PENGENALAN KEPADA PERUSAHAAN KUARI

INTEKMA RESORT, SHAH ALAM

17 hb November 2005

Cawangan Kejuruteraan Mekanikal

- What Is A Quarry ?
- History Of JKR Kuari
- Plants
- Road Works
- Management
- Costing And Controls
- Pollutions And Noise

JKR Kuari Bukit Penggorak

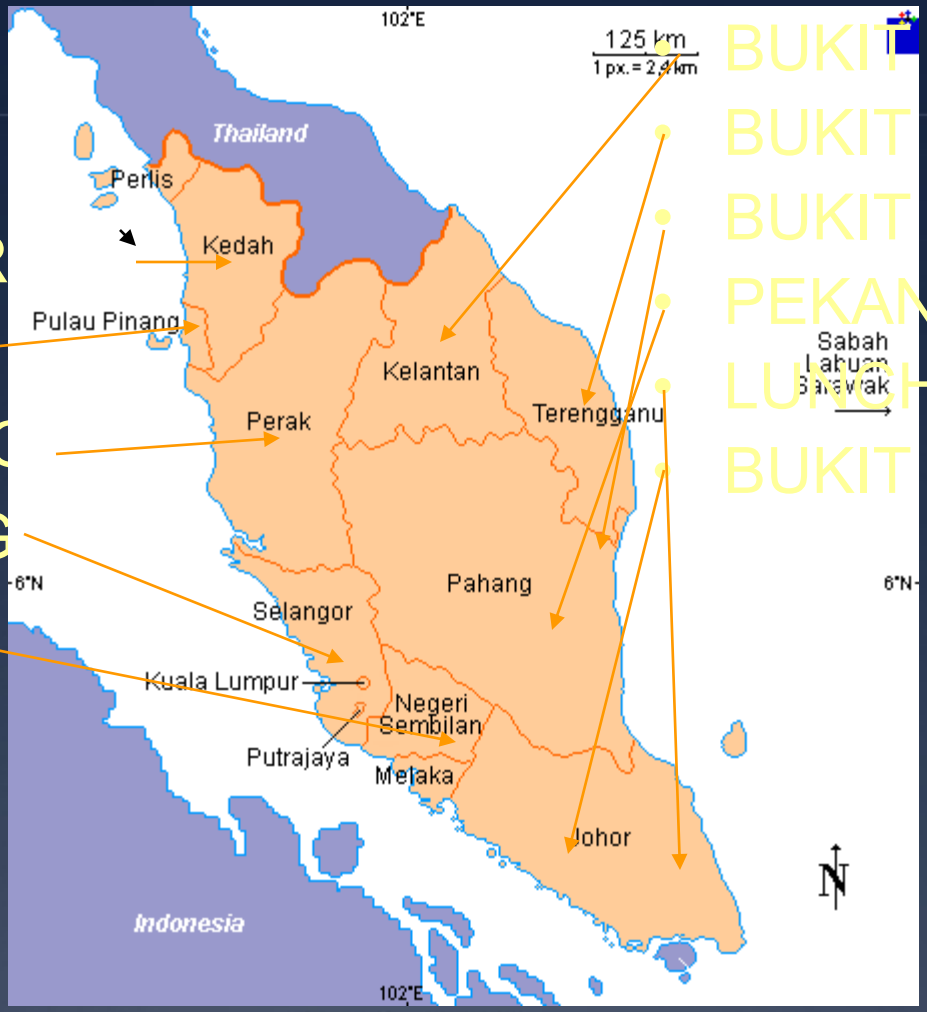
Definasi

QUARRY

- An Open Surface Excavation To Extract Stone From Pit or Hill

JKR KUARI

- GUNONG KER
- PENANTI
- KUALA DIPANG
- SUNGAI LONG
- GEMENCHEH



- BUKIT BULOH
- BUKIT JONG
- BUKIT PENGGORAK
- PEKAN AWAH
- LUNG HOO
- BUKIT MOR


QUARRY FACE

QUARRY FACE

REMOVAL OF OVERBURDEN

HYDRAULIC DRILLING MACHINE

Cawangan Ke

BLOCKS SENT TO PRIMARY CRUSHER

PRIMARY JAW CRUSHER


10/11/2005


10/11/2005


10/11/2005


SECONDARY HOUSE
SURGE BIN
10/11/2005

SECONDARY CRUSHING

GRADING BUNKERS


UTAMAKAN KESELAMATAN


10/11/2005


STACK TEMP
START
STOP
READY
OVEN TEMP
2004/04/23 12:00:51

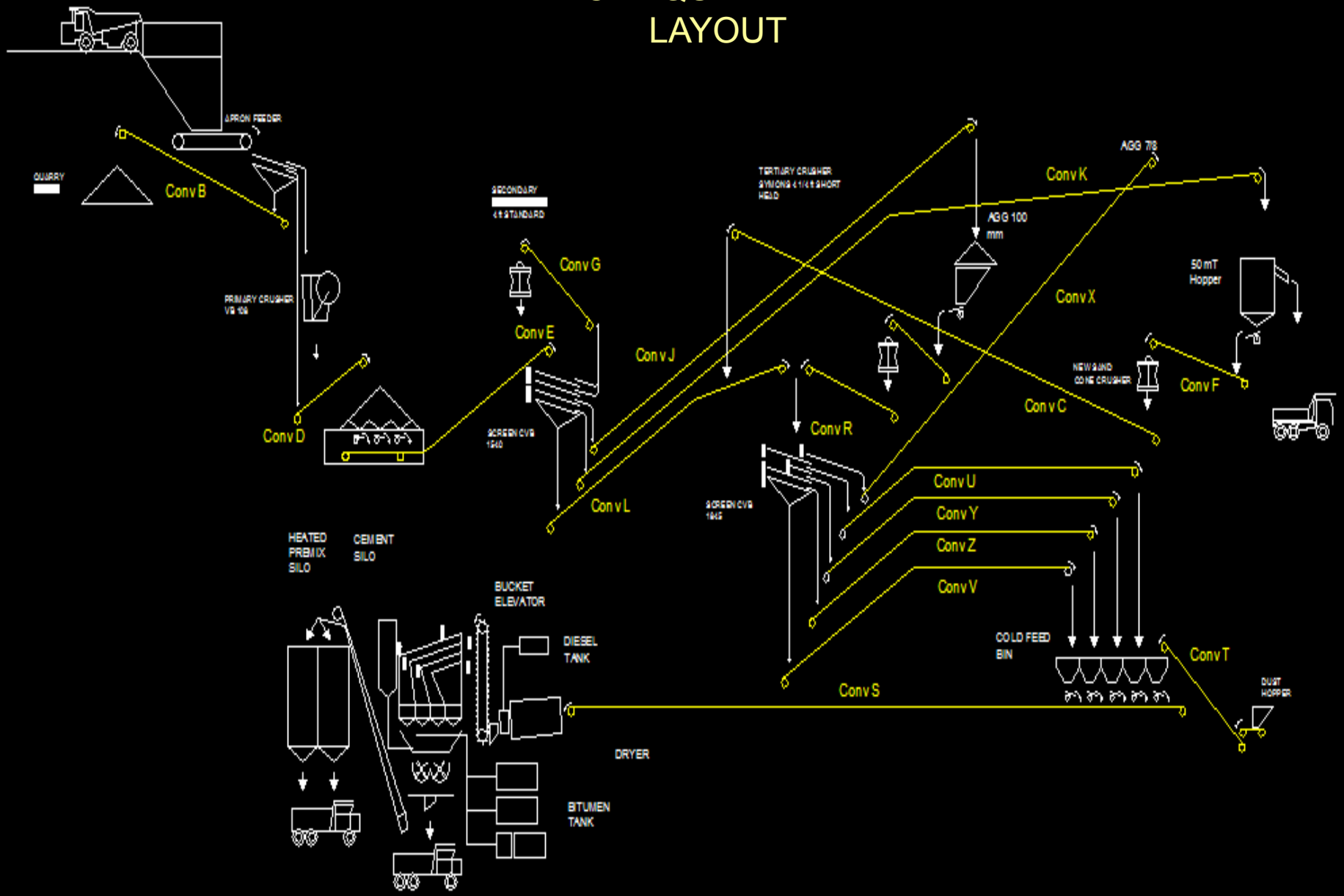

10/11/2005


PREMIX PLANT
10/11/2005

R & D ON TV3

