

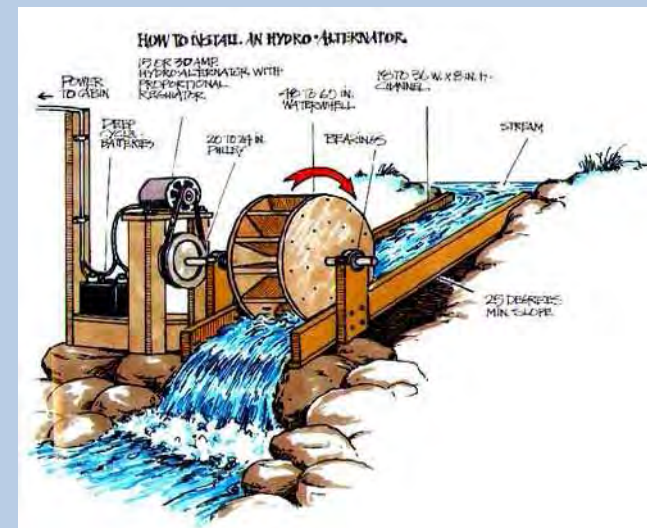


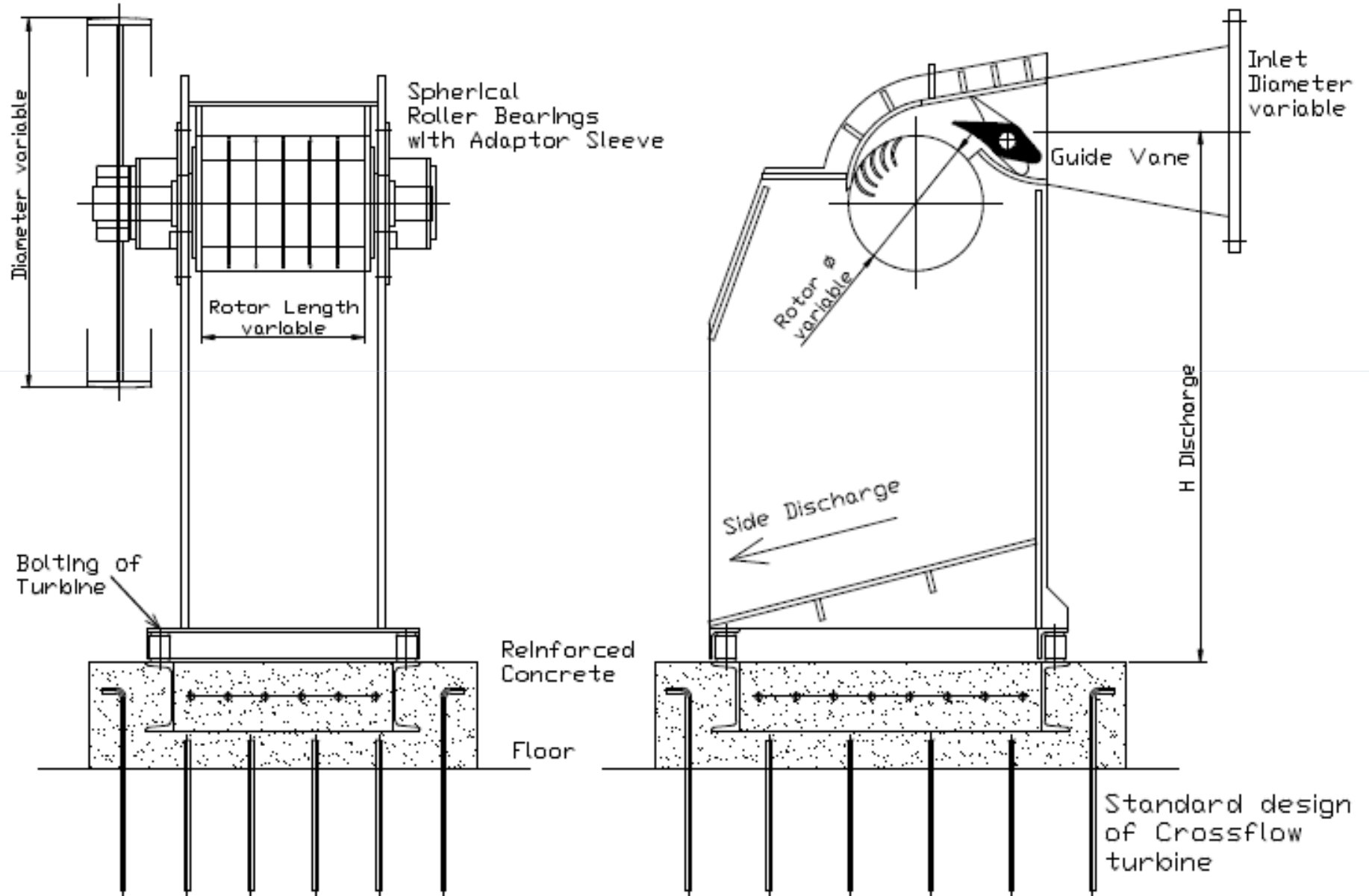
South Africa Hydropower 2010 16 March 2010

