APPENDIX - V

MEASURING INSTRUMENTS.

I.E. 510, I.E.520, I.E.560

STRAIN INDICATOR

I. E. 520

INTRODUCTION.

'IE' Strain Indicator is a completely silicon transistorised compact and portable readout instrument designed for stable and dynamic strain measurements by means of strain gauges arranged in quarter, half and full bridge networks. Strain gauges of 120, 300 or 600 ohms resistance can be employed for measurement. The instrument provides highly accurate and reliable readings of static strain value directly on meter, unaffected by any change in supply voltage. Output corresponding to dynamic strain is also available for oscillographic recording and such other purposes.

Using resistance strain gauges bonded to a member under study, strain resulting from stresses of a few pounds/inch^2 (kg/cm^2) upwards can be measured. By bonding strain gauges at suitable places on machines or structures, direct indication can be obtained in units of torque, load, pressure or any other strain producing physical quantity by calibration with known inputs. This instrument has a very wide range of application in the industrial field of mechanical and civil engineering, mining, spinning, ship and aircraft building etc.

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SPECIFICATIONS.

Range : 0 to ± 2000 and ± 1000 microstrains in 4 steps for types 500 and 510 respectively.

Microstrain Switch set at position	Meter dial range MICROSTRAIN	MICROSTRAIN per-scale division.
200/500	0 to ± 200/500	4/10
500/1000	0 to ± 500/1000	10/20
1000/5000	0 to ± 1000/5000	20/100
2000/10000	0 to ± 2000/10000	40/200

Accuracy : ± 1% of full scale or better

Input configurations : 1, 2 and 4 arm strain gauge networks.

Resistance of Strain Gauges : 120, 300 and 600 ohms.

Bridge excitation : Approximately 4.5 volts d.c. stabilised (variable)

Gauge factor adjustment : 2 to 4 continuous.

Indication : 114 mm dial Centre zero rectangular panel meter.

Recorder output : 2.0 millivolts/10 microstrains across 1000 ohms nominal.

Calibration : Internal

Power supply : 230 volts, 50 Hz A.C. mains - Battery operated instrument on request.

Dimension : 35 X 15 X 18 ⌀ cms.

Weight : 5 kgs. nominal.

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CONTROLS

1. BRIDGE Selector (3 position switch SW1) (Ref. fig.1)

   Position 4 : 4 active arms bridge is connected to INPUT terminals 1,2,3,4 and earth

   Position 2 : 2 active arms bridge is connected across input terminals, 1,2,3 and earth

   Position 1 : 1 active arm is connected across the input terminals 2,3 and earth

2. GAUGE RESISTANCE SELECTOR (3 position rotary switch SW2)

   When the switch SW1 is in position 2 or 1, the appropriate internal resistors corresponding to INPUT straingauge resistance can be selected by this switch to complete the bridge.

   Position 120 : The standard resistances of 120 ohms complete the bridge network.

   Position 300 : 300 ohms resistances complete the bridge network.

   Position 600 : 600 ohms resistances complete the bridge network.

3. FUNCTION SELECTOR (Rotary switch SW3 - five position)

   Position Zero : The amplifier input is short circuited. ZERO potentiometer has to be adjusted until the meter reads zero.

   Position G.F. : The lower scale of the meter (marked in green/red) reads the gauge factor. G.F.potentiometer has to be adjusted until the meter reads the required gauge factor.

   Position READ : The amplifier input is connected to the output of bridge. BAL potentiometer has to be adjusted until the meter reads zero and actual microstrains is read on panel.

   Position CAL : The internal calibration resistor is switched across one of the arms of bridge. Adjust CAL potentiometer until the meter reads full scale when G.F. adjusted for 2 and with the MICROSTRAIN switch SW 4 in 200/500.

   Position REC : The meter is cut off and the analogue signal is available across RECORDER terminals.

4. MICROSTRAINS Range Selector (Four position Rotary Switch SW 4)

Position 200/500	The meter reads ± 200/500 microstrains.
Position 500/1000	The meter reads ± 500/1000 k microstrains full scale.
Position 1000/5000	The meter reads ± 1000/5000 microstrains full scale.
Position 2000/10000	The meter reads ± 2000/10000 microstrains full scale.

5. ZERO Potentiometer P3: To be adjusted till the meter reads zero when the FUNCTION switch SW3 is in 'ZERO'.

6. G.F.Potentiometer P1 : To be adjusted till the meter reads the required gauge factor when the FUNCTION switch SW3 is in G.F.

7. BAL Potentiometer P5 : To be adjusted until the meter reads zero when the switches SW1 and SW3 are in appropriate positions and SW3 is in position 'READ' to balance the bridge for inherent unbalance.

8. CAL Potentiometer P4: To be adjusted until the meter reads full scale when G.1. is set at 2 and SW3 is in position CAL and SW4 in 500.

9. INPUT terminals 1,2,3,4 — Strain gauge bridge is to be connected to these terminals (as in fig.1)

10. RECORDER terminals — Analogue output is available across these terminals when the switch SW3 is in 'REC'

11. INDICATING METER (Panel meter M) : Indicates strain in four ranges and gauge factor.

12. MAINS-ON SW5 (Toggle Switch) : To switch 'ON' the instrument.

13. Indicator lamp (jewel lamp L) : Indicates whether the instrument is 'ON' or 'OFF'.

14. Fuse (500mA 250V): The protection fuse is at the rear side of the instrument.

OPERATING INSTRUCTIONS.

1. Observe if the pointer of the meter coincides with zero '0' If not, adjust to zero with screw driver control provided on the meter.
2. Connect the Strain gauge to the bridge INPUT terminals of the instrument. Connections of full, half or quarter bridge to be made as in fig. 1. The ground wire or shield of the connecting cable to be connected to Ground terminal marked
3. Turn the 'BRIDGE' switch to appropriate position depending on bridge configuration connected to INPUT terminals.

   for full bridge position 4
   for half bridge position 2
   for quarter bridge position 1
4. Turn the 'GAUGE RES' switch to the resistance of the strain gauge used.
5. Turn the 'FUNCTION' Switch to zero and 'MICROSTRAIN' Switch to '500'.
6. Plug the Mains cord to the 230 volts a.c. supply and switch ON the instrument (Green wire in power cord to be earthed separately if two pin plug is used).
7. Adjust the 'ZERO' potentiometer such that the meter reads zero. Allow the instrument to warm up for ten minutes.
8. Readjust the 'ZERO' for zero in the meter if it is changed.
9. Turn the 'FUNCTION' switch to 'G.F.'. Adjust 'G.F.' potentiometer until the meter reads 2 in lower scale (marked in black which is equivalent to 4.5 volts bridge excitation voltage)

10. Turn the 'FUNCTION' switch to 'READ'. Adjust 'BAL' Potentiometer until the meter reads zero.
11. Turn the 'FUNCTION' switch to 'CAL'. Adjust 'CAL' potentiometer R until the meter reads full scale.
12. Turn the 'FUNCTION' switch SW3 to 'READ'. Now the instrument is calibrated to read strain values with strain gauge of gauge factor 2 as follows.

200/500 microstrains	in position 200/500 of SW4
500/1000 microstrains	in position 500/1000 of SW4
1000/5000 microstrains	in position 1000/5000 of SW4
2000/10000 microstrains	in position 2000/10000 of SW4.

13. For other gauge factors, turn 'FUNCTION' switch SW3 to G.F. and adjust the G.F.potentiometer until the meter needle reads the required gauge factor between 2 and 4 in the lower scale.
14. Turn the 'FUNCTION' switch to 'READ'. Now the instrument is calibrated to read strain values using the strain gauges of the set gauge factor.
15. If recording oscillograph or oscilloscope is to be used, connect them to the output terminals T1, T2, RECORD and turn the 'FUNCTION' switch to position REC.

