

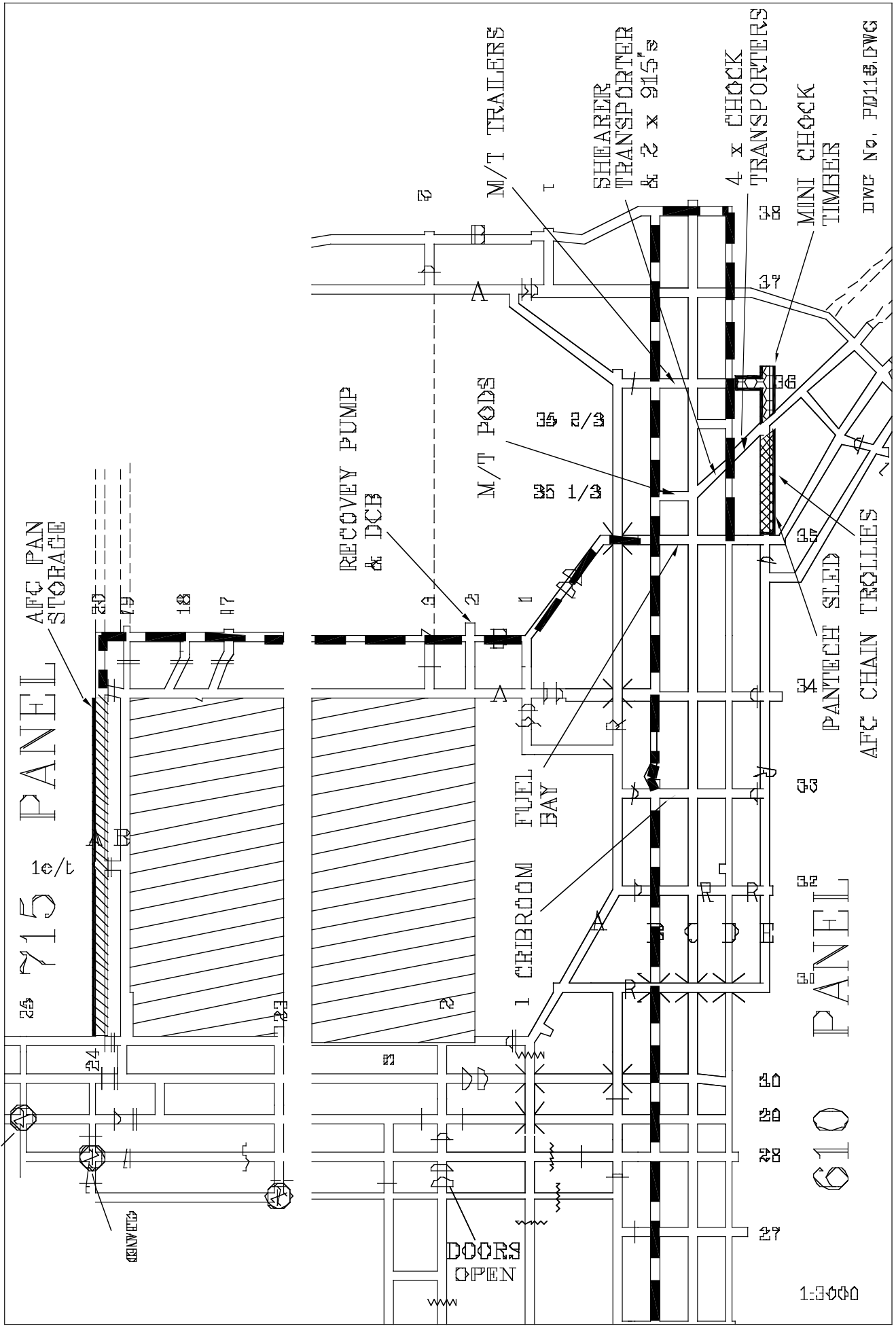
LONGWALL 20
TO
LONGWALL 21
CHANGEOVER

RECOVERY MANUAL

RECOVERY

Table Of Contents

	Page
Storage/Routes 610.....	4
Chock storage.....	5
Overhauls	6
13 th Last Pass to Last Pass (inc. Heusker Mesh).....	7 – 20
Maingate Drive.....	21
Shearer	21 & 23
Nylon Bretby.....	22
AFC chain	22, 24 – 25
Panline	22 – 23
DAC cable & unit.....	27
Lighting.....	28
Face cables & hoses.....	28
CIU & CIU cable.....	28
Goaf Plate.....	28
Maingate Cables	29–30
Stageloader.....	30 – 32
Chock Recovery	33 – 46
Pantech.....	47 – 50
Safe lifting.....	51 – 54



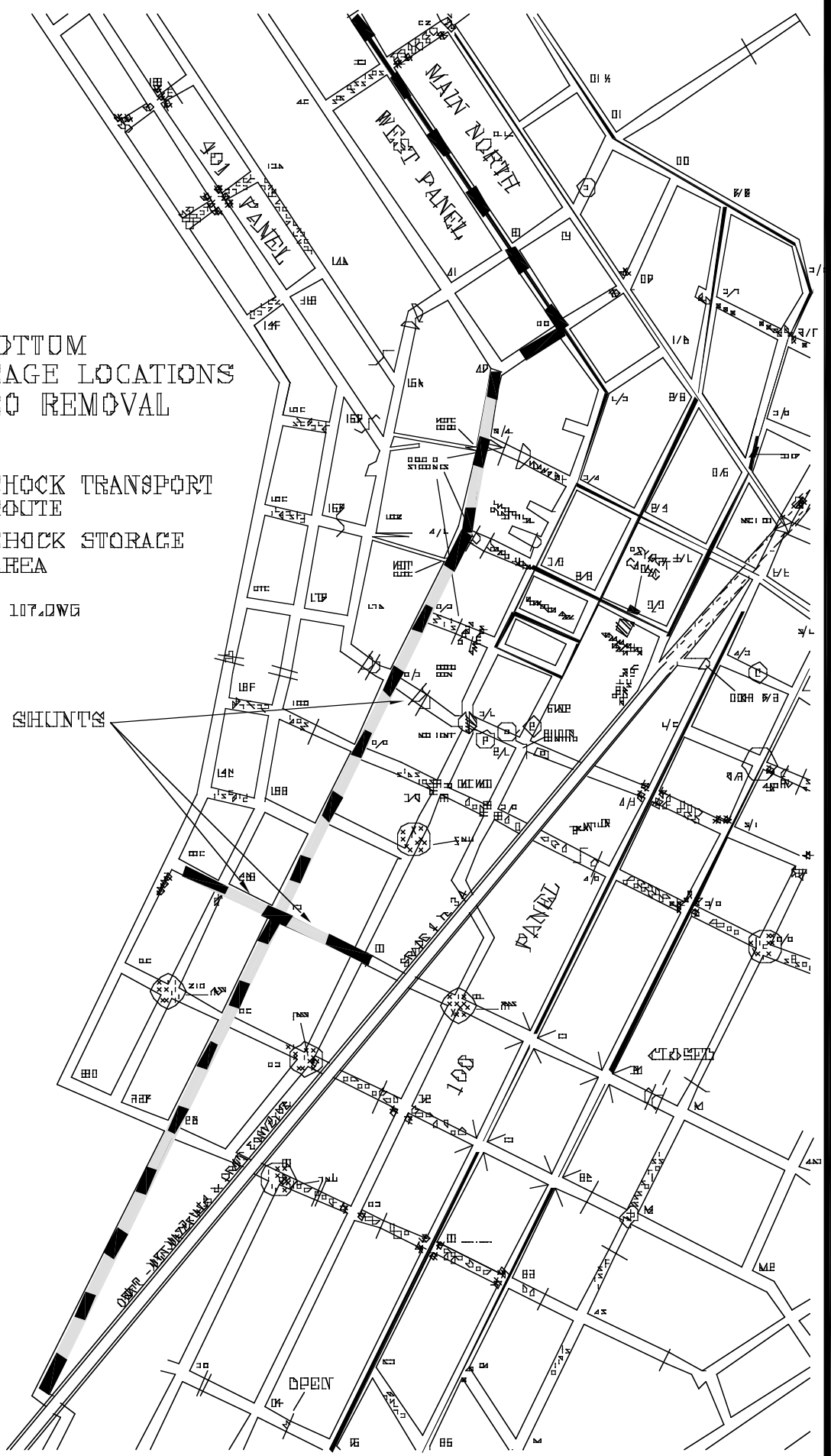
DWG No. P0118.DWG

PIT-BOTTOM
 CHOCK STORAGE LOCATIONS
 L/WALL 20 REMOVAL

-  CHOCK TRANSPORT ROUTE
-  CHOCK STORAGE AREA

DWG No. PD 107.006

SHUNTS



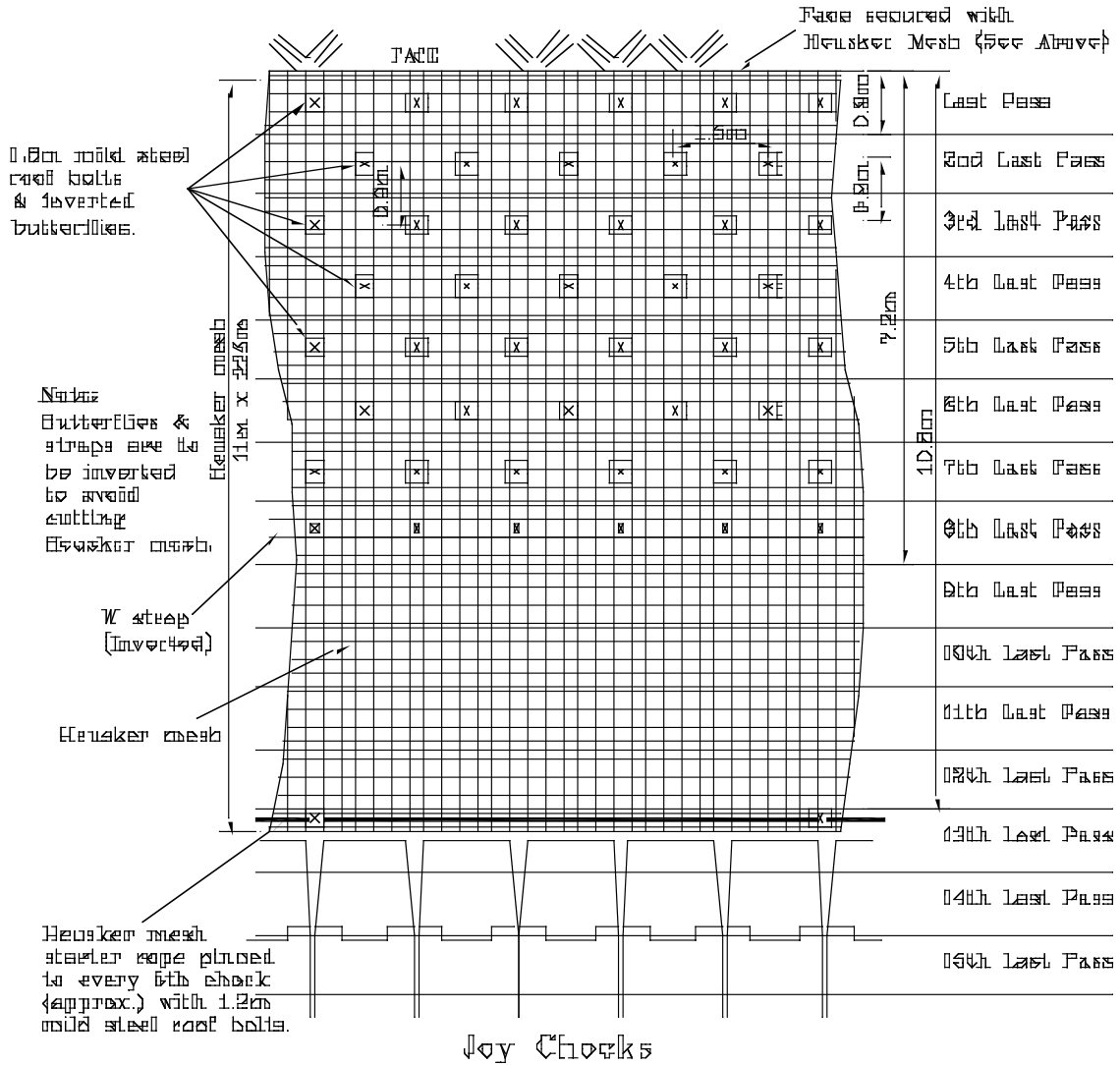
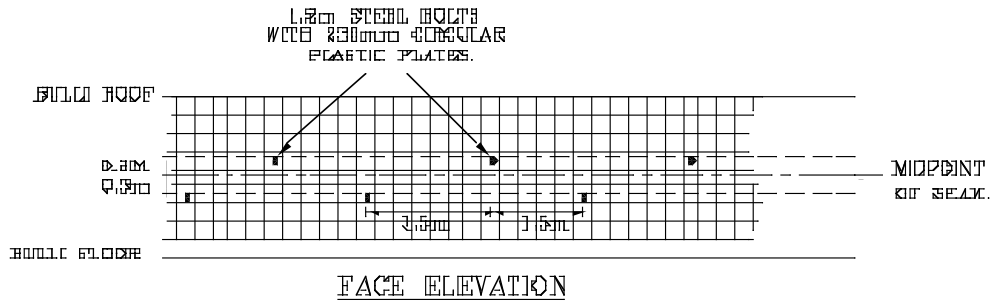
Longwall 20 to 21 Changeover

Items to go the surface and be sent away

1. Tailgate Drive Rotate Motor and New Carport
2. 1600mm Shearer Drums Repairs
3. Shearer Ranging Arm, Skid Shoe and Rack Wheel repairs
4. M/G Drive Repairs
5. Main Gate Drive Transmission Repairs
6. Swan Neck Repairs
7. BSL Tensionable End repairs
8. Goose Neck Sections Repairs
9. Nylon Bretby Repairs and reloading with Shearer cable and hose

Items to go to the surface

10. Roof Supports (# 18, 20, 29, 30, 46, 51, 55, 58,72, 74,79, 84, 86, 94, 102, 111, 114, 116, 117 & 122)..... Repairs to Carriages
11. Roof Supports (# 9, 37, 38, 83, 87, 107, 113, 124, 129 & 145).... Leg Replacement
12. Roof Support (# 153)..... Side Shield Replacement
13. Boot End Install piece of belt
14. Mini Pans Repairs
15. DCB N° 1 Repairs
16. DCB N° 2 Repairs
17. Hydraulic Tank..... Repairs
18. N° 3 Pump Service
19. N° 1 & 2 Pump Service
20. N° 1 Transformer..... Service
21. N° 2 Transformer..... Service
22. All Cables Testing and repairs
23. All Hoses Repairs and reloading
24. CIU's and DAC's Testing and repairs
25. Convertor Boxes and Lights Testing and repairs
26. Turntable & Vertical Bretby Repairs and store
27. Rigid Bretby..... Clean and Store
28. Mid-Face Pans N° 76-77 & 78-79 Repairs
29. AFC Chain Repairs & Reloading
30. BSL Chain..... Repairs & Reloading

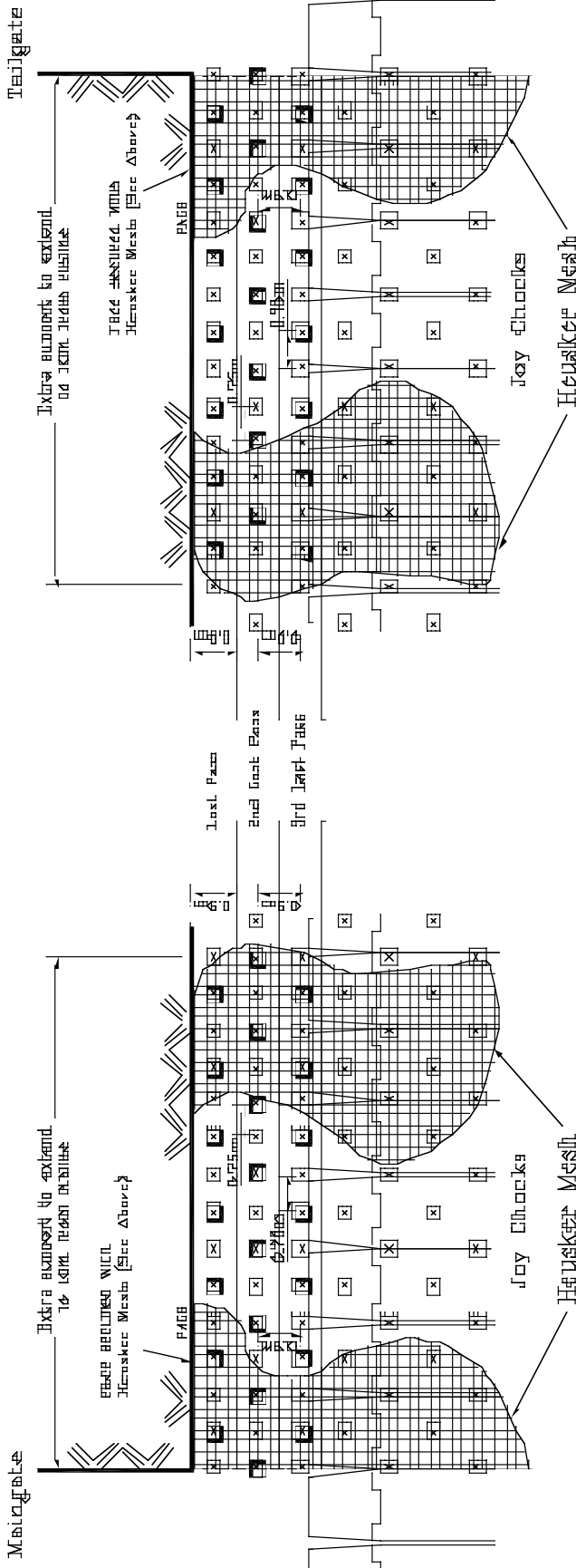


NOTE: - Total width of Housker Mesh = 12.5m

THIS PLAN INDICATES MINIMUM SUPPORTS.
NOTHING ON THESE SUPPORT PLACES SHALL PREVENT A WORKMAN FROM SETTING SUPPORTS IN HIS WORKING PLACE AT MORE FREQUENT INTERVALS THAN THOSE SPECIFIED ON THIS PLAN

11/11/2012 9/12/2012

PLAN SHOWING REQUIRED EXTRA ROOF SUPPORT WITHIN 10M OF GATEWAYS

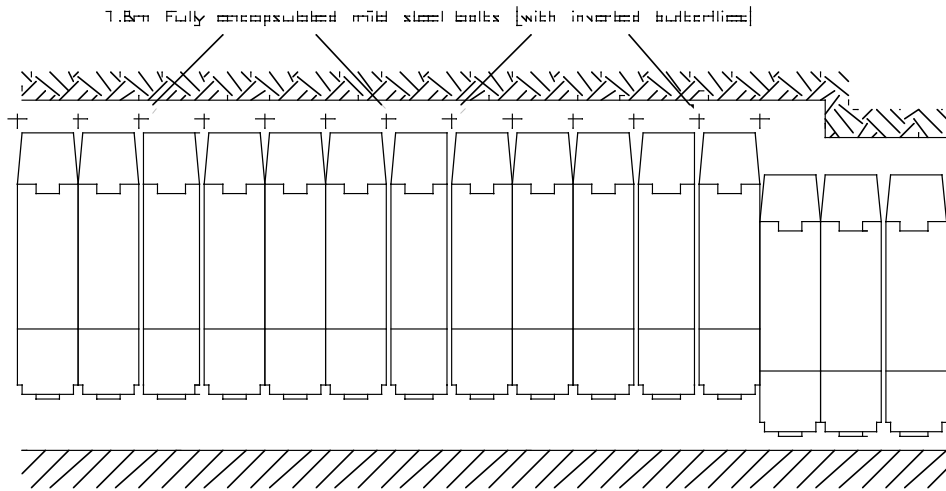


- Denotes Regular Bolting Density
- Denotes Additional Support Around Gateways

THIS PLAN INDICATES MINIMUM SUPPORT. NOTHING ON THESE SUPPORT ROLLERS SHALL PREVENT A WORKMAN FROM SETTING SUPPORTS IN HIS WORKING PLACE AT MORE FREQUENT INTERVALS THAN THOSE SHOWN ON THIS PLAN

BOLT UP SEQUENCE WITH HEUSKER MESH

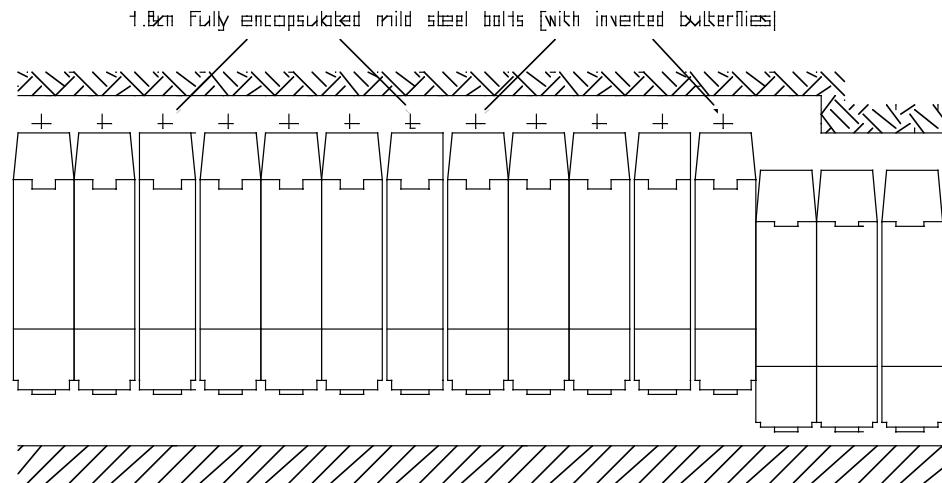
Not To Scale



GOAF

Step No.1 (7, 5, 4 & 1 Last Passes)

After cutting sequence, lower mesh roll and pin to roof with adjustable steel prop. Then bolt as close to the corners of the chocks as possible (as shown).



GOAF

Step No.2 (6, 3 & 2 Last Passes)

After cutting sequence, lower mesh roll and pin to roof with adjustable steel prop. Then bolt as close to the canopy tip of the chocks as possible (as shown).

THIS PLAN INDICATES MINIMUM
TIMBERING AND SUPPORT.
NOTHING IN THESE SUPPORT RULES
SHALL PREVENT A WORKMAN FROM
SETTING ADDITIONAL SUPPORTS IN HIS
WORKING PLACE AT MORE FREQUENT
INTERVALS THAN THOSE SPECIFIED ON
THIS PLAN.

13th LAST PASS

CUTTING HEIGHT

2.5m with the cutting stick at 900mm

SETTING UP THE FACE

- a) Cut a full pass using Bi-Di shearing. Don't leave a bench of coal on the floor.
- b) Advance the chocks leaving every 4th chock back (to bolt the starter rope).
- c) Leave the shearer at the T/G.
- d) Do not advance the panline.
- e) **Isolate power to AFC. All persons working on AFC are to use the Locked Box.**

TRANSPORT OF HEUSKER MESH THROUGH THE FACE-LINE

- f) Position the Heusker Mesh trailer at the T/G drive so the mesh has smooth exit from the trailer.
- g) Stand a timber prop at the T/G face corner to prevent the Heusker Mesh from being damaged when it is dragged onto the face.
- h) Drag and man handle the **BLUE** painted end of the Heusker Mesh until it is at the M/G end of the shearer. The **BLUE** painted end of the Heusker Mesh indicates the M/G end of the Mesh.
- i) With the small roll to the top, attach the Heusker Mesh to the T/G drum using two 10mm high tensile chains. Leave two men at the Mesh trailer and one man at the T/G DAC Cadlock.
- j) Slowly drag the Heusker Mesh along the face in front of the AFC panline **ensuring it does not twist i.e. small roll stays on top of the larger roll.** The shearer driver is to keep in constant contact with the man at the T/G DAC to ensure the Mesh is O.K.
- k) Leave a man at #78 chock and when the red paint mark on the Mesh (which indicates the centre of the Mesh) reaches the centre of **78/79 PAN JOINT**, stop the shearer as the Mesh is now in it's bolt-up position ready to hang.

LIFTING HEUSKER MESH TO THE ROOF

- l) Check that there are no twists in the roll, if any then straighten the roll out, as it will slow down the job later.
- m) Cut the white external ties, the mini-roll is then separated from the main roll and the steel starter rope is exposed.
- n) Starting at mid point, #78 and #82 chock (two crews) lift the steel starter rope on top of two Wombats. The Wombats then together lift this rope and the slack Heusker Mesh from the mini roll to the roof. Once pinned in position, two other bolters then drill and set a 1.2m bolt and plate each, which pins the Heusker Mesh to the roof.
- o) Now move the Wombats 4 chocks in either direction, lift the starter rope to the roof again, then install another 2 bolts and plates. Continue until the gate ends are reached.

SECURING HEUSKER MESH ROLL TO UNDERSIDE OF CANOPIES

- p) The Heusker Mesh roll comes with 'tails' fitted from the starter rope. Once the mini-roll had been lifted and pinned to the roof, these tails will be exposed and will line up with the winches mounted on the chocks.
- q) Once joined the winches are wound up and the main roll of Heusker Mesh is lifted to the underside of the chock canopies.
- r) The AFC should be examined from end to end to ensure that all materials have been removed prior to restart.
- s) Advance the panline.

12th LAST PASS

CUTTING HEIGHT

2.5m with the cutting stick at 900mm

- a) Depending on the prevailing roof conditions, cut the maximum number of chocks without causing the roof to fall using BI-DI shearing.
- b) As soon as practicable after the roof has been exposed lower the Heusker Mesh one web.
- c) Using the adjacent control toggle switches (do not use contact advance) sequentially fully advance the chocks ensuring they do not snag the mesh then set to the roof.