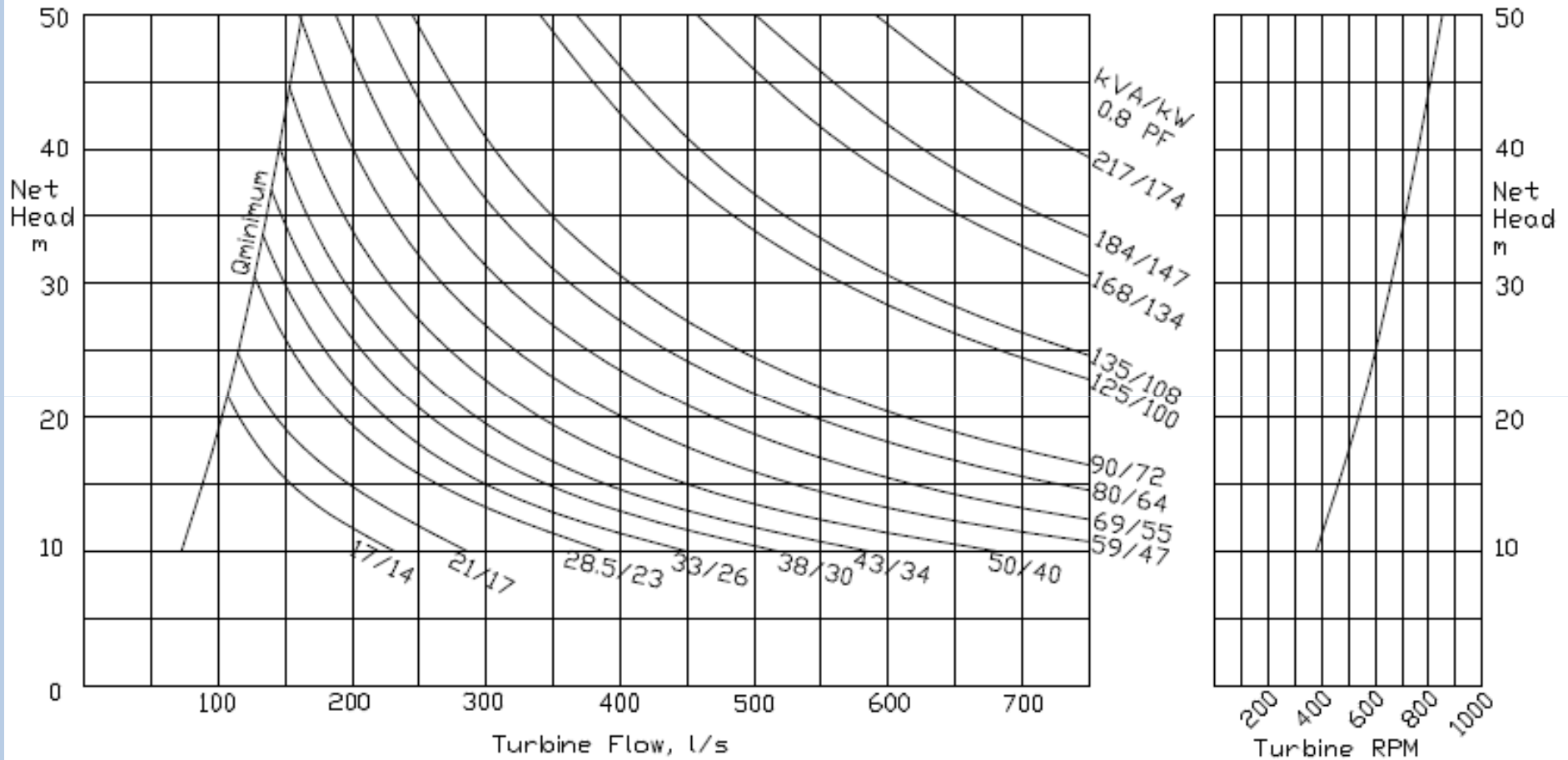
“Opportunities in the Small Scale Hydropower” Existing Pico, Micro, Mini and Small hydropower

BWG Hydro

Presented by :Bruno Graber







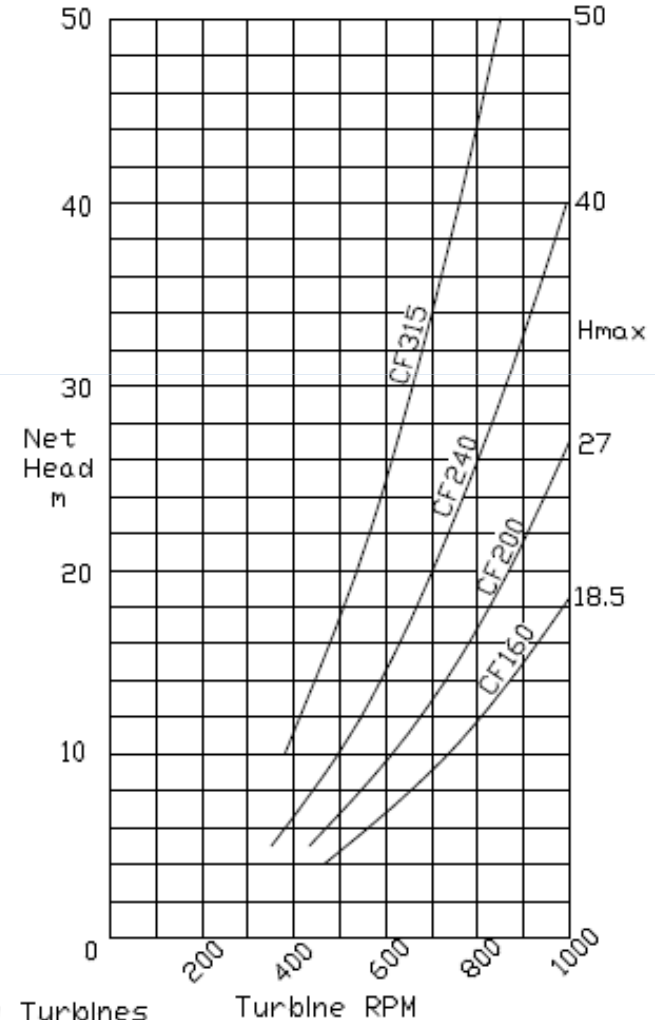
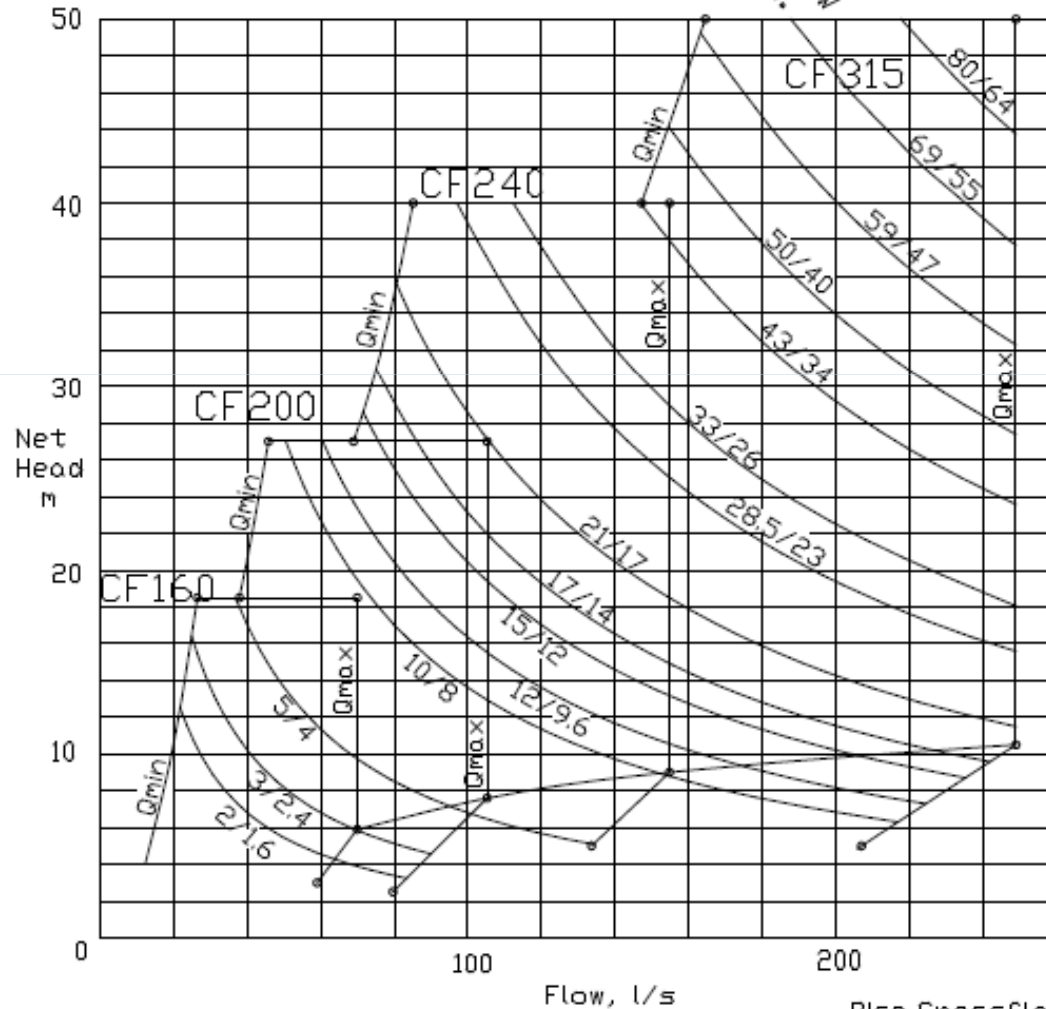
Generators shown are manufactured in RSA by AMAZWI, Wadeville

