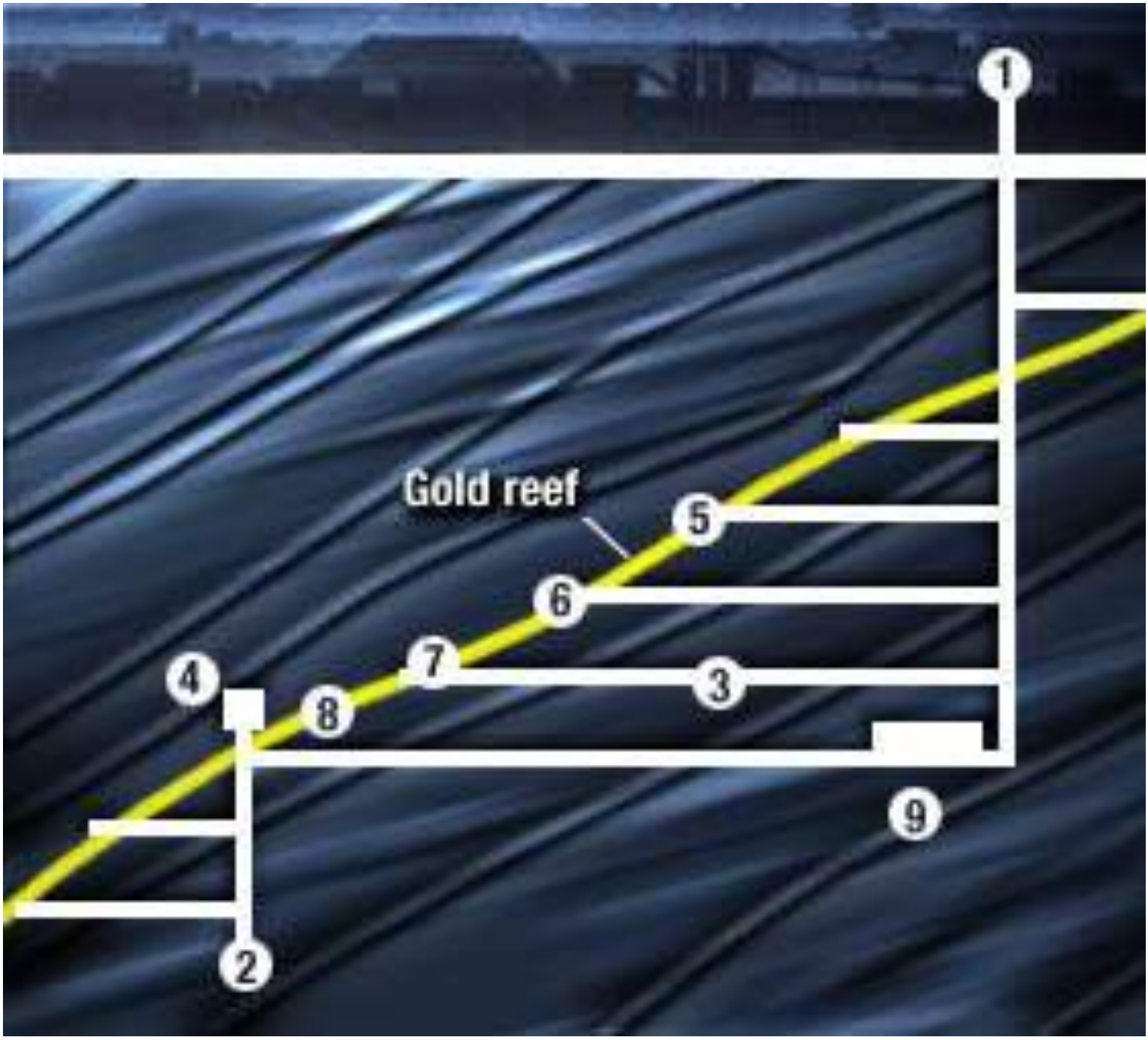
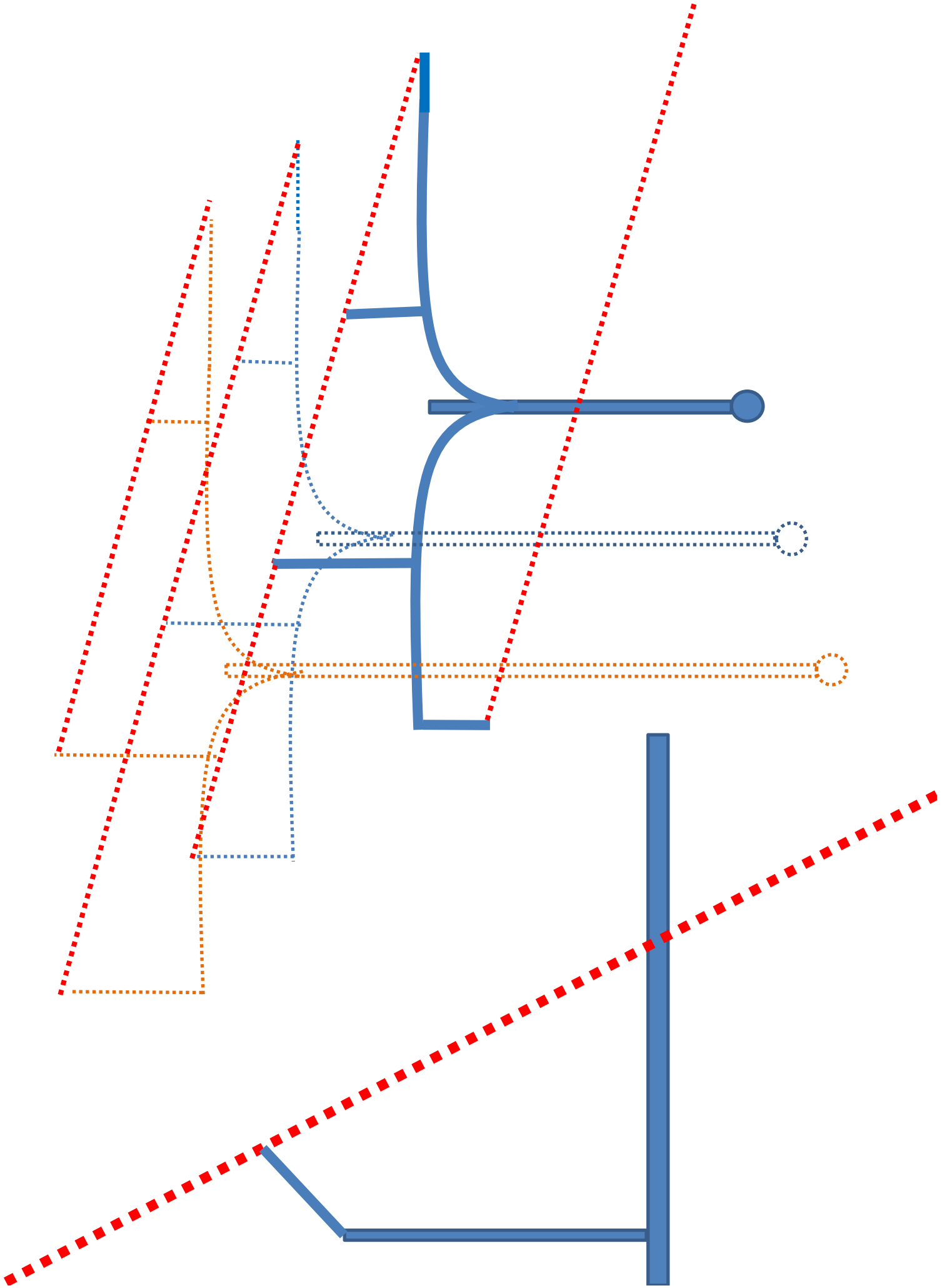
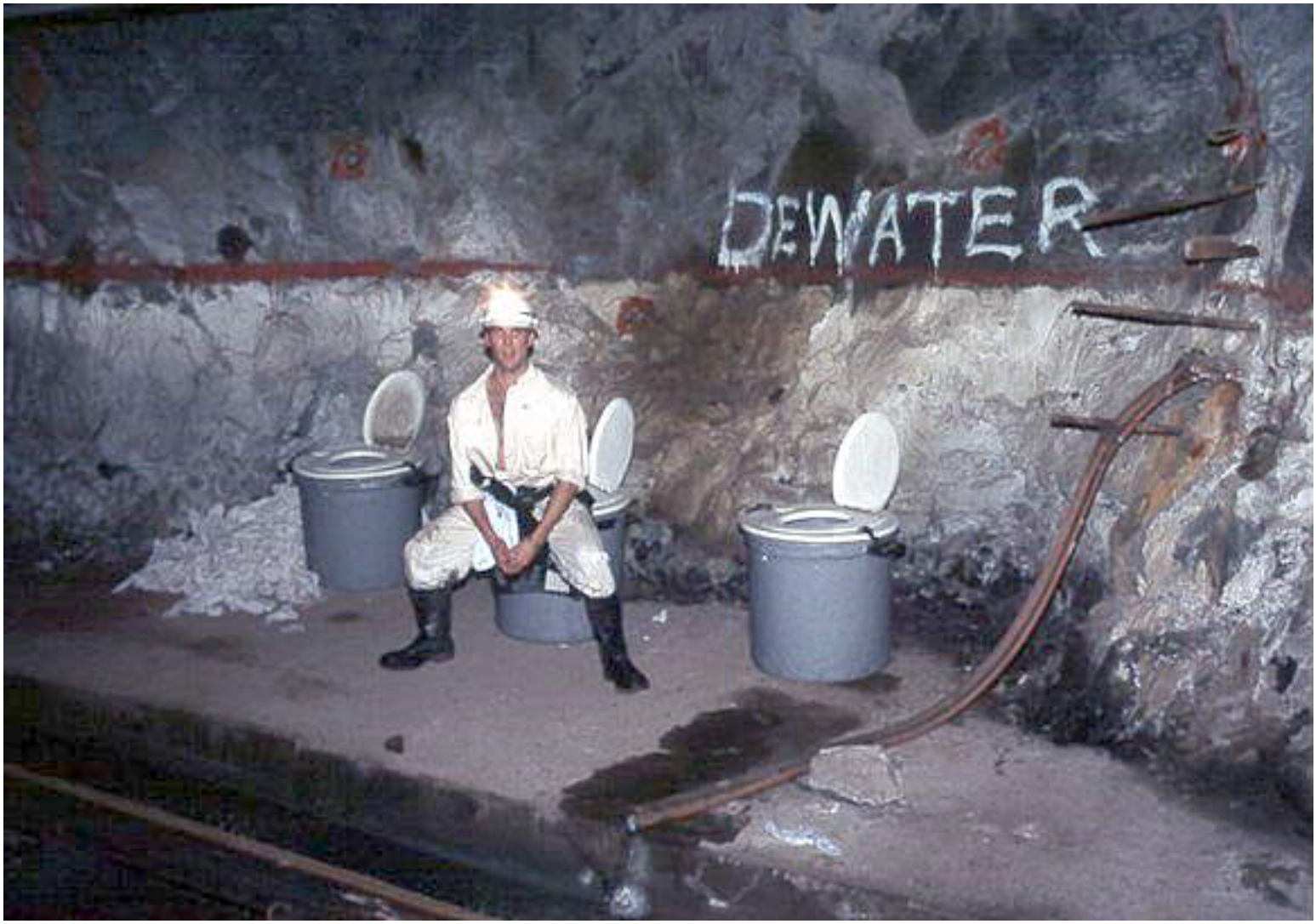
Development basics


1
Gold reef
5
6
7
3
4
8
9
2



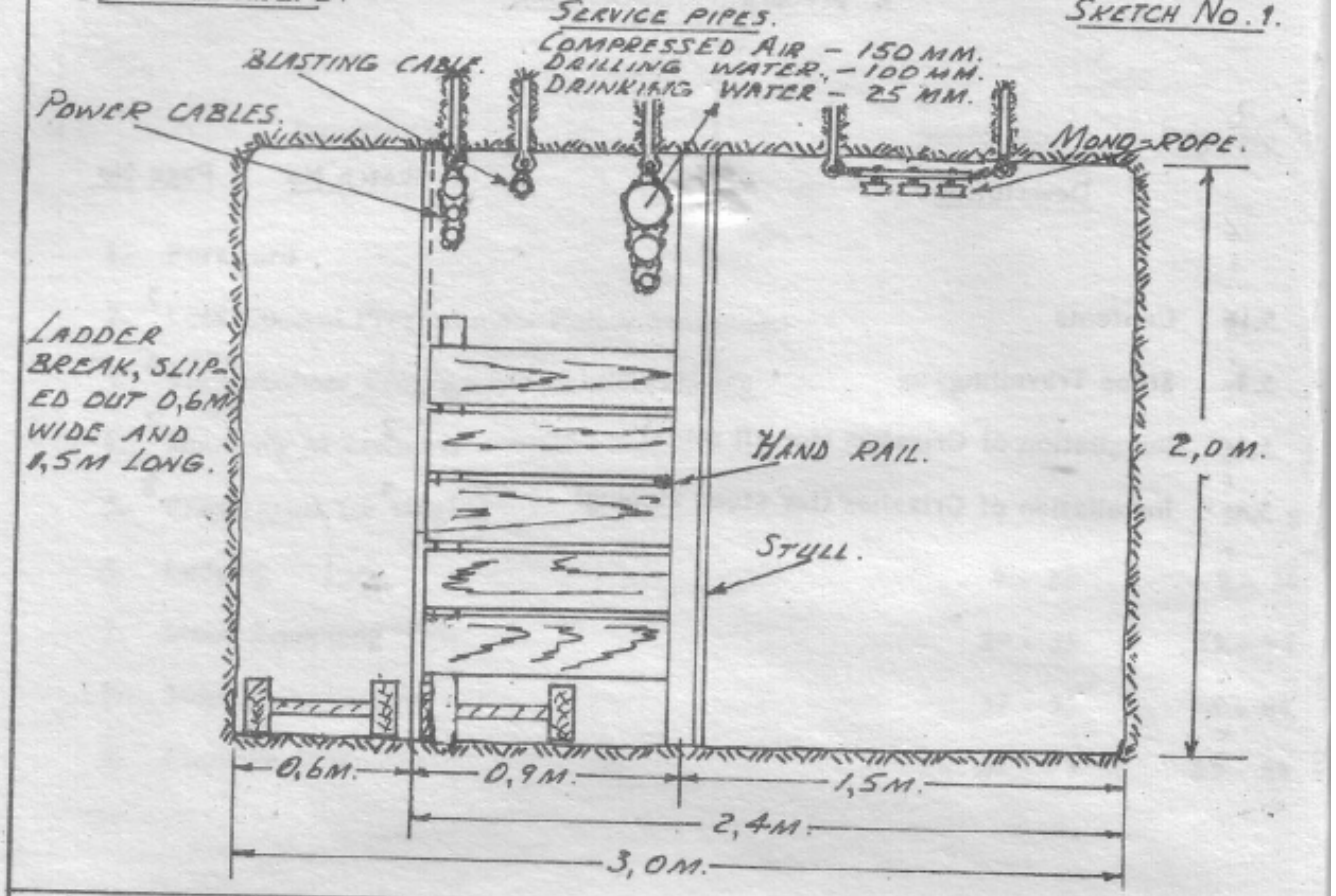


Breast conventional mining
(near horizontal)

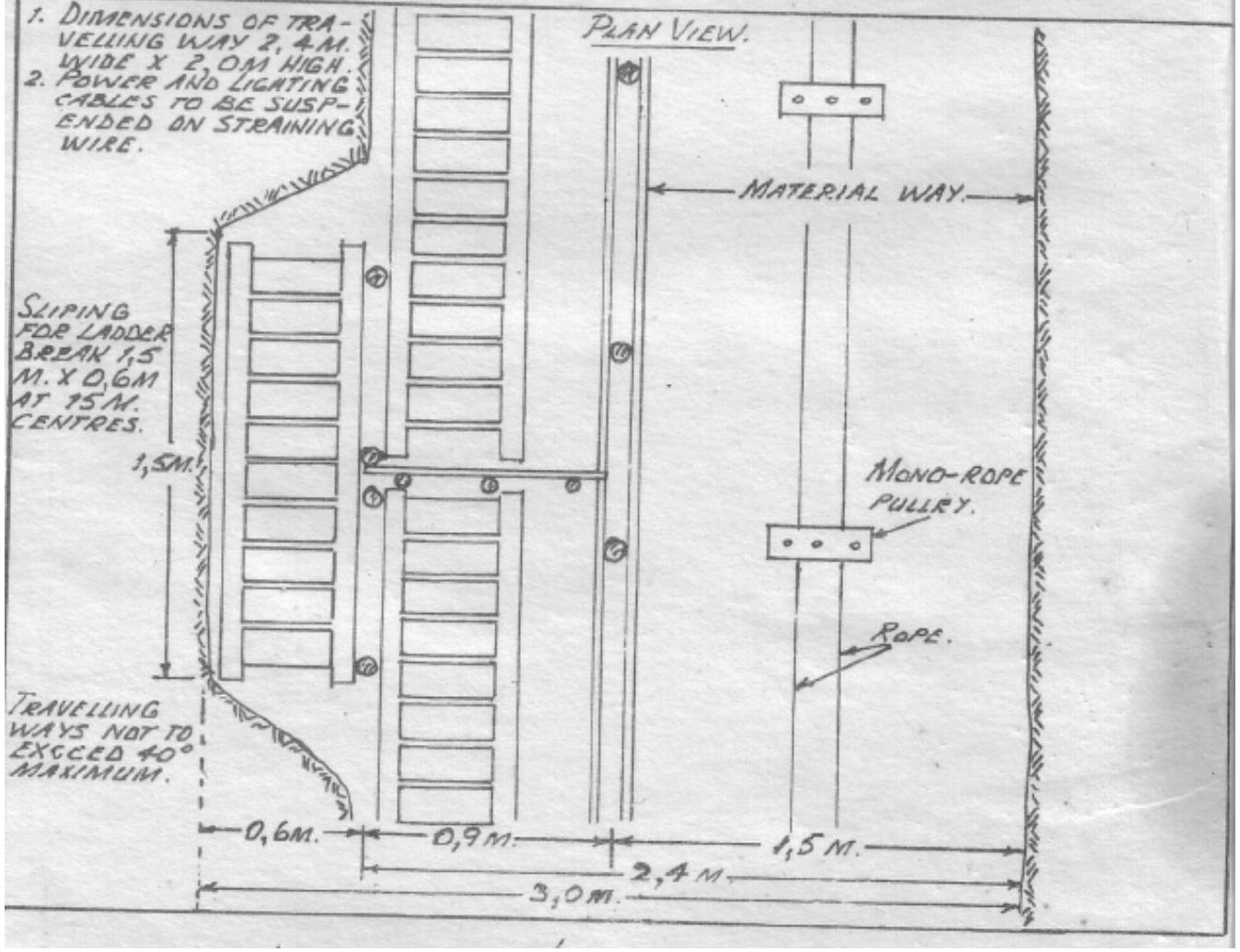
STOPE TRAVELLING WAY.

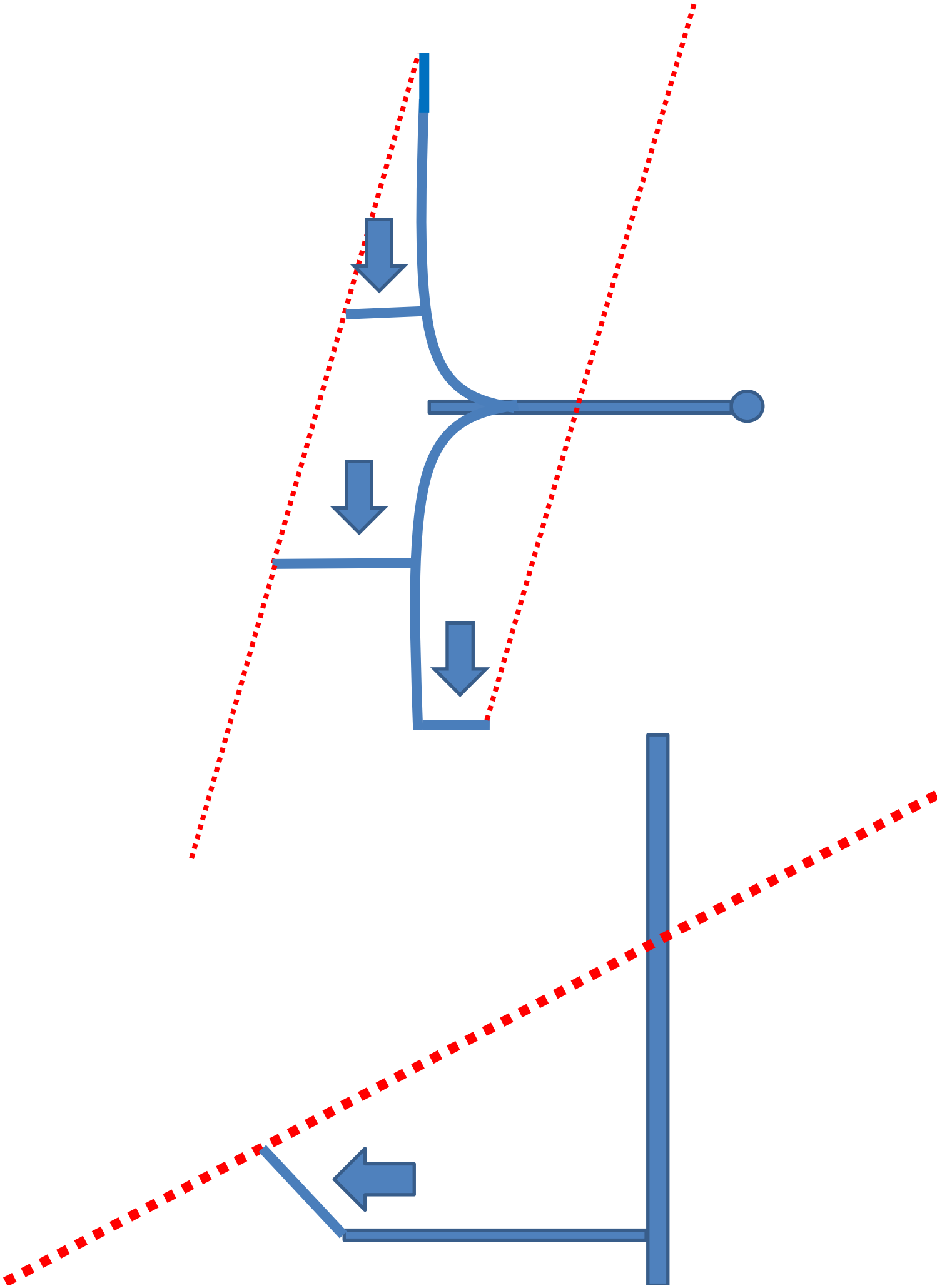
FOR ALL REEFS.

SKETCH No. 1.



1. DIMENSIONS OF TRAVELLING WAY 2,4M. WIDE X 2,0M HIGH.
2. POWER AND LIGHTING CABLES TO BE SUSPENDED ON STRAINING WIRE.





INSTALLATION OF A DEVELOPMENT/LEDGING GRIZZLEY
FOR ALL REEFS-EXCEPT 'B' REEF.

SKETCH NO. 2.

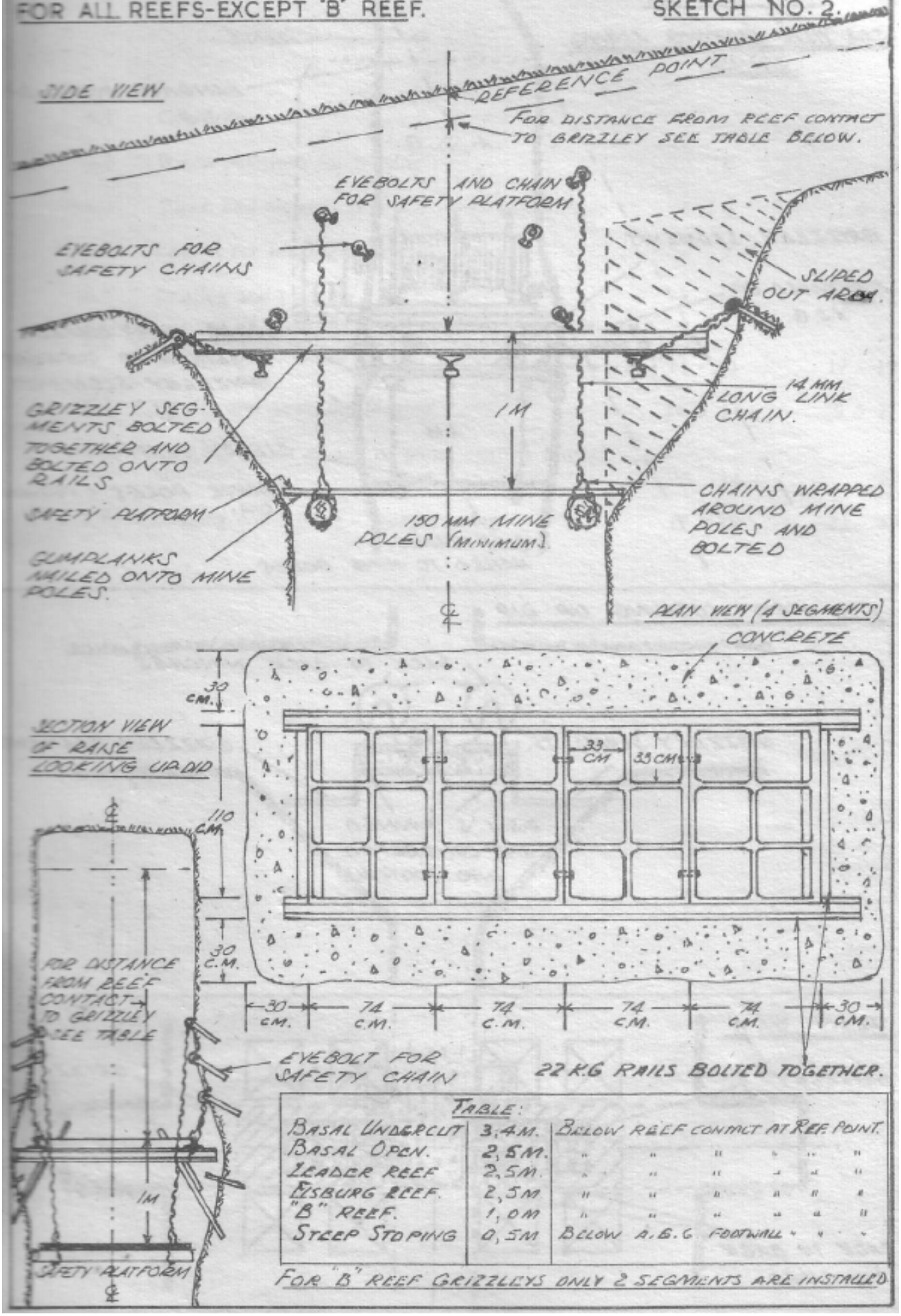
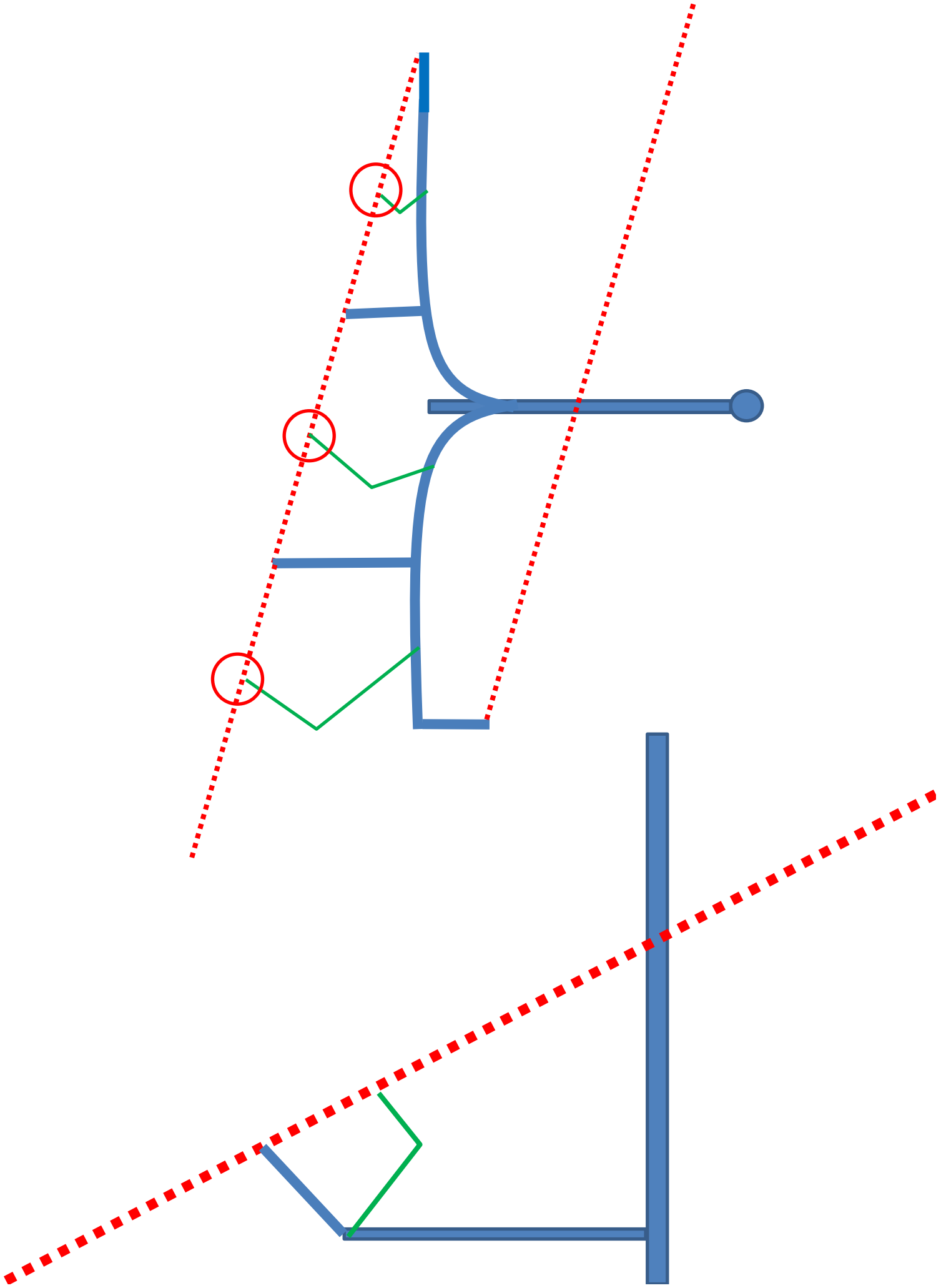


TABLE:

BASAL UNDERCUT	3,4M.	BELOW REEF CONTACT AT REEF POINT.
BASAL OPEN.	2,5M.	" " " " " "
LEADER REEF	2,5M.	" " " " " "
ELSBURG REEF.	2,5M	" " " " " "
"B" REEF.	1,0M	" " " " " "
STEEP STOPING	0,5M	BELOW A.B.G FOOTWALL " " "

FOR "B" REEF GRIZZLEYS ONLY 2 SEGMENTS ARE INSTALLED

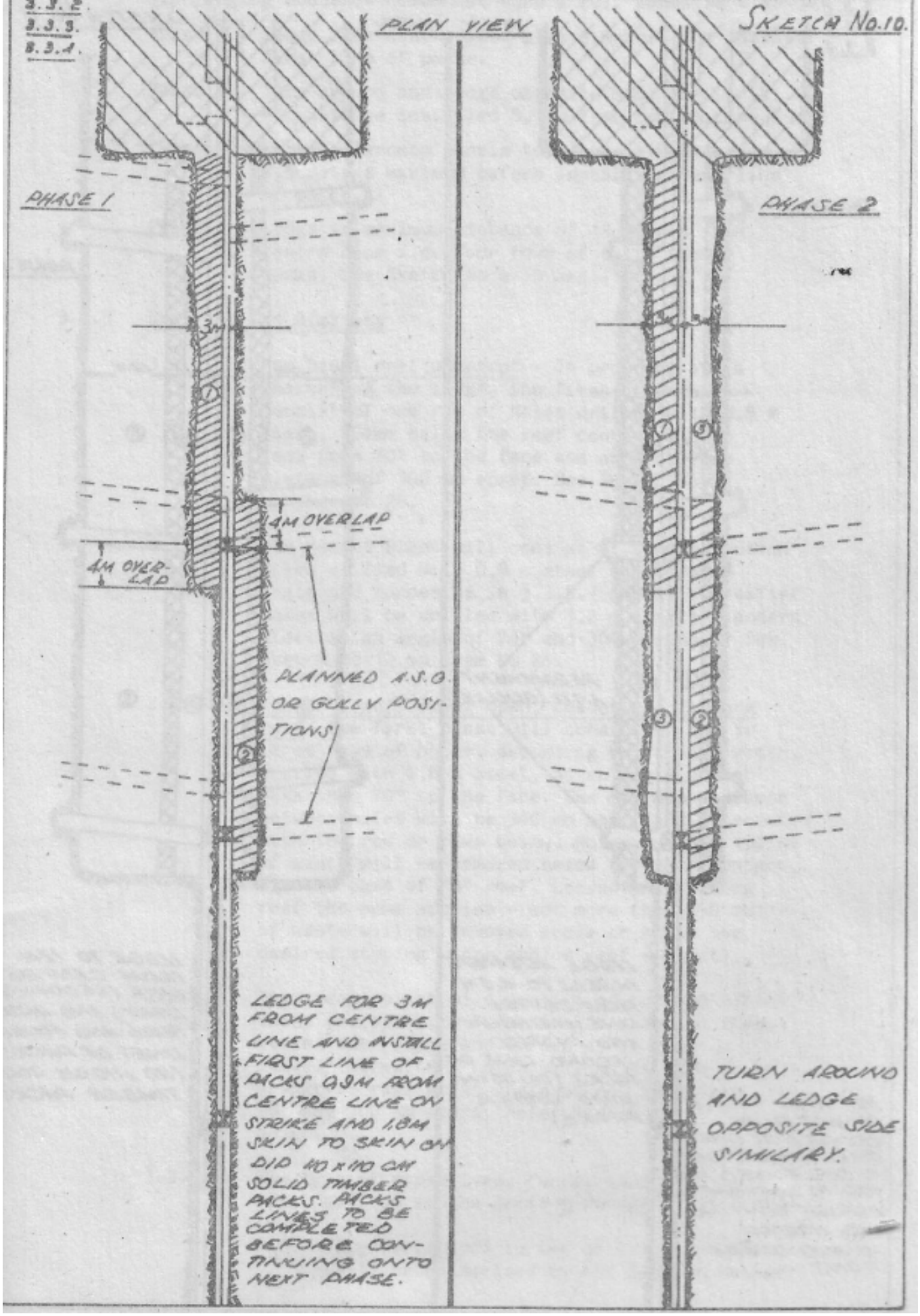


LEDGING SEQUENCE - FOR TWO PANELS AND MORE LEDGED CONCURRENTLY. CONVENTIONAL BREAST LEDGING - ALL REEFS

3.3.2.
3.3.3.
3.3.4.

PLAN VIEW

SKETCH No.10.

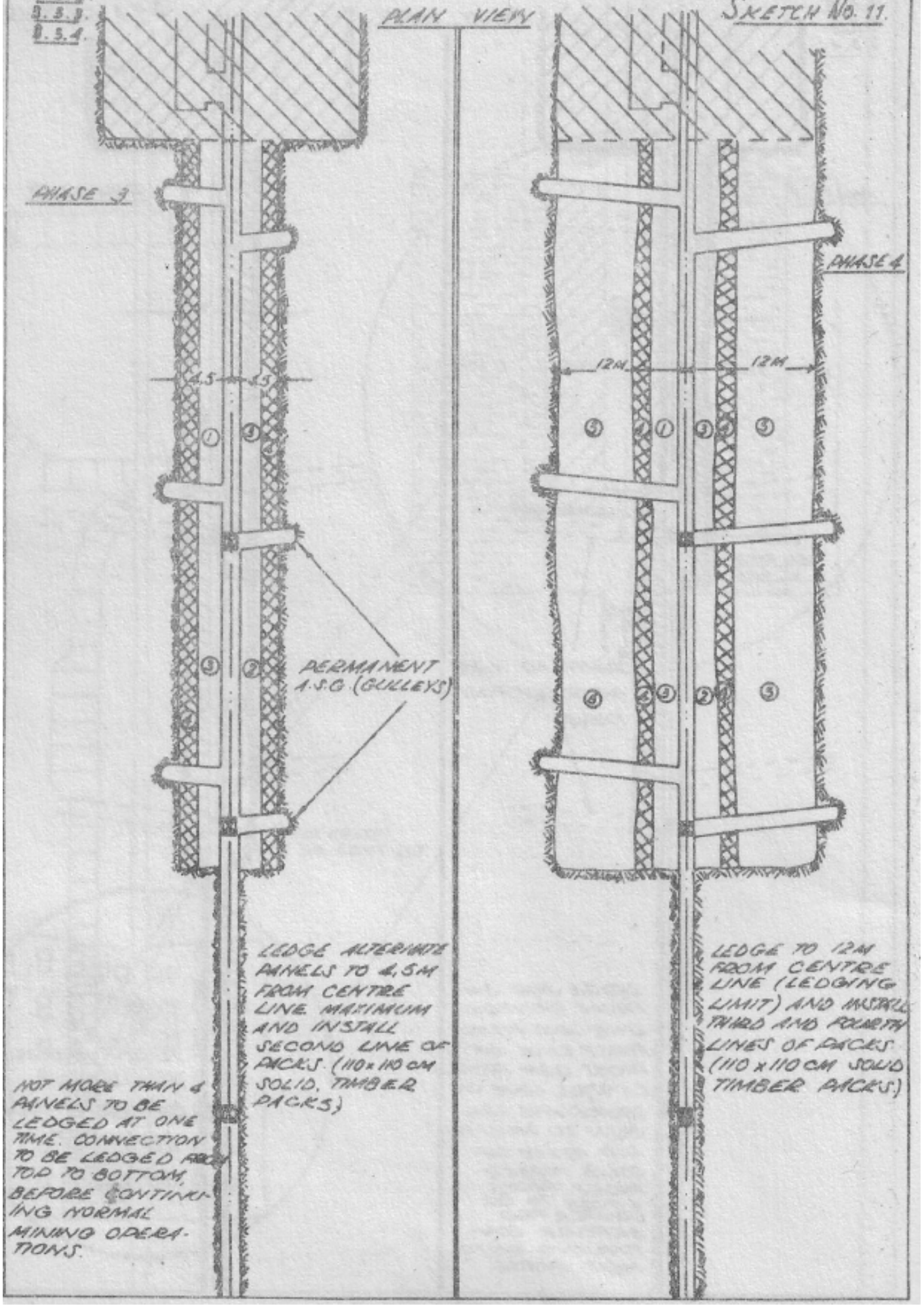


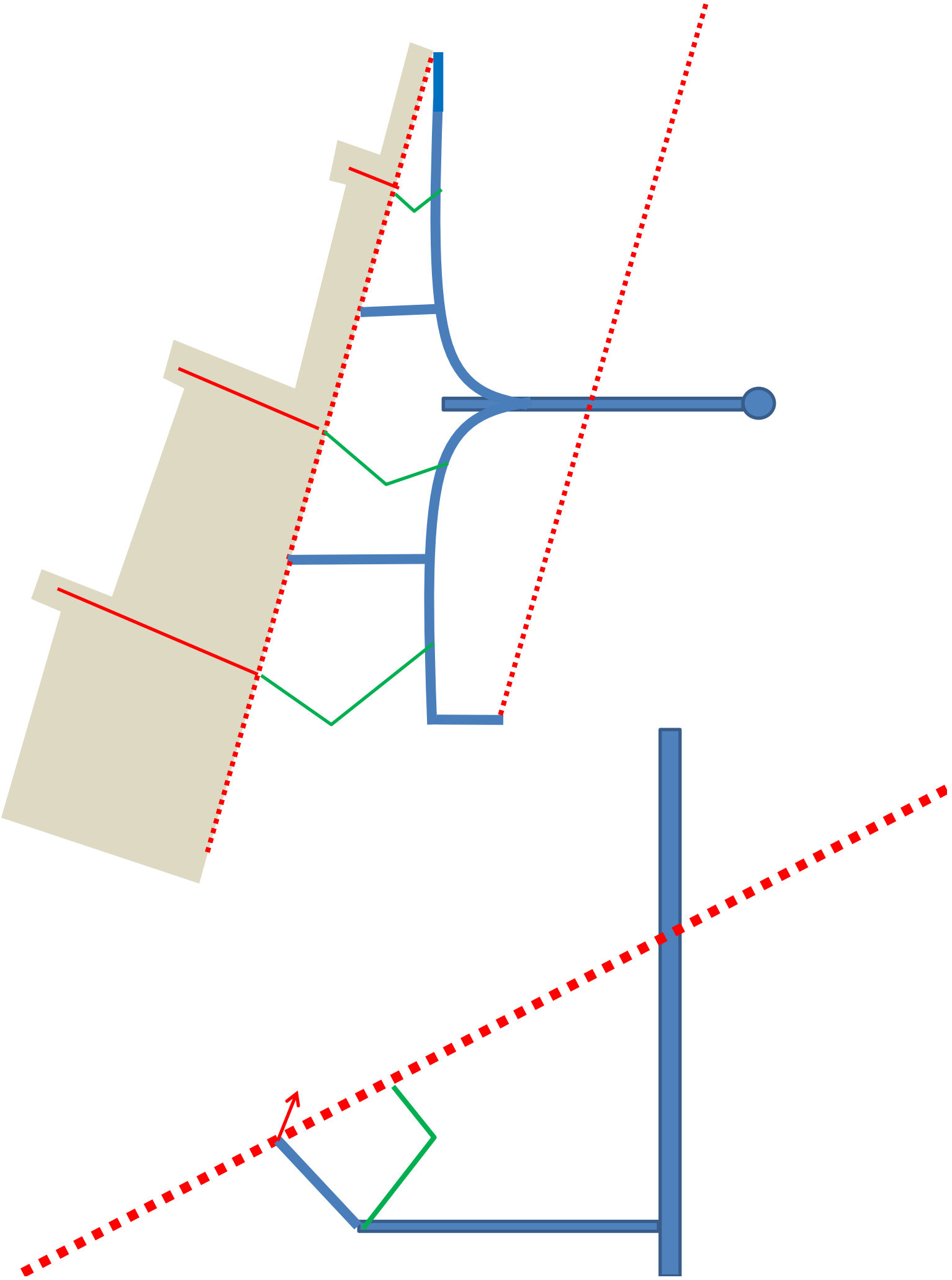
LEDGING SEQUENCE - FOR TWO PANELS AND MORE LEDGED CONCURRENTLY. CONVENTIAL BREAST LEDGING - ALL REEFS

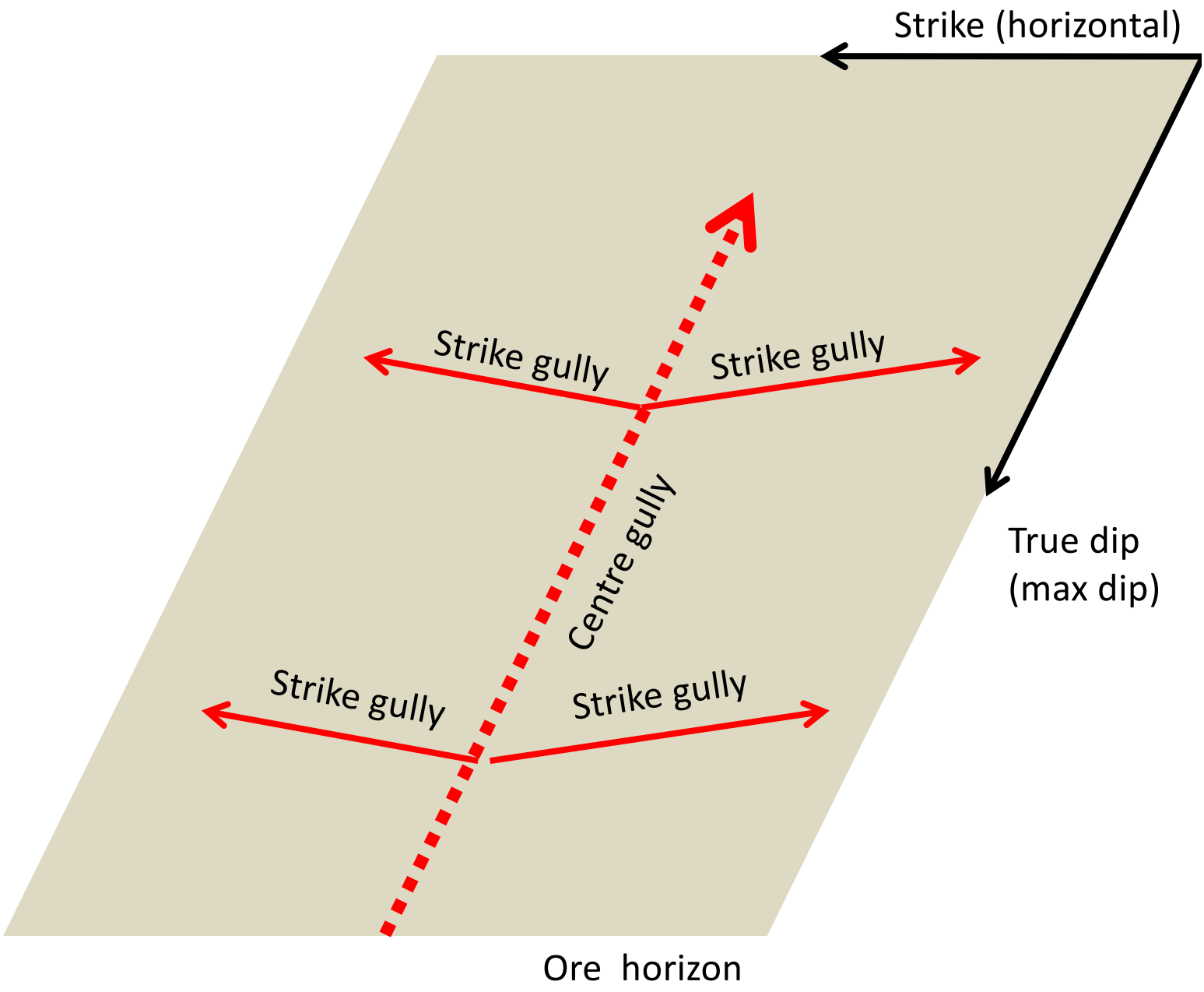
3.3.2.
3.3.3.
3.3.4.

PLAN VIEW

SKETCH No. 11.