Cawangan Kejuruteraan Mekanikal

TYPICAL QUARRY PLANT LAYOUT



INDUSTRI KUARI

- Granite
- Limestone
- Marble

Construction Aggregate

Dimension Stone

Cement

Calcium Carbonate Powder (Lime)

Dimension Stones

Tiles

Aggregate Production

- Extraction
- *Stripping*
- *Drilling and Blasting*
- *Scalping*
- *Primary Crushing*
- *Secondary and Tertiary Crushing*
- Screening
- *Product Quality*
- *Manufactured Fines*
- Stockpiling and Handling

Premix Production

- Design
- Setting
- Batching

WINNING

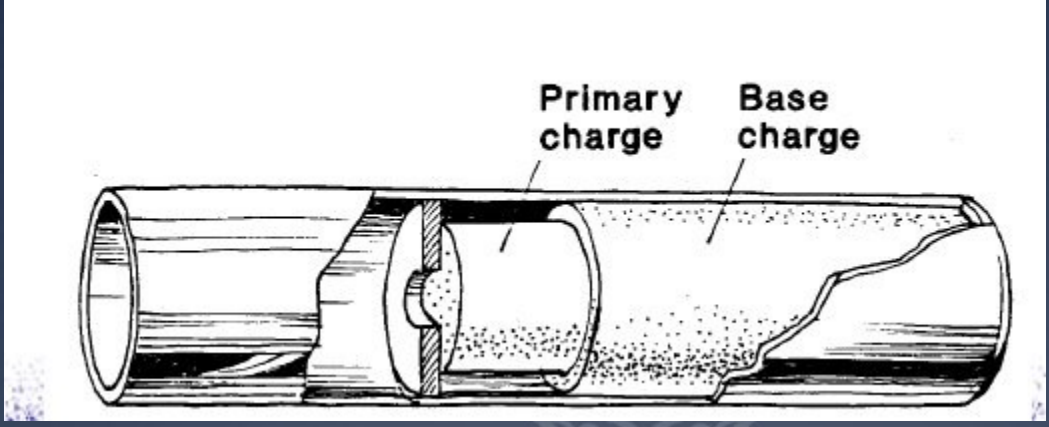
- Blasting
- Sawing
- Breaking
- Chipping

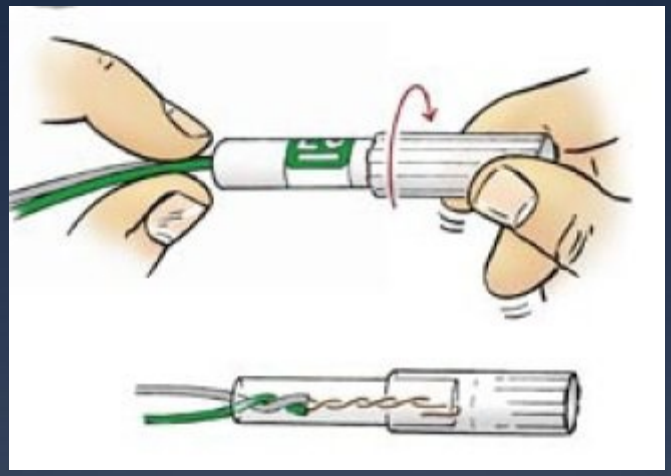
Detonator

- Detonator is a device designed to explode and initiate a high explosive
- Contain sensitive explosive charges encased in cylindrical
- metal shell
- Various detonators categorised with respect to initiation
- signal energy source, i.e. non-electric, electric, electronic
- Different strengths dependent on amount of base charge
- contained and identified by strength number

