Number of revolutions for the generator = 100 rev/min.

Lower for generator = 0.5 kW.

Safety factor = 2.0

Length of lever = 2000mm =2m.

Diameter of large pulley (d1) = 400mm.

Diameter of small pulley (d2) = 60mm.

Number of revolutions of small pulley = 100 rev/min.

Number of revolutions of large pulley = 15 rev/min.

Pulling tension (T) = 47.75 Nm.

(T1 – T2) = 1591.67 N.

Power of large pulley (Pl) = 500.037 W.

Efficiency = =

=1.000074

=100%.

1. BELT CALCULATION.
2. Velocity of belt.

V =

But we have

t - Pulley thickness t = 4mm.

V =

V = 0.381 m/s

1. Capacity.

We design center distance between two pulleys to be 50m. And assuming the coefficient of friction to be 0.4.

Capacity =

2 =

=

2 = 2.5

Capacity =

Capacity = 2.718

1. Constant K.

K =

K =

K = 0.63

1. Centrifugal stress.

c =

But w =

v= 0.381 m/s

g= 9.8 x 103

Sc =

Sc = N/mm2

1. Belt Width

Power transmitted per mm2

=

But S1 = 1.75 N/mm2

=

= 5.63 x 10-5Kw/mm2

Area of cross section of belt

A=

A =

A = 4.53 x 106mm2

Area of cross section of belt.

A =

b = width of belt.

b =

b =

b =

1. Length of Belt.

L=

2 =

=

2 = 3.84

L=

L = 1793.23mm

1. Initial Tension

2 = +

But T1 = S1D

T1=

T1 = 7.9275 x 103

T2

S2 = 0.644N/mm2

T2 = S2A

=

T2 =2.917x106N