Micro Cross Flow Turbine: CF315 with Intermediate Discs
 Performance Field



Generators:
 17 to 80 kVA from RSA
 2 to 15 kVA from China

Generator
 Power
 kVA / kW
 eta=80%



Tel& Fax: +27 (0) 11 391-3741
E-mail : bruno@bwghydro.co.za
www.bwghydro.co.za



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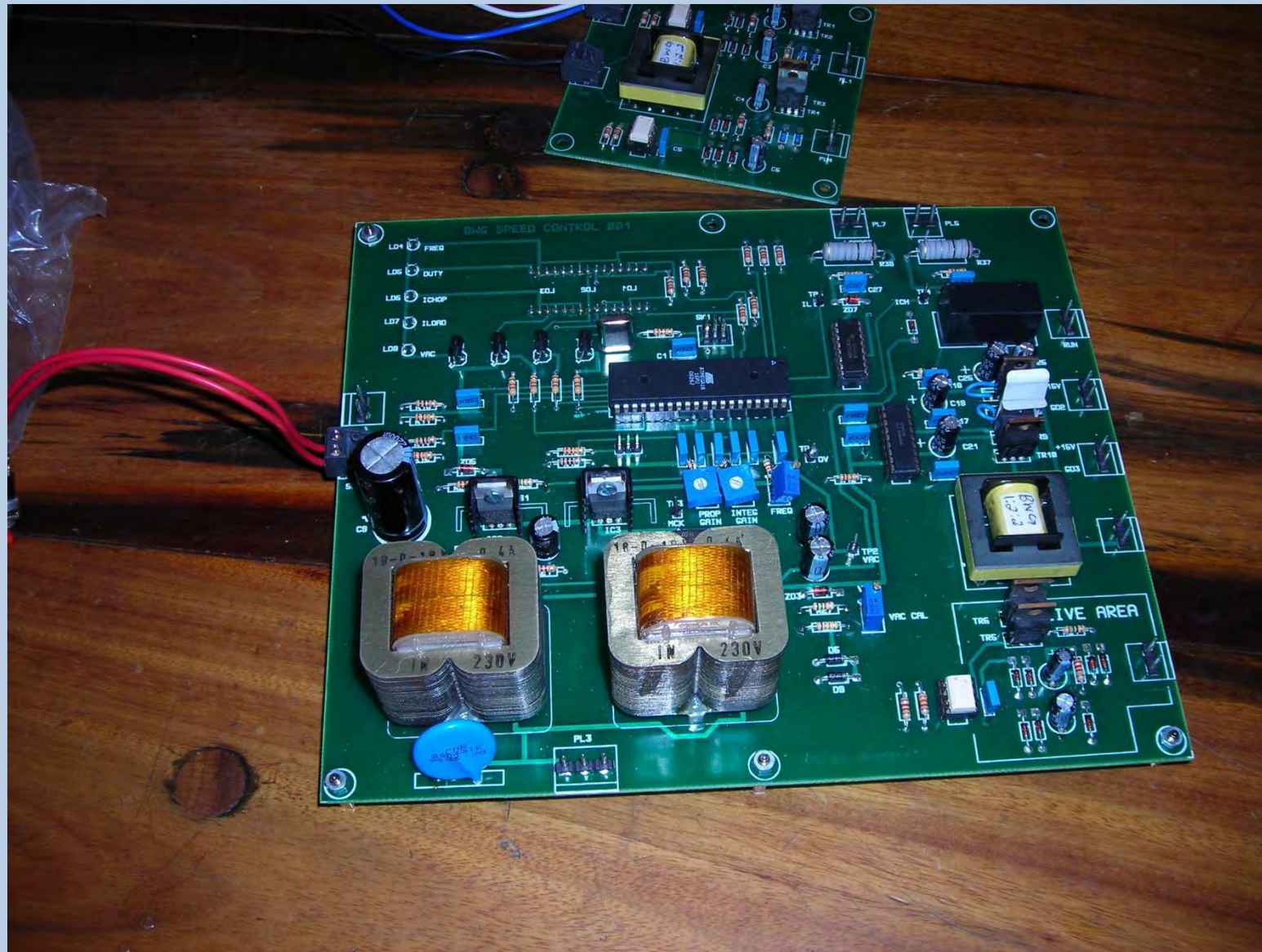