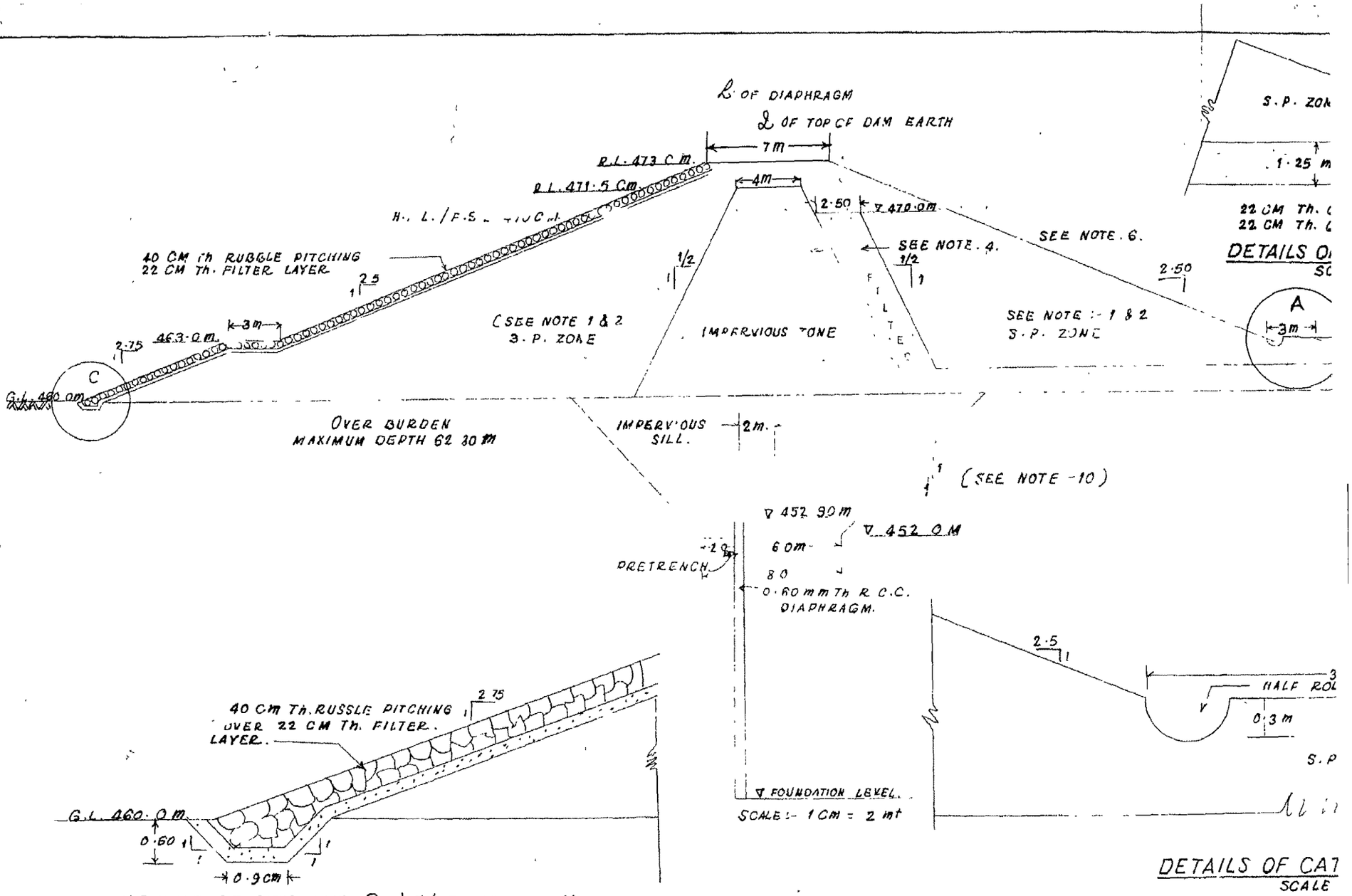
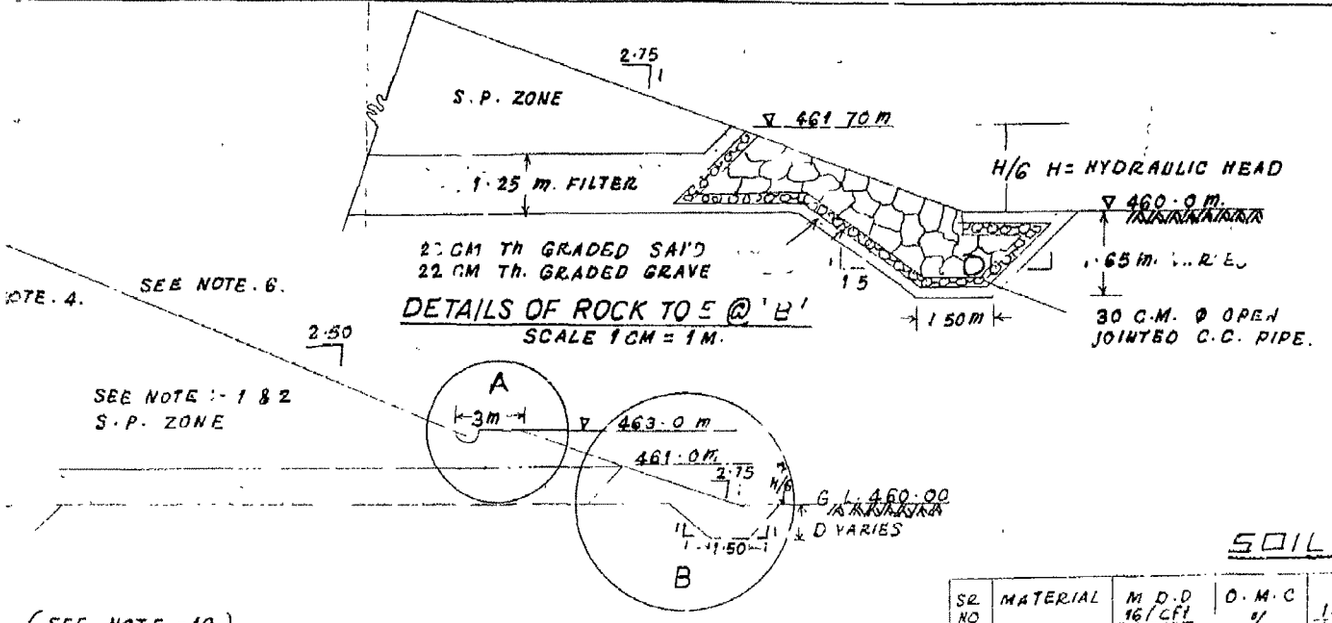

℄ OF DIAPHRAGM
℄ OF TOP OF DAM EARTH
7m
R.L. 473 C m.
R.L. 471·5 Cm.
H. L./F.S. +1.0 C.m.
4m
2·50
▽ 470·0m
SEE NOTE. 4.
SEE NOTE. 6.
40 CM th RUBBLE PITCHING
22 CM Th. FILTER LAYER
2·5
1
1/2
1/2
1
2·50
3m
2·75
463·0 m.
C
G.L. 460 0m
(SEE NOTE 1 & 2
S.P. ZONE
IMPERVIOUS ZONE
FILTER
SEE NOTE :- 1 & 2
S.P. ZONE
A
OVER BURDEN
MAXIMUM DEPTH 62 30 m
IMPERV'OUS
SILL.
2m.
(SEE NOTE -10)
▽ 452 90 m
▽ 452 0 M
6 0m
2 0
8 0
DRETRENCH
0·60 m m Th R C.C.
DIAPHRAGM.
▽ FOUNDATION LEVEL.
SCALE :- 1 CM = 2 mt
S.P. ZON
1·25 m
22 CM Th.
22 CM Th.
DETAILS O
SC
2·5
1
3
HALF ROU
0·3 m
S.P
40 Cm Th. RUSSLE PITCHING
OVER 22 CM Th. FILTER.
LAYER.
2 75
1
G.L. 460·0 m
0·60
1
1
1
0·9cm
DETAILS OF PITCHING @ 'C' SCALE 1 CM = 1/2 CM
DETAILS OF CAT
SCALE

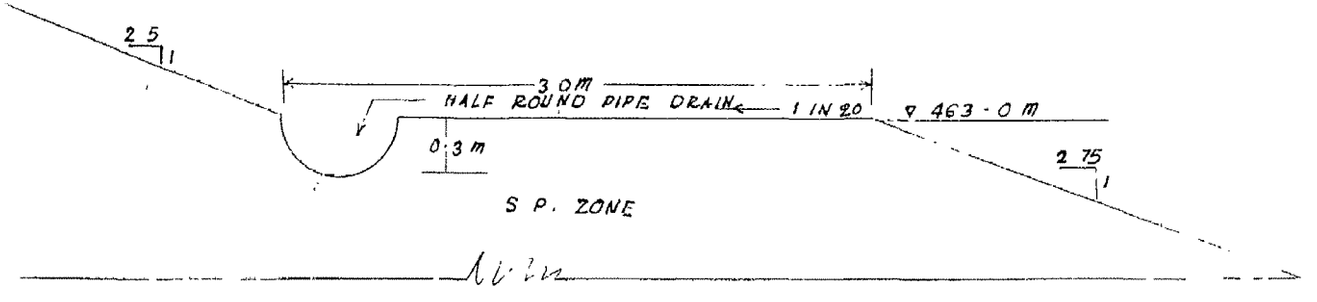
PLATE NO. 1



DETAILS OF ROCK TOE @ 'B'
SCALE 1 CM = 1 M.