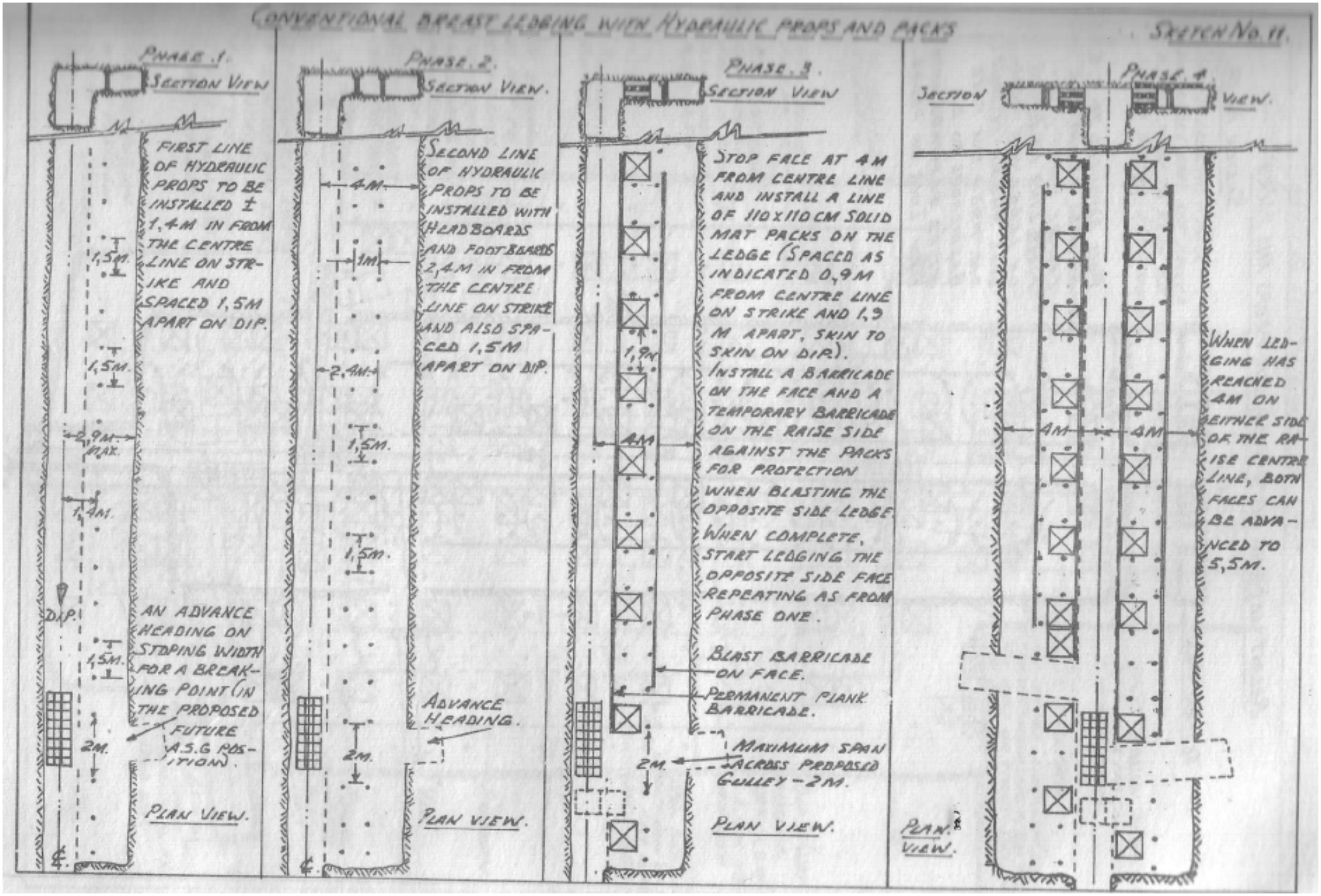





Strike (horizontal)
Strike gully
Strike gully
Centre gully
True dip
(max dip)
Strike gully
Strike gully
Ore horizon

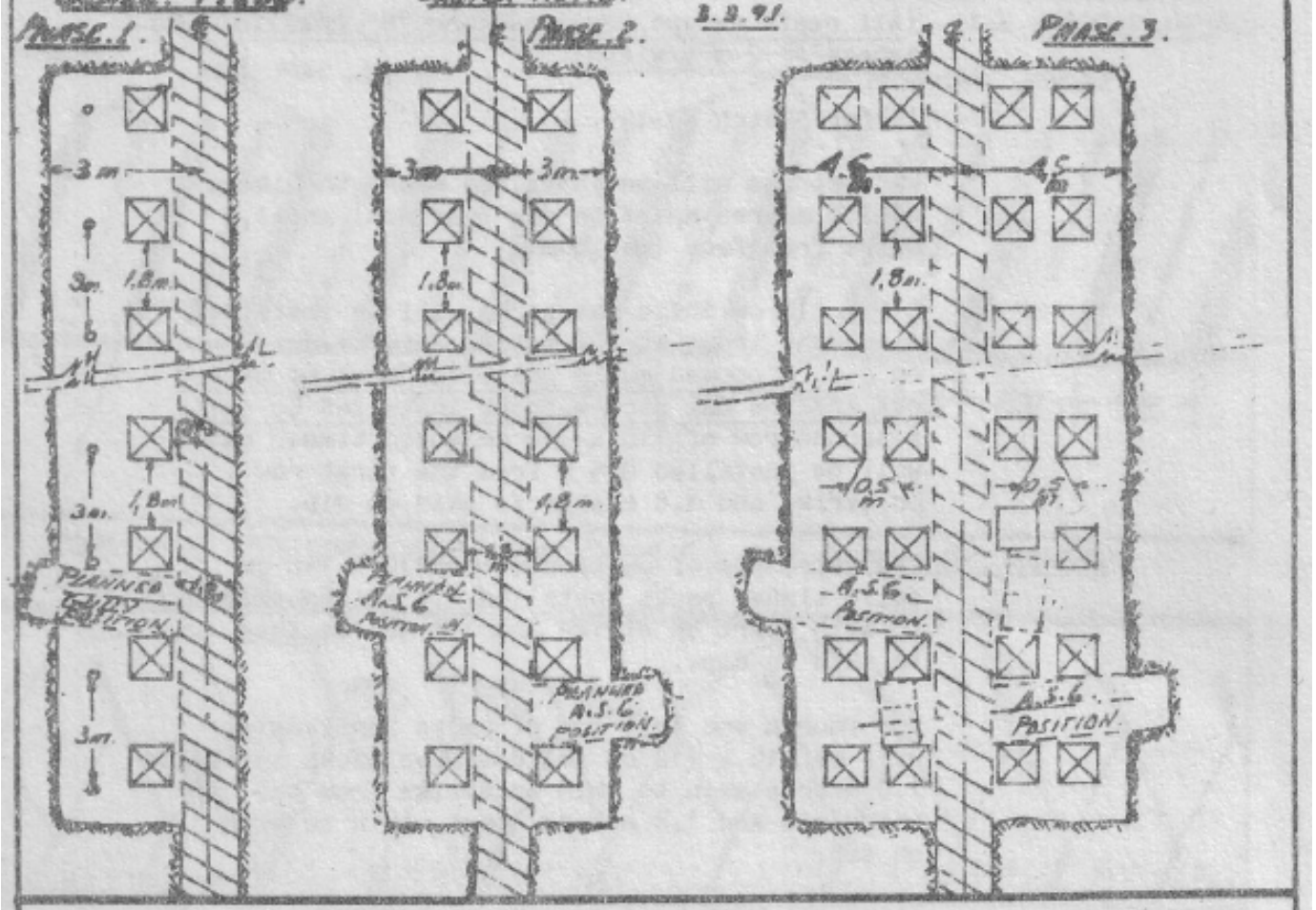
CONVENTIONAL BREAST LEDGING WITH HYDRAULIC PROPS AND PACKS

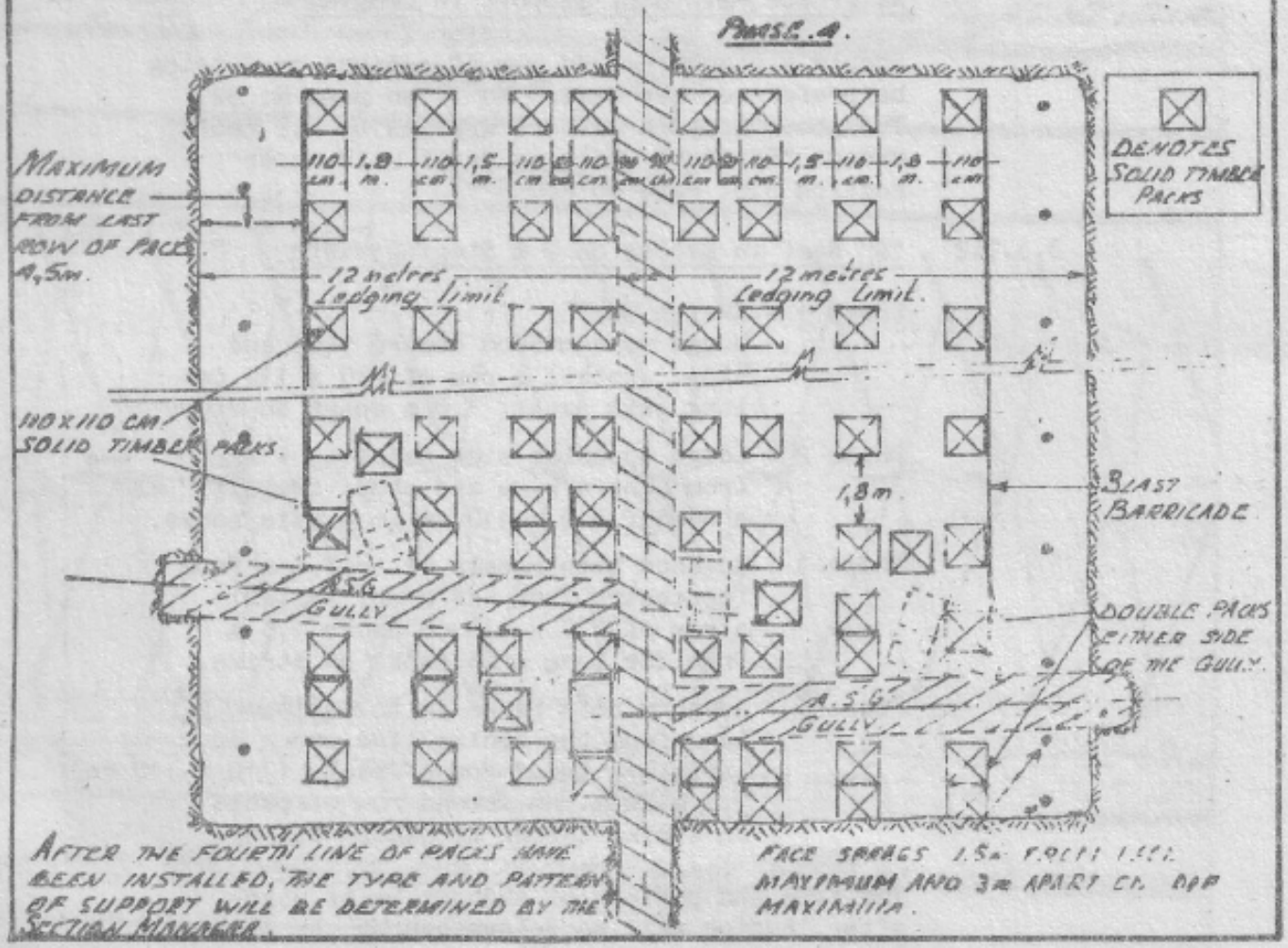
SKETCH No. 11.



CONVENTIONAL BREAST LEDGING WITH PACKS. - ALL REEFS EXCEPT PYRITES. AND 'B' REEF IN EXCESS OF 2m.

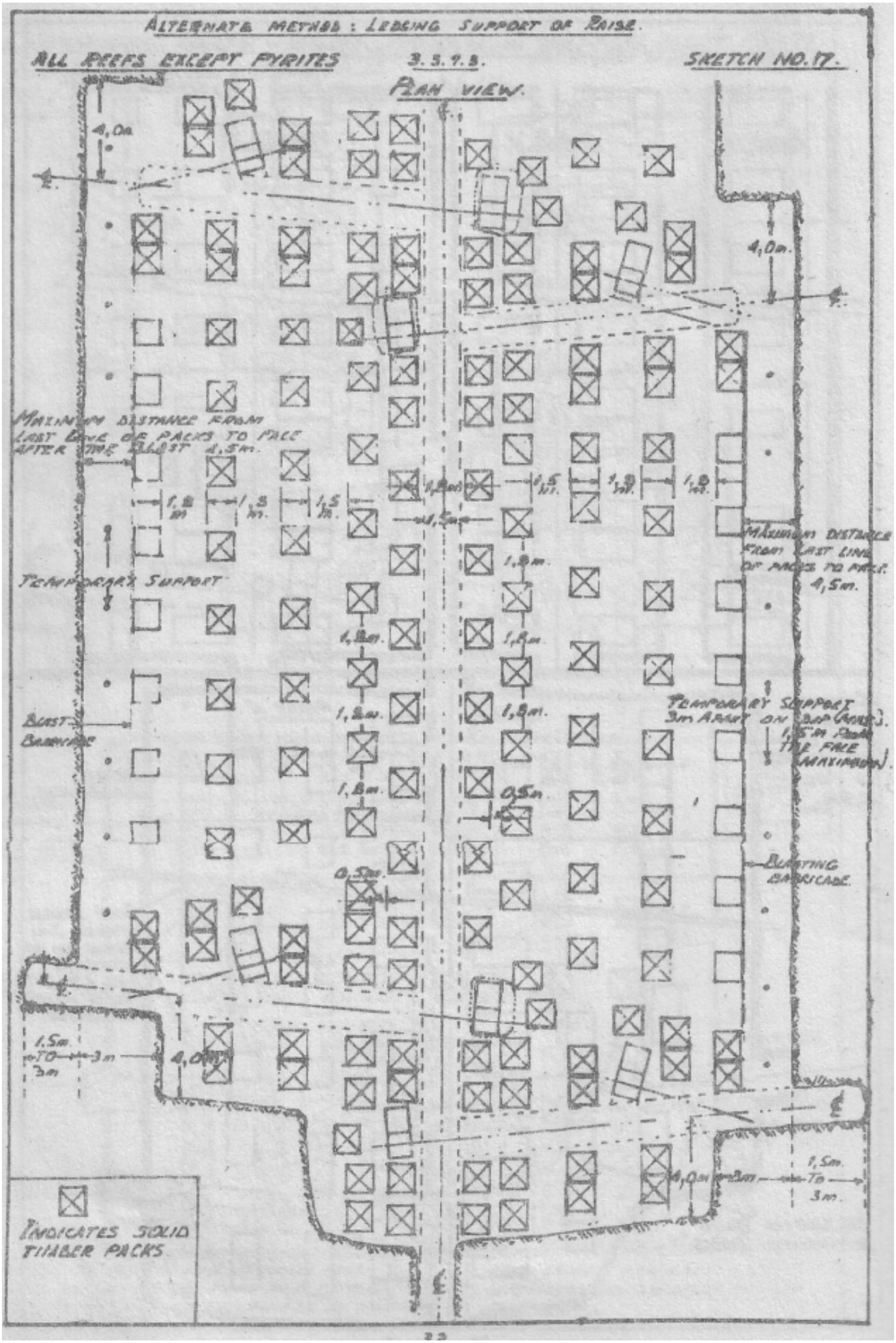
SCALE. 1:200. SECTION No. 15. 3.9.91.





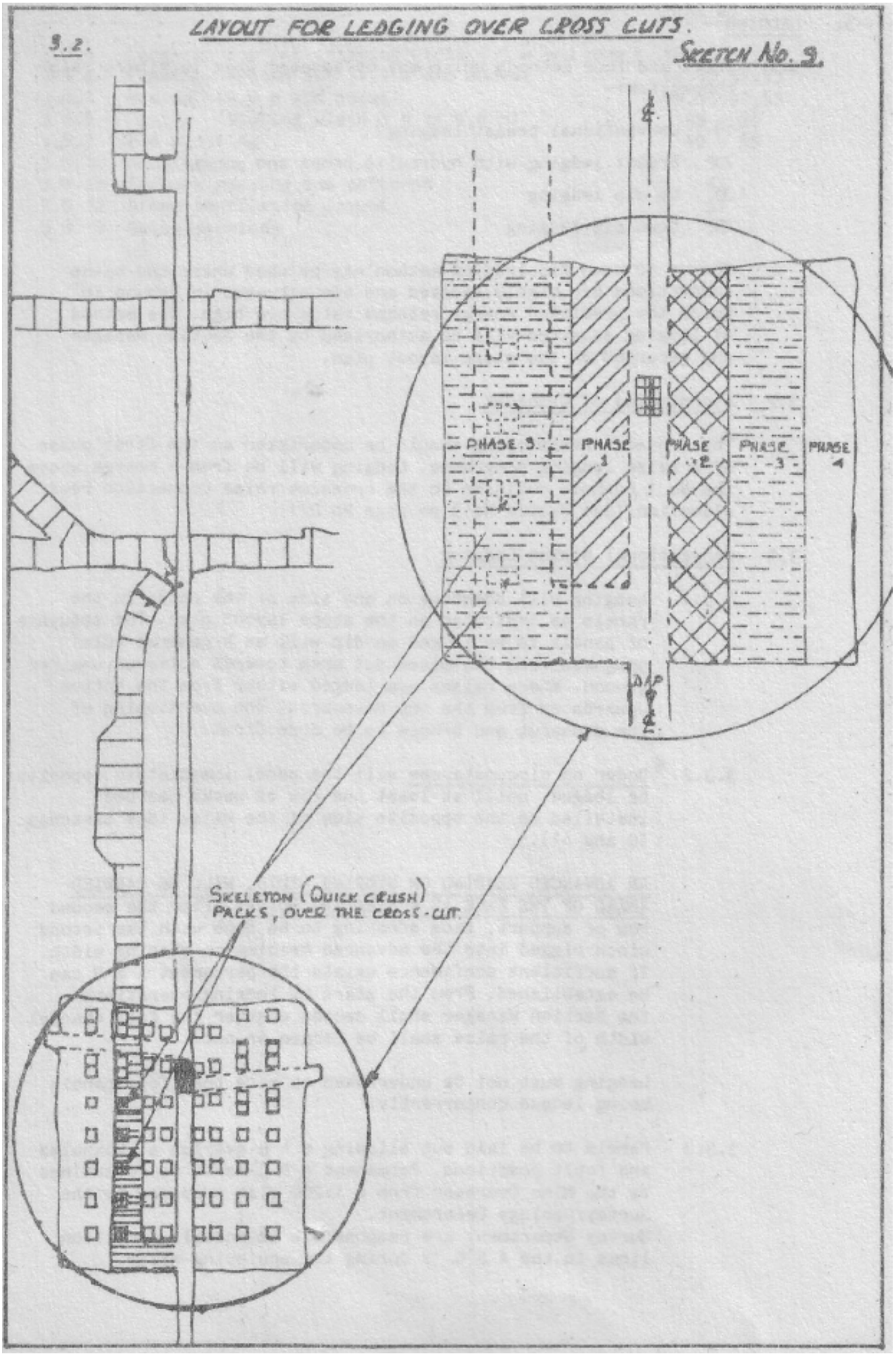
AFTER THE FOURTH LINE OF PACKS HAVE BEEN INSTALLED, THE TYPE AND PATTERN OF SUPPORT WILL BE DETERMINED BY THE SECTION MANAGER.

FACE SPRAGS 1.5m FROM FACE MAXIMUM AND 3m APART CENTRE TO CENTRE MAXIMUM.


ALTERNATE METHOD : LEDGING SUPPORT OR RAISE.
ALL REEFS EXCEPT PYRITES
3.3.9.3.
SKETCH NO. 17.
PLAN VIEW.
4,0m.
4,0m.
MAXIMUM DISTANCE FROM LAST LINE OF PACKS TO FACE AFTER TIME BLAST 4,5m.
TEMPORARY SUPPORT
MAXIMUM DISTANCE FROM LAST LINE OF PACKS TO FACE 4,5m.
1,8m.
1,8m.
1,8m.
1,8m.
1,8m.
1,8m.
1,8m.
1,8m.
1,8m.
0,5m.
0,5m.
BLAST BARRICADE
TEMPORARY SUPPORT 3m APART ON DIP (ONLY) 1,5m FROM THE FACE (MAXIMUM).
BLASTING BARRICADE.
1,5m TO 3m
4,0m
4,0m
2m
1,5m. To 3m.
INDICATES SOLID TIMBER PACKS.

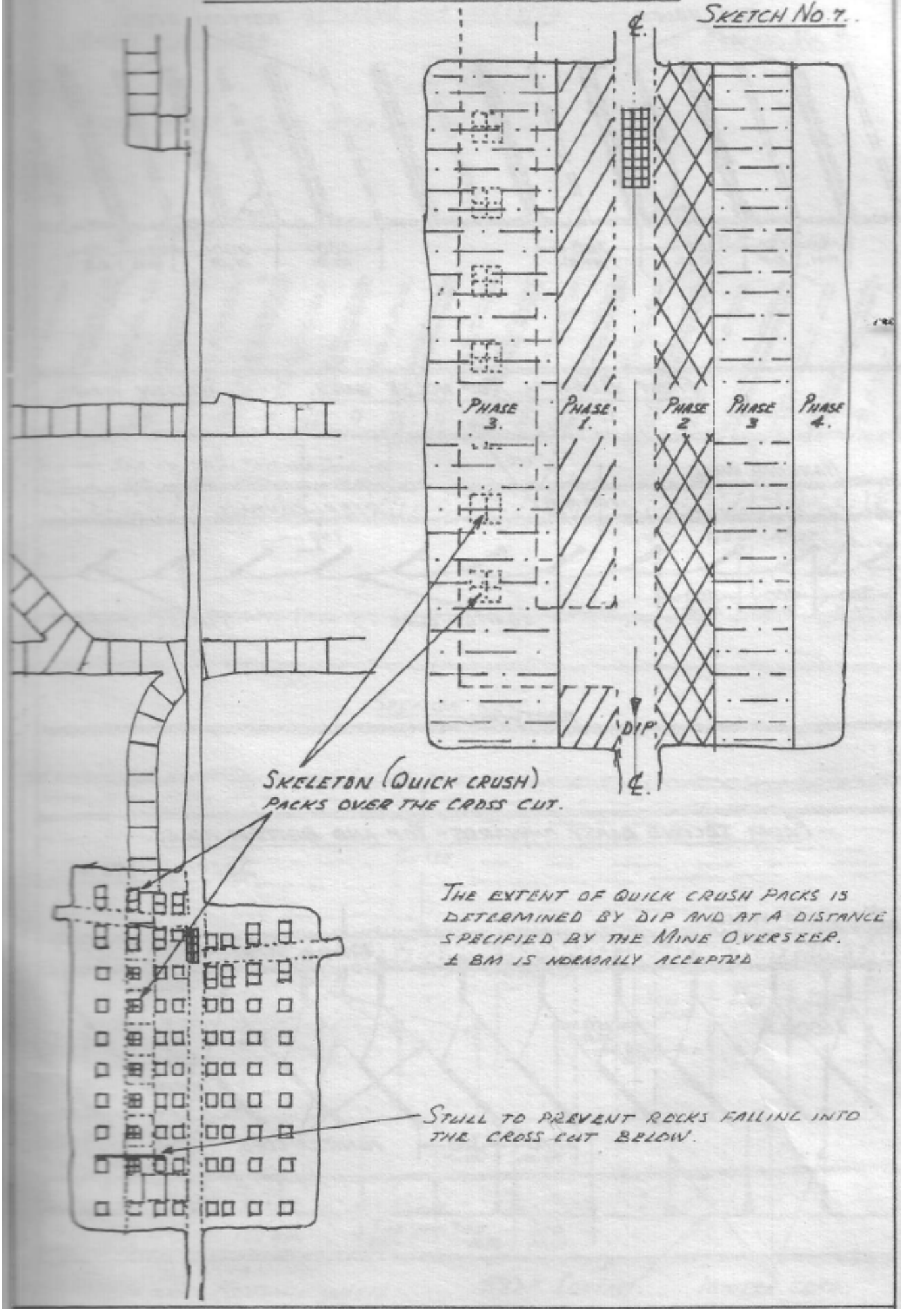
LAYOUT FOR LEDGING OVER CROSS CUTS.

SKETCH No. 9.



LAYOUT FOR LEDGING OVER CROSS CUTS.

SKETCH No. 7.

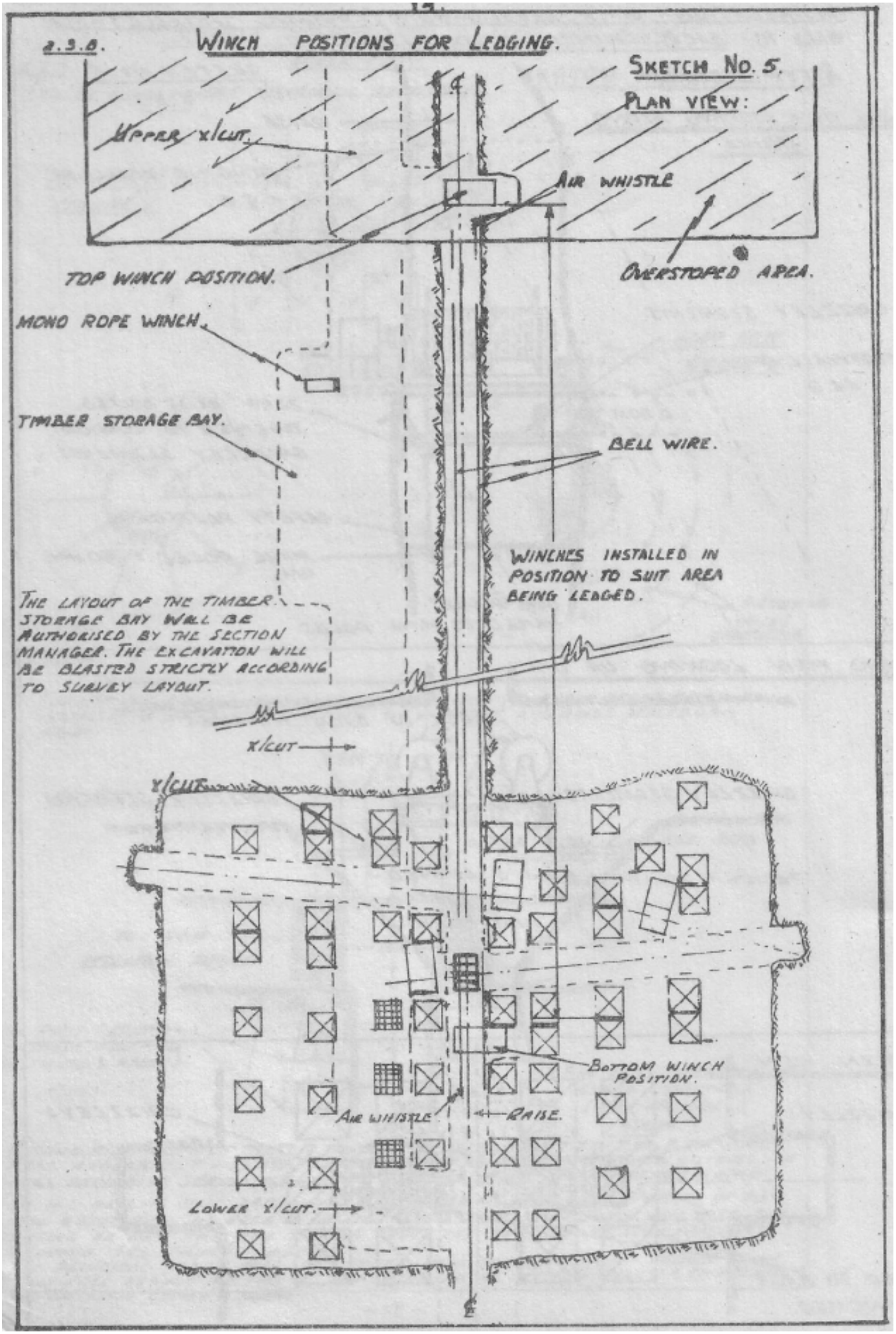


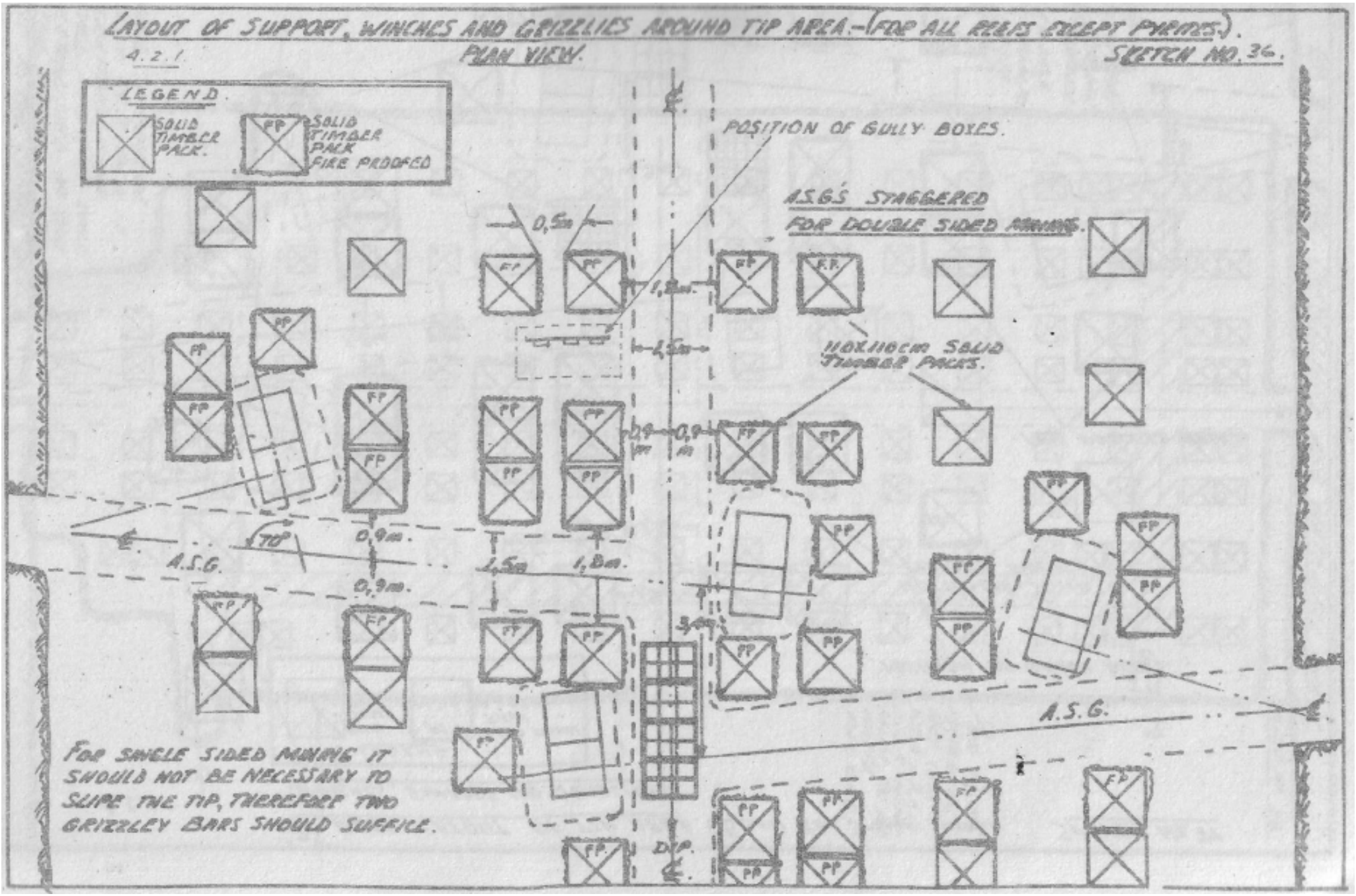
THE EXTENT OF QUICK CRUSH PACKS IS DETERMINED BY DIP AND AT A DISTANCE SPECIFIED BY THE MINE OVERSEER. 1 BM IS NORMALLY ACCEPTED

2.3.8.

WINCH POSITIONS FOR LEDGING.

SKETCH NO. 5.

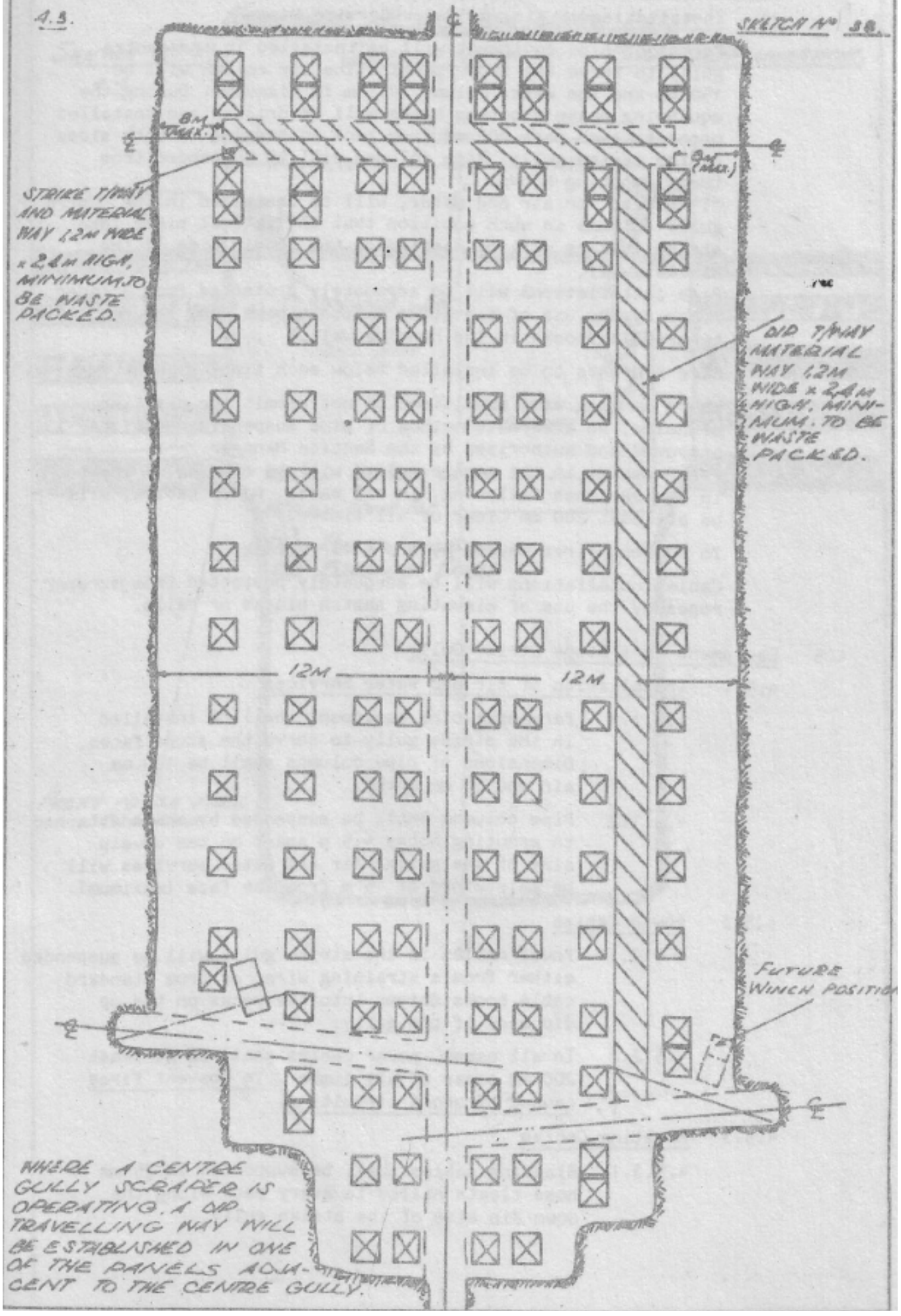



LAYOUT OF SUPPORT, WINCHES AND GRIZZLIES AROUND TIP AREA.-(FOR ALL REEFS EXCEPT PYRITES).
4.2.1.
PLAN VIEW.
SKETCH NO. 36.
LEGEND.
SOLID TIMBER PACK.
SOLID TIMBER PACK FIRE PROOFED
POSITION OF GULLY BOXES.
A.S.G.S STAGGERED FOR DOUBLE SIDED MINING.
110X110CM SOLID TIMBER PACKS.
0,5m
1,2m.
1,5m
2,9m
0,9m
1,5m
1,2m.
0,9m.
0,9m.
70°
A.S.G.
A.S.G.
3,6m
D/P.
FOR SINGLE SIDED MINING IT SHOULD NOT BE NECESSARY TO SLIPE THE TIP, THEREFORE TWO GRIZZLEY BARS SHOULD SUFFICE.

DIP AND STRIKE, TRAVELLING AND MATERIAL WAYS

A.3.

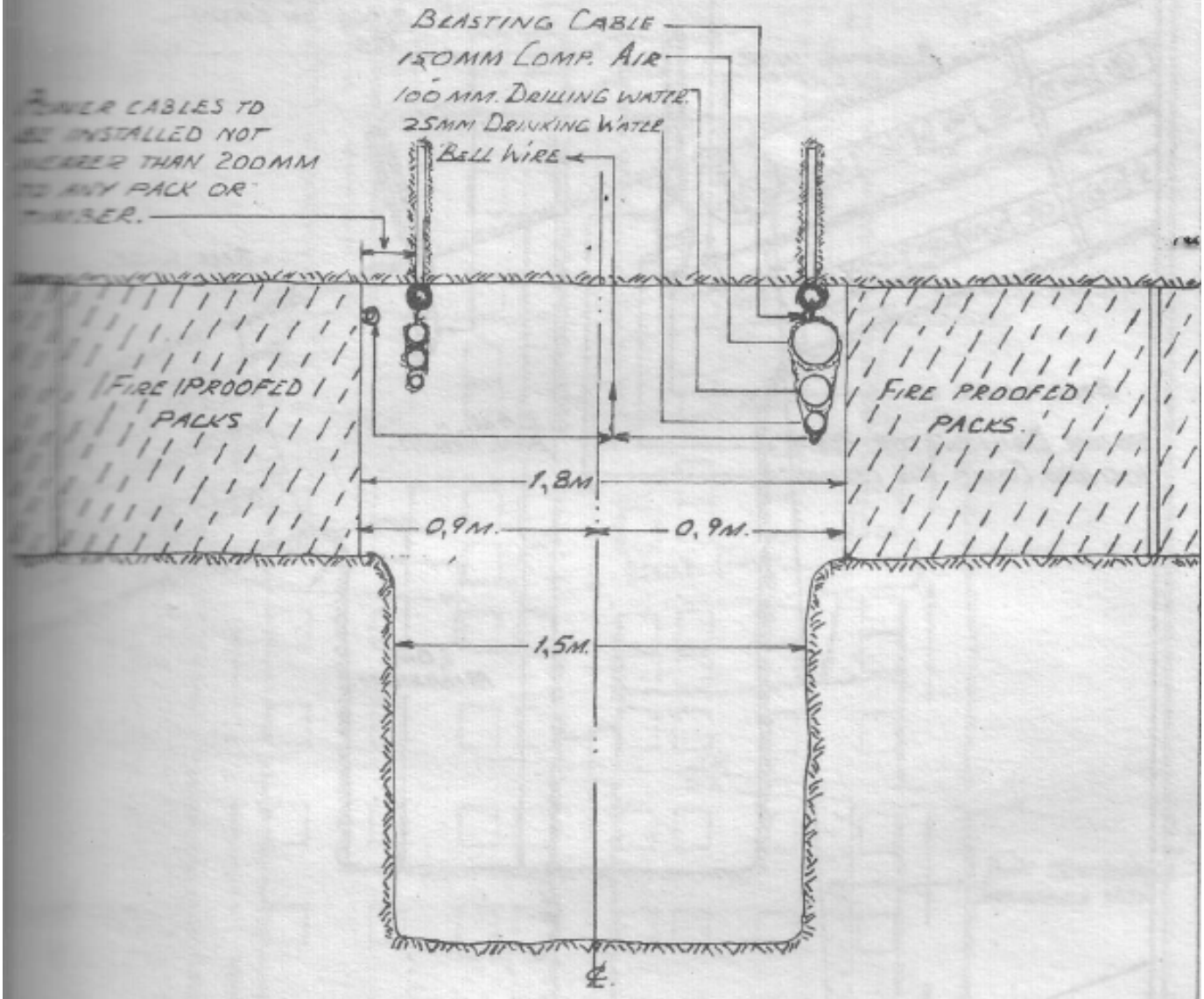
SKETCH No 38.



EQUIPMENT IN A STOPE CENTRE GULLEY. SKETCH NO. 30

SECTION VIEW.

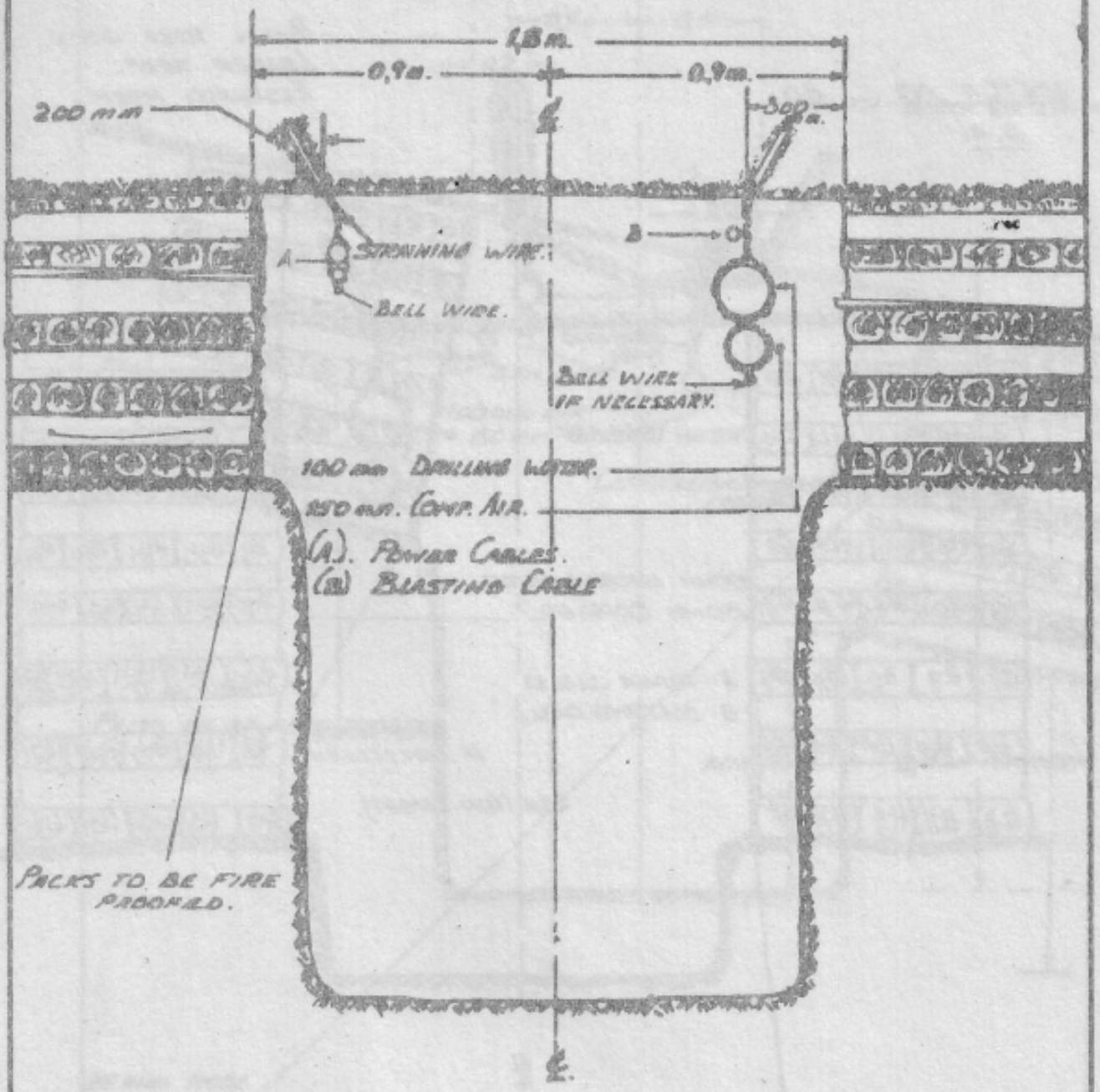
BASAL REEF UNDERCUT.



EQUIPMENT IN A STOPE CENTRE GULLY.

SKETCH No. 39. SECTION VIEW. BASAL REEF UNDERPOINT.

A.A.

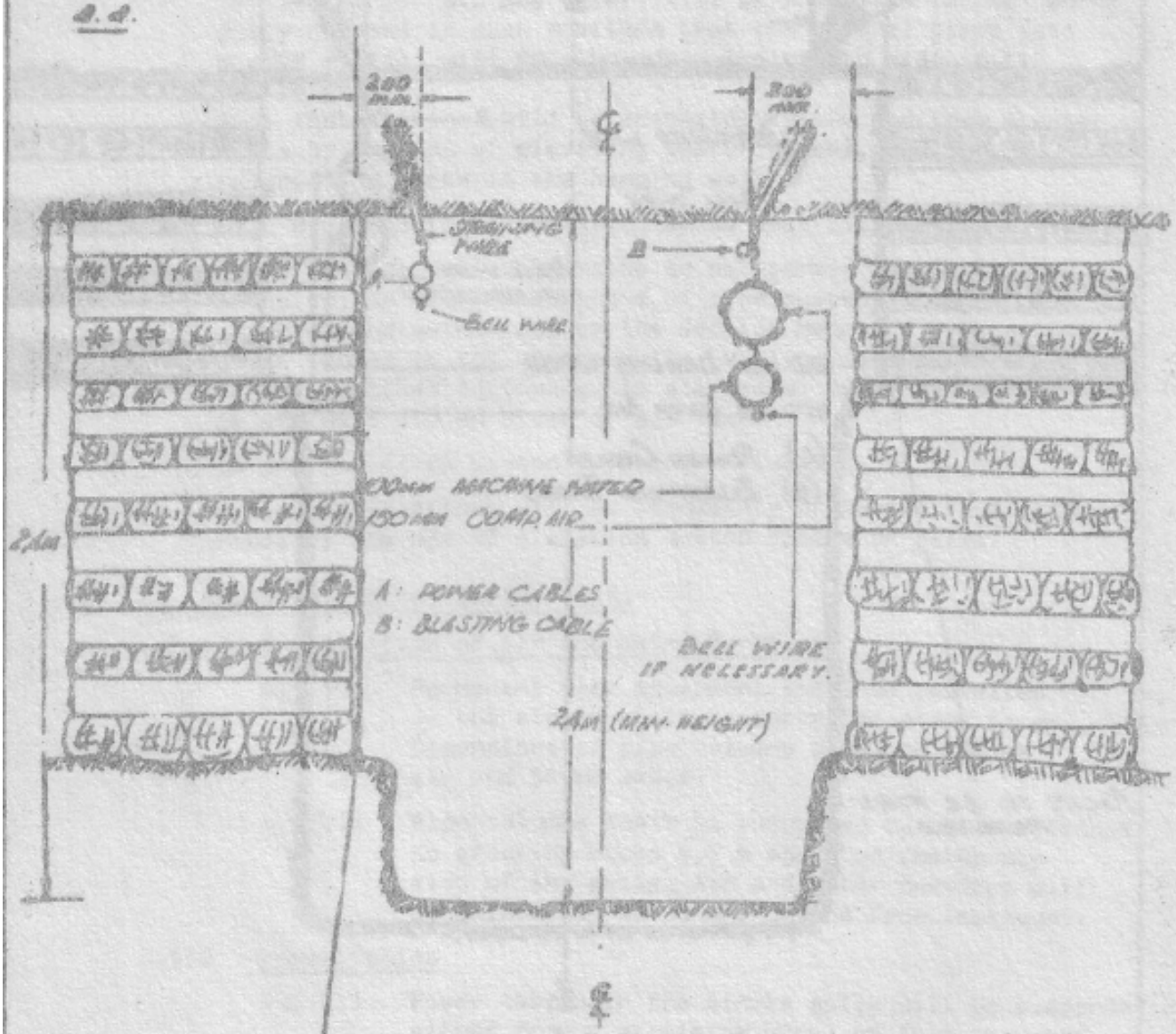


EQUIPMENT IN A STOPE CENTRE GULLY

BASAL REEF OPEN.
LEADER REEF.
ELSBURG REEF.