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E-mail : bruno@bwghydro.co.za
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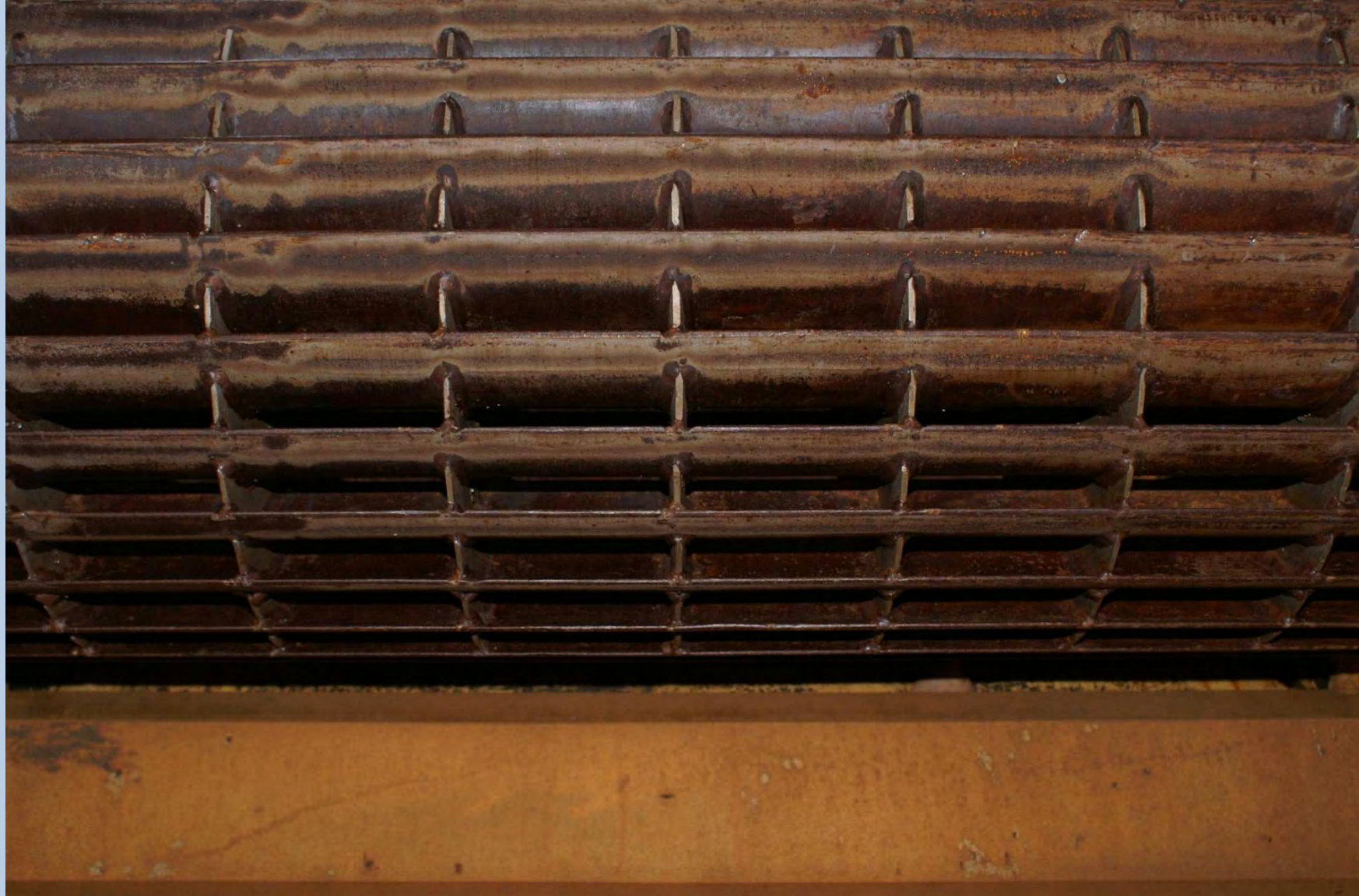


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E-mail : bruno@bwghydro.co.za
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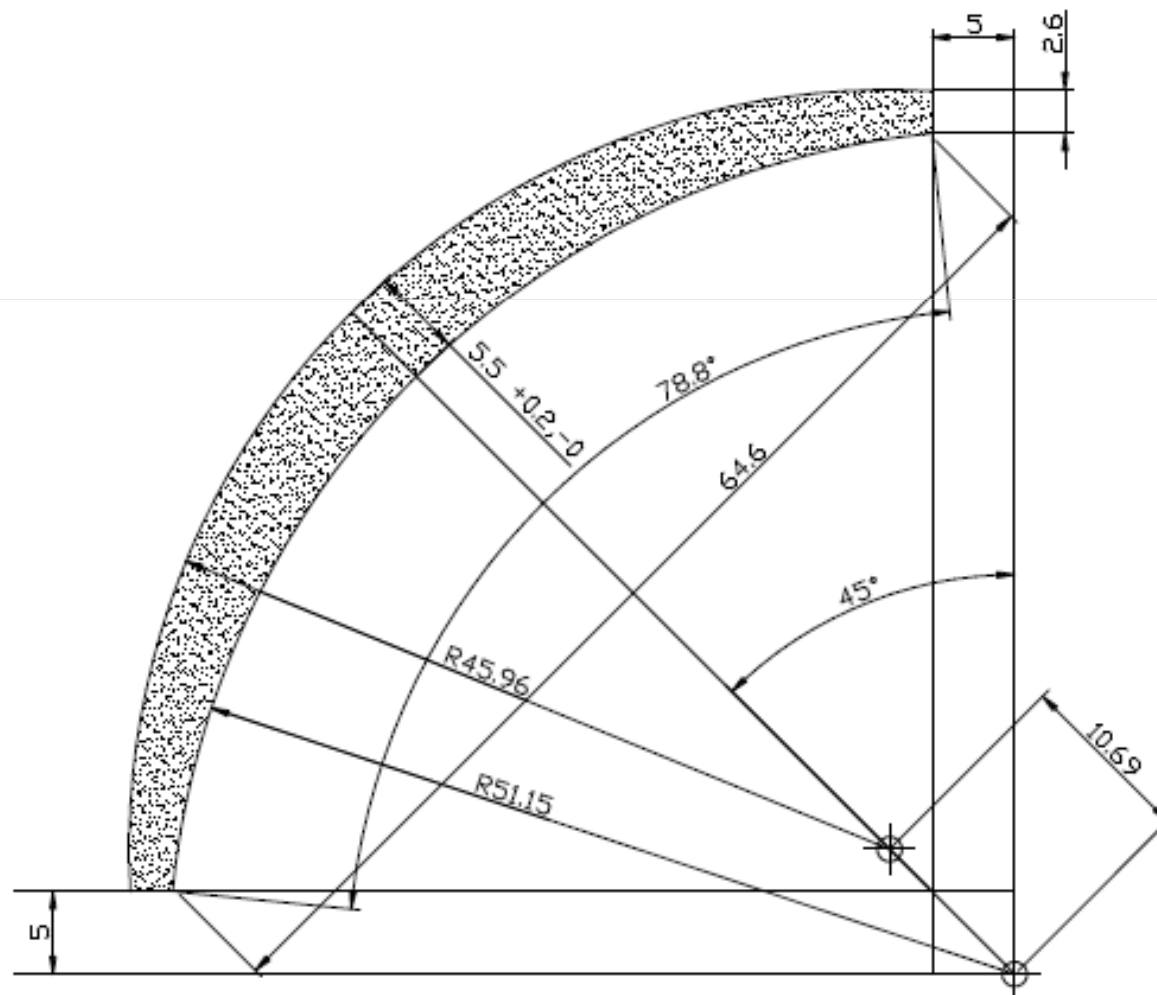
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Dress and Polish
allround