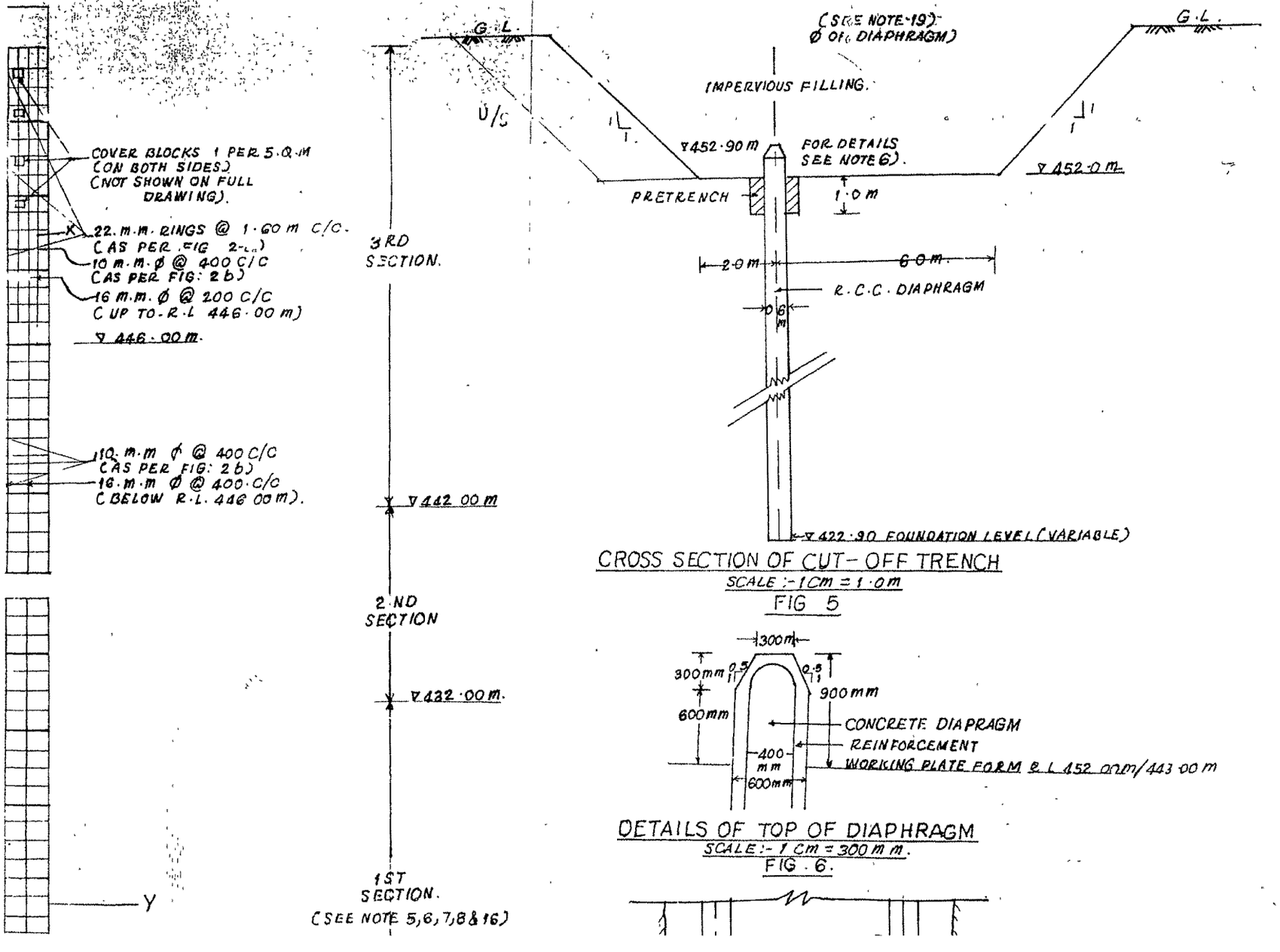
SOIL CONSTANTS.

SR. NO	MATERIAL	M.D.D gm/cft / kg/m3	O.M.C %	C lb/sft / kg/m2	Ø° / TAN Ø	SATURATED WT kg/m3	SUBMERGED WT kg/m3	MOIST WT. kg/m3
1	IMPERVIOUS	102.0 / 1634.0	17.0	190 / 9.27	18 / 0.325	2021	1021	1910
2	SEMI PERVIOUS	117.0 / 1874.0	14.0	0	30 / 0.577	2171	1171	2136
3	FILTER	100.0 / 1602.0	6.0	0	35 / 0.70	2002	1002	1698
4	FOUNDATION	107.0 / 1715.0	8.0	0	31 / 0.60	2008	1068	1852