Sequence (b) and (c) can be done whilst cutting continues.

- d) Winch the Heusker Mesh back to the underside of the canopies.
- e) Advance the panline.
- f) Double chock where possible especially in areas where the roof has fallen.
- g) If large cavities have formed in the roof install 1.8m bolts into the ends and face of the cavity to prevent it from getting larger.
- h) The AFC should be examined from end to end to ensure that all materials have been removed prior to restart.

11th – 9th LAST PASS

CUTTING HEIGHT

2.5m with the cutting stick at 900mm

- a) Same as 12th last pass but **do not double chock the 9th last pass.**

8th LAST PASS

CUTTING HEIGHT
2.5m with the cutting stick at 900mm

Bolting stations at #27, #54, #68, #88, #108, #122 & #144 chocks.

- a) Depending on the prevailing roof conditions, cut the maximum number of chocks without causing the roof to fall using BI-DI shearing.
- b) As soon as practicable after the roof has been exposed lower the Heusker Mesh one web.
- c) Using the adjacent control toggle switches (do not use contact advance) sequentially fully advance the chocks ensuring they do not snag the mesh then set to the roof.
Sequence (b) and (c) can be done whilst cutting continues.
- d) Do a clean up run if required
- e) Do not advance the panline.
- f) **Isolate power to AFC. All persons working on AFC are to use the Locked Box.**
- g) **Lower the mesh roll 750mm and use a Wombat to pin the mesh roll 750mm from the tip of the canopies.**
- h) **Use the adjustable square steel props to hold the mesh roll in place before removing the Wombat.**
- i) **Install W-straps in the inverted position (so they don't cut the Mesh) parallel to the face with a 1.8m fully encapsulated mild steel roof bolt. Bolts to be spaced at 1.5m centres and angled towards the face (see support diagrams on page N^o8 & 9).**
- j) **Start installing roof bolts into the 'W' strap except the last hole where the next 'W' is to be joined.**
- k) **Before installing the next 'W' strap, drill 1.8m hole in the last hole of the 'W' strap just installed then insert a 1.8m roof bolt through the first of the next strap to be installed and into the hole already drilled. Spin and set the bolt but do not tighten (if this bolt is tightened now the strap is unlikely to remain parallel to the face).**
- l) **Hold the strap parallel to the face with a Pogo Stick. Install the next bolt into the strap and tighten.**
- m) **Take the bolter back and tighten the bolt joining the two straps.**
- n) Winch the Heusker Mesh back to the underside of the canopies.
- o) Install additional bolts where required.
- p) Advance the panline.
- q) The AFC should be examined from end to end to ensure that all materials have been removed prior to restart.

7th LAST PASS

(See diagram on page #8)

CUTTING HEIGHT

2.5m with the cutting stick at 900mm

- a) Depending on the prevailing roof conditions, cut the maximum number of chocks without causing the roof to fall using BI-DI shearing.
- b) As soon as practicable after the roof has been exposed lower the Heusker Mesh one web.
- c) Using the adjacent control toggle switches, fully advance each chock ensuring they do not snag the mesh then set to the roof.
Sequence (b) and (c) can be done whilst cutting continues.
- d) Do a clean up run if required.
- e) Do not advance the panline.
- f) **Isolate power to AFC. All persons working on AFC are to use the Locked Box.**
- g) **Lower the mesh roll 750mm and use a Wombat to pin the mesh roll 750mm from the tip of the canopies.**
- h) **Use the adjustable square steel props to hold the mesh roll in place before removing the Wombat.**
- i) **Install 1.8m fully encapsulated mild steel roof bolts with inverted butterfly plates on the edge and as close as possible to the tip of the fully advanced chocks otherwise the shearer cutter drums will foul the mesh (see diagrams on page N^o7 & 9).**
- j) Install additional bolts in front of the mesh where any roof has fallen or face spalled.
- k) Winch the Heusker Mesh back to the underside of the canopies.
- l) The AFC should be examined from end to end to ensure that all materials have been removed prior to restart.
- m) Advance the panline.
- n) Continue removing the roll pins from the Eickotrack. Replace with 4½” x .5½” bolts and washers.

6th LAST PASS

CUTTING HEIGHT

2.5m with the cutting stick at 900mm

- a) Depending on the prevailing roof conditions, cut the maximum number of chocks without causing the roof to fall using BI-DI shearing.
- b) As soon as practicable after the roof has been exposed lower the Heusker Mesh one web.
- c) Using the adjacent control toggle switches, fully advance all the chocks in the area just cut ensuring they do not snag the mesh then set to the roof.

Sequence (b) and (c) can be done whilst cutting continues.

- d) Do a clean up run if required.
- e) Do not advance the panline.
- n) **Isolate power to AFC. All persons working on AFC are to use the Locked Box.**
- o) **Lower the mesh roll 750mm and use a Wombat to pin the mesh roll 750mm from the tip of the canopies.**
- p) **Use the adjustable square steel props to hold the mesh roll in place before removing the Wombat.**
- q) **Install 1.8m fully encapsulated mild steel roof bolts with inverted butterfly plates in the middle and as close as possible to the tip of the fully advanced chocks otherwise the shearer cutter drums will foul the mesh (see diagrams on page N^o7 & 9).**
- f) Install additional bolts in front of the mesh where any roof has fallen or face spalled.
- g) Winch the Heusker Mesh back to the underside of the canopies.
- h) The AFC should be examined from end to end to ensure that all materials have been removed prior to restart.
- i) Advance the panline.

5th LAST PASS
(See diagram on page #8)

CUTTING HEIGHT
2.5m with the cutting stick at 900mm

Same as 7th Last Pass.

WORK LIST AFTER 5th LAST PASS

1. Continue removing the roll pins from the Eickotrack. Replace with 4½” x 5½” bolts and washers.
2. Disconnect lights on Pantec and BSL.

4th LAST PASS
(See diagram on page #9)

CUTTING HEIGHT
2.5m with the cutting stick at 900mm

Same as 6th Last Pass.

3rd LAST PASS
(See diagram on page #8)

CUTTING HEIGHT
2.5m with the cutting stick at 900mm

Same as 7th Last Pass except an additional bolt is to be installed at each chock for the first 10m along the face from the M/G and T/G roadway. **See diagram on page N° 8.**

THE CHOCKS ARE NOW IN THEIR FINAL POSITION AFTER THEY HAVE BEEN ADVANCED ON THIS PASS.

WORK LIST AFTER 3rd LAST PASS

1. Continue removing the roll pins from the Eickotrack. Replace with 4½” x 5½” bolts and washers.
3. Disconnect No.1 and No.2 light circuits.
4. Remove converter boxes from chocks.

2nd LAST PASS

**CUTTING HEIGHT
2.5m with the cutting stick at 900mm**

Bolting stations at #27, #54, #68, #88, #108, #122 & #144 chocks.

- a) Depending on the prevailing roof conditions cut the maximum number of chocks without causing the roof to fall.
- b) Leave the shearer at the tailgate**

DO NOT ADVANCE THE CHOCKS

- c) Do a clean up run if required.
- d) Isolate power to AFC. All persons working on AFC are to use the Locked Box.**
- e) Lower the Heusker Mesh in the zone just cut.
- f) Use the adjustable square steel props to hold the Mesh in place to bolt.
- g) Bolt the roof with inverted butterfly plates and 1.8m fully encapsulated mild steel bolts on 1.5m spacings.
- h) Alternate the position of bolts on each pass from the centre to the edge of the chock canopies. An additional bolt is to be installed at each chock for the first 10m along the face from the M/G and T/G roadway. **(see support diagrams on page N° 8).**
- i) Install additional bolts in poor roof where required.
- j) Winch the Heusker Mesh back to the underside of the canopies.
- k) The AFC should be examined from end to end to ensure that all materials have been removed prior to restart.

WORK LIST AFTER 2nd LAST PASS

DO A CLEAN UP RUN FROM THE M/G TO THE T/G. PUSH THE M/G OVER USING THE RELAY BAR EXTENSION PIECES AND FORM A SNAKE ENDING AT N° 135 CHOCK THEN CUT BACK TO THE M/G.

1. Unhook every relay bar from the panline. Replace the front pin, washers and lynch pins into the appropriate holes in the relay bars. Lay out the relay bar extension pieces as we go.
2. Insert the relay bar extension every 3rd chock and push the panline over, working from the maingate to the tailgate. Move the relay bar extensions along the face until the entire panline is fully pushed over.

NOTE: The short extensions are for the maingate and tailgate.

3. Continue removing the roll pins from the Eickotrack. Replace with 4½” x 5½” bolts and washers.
4. Undo the Rigid Bretby joining bolts and remove the Vertical Bretby side plates when the Pantech is in its final position.

THE LAST PASS

CUTTING HEIGHT
2.5m with the cutting stick at 900mm

SEQUENCE N° 1

If roof conditions allow cut from #155 chock to #125 chock using Bi-Di.

- a) Do a clean up run if required.
- b) **Isolate power to AFC. All persons working on AFC are to use the Locked Box.**
- c) Lower the Heusker Mesh in the zone just cut.
- d) Use the adjustable square steel props to hold the Mesh in place to bolt.
- e) Bolt the roof with inverted butterfly plates and 1.8m fully encapsulated mild steel bolts on 1.5m spacings and an additional butterfly and 1.8m roof bolt into the Mesh where the roof and coal face meet. This additional bolt will make the Mesh hang down and against the coalface.
- f) Alternate the position of bolts on each pass from the centre to the edge of the chock canopies. An additional bolt is to be installed at each chock for the first 10m along the face from the M/G and T/G roadway. **(see support diagrams on page N° 7, 8 & 9).**
- g) While roof bolting this sequence set-up two Rib Borers in the zone just cut.

SEQUENCE N° 2

- If roof conditions allow cut from #125 chock to #100 chock using Bi-Di.
- Support same as 'Sequence N° 1 except for:

While roof bolting this sequence, lower the Heusker Mesh down the face and install a 1.2m rib bolt into the coal face in a 'W' pattern at every chock from #155 chock to #125 chock.

SEQUENCE N° 3

- If roof conditions allow cut from #100 chock to #75 chock using Bi-Di.
- Support same as 'Sequence N° 1 except for:

While roof bolting this sequence, lower the Heusker Mesh down the face and install a 1.2m rib bolt into the coal face in a 'W' pattern at every chock from #125 chock to #100 chock.

SEQUENCE N° 4

- If roof conditions allow cut from #75 chock to #50 chock using Bi-Di.
- Support same as 'Sequence N° 1 except for:

While roof bolting this sequence, lower the Heusker Mesh down the face and install a 1.2m rib bolt into the coal face in a 'W' pattern at every chock from #100 chock to #75 chock.

SEQUENCE N° 5

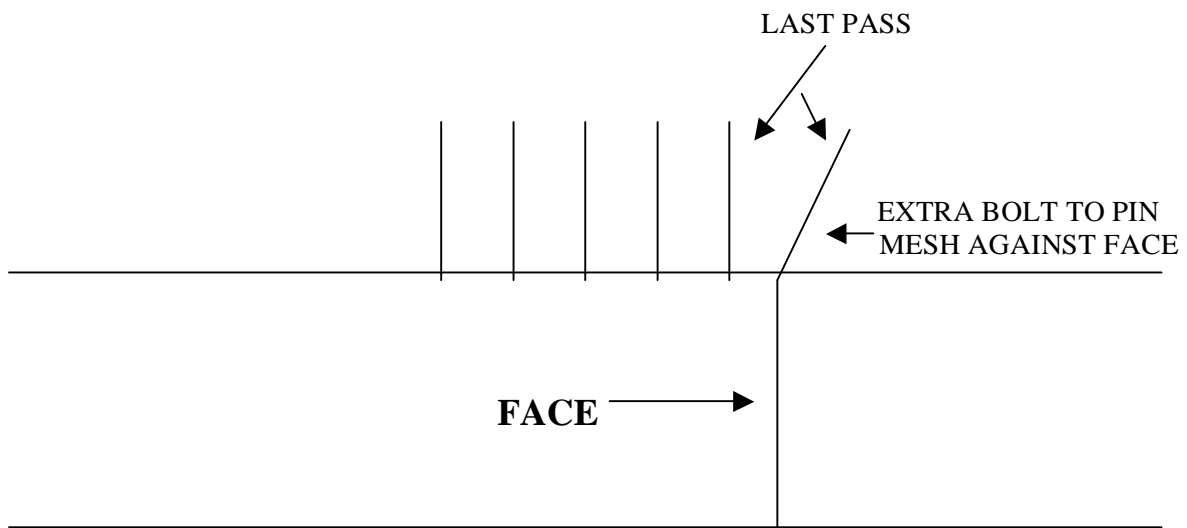
- If roof conditions allow cut from #50 chock to #25 chock using Bi-Di.
- Support same as 'Sequence N° 1 except for:

While roof bolting this sequence, lower the Heusker Mesh down the face and install a 1.2m rib bolt into the coal face in a 'W' pattern at every chock from #75 chock to #50 chock.

SEQUENCE N° 6

- If roof conditions allow cut from #25 chock to #3 chock using Bi-Di.
- Support same as 'Sequence N° 1 except for:

While roof bolting this sequence, lower the Heusker Mesh down the face and install a 1.2m rib bolt into the coal face in a 'W' pattern at every chock from #50 chock to #25 chock then #25 chock to #3 chock.



WORK LIST DURING AND AFTER THE LAST PASS

1. Complete Eickotrack roll pin removal and replacement with 4½" x 5½" bolts.
2. Undo the Rigid Bretby joining bolts and remove the Vertical Bretby side plates when the Pantech is in its final position.
3. Unbolt one side of every second AFC Sandwich plate.
4. Remove every second goaf and face side AFC dog bone (location tagged on pan sets).
5. Remove the Heusker Mesh winch and rollers.

WORK LIST AFTER THE LAST PASS

6. Run AFC and BSL chains to clear coal then position joining links on the AFC at the M/G and T/G and the BSL drive and non-drive sprockets.
7. Break the AFC chain (see M/G drive removal).
8. Break the BSL chain (see M/G drive removal).
9. Remove the Longwall belt via the loop take up.
10. Connect recovery pressure hose to N° 1 chock. Lower pressure to 200 Bar.
11. Haul the shearer and locate the maingate drum at N° 14 chock. Ranging arms are to be in the level position ready for loading onto the transporter.

All the face equipment is to be recovered via the Maingate starting with the Maingate Drive.

MAINGATE DRIVE REMOVAL PROCEDURE

- Ensure M/G drive is cleaned down.
- Ensure top AFC chain Rudd links at N⁰ 3 chock.
- Ensure BSL chain Rudd links at non-drive sprocket.
- Distension AFC and BSL chains. Break the top AFC chain at N⁰ 3 chock. Connect the T/G pony drive and pull the top AFC chain around the M/G drive sprocket.
- Break the BSL chain at the non-drive sprocket and pull the top chain back to clear the M/G drive. Pull the bottom BSL chain back from the delivery end using the 3 tonne Pull Lift until it clears the Main Gate drive. Don't drop chain on the boot end.
- Electricity, hydraulics, compressed air and water should be disconnected and tagged.
- Connect the 25mm hydraulic hose from the recovery pump to N⁰ 1 chock.
- Remove cable and hose ducting covers from around the M/G drive and Swan Neck.
- Remove cables and hoses from the M/G drive and Swan Neck and hang on the outbye rib of 2c/t.
- Remove the top and side covers to expose the M/G drive motor and gearbox.
- Break the M/G drive from the Swan Neck by removing the four flat dog bones and 50mm pin located on the pillar side of the gearbox.
- Pack timber under the M/G Drive motor and gearbox then remove all bolts (bottom ones first) connecting it to the M/G Drive. Chain motor so it does not move with the Drive.
- Pull the M/G drive back to clear the Swan Neck.
- Remove the four flat dog bones that join the M/G drive to the Ramp pan.
- Connect a 915 Eimco to the M/G drive and transport to pit bottom.
- Load the motor and gearbox onto a trailer, **secure** and send to surface.
- Return all chains and pull lifts to the orange recovery trailer.

SHEARER REMOVAL

- Shearer is to be left with the Maingate drum at N^o 14 chock with both ranging arms level.
- Pans are to be removed in sets of two to N^o 13 chock inclusive.
- Remove outrigger, disconnect cable and water hose.
- As the Shearer Transporter passes the DCB in 2c/t 611 stub start running out the miner cable (already on transporter) to the shearer. Plug the cable into the DCB and Shearer.
- Adjust face position to 100m; disable the cutter motors and cable pull switch.
- Remove the Maingate Cowl and Cutter Drum, load and secure onto a trailer.
- Align tracking sections on the AFC and shearer transporter by raising the pans and packing timber under pans. Four (4) pans have been left on the maingate side of the shearer to allow sufficient room to raise and level the AFC pans.
- The shearer transporter must be exactly aligned with the raised pans (there is no adaptor plate) before the shearer can be trammed on.
- After the shearer transporter is aligned, the shearer can be powered and hauled on. Once loaded disconnect the shearer cable and load the miner cable back onto the Shearer Transporter.
- Transport shearer outbye, remove the Tailgate Cowl and Cutter Drum, load and secure.

NYLON BRETBY REMOVAL

- Disconnect the Shearer cable and water hose at mid-face.
- Disconnect the Nylon Bretby anchor at N^o 77 chock.
- From the Maingate end, reel-up the nylon bretby complete with cable and hose onto the RED reel using the re-reeler and EJC 130 Eimco. Send bretby to the surface.

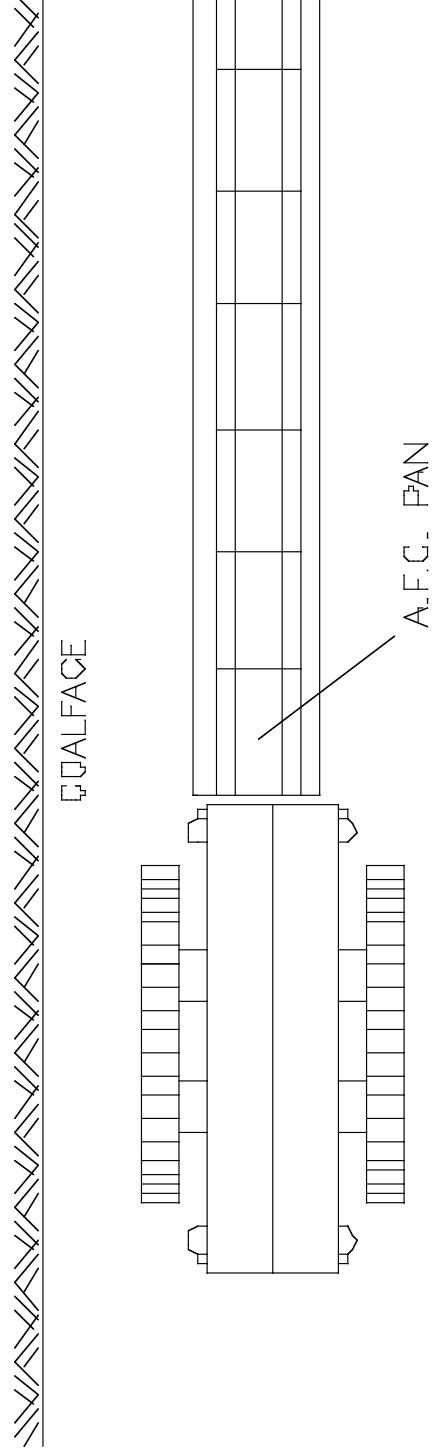
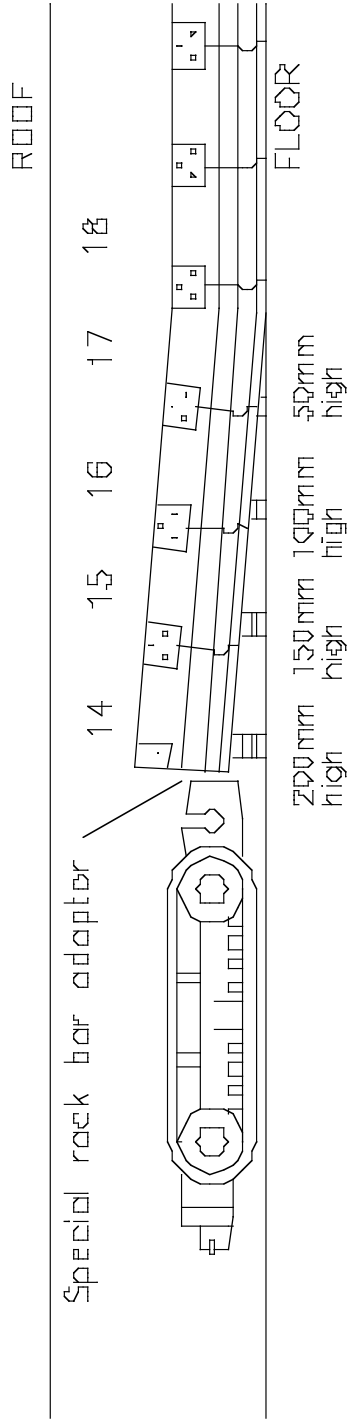
AFC CHAIN REMOVAL

- Position an empty chain trolley one trolley length from N^o 14 pan.
- Pull top chain layering chain onto trolley. Each trolley will hold up to 60 metres of chain.
- Secure the end of the chain to the trolley before transporting. Send each trolley the to surface as it is filled. Once on the surface the chain will be repaired and reloaded.

As the bottom chain is being pulled, work from the tailgate disconnecting dog bones and sandwich plates – tie dog bones securely onto pans.

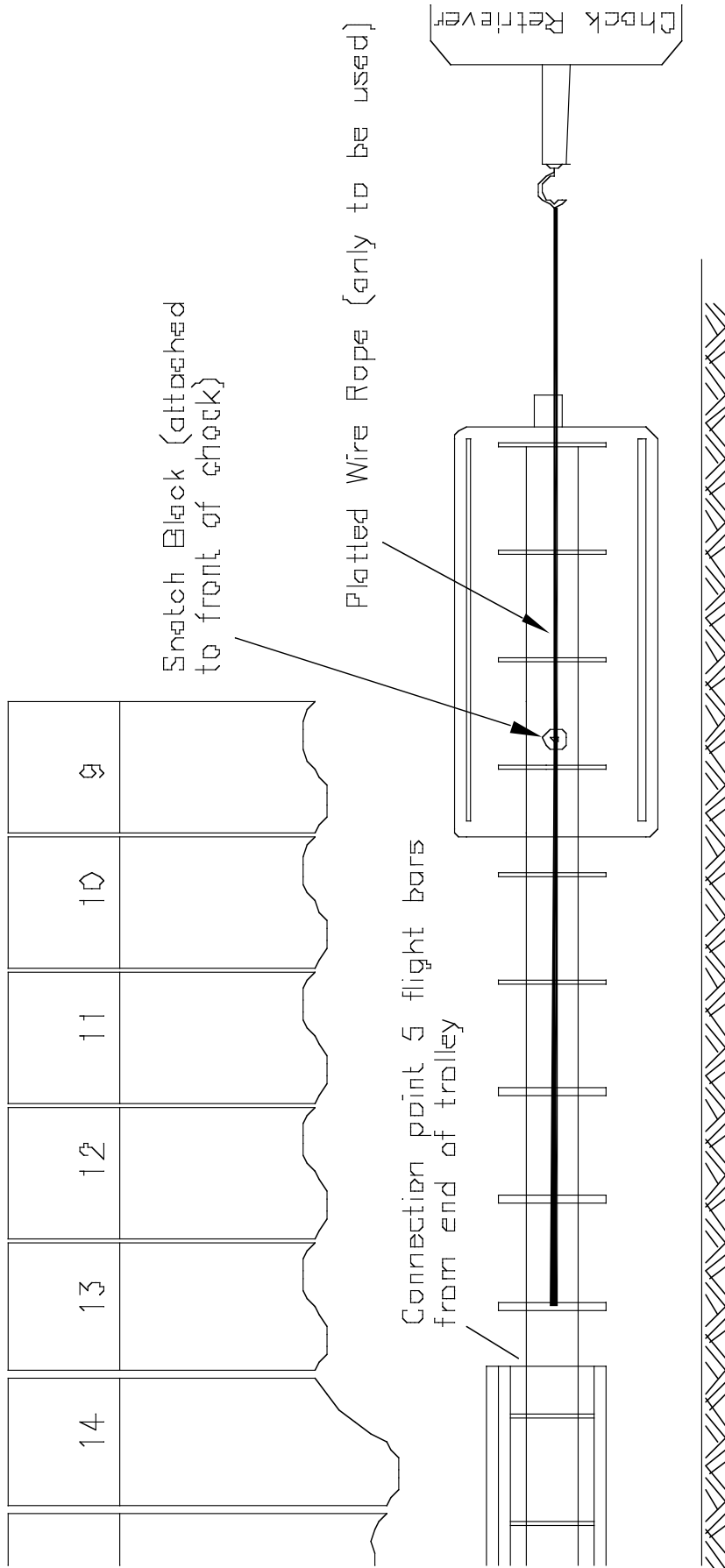
- When pulling chain the “pull points” are between the 4th and 5th flight bar from the end of the trolley, see diagram. There will be four (4) trolleys of top chain and five (5) trolleys of bottom chain. Take extra care when pulling the AFC chain.

SHEARER REMOVAL



Nobody is to be between the end of the pan and the tailgate area while chain is being pulled.