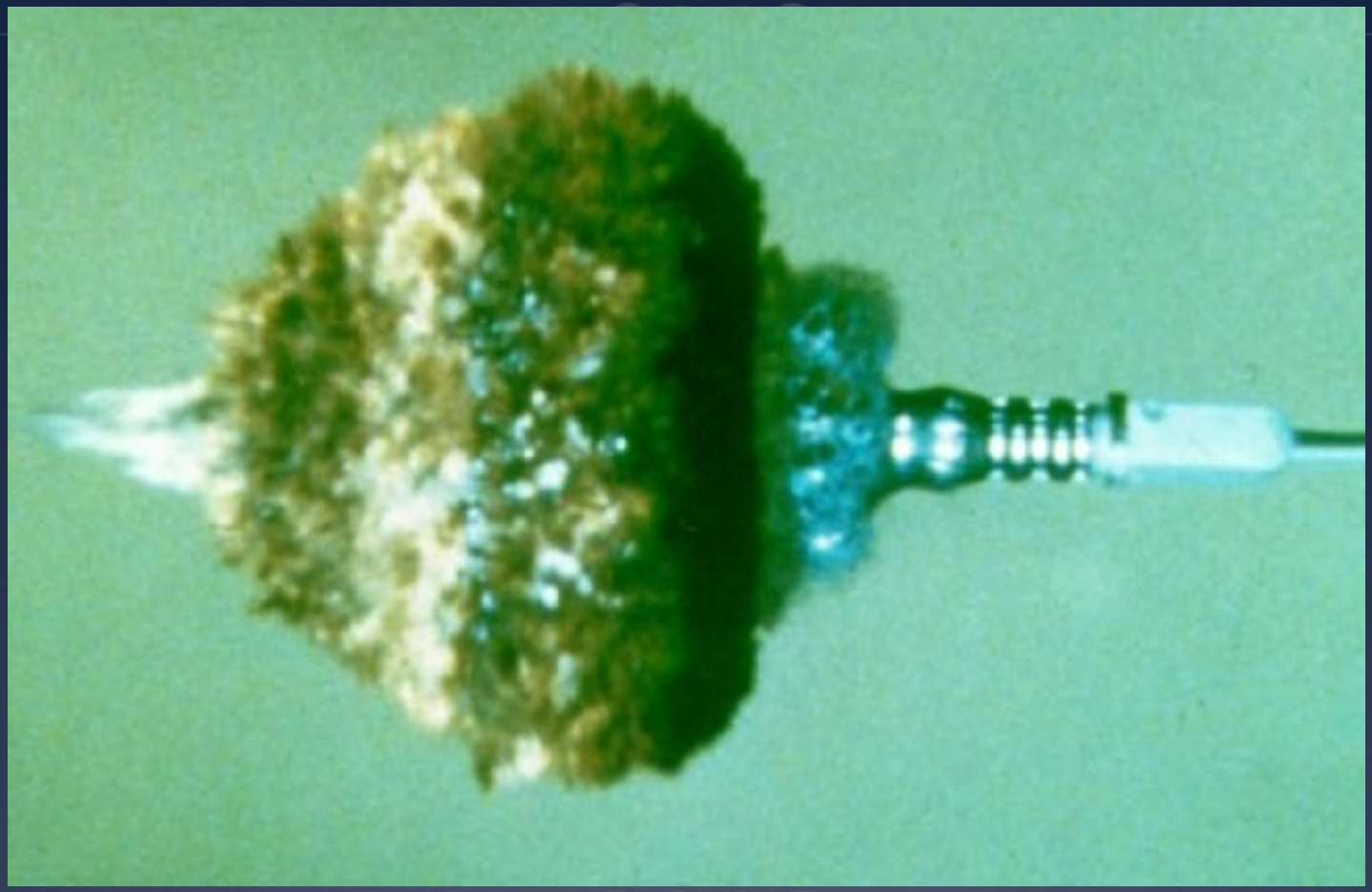
Plain Detonator

- Primary charge of ASA
- Base charge of PETN or RDX
- Initation via electric current passed through leg





DETONATOR BURSTING



ELECTRIC DETONATOR

Advantages:

- Higher degree of safety – remove blaster from shot
- Total control of initiation time
- Circuit Testing
- Better results with delays - different applications such as bench, trench and tunnel blasting
- Reduction in air blasts and ground vibration

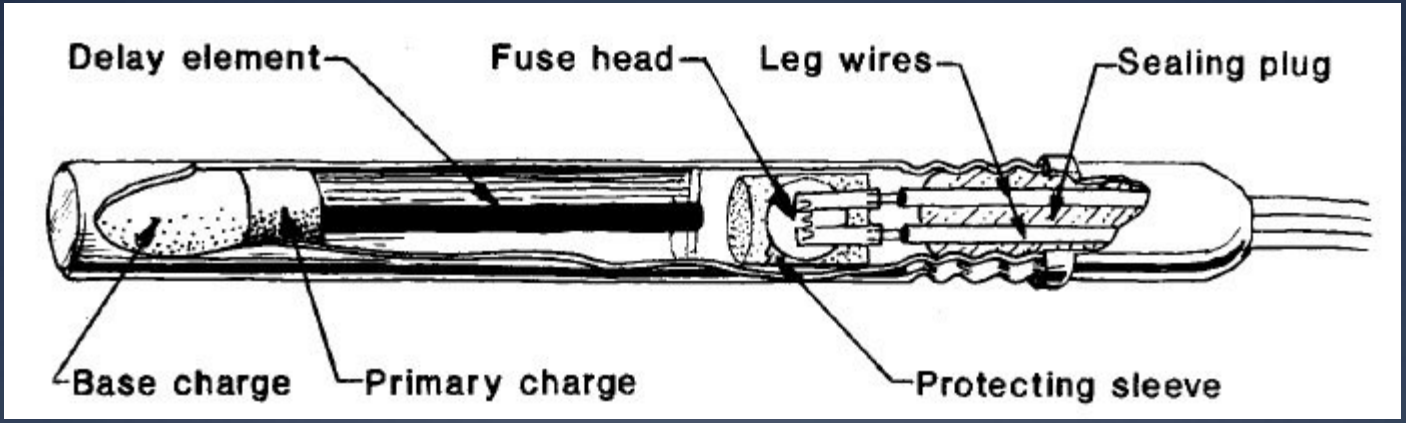
Disadvantages

- Risk of premature detonation!
- Extraneous sources of electricity such as lightning, static stray currents and radio frequency energy

HIGH EXPLOSIVE

Delay Electric Detonator

- Same as instantaneous electric detonator, except for inclusion of delay powder train
- Delay time based on length and composition of delay powder

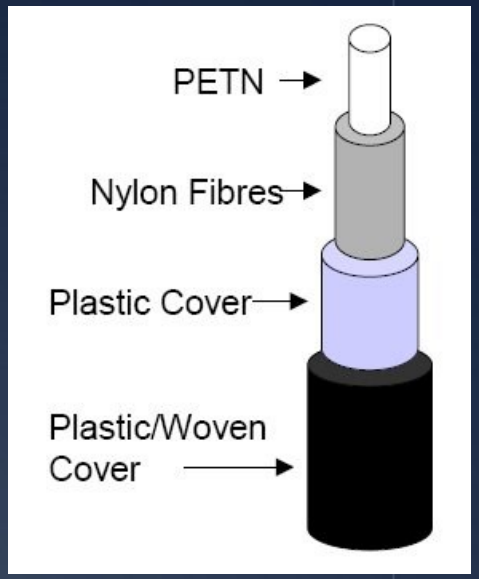


DANGER OF LIGHTNING

Cawangan Kejuruteraan Mekanikal

Detonating Cord

- Strong, flexible, continuous detonator
- Developed in 1907 in France
- Consisted of lead tube enclosing TNT
- PETN cotton core surrounded by various textile combinations, plastics and waterproofing materials
- Burning speed in excess of 7000m/s