SKETCH NO. 40.

A.A.



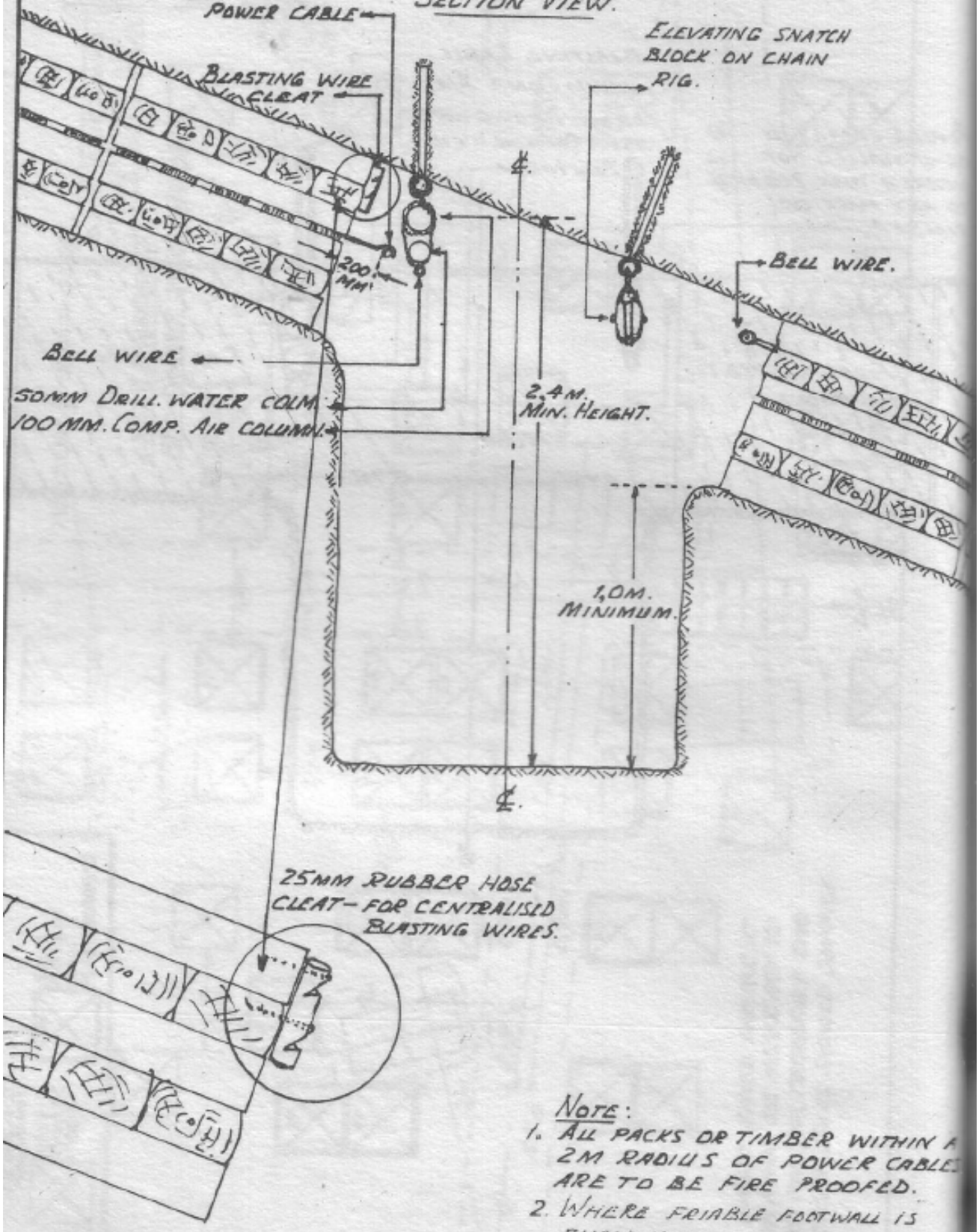
FACES TO BE FIRE PROOFED.

EQUIPMENT IN A STOPE STRIKE GULLEY.

SKETCH NO.

BASAL REEF UNDERCUT.

SECTION VIEW.



NOTE:

1. ALL PACKS OR TIMBER WITHIN A 2M RADIUS OF POWER CABLES ARE TO BE FIRE PROOFED.
2. WHERE FRIABLE FOOTWALL IS ENCOUNTERED ALONG GULLIES, L AXIS PACKS MAY BE INSTALLED U DIP

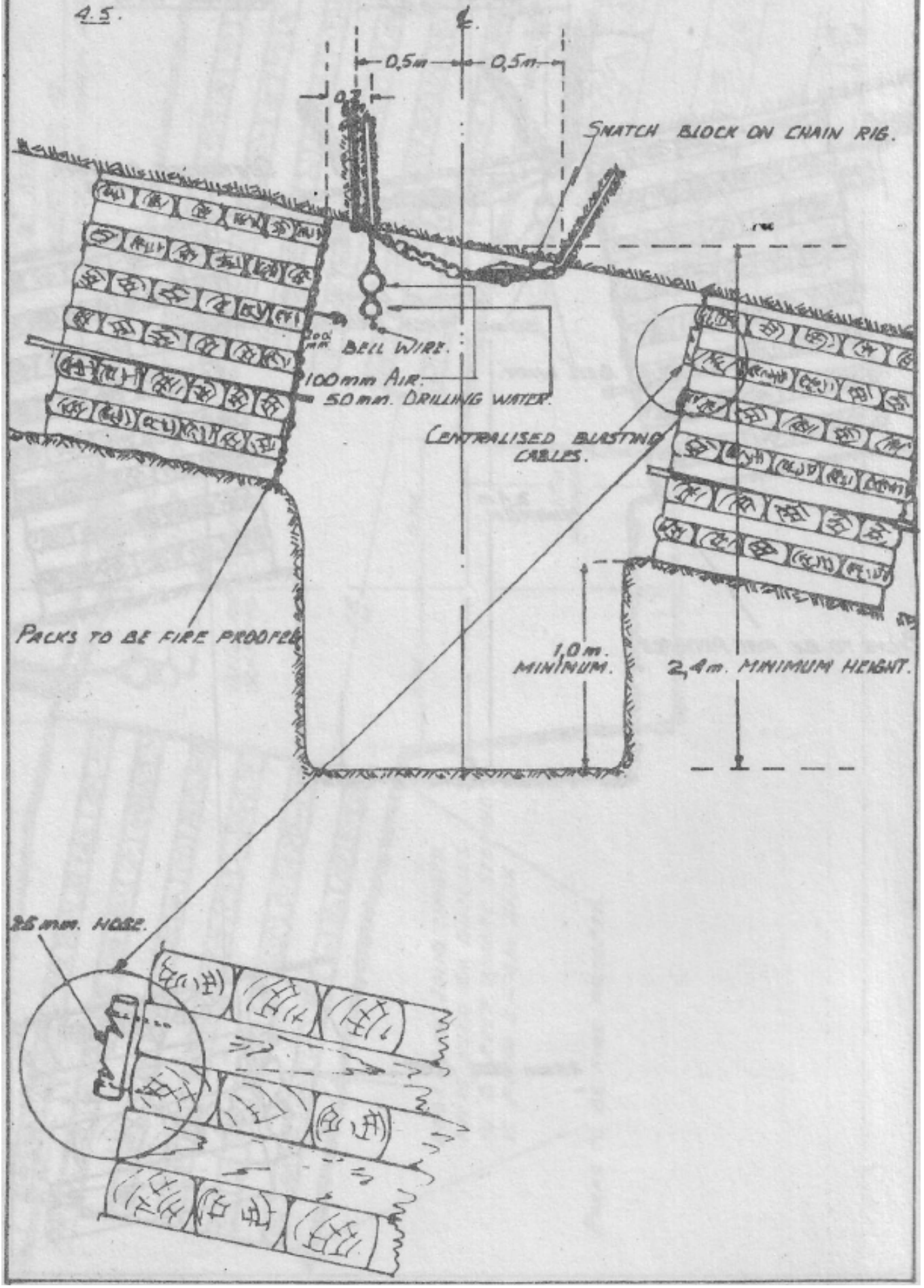
EQUIPMENT IN A STOPE STRIKE GULLY.

BASAL REEF UNDERCUT.

SKETCH No. 41

SECTION VIEW.

4.5.

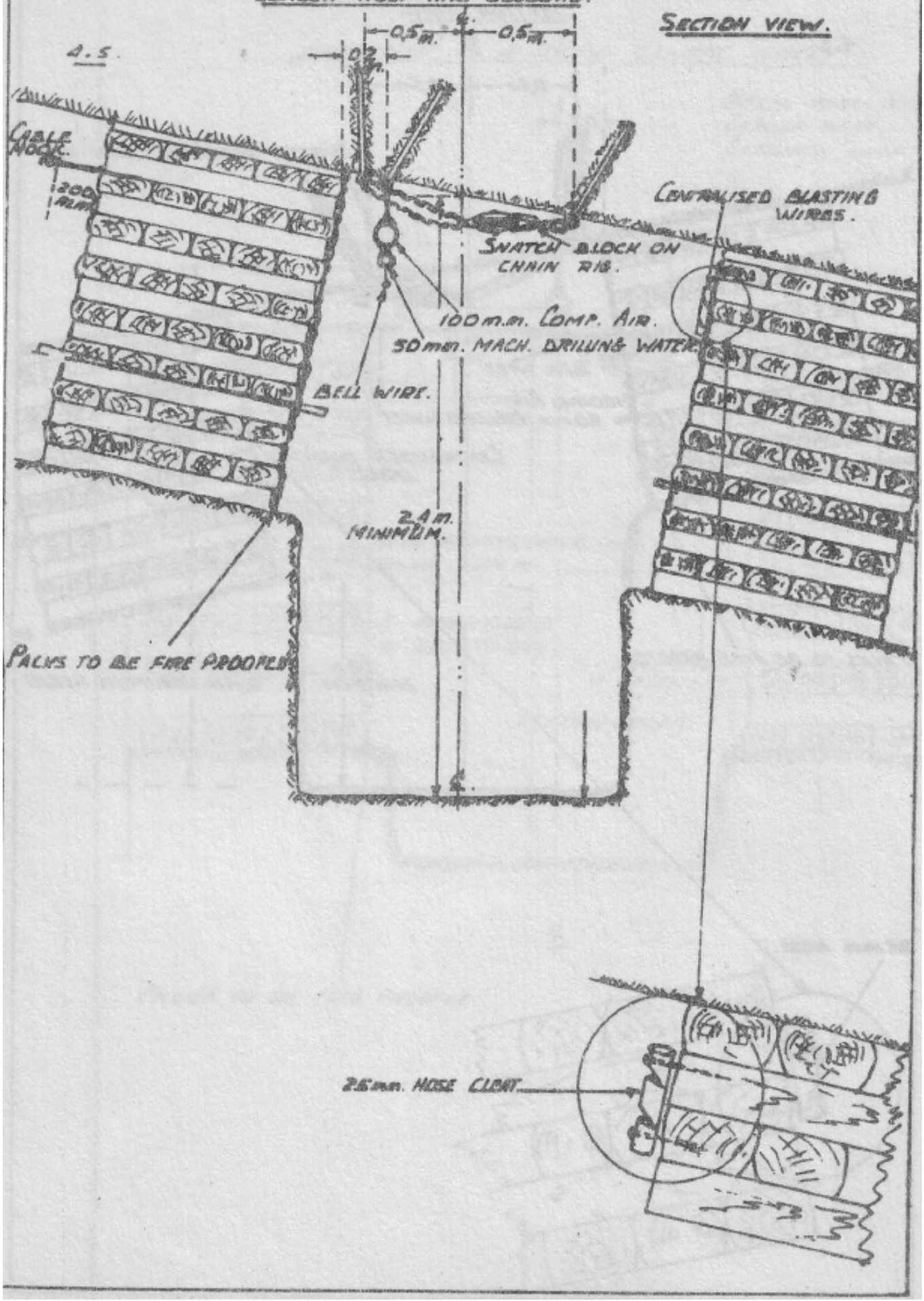


EQUIPMENT IN A STOPE STRIKE GULLY.

BASAL REEF OPEN.
LEADER REEF AND ELSBURG.

SKETCH No. 42

SECTION VIEW.



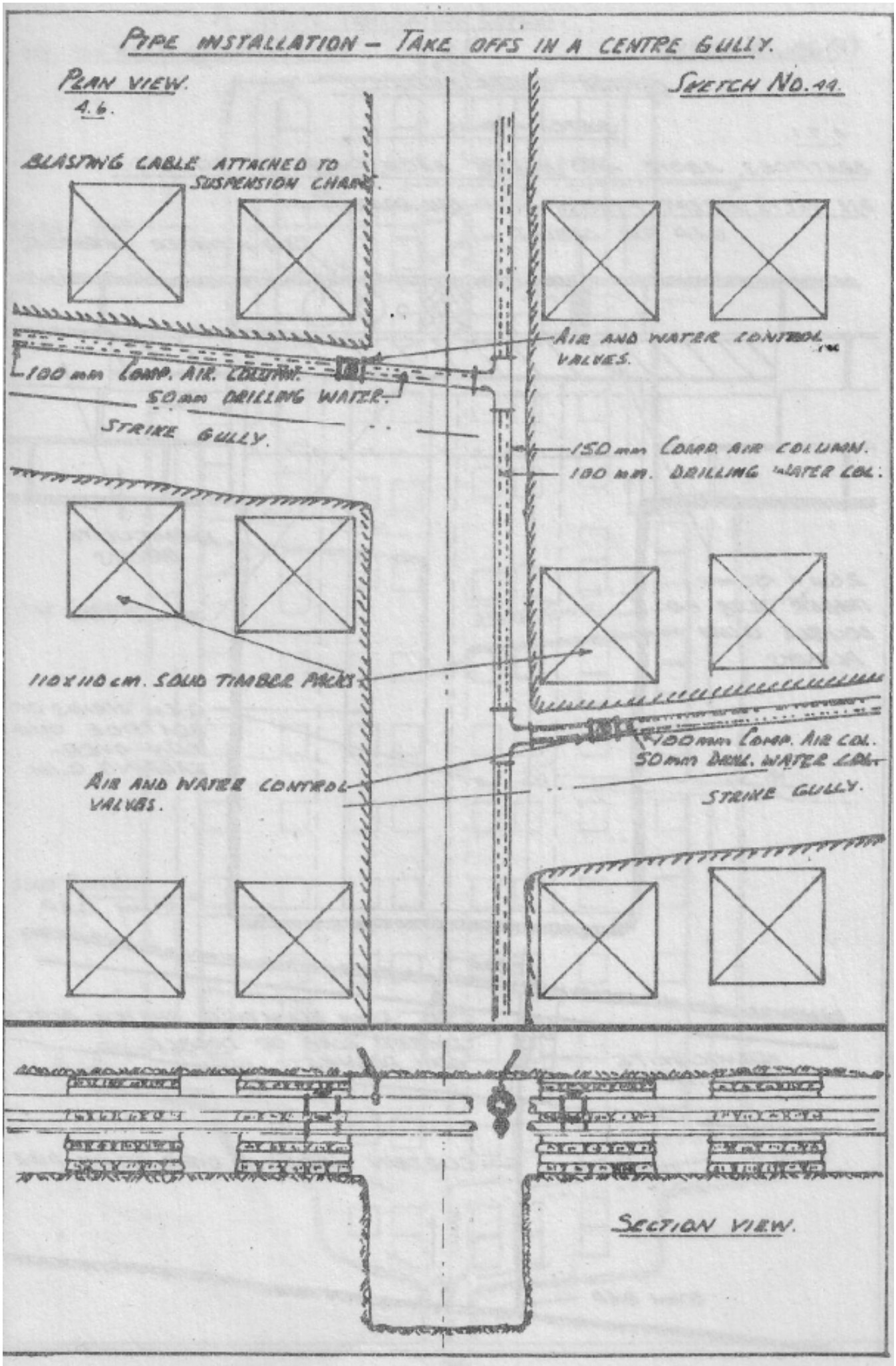
5.3.2 Pack Sizes for the Various Average Conditions are as below:

STOPING WIDTH	PACK SIZE	SKIN TO SKIN SPACING (MAX)	
		DIP	STRIKE
Nil to 150 cm	75 cm x 75 cm	2,5 m	2,5 m
150 cm to 300 cm	110 cm x 110 cm	2,5 m	2,5 m
300 cm and over	See Pyrite stoping		
"B" reef stoping width	"B" Reef pack size		
Nil to 110 cm	75 cm x 75 cm	1,8 m	1,8 m
110 cm to 250 cm	110 cm x 110 cm	1,8 m	1,8 m
250 cm to 300 cm	220 cm x 110 cm	1,8 m	1,8 m

PIPE INSTALLATION – TAKE OFFS IN A CENTRE GULLY.

PLAN VIEW.
4.6.

SKETCH NO. 44.

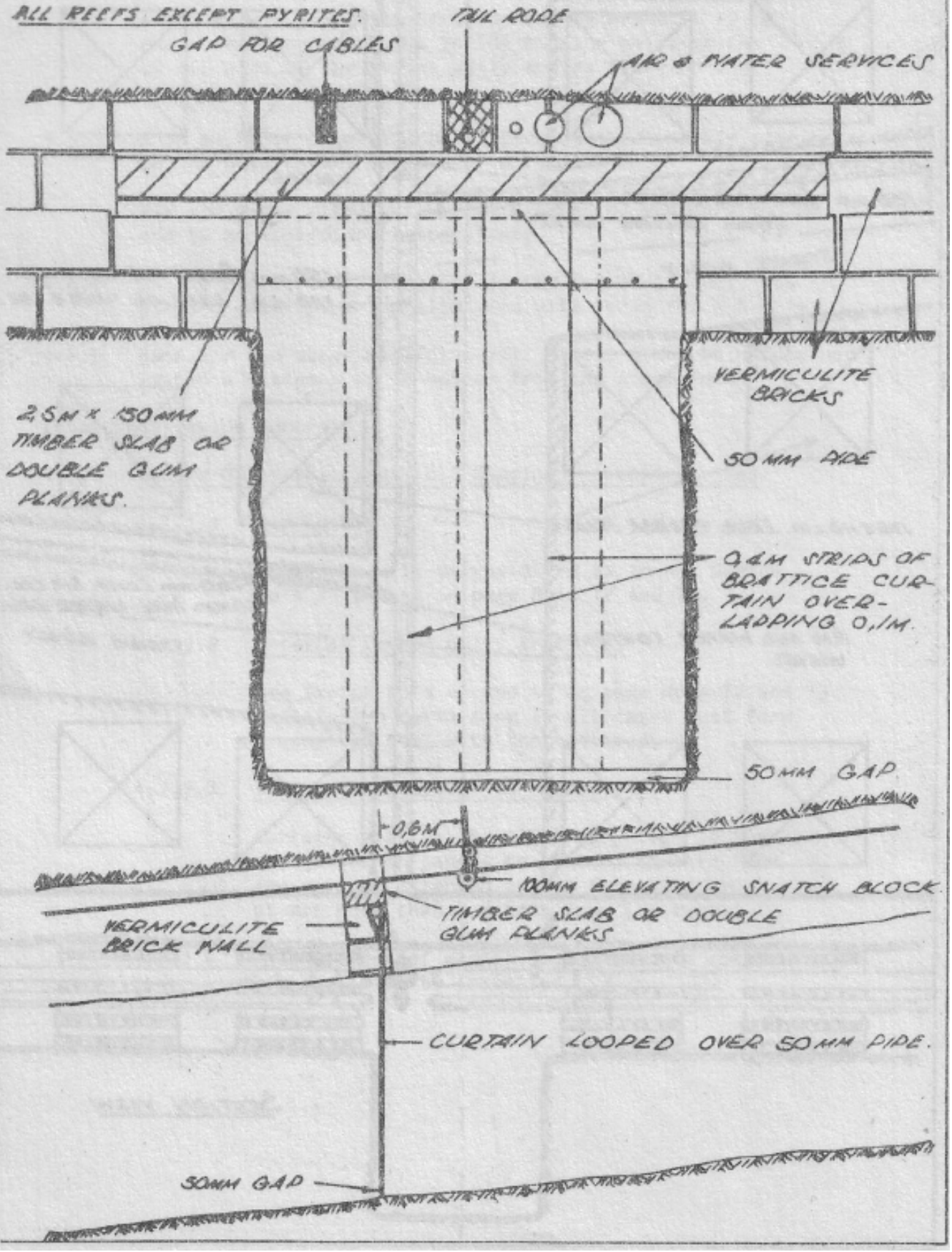


CENTRE GULLY BRATTICE

4.7.1. SKETCH NO. 45.

BRATTICES ABOVE AND BELOW EACH PAIR OF GULLIES

ALL REEFS EXCEPT PYRITES.

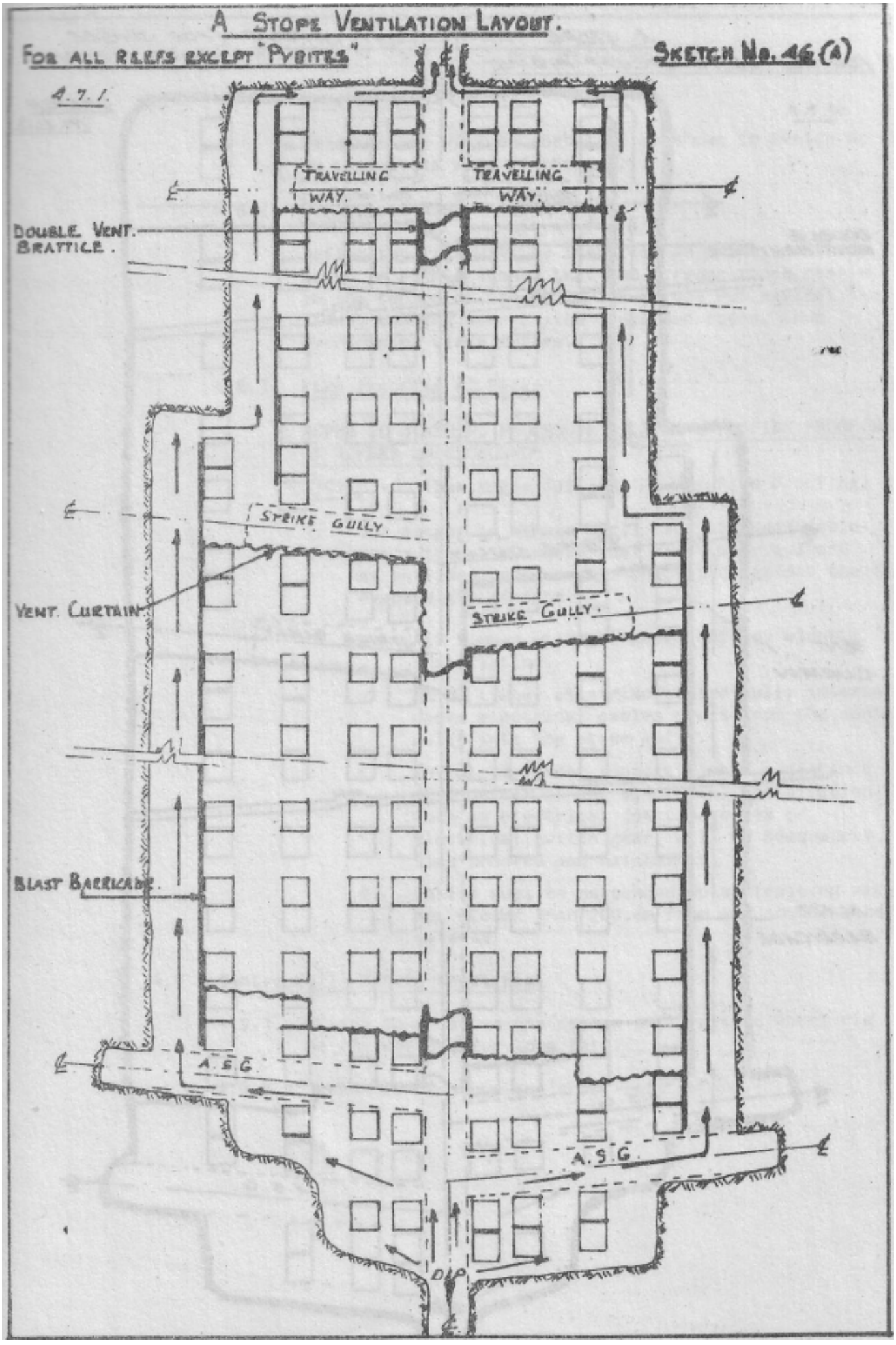


A STOPE VENTILATION LAYOUT.

FOR ALL REEFS EXCEPT "PYRITES"

SKETCH No. 46 (A)

4.7.1.

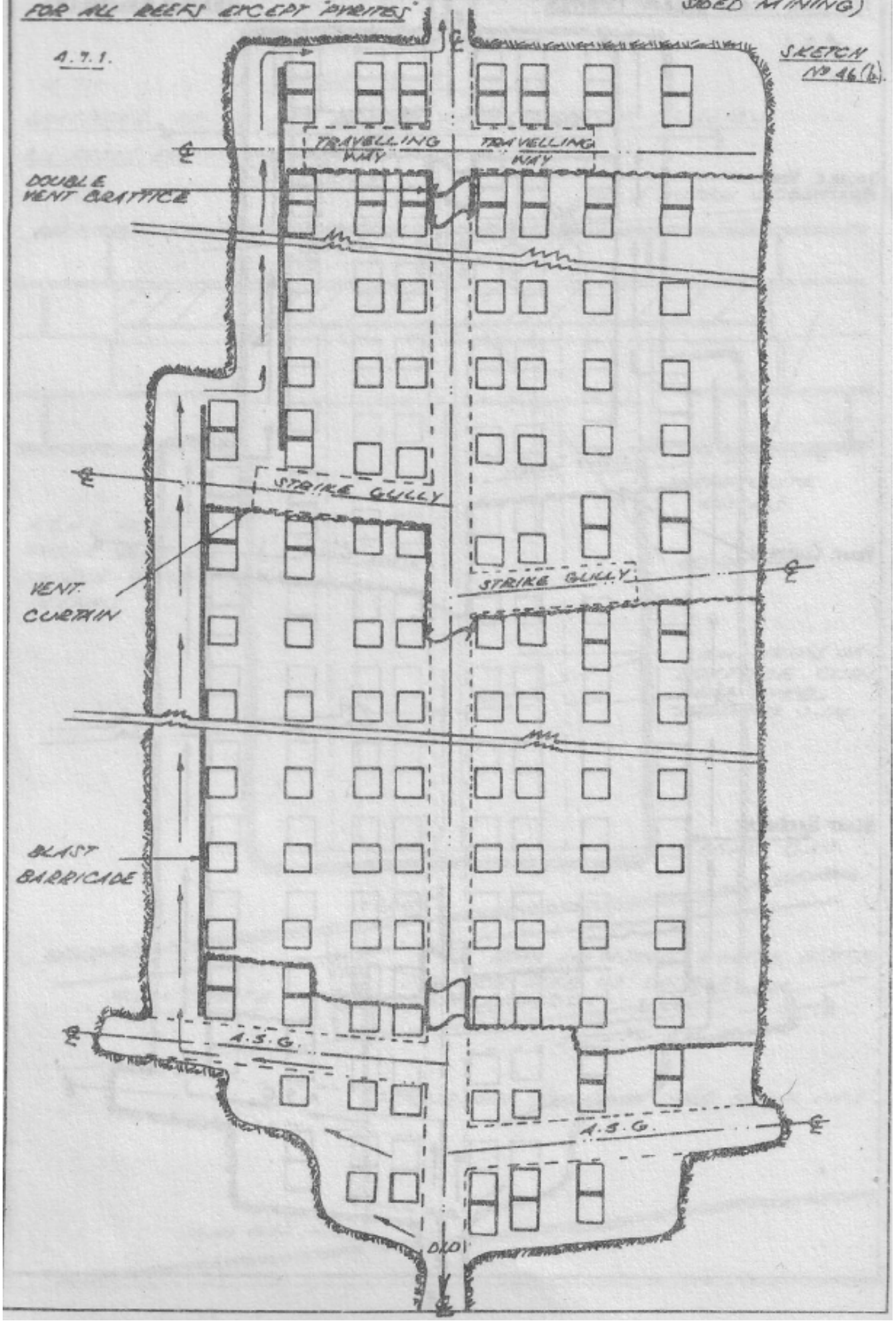


A STOPE VENTILATION LAYOUT (FOR SINGLE SIDED MINING)

FOR ALL REEFS EXCEPT PYRITES

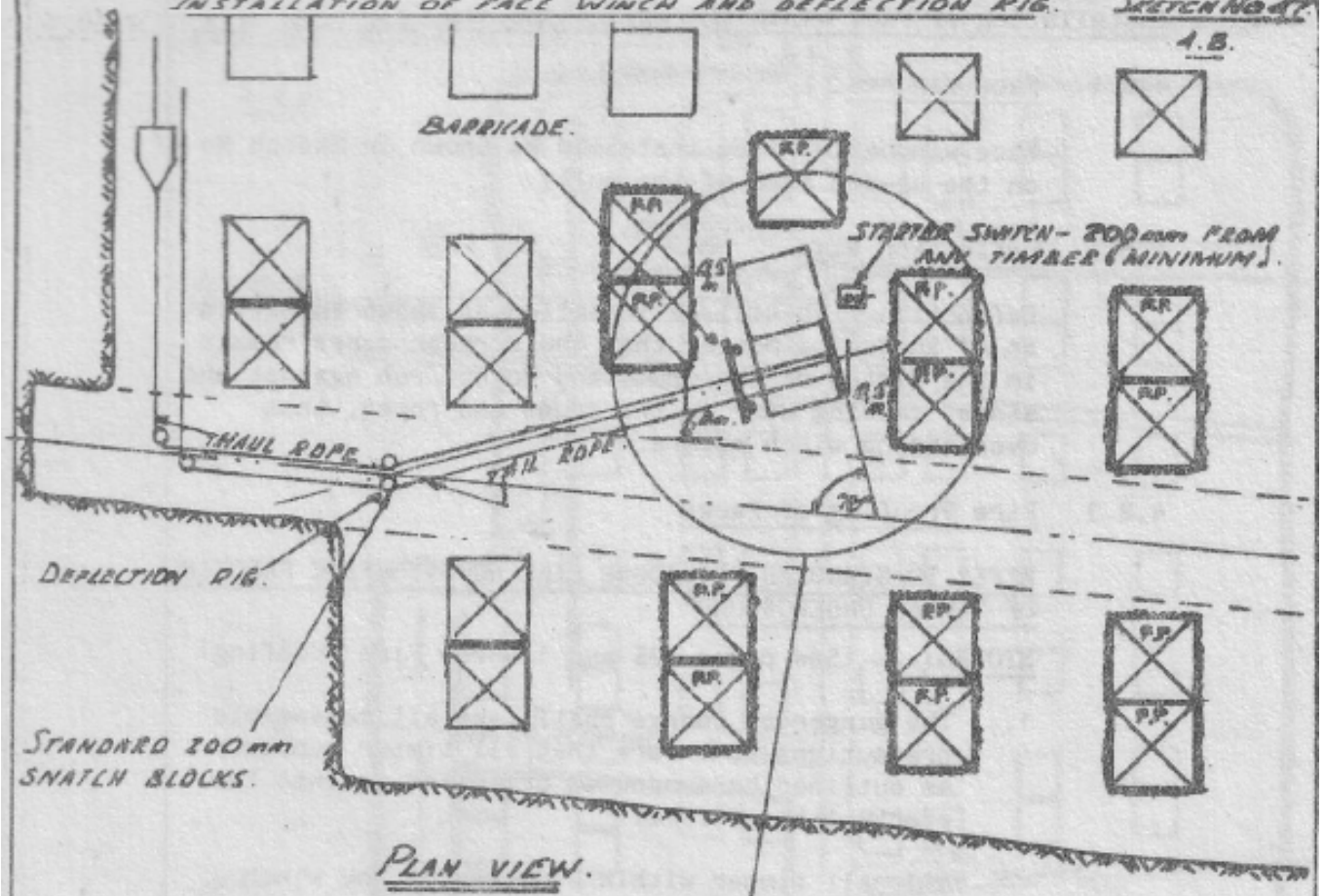
4.7.1.

SKETCH No 46(b).



INSTALLATION OF FACE WINCH AND DEFLECTION RIG. SKETCH No 47.

1.B.

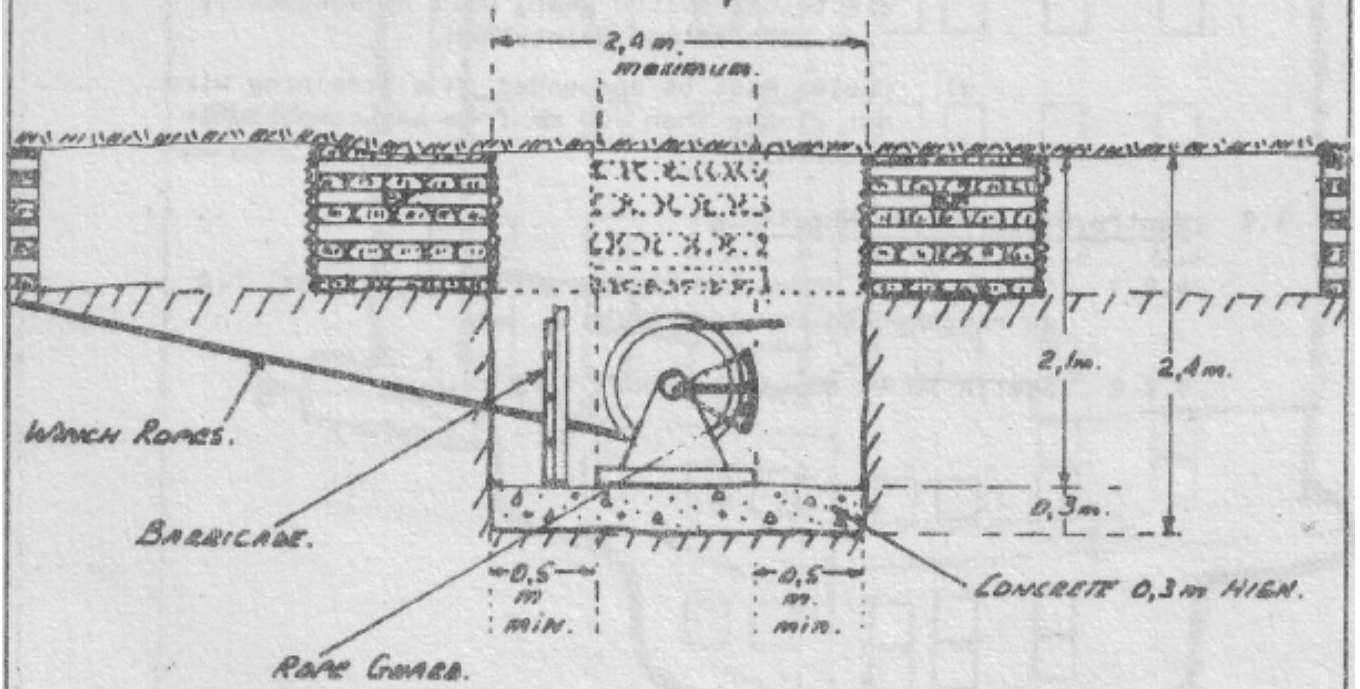


PLAN VIEW.

SECTION VIEW.

WINCH EXCAVATION DIMENSIONS.

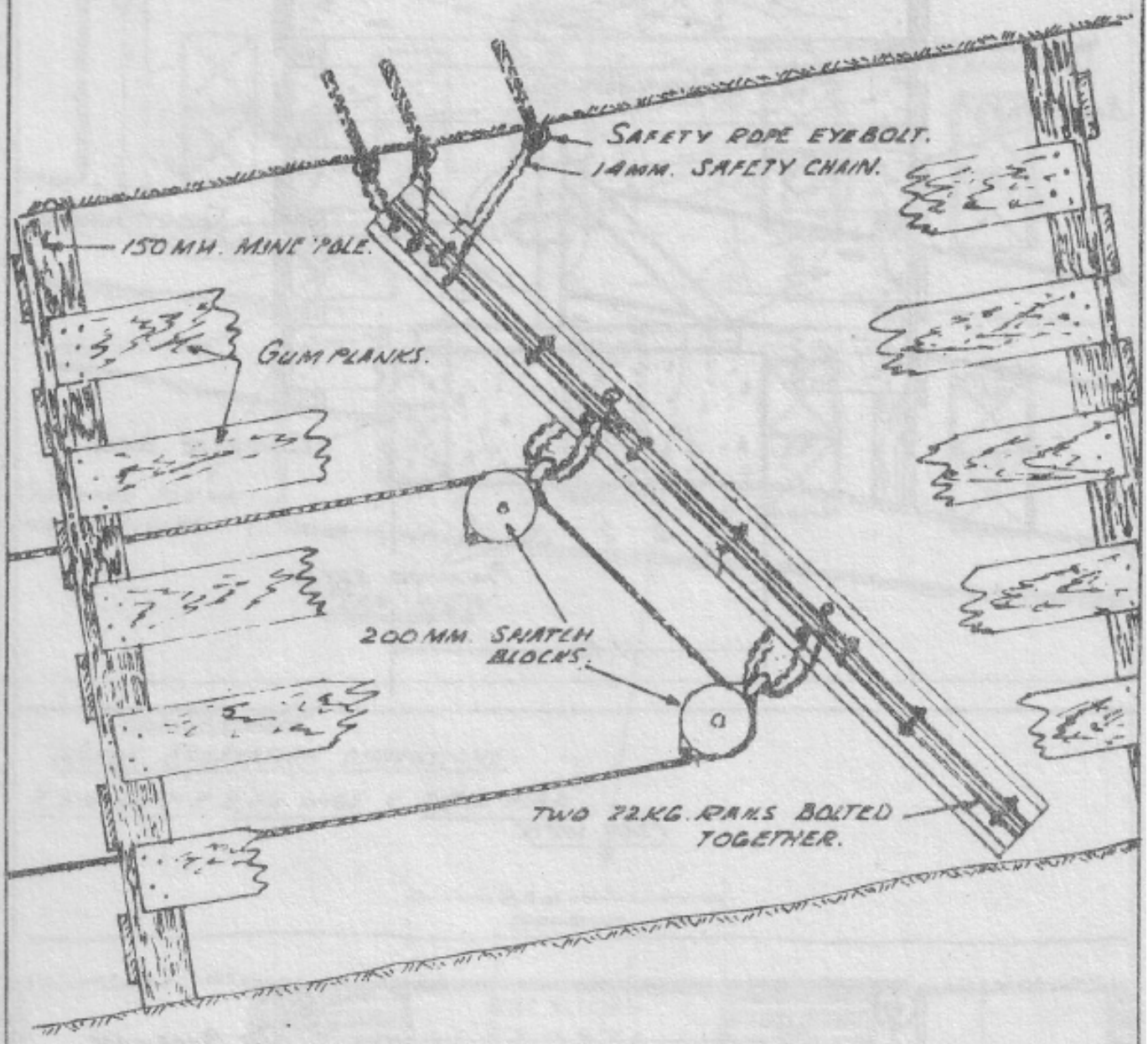
2,8m DEEP x 2,4m. WIDE x 2,4m HIGH.



CENTRE GULLY RETURN WHEEL RIG.
(SHORT TERM METHOD.)

SKETCH No. 49.

4.9.2.

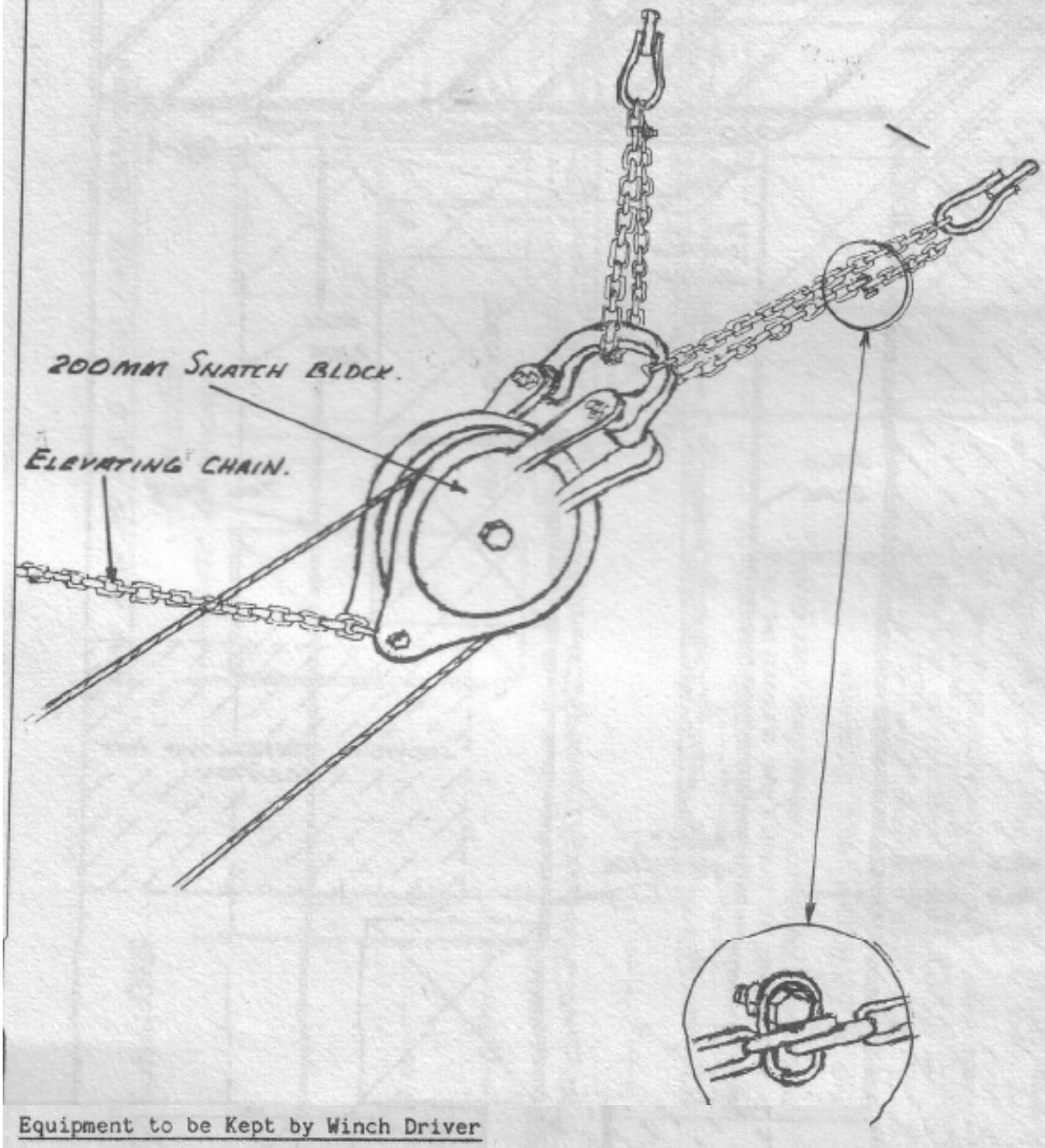


INSTALLATION OF STANDARD SCRAPER RIGS.

SKETCH NO. 48.

RETURN WHEEL RIGS FOR SCRAPER GULLIES.

THE EYEBOLT HOLES MUST BE DRILLED CONCURRENTLY WITH THE ROUND, USING A JUMPER AT LEAST 400MM LONGER THAN THE BLAST HOLES.
THE SNATCH BLOCK WILL BE SECURED FROM AT LEAST TWO ANCHORING POINTS (EYE BOLTS) WITH TWO SEPARATE 14 MM LONG LINK CHAINS



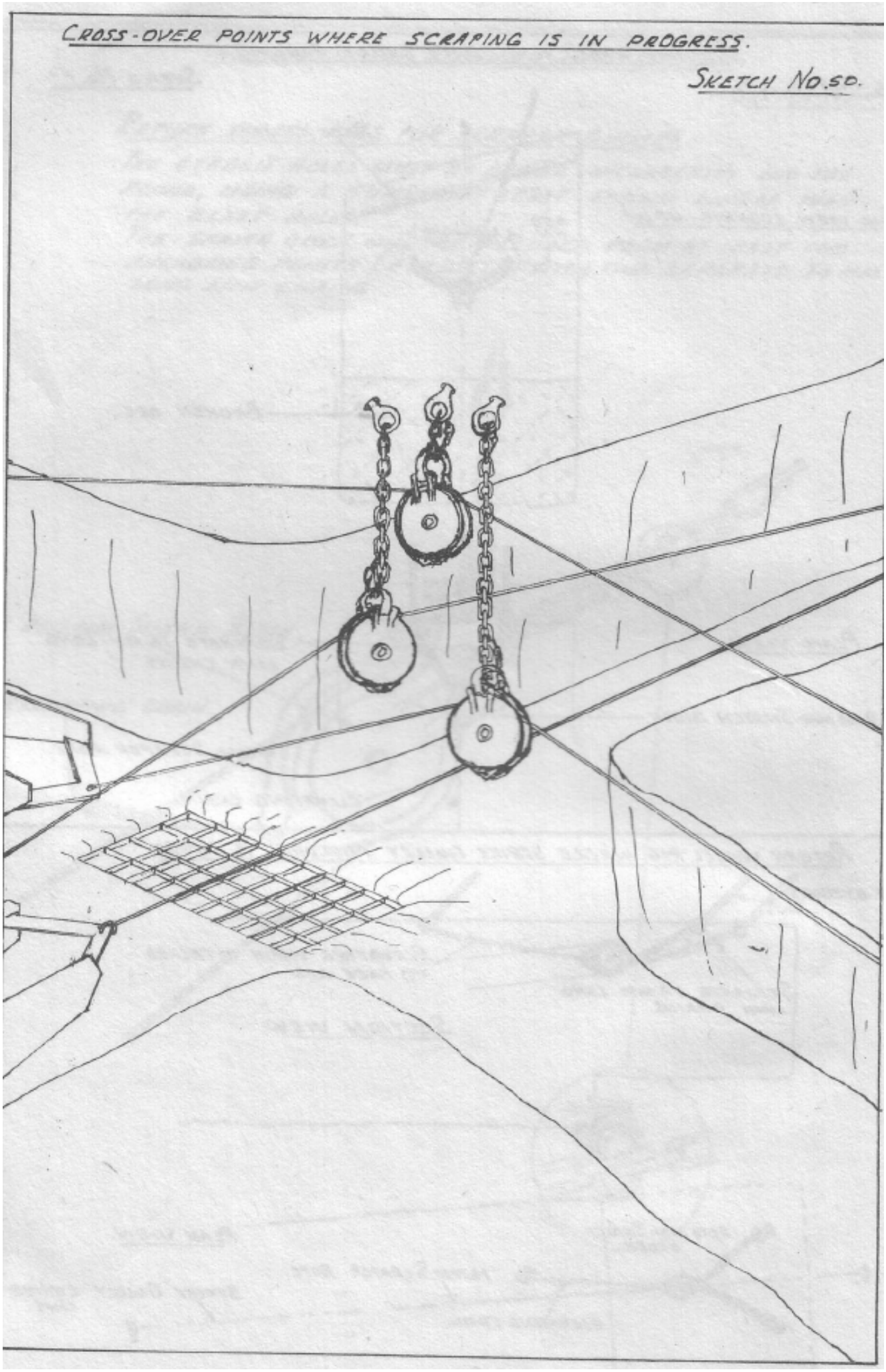
Equipment to be Kept by Winch Driver

Equipment for cleaning the face.