DETAILS OF CATCH WATER DRAIN @ 'A'
SCALE 1 CM = 0.25 m

PLATE NO. 3



CROSS SECTION OF CUT-OFF TRENCH

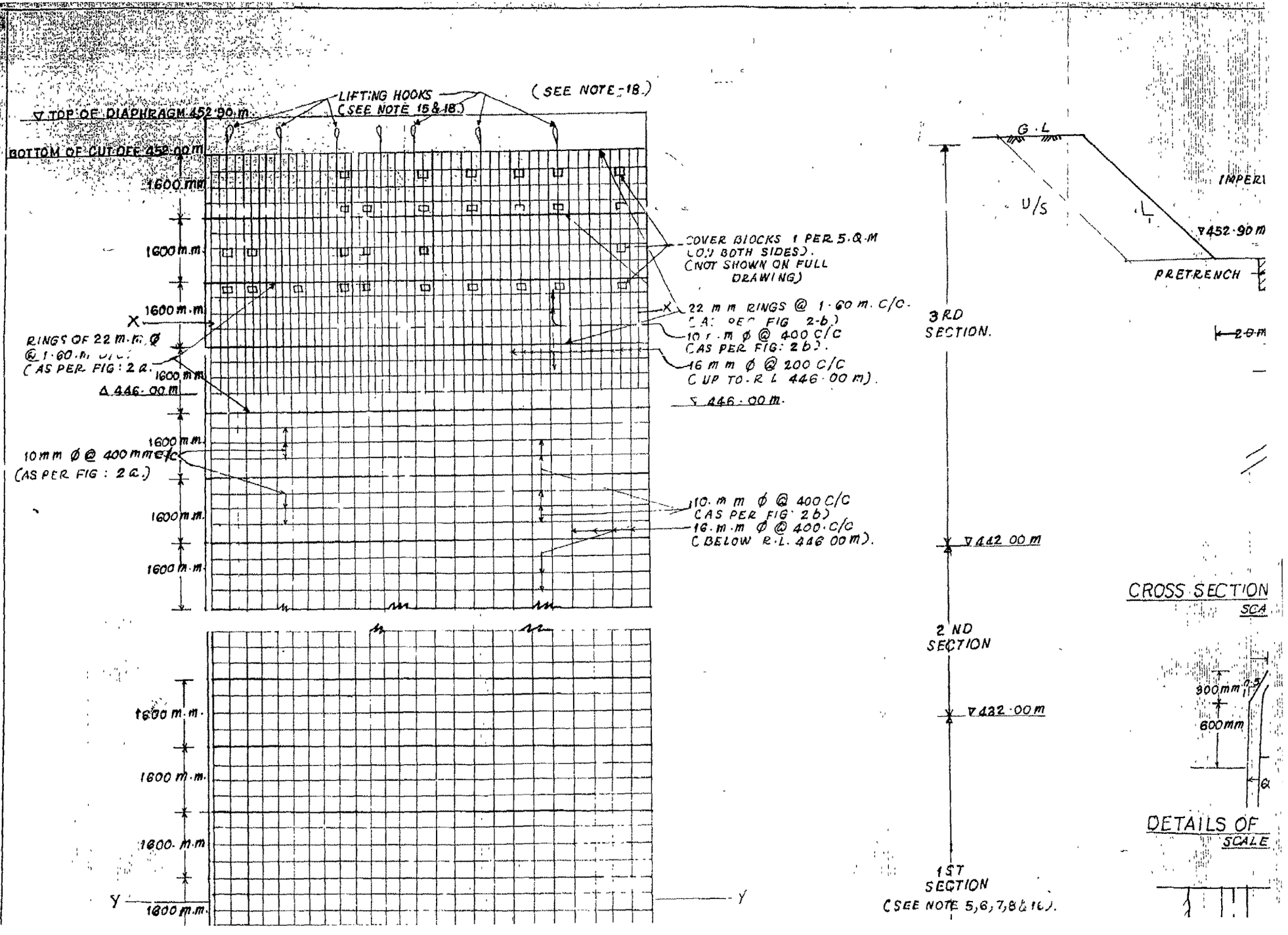
SCALE :- 1 Cm = 1.0 m

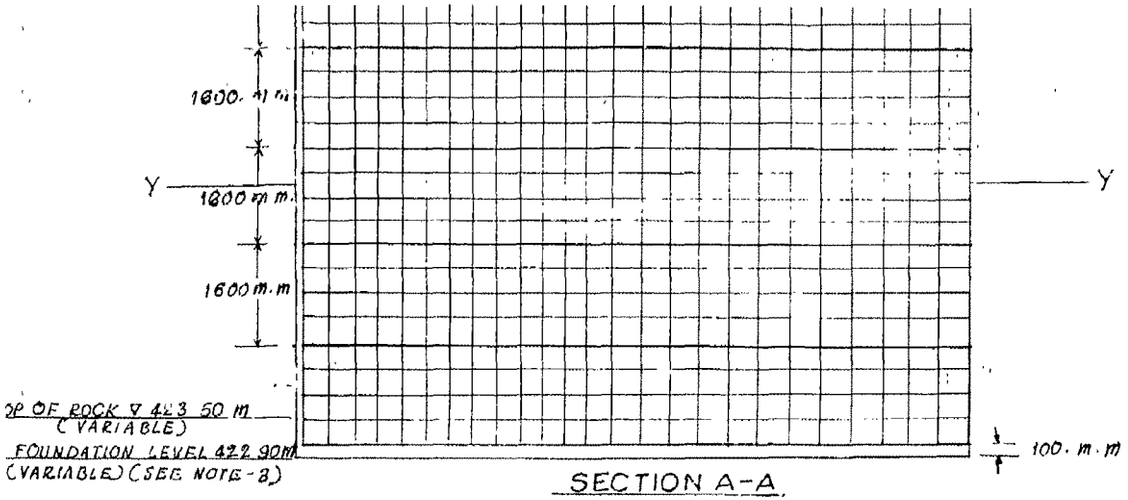
FIG 5

DETAILS OF TOP OF DIAPHRAGM

SCALE :- 1 Cm = 300 m m.

FIG. 6.


LIFTING HOOKS (SEE NOTE 15 & 18.)
(SEE NOTE-18.)
▽ TOP OF DIAPHRAGM 452.90 m.
BOTTOM OF CUT OFF 452.00 m
1600 m.m.
1600 m.m.
1600 m.m.
X
RINGS OF 22 m.m. Ø @ 1.60 m. C/C (AS PER FIG: 2 a.)
1600 m.m.
△ 446.00 m.
1600 m.m.
10 m m Ø @ 400 mm c/c (AS PER FIG : 2 a.)
1600 m.m.
1600 m.m.
COVER BLOCKS 1 PER 5.0 M (ON BOTH SIDES). (NOT SHOWN ON FULL DRAWING)
22 m m RINGS @ 1.60 m. C/C (AS PER FIG 2-b)
10 m.m Ø @ 400 C/C (AS PER FIG: 2 b).
16 m m Ø @ 200 C/C (UP TO R.L 446.00 m).
▽ 446.00 m.
10 m m Ø @ 400 C/C (AS PER FIG 2 b)
16 m.m Ø @ 400 C/C (BELOW R.L. 446.00 m).
1600 m.m.
1600 m.m.
1600 m.m.
Y
1600 m.m.
Y
G.L
U/S
D/S
IMPERI
▽ 452.90 m
PRETRENCH
3RD SECTION.
2.0 m
▽ 442.00 m
2 ND SECTION
▽ 432.00 m
1ST SECTION
(SEE NOTE 5,6,7,8 & 16).
CROSS SECTION
SCA
300 mm
600 mm
DETAILS OF
SCALE



SECTION A-A

FIG: 1 (SEE NOTE :- 1, 2, 9, 10, 11)

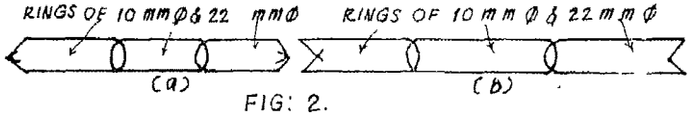
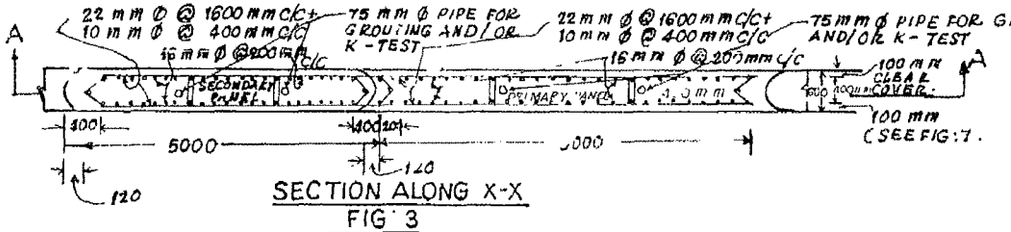
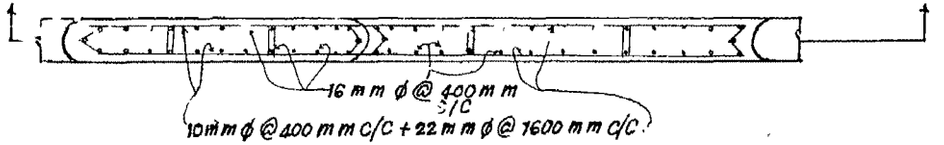


FIG: 2.



SECTION ALONG X-X

FIG 3

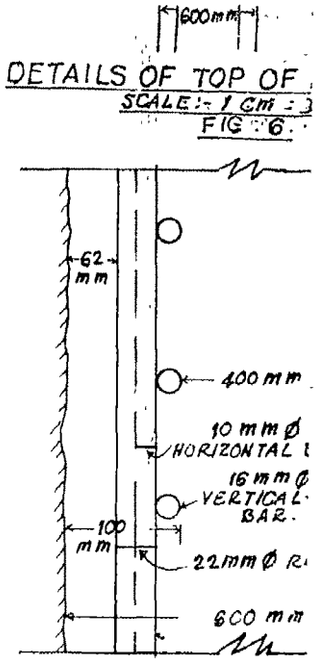


SECTION ALONG Y-Y

FIG: 4

Reinforcement details for Panels / SCALE :- 1Cm : 800m.m.

(SEE NOTE 5, 6, 7, 8 & 16)



DETAILS OF TOP OF

SCALE :- 1 Cm :

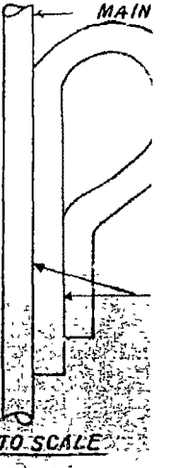
FIG: 6.