PETN Pentaerythritoltetranitrate

- **DETONATING CORD**
- Advantages:
- - Versatile, safe for use in extraneous electricity
- environments, simultaneously firing without
- detonators, no hole limit, totally consumed,
- inexpensive
- - Incorporation of delay connector in 1950, allowed
- sequential blasting of larger patterns than electric
- Disadvantages:
- - Noisy initiation, large amount of cord movement,
- disruption to stemming column when down the hole

BLASTING AGENT

- ANFO
- HIGH EXPLOSIVE
- DETONATOR
- CORDS
- EXPLODER

ANFO

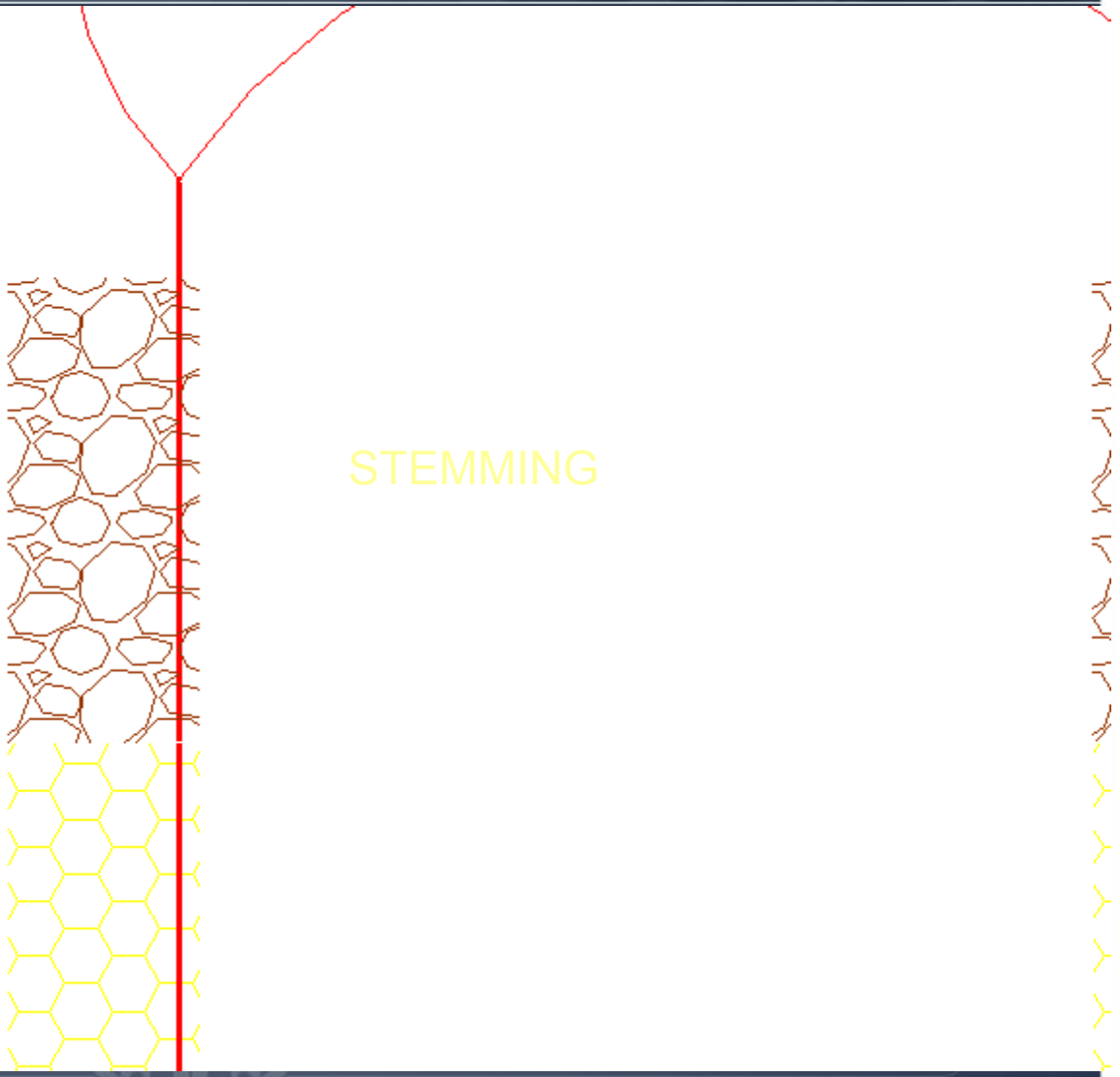
- Ammonium Nitrate Fuel Oil
- Mixture 96 % Ammonium Nitrate with 4 % Diesel
- Gas Producer – O_2 H_2 H_2S CO CO_2

SHOT HOLES

BENCH

FACE

TOE



Aggregate Stockpile

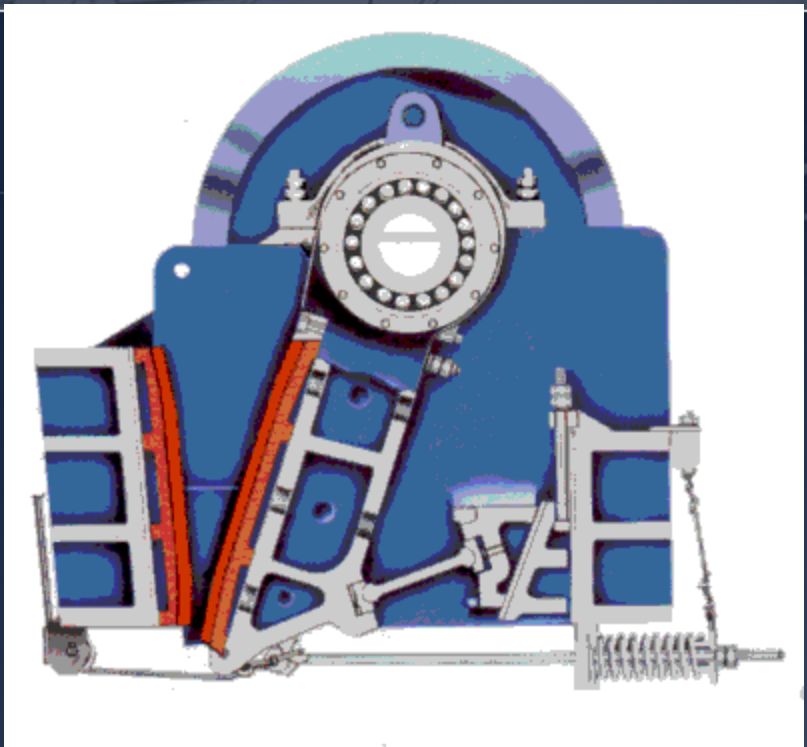
JKR KUARI BUKIT PENGGORAK, KUANTAN

MATERIALS STANDARD

MECHANICAL PROPERTIES	STANDARD	REQUIREMENT
Crushing Value	MS 30	< = 30
Soundness	AASHTO Test Method T104	< = 12 %
Flakiness Index	MS 30	< = 30
Water Absorption	MS 30	< = 2 %
Polish Stone Value (Wearing Course Only)	MS 30	> = 40