1. Spare eyebolts
2. 200 mm snatch blocks
3. 100 mm snatch blocks
4. Spare bolts and nuts
5. 14 mm long link chain
6. 2 Kg hammers
7. 4 Kg hammers
8. Splicing tools
9. Cold sets
10. 2 x 19 mm Box spanners
11. 2 x 19 mm Flat spanners
12. 2 x 16 mm Box spanners
13. 2 x 16 mm Flat spanners
14. 1,2 m and 2 m pinch bars
15. Triangular danger signs
16. 1 Spare coil of scraper rope
17. Bell wire

CROSS-OVER POINTS WHERE SCRAPING IS IN PROGRESS.

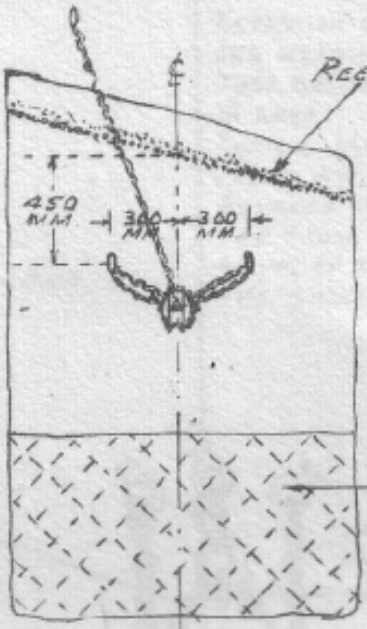
SKETCH NO. 50.

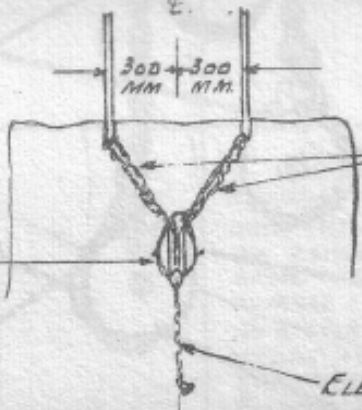


RETURN WHEEL IN A STRIKE GULLEY HEADING.

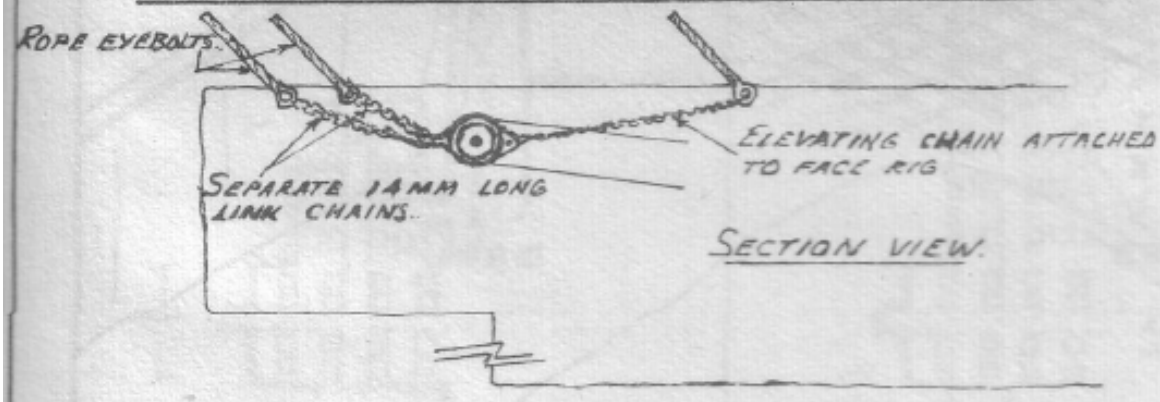
ALL REEFS.

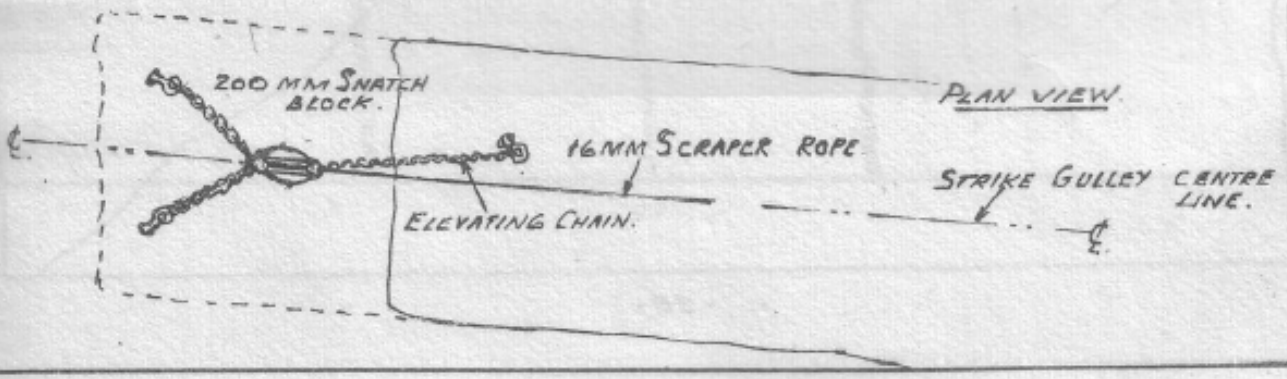
SKETCH No. 49.





RETURN WHEEL RIG WHERE STRIKE GULLEY FOOTWALL IS LIFTED.





PANEL CLEANING - FACE SCRAPING.

FOR ALL REEFS EXCEPT 'PYRITES'.

SKETCH NO 45.

CLEANING:

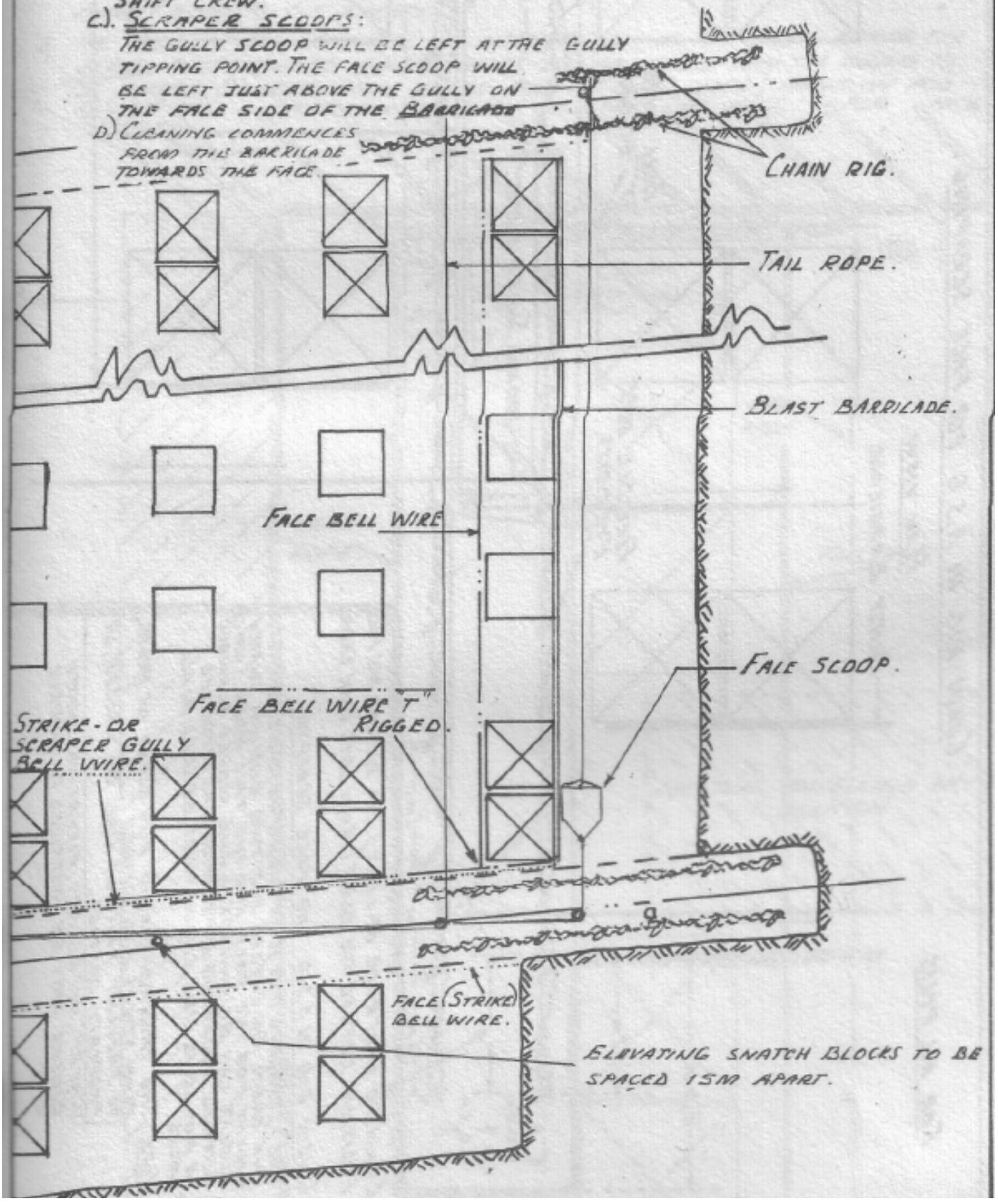
DAY SHIFT PREPARATION FOR NIGHT SHIFT CLEANING:

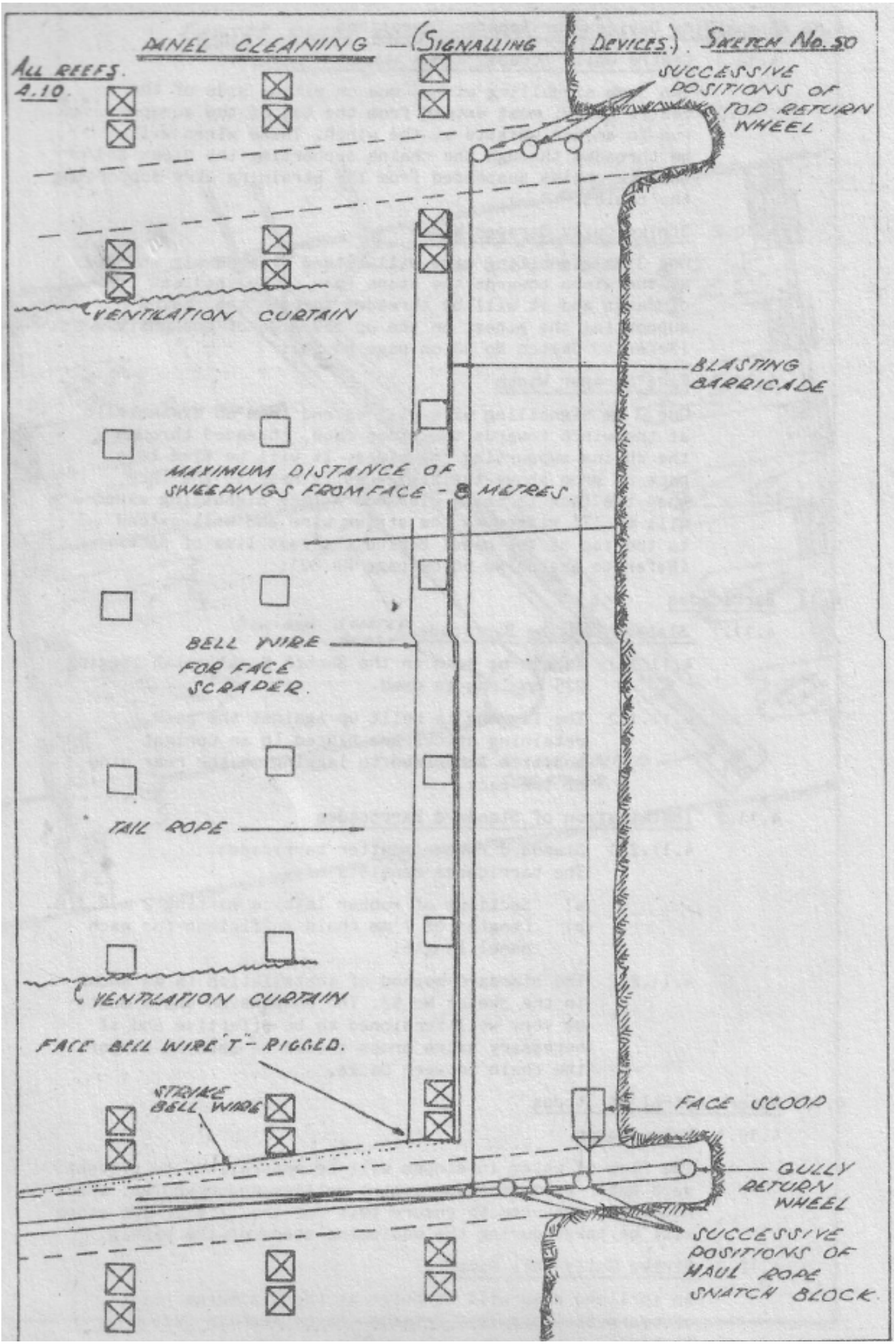
a) ALL RIG HOLES MUST BE DRILLED AND RIGS INSTALLED TO STANDARD, BY THE DAY SHIFT CREW.

b). THE FACE SCRAPER ROPES ARE TO BE TIED UP AGAINST THE HANGING ON THE BARRICADE BY THE DAY SHIFT CREW. A SUBSTANTIAL LOOP OF ROPE MUST BE LEFT AT THE TOP LIMIT OF THE PANEL FOR RIGGING PURPOSES BY THE NIGHT SHIFT CREW.

c). SCRAPER SCOOPS:
THE GULLY SCOOP WILL BE LEFT AT THE GULLY TIPPING POINT. THE FACE SCOOP WILL BE LEFT JUST ABOVE THE GULLY ON THE FACE SIDE OF THE BARRICADE

D) CLEANING COMMENCES FROM THE BARRICADE TOWARDS THE FACE



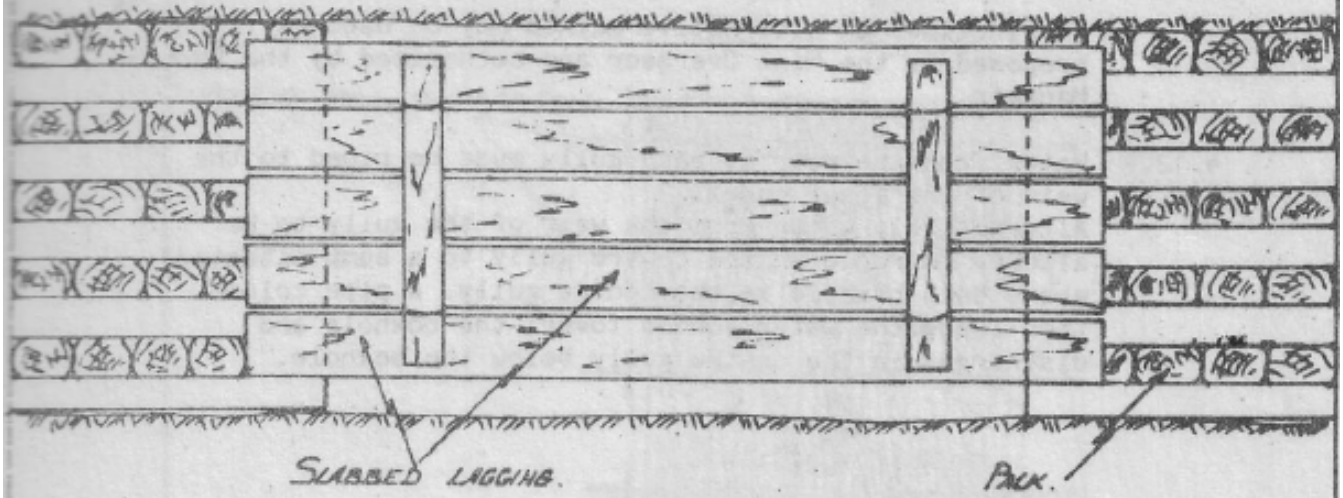

PANEL CLEANING — (SIGNALLING DEVICES). SKETCH No. 50
ALL REEFS.
A.10.
SUCCESSIVE POSITIONS OF TOP RETURN WHEEL
VENTILATION CURTAIN
BLASTING BARRICADE
MAXIMUM DISTANCE OF SWEEPINGS FROM FACE - 8 METRES.
BELL WIRE FOR FACE SCRAPER.
TAIL ROPE
VENTILATION CURTAIN
FACE BELL WIRE 'T' - RIGGED.
STRIKE BELL WIRE
FACE SCOOP
GULLY RETURN WHEEL
SUCCESSIVE POSITIONS OF HAUL ROPE SNATCH BLOCK.

SLABBED LAGGING BARRICADE.

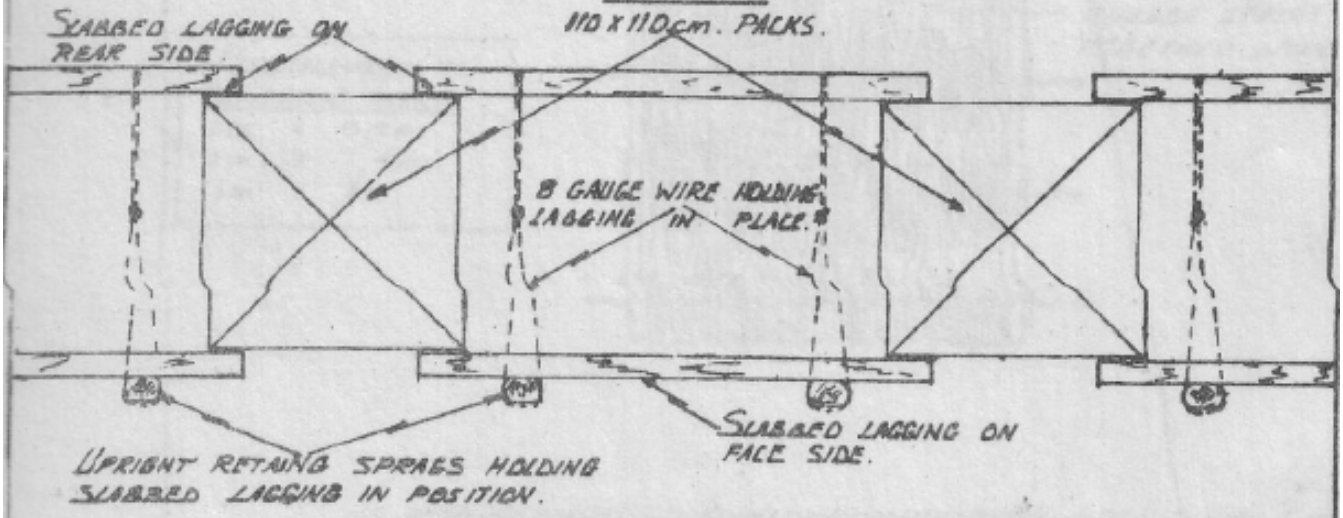
SKETCH No. 51.

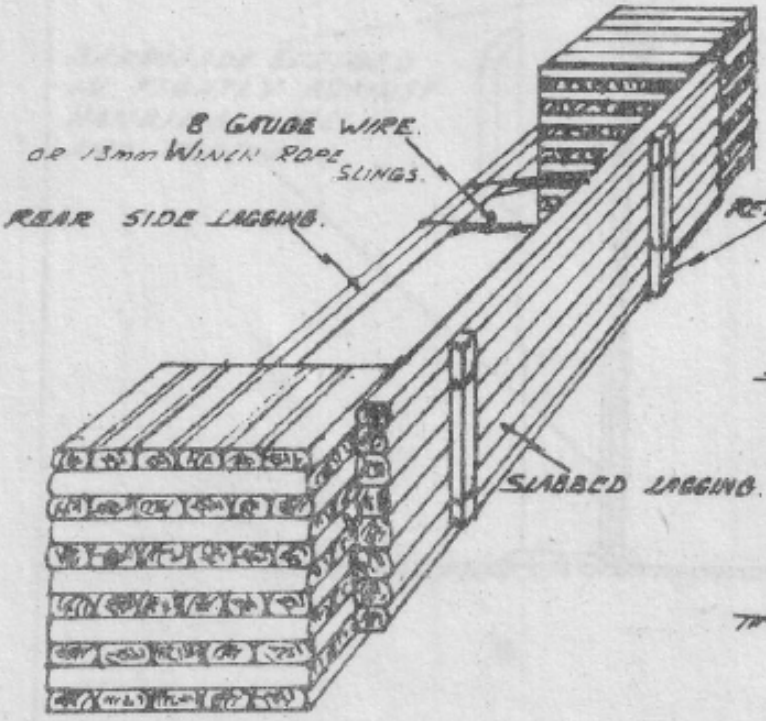
4.11.1.

SECTION VIEW.

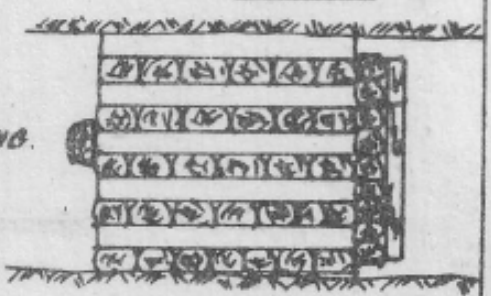


PLAN VIEW.





END VIEW.

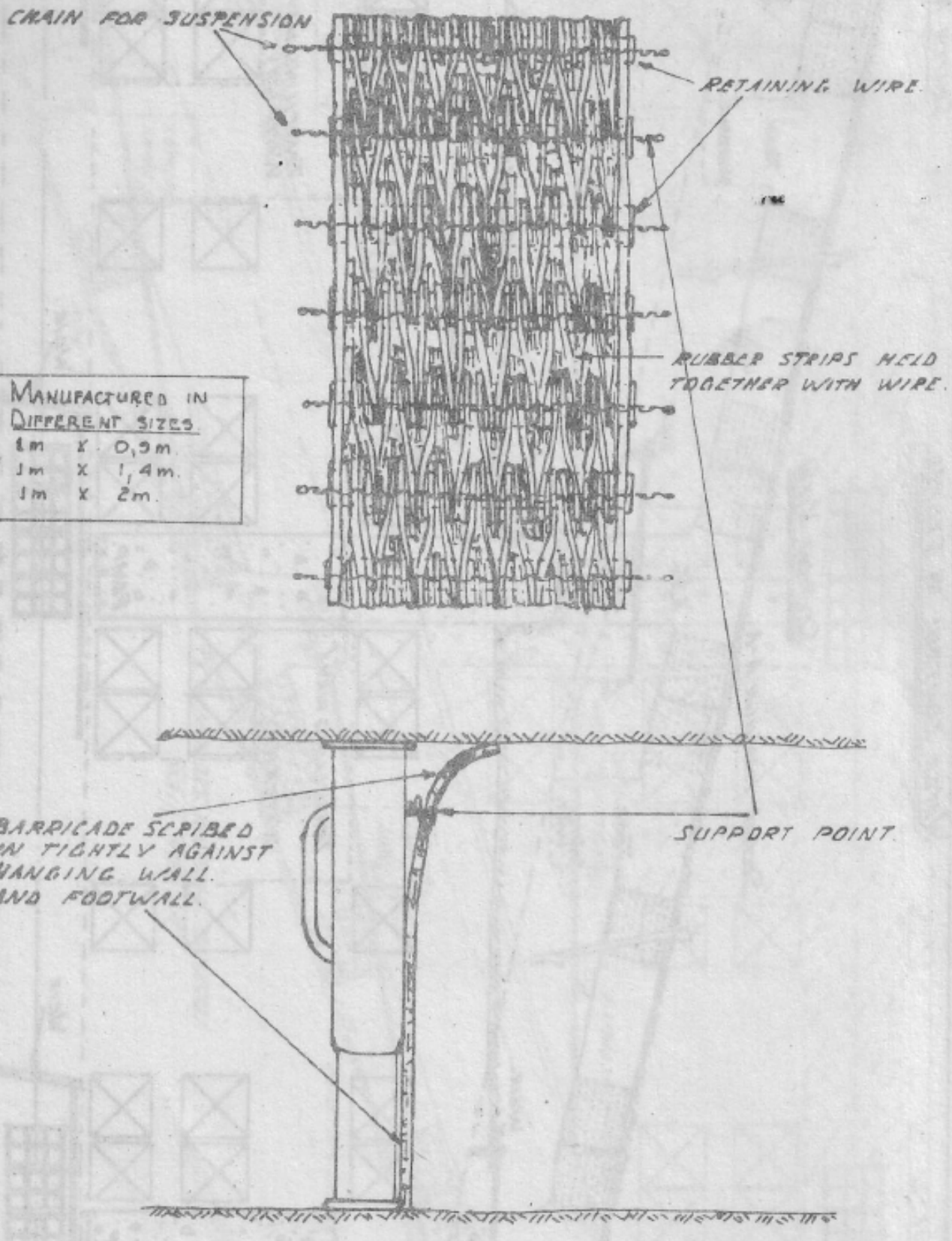


RUBBER BLAST BARRICADES.

SKETCH NO. 52.

4.11.2.

FRONT VIEW.

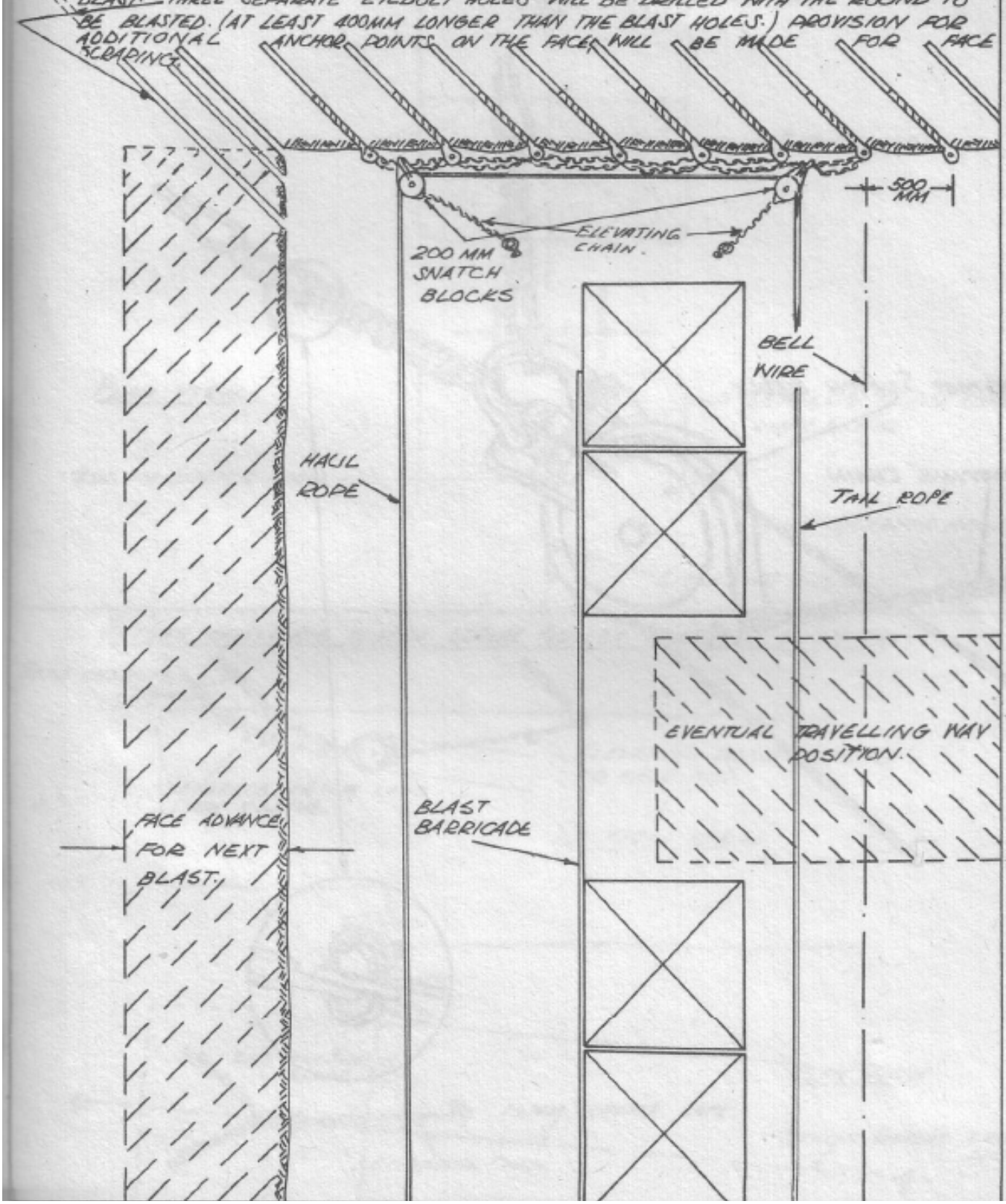


CHAIN RIG FOR SOLID ABUTMENTS

SKETCH NO. 47.

PLAN VIEW

1. THE RIG WILL CONSIST OF A ROW OF FLEXIBLE ROPE EYEBOLTS DRILLED INTO THE ABUTMENT SPACED 500 MM APART WITH A DOUBLE 14MM LONG LINK CHAIN THREADED THROUGH THE EYEBOLTS AND BOLTED BY MEANS OF BOLTS AND NUTS OR "DAVIDSON LINKS" BETWEEN THE EYEBOLTS.
2. THE EYEBOLTS AND CHAIN WILL BE INSTALLED UP TO THE FACE BEFORE THE BLAST. THREE SEPARATE EYEBOLT HOLES WILL BE DRILLED WITH THE ROUND TO BE BLASTED. (AT LEAST 400MM LONGER THAN THE BLAST HOLES.) PROVISION FOR ADDITIONAL ANCHOR POINTS ON THE FACE WILL BE MADE FOR FACE SCRAPING.



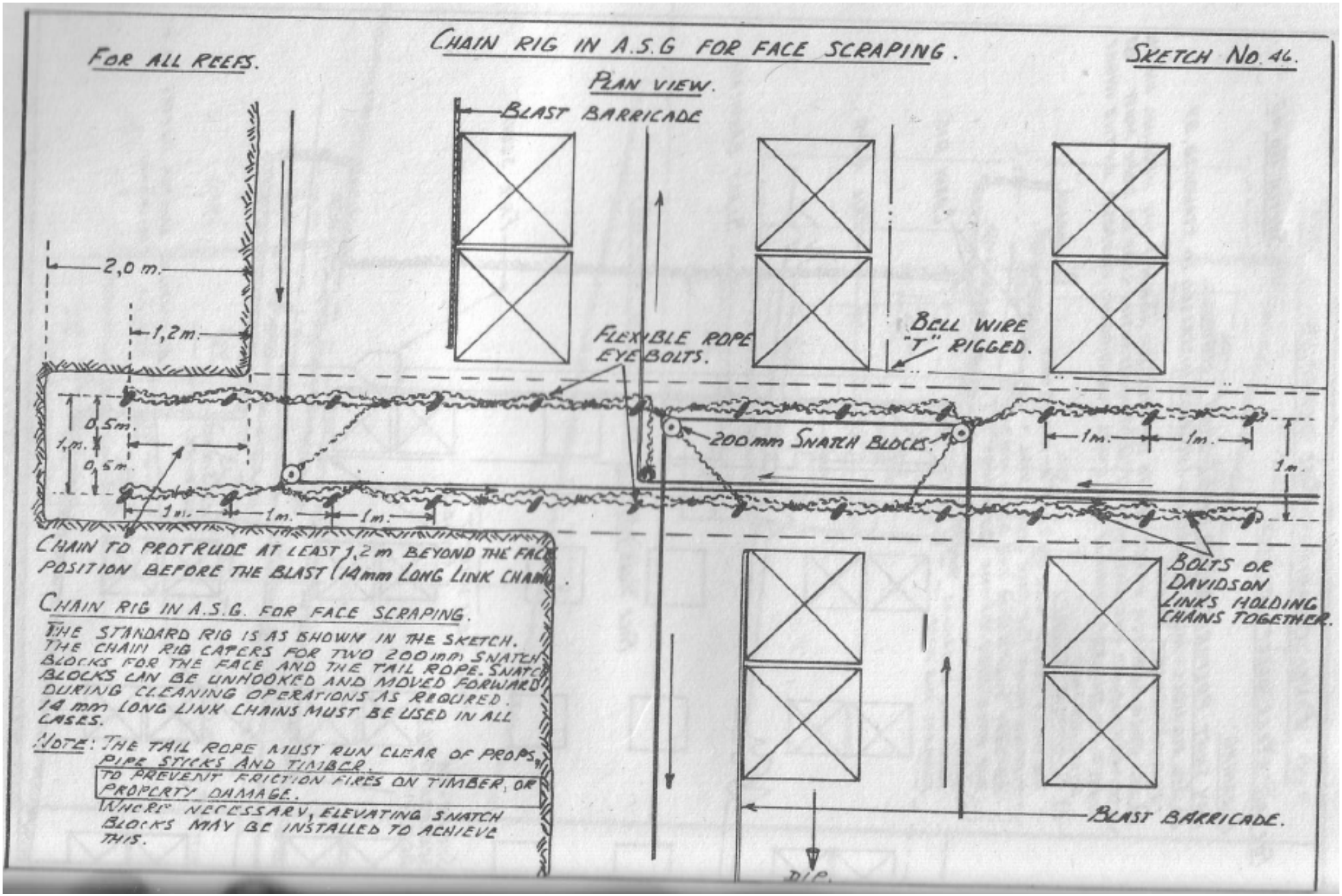
Main reef leader (conglomerate)

FOR ALL REEFS.

CHAIN RIG IN A.S.G FOR FACE SCRAPING.

SKETCH NO. 46.

PLAN VIEW.



CHAIN RIG IN A.S.G. FOR FACE SCRAPING.

THE STANDARD RIG IS AS SHOWN IN THE SKETCH. THE CHAIN RIG CATERS FOR TWO 200mm SNATCH BLOCKS FOR THE FACE AND THE TAIL ROPE. SNATCH BLOCKS CAN BE UNHOOKED AND MOVED FORWARD DURING CLEANING OPERATIONS AS REQUIRED. 14 mm LONG LINK CHAINS MUST BE USED IN ALL CASES.

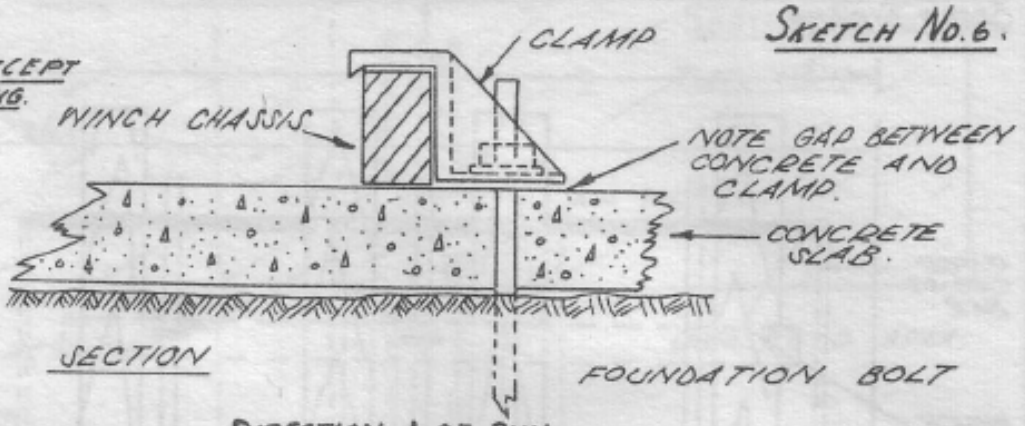
NOTE: THE TAIL ROPE MUST RUN CLEAR OF PROPS, PIPE STICKS AND TIMBER.
TO PREVENT FRICTION FIRES ON TIMBER, OR PROPERTY DAMAGE.
WHERE NECESSARY, ELEVATING SNATCH BLOCKS MAY BE INSTALLED TO ACHIEVE THIS.

ILLUSTRATION

RESIN GROUTED ANCHOR BOLTS

SKETCH No.6.

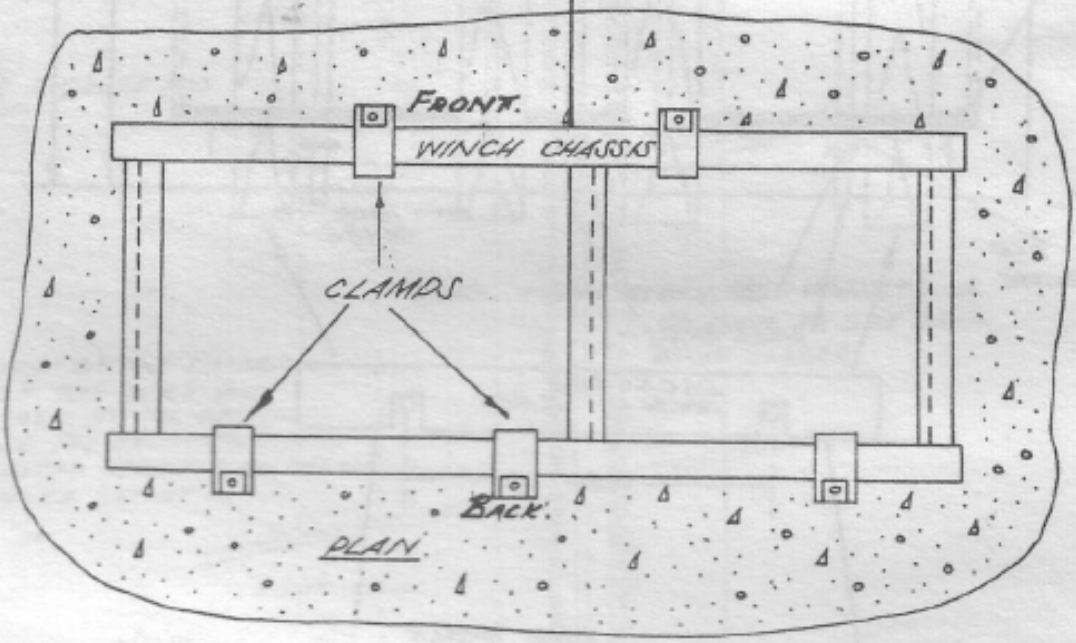
ALL AREAS EXCEPT STEEP STOPING.



SECTION

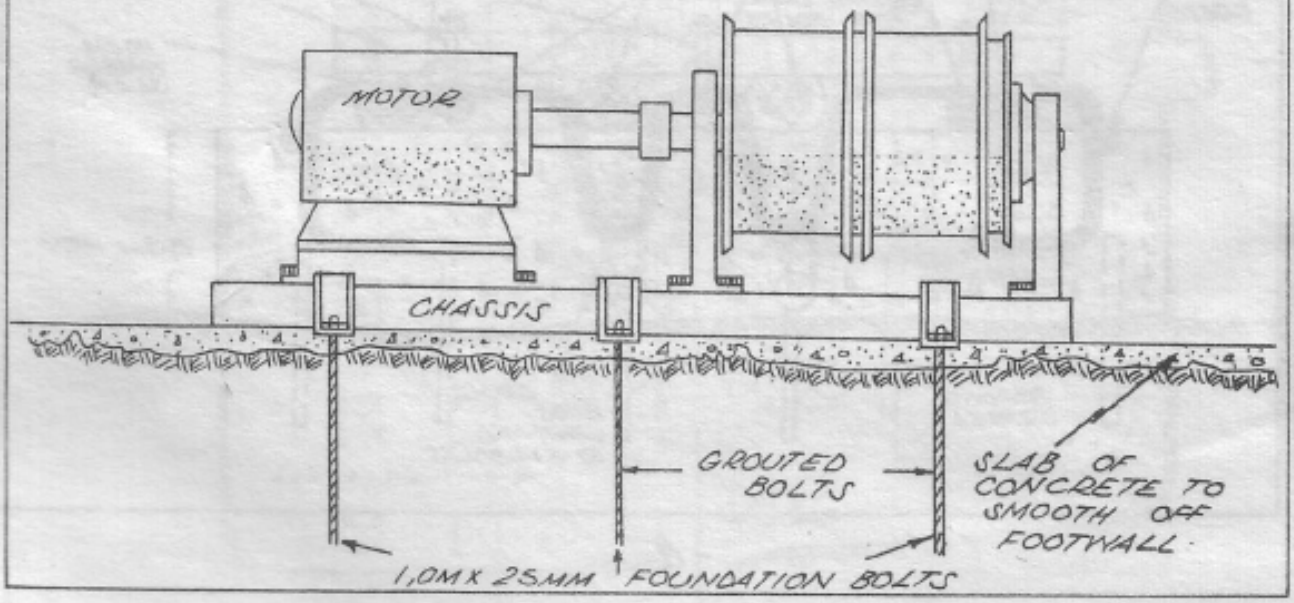
FOUNDATION BOLT

DIRECTION OF PULL.

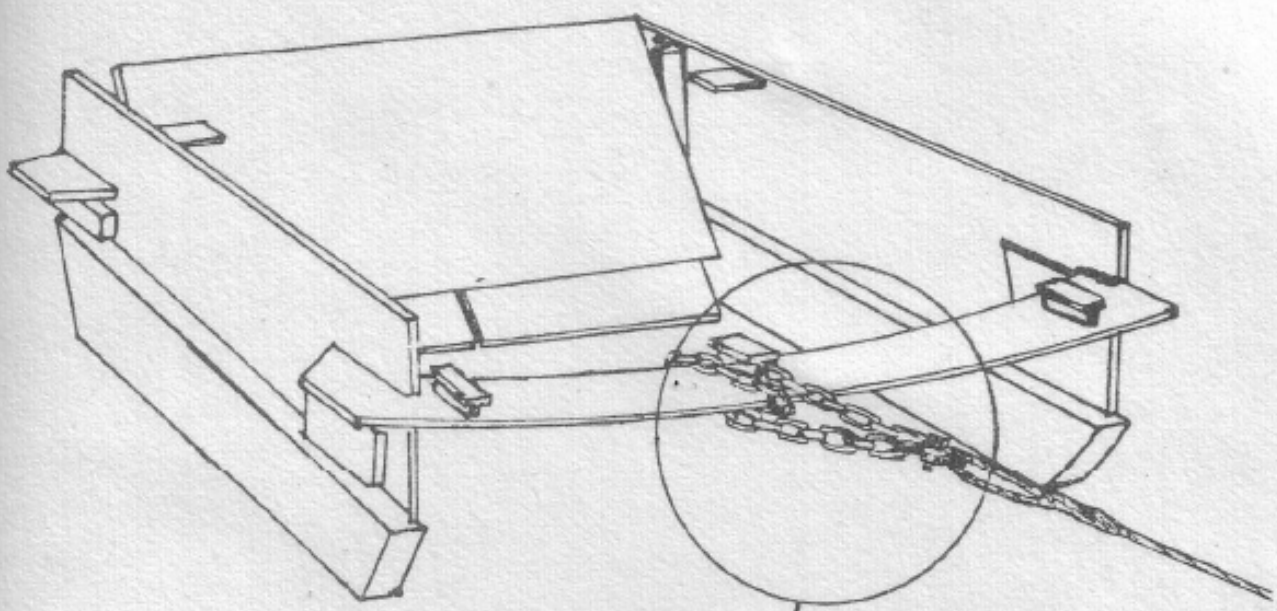


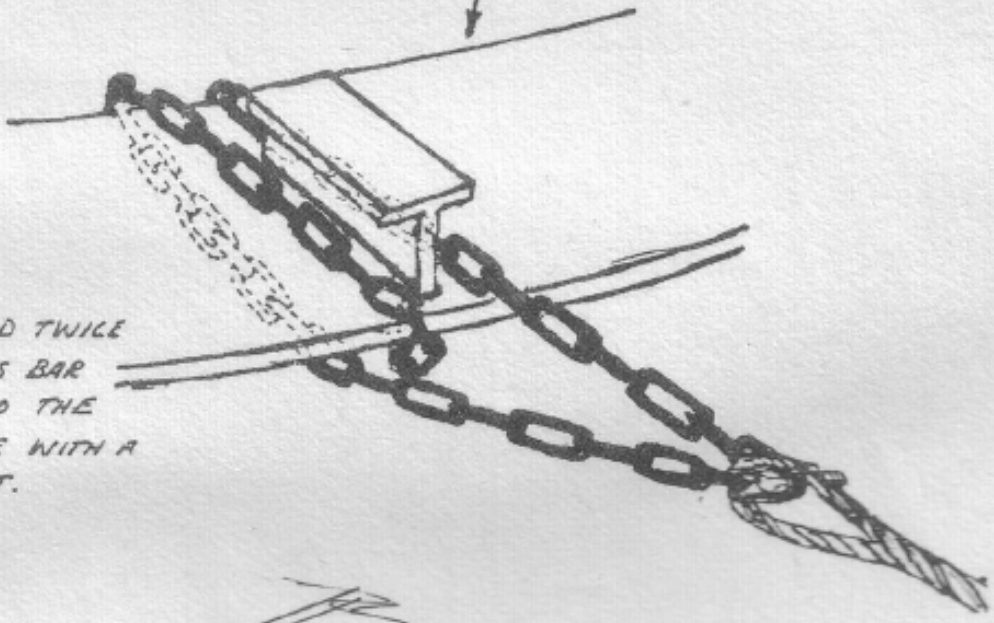
PLAN

BACKVIEW OF WINCH SHOWING CLAMP POSITIONS

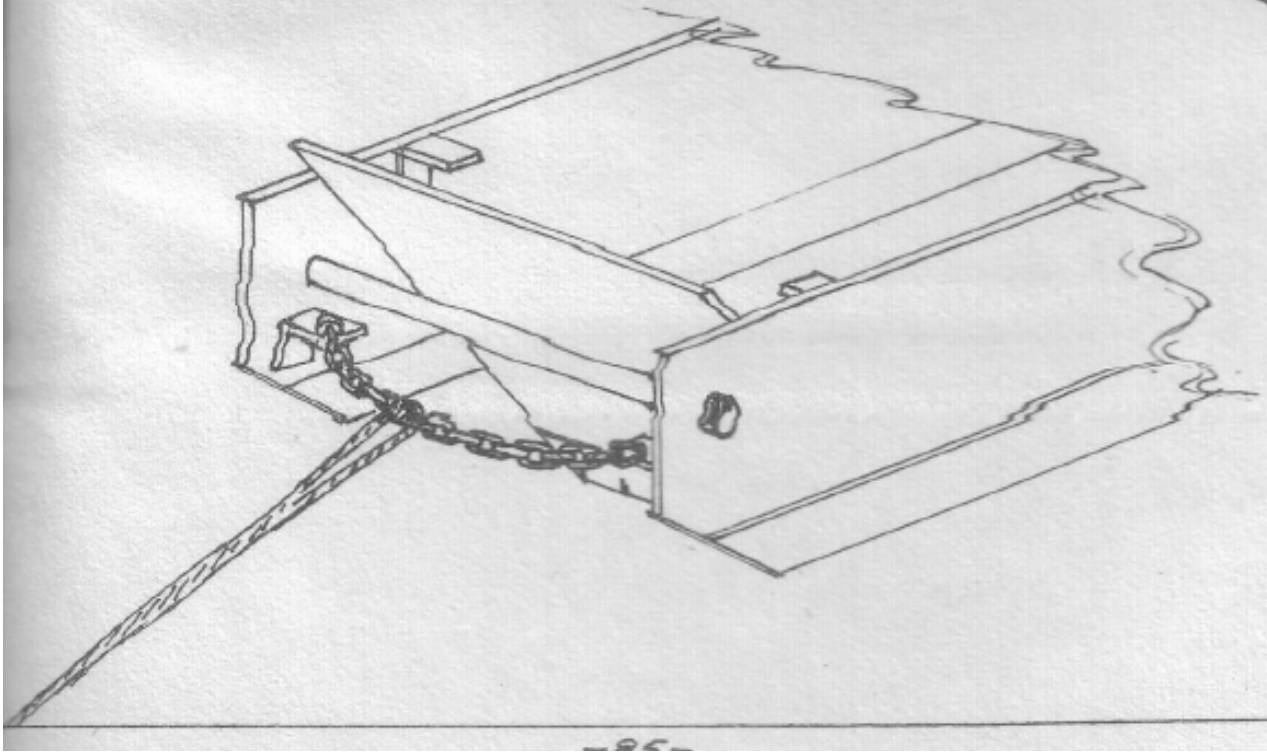


METHOD OF ATTACHING A WINCH ROPE TO A SCRAPER. SCOOP.



