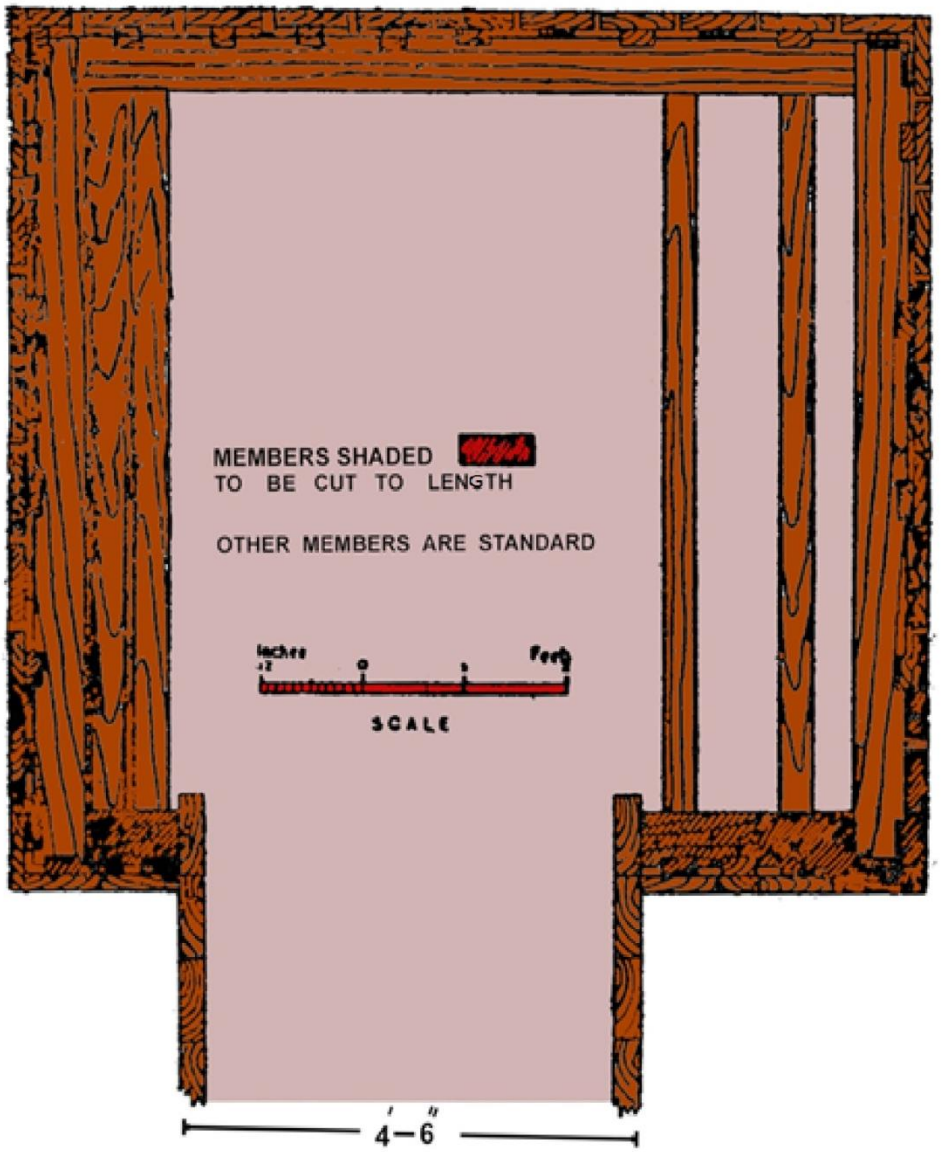

Fig 48E1-3: Breaking Out a Heading from the Short Side of a 9 ft x 8 ft Shaft

Plan View Showing Special Frame

g. Drive in puncheons between the frames of walings.

h. Raise the runners which cover the face of the proposed heading.

j. Construct the second frame of the heading bringing the one inch bottom spreaders to the same level as the two inch bottom spreader of the first frame.

k. Add further heading frames as required.