MAINGATE AREA CHAIN LOADING PROCEDURE

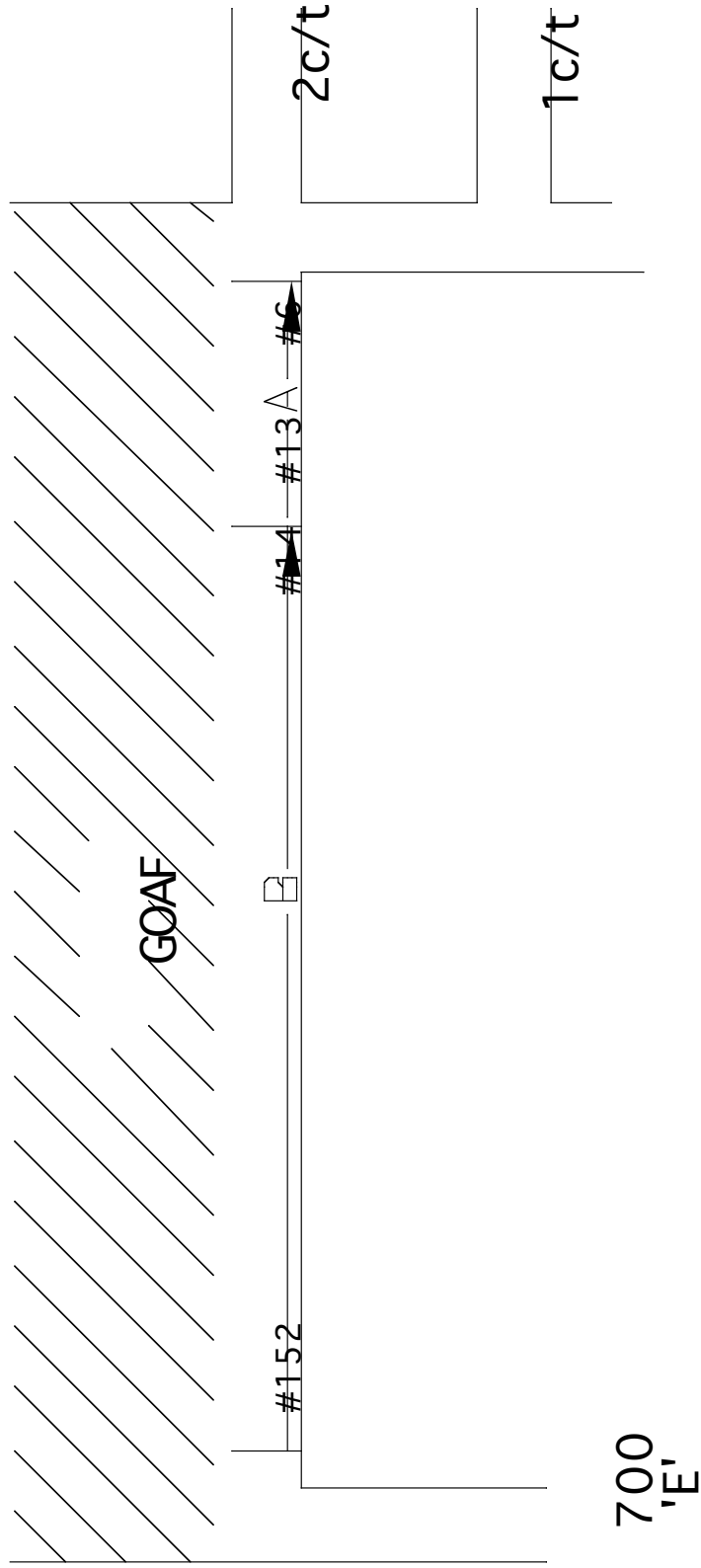


Approx 60m of chain per trolley
 & identify trolley (top or bottom chain)
 Paint ends of chain on top of the trolley.

Rev.5/5/03 ACAD11

LONGWALL 20 PANLINE RECOVERY SEQUENCE

- A. Remove # 6 to # 13 for shearer recovery.
- B. Remove # 14 to # 152 via Maingate.
- N.B. Store pans in 715 Panel



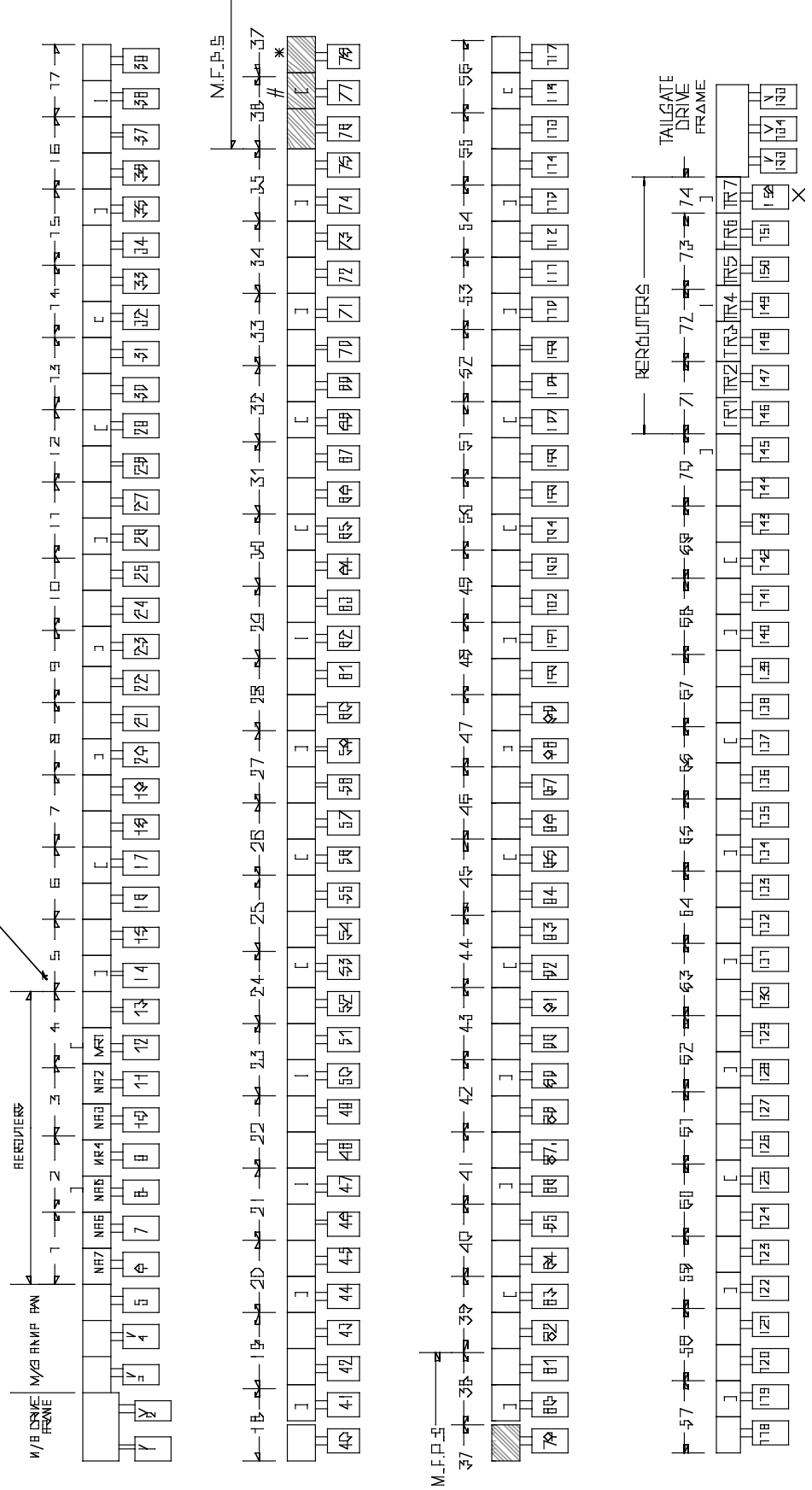
NOT TO SCALE

LONGWALL 20 PAN RECOVERY DIAGRAM

BREITBY ANCHOR POINT 77 X SINGLE PAN
 V 180MM BORE RAM R REROUTER PAN * HIGH PAN 78

▨ PANS TO SURFACE FOR REPAIRS (SETS 36 & 37)

RECOVER PANS TO HERE FOR SHEARER & CHAIN REMOVAL



AFC PAN REMOVAL

- Continue removing the dog bones from the face and goaf of the pans and tie the dog bones securely to the pans for transport.
- Remove Eickotrack pins and Eickotrack and tie securely to pans for transportation.
- Unbolt one side of the sandwich plate at the break point.
- The hoses and small cables (25mm hoses, 2 methanometer, CO₂ monitor and flow switch cables) are to be removed from the spill plates and placed neatly onto the chock pontoons.
- Remove the 2 x AFC T/G cables from the spill plate pins and place neatly at the back of the chock pontoons.
- Secure the spill plate pins to the pans.
- The shearer M/G to mid-face cable will be removed from the spill plate and placed neatly at the back of the chock pontoons.
- Place remaining hydraulic (2), water (2) and air (1) hoses neatly at the back of the chock pontoons.
- Break the pan line into sets of two (2) pans except for N^o 152 pan, which is a single pan (see pan diagram). Each break point has been marked with red paint.
- Pans are to be removed via the Maingate in sets of two using two EJC 130 Eimcos and two QDS Pan Pickers.
- AFC pans are to be removed and stored in their numerical order (N^o 6 – 152 pan) in 715.

DAC CABLE and UNIT REMOVAL

- Disconnect cables from DAC units and place staples in the bag provided.
- Fit plastic caps to cable plugs and unit sockets.
- Remove cables from chocks, roll up and tie. Leave cables in chocks.
- Unbolt units from brackets and brackets from chocks.
- Leave units and brackets in chocks.
- Once pans are removed load DAC units, cables and 'L' brackets into wire baskets (as marked), which will be on stonedust trolley.
- Send the stonedust trolley with baskets to the surface.

LIGHTING

- Unplug lights from convertor boxes and fit caps to plugs and sockets, roll up and tie cable. Tag any light fitting that may require repairs and send/take to surface each shift.
- Place all serviceable lights on chock pontoons.
- Disconnect 110v supply cable and zip tie plastic bags over gland ends.
- Roll up and tie cable. Place on chock pontoons.
- Remove convertor boxes from brackets and store neatly in the chock.
- Cables, light fittings and convertor boxes will be sent to the surface.

FACE CABLE and HOSE REMOVAL

- Once pans have been removed load all face cables face hoses onto trolleys or pods and send to surface.

CIU and CIU CABLE REMOVAL

- Unplug 'inchock' and 'interchock' from CIU's and valve packs.
- Place staples in separate bags provided.
- Cap plugs, roll up and tie cables, leave cables in chocks.
- Remove CIU's, complete with mounting plate, from chock brackets and refit locking cap screw to it.
- Fit plastic caps to CIU sockets.
- Store CIU in chock.
- Once pans are removed load CIU's, cables and mounting brackets into bins (as marked), which will be on white stonedust trolley.
- Send the trolley to surface.

GOAF PLATE REMOVAL

- Unbolt and remove pins from the goaf plate. Remove the goaf plate from the Tailgate Drive using a pull lift.
- Put pins and bolts back in place and send goaf plate to the surface after the Tailgate Drive has been removed.

TAILGATE DRIVE REMOVAL (Mechanical)

- Position and break AFC chain once AFC, BSL and belt has been run clean.
- Remove the dog bones from face and goaf side of AFC at the connection between the Tailgate drive and the AFC pan, between N° 153 and N° 152 chocks.
- Tie the dog bones securely to the pans.
- Pull the Tailgate Drive out via the Maingate using the Chock Retriever or 915Eimco.

TAILGATE DRIVE REMOVAL (Electrical)

- Disconnect DAC cable running between cadlock at N° 152 chock and Tailgate Drive, fit plastic caps to the plugs and sockets, roll up and tie cable.
- Disconnect short DAC cables on Tailgate Drive, fit plastic caps to all plugs and sockets.
- Remove water flow and ‘pony drive’ junction boxes complete with their respective switches and cables. Roll up and tie cable.
- Leave all above gear at N° 152 chock.
- Unplug Tailgate Drive motor cables; bag plugs and pull back clear of Tailgate Drive.

MAINGATE CABLE REMOVAL

Power Cables

- Remove all plugs, from 1100-volt manifold and plug in all test plugs.
- Unplug cables from:
 - i. BSL motor
 - ii. Crusher motor
- Bag all plugs.
- Power cables to be loaded into ‘wide’ MPV pods or high sided trolley and sent to surface.

Small Cables

- Lighting Cables to have been disconnected, if not disconnect at convertor boxes. Roll up the two roadway cables and load into pods or high-sided trolley.
- DAC Cables to be disconnected from lockouts and cadlocks on BSL in maingate, N° 4 chock, 321 console and at couplers. Bag plugs, roll up cables and load into pods/high sided trolley. Couplers are to be bagged and brought to surface.
- CIU roadway cables to be disconnected at joins, plugs bagged and cables rolled up and loaded into pods or high-sided trolley.
- Disconnect AFC water flow switch, crusher stand still, methanometer and CO₂ cables at 'J' box on maingate drive and roundabout, roll up and load out.
- 'J' box at the roundabout can be removed with AFC water flow switch, crusher stand still, methanometer and CO₂ outbye cables in place together with Fras hose.

IT MAY BE NECESSARY TO CUT THE 'FRAS' HOSE PROTECTING THE DAC, CIU AND LIGHTING CABLES BEFORE REMOVAL.

BEFORE POWER IS REMOVED FROM PANTECH

- Ensure BSL and belt have been run completely clean.
- Position a set of joining links at the drive and non-drive sprockets.
- Slacken the BSL chain by withdrawing the tensionable section of the BSL and break the chain at the drive sprocket.

BOOT DISMANTLE

- Remove belt from boot.
- Disconnect sequence cable from boot switch Remove switch and mounting bracket from bridge and send to surface.
- Remove bridge from boot.
- Lift boot towards roof using the bootjacks making sure it is high enough to remove both pins located on each side of BSL (as shown in diagram).
- Connect 2 x 3 tonne pull lifts to each side of the BSL lifting lugs.
- Fit both towing wheels and hubs.
- Lower boot with hydraulic jacks, connect towbar, disconnect hydraulic hoses, remove control valve bank and place onto boot. Use 913 Eimco with special tow hitch and transport to surface.

BSL CHAIN REMOVAL

- The BSL chain will be removed once the rigid brestby and boot end have removed.

- The BSL chain is to be removed from the drive end using a plaited wire rope and EJC130 Eimco to pull it into an MPV pod positioned one pod length in front of the delivery end.
- Send to the surface for reloading.

BSL REMOVAL

- Remove the Vertical Bretby and load onto trailer. Transport to pit bottom.
- Remove Turntable and load onto trailer. Transport to pit bottom.
- Remove remaining cable/hose trays and lay against rib.
- Remove bolts (painted red) from BSL Tensionable End to Goose Neck.
- Back special trailer under BSL Tensionable End. Lower 3 tonne pull lifts until the Tensionable End is sitting on trailer.
- Chain BSL Tensionable End down to trailer and transport to pit bottom.
- Remove bolts (painted red) from the small section of Goose Neck.
- Remove small section of Goose Neck (as shown in diagram) onto trailer. Transport to pit bottom.
- The next section should be broken at the crusher by removing bolts (painted red) and loaded onto a trailer. Transport to pit bottom.
- Remove crusher with 915 forks after breaking the two dog bones (painted red). Transport to 36c/t B-A 610.
- Remove Mini Pans with 915 Eimco after breaking the dog bones (painted red). Transport to pit bottom.
- Remove Swan Neck with 915 Eimco and transport to pit bottom.
- Load all cable/hose trays and transport to pit bottom.

CHOCK REMOVAL

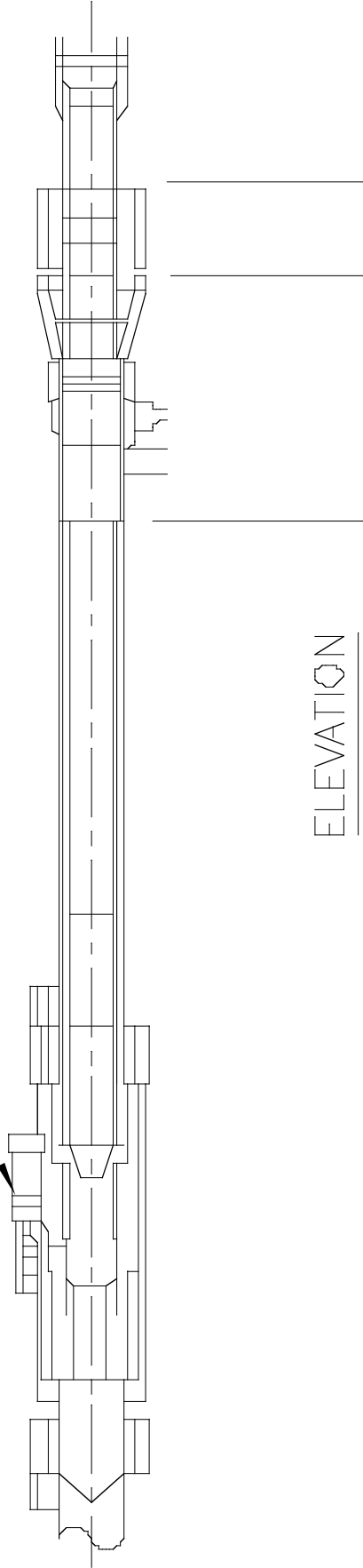
STAGELoader TRANSPORTATION SECTIONS

PLAN

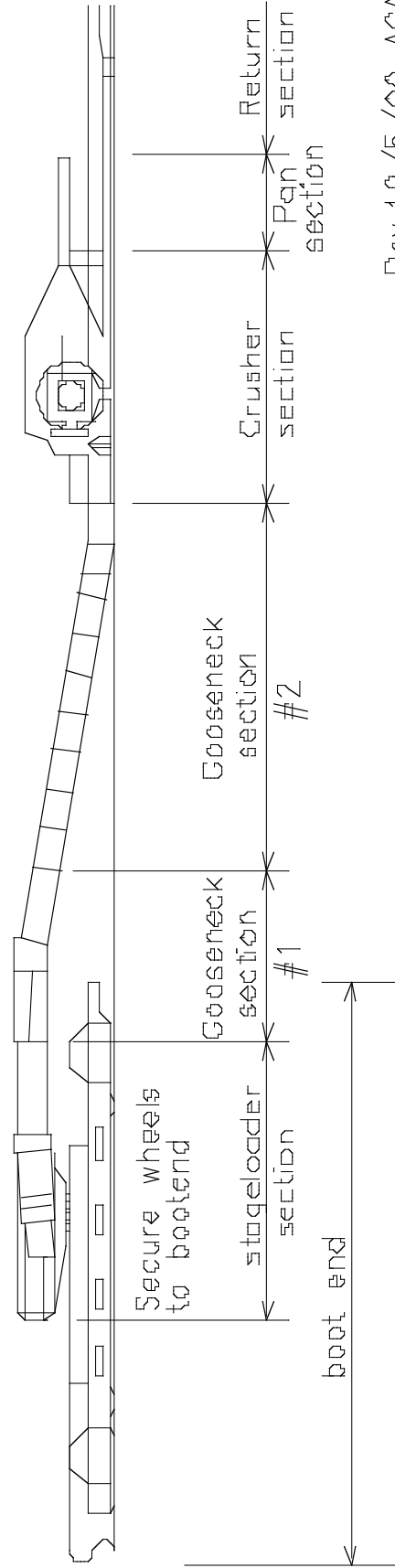
Break BSL chain here
(at connecting links)

Break BSL chain here
(at connecting links)

Remove Motor & Gearbox



ELEVATION

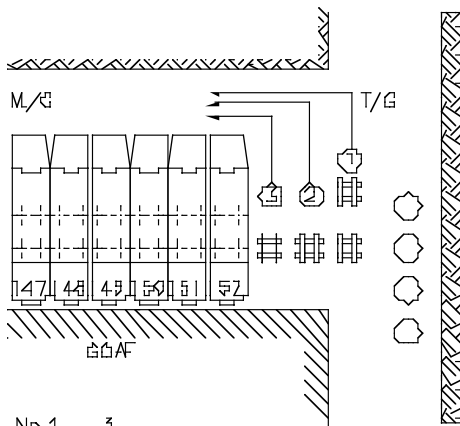


- Disconnect DAC lockouts and cadlocks, CIU's and Lighting circuits and remove units from chocks.
- Load out cables and hoses from chock pontoons onto trailers.
- Load all DAC lockouts and cadlocks, CIU's, lighting convertor boxes, light fittings, interchock, inchock, DAC and lighting cables into containers on stonedust trailer.
- All chocks are to be recovered via the maingate.
- Check that the recovery power pack unloader valves are set at 200 bar.
- Connect recovery hydraulic power pack to N^o 1 chock.
- Pull side shields in, level canopy tip and lower chocks to **1.7 metres**.

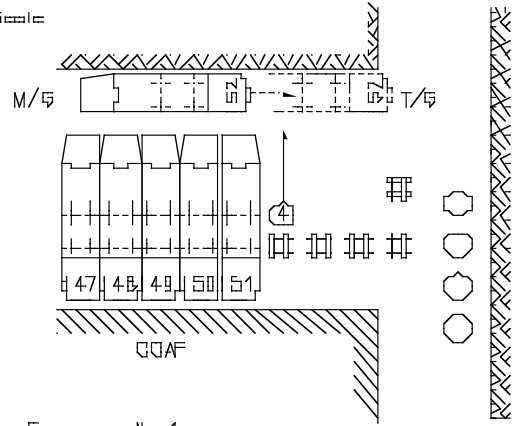
ENSURE CHOCK IS MEASURED FRONT AND REAR WITH MEASURING STICK

- Put wooden (1m x 50mm x 150mm) lagging beneath the relay bar and on top of the pontoons to support the relay bar during transportation.
- Loop hoses to back of chock manifold and replace staples.
- Connect wander lead as shown in hydraulic hosing diagram to pull chocks from N^o 155, 154 and 153. Return fluid to be dumped on ground.
- Once chock N^o 153 has been removed set-up N^o 152 and 151 as buttress chocks.
- Chocks N^o 153, 145, 129, 124, 122, 117, 116, 114, 113, 111, 107, 102, 94, 87, 86, 84, 83, 79, 74, 72, 58, 55, 51, 46, 38, 37, 30, 29, 20, 18 and 9 are to be sent to the surface for repairs.
- Old chocks N^o 69, 70, 71, 73, 74, 75, 76, 77, 77, 78, 79 and 80 are to be installed as new face chocks No. 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151 and 152. These twelve (12) chocks will be recovered and sold at the completion of L/W 21.
- Old maingate chocks No. 1, 2, 3 and 4 are to be installed as **NEW** maingate chocks N^o 1, 2, 3, and 4. Store at 20c/t B-C N-W.
- Old tailgate chocks N^o 155, 154, and 153 are to be installed as **NEW** tailgate chock N^o 155 and 154 (N^o 153 T/G chock to surface for repairs). Store at 18c/t B-C N-W.

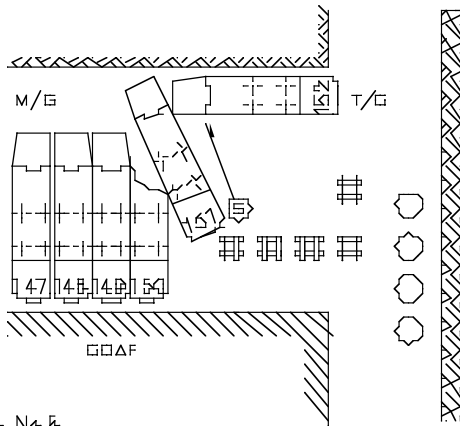
SEQUENCE SETUP "C" FOR TRAILING CHOCKS



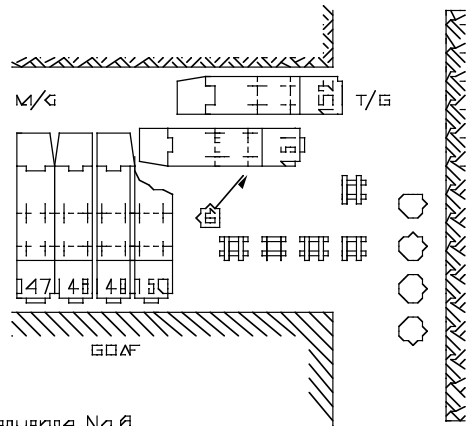
Sequence No. 1 — 3
Using the Mule, pull chocks 151, 154 & 153 as shown then build 1m x 1m timber chocks in locations shown.



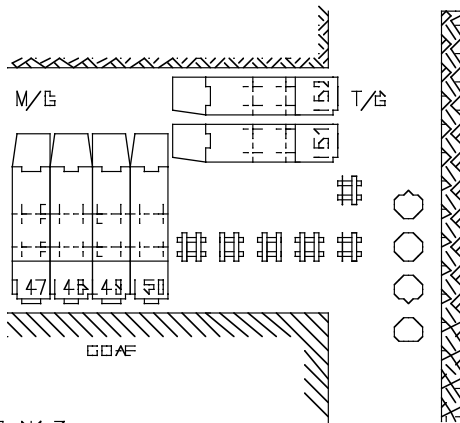
Sequence No. 4
Pull chock 152 toward using one mule then pull one chock backwards using the "Big Dick" positioning it as shown. Set the chock to the roof and build a 1m x 1m timber chock as shown.



Sequence No. 5
Using the Mule, pull chock 151 forward until the rear is clear of the timber chocks. Do not set to roof.



Sequence No. 6
Using the "Big Dick" pull the back of the chock around until the chock is parallel with 152 chock. Do not set to roof.