(NOT TO SC

PLAN SHOWING THE

REINFORCEM

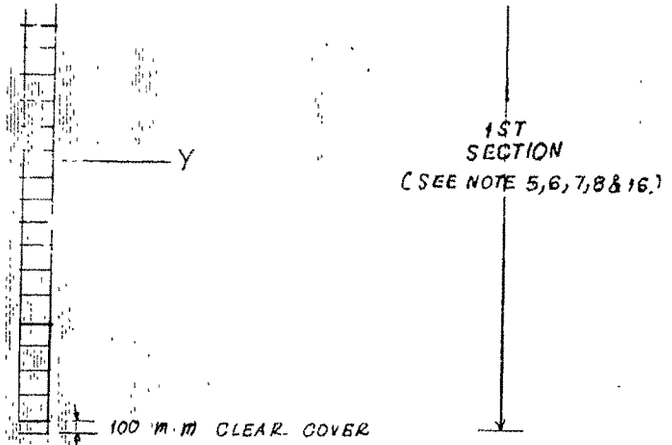
FIG:



NOT TO SCALE

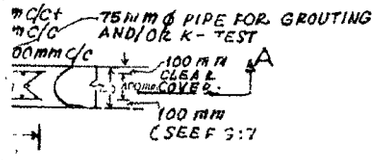
LIFTING HOOK

FIG: 8

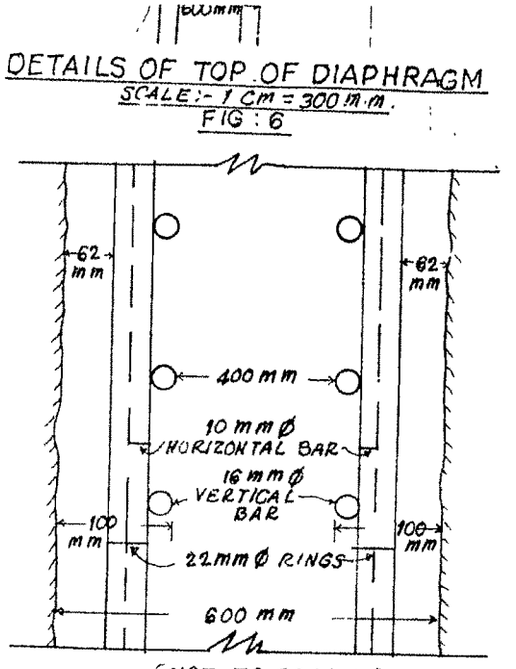


1ST SECTION
(SEE NOTE 5,6,7,8 & 16.)

,10,11)

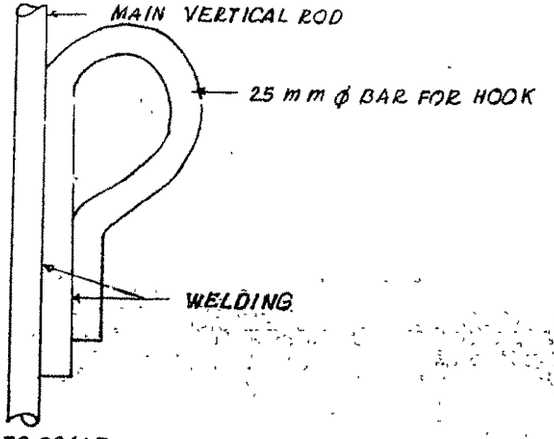


Cm. 800m.m.

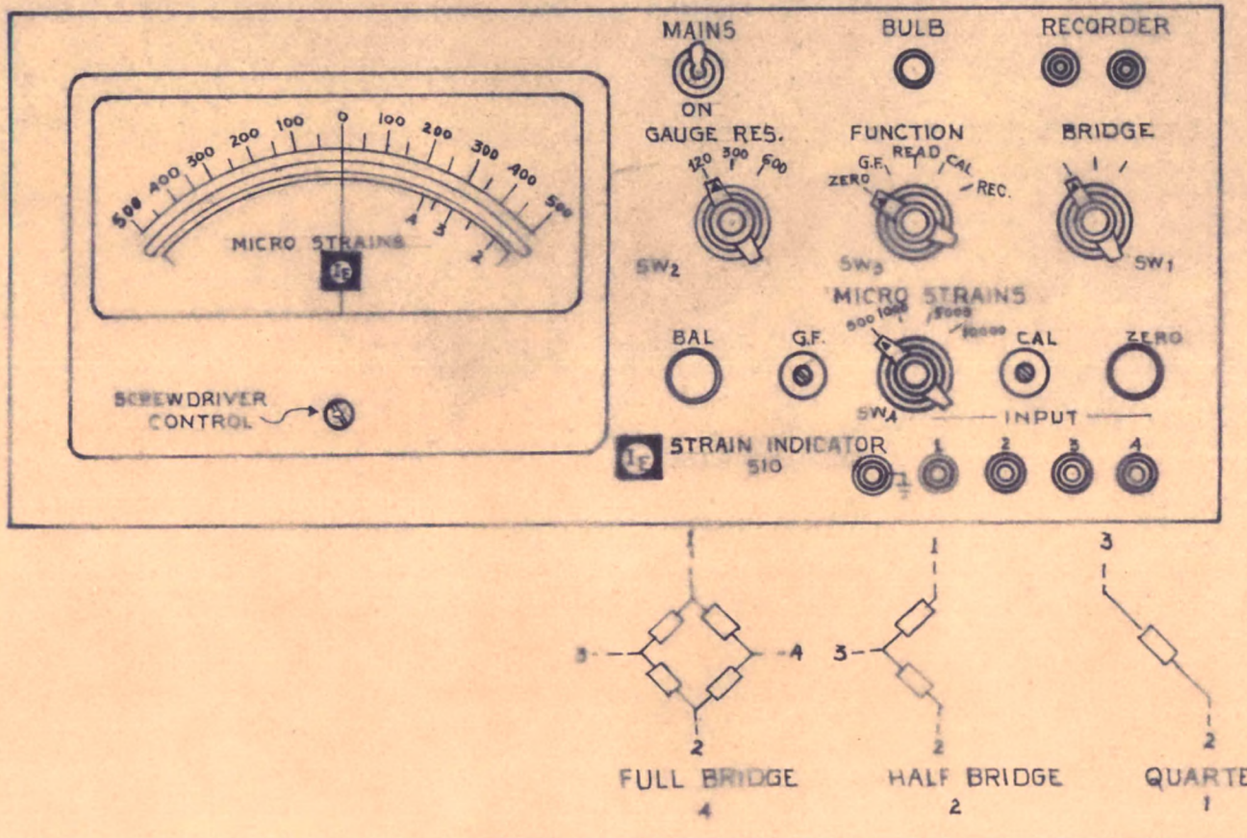


DETAILS OF TOP OF DIAPHRAGM
SCALE:- 1 Cm = 300 m.m.
FIG : 6

(NOT TO SCALE.)
PLAN SHOWING THE COVER FOR REINFORCEMENT STEEL
FIG: 7



NOT TO SCALE
LIFTING HOOK
FIG: 8



I.E.510 FRONT PANELLAY OUT

FIG.: A-2.

DIGITAL STRAIN INDICATOR

TYPE - 520.

DIGITAL STRAIN INDICATOR

TYPE - 520

INTRODUCTION :-

Digital Strain Indicator Type 520 has many significant new features which make it one of the most practical strain Indicators available. A. F. Generator excites the Strain gauge and drives the phase demodulator circuit.

Designed for simple, fast and dependable operation, the type 520 may be used with most commercially available strain gauges in 1, 2 or 4 arm networks. It also provides direct indication of measured variables when used with transducers having bonded or unbonded strain gauges. The digital read out on the calibrated ten turn dial and a step switch eliminates interpolation and parallex errors. Recorder terminals are provided for low level dynamic strain recording or observation. Wider gauge factor and gauge resistance ranges, printed circuits with all silicon transistors, portability and highly stable power supply improve performance, simplify operation and assure long trouble free service. The instrument operates on 230 Volts 50 H_z., Single Phase A.C.

Using resistance strain gauges bonded to a member under study, strain resulting from stresses of a few pounds/inch^2 (Kg./Cm^2) upwards can be measured. By bonding strain gauges at suitable places

on machines or structures, direct indication can be obtained in units~~x~~ or torque, load, pressure or any other strain producting physical quantity by calibration with known inputs. This instrument has a very wide range of application in the Industrial field of Mechanical & Civil Engineering, Mining, Spinning, Ship and Aircraft building etc.

SPECIFICATIONS

Total Indicator Range	-	± 5,000 microstrains or 10,000 microstrains.
Accuracy	-	± 1% of fullscale division
Readibility	-	Less than 2 microstrains
Linearity	-	± 1%
Input	-	1, 2 or 4 arm strain gauge network.
Input terminals	-	Colour coded terminals.
Gauge factor range	-	2 to 4
Gauge resistance range	-	120 ohms, 300 ohms and 600 ohms.
Calibration	-	Internal
Recorder terminasl	-	Dynamic strain range) ± 100 microstrains) ± 1%
	-	Linearity - ± 1% full range
	-	Output - ± 15mV across 1000 ohms for 100 microns.
		Frequency response) - D.C. to 200 Hz.
Bridge excitation	-	2 Volts, 1000 Hz (nominal)
Power Supply	-	230 Volts 50 Hz. ± 10% A.C.MAINS

C O N T R O L S

1. 'BRIDGE' Selector (3 position Rotary Switch SW1)

   Position '4' - 4 active arms bridge is connected to INPUT terminals 1,2,3,4 and earth.