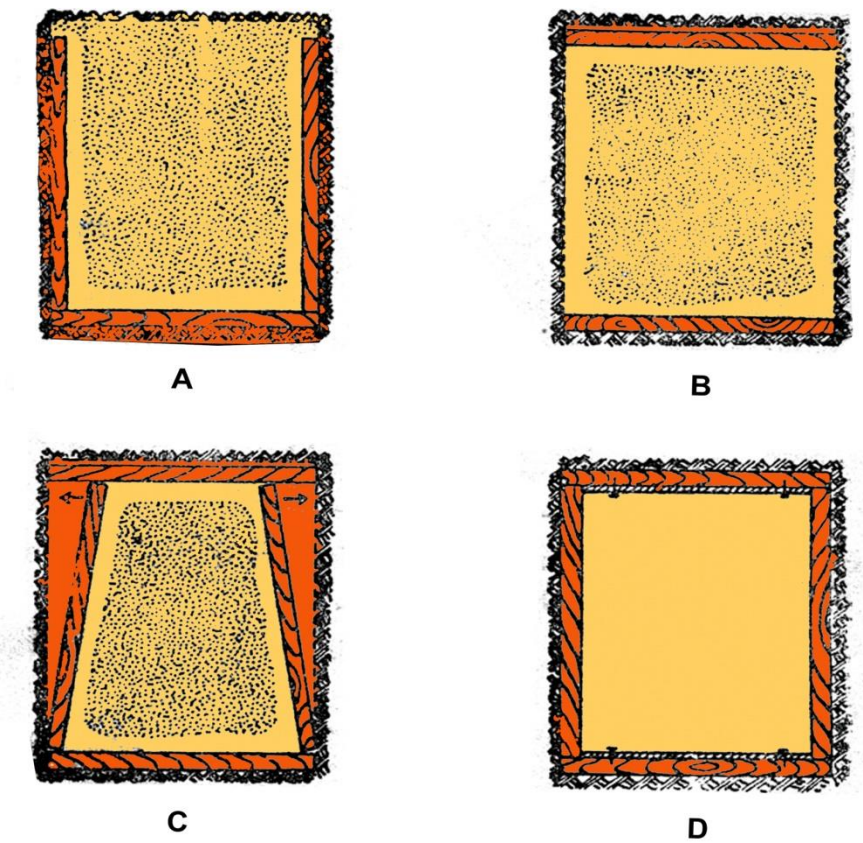

Fig 48E1-4: Constructing a Heading Frame

Putting in Frames (Fig 48E1-4)

3. a. Set in the groundsill at the required level and the side trees at just less than spreader length (four feet) apart.

b. Remove the side trees and set in the top still at a little less than side tree height (five feet) above the groundsill.

c. Place in the side trees at a slant and drive outwards to force the top sill firmly against the roof.

d. Remove the earth from the center of the frame and drive in the spreaders as soon as possible. Nail or screw the spreaders into position.

Provision of Adequate Support

4. a. In extremely firm ground and when time is of vital importance frames may be placed at open spacing. In all other circumstances close spacing must be used.

b. If any ground face is left for a period it must be given temporary support (Fig 48E1-5).

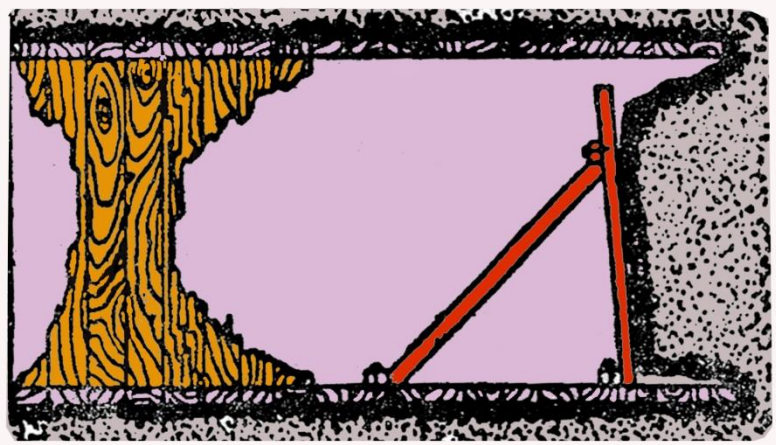

Fig 48E1-5: Supporting the Earth Face in a Heading

APPENDIX 1

REPORT OF A UXB

PART 1

(To be completed at CD control)

To:

Commissioner No.....Region/sub-Region.