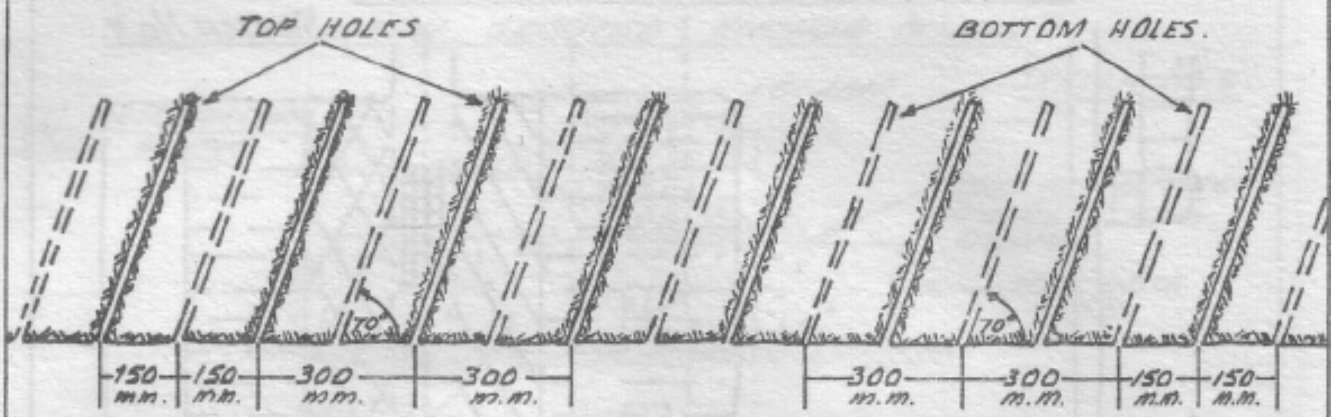


A 14MM LONG LINK CHAIN IS TO BE WOUND TWICE AROUND SCRAPER CROSS BAR AND THEN ATTACHED TO THE SCRAPER (WINCH) ROPE WITH A 20 MM BOLT AND NUT.

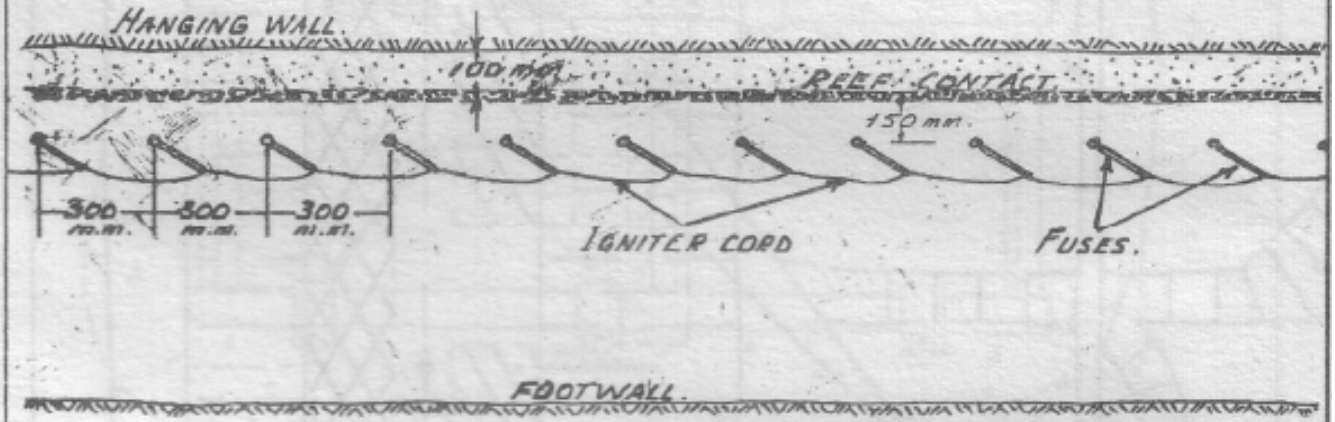


DRILLING AND BLASTING — BASAL UNDERCUT.

PLAN VIEW. — SKETCH No. 8.

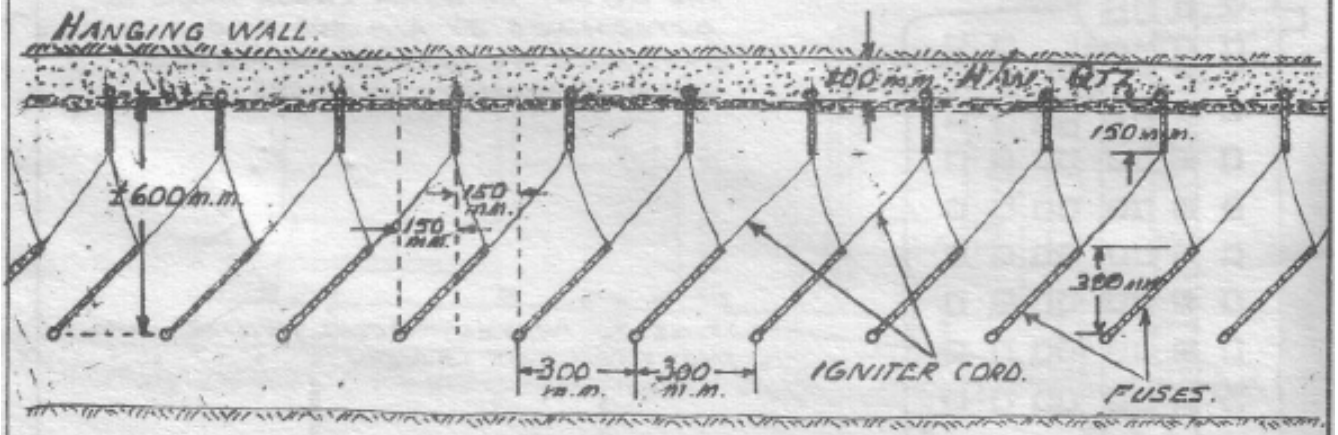


FIRST BLAST — TOP HOLES ONLY — SECTION VIEW.



FROM SECOND BLAST ONWARDS — TOP AND BOTTOM HOLES.

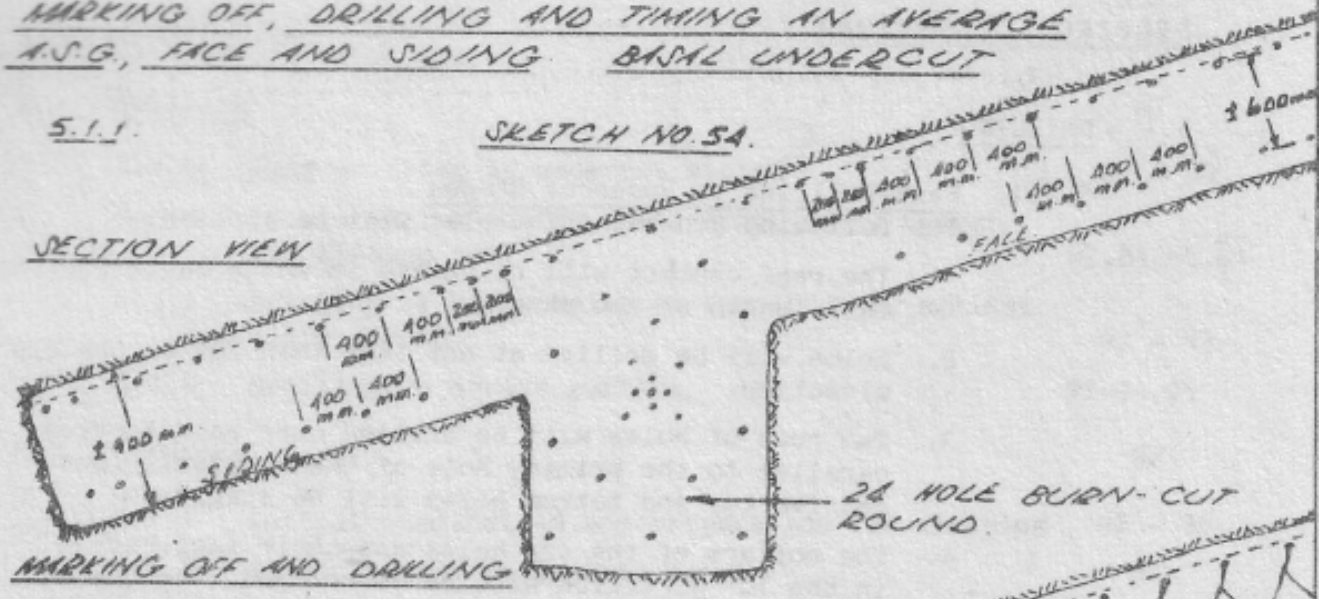
SECTION VIEW.

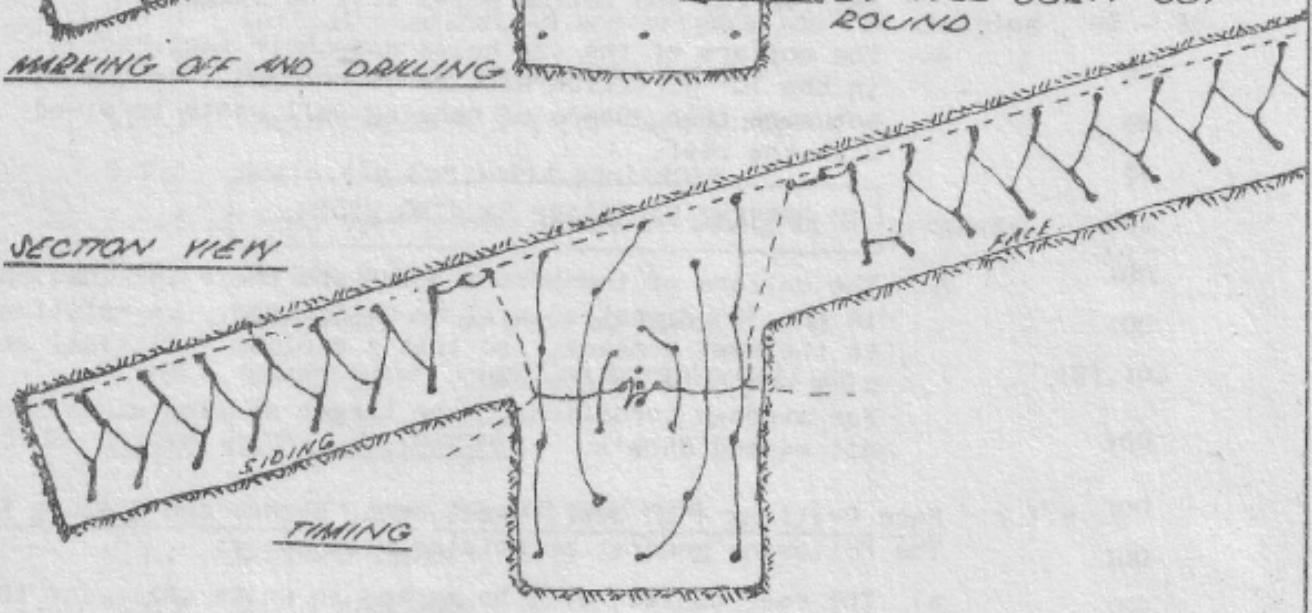


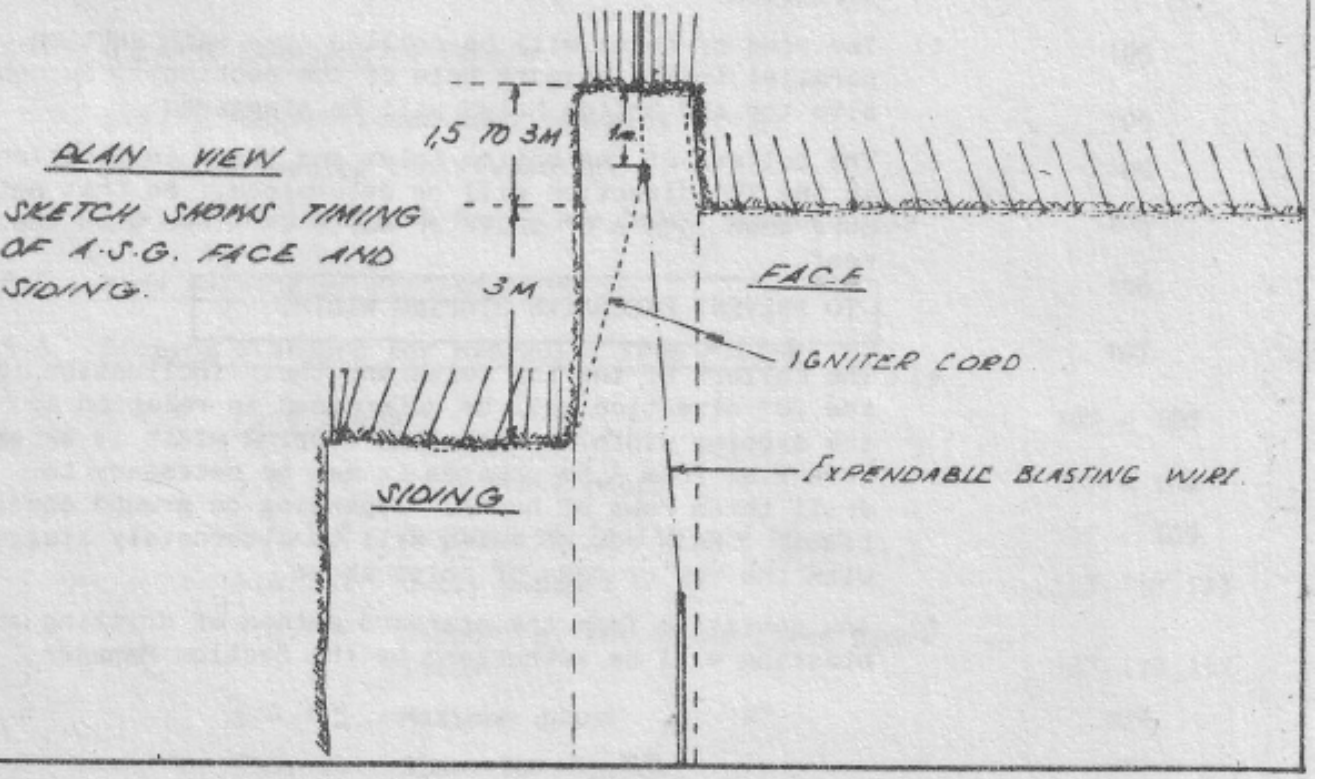
MARKING OFF, DRILLING AND TIMING AN AVERAGE A.S.G., FACE AND SIDING BASAL UNDERCUT

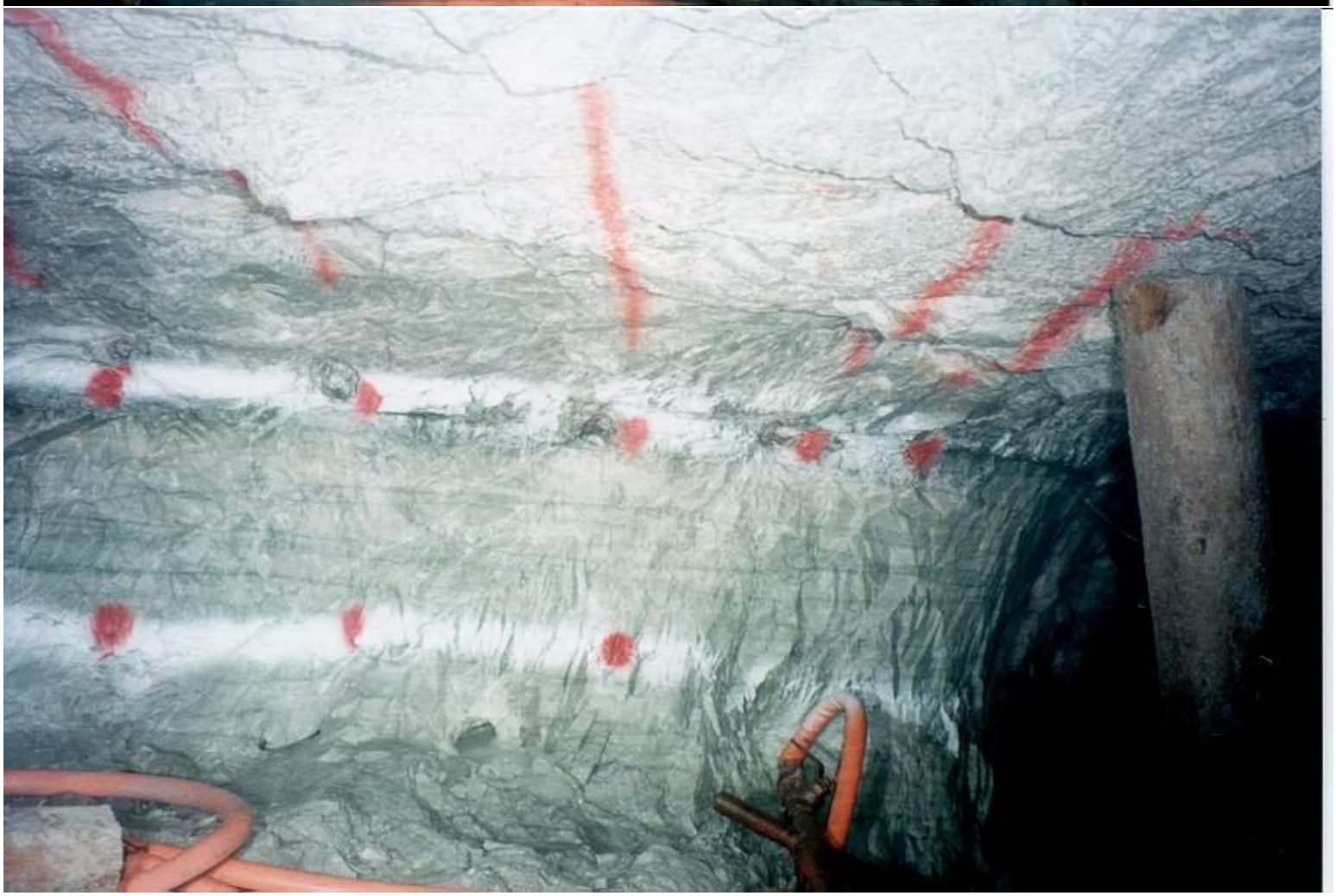
5.1.1.

SKETCH NO. 54.







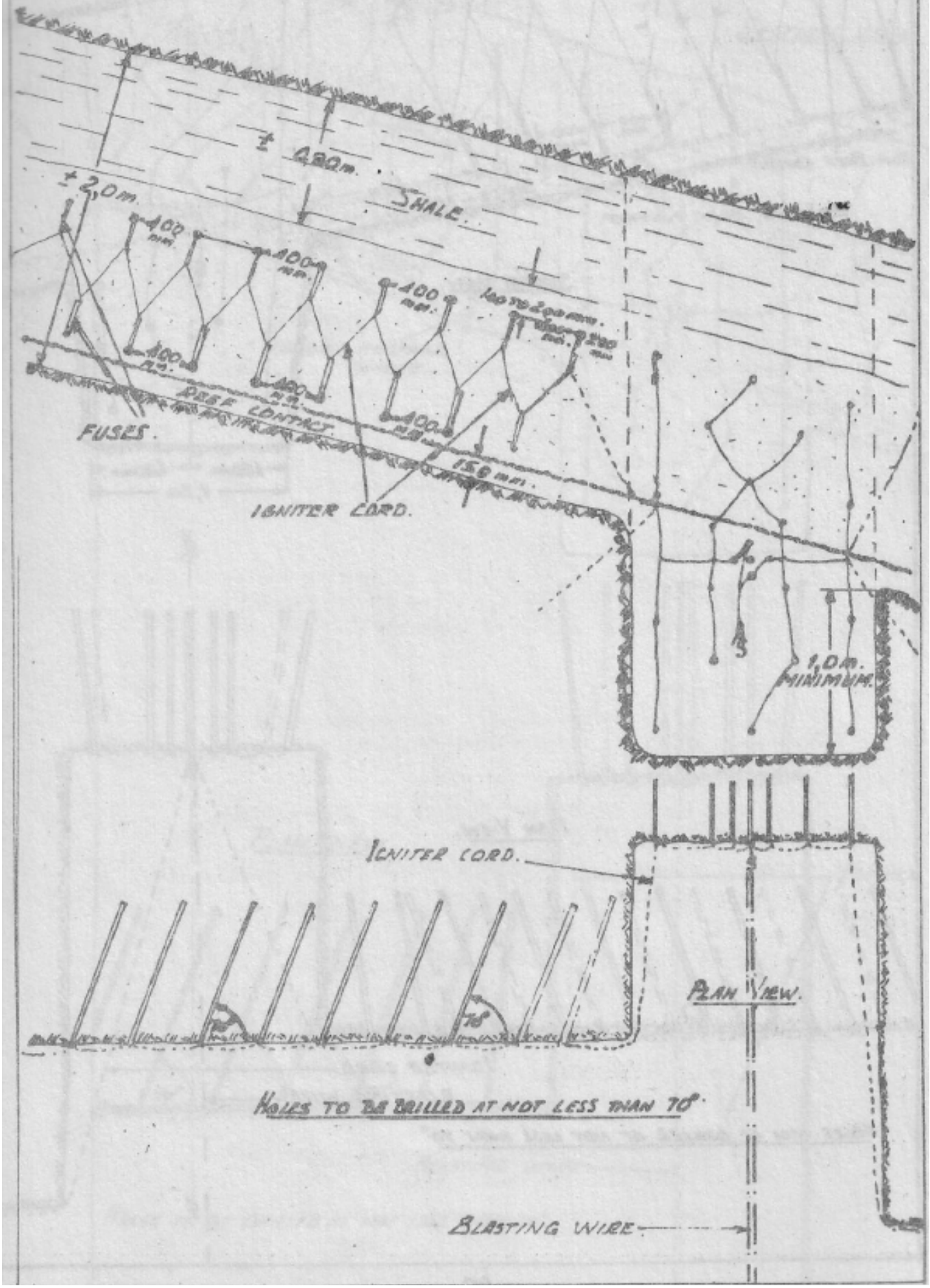


MARKING OFF. DRILLING AND TIMING A "BASAL" REEF OPEN FACE.

5.1.2.

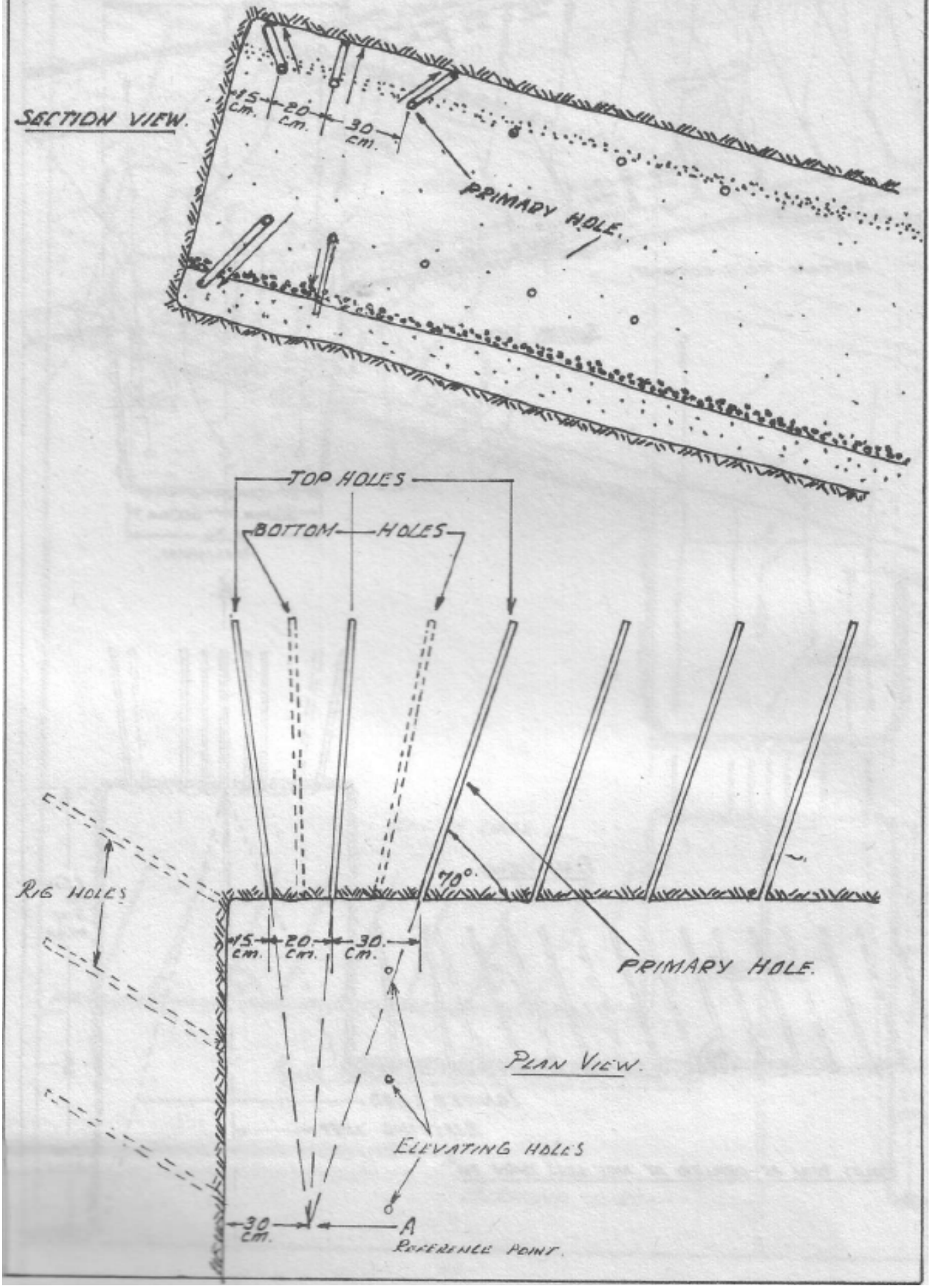
SECTION VIEW

SKETCH No. 65.



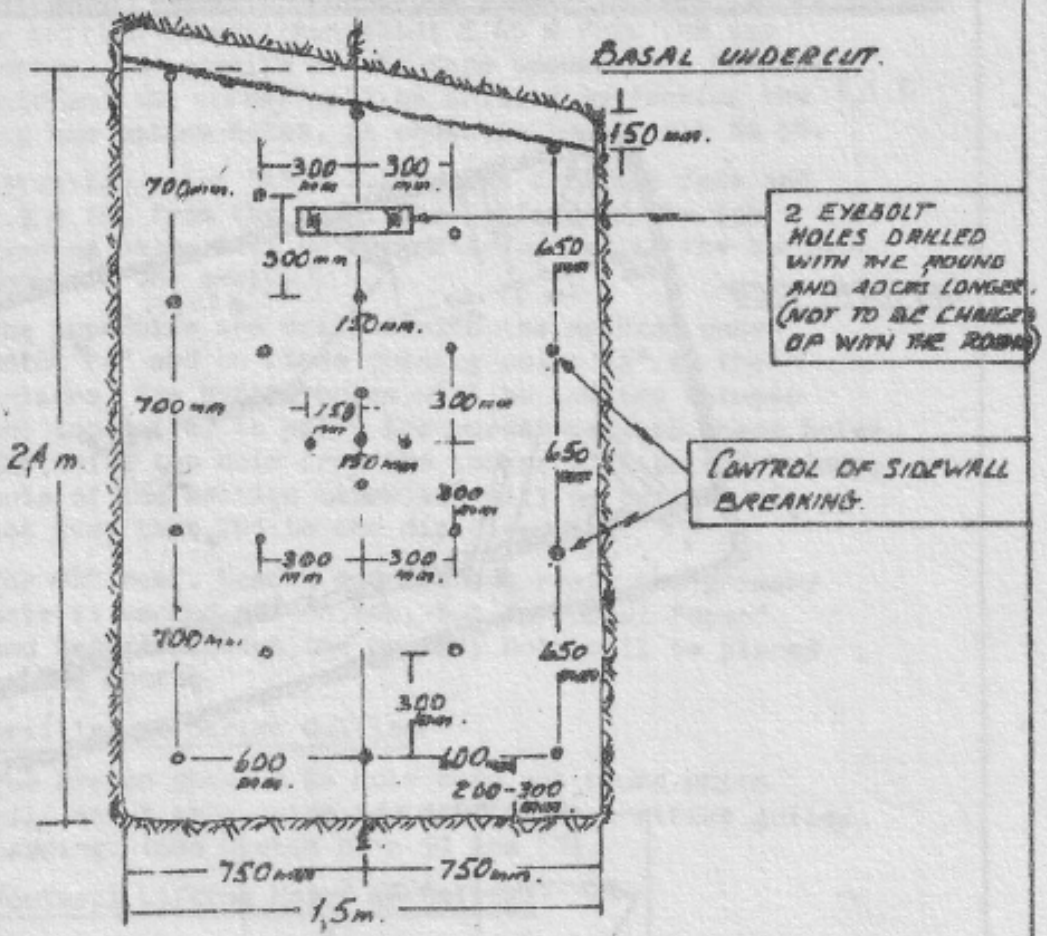
DRILLING OF BLAST HOLES AT TOP OF PANEL AGAINST SOLID ABUTMENT.

SKETCH. No. 42

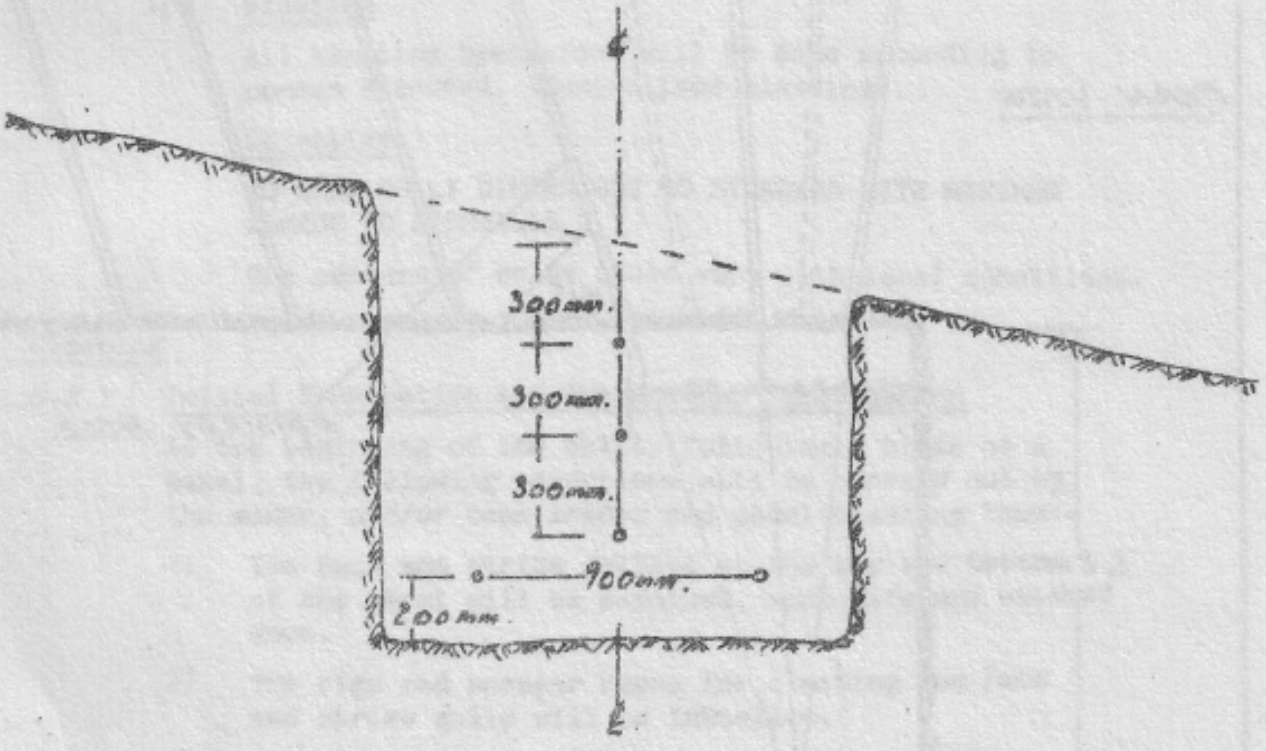


STRIKE GULLY HEADING (A.S.B.).

5.1.1. 24 HOLE BURN CUT ROUND. SKETCH No. 59



FOOTWALL LIFTING HOLES IN A STRIKE GULLY.

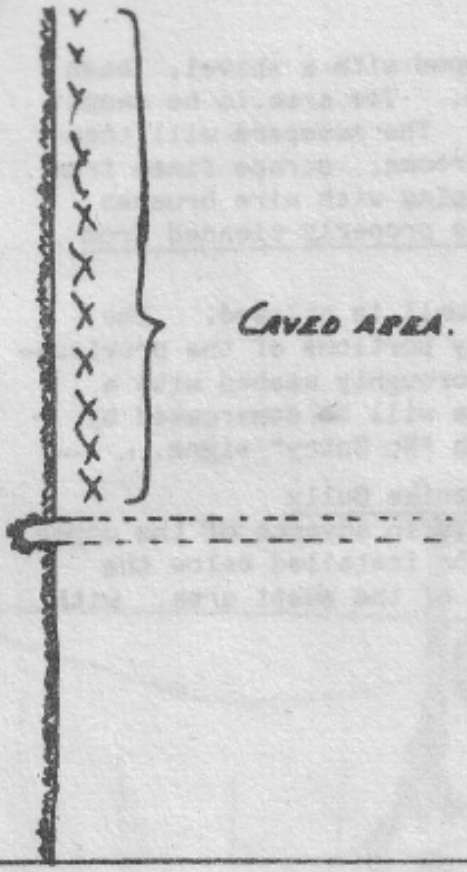


WIDE RAISING OF PROBLEM AREAS.

SKETCH No. 67.

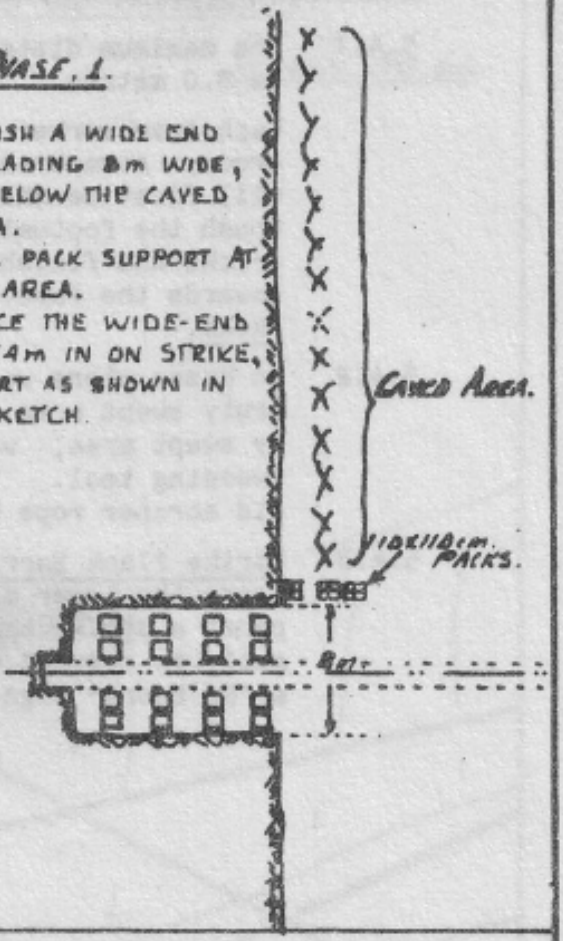
C.S.

PLAN VIEW.



PHASE. 1.

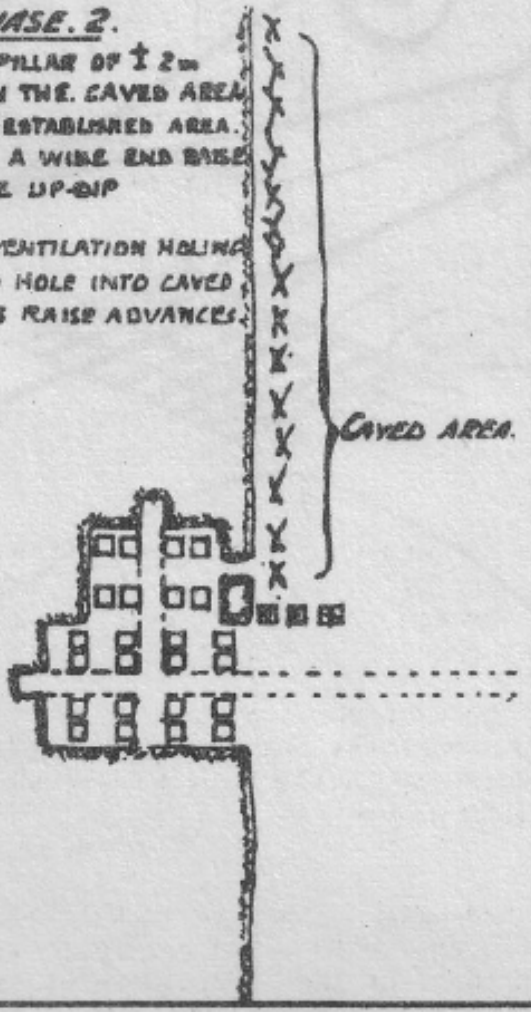
ESTABLISH A WIDE END AND HEADING 8m WIDE, JUST BELOW THE CAVED IN AREA.
INSTALL PACK SUPPORT AT CAVED AREA.
ADVANCE THE WIDE-END FOR ± 14m IN ON STRIKE, SUPPORT AS SHOWN IN THE SKETCH.



PHASE. 2.

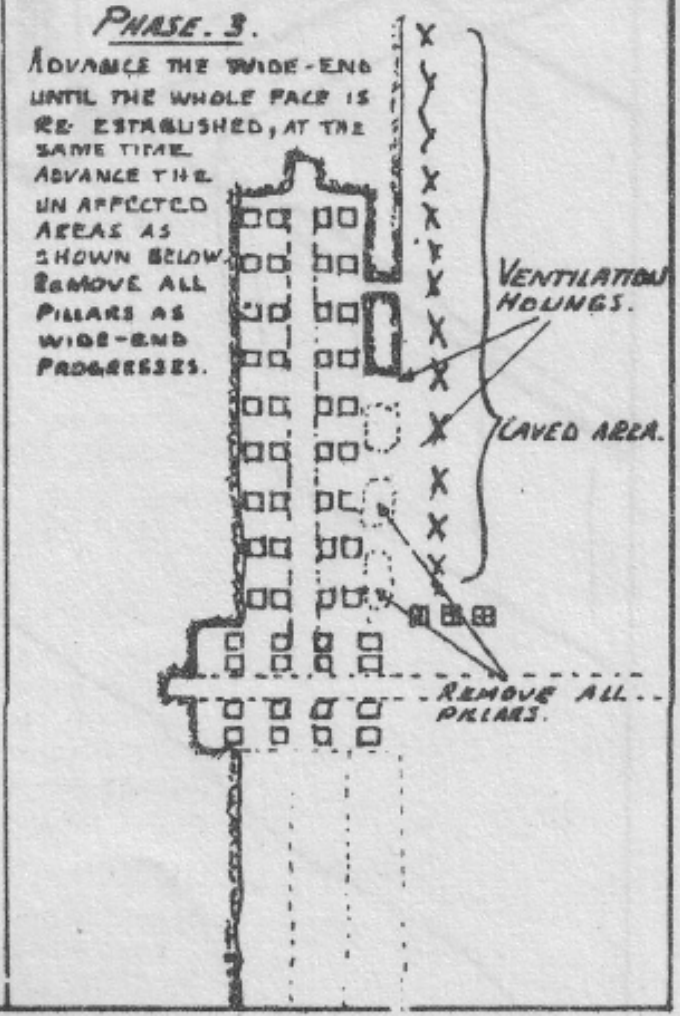
LEAVE A PILLAR OF ± 2m BETWEEN THE CAVED AREA AND RE-ESTABLISHED AREA.
ADVANCE A WIDE END BASE 8m WIDE UP-DIP

BLAST VENTILATION HOLING BACK TO HOLE INTO CAVED AREA AS RAISE ADVANCES.



PHASE. 3.

ADVANCE THE WIDE-END UNTIL THE WHOLE FACE IS RE-ESTABLISHED, AT THE SAME TIME ADVANCE THE UN AFFECTED AREAS AS SHOWN BELOW. REMOVE ALL PILLARS AS WIDE-END PROGRESSES.

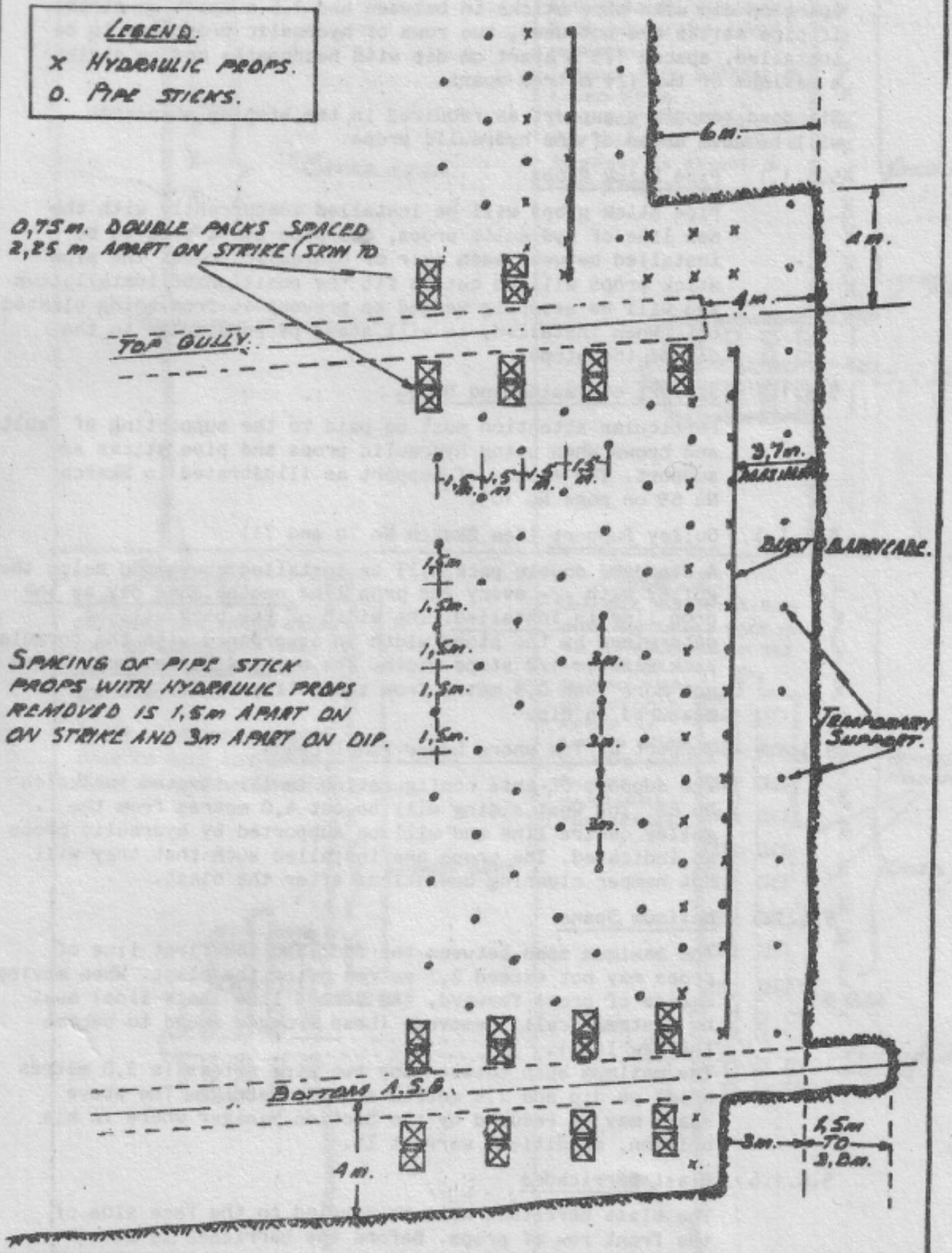


HYDRAULIC PROPS-PIPE STICKS AND BLAST BARRICADES.

E.6.1.1.

SKETCH NO. 6.8

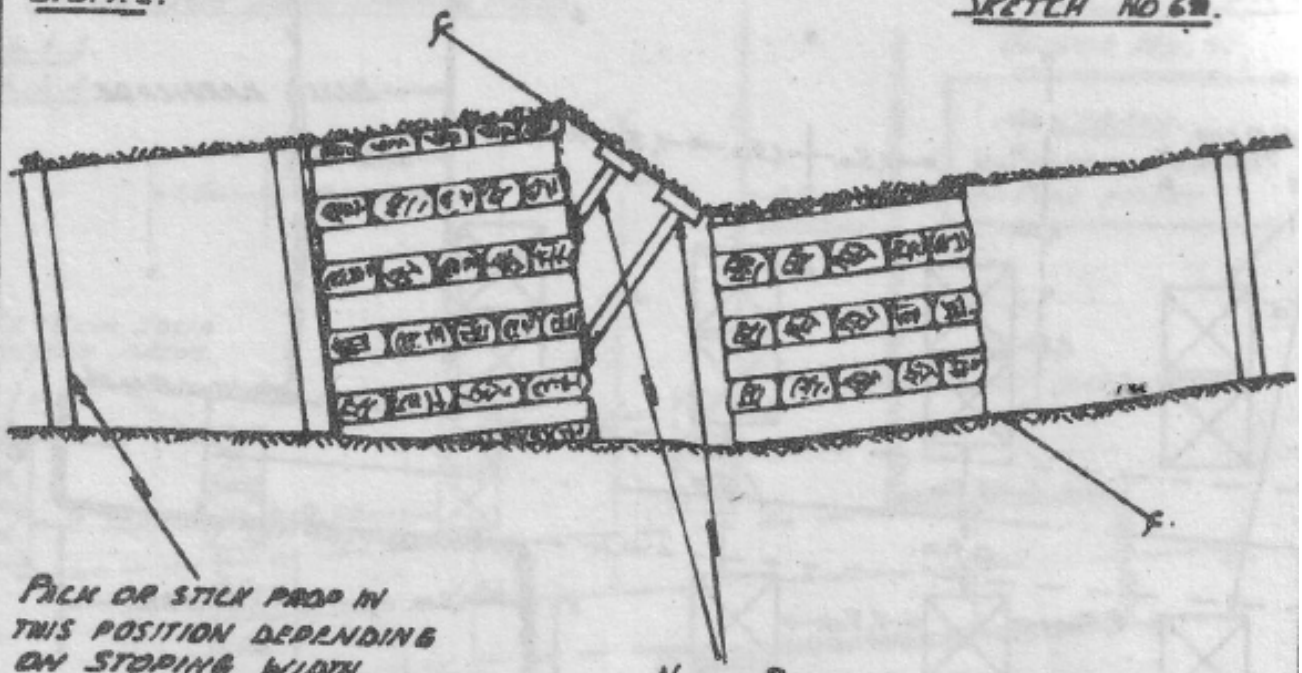
PLAN VIEW.