   Position '2' - 2 active arms bridge is connected to INPUT terminals 1,2,3 and earth.

   Position '1' - 1 active arm bridge is connected to INPUT terminals 2,3, and earth.

2. 'GAUGE RES' Selector (3 position Rotary Switch SW2) - to be set to the proper Gauge Resistance Position when operating on 2 or 1 arm bridge configuration.

   Position '120' - Precision 120 ohms Resistors complete the bridge network.

   Position '300' - Precision 300 ohms Resistors completes the bridge network.

   Position '600' - Precision 600 ohms Resistors complete the bridge network.

3. 'FUNCTION' Selector (4 position Rotary Switch SW3)

   Position 'BAL' - Meter reading is adjusted to miniumm when no strain is applied on the bridge by using C-BAL control.

   Position 'READ' - Meter reading is adjusted to zero by using R-BAL control.

Position 'CAL' - The internal calibration Resistor (equivalent to 100 microstrains at G.F.2) is switched across one of the arms of bridge so that the meter reads for 100 microstrains

Position 'REC' - The meter is cut off to obtain analogue output at the recorder terminals for Oscillograph etc.

MICROSTRAINS: (ten turn potentiometer) : The meter reading is adjusted to m zero when position of FUNCTION Switch is in READ after applying the Strain on the bridge.

MICROSTRAINS x 1000 (11 position Rotary Switch SW4): Graduated from 0 to 10. Compensating signal equivalent to 0 to 10 x 10^3 Microstrains is generated in steps of 1000 Microstrains.

C - BAL : Meter reading is adjusted to minimum when FUNCTION Switch is in position 'BAL' and no strain is applied on the bridge.

R - BAL (Potentiometer) : Meter reading is adjusted to zero using this control with the FUNCTION switch in position READ when no strain is applied on the bridge.

'INPUT' Terminals (1,2,3,4 and earth) : Strain gauge bridge is to be connected to these terminals.

'RECORDER' Terminals (Analogue output is available across these terminals when FUNCTION Switch is in position REC.

MAINS/ON (Toggle Switch SW5): To switch on the instrument.

Neon Lamp : Indicates whether the instrument is ON/OFF.

FUSE (500 ma 250V) : Provided at the rear panel for protection of the instrument.

REAR PANEL

1. Bridge 'SEL' : (3 position rotary switches)
2. Gauge RES SEL : (3 position rotary switch)
3. 'INPUT' (Terminals) : 1,2,3,4.
4. 'RECORDER' (Terminal) : Analogue output.
5. FUSE (500 ma 230V) provided for the pretection of the instrument.

OPERATION.

1. Adjust the Mechanical Zero of the meter by operating the Screw Driver control provided on the meter.

2. Connect the Strain gauge bridge to the INPUT terminals as shown in Fig.1(b). The shield of the Bridge cable should be connected to the terminal marked.

3. Turn the 'BRIDGE SEL' switch to the appropriate position depending on the Bridge configuration.

   For 4 arm (full) bridge - Position 4
   For 2 arm (half) bridge - Position 2
   For 1 arm (Quarter) bridge-Position 1

4. (In position 2 and 1, precision standard Resistors inside the instrument provide rest of the arms of the bridge.)

5. Turn the 'GAUGE' RES' Switch to the resistance of the strain gauge used.

6. Set the G.F.Potentiometer to read 0. This corresponds to a GF of 2. (look to the table provided for other G.P.settings).

7. Plug the Mains cord to 230 V 50 Hz Single phase A.C.Mains and Switch ON the instrument by operating MAINS/ON Switch. (Green wire of the power cord should be earthed separately, if a 2 pin plug is used).

8. Slide the Function Switch to BAL and MICROSTRAINS x 1000 switch to position 5 and MICROSTRAINS Dial to position 550.

9. Adjust C-BAL and R-BAL simultaneously until the meter reads towards zero.

10. Slide the Function switch to position READ and adjust R-BAL until the meter reads zero.

11. Slide the FUNCTION switch to BAL and readjust C-BAL until the meter reads towards zero.

12. Slide the FUNCTION switch to position READ and adjust R-BAL until the meter reads zero. (10 and 11 should be repeated until minimum possible reading in meter is achieved when FUNCTION switch is at BAL). Note down the reading on MICROSTRAINS x 1000 switch and MICROSTRAINS Dial which is 5500 micfostrains.

13. Slide the Function switch to CAL. Now the meter reads corresponding to 100 microstrains. Adjust the MICROSTRAIN dial until the

meter reads zero. Note down the dial reading. The difference between the readings taken in 12 and 13 should read 100 micro-strains within the adcuracy claimed.

14. Adjust the G.F.Potentiometer to the required value.

15. Slidet the Function Switch to READ and adjust R-BAL until the meter reads zero. Read the initial value on the dial which is 5500 micro-strains. Now the instrument is ready for measuring microstrain values.

On application of strain to the strain gauge bridge the resultant output voltage will be in phase with strain in compression or tension and hence the meter pointer deflects to one side. Balance out this voltage until the meter reads zero by MICROSTRAIN Dial and MICROSTRAIN x 1000 Switch. Read the final reading of the MICROSTRAIN Dial and MICROSTRAIN x 1000 switch.

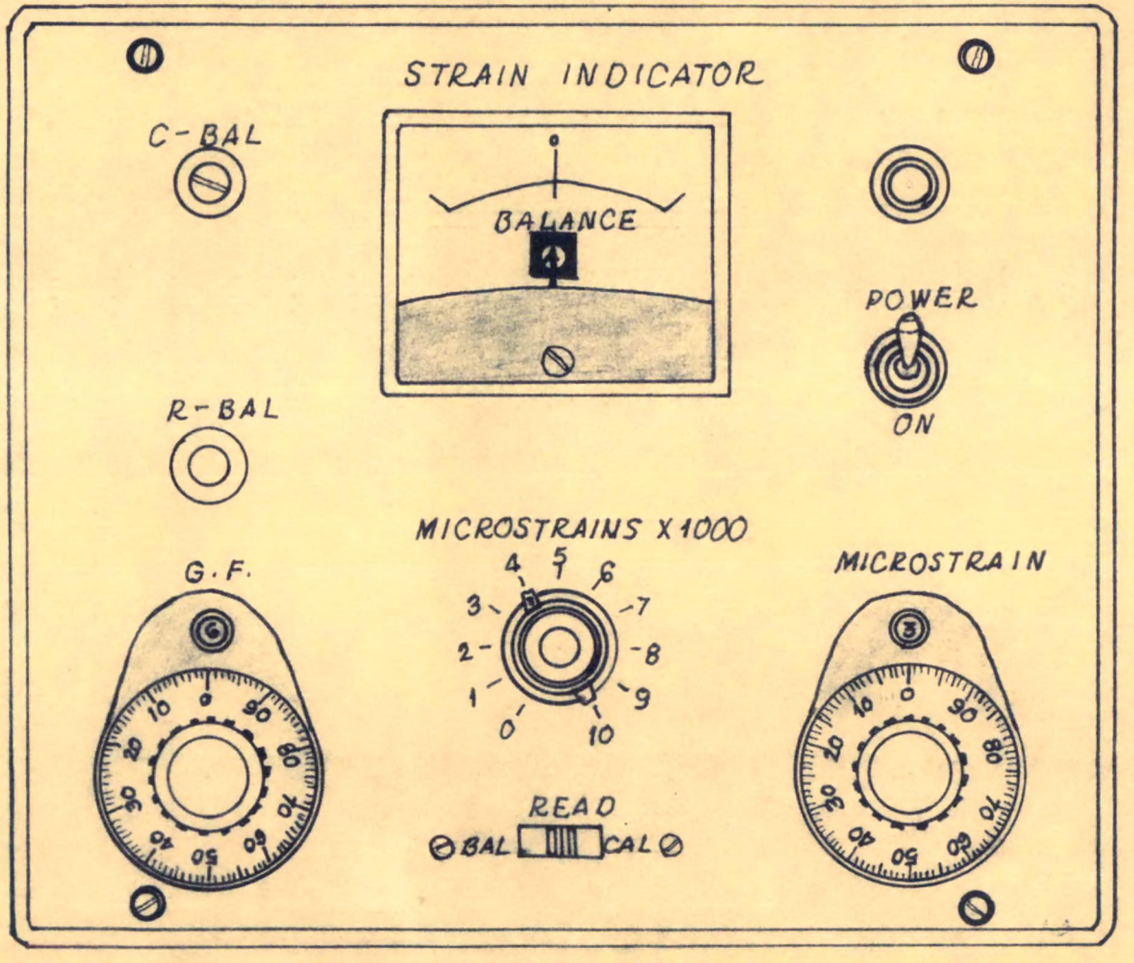
The strain produced is the difference between initial and final reading of the MICROSTRAIN dial and MICROSTRAIN x 1000 switch.