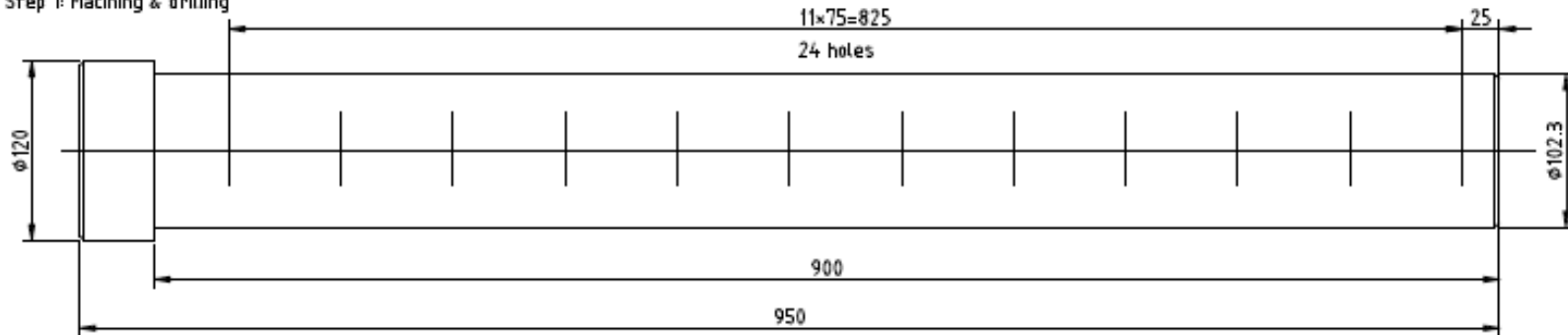
Dress both
Inlet and Outlet
Edges

KUVANGO 1
Pico & Micro
CF325: Fixed
Blade Profile
28 Blades

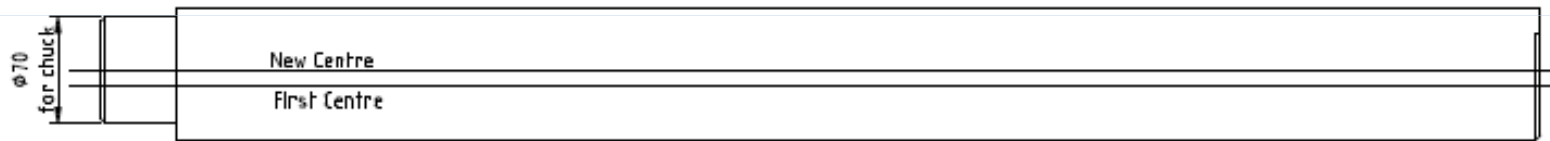
2.1.1



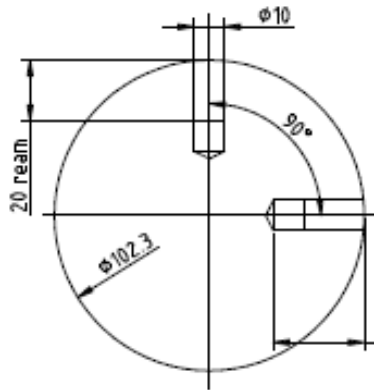
Step 1: Macining & drilling



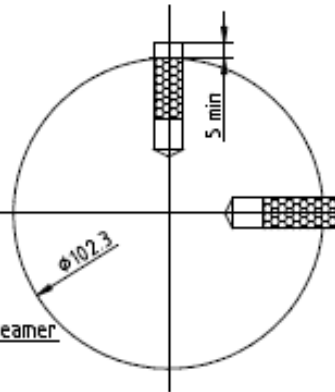
Step 3 and 4



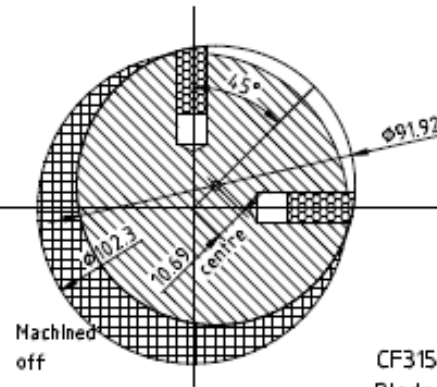
Step 1: Machning & drilling



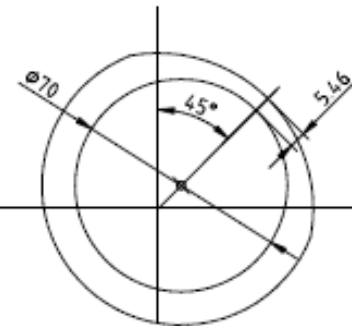
Step 2: Insert Pins [glue ?]