1. Exact Location .....
   .....Map Ref ...OS ser No..... .....
   .....Time of fall.....
   Date of fall.....
2. Local contact
   Name..... Category allotted…
   Address.....
   .....
   (This can only be “B”, “C” or “D”)
   Tel No.....
3. Is it camoutflet ?
4. Estimated weight and type of UXB.....
5. Diameter of hole entry.....
6. Buried or unburied? .....
7. Described:
   a. Any Part of UXB if exposed.....
   b. Any portion of UXB found in vicinity.....
   c. Colour and markings found on any part.....
8. State where any portion of UXB may be found.....
9. State where appropriate safety precaution involve:
   a. Evacuation of dwellings giving est no of persons.....
   b. Evacuation of factories.....
   Interruption of public utility services communications etc.
   giving details.....
   c. Stoppage of rail traffic.....

Signed.....Rank.....
Appointment.....Date.....

CLEARANCE CERTIFICATE

PART IV

(To be completed by BD Officer)

Serial No _____

1. The UXB at:

_____

Has now been

a. Disposed of, size _____ Type _____
b. Discredited: found to be a _____
If camouflet formed, state action taken _____
_____
c. Abandoned, est, size _____ Type _____

2. Signed _____ Date _____
Appointment _____ Rank _____
_____ Bd Coy/PI

PART II

(To be completed at Region/sub-Region)

1. If category "A" allotted _____
2. Passed for action to _____ BD Coy/PI _____
Time _____ Date _____ signed _____ Rank ___

(For Region/sub Region Commissioner)

PART III

(To be completed by BD Officer)

1. Report verified time_____ Date_____
2. Operations commenced_____
   Time_____ Date_____
3. Operations carried out by _____
   To_____ BD Coy/PI
4. Operation carried out by_____
   _____ABD Unit
5. Size and type of bomb_____
6. Fuze(s) fitted _____
7. Penetration _____
8. Offset_____How Fuze (s) dealt with_____
9. How bomb disposed of_____
10. Operations completion time_____
    Date_____
11. Clearance Certificate handed to_____ Time _____Date_____
12. Special observations

    (Sketches of works to be attached)

    Returned to OC_____.BD Coy/PI Signed _____Rank_____
    Appointment _____
    Date_____
13. Returned to _____Date _____
    (Region/Sub-Region) Signed_____Rank_____
    OC_____BD/coy/PI
    Date_____
14. Sent to Engineer Directorate Signed _____Rank_____
    Appointment _____
    Date_____

TABLE 17 - CONVERSION TABLES

Values of Prefixes of Sub-Multiples and Multiples of Metric Units

Prefix	Numerical Value	
Milli	0.001	10^{-3}
Centi	0.01	10^{-2}
Deci	0.1	10^{-2}
Deca	10	10
Hecto	100	10^{-3}
Kilo	1000	10^{-3}

Principal Conversion Factors

1 inch = 25.40 millimeters
1 pound = 453.592 grams = 7000 grains
1 tola = 180 grains
1 gallon= 4.54596 Litres

Length

Meters	Yards	Feet	Inches
1	1.09361	3.28084	39.3701
0.9144	1	3	36
0.3048	0.333	1	12
0.0254	0.0277778	0.08333	1

1 Chain= 100 links; 1 link= 7.92 inches= 201.168 mm

Kilometers	Miles
1	0.62137
1.609 344	1

Area

Square Meters	Square Yards	Square Feet	Square Inches
1	1.595.99	10.763.9	1 550.00
0.836 13	1	9	1296
0.092 903	0.111 111	1	144
0.000 645 16	0.000 771 60	0.006 944 4	1

1 sq kilometer = 0.38610 square miles
1 sq mile = 640 acres = 2.5899 sq kilometers
1 acre = 10 sq chains
1 sq chain = 184 sq Yards= 404.646 sq meters