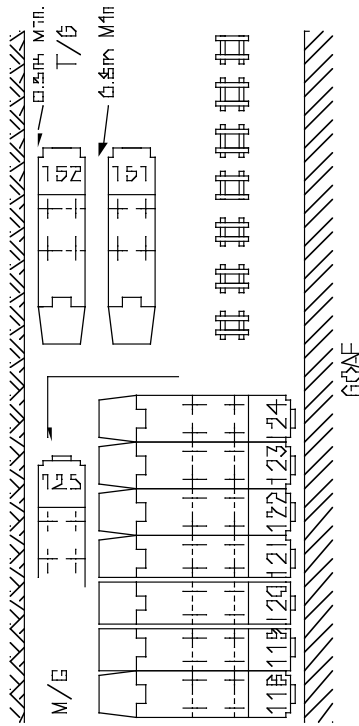


Sequence No. 7
Pull 151 chock back level with 152 chock using the "Big Dick" & set to roof. Build 1m x 1m wooden chocks as shown.

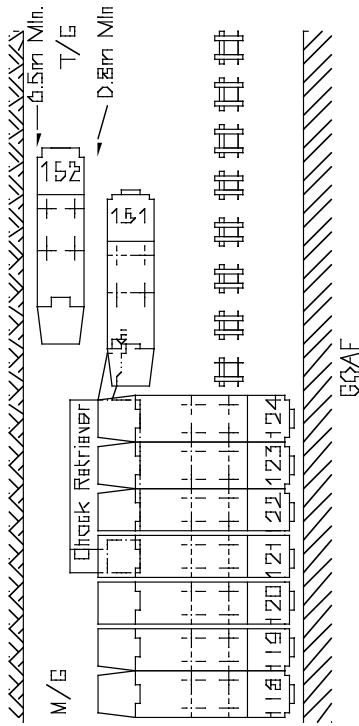
THIS PLAN INDICATES MINIMUM TIMBERING AND SUPPORT. NOTHING IN THESE SUPPORT RULES SHALL PREVENT A WORKMAN FROM SETTING ADDITIONAL SUPPORTS IN HIS WORKING PLACE AT MORE FREQUENT INTERVALS THAN THOSE SPECIFIED ON THIS PLAN.

CHOCK RECOVERY SEQUENCE USING BUTTRESS CHOCKS IN GOOD ROOF CONDITIONS

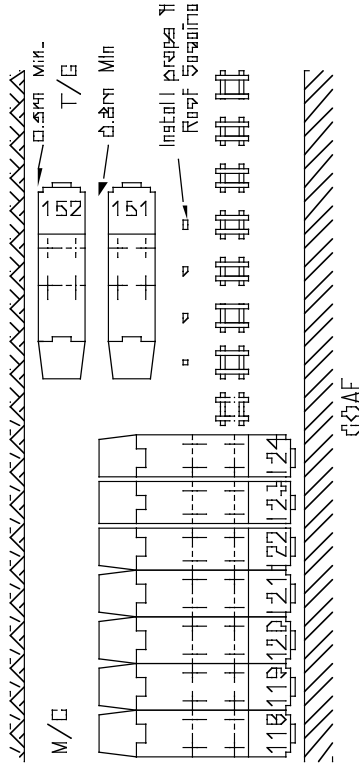
1181 191 201 211 221 231 241



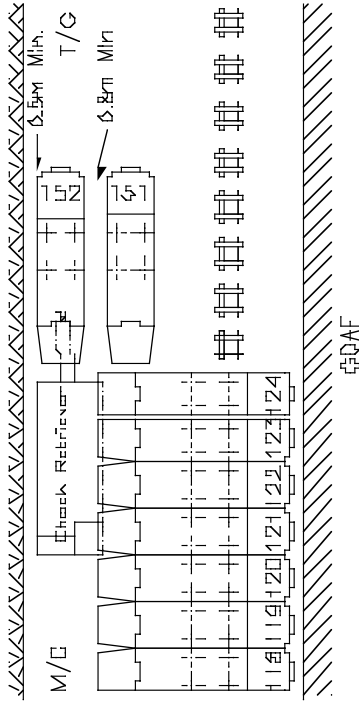
Sequence No. 1
Pull 125 chock with Chock Retriever and remove from face line.



Sequence No. 1
Lower the front side Buttress chock and advance until the tip of the chock is as close as possible to the last of the face chocks (124 Chock) without impeding its removal.



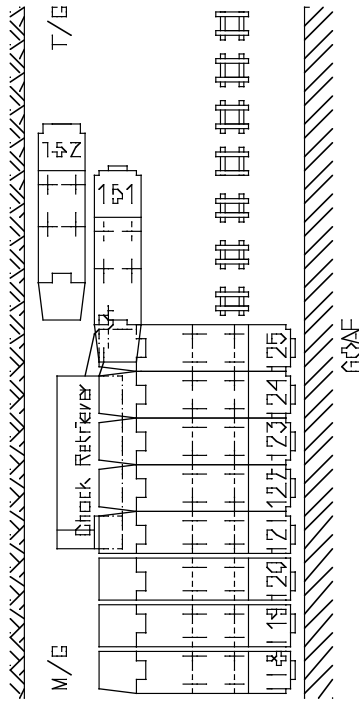
Sequence No. 2
Pull 1 in x 1 in wooden chock on ground. At this point sequence is repetitive.



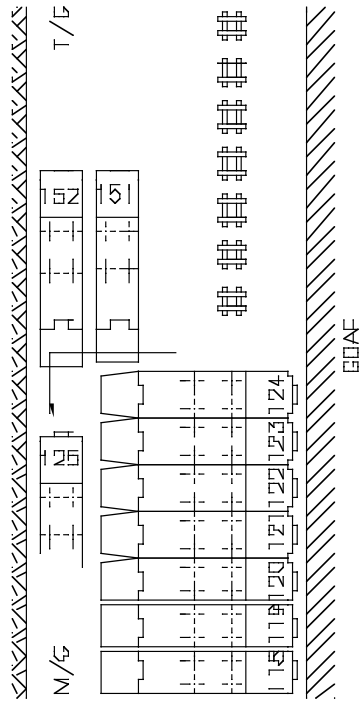
Sequence No. 2
Advance face side Buttress Chock (152) with Chock Retriever until it is adjacent to 151 chock as shown.

CHOCK RECOVERY SEQUENCE USING BUTTRESS CHOCKS IN POOR ROOF CONDITIONS

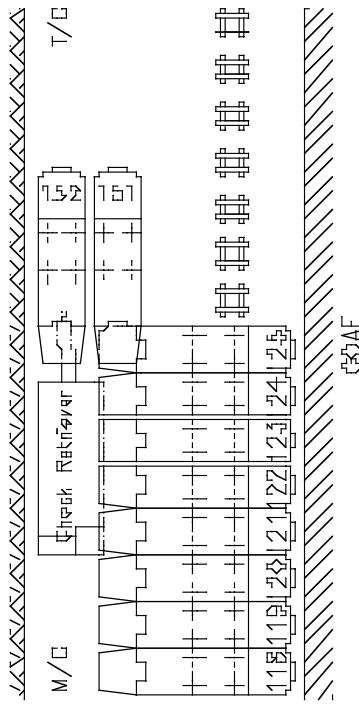
NOT TO SCALE



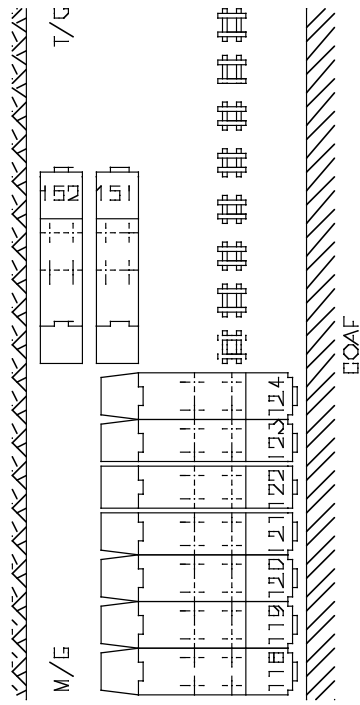
Sequence No. 1
 Lower 125 chock against to allow the recovery of the
 good side Buttress chock in a lowered position to slide
 over the top. Then proceed to advance the good side
 Buttress chock to its new location.



Sequence No. 2
 Pull 125 chock with Chock Retriever and remove from
 location.

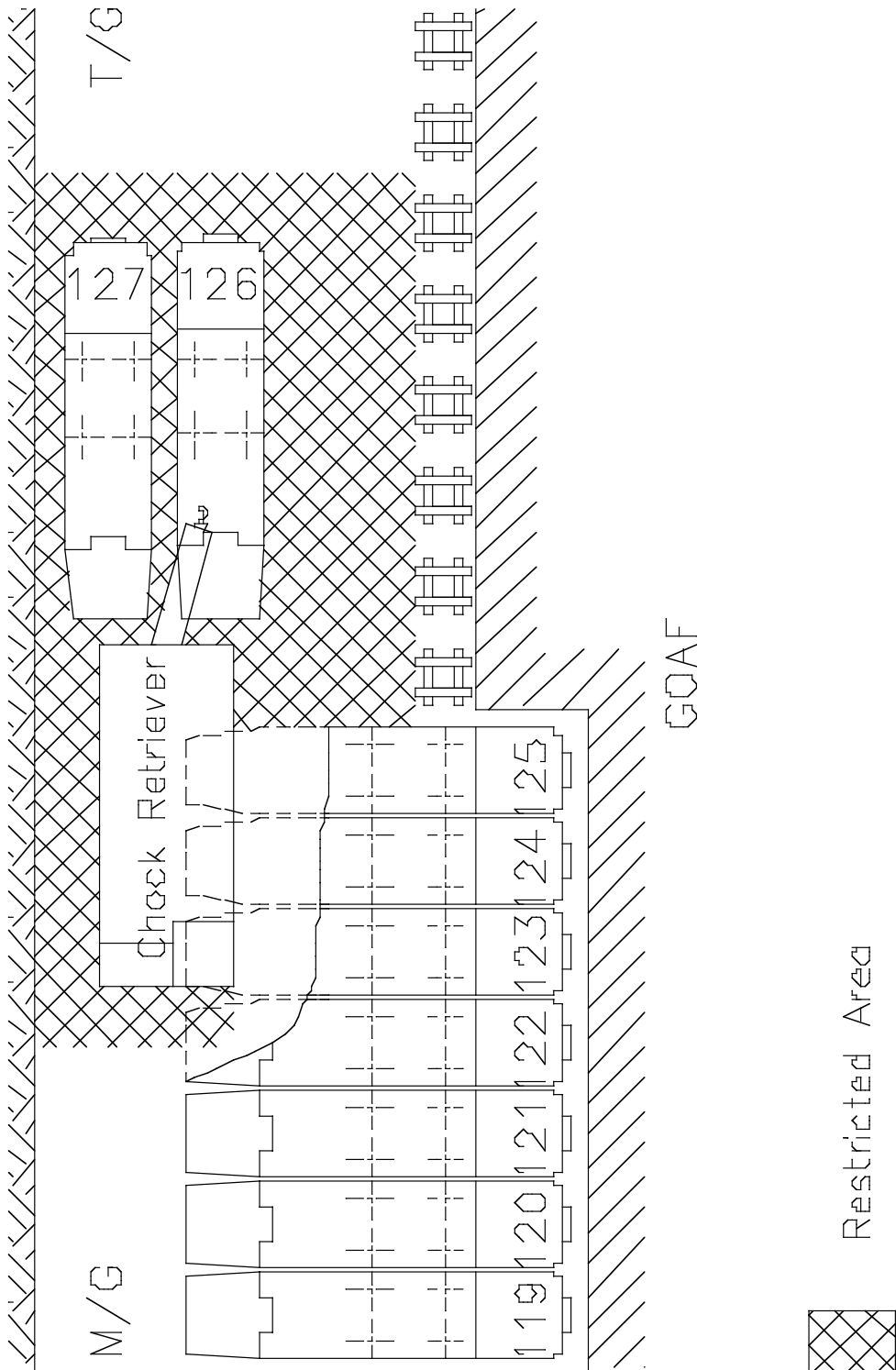


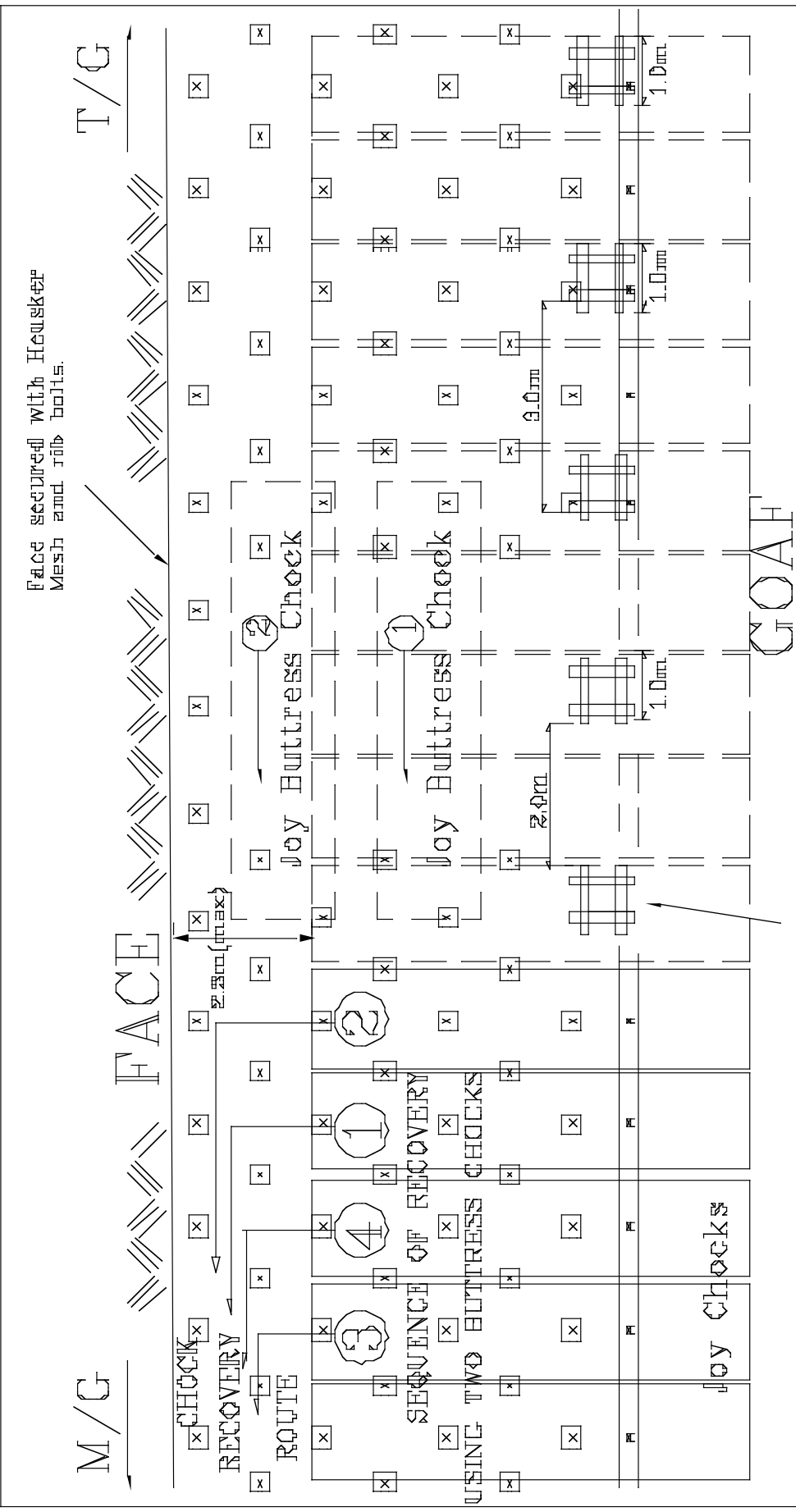
Sequence No. 3
 Advance face side Buttress Chock (125) with Chock
 Retriever until it is adjacent to 151 chock as shown.



Sequence No. 4
 Build in x 1m wooden chock as shown. At this point
 sequence is repetitive.

PLAN SHOWING RESTRICTED AREA WHILST ADVANCING BUTTRESS CHOCKS & RECOVERING FACE CHOCKS

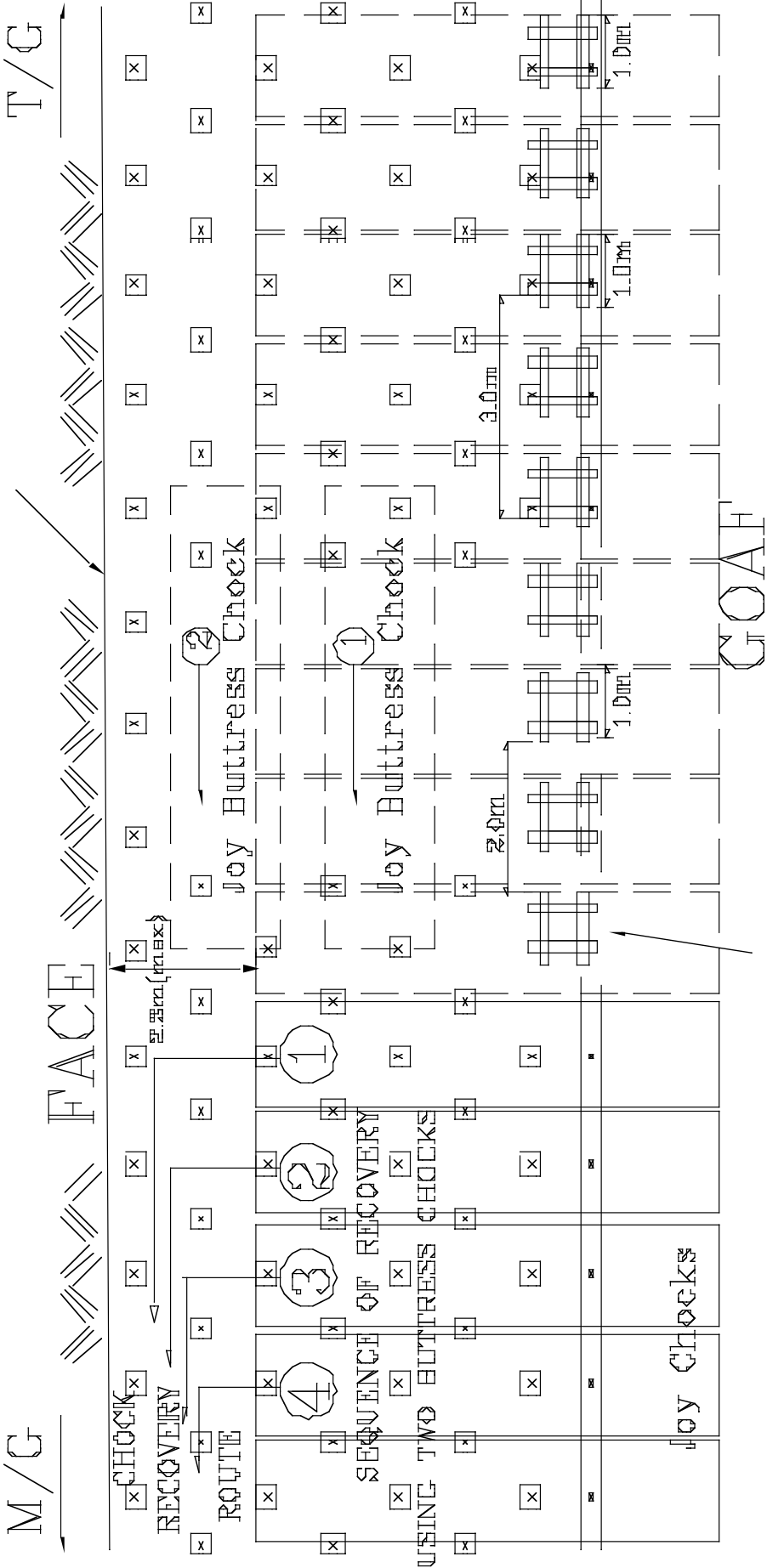




Build 1 meter wooden chocks on
 in by edge of canopy. This allows
 sufficient clearance for the joy chock
 to be turned without knocking down
 wooden chock.

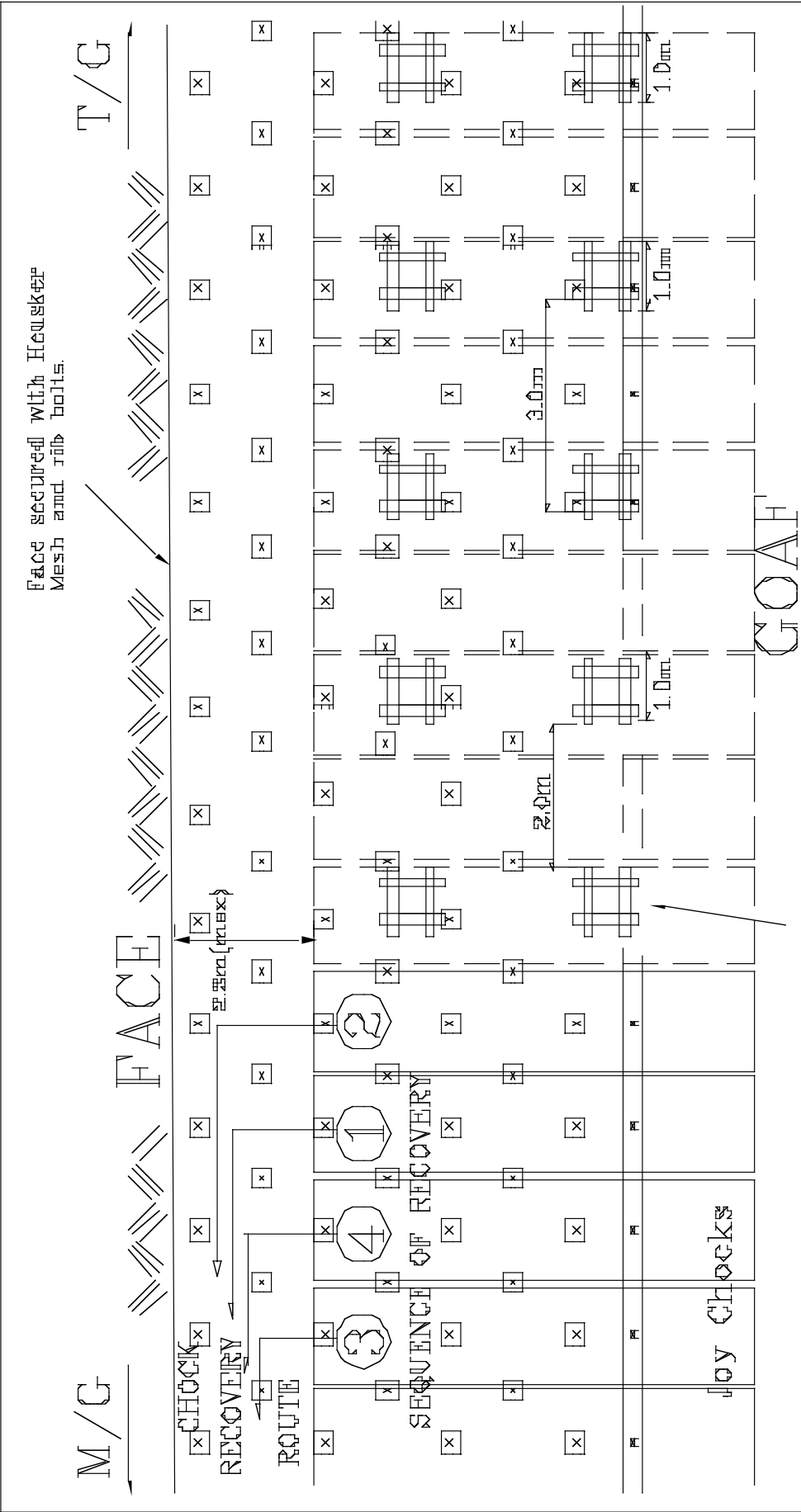
THIS PLAN INDICATES MINIMUM
 TIMBERING AND SUPPORT.
 NOTHING IN THIS SUPPORT RULES
 SHALL PREVENT A WORKMAN FROM
 SETTING ADDITIONAL SUPPORTS IN FOR
 WORKING PLAC AT MORE FREQUENT
 INTERVALS THAN THOSE SHOWN
 ON THIS PLAN

FACE SECURED WITH HOLLOW
MESH AND TIE BOLTS.



Build 1 metre wooden chocks on
inbye edge of canopy. This allows
sufficient clearance for the joy chock
to be turned without knocking down
wooden chock.