SUPPORT OF HEADS AND BROWS WHEN USING HYDRAULIC PROPS AND PIPE STICKS

5.6.1.2.

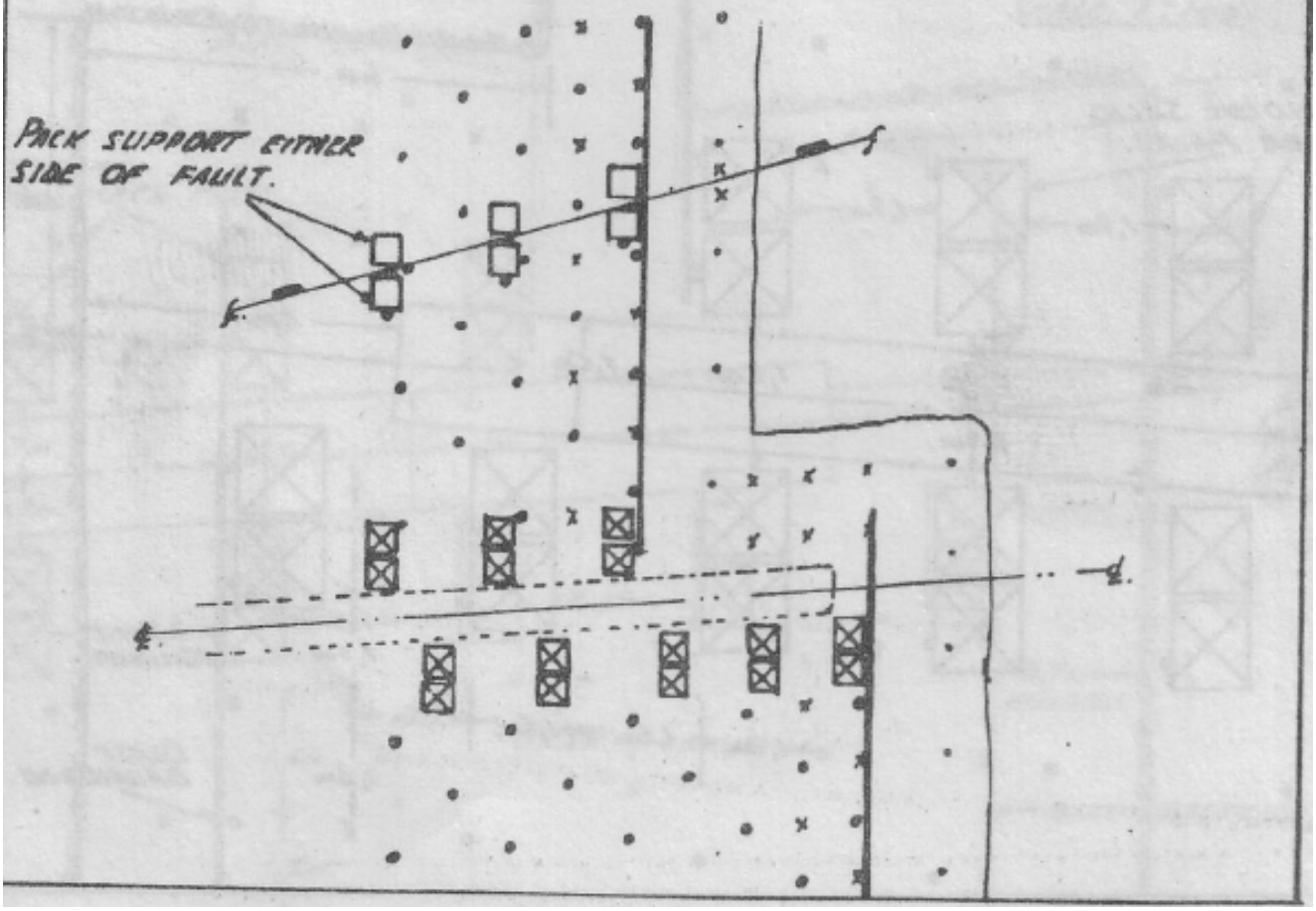
SKETCH NO 62.



PACK OR STICK PROP IN THIS POSITION DEPENDING ON STOPING WIDTH.

NOTE: BLOCKING OR CROSS SPRAG AGAINST FACE OF BROW.

PLAN VIEW.

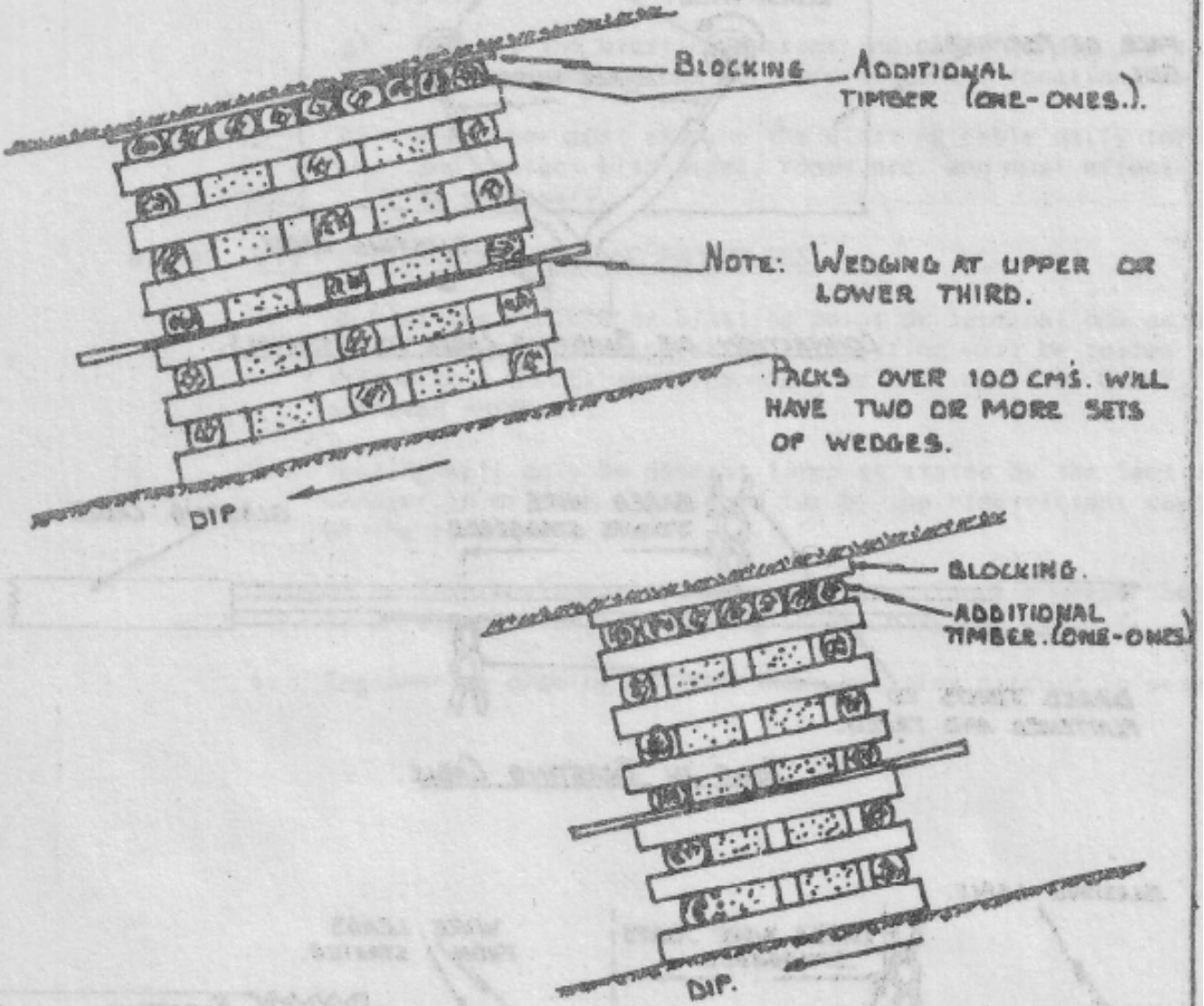


PACK SUPPORT EITHER SIDE OF FAULT.

Installation of Support.

Blocking Procedure and use of additional single timber units (one-ones) to provide maximum bearing area.

Sketch No. 7a.



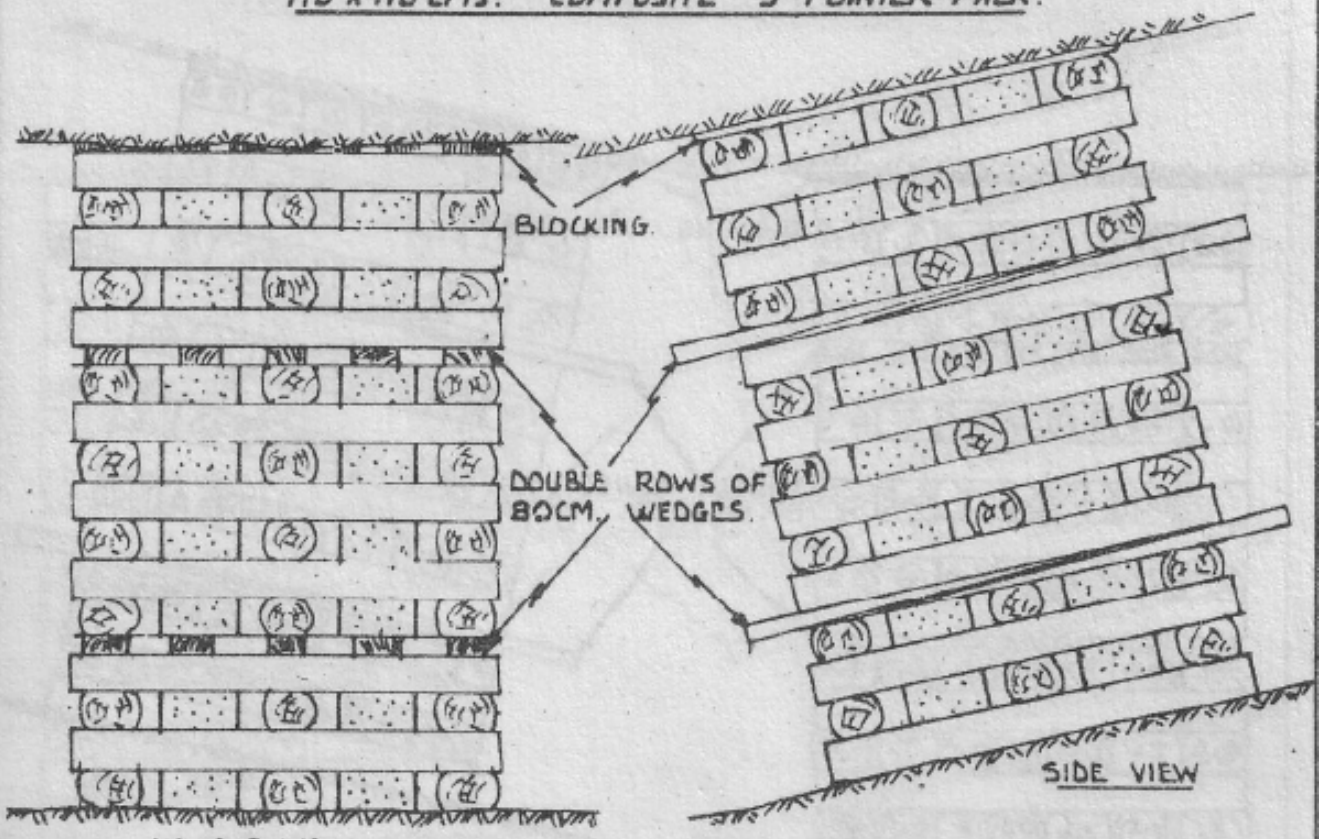
Note: General rule for composite units.

1) For units on dip, bricks are above timber.
2) For units on strike, bricks are below timber.

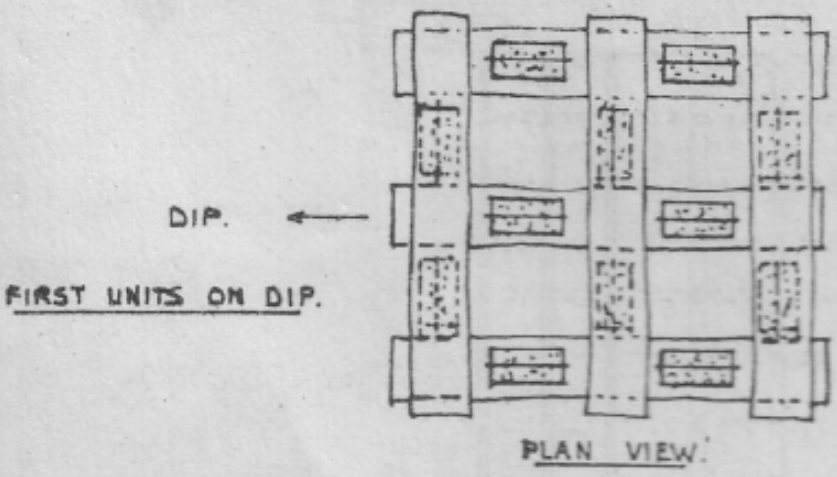
INSTALLATION OF SUPPORT.

SKETCH NO 74.

110 X 110 CMS. COMPOSITE 9 POINTER PACK.



WEDGE UPPER AND LOWER THIRD.

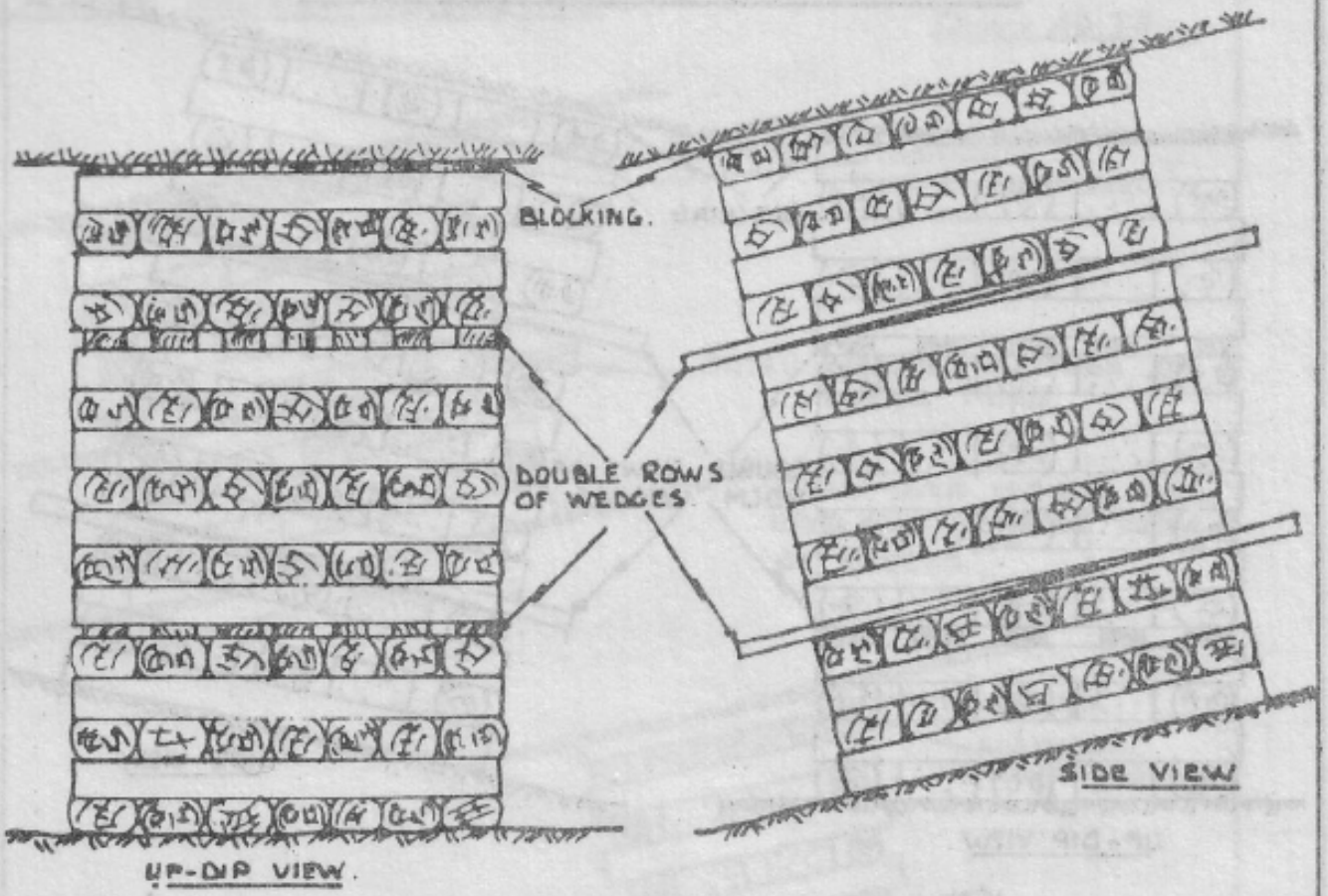


FOR USE IN STOPING WIDTHS OVER 150 CMS.

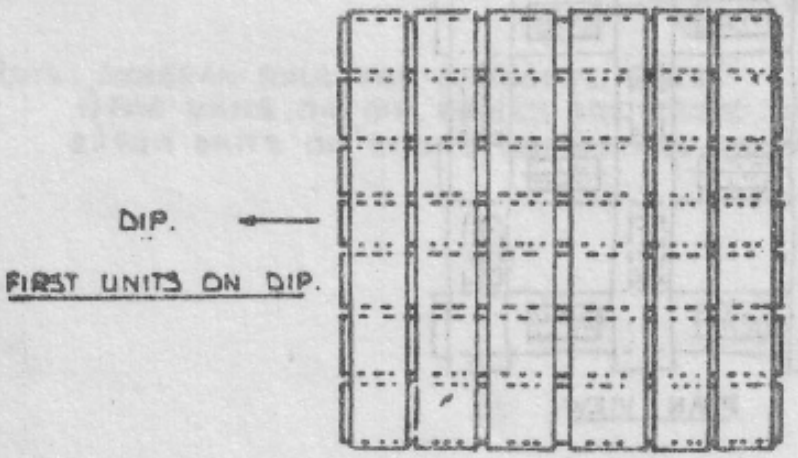
INSTALLATION OF SUPPORT.

SKETCH NO. 75.

110 x 110CM. SOLID TIMBER MAT PACK.



WEDGE UPPER AND LOWER THIRD.

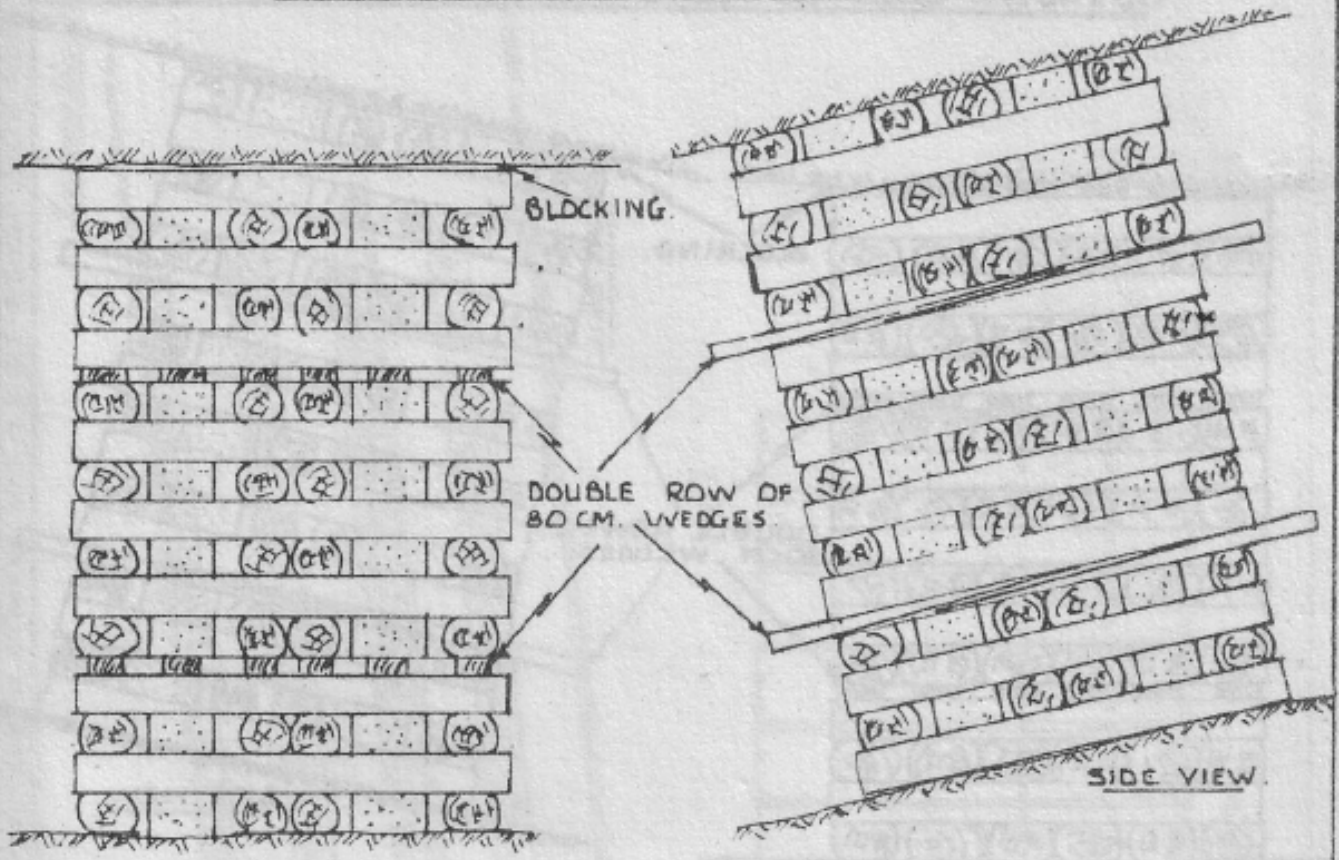


FOR USE IN STOPING WIDTHS OVER 150 CM'S.

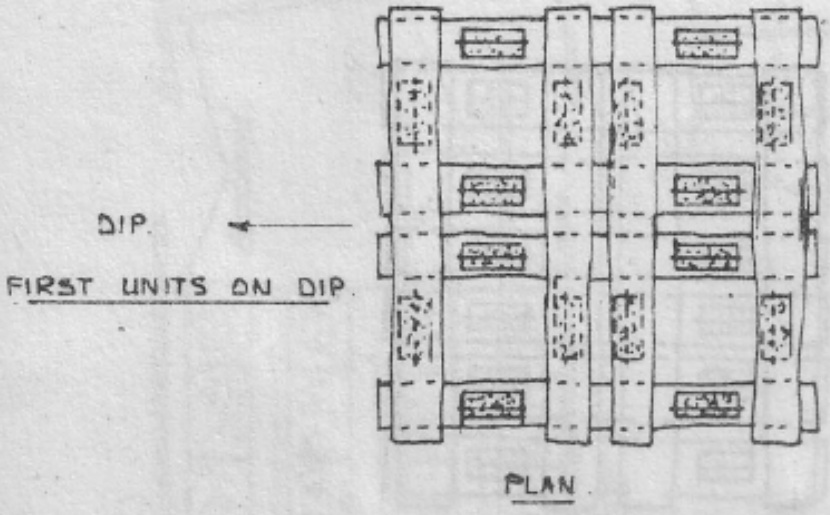
INSTALLATION OF SUPPORT.

SKETCH No. 74.

110 X 110 CM. COMPOSITE 16 POINTER PACK.

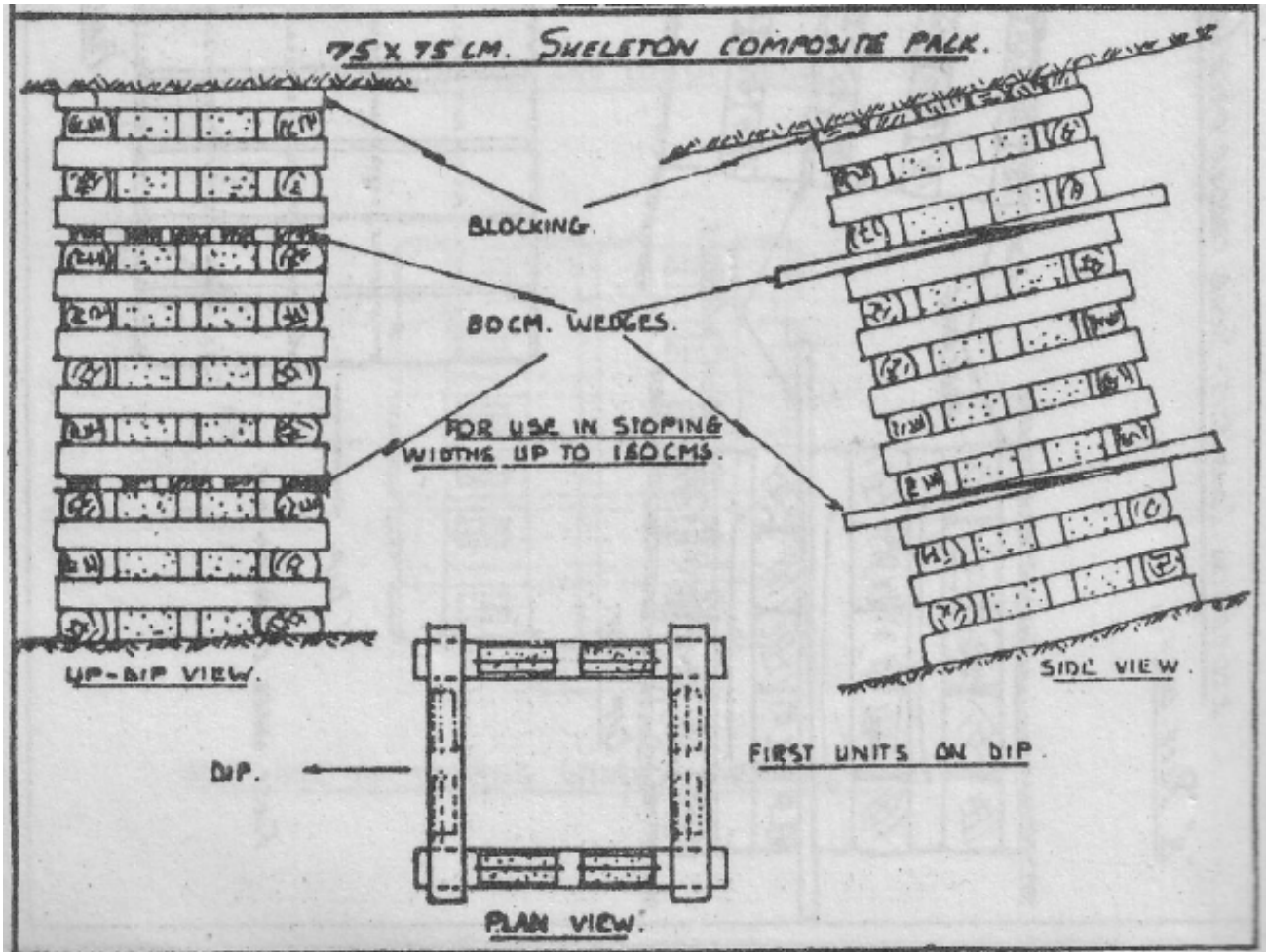


WEDGE UPPER AND LOWER THIRD.



FOR USE IN STOPING WIDTHS OVER 150 CMS.

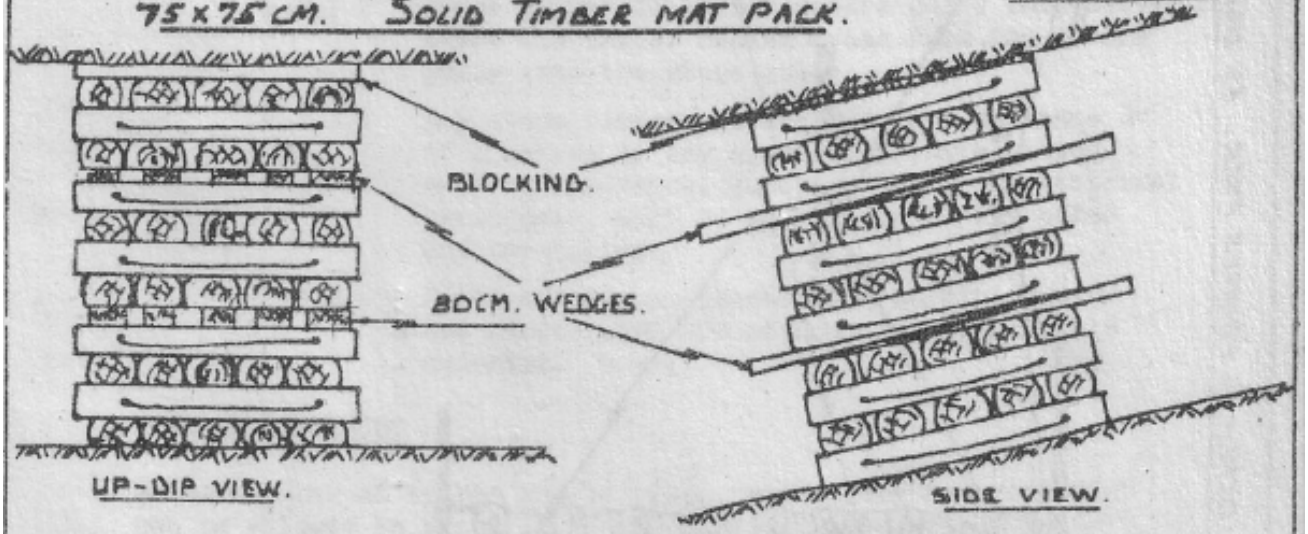
75 x 75 cm. Skeleton composite pack.



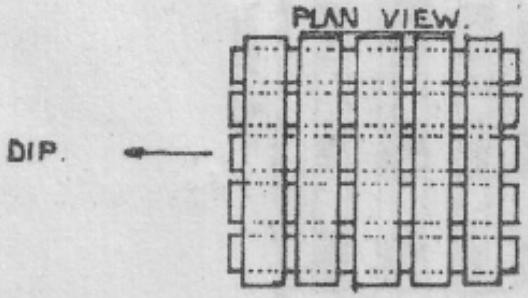
Installation of Support.

Sketch No. 80

75 x 75 cm. Solid Timber mat pack.

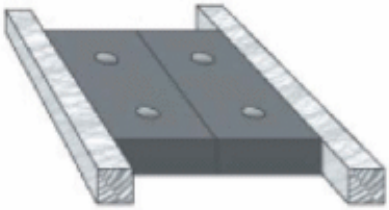


Wedge upper and lower third.

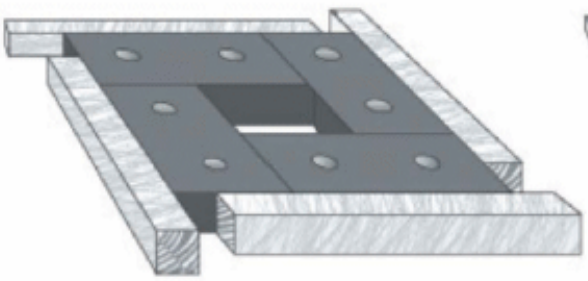


FOR USE IN STOPING WIDTHS UP TO 150 CMS.

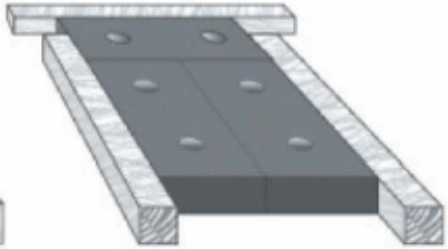
90 x 90



120 x 120



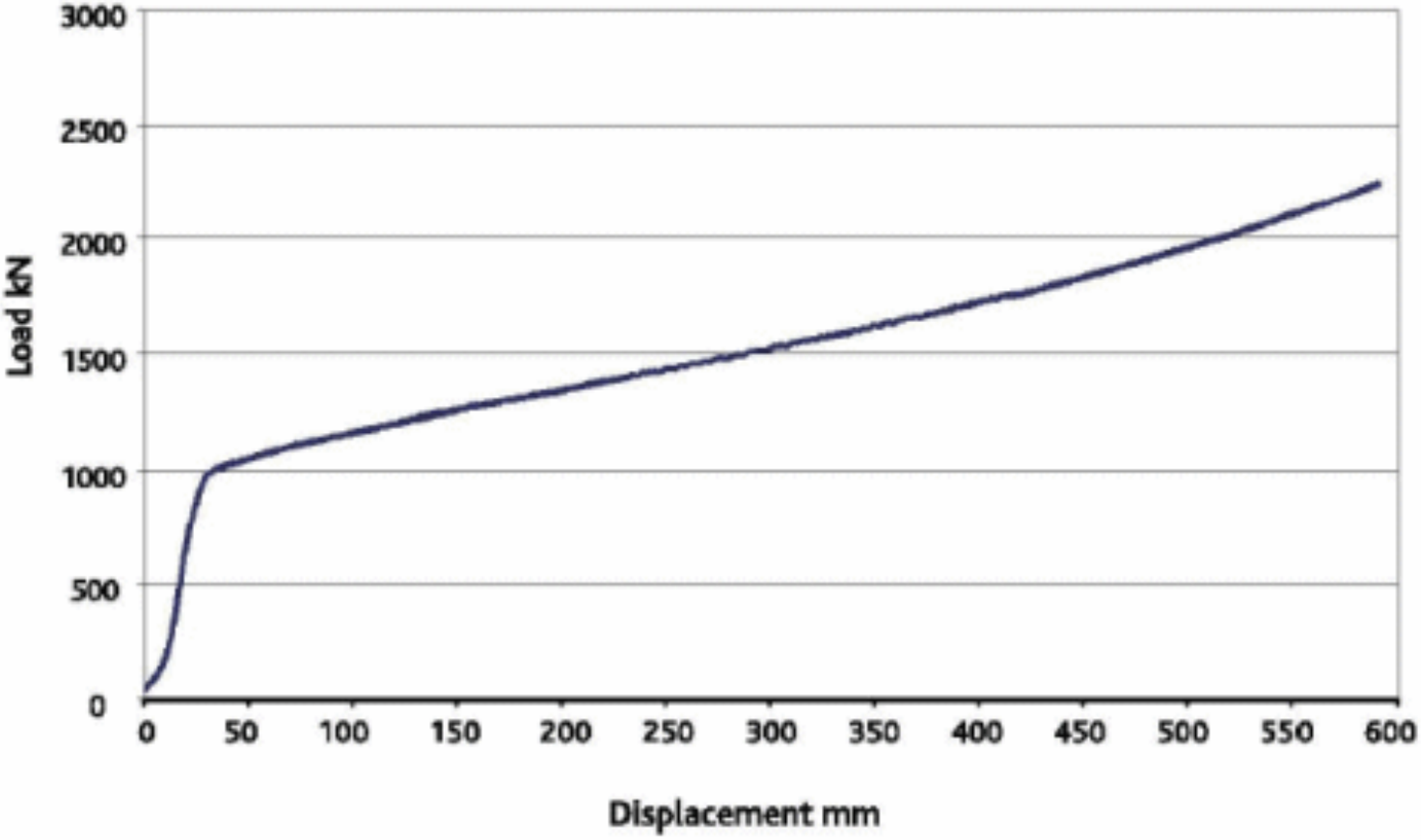
90 x 120



Grinpak 90-90

Configuration 90x90

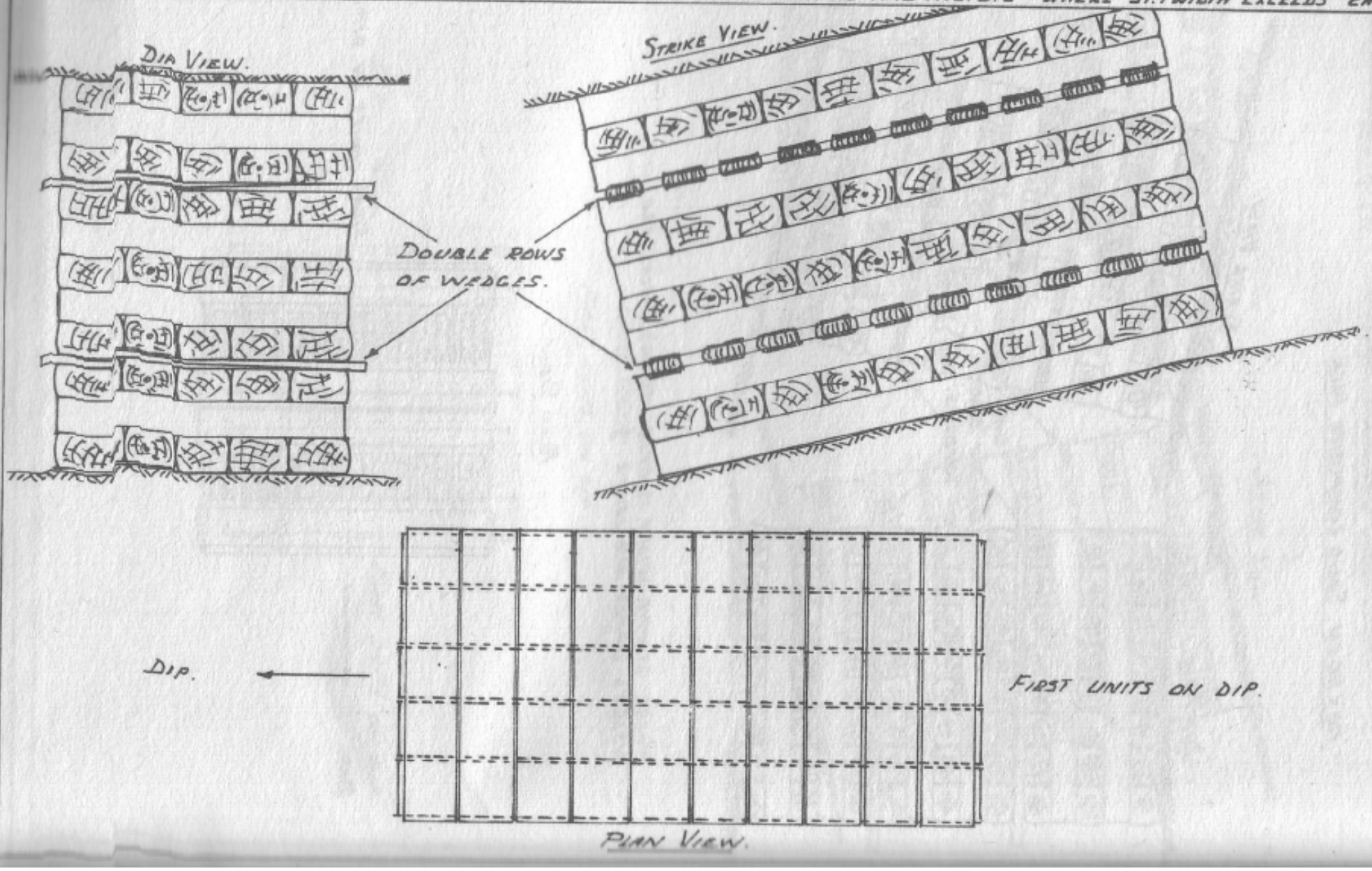
Test Height 1.8m



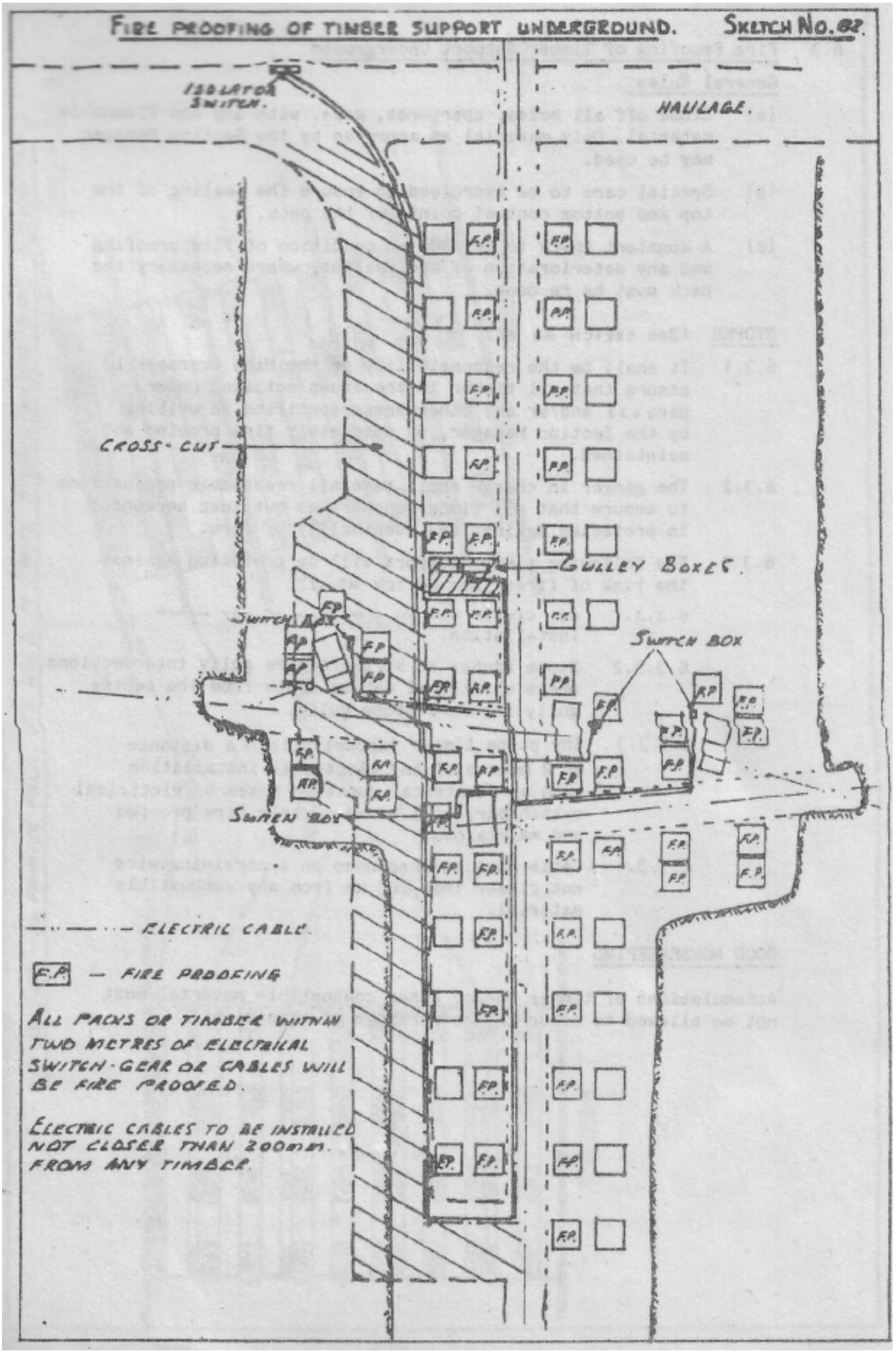
INSTALLATION OF PACK SUPPORT.

SKETCH No. 63.

220 X 110 CM. LONG AXIS - SOLID TIMBER-PACK (FOR USE ALONG T/WAYS AND A.S.G.'S - WHERE ST./WIDTH EXCEEDS 2M).



FIRE PROOFING OF TIMBER SUPPORT UNDERGROUND. SKETCH NO. 82.

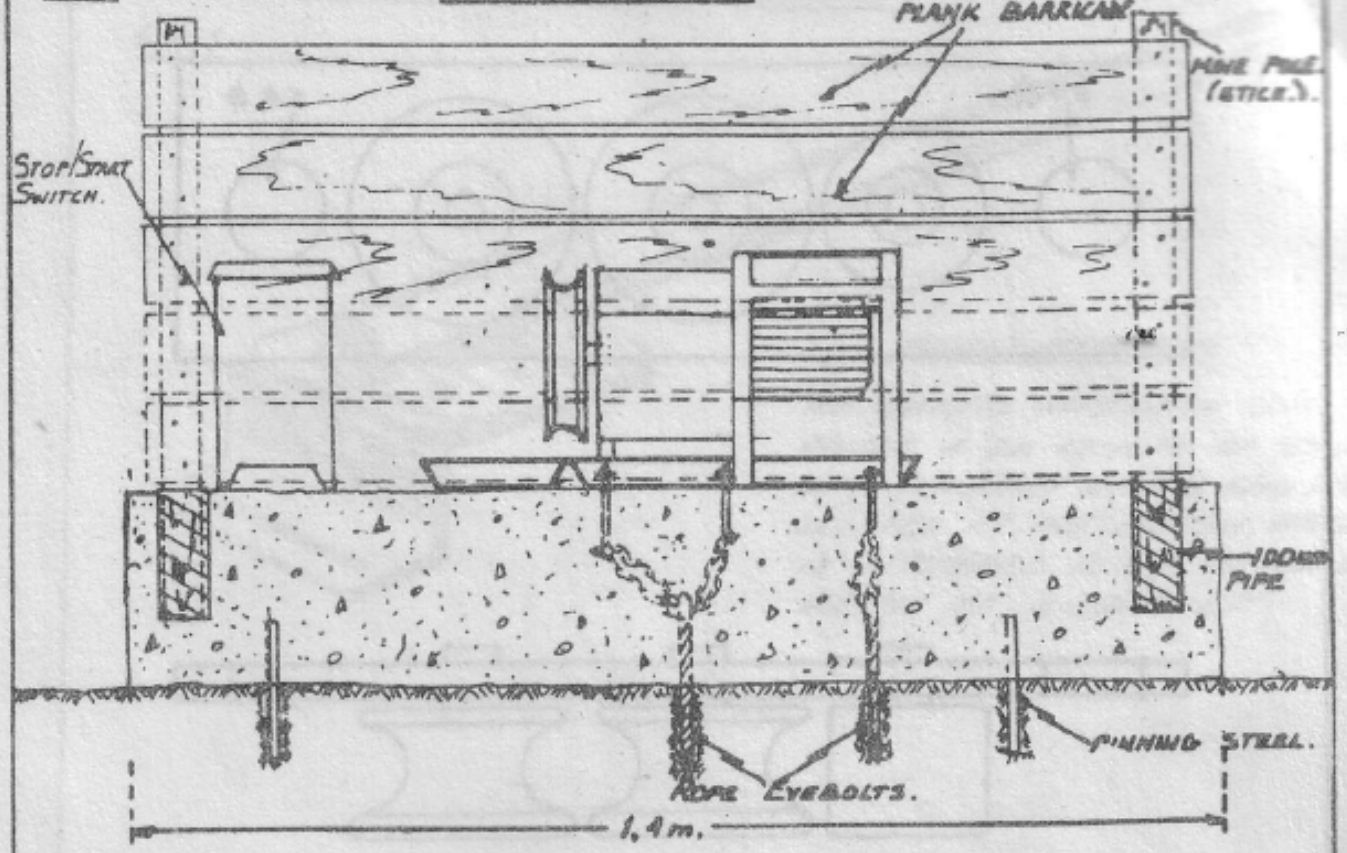


MONO-ROPE WINCH and BARRICADE — WINCH BED AND DIMENSIONS.