MARSHALL PROPERTIES	WEARING	BINDER
Stabilty	> 500 kg	> 450 kg
Flow	2 mm - 4 mm	2 mm - 4 mm
Stiffness	> 250 kg/mm	> 225 kg/mm
Air Void in Mix	3 - 5 Percent	3 - 7 Percent
Void in Aggregate Filled With Bitumen	75 - 85 Percent	65 - 80 Percent

PHYSICAL PROPERTIES OF MIX AND MATERIALS		
Bitumen Content	5.0 - 7.0 Percent	ACW 14 Wearing
	5.5 - 6.5 Percent	ACW 14 Binder
	4.0 - 6.0 Percent	ACB 28 Binder
Density of Mix	2.33 mT per m3	
SG Bitumen 80 - 100	1.022	
Satu Ela Metal	0.667 mT	
Satu Ela Premix	0.625 mT	
Satu mT Bitumen	20 mT Premix	
Satu litre Diesel	0.2 mT Premix	5 litre per mT Premix



PRIMARY CRUSHER

Double Toggle

Single Toggle

Jaw Crusher is primary or the main crushers in a quarry.

The size of a jaw crusher is designated by the rectangular or square opening at the top of the jaws (feed opening). For instance, a 24 x 36 jaw crusher has a opening of 24" by 36", a 56 x 56 jaw crusher has a opening of 56" square.

Primary jaw crushers are typically of the square opening design, and secondary jaw crushers are of the rectangular opening design. However, there are many exceptions to this general rule.

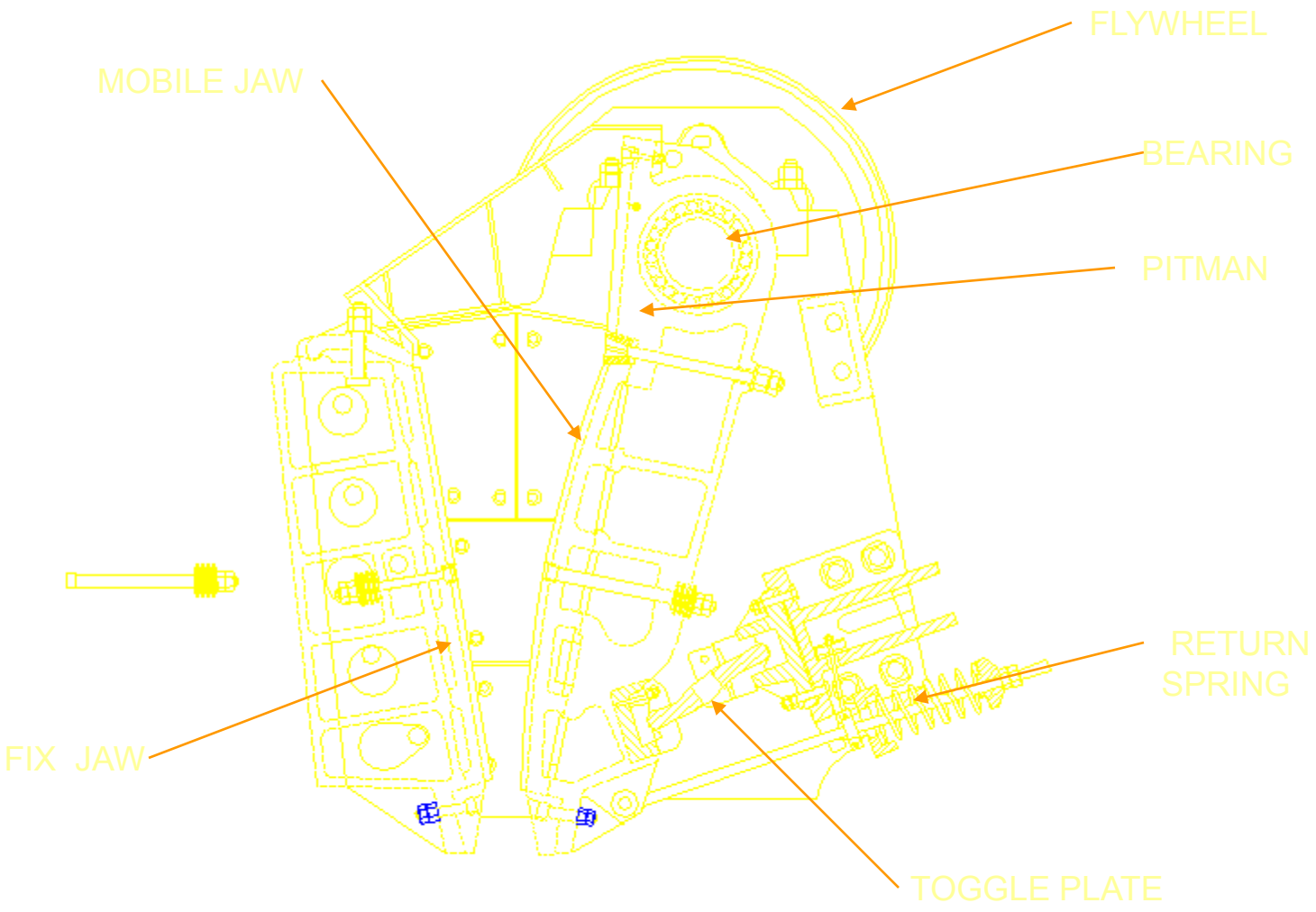
A Jaw Crusher reduces large size rocks or ore by placing the rock into compression.

A fixed jaw, mounted in a "V" alignment is the stationary breaking surface, while the movable jaw exerts force on the rock by forcing it against the stationary plate.