THIS PLAN INDICATES MINIMUM
TURNING AND SUPPORT
POSITIONS IN THESE SUPPORT RULES
SHALL PREVENT A WORKMAN FROM
SETTING ADDITIONAL SUPPORTS IN FOR
WORKING PLACES AT MORE FREQUENT
INTERVALS THAN THOSE SPECIFIED
ON THIS PLAN

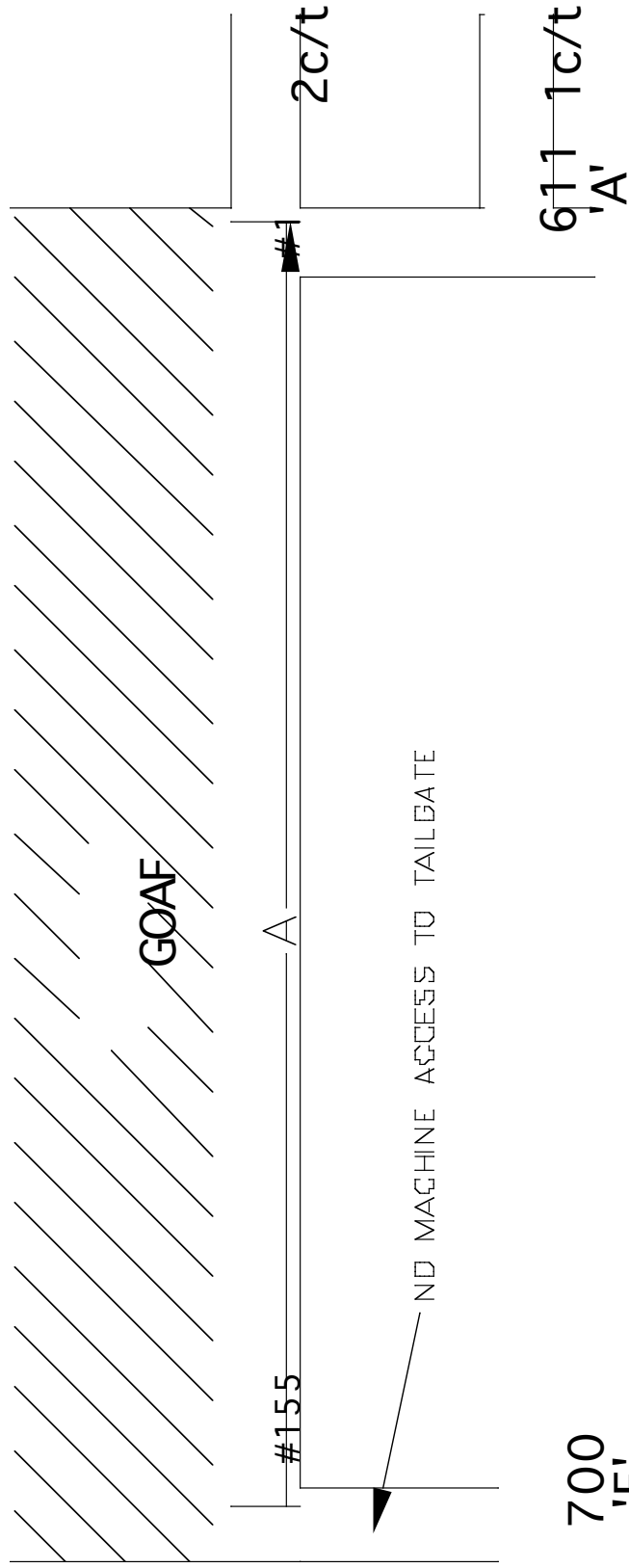


Build 1 meters wooden shacks on inbye edge of canopy. This allows sufficient clearance for the chock to be turned without knocking down wooden shacks.

THIS PLAN INDICATES MINIMUM TIMBERING AND SUPPORT. NOTHING IN THESE SUPPORT RULES SHALL PREVENT A WORKMAN FROM SETTING ADDITIONAL SUPPORTS IN FOR WORKING PLACES AT MORE FREQUENT INTERVALS THAN REQUIRED SPECIFIED ON THIS PLAN

LONGWALL 20 CHOCK RECOVERY SEQUENCE

A. #155 to #1 via Maingate



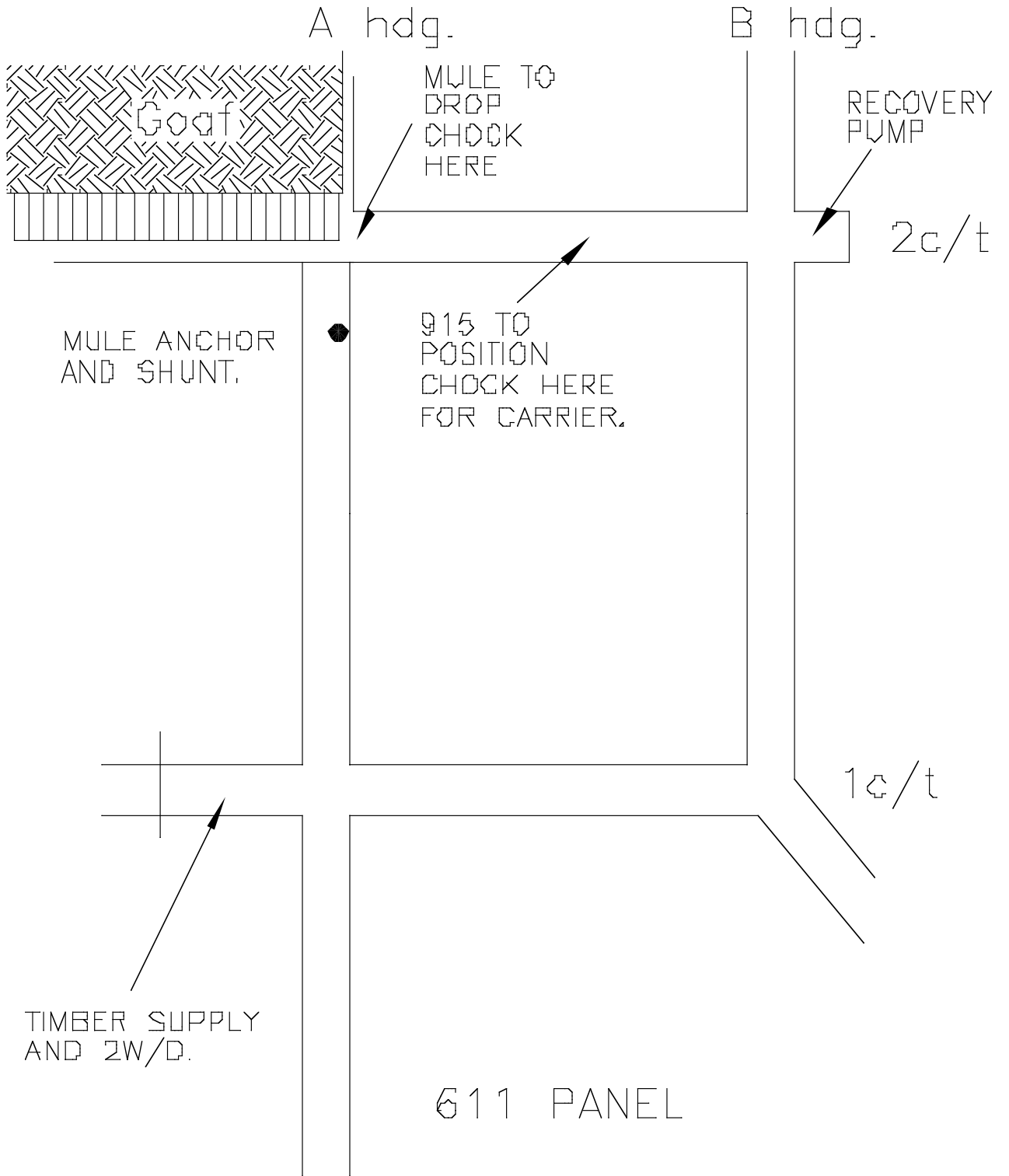
700
'E'

NOTE

- * 31 CHOCKS GOING TO SURFACE FOR REPAIRS.
- * T/G & M/G CHOCKS TO BE STORED IN N/WEST c/t's
- * ALL OTHER CHOCKS TO BE STORED BEHIND PIT BOTTOM

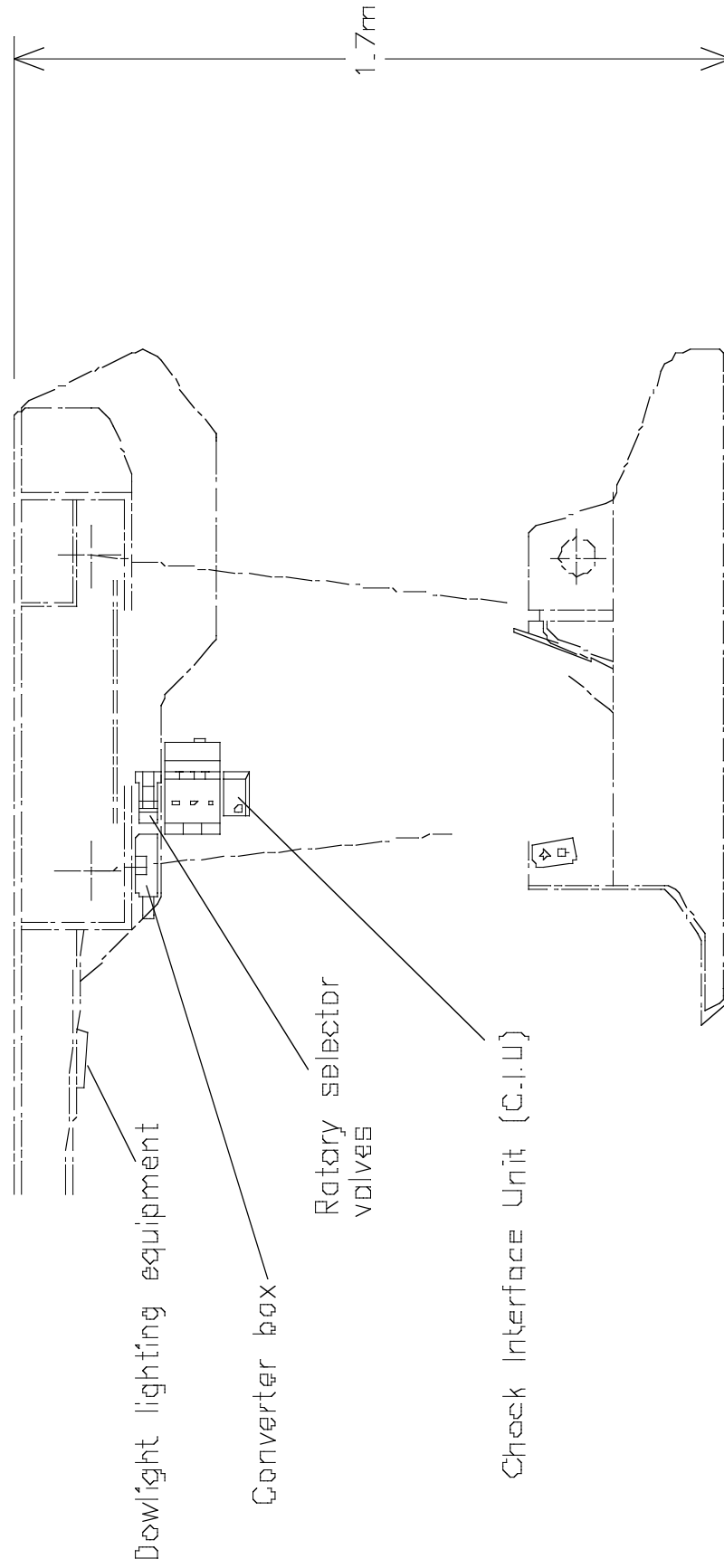
NOT TO SCALE

CHOCK REMOVAL VIA MAINGATE (USING MULE)



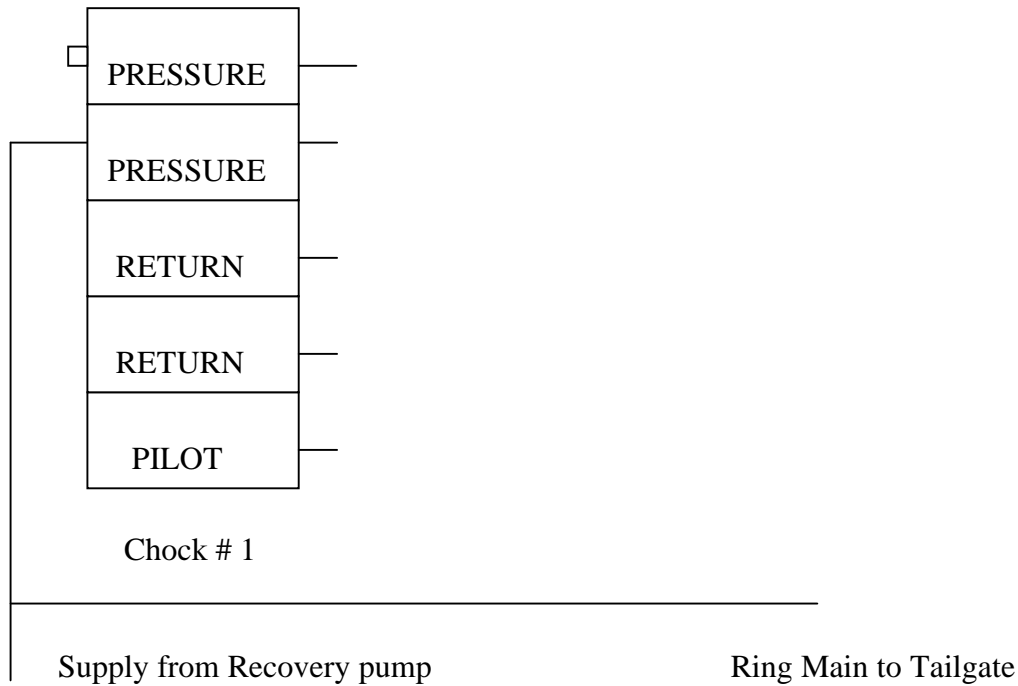
5/5/D3 tcc-453c.dwg

CHOCK CONTROLS LAYOUT



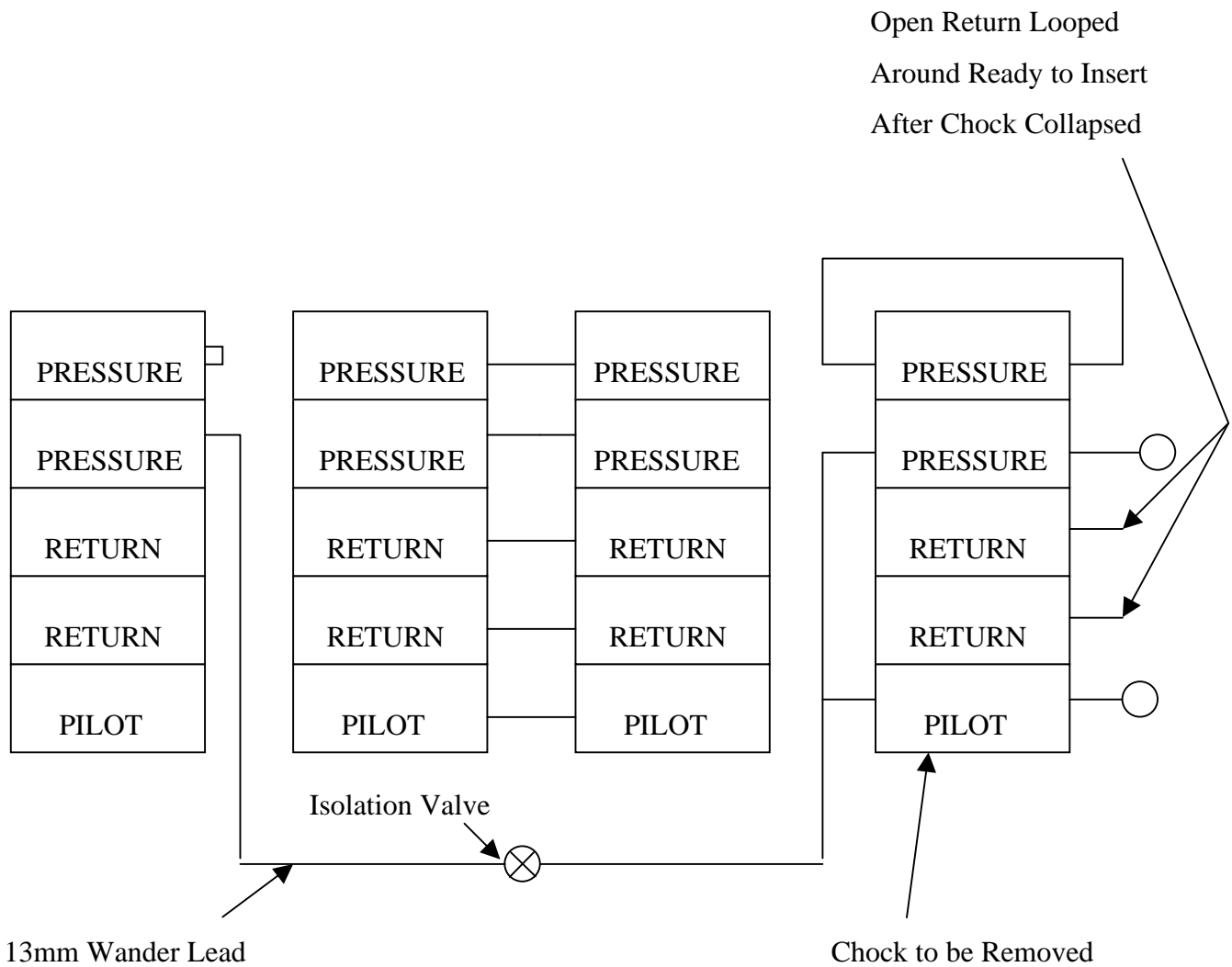
Rev. 19/5/00 ACAD18

INSTRUCTIONS AND HYDRAULIC HOISING DIAGRAMS TO SUPPLY HYDRAULIC PRESSURE TO THE LONGWALL FACE.



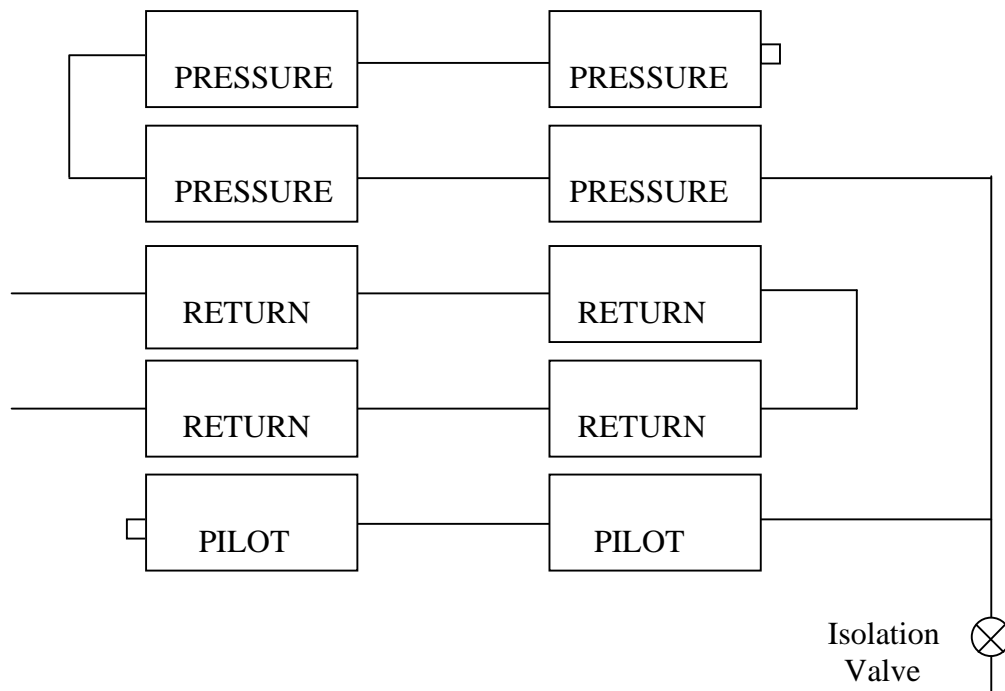
- 1) Uncouple all hoses from the maingate side of N^o 1 chock manifold.
- 2) Couple the pressure supply hose from the recovery pump into the 25mm pressure port of N^o 1 chock and 'T' off to the 25mm Ring Main hose run to the Tailgate.
- 3) Blank off the second 25mm pressure port on N^o 1 chock.
- 4) Uncouple all hoses from the tailgate side of N^o 145 chock manifold.
- 5) Connect wander leads ready for removal (see diagram for chock removal on next page)

INSTRUCTIONS AND HYDRAULIC HOSEING DIAGRAMS FOR CHOCK REMOVAL



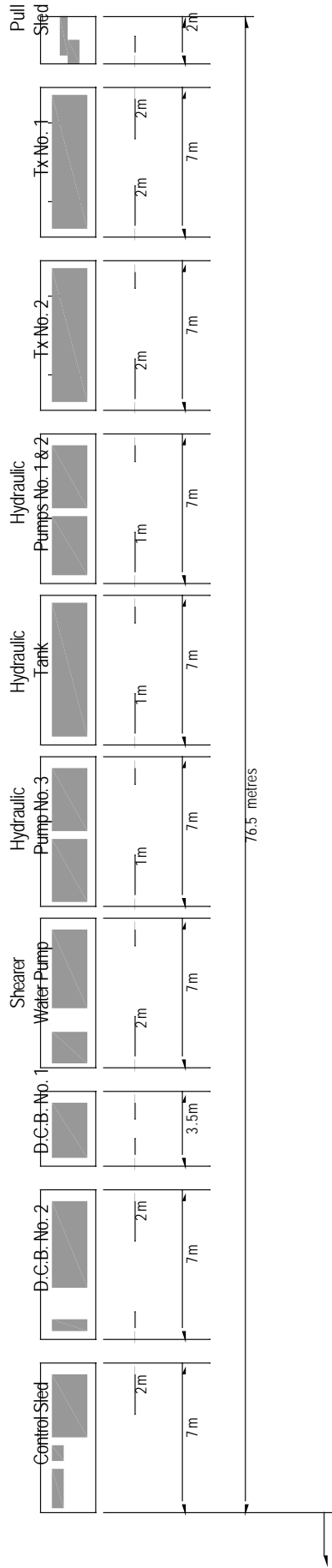
- 1) Uncouple all hoses from the maingate side of manifold.
- 2) Couple the Wander Lead into one 25mm pressure port and 20mm pilot port
- 3) Loop all inter-chock hoses back to maingate side of chock.
- 4) Cap 20mm pilot hose and one 25mm pressure hose with valves.
- 5) Fit remaining 25mm pressure hose into maingate side of manifold.
- 6) Leave both returns open
- 7) Lower chock to correct height (1.6m) use measuring stick to check.
- 8) Retract side shields.
- 9) Retract push ram until wedge is fully retracted and canopy is level.
- 10) Isolate valve on wander lead..
- 11) Open capping on inter-chock hose to decay hydraulic pressure in chock.
- 12) Uncouple wander lead.
- 13) Ensure all inter-chock hoses have been looped back into the manifold and at least one leg of the staple has been inserted.

INSTRUCTIONS AND HYDRAULIC HOISING DIAGRAM FOR BUTTRESS CHOCKS.



- 1) The ring main hose will have been disconnected on the maingate side of N^o 155 chock. Fit an isolation valve to the end of the hose run from the maingate side of N^o 155 chock to the maingate.
- 2) Couple a 25mm pressure hose to the isolation valve and run the hose to the face side of the manifold of the face side chock.
- 3) Couple the 25mm pressure hose into the pressure port of the face side chock and 'T' off to the 20mm pilot port.
- 4) Blank off the second 25mm pressure port on the face side chock and loop a 32mm return hose to both of the 32mm return ports on the face side manifold of the face side chock.
- 5) Couple hoses between the two buttress chocks.
- 6) Loop a 25mm pressure hose between the pressure port on the goaf side of the manifold of the goaf side chock and blank off the 20mm pilot port.
- 7) The 32mm return ports of the goaf side chock are left open to atmosphere.
- 8) In the maingate, couple the maingate end of the 25mm ring main into a 'T' off the 25mm pressure supply hose from the recovery pump.
- 9) Make sure ladder ring main hoses, fittings and valves have been removed from N^o 52 and N^o 100 chocks and the ring main at the same location and the hoses reconnected through.
- 10) Make sure that the pressure of the recovery pump is set to the correct pressure (200 Bar max).
- 11) As buttress chocks are advanced the supply hose to the chocks are to have the ties undone and the hose rolled up. Drop excess hoses out when possible.

PANTECH ARRANGEMENT LONGWALL 19 & 20



Drawing No. PD 63.dwg 2/8/01

PANTEC REMOVAL

CONROL SLED REMOVAL

- Check all small cables have been either disconnected or pulled back and packed onto control sled. Bag and identify cable connections.
- Check No. 1 light circuit cable to the face has been disconnected from control sled convertor box. Leave incoming 110 volt supply connected with plug and cable pulled back onto the sled.
- Unplug all multi pin plugs from PLC marshalling enclosure, bag plugs and pull clear.
- Disconnect joining links and fit white drawbar.
- Place tag marked 'inbye end' on inbye end of control sled.
- Remove control sled and send to surface.

N° 1 DCB REMOVAL

- Pull the five 110 volt receptacles, two methanometer bypass cables and two multi pin plugs and cables back, wrap around DCB. Tie each cable individually at corners of DCB and to 'S' hooks on top of DCB. *Pantech lighting supply cable and plug to the convertor box can be left connected and stored on the sled.*
- Pull the six 1100 volt receptacles and cables back, wrap around DCB. Tie each cable individually at corners of DCB and to 'S' hooks on top of DCB.
- Disconnect joining links.
- Pull all cables clear of DCB.
- Fit drawbar and remove DCB.
- Transport to surface.

N° 2 DCB REMOVAL

- Pull the two methanometer bypass cables and two multi pin plugs and cables back onto sled wrapping cables around sled and securing with rope.
- Disconnect joining links.
- Pull all cables clear of DCB.
- Fit blue drawbar and remove DCB.
- Transport to surface.

SHEARER WATER PUMP REMOVAL

- Disconnect power cable and hang in rib.
- Disconnect multi pin PLC cable at stop/start station. Roll up cable for transportation to the surface.
- Check all hoses are disconnected.
- Disconnect joining links.
- Pull all cables clear of sled.
- Fit drawbar and remove pump.
- Transport to surface.

HYDRAULIC PUMP REMOVAL

- Unplug all power cables and load onto rib.
- Check all hoses are disconnected.
- Disconnect, bag and roll up all control cables. Transport to the surface safely.
- Disconnect joining links.
- Pull all cables clear of sled.
- Fit drawbar and remove pump.
- Transport to surface.