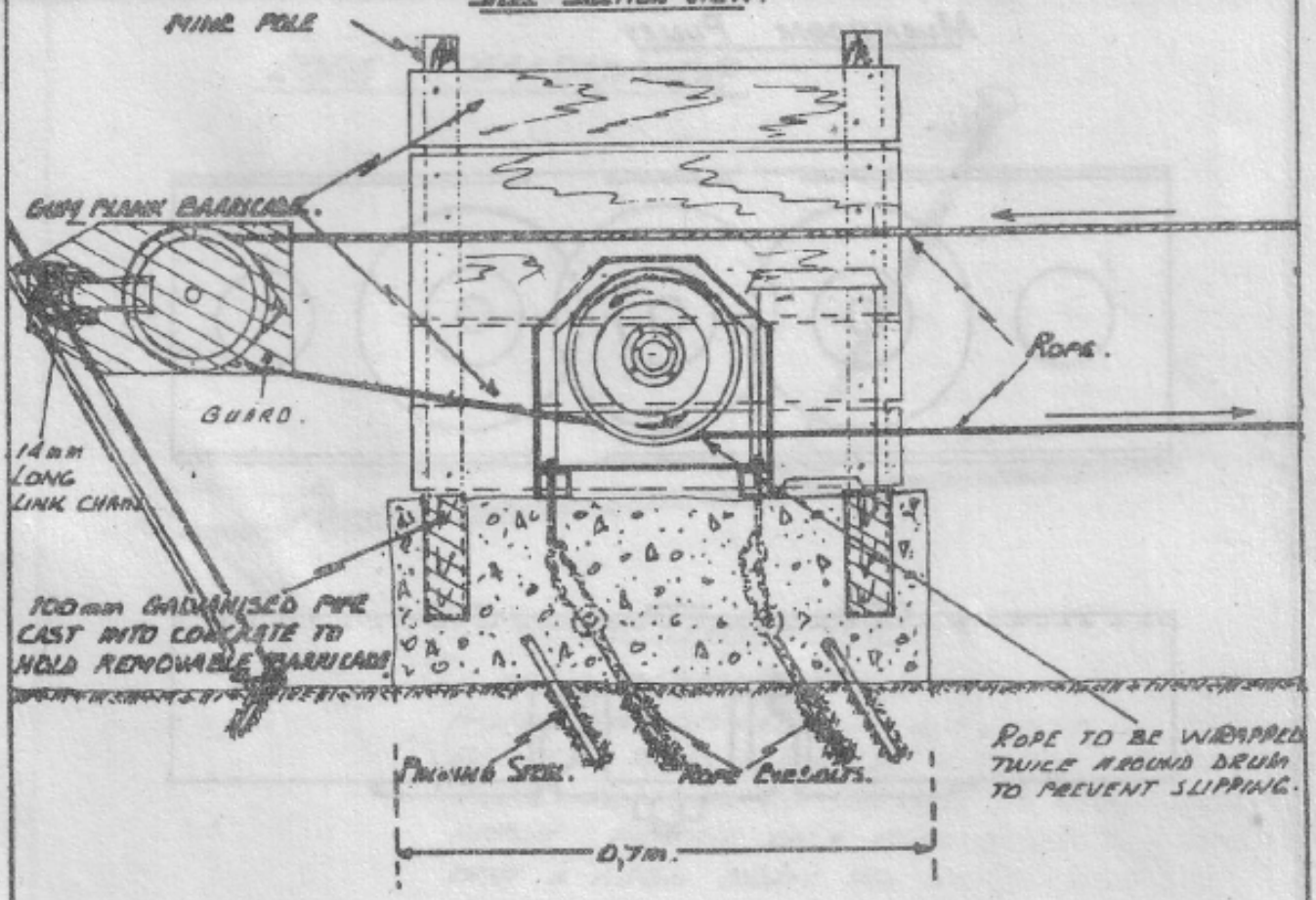
6.4.2.
6.4.3.

SKETCH No. [illegible]

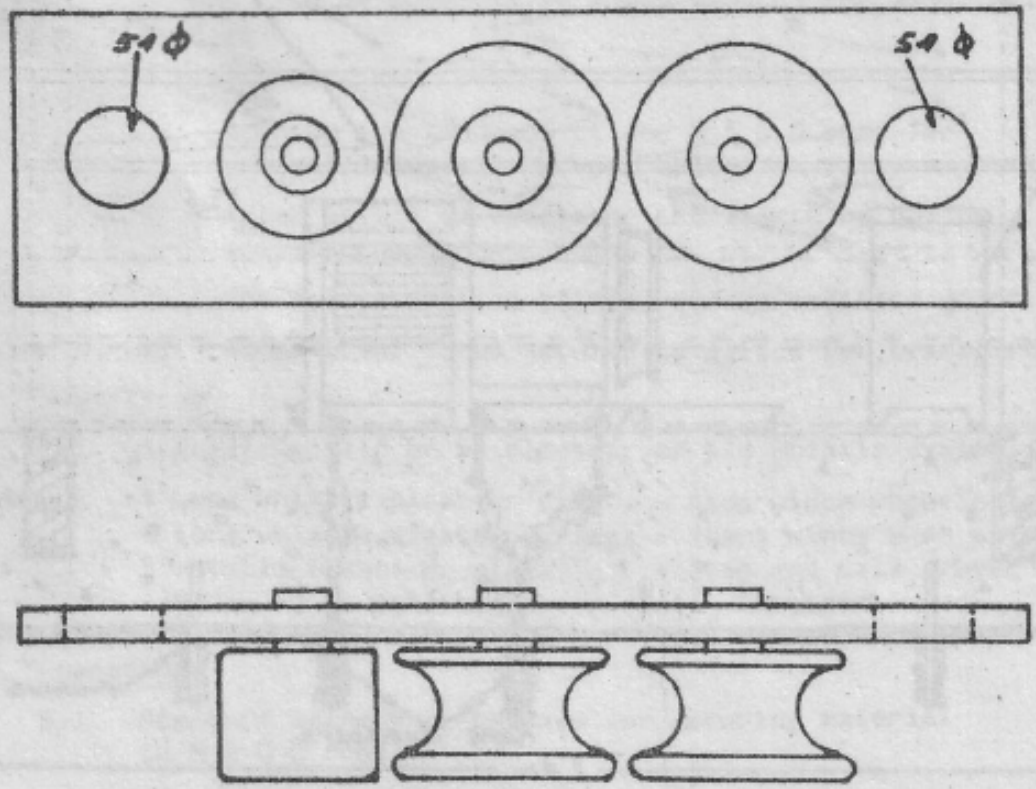
FRONT SECTION VIEW.



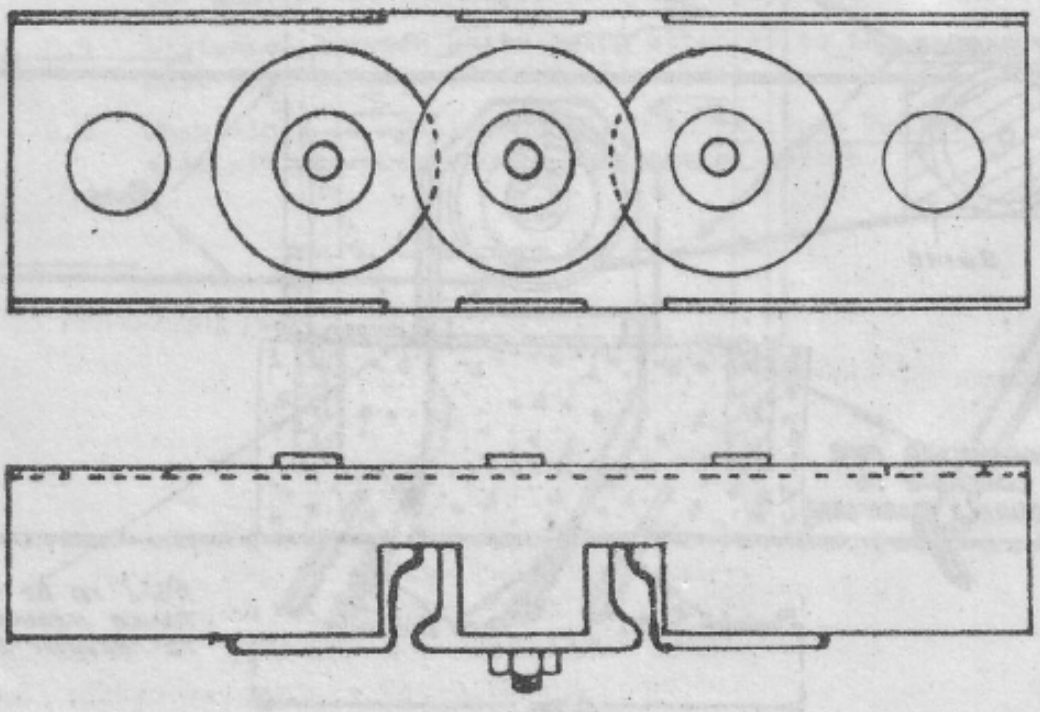
SIDE SECTION VIEW.



M.P.S. 2. Special Pulley. Sketch No. B4.

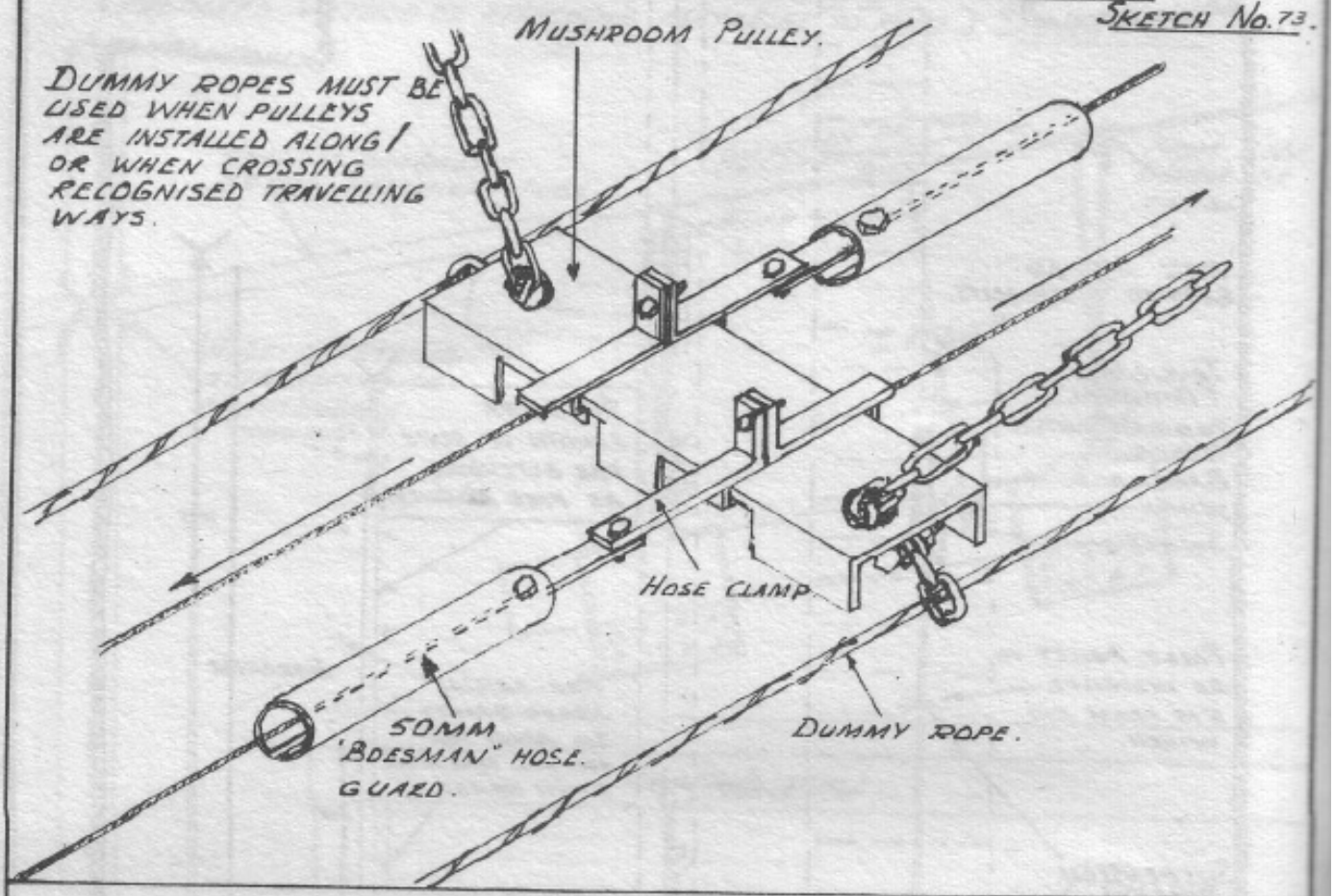


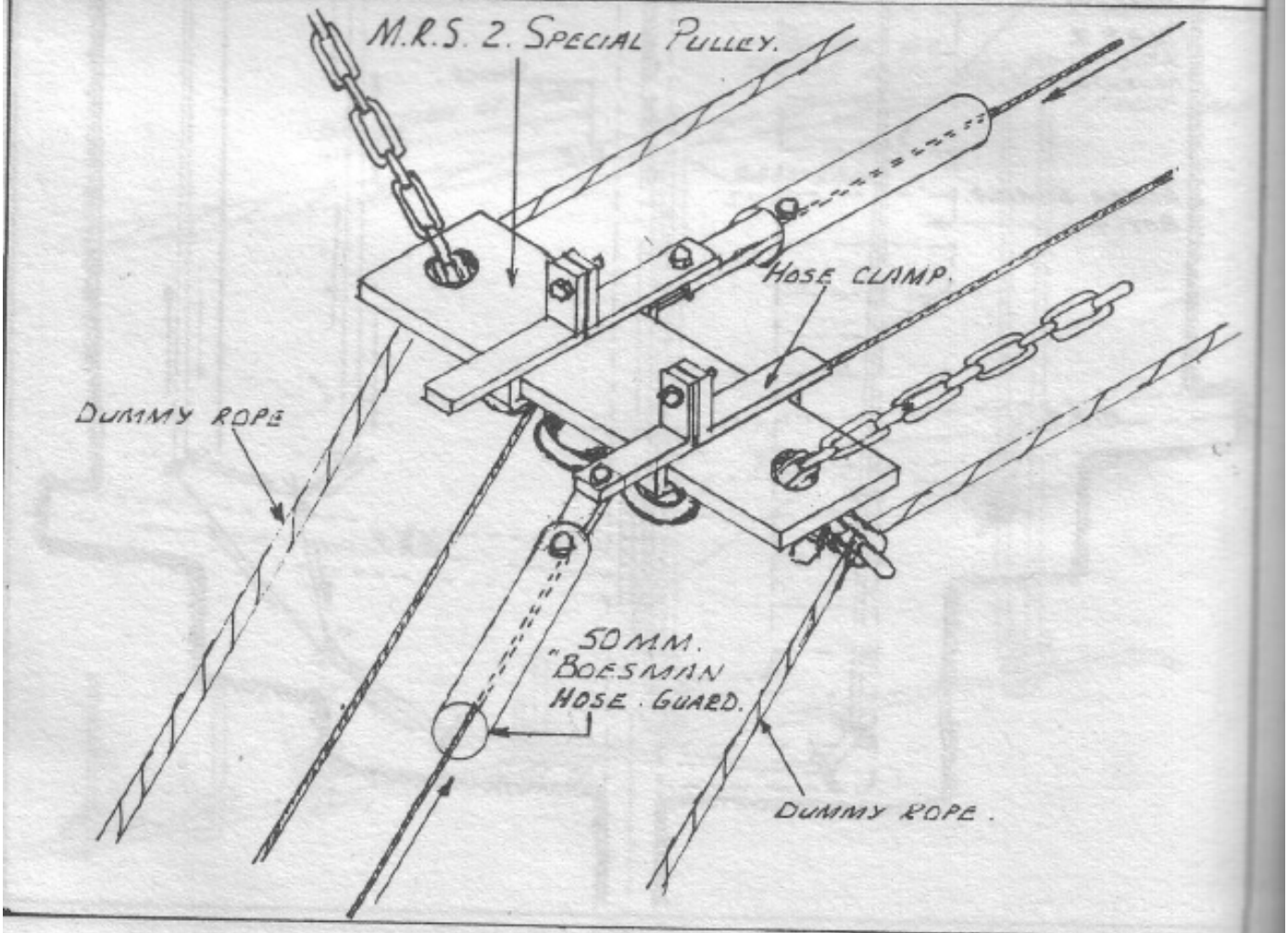
Mushroom Pulley.



PULLEY ATTACHMENT - SHOWING GUARDS AND DUMMY ROPES.

SKETCH No. 73.

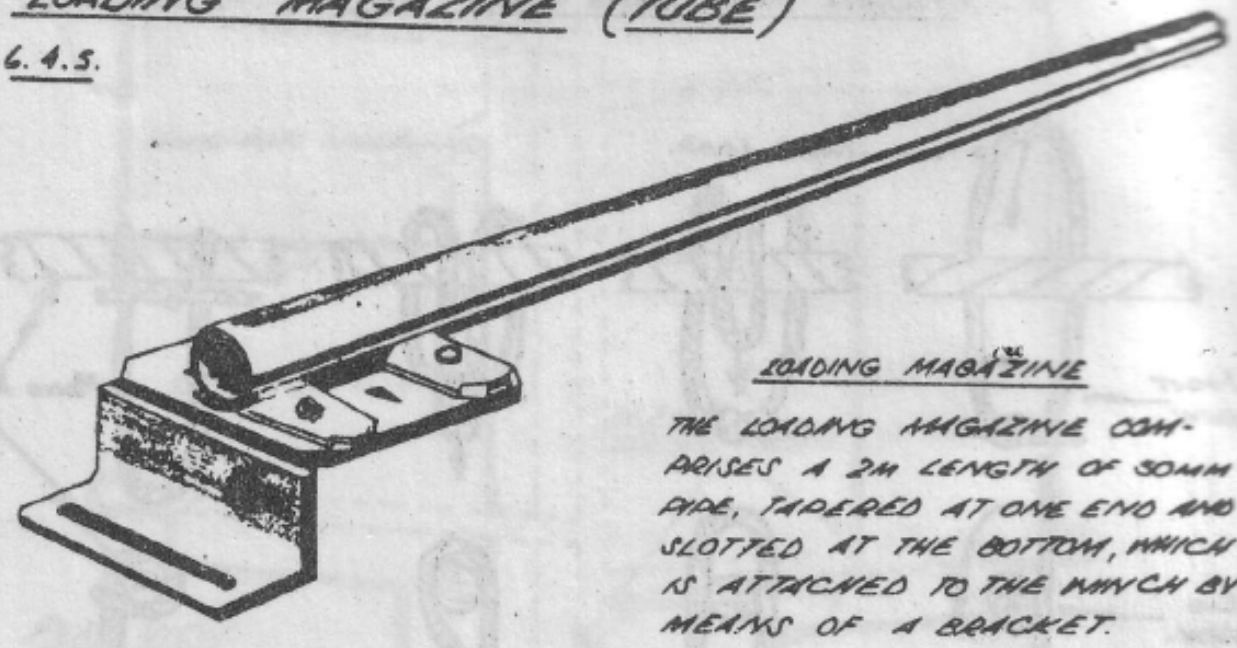




SKETCH NO. 85

LOADING MAGAZINE (TUBE)

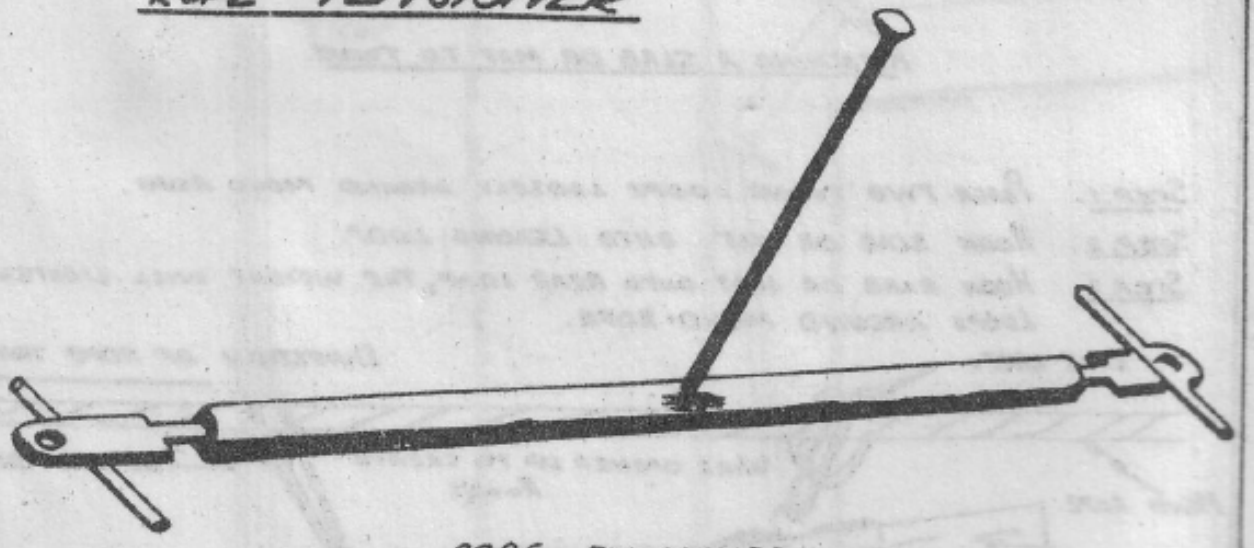
6.4.5.



LOADING MAGAZINE

THE LOADING MAGAZINE COMPRISES A 2M LENGTH OF 90MM PIPE, TAPERED AT ONE END AND SLOTTED AT THE BOTTOM, WHICH IS ATTACHED TO THE WINCH BY MEANS OF A BRACKET.

ROPE TENSIONER

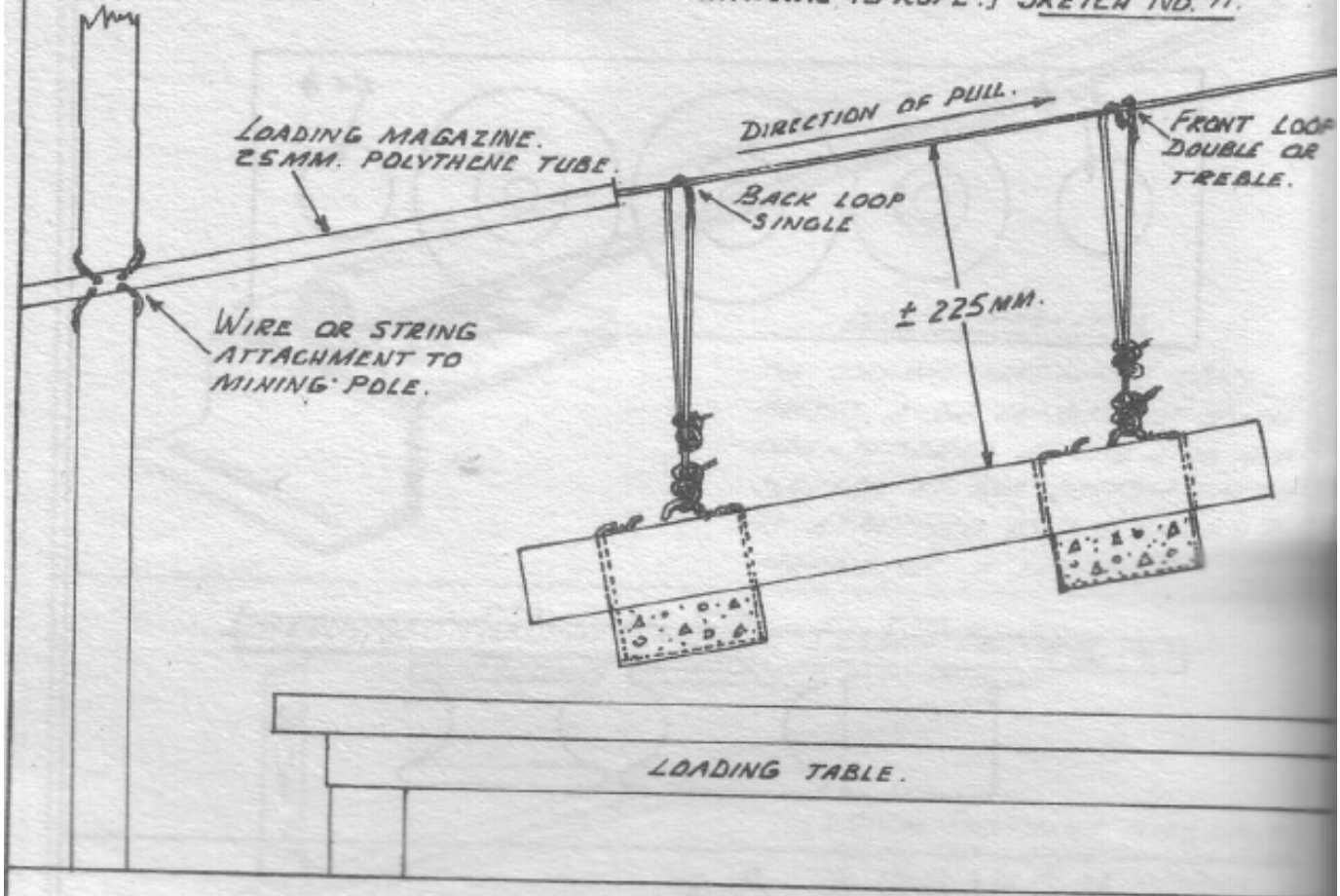


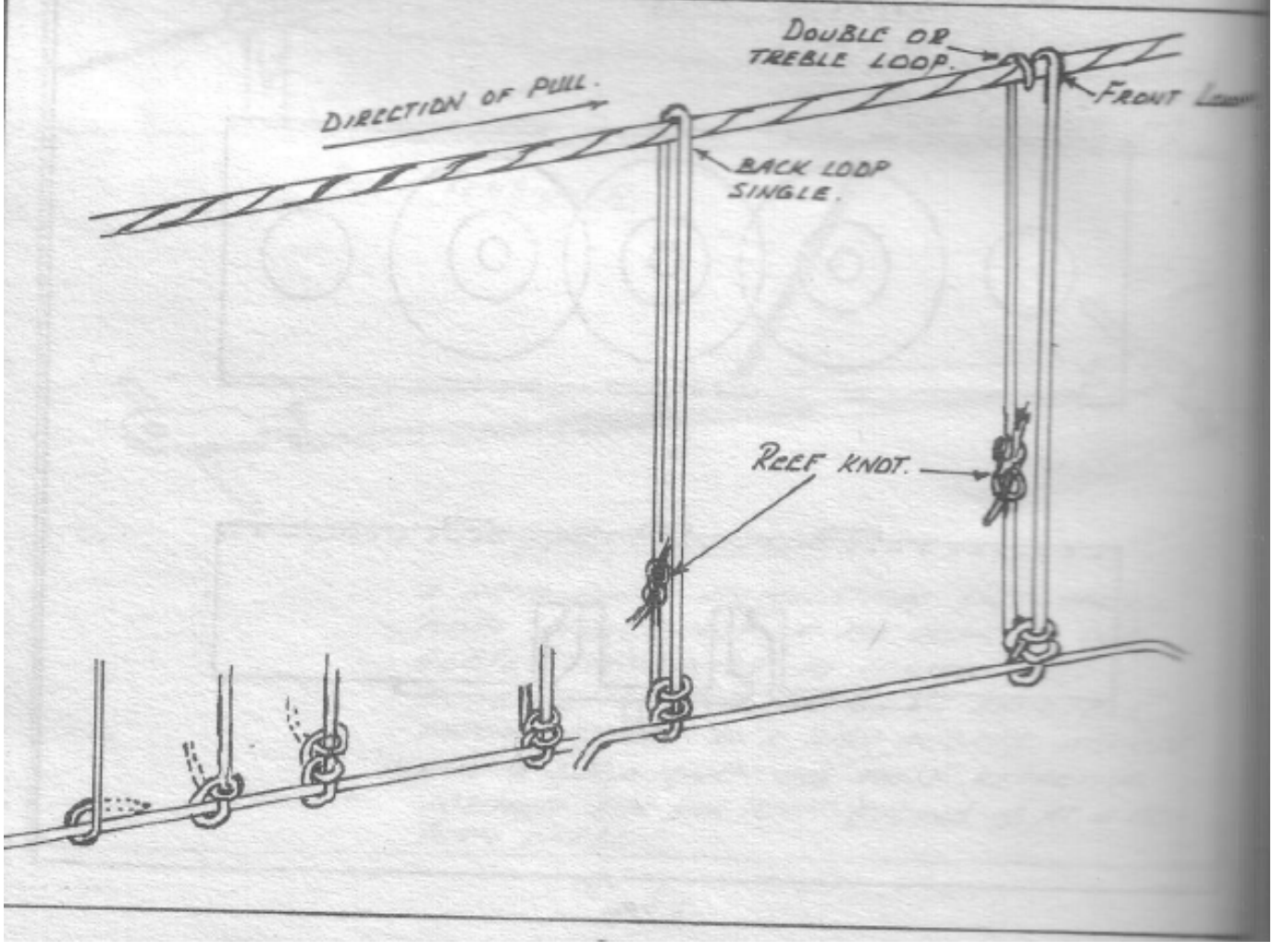
ROPE TENSIONER

A MONO-ROPE INSTALLATION WILL ONLY WORK EFFECTIVELY IF THE ROPE IS CORRECTLY TENSIONED. TO ACHIEVE THIS A ROPE TENSIONING DEVICE IS AVAILABLE WHICH WORKS ON A TURN-BUCKLE ACTION WITH A 1,25M DRAW. THE MOST EFFECTIVE POSITION FOR THE TURN-BUCKLE IS AT A RETURN WHEEL.

MOND-ROPE (M.A.C.C.). WINCH OPERATION.

(PROPOSED METHOD OF ATTACHING MATERIAL TO ROPE.) SKETCH NO. 71.

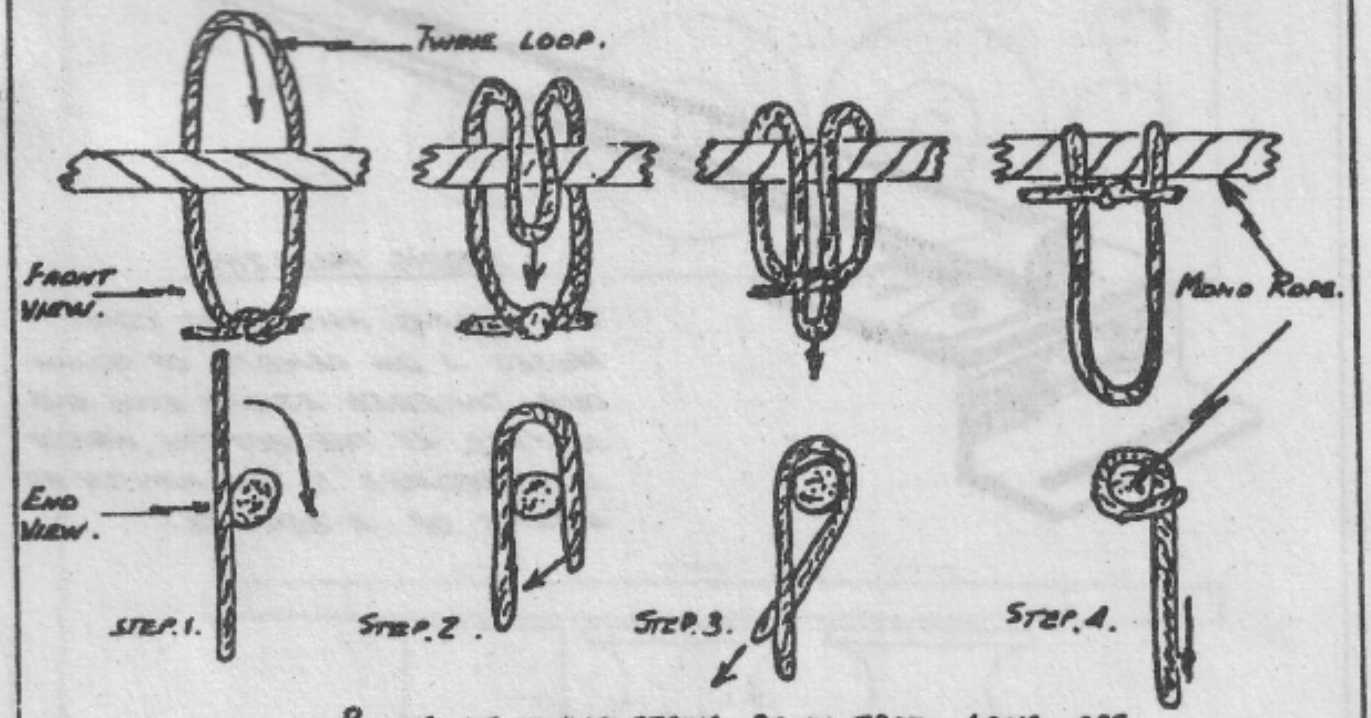




NOTES ON INSTALLATION AND USE OF MONO-ROPEWAYS.

ATTACHING TWINE LOOPS AROUND ROPE. SHEET No 84

G.A.B.



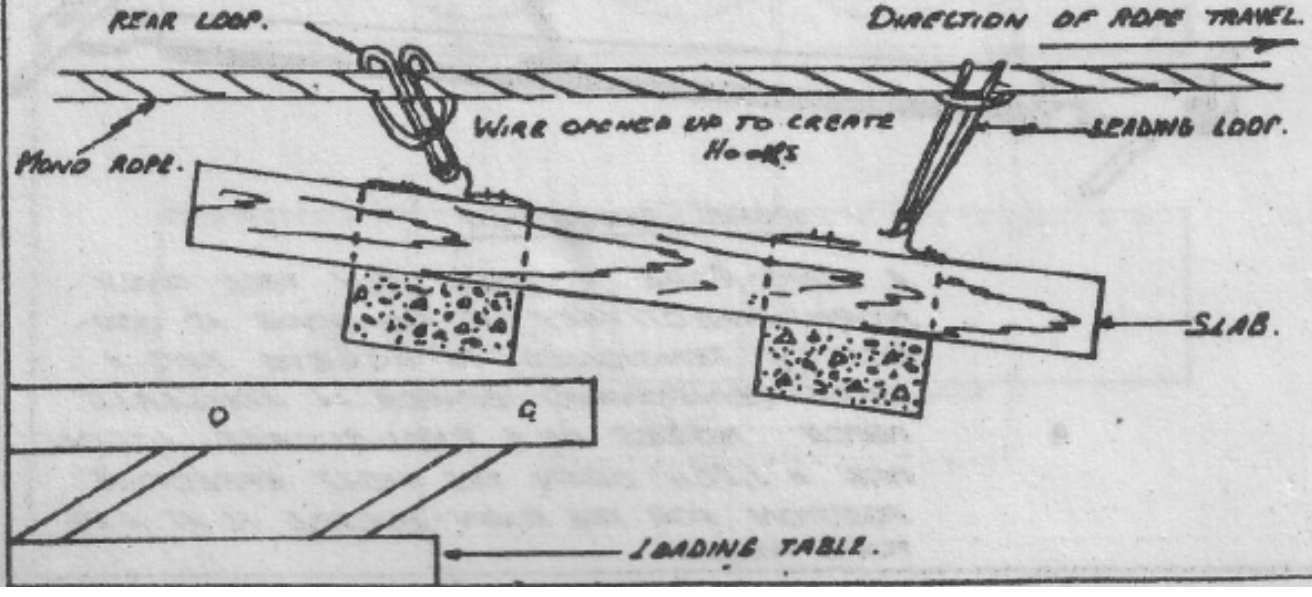
PIECES OF TWINE STRING 30 TO 50cm. LONG ARE USED TO MAKE LOOPS.

ATTACHING A SLAB OR MAT TO TWINE.

STEP. 1. PLACE TWO TWINE LOOPS LOOSELY AROUND MONO ROPE.

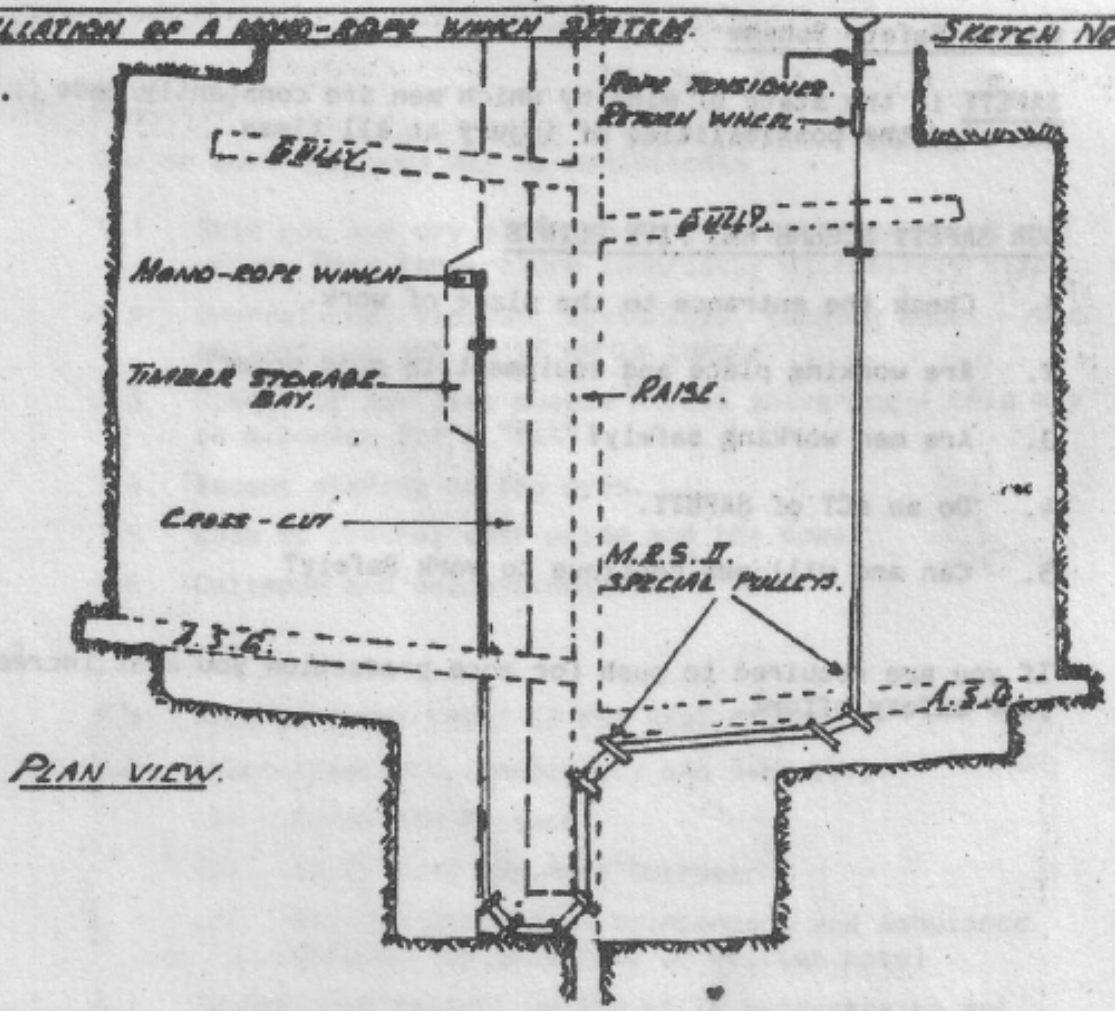
STEP. 2. HOOK SLAB OR MAT INTO LEADING LOOP.

STEP. 3. HOOK SLAB OR MAT ONTO REAR LOOP, THE WEIGHT WILL LIGHTEN LOOPS AROUND MONO-ROPE.

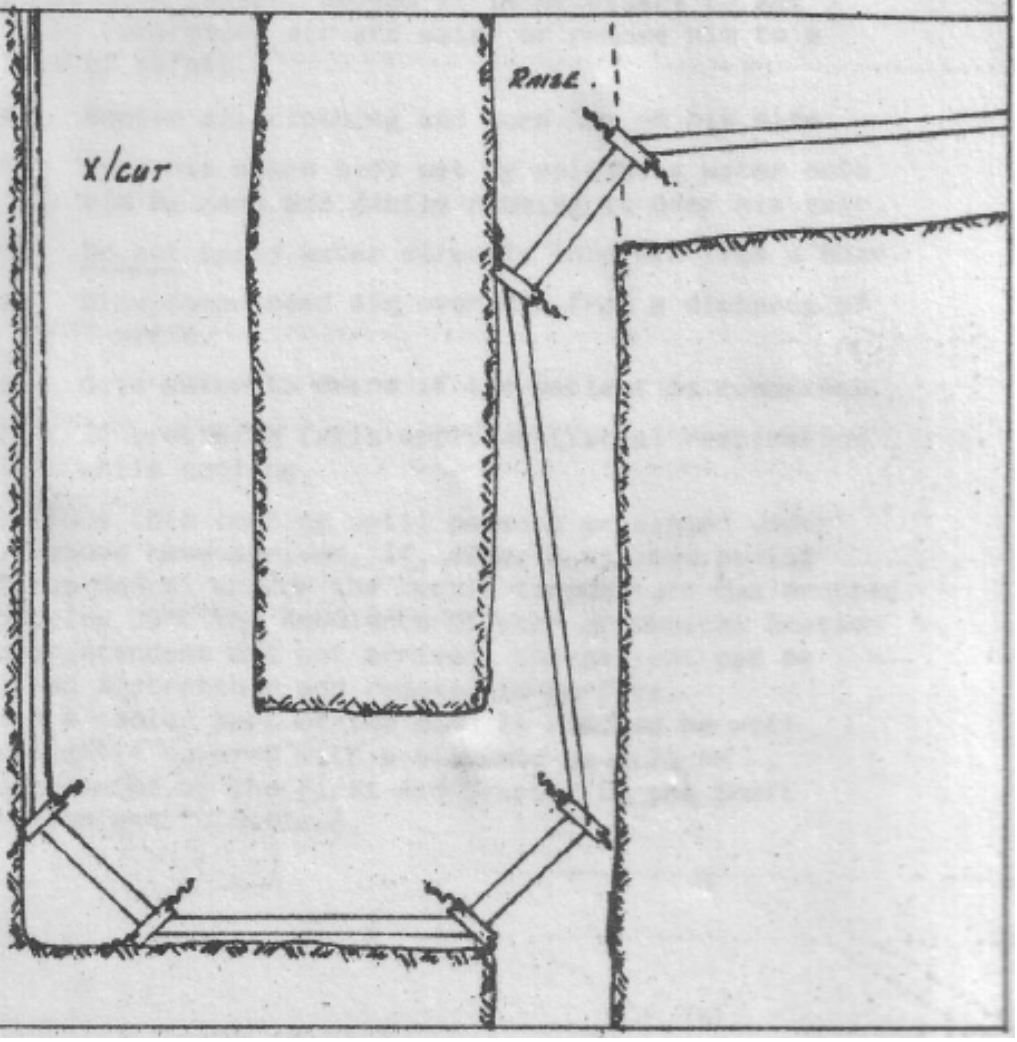


INSTALLATION OF A HAND-ROPE WINCH SYSTEM. SKETCH No. 87.

6.4.8.



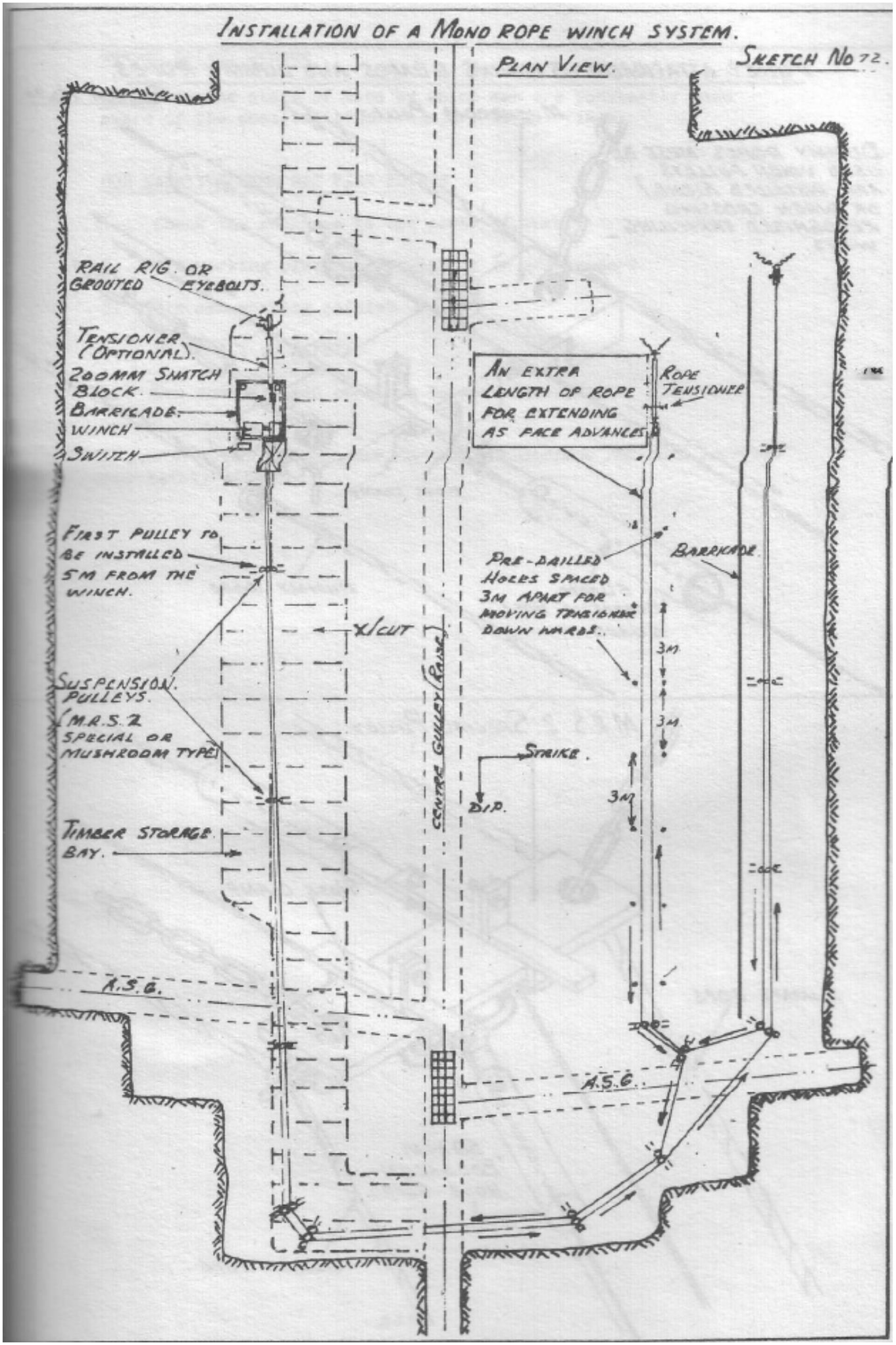
PLAN VIEW.



INSTALLATION OF A MOND ROPE WINCH SYSTEM.

PLAN VIEW.

SKETCH No 72.