NOTE : While using Quarter bridge, the temperature effects may appear, since there is no external compensating Strain gauge and hence the stability of the readings depends on the strain gauge used.

If the strain to be measured is more than 4500 Microstrains the dial reading can be set at any convenient value so that the measurement can be made accurately and the R-BAL has to be adjusted correspondingly.

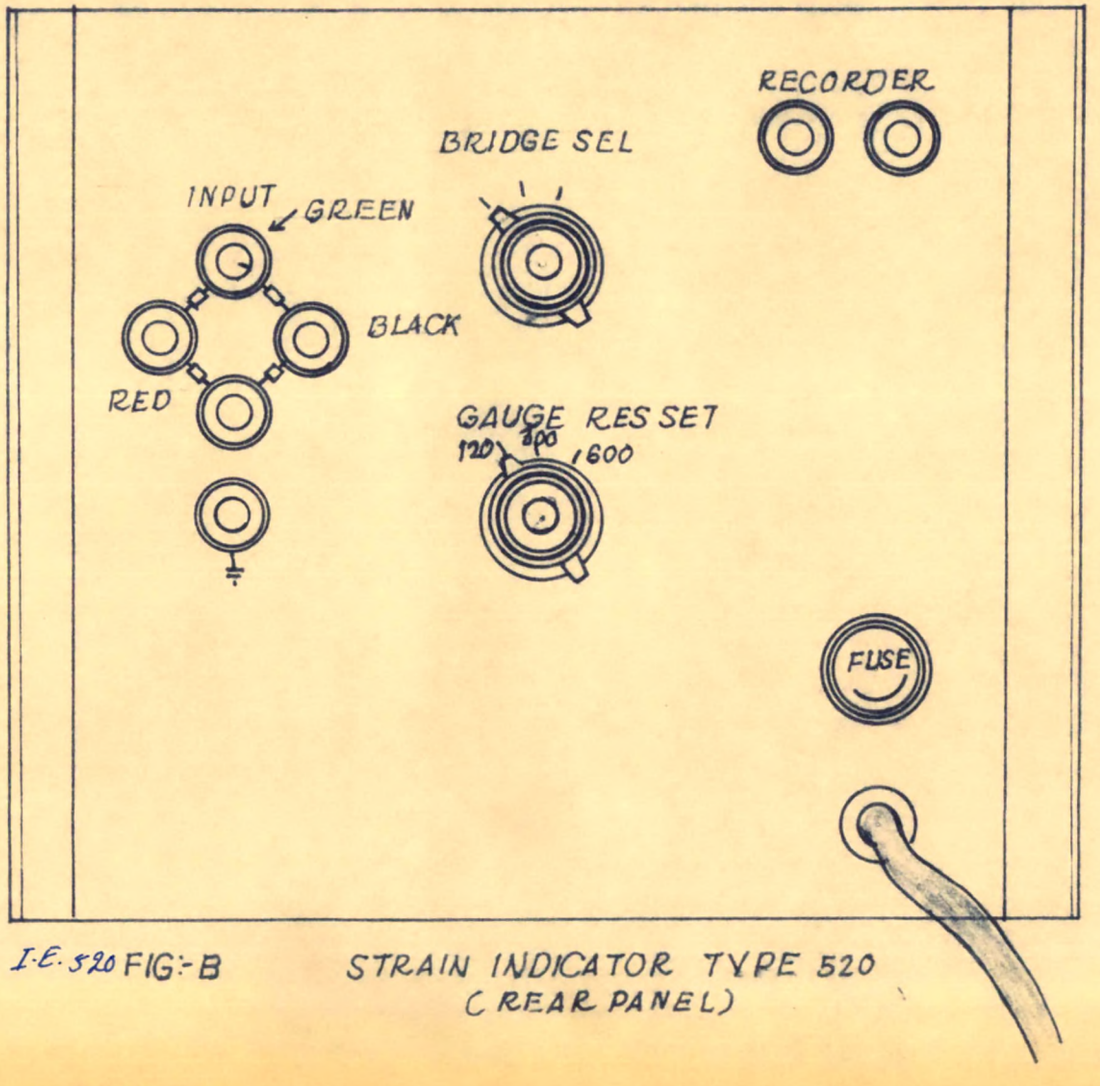
G. F.		Potentiometer Setting.
2.0	...	000
2.1	...	050
2.2	...	100
2.3	...	150
2.4	...	200
2.5	...	250
2.6	...	300
2.7	...	350
2.8	...	400
2.9	...	450
3.0	...	500
3.1	...	550
3.2	...	600
3.3	...	650
3.4	...	700
3.5	...	750
3.6	...	800
3.7	...	850
3.8	...	900
3.9	...	950
4.0	...	1000

Release.



FRONT PANEL.

I.E.520 FIG:-A



I.E. 520 FIG:- B

STRAIN INDICATOR TYPE 520
(REAR PANEL)

TEN CHANNEL SWITCHING BALANCING AND CALIBRATION UNIT TYPE-560

THE CHANNEL SWITCHING BALANCING AND CALIBRATION UNIT

TYPE - 560.

INTRODUCTION.

Type 560 Ten Channel Switching and Balancing Unit provides manual switching and balancing for both resistance and capacitance of Strain gauge bridge networks. The Unit is used where several readings must be taken on each group of strain gauge bridge networks and where the time factor is important because of economy, availability of testing facilities, ambient temperature variation and creep. The Type 560 Ten channel switching and balancing unit is used with "IE" Digital Strain Indicator Type 520. The output from each bridge is brought to a common terminal through a 10 way rotary switch which selects each channel at a time.

The primary advantages of this Instrument are the high repeatability due to low switch contact resistance, Individual gauge bridge balancing, provision for full and half bridge configurations, accommodation for various gauge resistance.

SPECIFICATIONS

Input	: 2 and 4 arm Strain gauges or Strain gauge Transducers.
Number of channels	: Ten
Gauge Resistance	: 120, 300, 600 ohms.
Gauge factor	: Any gauge that the Strain measuring bridge can handle.

Dimension : 550 x 250 x 150 mm

Power requirement : Unit is entirely passive.

C O N T R O L S.

I. FRONT PANEL:-

1. CHANNEL SELECTOR (11 position Rotary Switch SW1)

   Position 'OFF' - The 'OUTPUT' socket is connected to the binding terminals A, B, C and D on the rear panel.

   Position '1 to 10'- The 'OUTPUT' socket is connected to the selected bridge through the selected socket on the rear panel.

2. 'OUTPUT' (8 pin socket) The Strain Indicator is connected to this socket. The excitation Voltage is fed through inlets ONE and TWO. And the output of the selected bridge is connected to the Strain Indicator through inlets THREE and FOUR.

3. 'R-BALANCE' (10 Nos. Ten turn Potentiometers R1 to R10)
   These are provided to correct the inherent unbalance in the bridges connected. To be adjusted until the meter on the Strain Indicator reads 'Zero' when the 'FUNCTION' switch of the Strain Indicator is in position 'READ'.

4. 'C-BALANCE' (10 Nos. Single turn Potentiometers R11 to R20) - These are provided to compensate for the capacitance unbalance in the bridges connected. To be adjusted until the meter on the Strain Indicator reads towards zero when the 'FUNCTION' switch of the Strain Indicator is in position 'BAL'.

II. REAR PANEL:-

1. 'INPUT' (10 Nos. 8 pin sockets) - These are provided to connect Strain gauge bridge networks to the unit. The Strain gauge bridges are to be connected to the free end of cables supplied as shown in the diagram 3 and plugged in to the sockets.

O P E R A T I O N.