N° 1 TRANSFORMER REMOVAL

- Check HT power has been isolated and tagged at circuit breaker.
- Disconnect incoming and 14 metre flex. HT cable and hang in the rib.
- AFC water flow switch, crusher stand still, methanometer and CO₂ Disconnect the two 1100 volt feeder cables and hang in the rib.
- Disconnect joining links.
- Pull all cables clear of transformer.
- Fit red drawbar and remove transformer.
- Transport to surface

N° 2 TRANSFORMER REMOVAL

- Check HT power has been isolated and tagged at circuit breaker.

- Disconnect the 14m flex. HT cable and hang in rib.
- Disconnect the two 1100 volt feeder cables and hang in the rib.
- Disconnect joining links.
- Pull all cables clear of transformer.
- Fit red drawbar and remove transformer.
- Transport to surface.

WIRE ROPE SLINGS

DIRECT LOAD	CHOKES ROUND LOAD	CHOKES SQUARE LOAD	DIRECT LOAD			MULTI LEG CHOKES ROUND			MULTI LEG CHOKES SQUARE			BASKET HITCH ROUND			BASKET HITCH SQUARE		
			30°	60°	90°	120°	30°	60°	30°	60°	30°	60°	120°	90°	120°	60°	90°
0.57	0.42	0.28	1.1	0.89	0.80	0.57	0.83	0.74	0.55	0.49	1.78	1.6	1.1	0.89	0.80	0.57	
0.89	0.67	0.44	1.7	1.5	1.2	0.89	1.3	1.1	0.85	0.75	3.0	2.4	1.7	1.5	1.2	0.89	
1.3	0.96	0.64	2.5	2.2	1.8	1.3	1.8	1.6	1.2	1.1	4.4	3.6	2.6	2.2	1.8	1.3	
1.5	1.1	0.75	2.9	2.6	2.1	1.5	2.2	1.9	1.4	1.3	5.2	4.2	3.0	2.6	2.1	1.5	
1.7	1.3	0.85	3.4	3.0	2.5	1.7	2.5	2.2	1.7	1.5	6.0	5.0	3.4	3.0	2.5	1.7	
2.3	1.7	1.15	4.4	4.0	3.2	2.3	3.3	3.0	2.2	2.0	8.0	6.4	4.6	4.0	3.2	2.3	
2.9	2.2	1.45	5.6	5.0	4.1	2.9	4.2	3.8	2.8	2.5	10.0	8.2	5.8	5.0	4.1	2.9	
3.6	2.7	1.80	6.9	6.2	5.0	3.6	5.2	4.6	3.4	3.1	12.4	10.0	6.8	6.2	5.0	3.6	
4.3	3.2	2.15	8.3	7.5	6.1	4.3	6.3	5.6	4.1	3.7	15.0	12.2	8.6	7.5	6.1	4.3	
5.1	3.8	2.5	10.0	8.9	7.3	5.1	7.4	6.7	5.0	4.4	17.8	14.6	10.2	8.9	7.3	5.1	
6.0	4.5	3.0	11.7	10.5	8.5	6.0	8.7	7.8	5.8	5.2	21.0	17.0	12.0	10.5	8.5	6.0	
7.0	5.2	3.5	13.5	12.1	9.9	7.0	10.1	9.1	6.7	6.0	24.2	19.8	14.0	12.1	9.9	7.0	
9.1	6.8	4.5	17.7	15.8	13.0	9.1	13.3	11.9	8.8	7.9	31.6	26.0	18.2	15.8	13.0	9.1	

1570 GRADE FIBRE CORE

RULE OF THUMB FORMULAE

DETERMINE SAFE WORKING LOAD

WIRE ROPE	-	$D^2 \times 8 = \text{SWL IN KG}$
CHAIN	-	$D^2 \times .3 \times \text{GRADE} = \text{SWL IN KG}$
FIBRE ROPE	-	$D^2 = \text{SWL IN KG}$

DETERMINE SLING SIZE

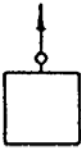

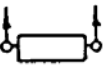


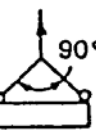
WIRE ROPE		$\sqrt{\frac{\text{LOAD IN KG}}{8 \times \text{LOAD FACTORS}}}$
CHAIN		$\sqrt{\frac{\text{LOAD IN KG}}{.3 \times \text{GRADE} \times \text{LOAD FACTORS}}}$
FIBRE		$\sqrt{\frac{\text{LOAD IN KG}}{\text{LOAD FACTORS}}}$

LOAD FACTORS

REEVED	-	SQUARE LOAD	.5
		ROUND LOAD	.75

INCLUDED ANGLES	0°	2
	30°	1.93
	60°	1.75
	90°	1.41
	120°	1

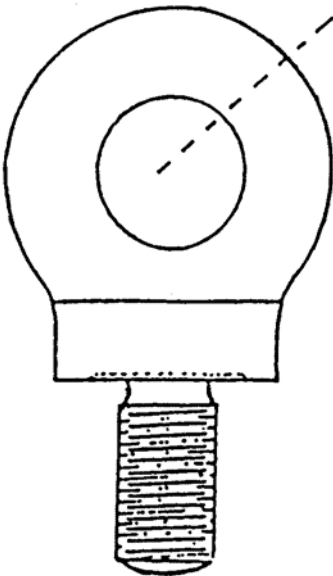
TABLE B1
SWL FOR CLASS 3 LOAD APPLICATION AS SPECIFIED BY AS 1418, PART 1

1	2	3	4	5	6	7
Nominal size of eyebolt	SWL for Class 3 load application as specified by AS 1418, Part 1 (See Clause 3.8.2)					
	Single eyebolt		Pair of eyebolts (see Note)			
	Axial 	Trunnion-type mounting 	Perpendicular 	Included angle 30° 	Included angle 60° 	Included angle 90° 
M12	0.32	0.08	0.16	0.40	0.26	0.16
M16	0.63	0.16	0.32	0.79	0.50	0.32
M20	1.25	0.31	0.63	1.6	1.0	0.63
M24	2.0	0.50	1.0	2.5	1.6	1.0
M30	3.2	0.80	1.6	4.0	2.6	1.6
M36	5.0	1.3	2.5	6.3	4.0	2.5
M42	6.3	1.6	3.2	7.9	5.0	3.2
M48	8.0	2.0	4.0	10	6.4	4.0
M56	12	3.0	6.0	15	9.6	6.0
M64	16	4.0	8.0	20	13	8.0
M72	20	5.0	10	25	16	10
Reduction factor for single eyebolt						
1	0.25	0.25	0.25	0.63	0.40	0.25

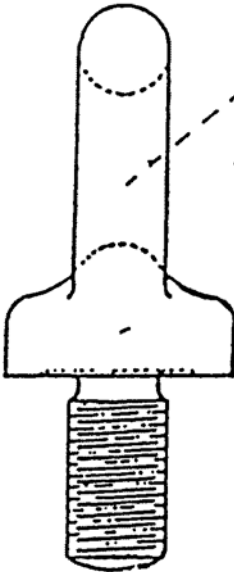
NOTE: The included angle, between the legs of every two-leg sling connected to a load by a pair of eyebolts, should not exceed 90 degrees.

ANGLED LIFTS

DIRECTION OF LIFT



CORRECT



COLLAR EYEBOLT

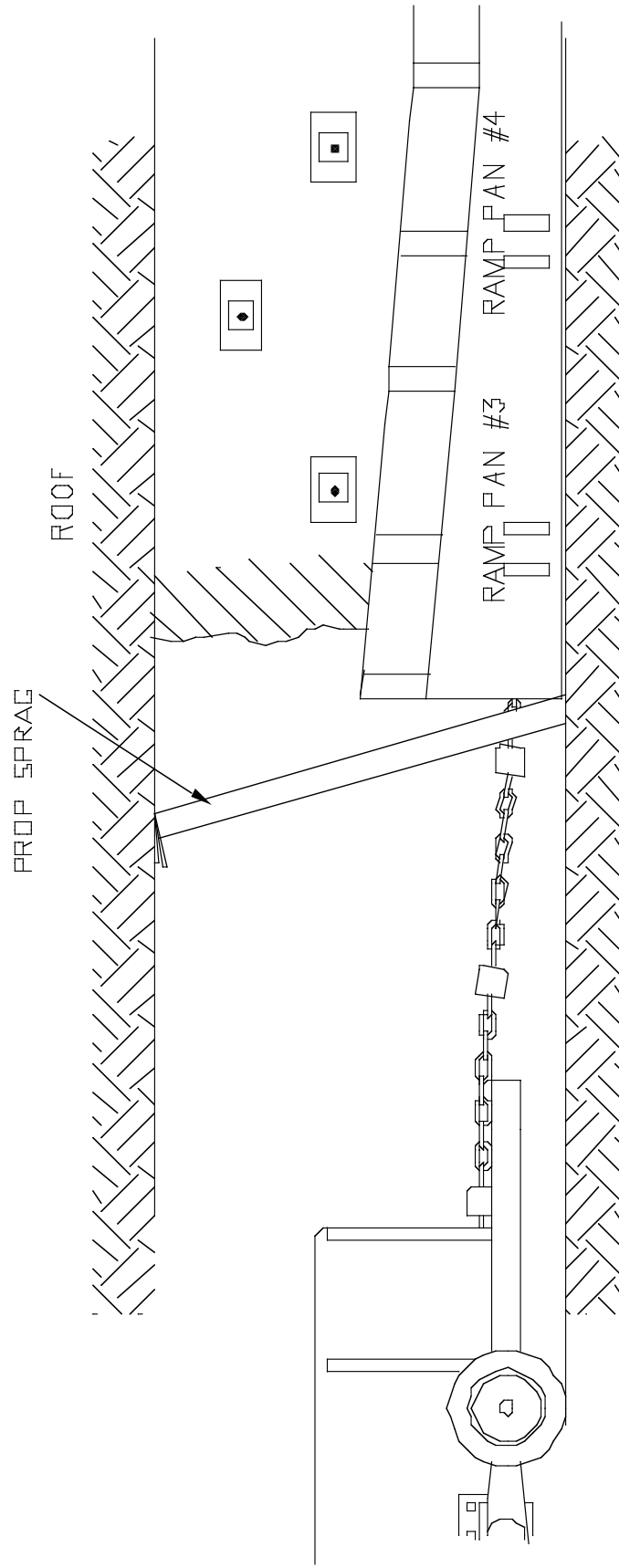
WRONG

INSTALLATION

Table Of Contents

	Page
Panline	57 - 63
Face Cables	64 - 65
Chock Installation.....	66 - 67
Maingate Drive.....	67
Maingate Cable Handling	68
Stageloader.....	69 – 70
Hauhinco Hydraulic Pump Set-out.....	71
Cable arrangement in Rigid Bretby.....	72
Pantec.....	73 – 79
Shearer	80 – 81
Longwall Cable Numbers	82 – 83
Dowlight & DAC	84 – 85
Chock Control	86
Face Power Cables	87
Converter Box	88
Chock Lighting & AFC Control	89
Small Cables	90
Pantec Power Cables	91
Wire Rope Slings.....	92 – 95

PANLINE AND AFC BOTTOM CHAIN INSTALLATION— PROP SPRAG AND CHAIN TRAILER



AFC PANLINE INSTALLATION PROCEDURE

Install the ramp pan first.

Pans with yellow tags indicating pan number are to be installed in the numbered location. These pans include the M/G & T/G re-routers.

PANS:

- **Clean the bottom race before transporting.**
- **Transported in sets of two using two EJC 130 Eimcos with a QDS Pan Picker attached.**
- **The bottom AFC chain is to be pulled using a 915 Eimco and not the Pan Picker.**
- **The first 24 pans to be installed are in 19c/t 611.**
- **Then relocate the T/G re-router pans from the 715 bleeder to 19c/t 611 which will clear the way to the remaining standard pans.**
- **Install pans as recovered except those with yellow tags.**

NOTE: The 26mm chain used to thread through the bottom race of the AFC pans is on the Ramp Pan.

Sequence A

1. Position the Ramp Pan lining the spill plates up with the survey line on the roof (see diagram on page 63).
2. Set two timber props against the bottom of the M/G end of N^o14 pan. This is to prevent the pans from being pushed forward as each successive pan set is installed. The props are to be set to allow free travel of the bottom AFC chain into the bottom race.
3. Position the bottom AFC chain trailer with the 38m (approx) lengths of old 26mm chain attached close to the M/G end of the Ramp Pan.
4. Pull one end of the 26mm chain through the pan set until there is approx. 4m of chain through the other side (enough to feed through the next pan set).
5. Prior to installing the next pan set, pull the 26mm chain through the bottom race.
6. Line up and level the next pan set to be installed by rotating the Pan Picker. **Keep hands and feet clear** then join the pan sets.
7. Fit the face and chock side dog bones with their keeper plates and lynch pins.
8. Line the spill plates with the survey line on the roof (see diagram).
9. Install the Eicko Track bar onto the clogs with its two pins and roll pins.
10. Bolt the sandwich plate to the spill plates.
11. Check that the panline has not moved towards the maingate. If it has then pull it back. This will not have to be checked once sufficient pans have been installed to anchor the panline in position.

12. Repeat steps 4 to 11 until there is no slack 26mm chain remaining.
13. Connect the 26mm chain to the 915 Eimco at the T/G end of the panline and pull the bottom AFC chain through until the first flyght bar is visible at the end of the T/G end panline.
14. Replace the 39m (approx.) length of BSL chain with a 6m (approx.) length of 26mm chain. This short length of 26mm chain is attached to the 38m length.

Sequence B

15. Repeat steps 4 to 11 installing pans and bottom AFC chain to #145 chock.
16. Pull the bottom AFC chain remaining on the trailer to the T/G leaving 1m at the M/G.
17. Push the slack bottom AFC chain into the AFC pan race at the T/G. This can be achieved by using a 2m length of 50mm x 150mm lagging against a flyght bar at the last pan and the rear of the Eimco. Push one flyght into the bottom race at a tome.

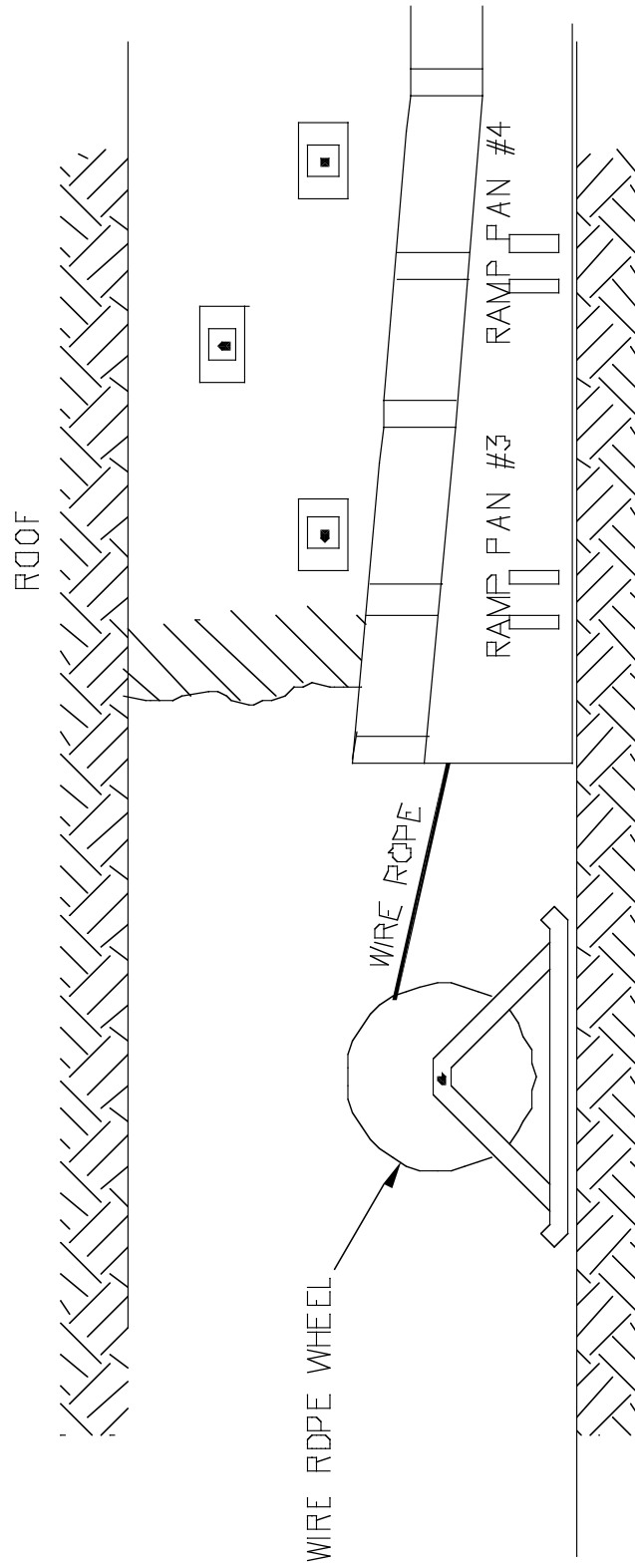
Sequence C

18. After the shearer has been installed, install the T/G re-router pan sets and bottom AFC chain as above and again leaving 1m of slack AFC chain at the T/G end of the panline.

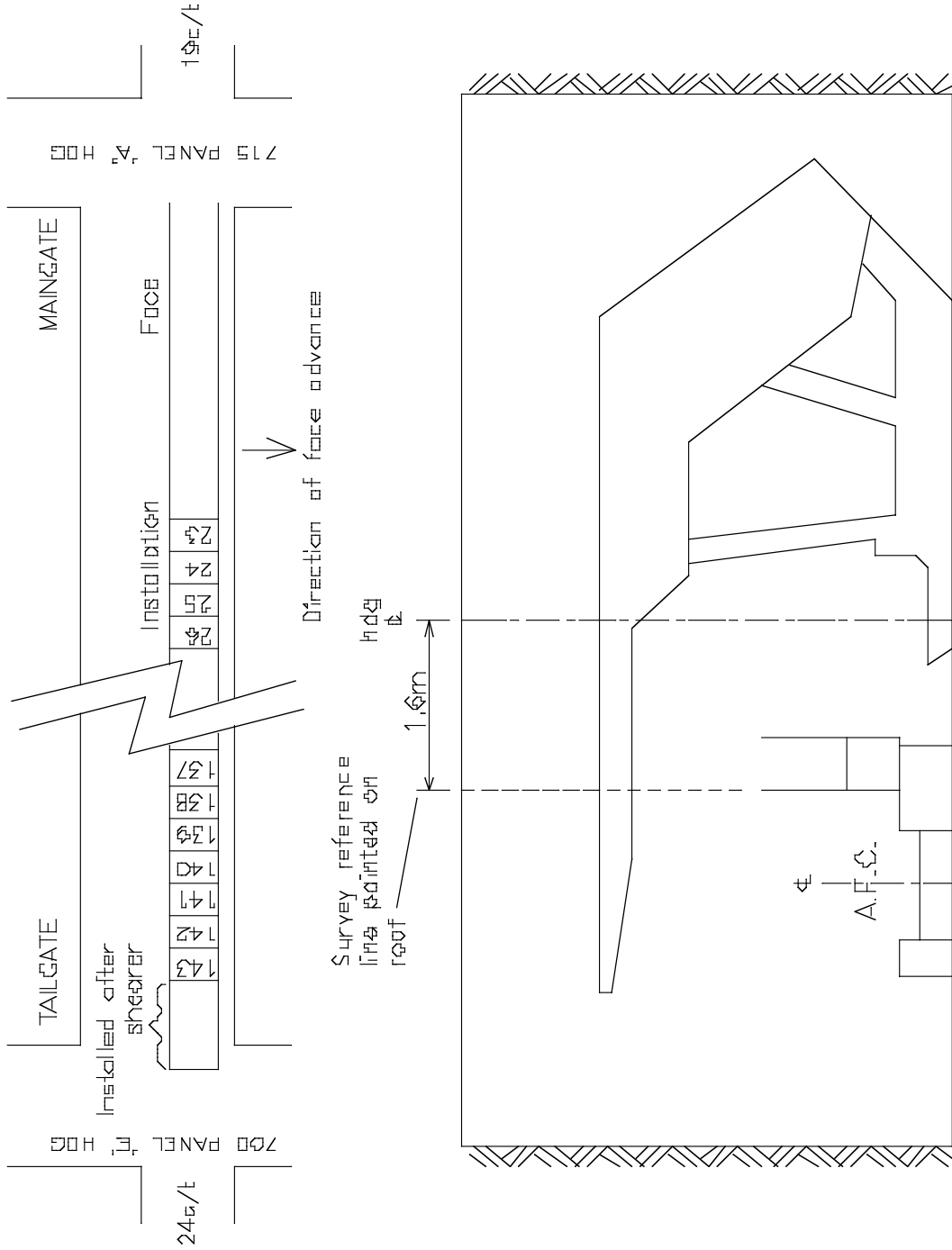
NOTE:

Ensure there is still bottom AFC chain hanging out the M/G end of the Ramp Pan.

PANLINE AND AFC TOP CHAIN INSTALLATION— WITH WIRE ROPE REEL



A.F.C. PAN INSTALLATION



AFC Cable Installation

After the M/G cables have been installed, the tailgate motor cables and shearer (M/G to mid face) cable can now be installed into the AFC spill plates. See spill plate diagram.

Slack mid-face shearer cable is to be stored neatly and securely at mid-face and the plugs covered to prevent water intrusion.

Face Hose Installation

After the M/G 50mm slimline air and water and shearer water hose has been installed, join to the face 50mm slimline air and water and the mid-face shearer water hose and install into the AFC spill plates. See spill plate diagram.

Position the 25mm air and water outlets so they are accessible.

Install the pressure and return ring main hoses into N°1 chock and N°155 chock.

Chock Installation

Chock Control Installation

CIU to be installed on every chock bolted to mounting bracket using four M6 x 25mm set screws.

Inchock cable is to be connected between CIU and valve pack using a **thin** layer of protective grease.

Interchock cable is to be connected between CIU on adjacent chock using a **thin** layer of protective grease. Cables are to be suspended on rubber straps with DAC and lighting cables.

Note: Stagger chock cables (three metre) to be installed between No. 2 and No. 3 chocks and No. 152 and No. 153 chocks.

Termination plug to be fitted on the outgoing interchock cable socket of No. 155 chock CIU.

Address plugs to be fitted to plug PL15 using protective grease provided. Apply a **thin** layer of grease to the socket on the CIU. The number on the back of the address plug **must** correspond to the chock location number on the face ie No. 34 chock must have No. 34 address plug installed on CIU.

DAC Installation

Cadlock is to be fitted to No. 4, a lockout is to be fitted to No. 8 chock, Cadlock is to be fitted to No. 12 then units to be installed every fourth chock.

The cadlock is to be followed by two lockouts then another cadlock and so on.
At the T/G a cadlock is fitted to No. 152 chock.

See installation diagram.

Maingate Drive Installation

Install three sets of three re-router pans. See pan diagram.

Install ramp pan. Align ramp pan with re-router pan, MR7, sigma section join and fit dog bones.

Install maingate drive. Align with end of ramp pan join and fit dog bones.

Note: Dog bones are flat type and there are two dog bones on each side of the drive.

Install the maingate drive motor and gearbox.

Install the swan neck section. Align with drive and fit dog bones and pins. Couple the transmission to the drive.

Install the cable duct along the swan neck, around the drive and along the ramp pan.

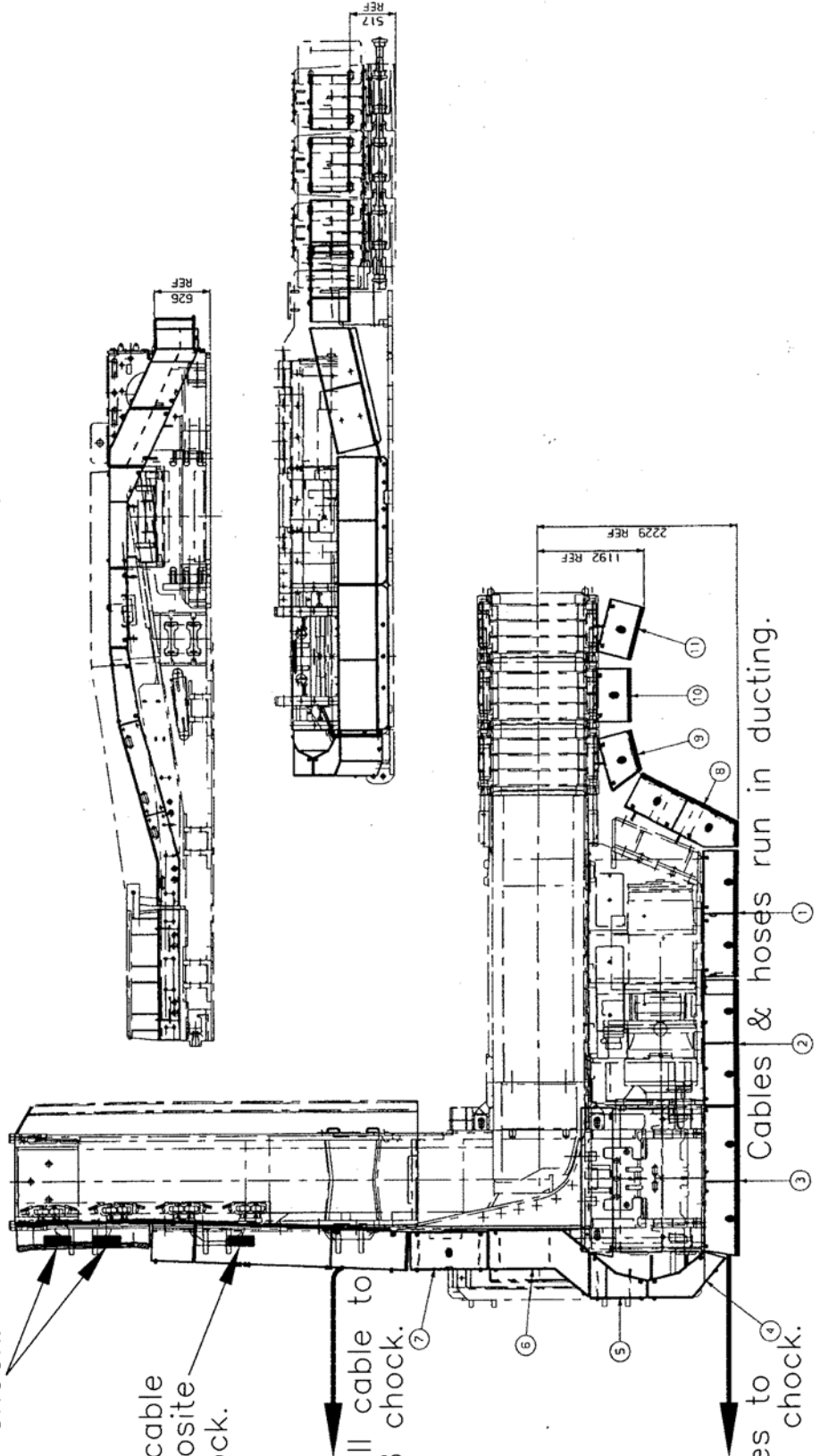
MAINGATE CABLE HANDLING

AFC—Tailgate cable
plugs opposite
No.5 chock.