Steep mining

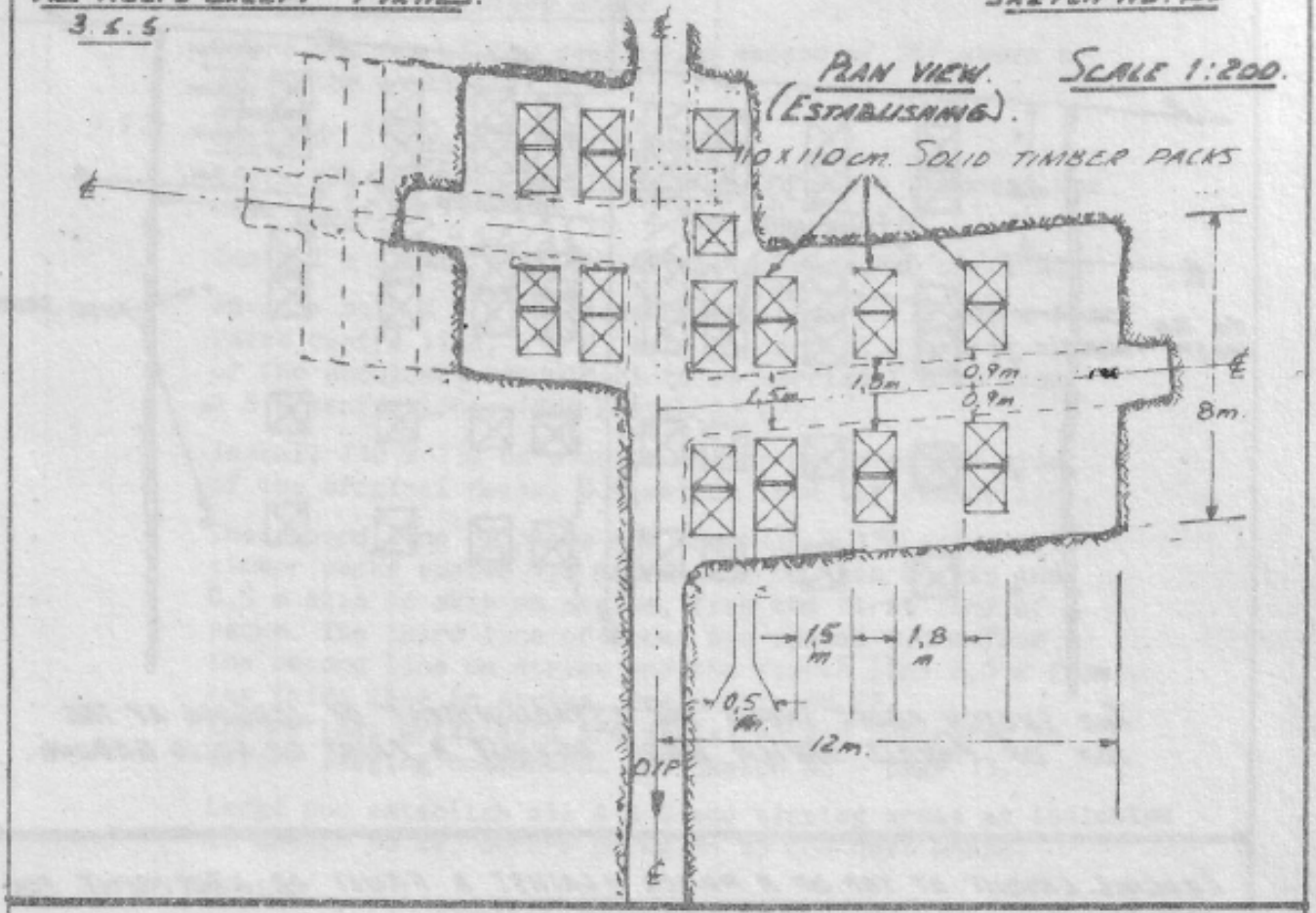
(reef dips in excess of 35deg)

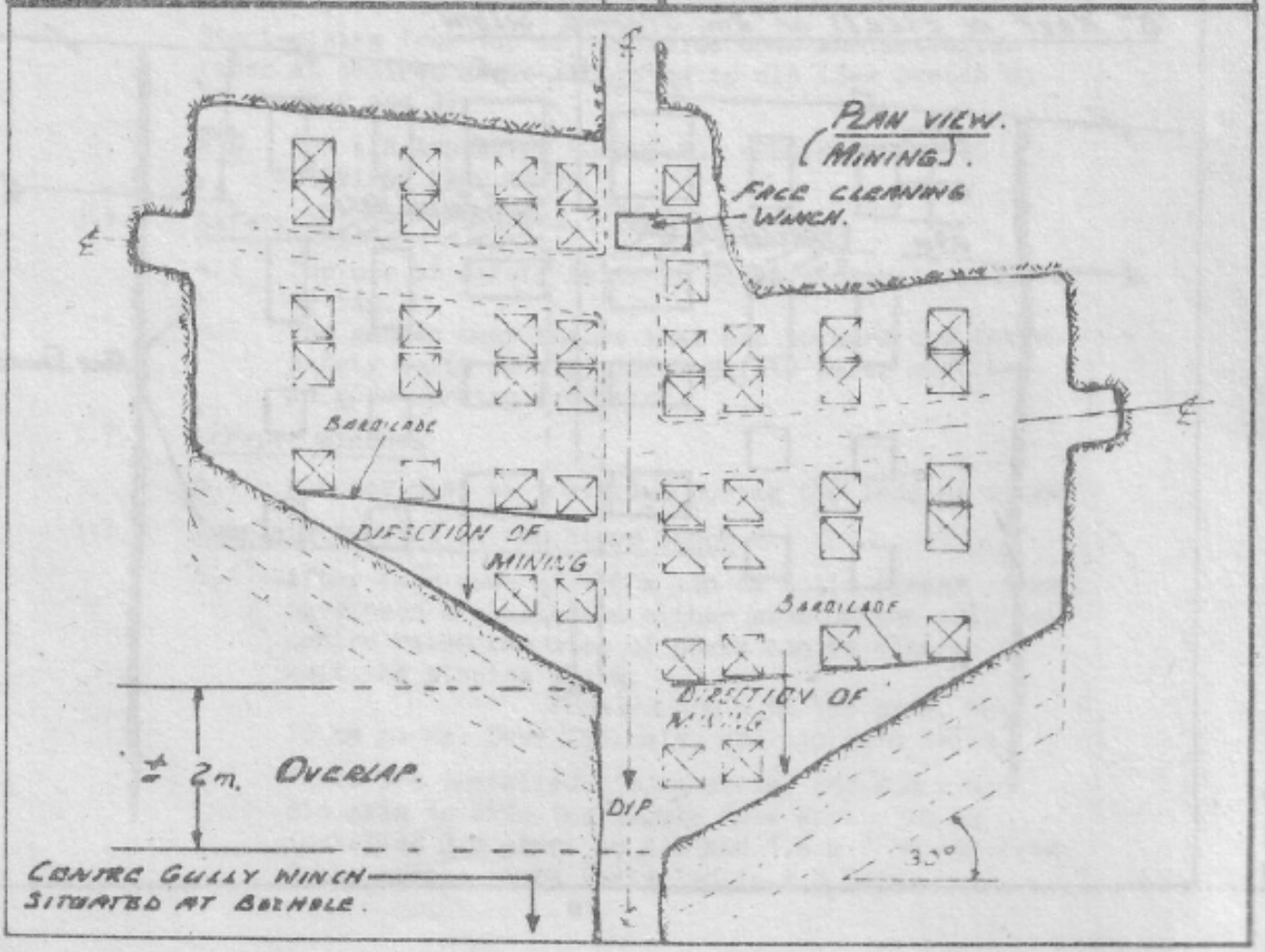
DOWN-DIP LEDGING – METHOD, SEQUENCE AND SUPPORT.

ALL REEFS EXCEPT "PYRITES."

SKETCH NO. 2.

3.2.5.



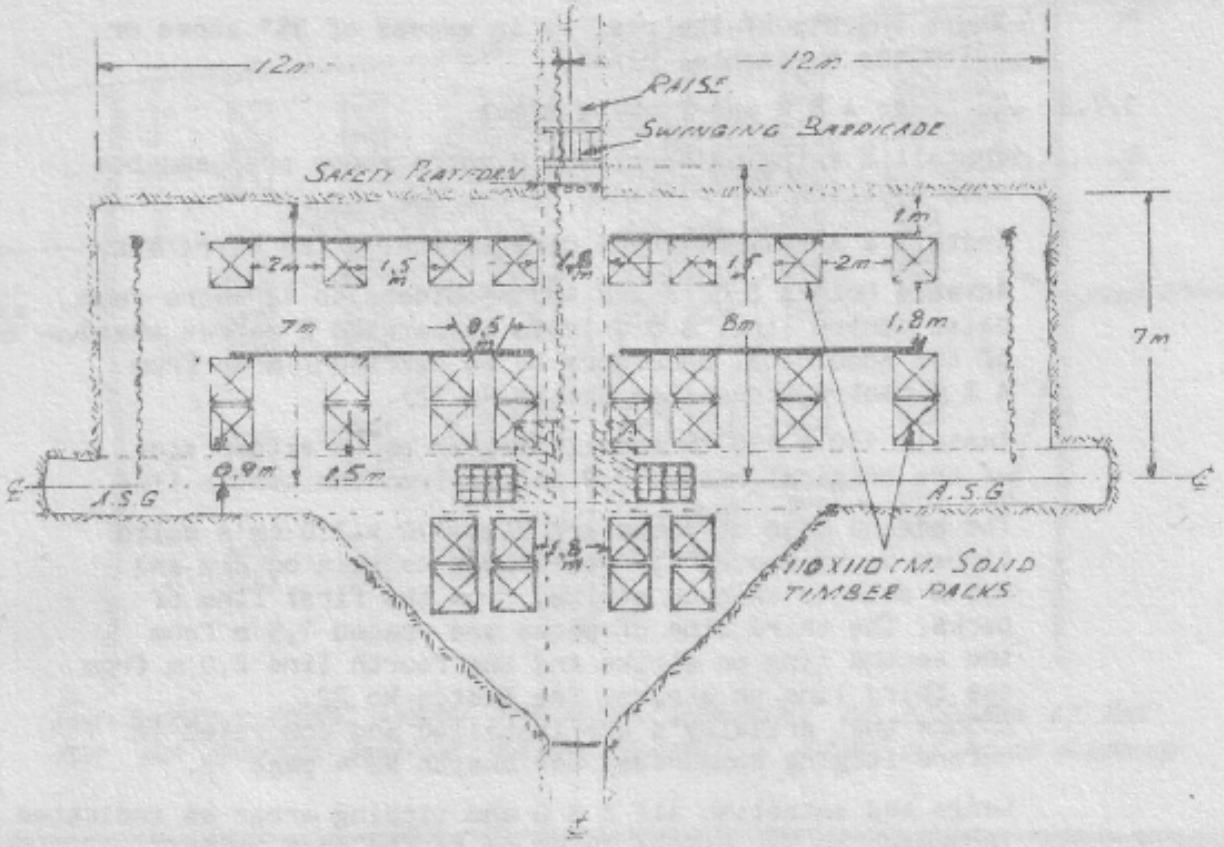


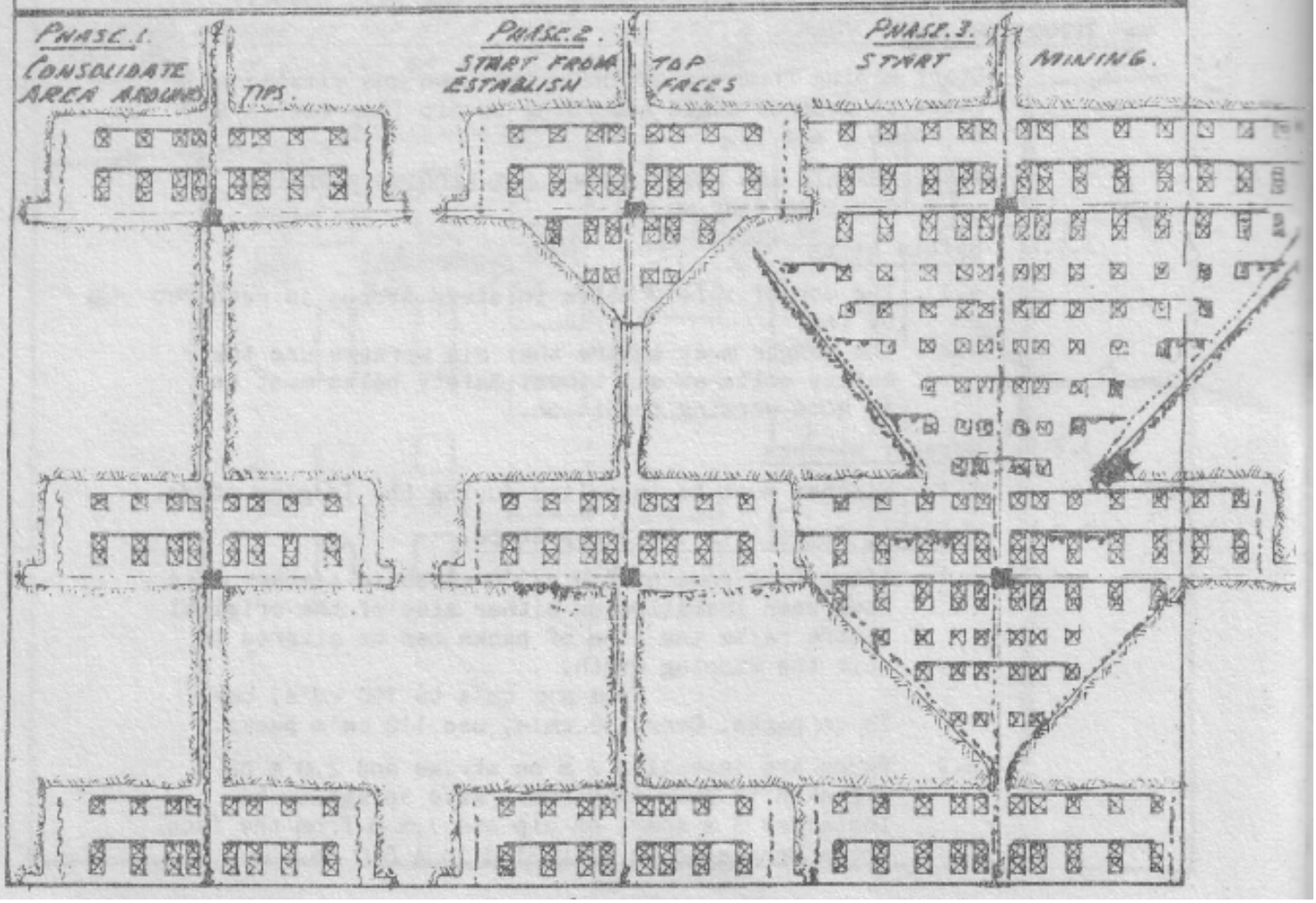
STEEP STOPING – LEDGING LAYOUT AROUND TIP AREA.

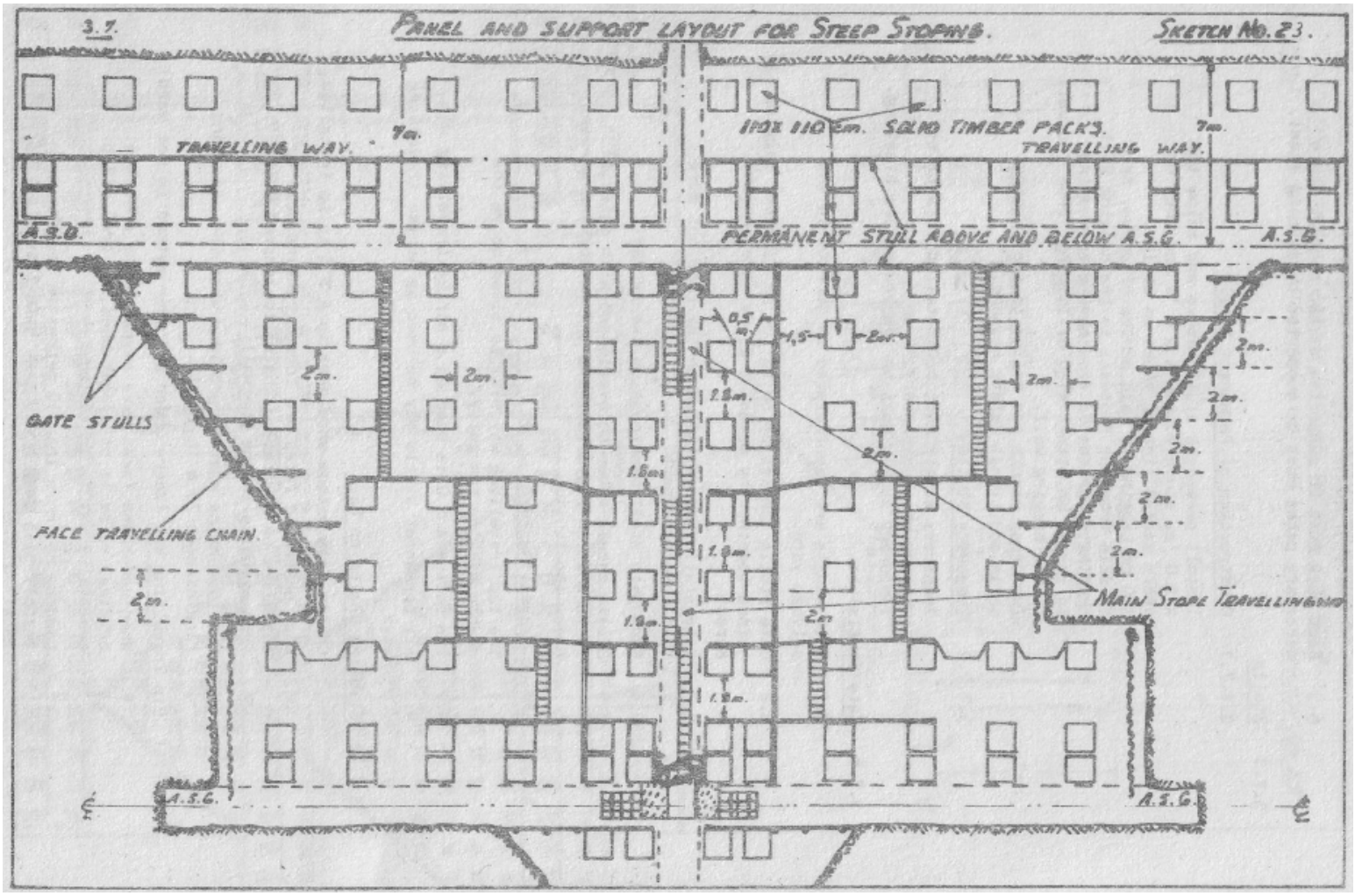
PLAN VIEW:

SKETCH No. 22.

3. 7. 2.



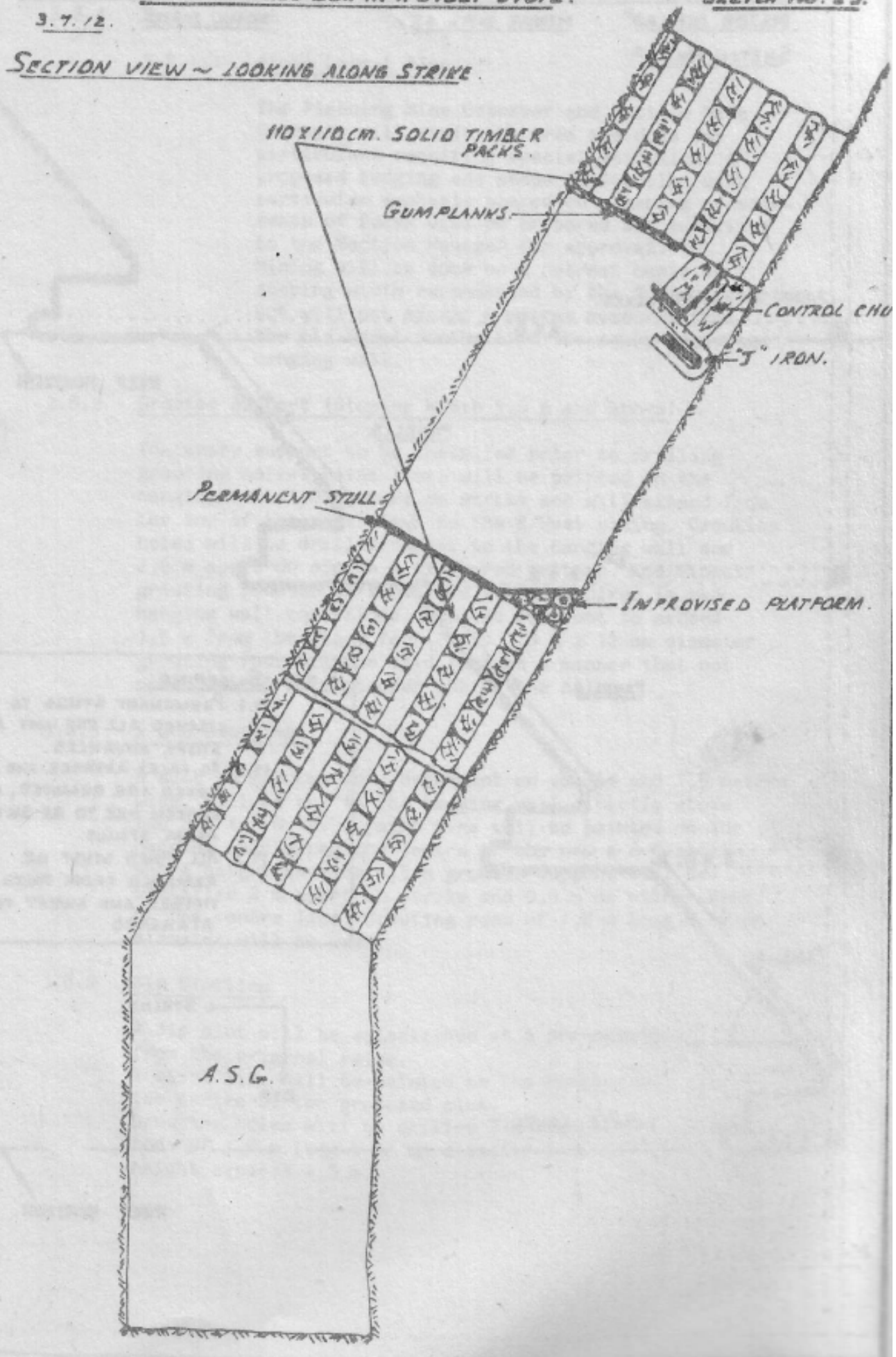



3.7.
PANEL AND SUPPORT LAYOUT FOR STEEP STOPING.
SKETCH No. 23.
TRAVELLING WAY.
7m.
IPOX 110 cm. SOLID TIMBER PACK'S.
TRAVELLING WAY.
7m.
A.S.G.
PERMANENT STULL ABOVE AND BELOW A.S.G.
A.S.G.
GATE STULLS
PACE TRAVELLING CHAIN.
0.5 m
1.5
2m.
1.8m.
1.9m.
MAIN STOPE TRAVELLINGWAY
A.S.G.
A.S.G.

STOPE CONTROL BOX IN A STEEP STOPE. SKETCH NO. 25.

3.7.12.

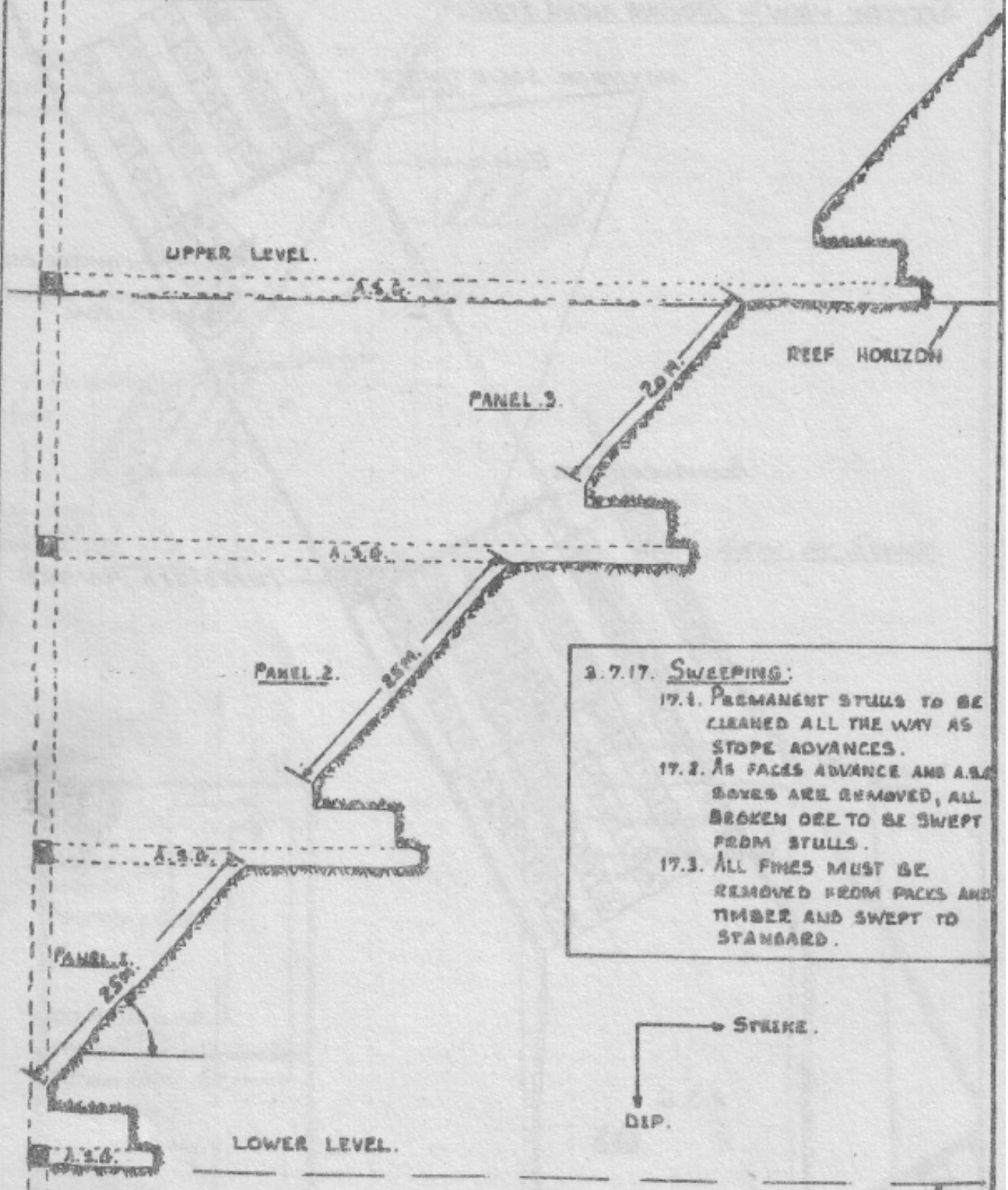
SECTION VIEW ~ LOOKING ALONG STRIKE.



PLAN VIEW OF A STEEP STOPE - LOOKING AT 90° TO THE PLANE OF THE REEF.

MAJOR DIP - 60° MINOR DIP = 49°. SCALE 1:500.

SKETCH No. 24.

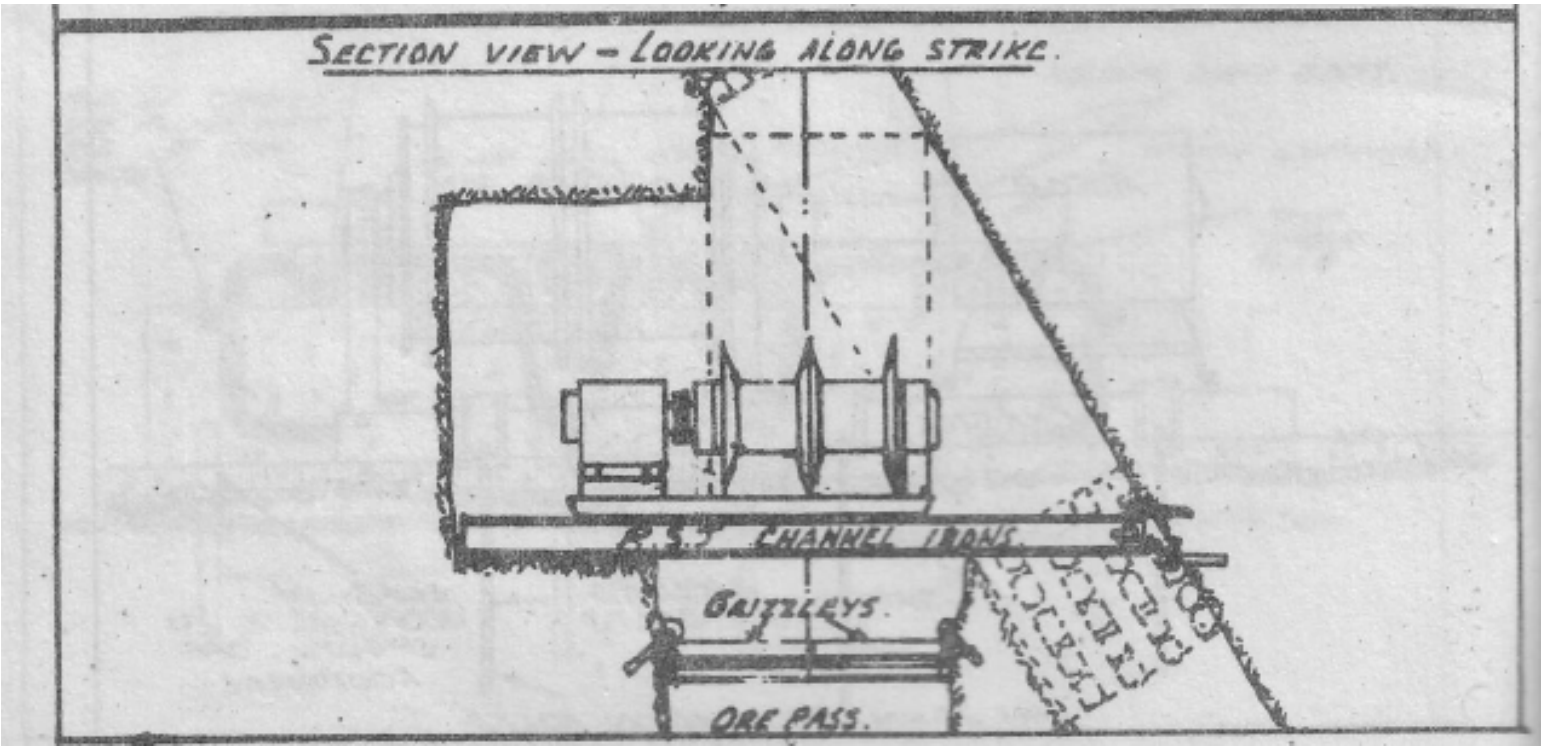


2.7.17. SWEEPING:

17.1. PERMANENT STULLS TO BE CLEANED ALL THE WAY AS STOPE ADVANCES.

17.2. AS FACES ADVANCE AND A.S.G. BOXES ARE REMOVED, ALL BROKEN ORE TO BE SWEPT FROM STULLS.

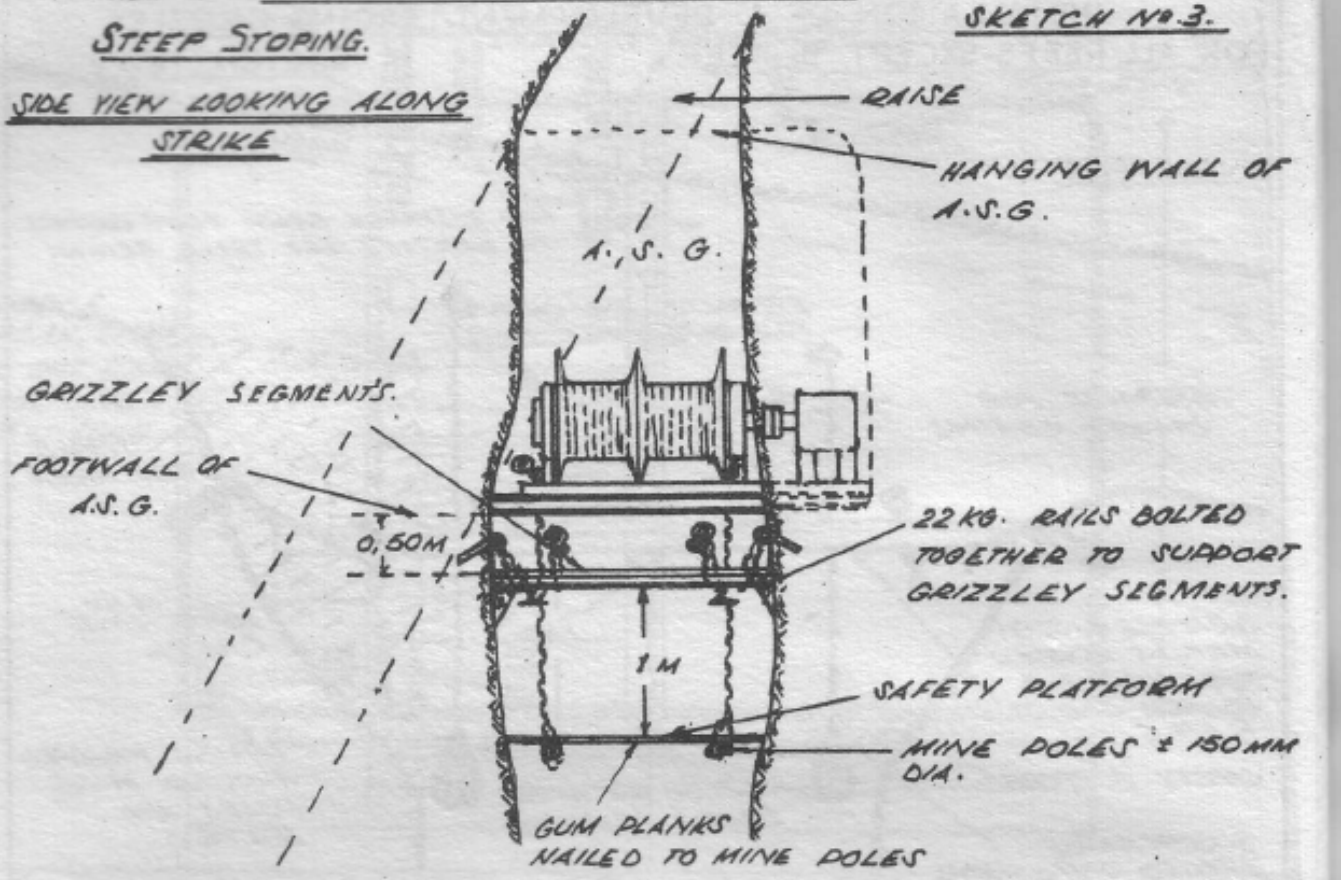
17.3. ALL FINES MUST BE REMOVED FROM PACKS AND TIMBER AND SWEPT TO STANDARD.

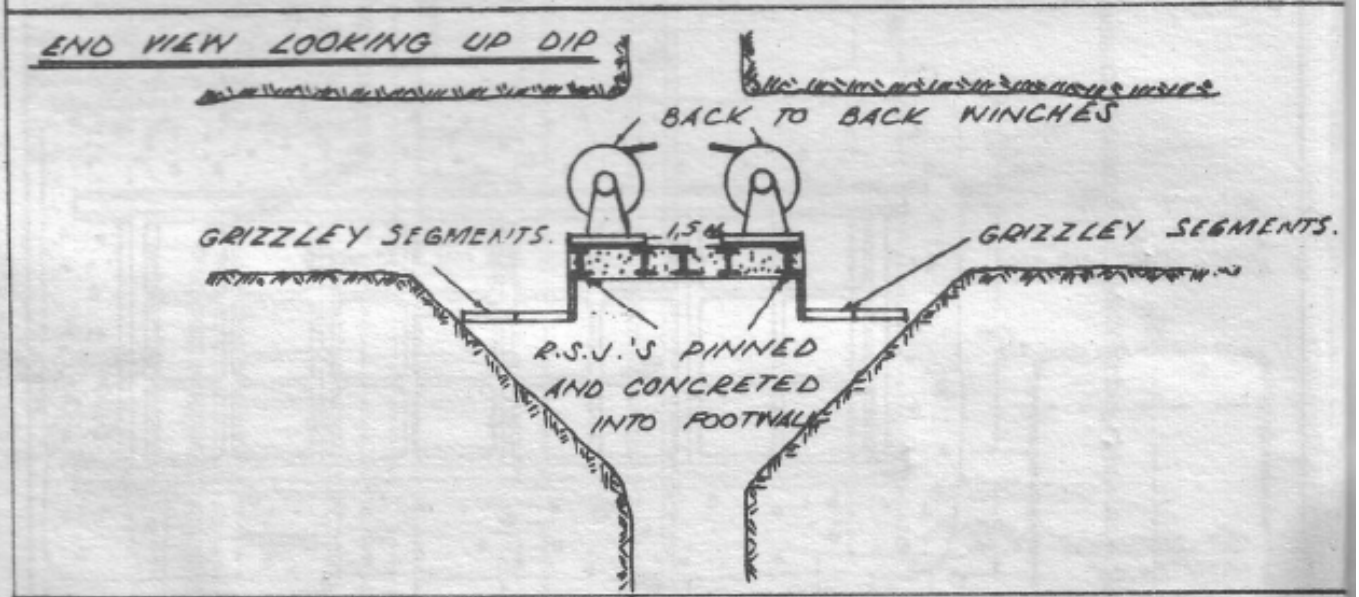

SECTION VIEW - LOOKING ALONG STRIKE.
CHANNEL IRONS.
GRIZZLEYS.
ORE PASS.

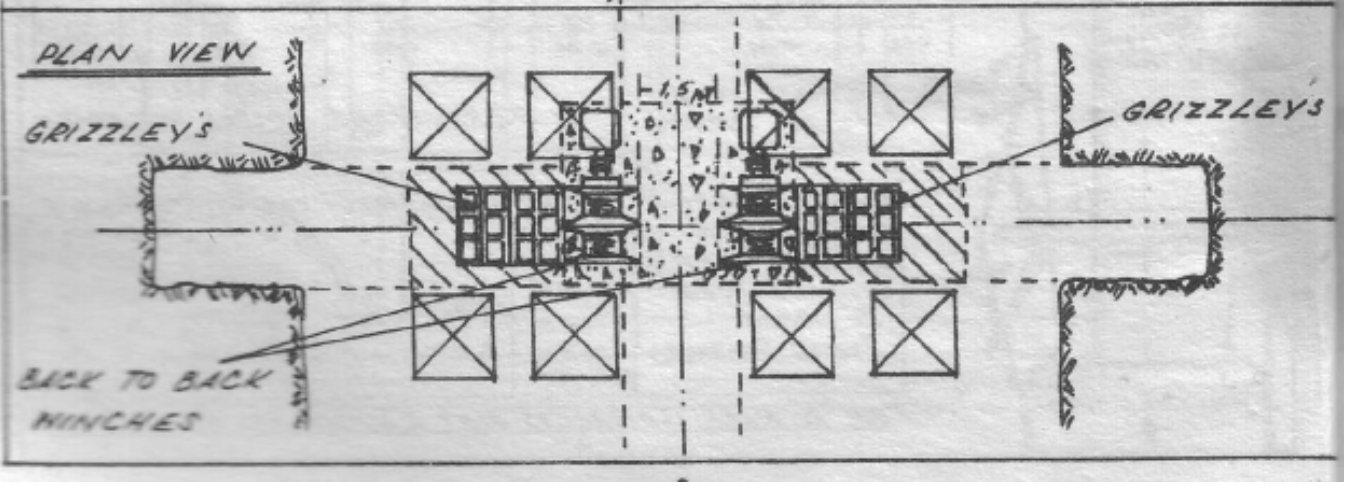
INSTALLATION OF A DEVELOPMENT/LEDGING GRIZZLEY - FOR BACK TO BACK WINCH INSTALLATION

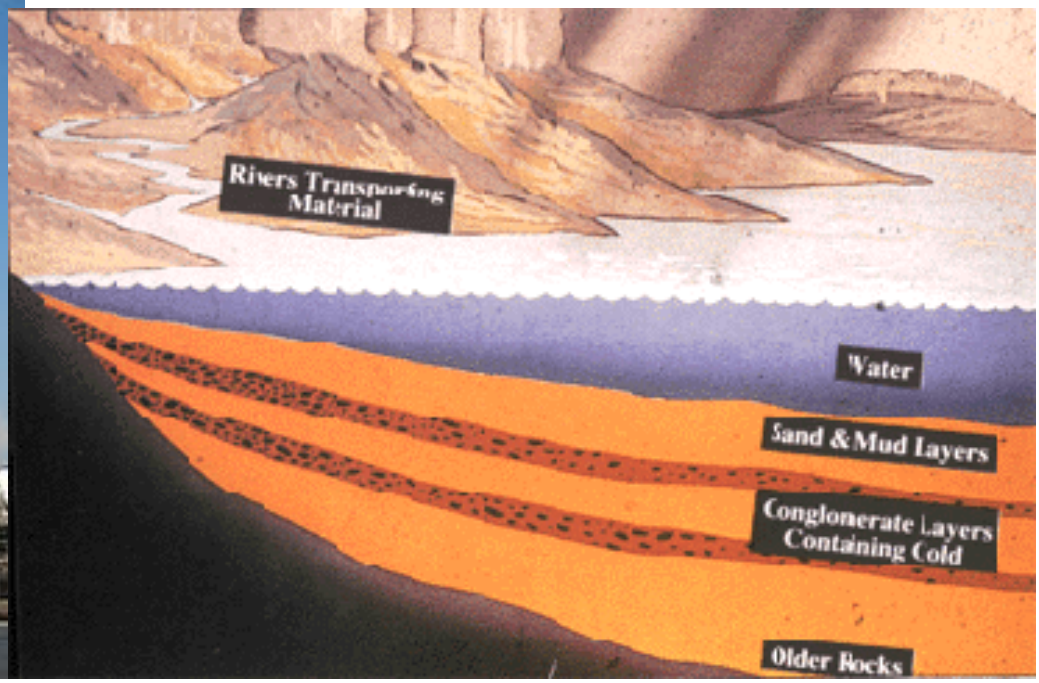
STEEP STOPING.

SKETCH No. 3.

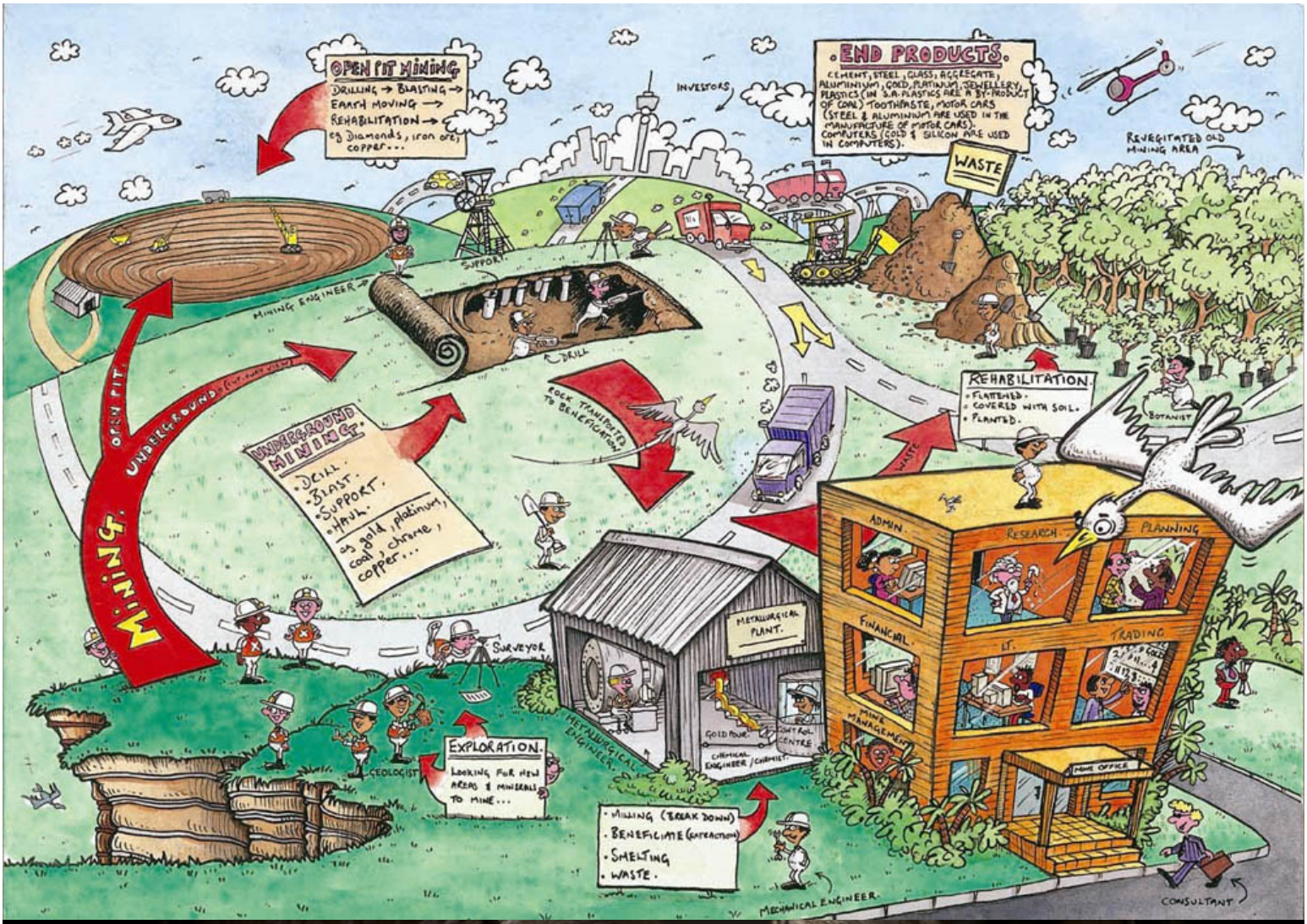







Rivers Transporting Material
Water
Sand & Mud Layers
Conglonerate Layers Containing Cold
Older Rocks


REFUGE BAY
TOEVLUGSTONNEL
MASIZA TONNEL
232


OPEN PIT MINING
DRILLING → BLASTING →
EARTH MOVING →
REHABILITATION →
eg Diamonds, iron ore, copper...
INVESTORS
END PRODUCTS
CEMENT, STEEL, GLASS, AGGREGATE, ALUMINIUM, GOLD, PLATINUM, JEWELLERY, PLASTICS (IN S.A. PLASTICS ARE A BY-PRODUCT OF COAL) TOOTHPASTE, MOTOR CARS (STEEL & ALUMINIUM ARE USED IN THE MANUFACTURE OF MOTOR CARS). COMPUTERS (GOLD & SILICON ARE USED IN COMPUTERS).
WASTE
REVEGITATED OLD MINING AREA
MINING
OPEN PIT
UNDERGROUND
MINING ENGINEER
SUPPORT
DRILL
UNDERGROUND MINING
• DRILL.
• BLAST.
• SUPPORT.
• HAUL.
eg gold, platinum, coal, chrome, copper...
ROCK TRANSPORTED TO BENEFICIATION
REHABILITATION
• FLATTENED.
• COVERED WITH SOIL.
• PLANTED.
BOTANIST
WASTE
ADMIN
RESEARCH
PLANNING
FINANCIAL
LT.
TRADING
MINE MANAGEMENT
MINE OFFICE
METALLURGICAL PLANT.
GOLD POUR
CONTROL CENTRE
CHEMICAL ENGINEER / CHEMIST
METALLURGICAL ENGINEER
SURVEYOR
GEOLOGIST
EXPLORATION.
LOOKING FOR NEW AREAS & MINERALS TO MINE...
• MILLING (BREAK DOWN)
• BENEFICIATE (EXTRACTION)
• SMELTING
• WASTE.
MECHANICAL ENGINEER
CONSULTANT