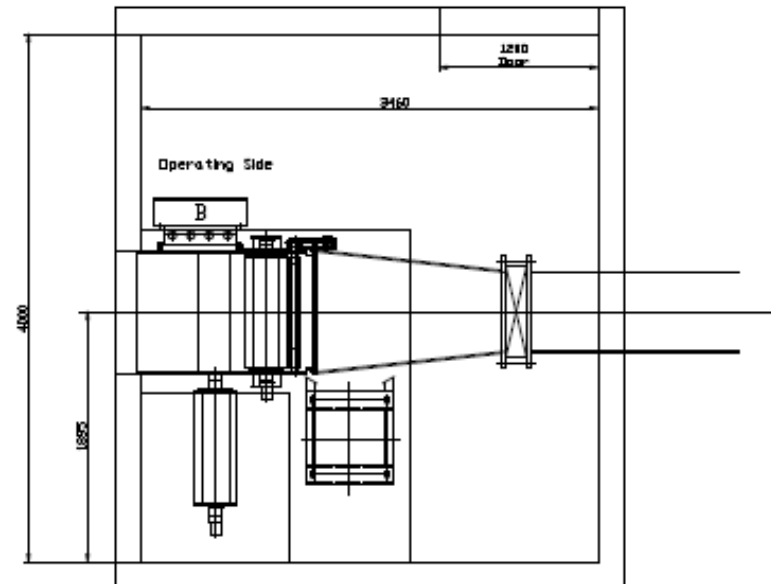
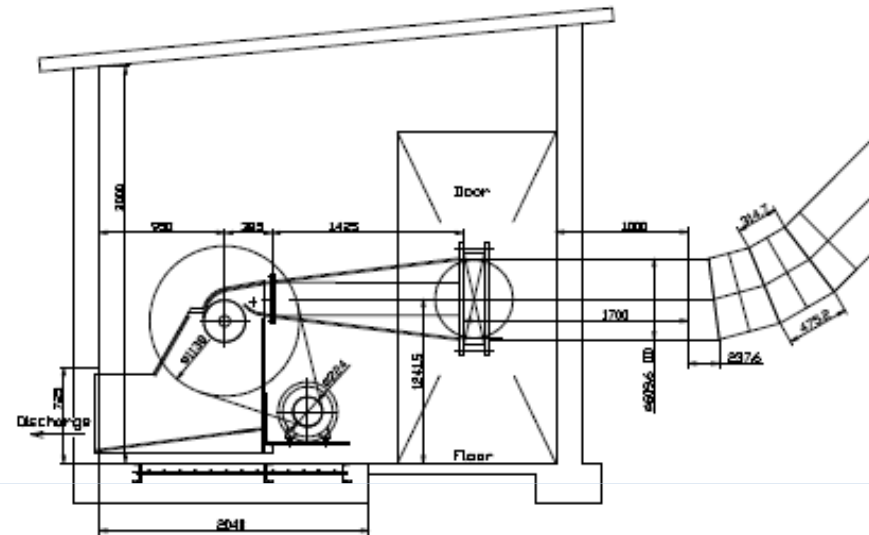
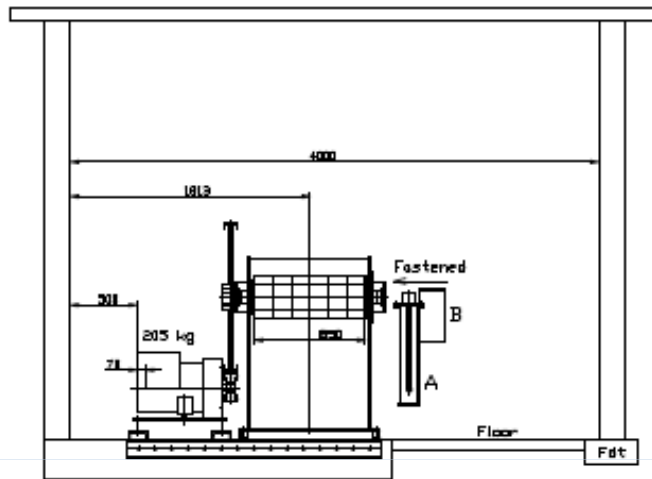
Step 3: Machine off-centre



Step 4: Machine 70



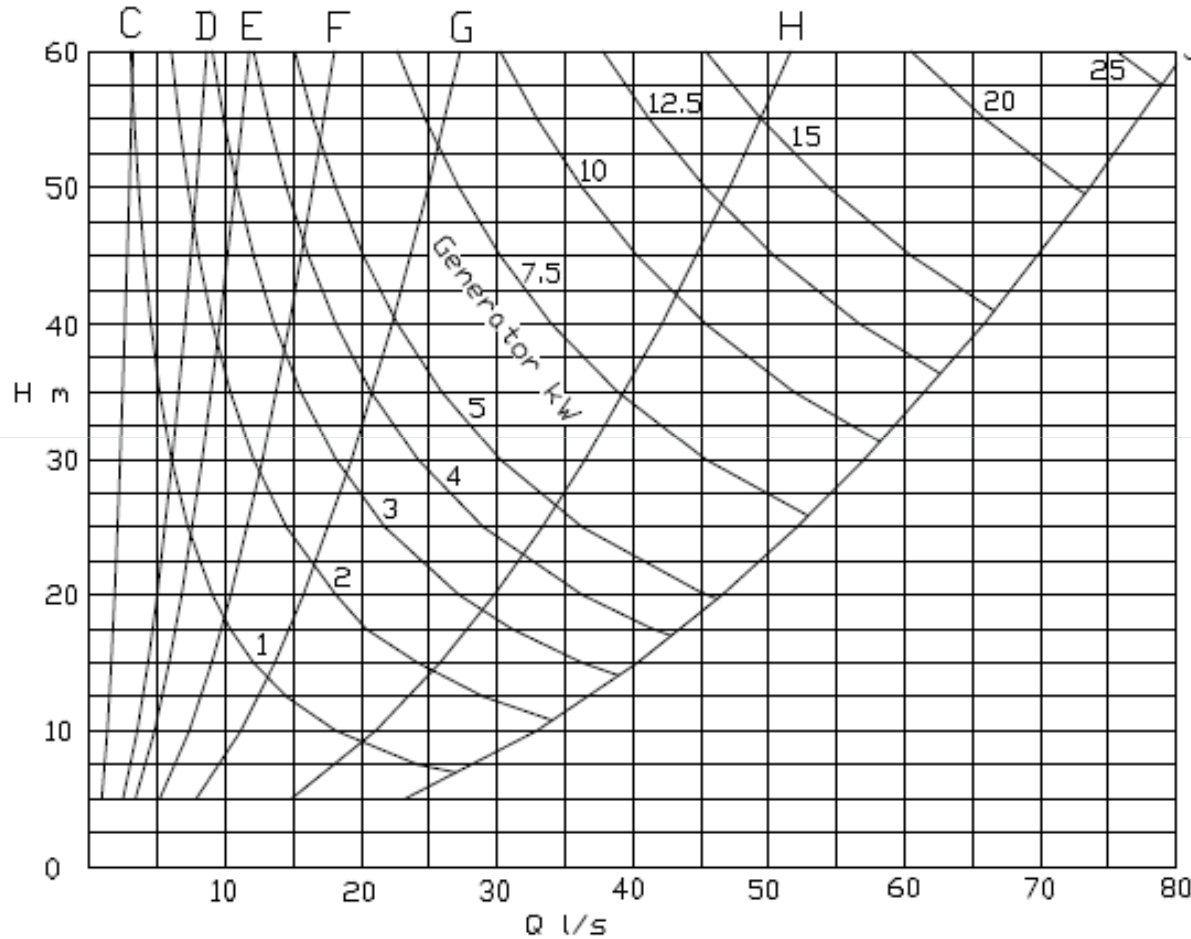
CF315x: Fixed
 Blade Machining Jig: Shaft; 1 off
 Steel
 EXISTING 2.2.1



Flow = 608 l/s
 Net Head = 6.0 m
 Generator Power = 23.0 kW
 Generator Rating = 28.5 kVA
 Power Factor = 0.81

KUVANGO 1
 Angola
 Power Station
 Layout

7



Bucket	Max. Jet dia. mm
B	6.6 not shown
C	11
D	18
E	21
F	26
G	32
H	44
J	55

Single jet Pelton
 Performance Field

Standard is also
 2-jet Pelton,
 doubling flow
 and power

Further Standard is
 two wheels with four jets,
 giving flow and power
 four fold.