Shearer cable
plug opposite
No.4 chock.

Small cable to
No.8 chock.

Hoses to
No.1 chock.



BSL Installation

The BSL will be installed from the maingate drive (swan neck section) outbye.

Install mini pans onto the swan neck section of maingate drive, align the sigma section of raceway and join. Fit dog bones to both sides.

Install crusher with motor and gearbox on the walkway side. Align the sigma section of raceway, join and fit dog bones.

Install Gooseneck section (No. 2 & 3). Align sigma section of raceway, support outbye end of gooseneck and bolt inbye end to crusher.

Install Gooseneck section No. 1.

Install Stageloader section.

Install BSL chain.

Install boot end and lower stage loader section onto boot end.

Install turn around section at inbye end of the Stageloader.

Install cable duct to gooseneck section to maingate.

Install Vertical bretby.

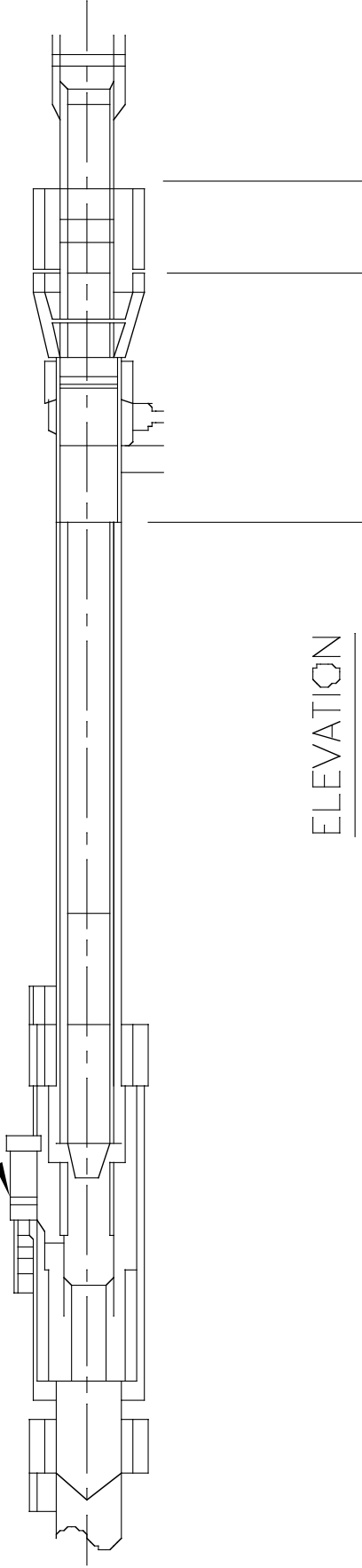
STAGELoader TRANSPORTATION SECTIONS

PLAN

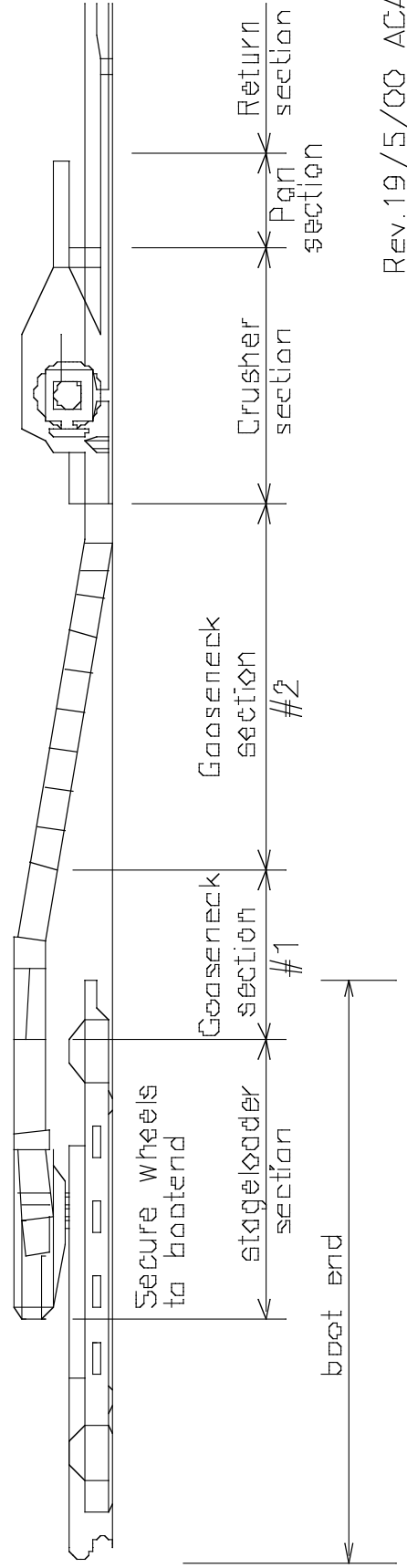
Break BSL chain here
{at connecting links}

Break BSL chain here
{at connecting links}

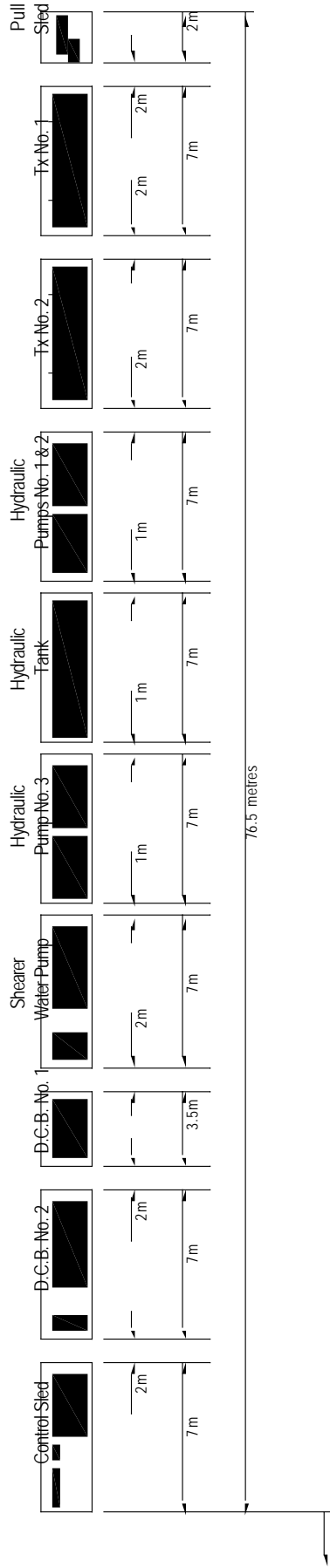
Remove Motor & Gearbox



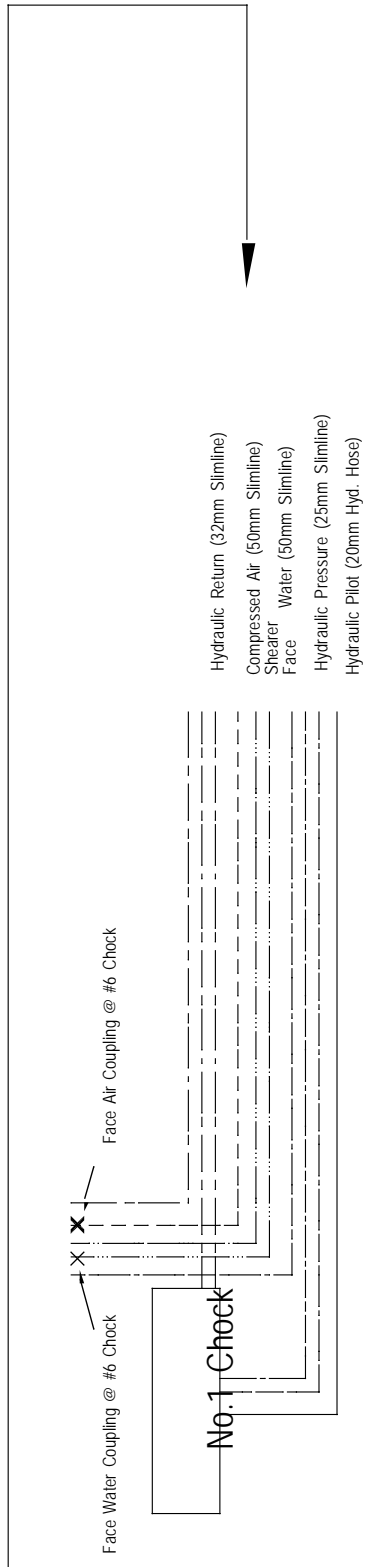
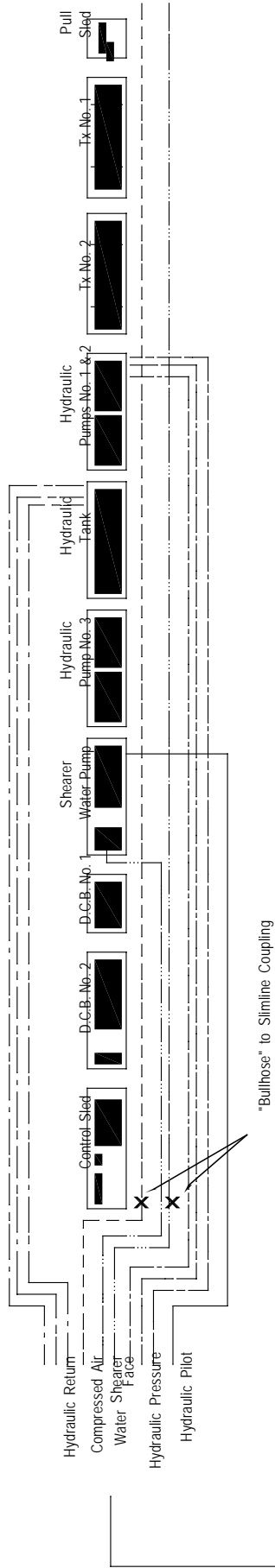
ELEVATION



PANTECH ARRANGEMENT

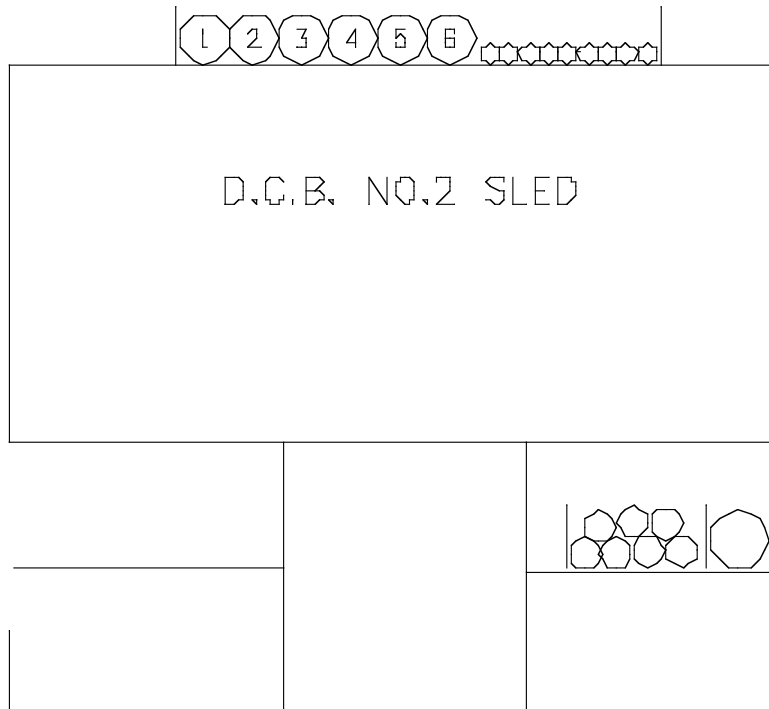


MAINGATE HOSE SCHEMATIC



CABLES AND HOSES AROUND D.C.B NO.2

LOOKING INBYE



CABLES THAT RUN
OVER D.C.B. NO. 2 SLED.

- 3 X HYDRAULIC PUMP CABLE
- 5 X 1100 VOLT CABLES(MARKED 1 TO 5)
- 1 X HYD. PUMP CONTROL CABLE
- 1 X SHEARER WATER PUMP CONTROL CABLE
- 1 X SHEARER WATER PUMP CABLE
- 1 X PANTECH LIGHTING CABLE
- 1 X DUPLINE CABLE
- 1 X PAC CABLE, BMA CABLE

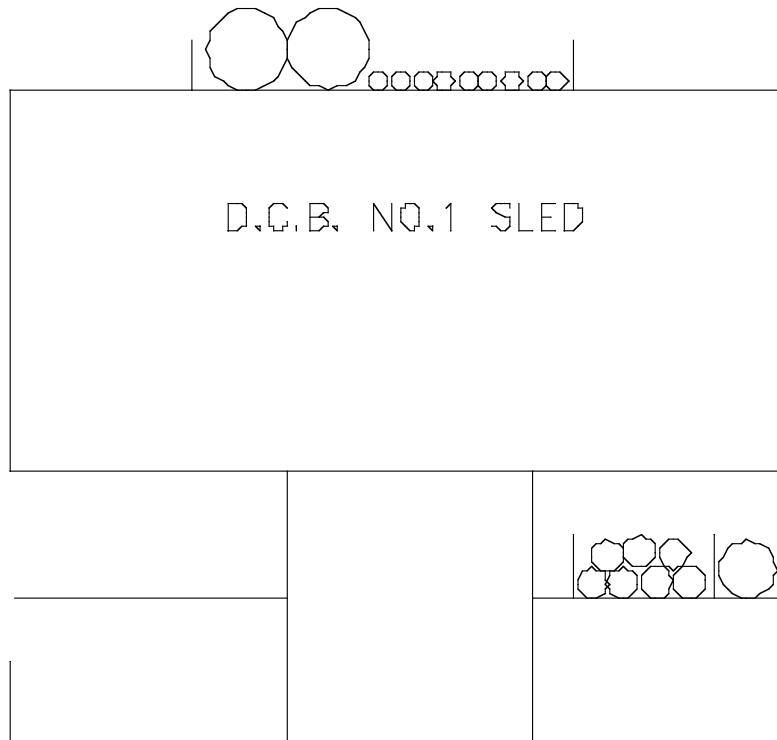
HOSES THAT RUN IN
HOLDER OUTSIDE D.C.B.
NO.2 SLED

- 2 X HIGH PRESSURE HYDRAULIC HOSES
- 1 X PILOT HYDRAULIC HOSE
- 2 X RETURN HYDRAULIC HOSE
- 1 X WATER HOSE - 75MM FRAC
- 1 X AIR HOSE - 50MM Ø90Ø SLIMLINE
- 1 X HIGH PRESSURE WATER HOSE - 50MM Ø90Ø SLIMLINE

29/04/93 Rev.11/9/02 DWGS/ACAD47

CABLES AND HOSES AROUND D.C.B NO.1 SLED

LOOKING INBYE



CABLES THAT RUN OVER D.C.B. NO. 1 SLED

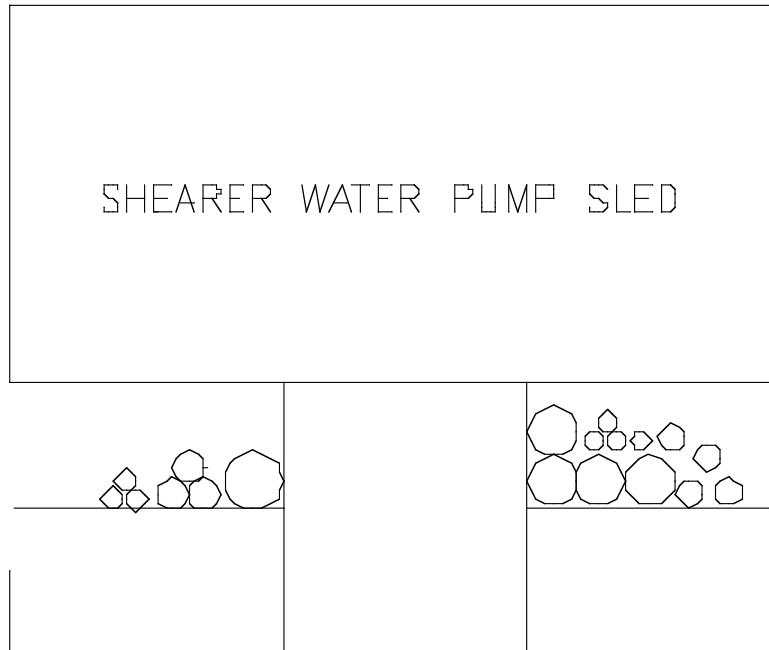
- 3 X HYDRAULIC PUMP CABLES
- 2 X FEEDER CABLES
- 1 X HYD. PUMP CONTROL CABLE
- 1 X SHEARER WATER PUMP CONTROL CABLE
- 1 X SHEARER WATER PUMP CABLE
- 1 X PANTECH LIGHTING CABLE
- 1 X DWPLINE CABLE
- 1 X DAC BMA CABLE

HOSES THAT RUN IN HOLDER OUTSIDE D.C.B. NO.1 SLED

- 2 X HIGH PRESSURE HYDRAULIC HOSES
- 1 X PILOT HYDRAULIC HOSE
- 2 X RETURN HYDRAULIC HOSE
- 1 X WATER HOSE - 75MM FRAC
- 1 X AIR HOSE - 50MM DABO SLIMLINE
- 1 X HIGH PRESSURE WATER HOSE - 50MM DABO SLIMLINE

28/04/03 Rev.11/8/02 DW55/ACAD42

LOOKING INBYE



HOSES

- 2 X HIGH PRESSURE HYDRAULIC HOSES
- 1 X PILOT HYDRAULIC HOSE
- 2 X RETURN HYDRAULIC HOSE
- 1 X WATER HOSE - 75MM FRAS
- 1 X AIR HOSE - 50MM SLIMLINE

CABLES

- 4 X FEEDER CABLE
- 3 X HYDRAULIC PUMP CABLES
- 1 X HYDRAULIC PUMP CONTROL CABLES
- 1 X SHEARER WATER PUMP CABLE
- 1 X PANTECH LIGHTING CABLE
- 1 X DUPLINE CABLE
- 1 X DAC BMA CABLE

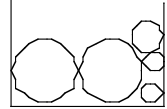
PLEASE NOTE

A 50MM WATER HOSE RUNS INTO THE SHEARER WATER PUMP AND COMES OUT AND CONTINUES AS A 50MM HIGH PRESSURE SLIMLINE HOSE.
THE TWO HIGH PRESSURE HYDRAULIC LINES RUN INTO A FILTER PANEL ON THIS SLED AND COMES OUT AS A TWO HIGH PRESSURE HYDRAULIC HOSES AND ONE PILOT HYDRAULIC HOSE.

29/04/03 Rev.11/9/02 DWGS/ACAD43

LOOKING INBYE

TRANSFORMER NO.2



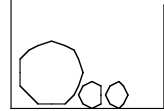
CABLES THAT RUN OVER MUDGUARDS OF TRANSFORMER NO.2

- 2 X FEEDER CABLE
- 1 X PANTECH LIGHTING CABLE
- 1 X DUPLINE CABLE
- 1 X DAC BMA CABLE

23/04/03 Rev.11/9/02 DWGS/ACAD44

LOOKING INBYE

TRANSFORMER NO.1



CABLES THAT RUN OVER MUDGUARDS OF TRANSFORMER NO.1

- 1 X FLEXIBLE H/T CABLE
- 1 X DUPLINE CABLE
- 1 X DAG BMA CABLE

23/04/93 Rev.11/9/02 DWGS/ACAD45

Shearer Installation

The shearer is to be installed at the tailgate.

The maingate drum and cowl is to be fitted prior to taking the shearer into the face line.

Take shearer into face line and height permitting the tailgate drum and cowl can be fitted.

Pans are to be lifted to align tracking sections on the AFC and Shearer transported by raising the pans and packing timber under pans.

The shearer transporter must be exactly aligned with the AFC panline before the shearer can be trammed onto the AFC.

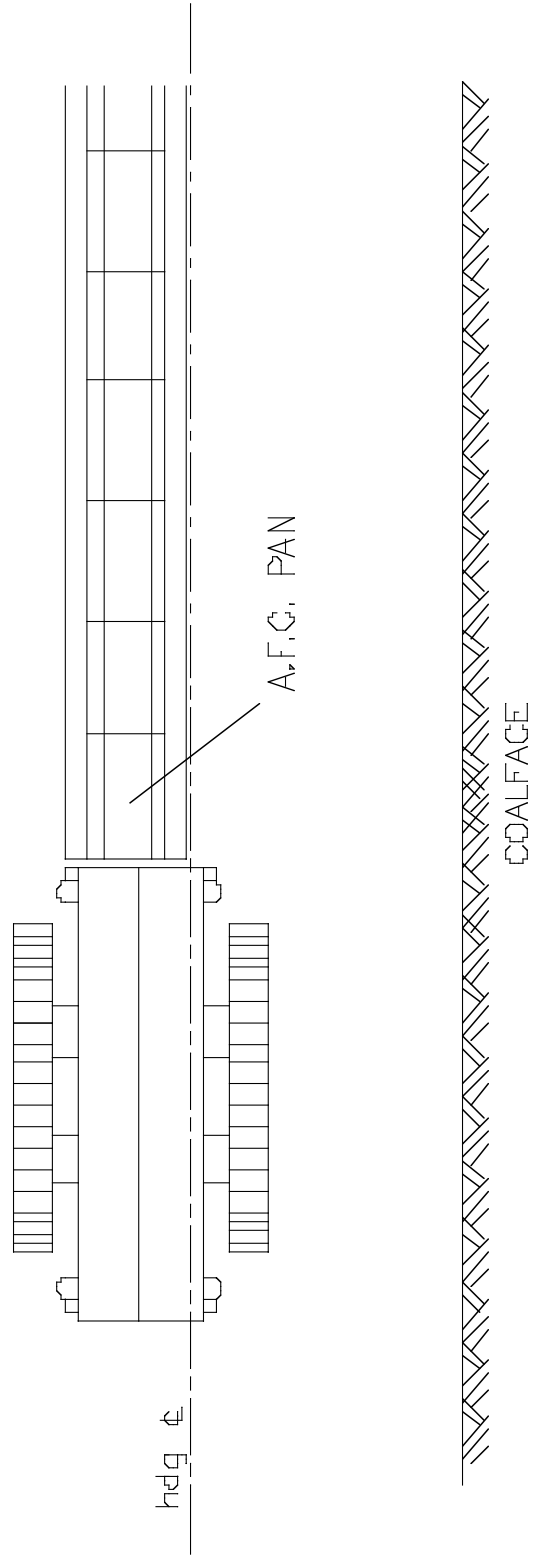
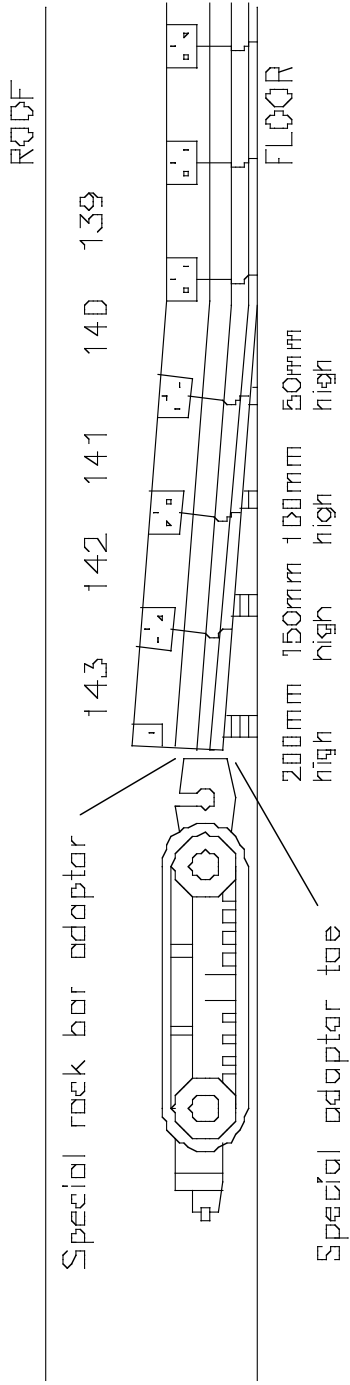
Connect a 300amp jumper cable between the shearer and power tram.

Start power tram and shearer and tram shearer onto AFC pans. Tram the shearer along pans until the tailgate end of the shearer is four (4) pans from the end of the pans.