1. Set the Strain Indicator type 520 independently using a strain gauge bridge until operation 14 of the Strain Indicator type 520.
2. Connect the Strain gauge bridges to the free end of input cables as shown in figure 2a or 2b.
3. Plug the input cables to the 'INPUT' Sockets by using the connectors provided.
4. Keep the Strain Indicator OFF and remove the bridge connected to the Strain Indicator without disturbing other controls.
5. Connect the output cable to the Strain Indicator terminals as in fig.20 and plug the other end of the cable to the 'OUTPUT' socket.

6. Select the channel required by operating the 'CHANNEL SELECTOR' switch SW1.

7. Set '4 - 2' toggle switch SW2 in the appropriate position depending on the strain gauge network selected by the 'CHANNEL SELECTOR' Switch SW1.

8. Put 'ON' the Strain Indicator and keep the 'BRIDGE' switch in position '4'.

9. Adjust 'R-BALANCE' and C-BALANCE' potentiometers of the channel selected until the meter reads towards zero keeping the 'FUNCTION' switch of Strain Indicator at position 'BAL'.

10. Adjust 'R-BALANCE' potentiometer of the channel selected until the meter reads zero keeping the 'FUNCTION' switch of Strain Indicator at position 'READ'.

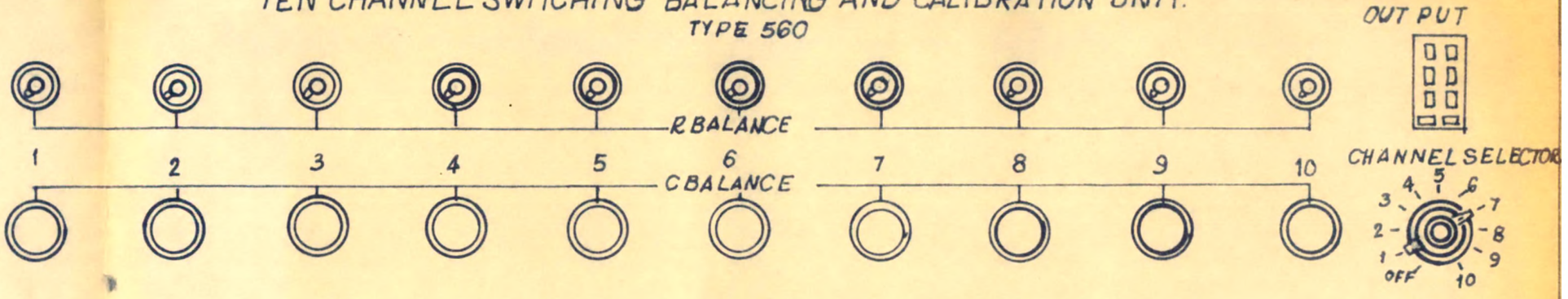
11. Repeat operation 9 and 10 at least two times to get a minimum reading of the meter when the 'FUNCTION' switch of the Strain Indicator is in position 'BAL'.

12. Set the 'FUNCTION' switch of the Strain Indicator to position 'READ' and adjust 'R-BALANCE' for the meter to read zero. Now the channel is ready for measurement.

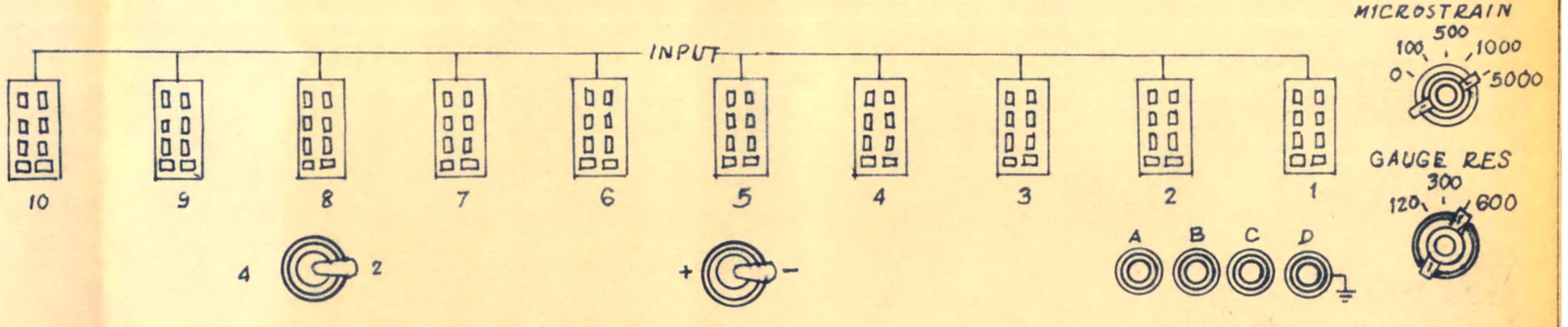
Note: The A, B, C, D terminals provided on the rear panel of the instrument is to be used only to couple another Ten Channel unit and not for other purposes.

TEN CHANNEL SWITCHING BALANCING AND CALIBRATION UNIT.

TYPE 560



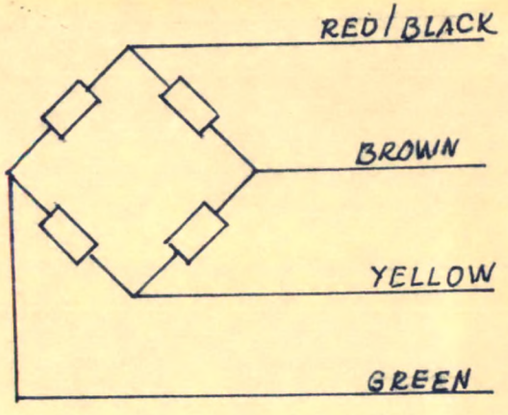
FRONT PANEL



REAR PANEL

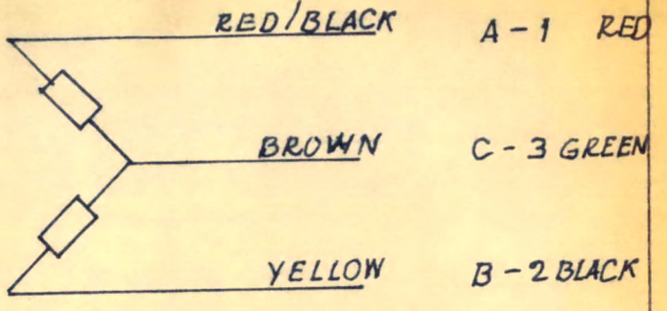
I.E. 560 FIG:- A

FOUR ARM

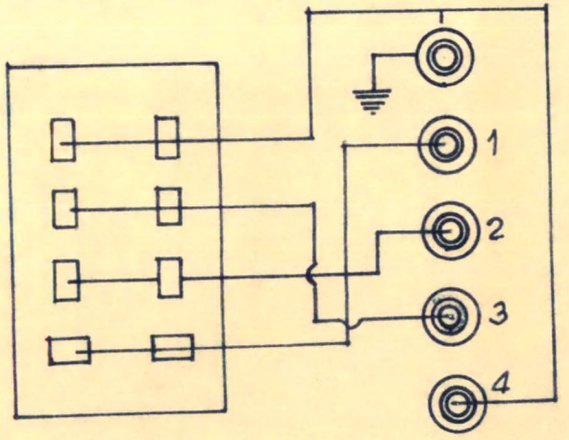


2a

TWO ARM



2b

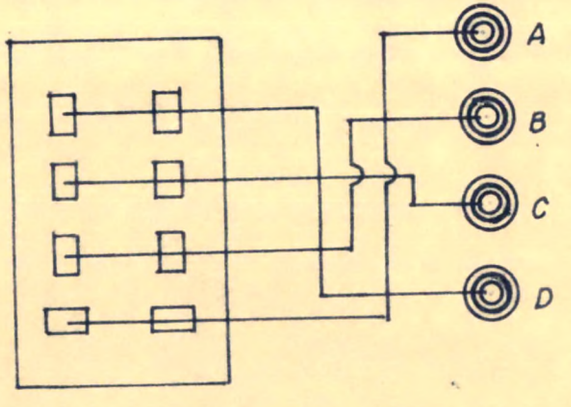


OUT PUT SOCKET OF 560

IN-PUT TERMINALS OF 520

2C

TEN CHANNEL BALANCING UNIT - 560



OUT-PUT SOCKET OF II UNIT

TERMINALS OF I UNIT

2d

INI

I.E.560B