NOTE:- 1 ‘acre’ = 100 sq meters =0.0247105 acres

Volume

Cu Meter	Cu yards	Cu Feet	Gallons (Imp)
1	1.30795	35.315	219.969
0.76455	1	27	168.178
0.0045609	0.0059461	0.160544	1
.028317	.03703	1	6.2288

1cu in = 16.3871 cu cms
1 cu cm = .061024 cu inch
1 liter = 1000.028 cu cm=0.21998 gals
1 gallon = 4.54596 liters

Weight

Kilogram	Pound	Oz
1	2.20462	35.2740
.04535924	1	16
.0283495	.0625	1

1 Metric tonne = 1000 kilogram = .9842 tons
1 Ton = 2240 pounds = 1.01605 metric tones

Speed

Kilometers per Hour	Centimeters per Second	Miles per hour	Feet per Second
1	27.777 8	0.621 37	0.911 34
0.036 000 1	1	0.022 369 4	0.032 8084
1.609 34	44.704 0	1	1.466 67
1.097 28	30.48	0.681 82	1

Density and Concentration

* Gram per cubic Centimeter	Hundredweight per cubic yard	Pounds per Cubic foot	Pounds per Cubic Inch
1	15.0496	62.428	0.0361273
0.066447	1	4.14815	0.0024
0.0160 185	0.24107 1	1	0.0005 7870
27.6799	4616.571	1728	1

Stress and Pressure

Kilograms per sq Millimeter	pounds per sq Inch	Tons per sq Inch	Tons per sq Foot
1	1 422.33	0.634 97	91.436
0.000703 07	1	0.000446 429	0.064
286			
1.574 88	2 240	1	144
0.010 936 6	5.555 6	0.006 944 4	1

* Grams per cubic centimeter ate equal to tonnes per cubic meter and kilograms per cubic decimeter.

Weight and Strength of Materials

Conversion	Existing Practice	Metric Units to be Used	factor
Simpler weights of materials	Ton	Metric Tonne	1.016
	Cwt	q (quintal)	0.508
	oz (ounces)	g (grams)	28.350
	Ib	Kg	0.454
Weight per unit length	Ibs/yd	Kg/m	0.496
	Ibs/ft	kg/m	1.488
Density	Ibs/cu in	g/cu/ m	27.680
	Ibs/cu ft	Kg/cu in	16.019
	cwt/cu yd	q/cu m	0.664
Concentration	oz/imp/gal	g/litre	6.236
	Ibs/cft/	g/litre	16.019
Compressive strength requirements of materials	Ibs/sq in	kg/sq cm	0.0703
Tensile strength requirement of material ...	tons/sq/in	kg/sq cm	1.5749
Breaking loads of materials....	Ib	kg	0.454

stresses (tensile, compressive, bearing or shear)	Ib/sq in	kg/sq cm	0.070.
Hydraulic pressure (head)	ft	m	0.305
Other pressers ..	Ibs/sq/in	kg/sq cm	0.0703
Bearing pressures ...	Tons or Ib per sq ft	Metric tonne or kg per sq m	10.9366 4.8824
Atmospheric pressure in head of water	ft	m	0.305

Conversion	Existing Practice	Metric Units to be Used	factor
Atmospheric pressure in head of mercury	in	mm	25.4
Moment of inertia	in4	cm4	41.62
Section modulus	in3	cm3	16.39
Radius of gyration	in	cm	2.54
Bending moment and ..	in Ib	kg cm	1.152
Moments	ft Ib	kg cm	13.83
	In tons	kg m	25.803
Forces	Ib/sq ft	kg/sq m	4.88
	tons/sq ft	tonne/sq m	10.931
	tons/rft	tons/m	3.33
	Ibs/rft	kg/m	1.488
Speed, Velocity	MPH or	km PH	1.609
	FPS	m PS	0.3048
Acceleration	ft per Second per second	Metre per second per second	0.3048
Discharge in rivers, channels etc.	cusec	cubic metre per second	0.0283
Velocity head	ft	m	0.3048
Work and energy	foot pound	kilogram Metre	0.1383
Power	HP	Metric HP	0.1383
		Kilowatts	**0.746**