Shutdown power tram and disconnect jumper from shearer. Load jumper onto power tram and send to pit bottom

Fit outrigger and connect cable, the high-pressure water hose and nylon bretby.

SHEARER INSTALLATION



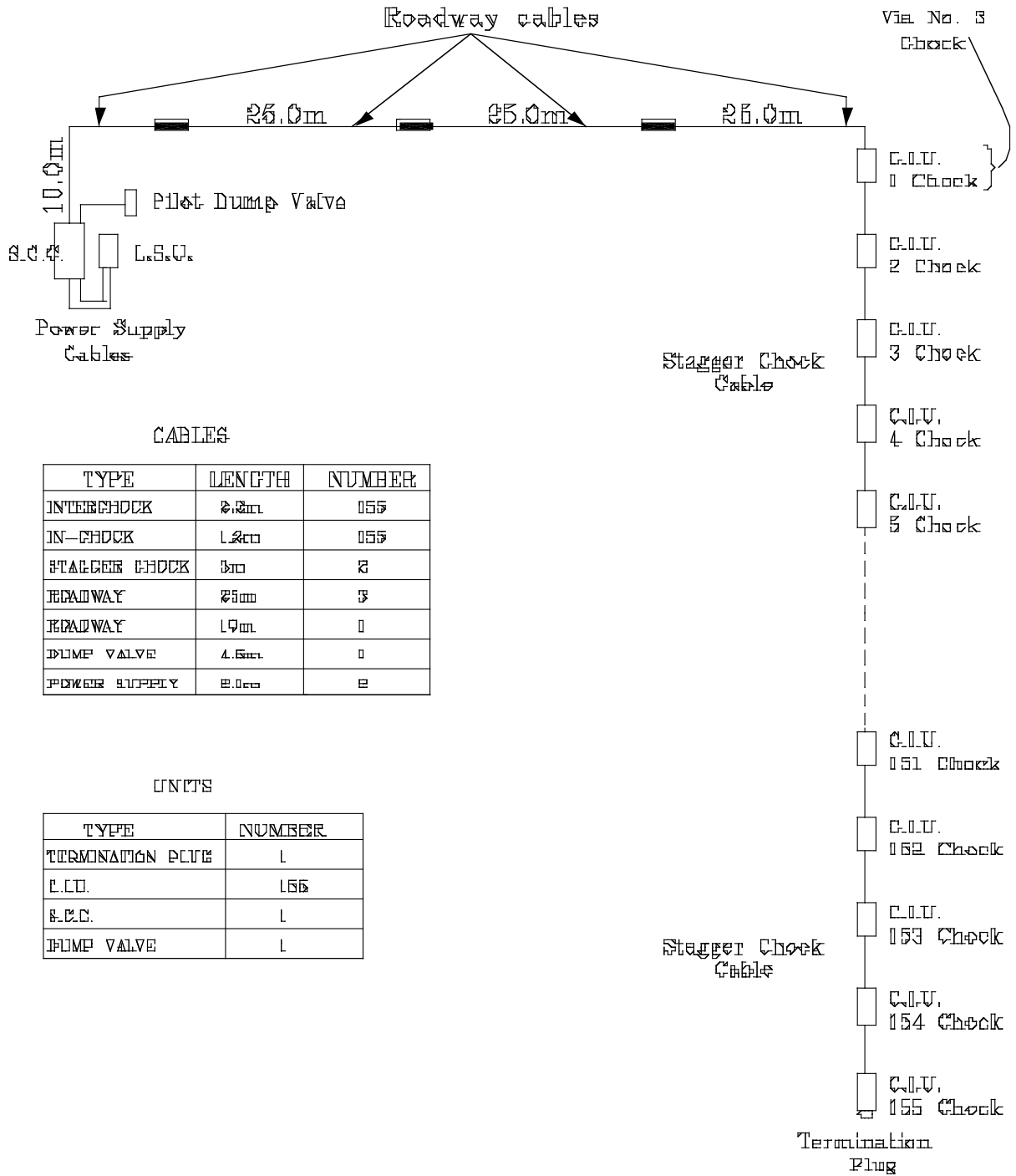
25/D5/94 Rev.19/D5/00 DRG.NO. DWGS\ACAD84

LONGWALL CABLES

AREA	CABLE NUMBER	LENGTH	USE	
HIGH TENSION	TL HT A1	90 metres	11 kV feeders from circuit breaker to transformer N°2	
	TL HT A2	90 metres		
	TL HT A3	90 metres		
	TL HT A4	90 metres		
	TL HT A5	90 metres		
	TL HT B1	32 metres	Spare	
	TL HT B1	32 metres	Spare	
	TL HT C1	14 metres	11 kV feeders from N°1 transformer to N°2 transformer - two Spares	
	TL HT C2	14 metres		
	TL HT C3	14 metres		
	D.C.B FEEDER	TL FB A1	50 metres	1100V feeders from N°1 transformer to N°1 D.C.B - two Spares
		TL FB A2	50 metres	
TL FB A3		50 metres		
TL FB A4		50 metres		
TL FC A1		45 metres	1100V feeders from N°2 transformer to N°2 D.C.B - two Spares	
TL FC A2		45 metres		
TL FC A3		45 metres		
TL FC A4		45 metres		
PUMP	TL P1 A1	35 metres	Supply cable from 1100 V manifold to N°1 pump - one spare	
	TL P1 A2	35 metres		
	TL P2 A1	50 metres	Supply cable from 1100 V manifold to N°2 pump - one spare	
	TL P2 A2	50 metres		
	TL P3 A1	50 metres	Supply cable from 1100 V manifold to N°2 pump - one spare	
	TL P3 A2	50 metres		
WATER PUMP	TL WP A1	20 metres	Supply cable from 1100 V manifold to Shearer water pump- one spare	
	TL TP A2			
B.S.L	TL SL A1	69 metres	Supply cable from 1100 V manifold to B.S.L - one spare	
	TL SL A2			

AREA	CABLE NUMBER	LENGTH	USE
CRUSHER	TL C A1	72 metres	Supply cable from 1100 V manifold to Crusher - one spare
	TL C A2	72 metres	
A.F.C	TL MC A1	76 metres	Supply cable from 1100 V manifold to maingate drive motor - two Spares
	TL MC A2	76 metres	
	TL MC A3	76 metres	
	TL MC A4	76 metres	
	TL TC A1	86 metres	Supply cable from 1100 V manifold to opposite N°5 Chock - two Spares
	TL TC A2	86 metres	
	TL TC A3	86 metres	
	TL TC A4	86 metres	
	TL TC B1	230 metres	Supply cable from opposite N°5 chock to tailgate drive motor - two Spares
	TL TC B2	230 metres	
	TL TC B3	230 metres	
	TL TC B4	230 metres	
SHEARER	TL S A3	86 metres	Supply cable from 1100 V manifold to opposite N°4 Chock - one spare
	TL S A4	86 metres	
	TL S B3	116 metres	Supply cable from opposite N°4 chock to mid-face - one spare
	TL S B4	116 metres	
	TL S C3	117 metres	Supply cable from mid-face to Shearer - one spare
	TL S C4	117 metres	
LIGHTING	TL L1 A1	10 metres	110 V manifold to convertor box on control sled - one spare
	TL L1 A2	10 metres	
	TL L1 B1	78 metres	From convertor box on control sled to convertor box on maingate drive - one spare
	TL L1 B2	78 metres	
	TL L2 A1	76 metres	110 V manifold to convertor box on B.S.L - one spare
	TL L2 A2	76 metres	

CHOCK CONTROL INSTALLATION



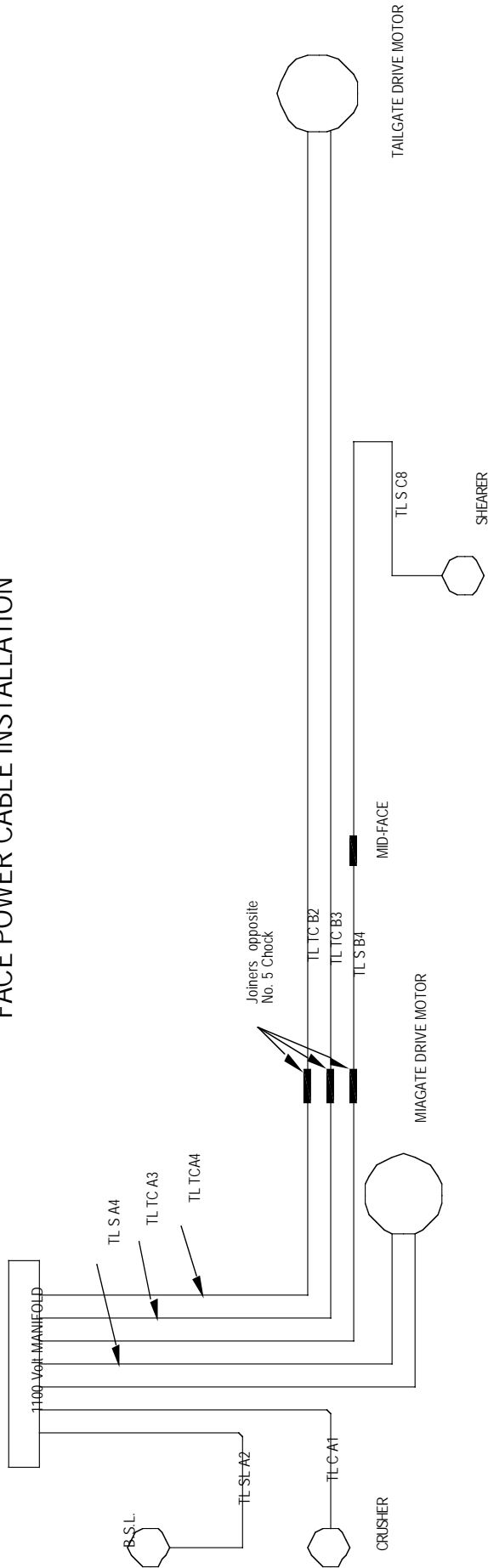
CABLES

TYPE	LENGTH	NUMBER
INTERCHOCK	2.2m	155
IN-CHOCK	1.2m	155
STAGGER CHOCK	3m	2
ROADWAY	25m	3
ROADWAY	19m	1
DUMP VALVE	4.5m	1
POWER SUPPLY	2.0m	2

UNITS

TYPE	NUMBER
TERMINATION PLUG	1
L.C.U.	155
S.C.C.	1
DUMP VALVE	1

FACE POWER CABLE INSTALLATION



FACE POWER CABLES

USE	CABLE NUMBER	TYPE/SIZE	LENGTH
CRUSHER	TL C A1 & A2	241 / 95mm	72 Metres
	TL S A4 & A2	241 / 95mm	69 Metres
TAILGATE DRIVE	TL M C A1 to A4	241 / 150mm	76 Metres
	TL M C A1 to A4	241 / 150mm	86 Metres
SHEARER	TL M C B1 to B4	241 / 150mm	236 Metres
	TL S A3 & A4	240 / 120mm	86 Metres
	TL S B3 & B4	240 / 120mm	116 Metres
	TL S C5 to C6	241 SL / 120mm	117 Metres

CHOCK CONVERTOR BOX INSTALLATION

	121
C	122
	123
	124
C	125
	126
	127
C	128
	129
	130
C	131
	132
	133
C	134
	135
	136
C	137
	138
	139
C	140
	141
	142
C	143
	144
	145
C	146
	147
	148
C	149
	150
	151
C	152
	153
	154
	155

	81
	82
C	83
	84
	85
C	86
	87
	88
C	89
	90
	91
C	92
	93
	94
C	95
	96
	97
C	98
	99
	100
C	101
	102
	103
C	104
	105
	106
C	107
	108
	109
C	110
	111
	112
C	113
	114
	115
C	116
	117
	118
C	119
	120

C	41
	42
	43
C	44
	45
	46
C	47
	48
	49
C	50
	51
	52
C	53
	54
	55
C	56
	57
	58
C	59
	60
	61
C	62
	63
	64
C	65
	66
	67
C	68
	69
	70
C	71
	72
	73
C	74
	75
	76
C	77
	78
	79
C	80

	1
C	2
	3
	4
C	5
	6
	7
C	8
	9
	10
C	11
	12
	13
C	14
	15
	16
C	17
	18
	19
C	20
	21
	22
C	23
	24
	25
C	26
	27
	28
C	29
	30
	31
C	32
	33
	34
C	35
	36
	37
C	38
	39
	40

C - CONVERTOR BOX

CHOCK INSTALLATION DIAGRAM

LIGHTING AND A.F.C. CONTROL

		121
1		122
		123
	L	124
2		125
		126
		127
1	L	128
		129
		130
2		131
		C 132
		133
1		134
		135
	L	136
2		137
		138
		139
1	L	140
		141
		142
2		143
		C 144
		145
1		146
		147
	L	148
2		149
		150
		151
1		C 152
		153
2		154
		155

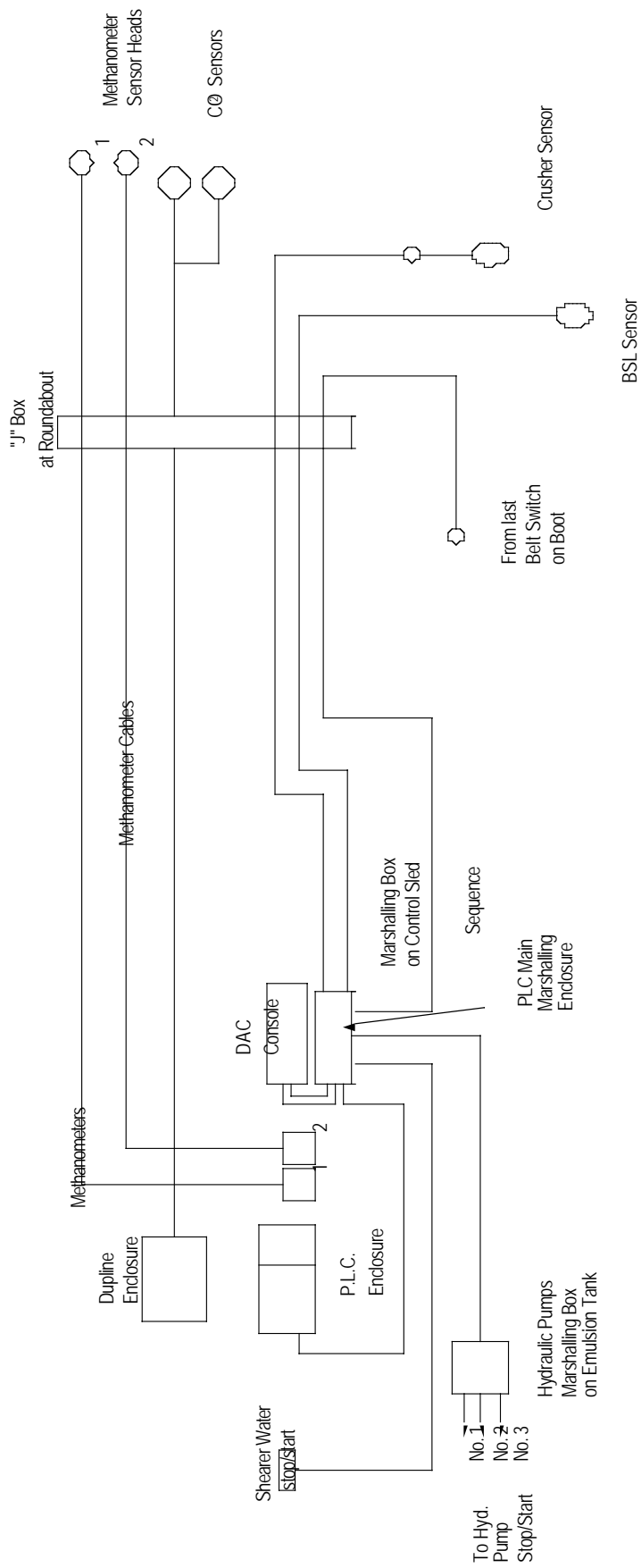
		81
		82
2		83
		C 84
		85
1		86
		87
	L	88
2		89
		90
		91
1	L	92
		93
		94
2		95
		C 96
		97
1		98
		99
	L	100
2		101
		102
		103
1	L	104
		105
		106
2		107
		C 108
		109
1		110
		111
	L	112
2		113
		114
		115
1	L	116
		117
		118
2		119
		C 120

2		41
		42
		43
1	L	44
		45
		46
2		47
		C 48
		49
1		50
		51
	L	52
2		53
		54
		55
1	L	56
		57
		58
2		59
		C 60
		61
1		62
		63
	L	64
2		65
		66
		67
1	L	68
		69
		70
2		71
		C 72
		73
1		74
		75
		76
2		77
		78
		79
1	L	80

		1
1		2
		3
		C 4
2		5
		6
		7
1	L	8
		9
		10
2		11
		C 12
		13
1		14
		15
	L	16
2		17
		18
		19
1	L	20
		21
		22
2		23
		C 24
		25
1		26
		27
	L	28
2		29
		30
		31
1	L	32
		33
		34
2		35
		C 36
		37
1		38
		39
	L	40

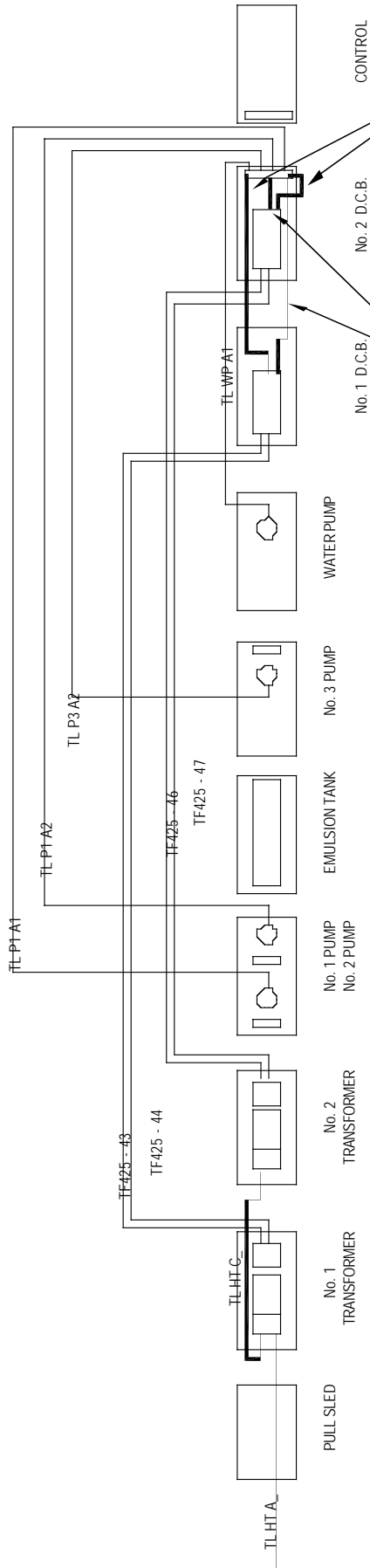
1 - Nº 1 LIGHTING CIRCUIT
 2 - Nº 2 LIGHTING CIRCUIT
 L - D.A.C. LOCKOUT KEY
 C - D.A.C. CADLOCK

SMALL CABLE INSTALLATION



For homatropal ventilation the methanometer sensors are to be located in the maingate, mounted on No. 4 chock, as is CO Sensors

PANTECH POWER CABLE INSTALLATION



Six 150mm Cables for each D.C.B. and fitted with 300A restrained receptacles at 1100 volt manifold.

Five 10mm Cables for each D.C.B. glanded into D.C.B. and fitted with 55A 110V restrained receptacles at 110 volt manifold.

PANTECH POWER CABLES			
USE	CABLE NUMBERS	TYPE / SIZE	LENGTH
HIGH TENSION - Feeder Cables	TL-HT-A1 TO A4	260 / 50mm	90 metres
	TL-HT-C1 TO C3	260 / 50mm	14 metres
PUMP CABLES	TL-PT-A1 & A2	241 / 25mm	55 metres
	TL-P2-A1 & A2	241 / 25mm	55 metres
	TL-P3-A1 & A2	241 / 25mm	40 metres
	TL-P2-A1 & A2	241 / 25mm	20 metres
D.C.B. FEEDER CABLES	TF425-43 & 44	241 / 240mm	52 metres
	TF425-46 & 47	241 / 240mm	47 metres

WIRE ROPE SLINGS

	CHOKE ROUND LOAD		CHOKE SQUARE LOAD		DIRECT LOAD				MULTI LEG CHOKES ROUND		MULTI LEG CHOKES SQUARE		BASKET HITCH ROUND		BASKET HITCH SQUARE	
	30°	60°	90°	120°	30°	60°	90°	120°	30°	60°	90°	120°	30°	60°	90°	120°
DIRECT LOAD																
CHOKE ROUND LOAD																
CHOKE SQUARE LOAD																
MULTI LEG CHOKES ROUND																
MULTI LEG CHOKES SQUARE																
BASKET HITCH ROUND																
BASKET HITCH SQUARE																

1570 GRADE FIBRE CORE

0.57	0.42	0.28	1.1	0.89	0.80	0.57	0.83	0.74	0.55	0.49	1.78	1.6	1.1	0.89	0.80	0.57
0.89	0.67	0.44	1.7	1.5	1.2	0.89	1.3	1.1	0.85	0.75	3.0	2.4	1.7	1.5	1.2	0.89
1.3	0.96	0.64	2.5	2.2	1.8	1.3	1.8	1.6	1.2	1.1	4.4	3.6	2.6	2.2	1.8	1.3
1.5	1.1	0.75	2.9	2.6	2.1	1.5	2.2	1.9	1.4	1.3	5.2	4.2	3.0	2.6	2.1	1.5
1.7	1.3	0.85	3.4	3.0	2.5	1.7	2.5	2.2	1.7	1.5	6.0	5.0	3.4	3.0	2.5	1.7
2.3	1.7	1.15	4.4	4.0	3.2	2.3	3.3	3.0	2.2	2.0	8.0	6.4	4.6	4.0	3.2	2.3
2.9	2.2	1.45	5.6	5.0	4.1	2.9	4.2	3.8	2.8	2.5	10.0	8.2	5.8	5.0	4.1	2.9
3.6	2.7	1.80	6.9	6.2	5.0	3.6	5.2	4.6	3.4	3.1	12.4	10.0	6.8	6.2	5.0	3.6
4.3	3.2	2.15	8.3	7.5	6.1	4.3	6.3	5.6	4.1	3.7	15.0	12.2	8.6	7.5	6.1	4.3
5.1	3.8	2.5	10.0	8.9	7.3	5.1	7.4	6.7	5.0	4.4	17.8	14.6	10.2	8.9	7.3	5.1
6.0	4.5	3.0	11.7	10.5	8.5	6.0	8.7	7.8	5.8	5.2	21.0	17.0	12.0	10.5	8.5	6.0
7.0	5.2	3.5	13.5	12.1	9.9	7.0	10.1	9.1	6.7	6.0	24.2	19.8	14.0	12.1	9.9	7.0
9.1	6.8	4.5	17.7	15.8	13.0	9.1	13.3	11.9	8.8	7.9	31.6	26.0	18.2	15.8	13.0	9.1

RULE OF THUMB FORMULAE

DETERMINE SAFE WORKING LOAD

WIRE ROPE	-	$D^2 \times 8 = \text{SWL IN KG}$
CHAIN	-	$D^2 \times .3 \times \text{GRADE} = \text{SWL IN KG}$
FIBRE ROPE	-	$D^2 = \text{SWL IN KG}$

DETERMINE SLING SIZE

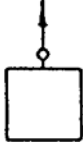
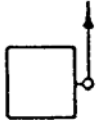
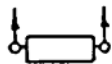

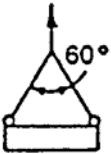
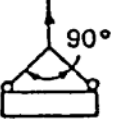
WIRE ROPE	$\sqrt{\frac{\text{LOAD IN KG}}{8 \times \text{LOAD FACTORS}}}$
CHAIN	$\sqrt{\frac{\text{LOAD IN KG}}{.3 \times \text{GRADE} \times \text{LOAD FACTORS}}}$
FIBRE	$\sqrt{\frac{\text{LOAD IN KG}}{\text{LOAD FACTORS}}}$

LOAD FACTORS

REEVED	-	SQUARE LOAD	.5
		ROUND LOAD	.75

INCLUDED ANGLES	0°	2
	30°	1.93
	60°	1.75
	90°	1.41
	120°	1

TABLE B1
SWL FOR CLASS 3 LOAD APPLICATION AS SPECIFIED BY AS 1418, PART 1

1	2	3	4	5	6	7
Nominal size of eyebolt	SWL for Class 3 load application as specified by AS 1418, Part 1 (See Clause 3.8.2)					
	Single eyebolt		Pair of eyebolts (see Note)			
	Axial 	Trunnion-type mounting 	Perpendicular 	Included angle 30° 	Included angle 60° 	Included angle 90° 
M12	0.32	0.08	0.16	0.40	0.26	0.16
M16	0.63	0.16	0.32	0.79	0.50	0.32
M20	1.25	0.31	0.63	1.6	1.0	0.63
M24	2.0	0.50	1.0	2.5	1.6	1.0
M30	3.2	0.80	1.6	4.0	2.6	1.6
M36	5.0	1.3	2.5	6.3	4.0	2.5
M42	6.3	1.6	3.2	7.9	5.0	3.2
M48	8.0	2.0	4.0	10	6.4	4.0
M56	12	3.0	6.0	15	9.6	6.0
M64	16	4.0	8.0	20	13	8.0
M72	20	5.0	10	25	16	10
Reduction factor for single eyebolt						
1	0.25	0.25	0.63	0.40	0.25	

NOTE: The included angle, between the legs of every two-leg sling connected to a load by a pair of eyebolts, should not exceed 90 degrees.

ANGLED LIFTS