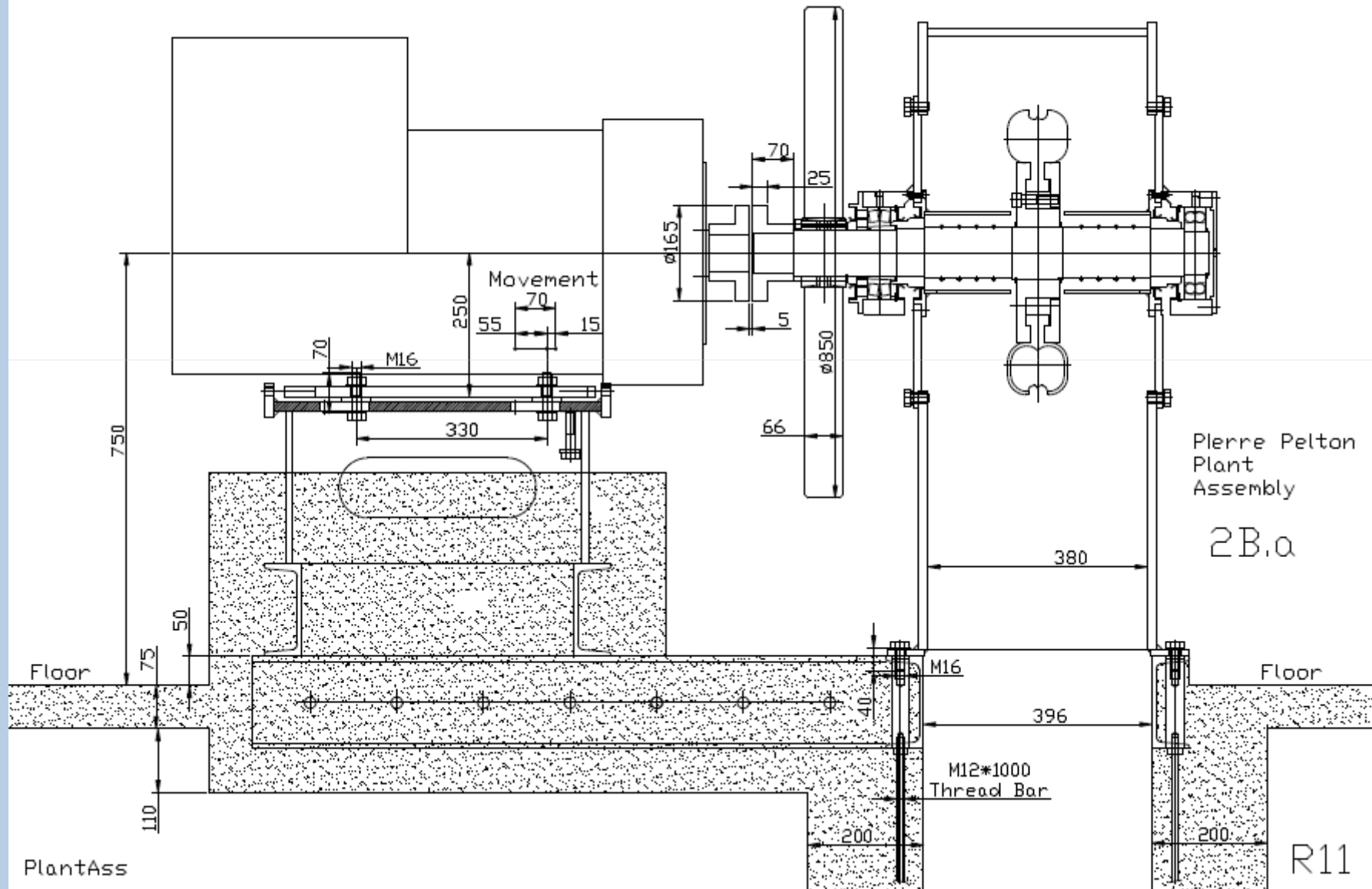
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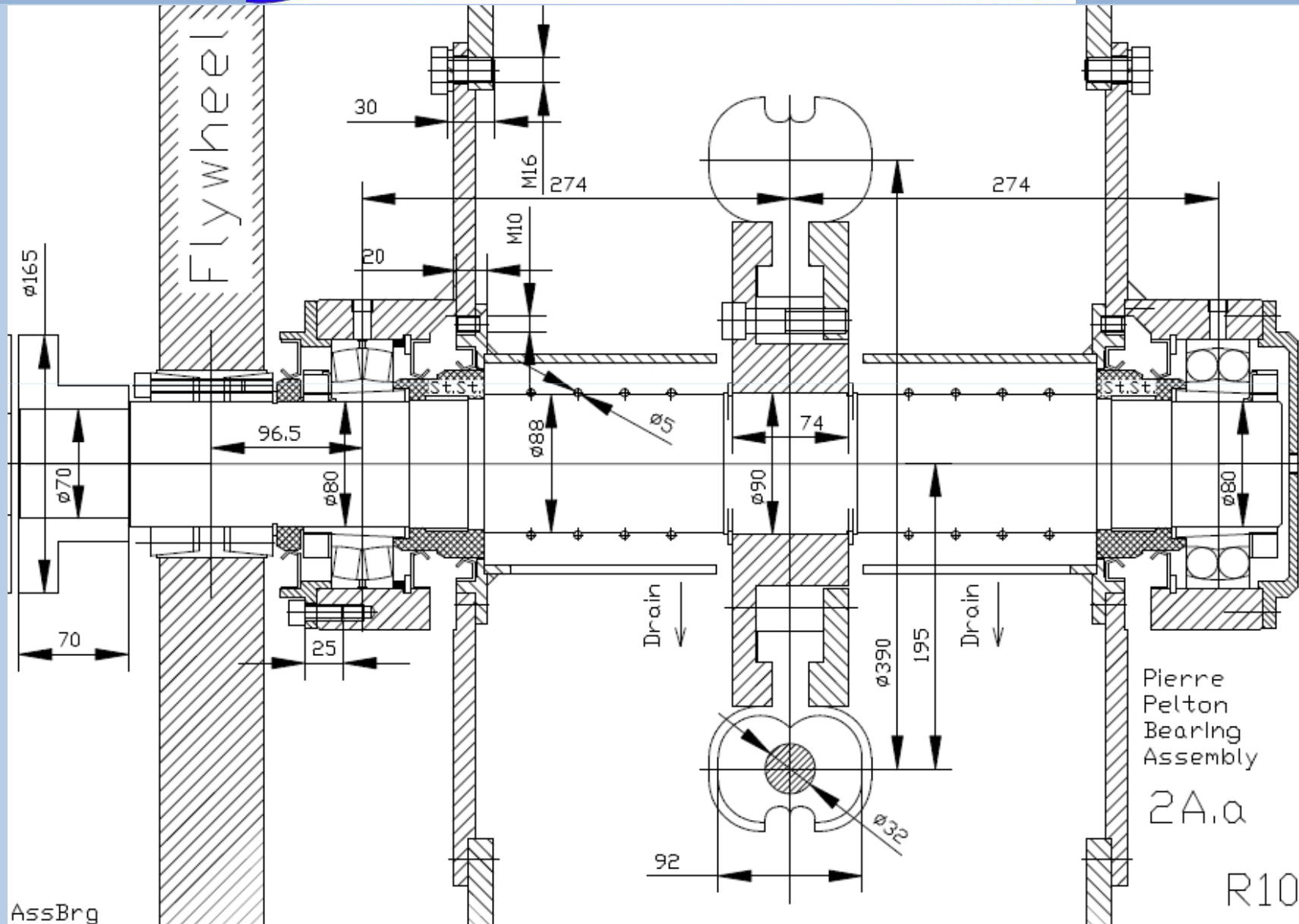