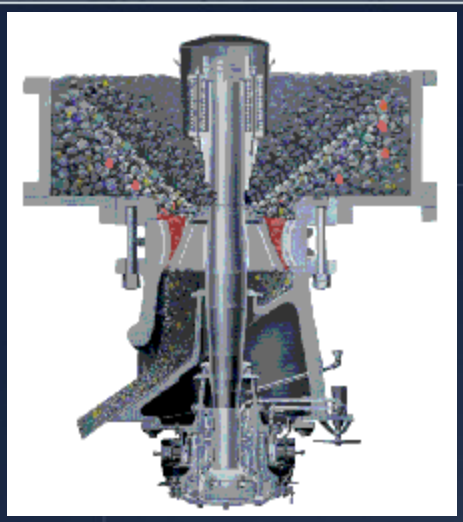
The space at the bottom of the "V" aligned jaw plates is the crusher product size gap, or the size of the crushed product from the jaw crusher.

The rock remains in the jaws until it is small enough to pass through the gap at the bottom of the jaws.

Sectional View Of Jaw Crusher



BEARING AND ECCENTRIC THROWS



A Gyratory Cone Crusher is one of the main types of secondary crushers in a quarry.

The crushing action is caused by the closing of the gap between the mantle line (movable) mounted on the central vertical spindle and the concave liners (fixed) mounted on the main frame of the crusher.

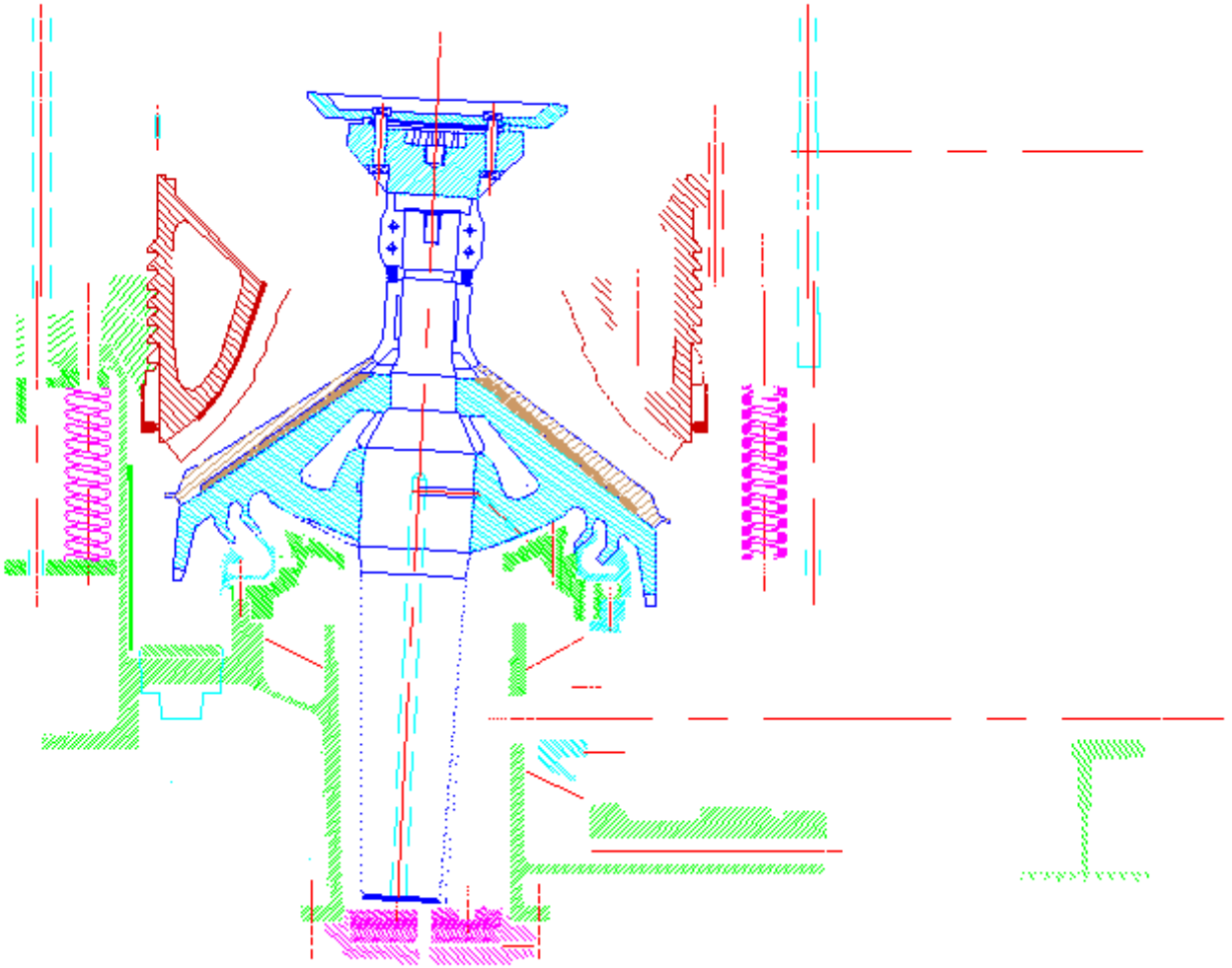
The gap is opened and closed by an eccentric on the bottom of the spindle that causes the central vertical spindle to gyrate.

The vertical spindle is free to rotate around its own axis. The crusher illustrated is a short-shaft suspended spindle type, meaning that the main shaft is suspended at the top and that the eccentric is mounted above the gear.

The short-shaft design differ from the long-shaft design in which the eccentric is mounted below the gear.