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Compression Spring:

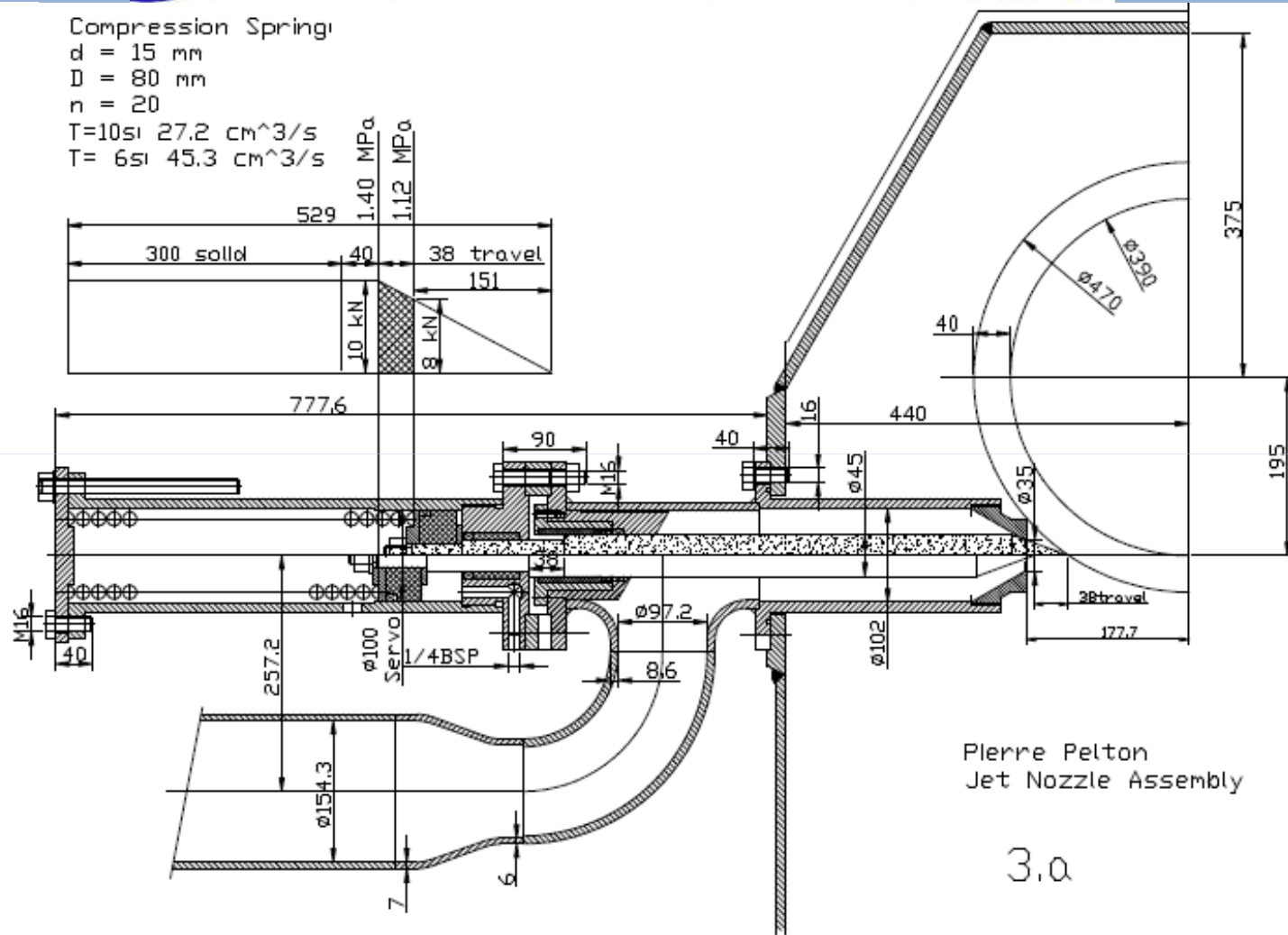
$d = 15 \text{ mm}$

$D = 80 \text{ mm}$

$n = 20$

$T = 10 \text{ si } 27.2 \text{ cm}^3/\text{s}$

$T = 6 \text{ si } 45.3 \text{ cm}^3/\text{s}$



Pierre Pelton
 Jet Nozzle Assembly

3.a

Tel& Fax: +27 (0) 11 391-3741
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Tel& Fax: +27 (0) 11 391-3741
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www.bwghydro.co.za



THANK YOU

Postal Address :

P O Box 6253

BIRCHLEIGH

1621

Republic of South Africa

Telephone & Fax No.

+27 (0)11 391-3741

E-mail : bruno@bwghydro.co.za

Web : www.bwghydro.co.za