SYMONS CONE CRUSHER

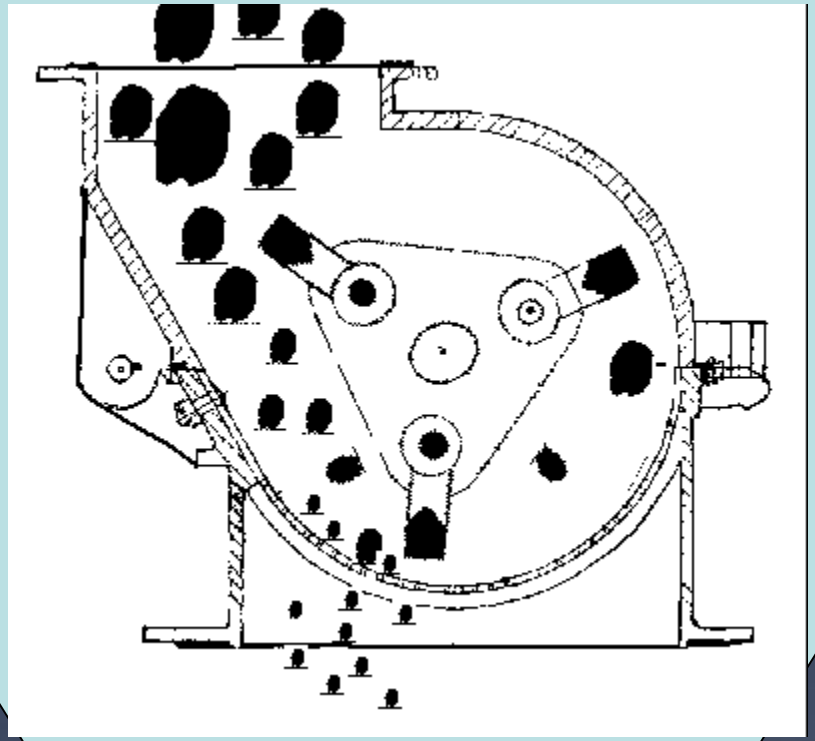
Cawangan Kejuruteraan Mekanikal



SYMONS CONE CRUSHER 4 FT STANDARD

Cawangan Kejuruteraan Mekanikal

Impact Crusher



An Impactor crushes material by impacting it against a rotating hammer (typically traveling between 750 RPM and 1800 RPM).

Then the material is forced against a rugged solid plate called a "breaker plate" which further degrades the particle size.

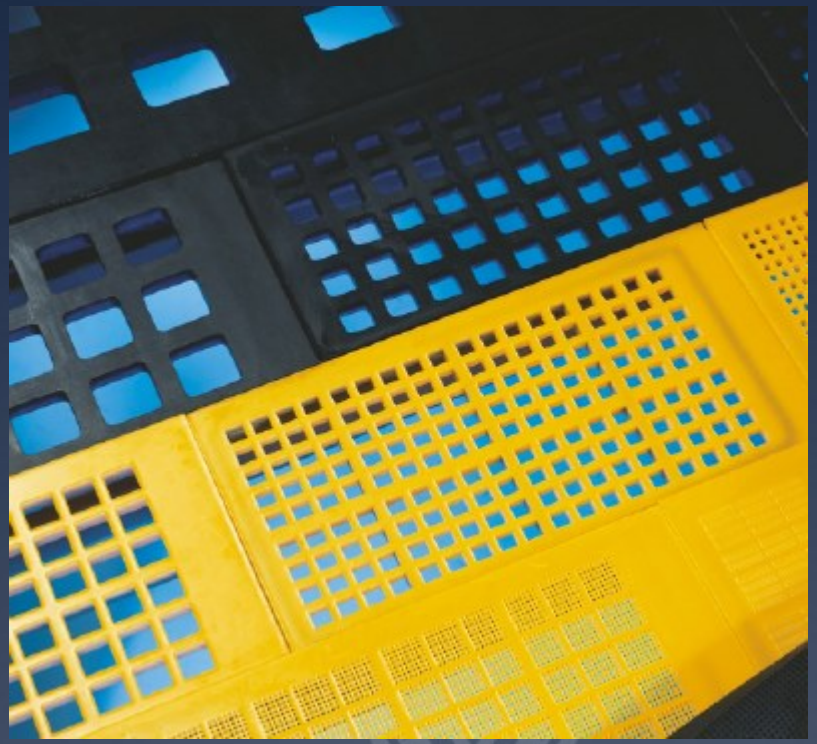
Finally, the material is forced over a discharge grate by the hammers, where crushed finer particles drop through the discharge grate and larger particles travel around for another crushing cycle, until they fall through the discharge grid.

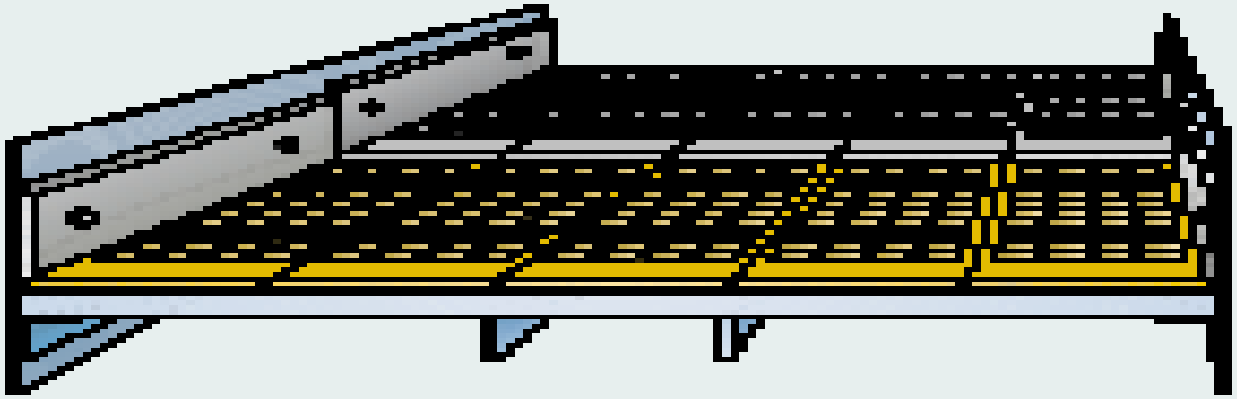
During the entire time the material is traveling around in the Impactor it is constantly being impacted by the hammers, and the side of the mill casing, causing breakage of the particles.

This sequence repeats itself between 750 - 1800 times each minute, until the particle is ground fine enough to fall through the discharge grid.

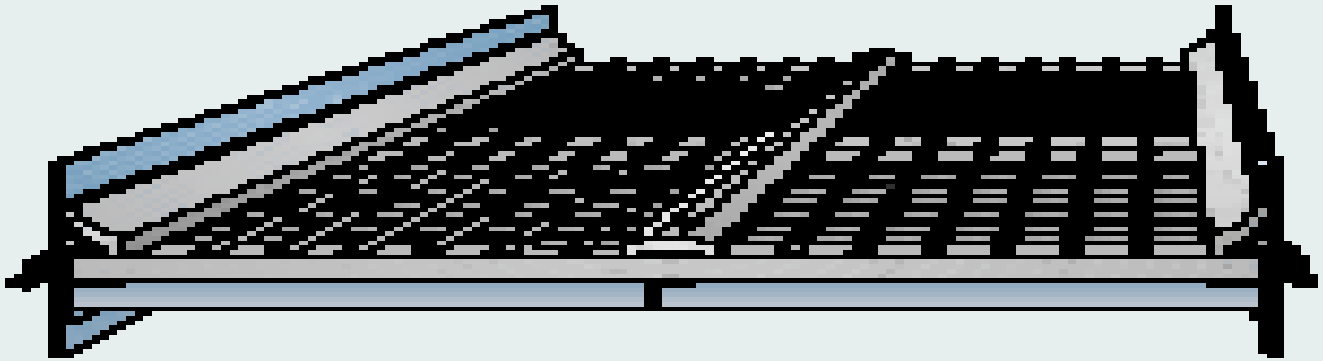
Screening & Selection

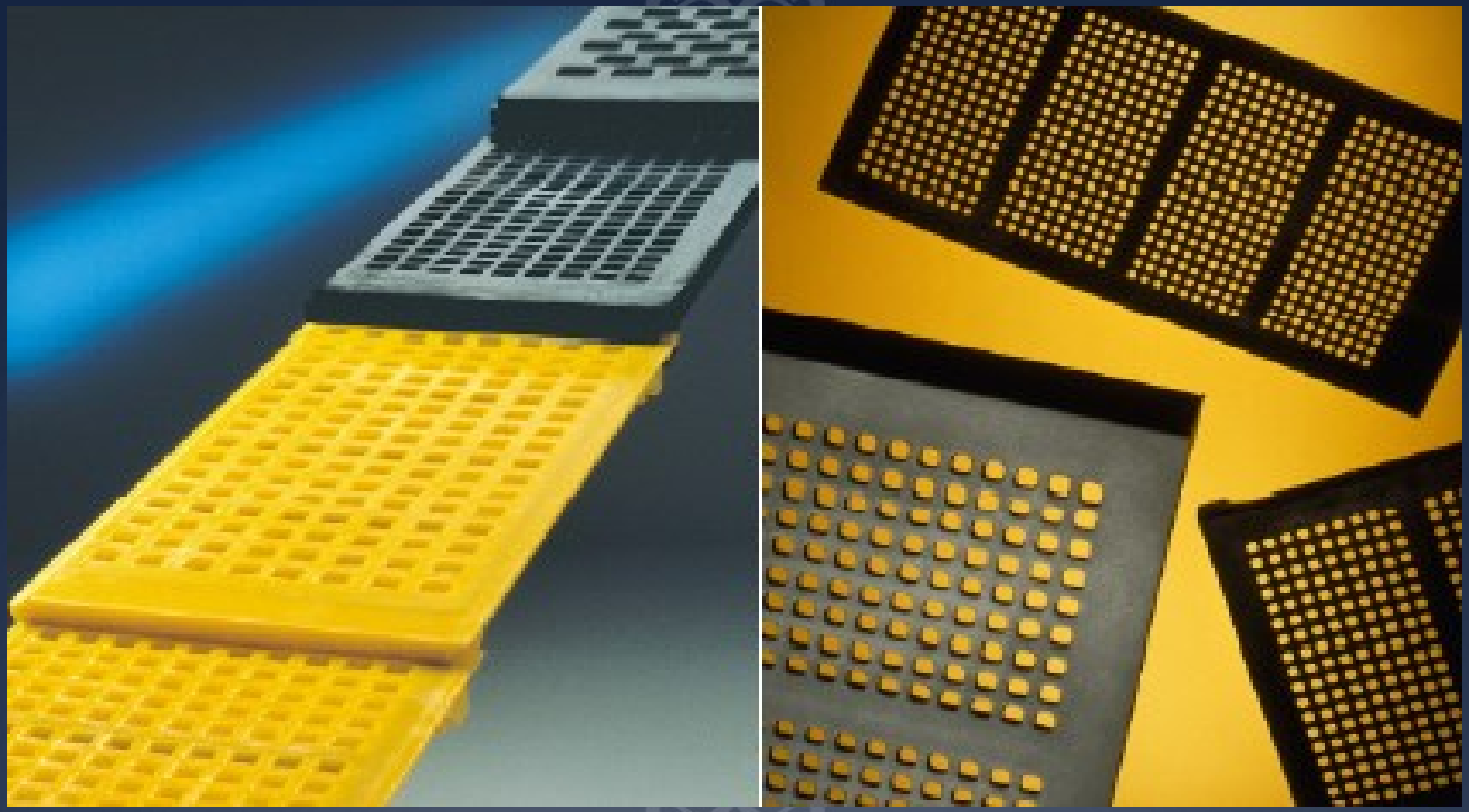
- To separate material
- To select



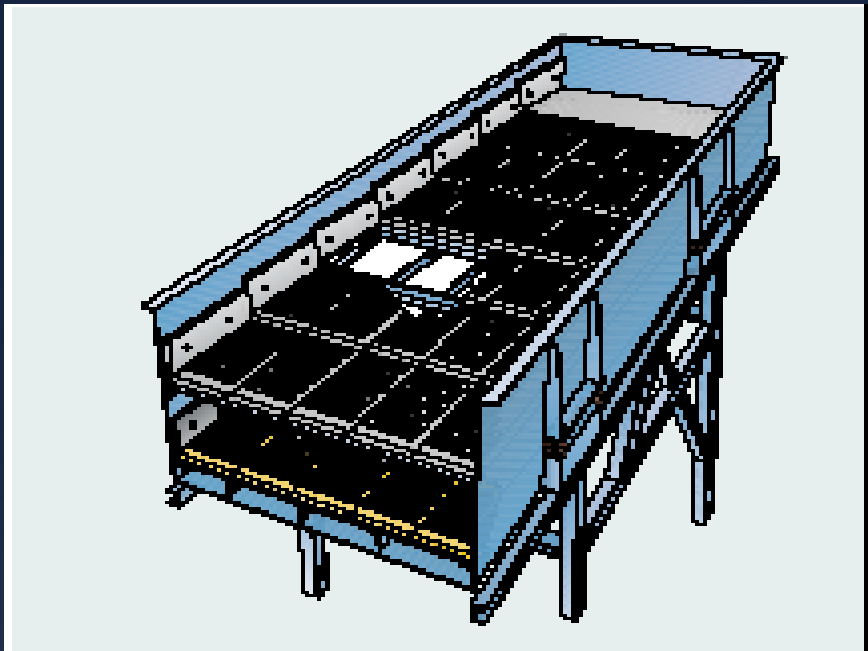


Trailer Mechanical stop system





Cawangan Kejuruteraan Mekanikal



Trailer 'step-on' frame

Cawangan Kejuruteraan Mekanikal

PREMIX PLANT

CVB 1540

CVB 1845

PREMIX PRODUCTION

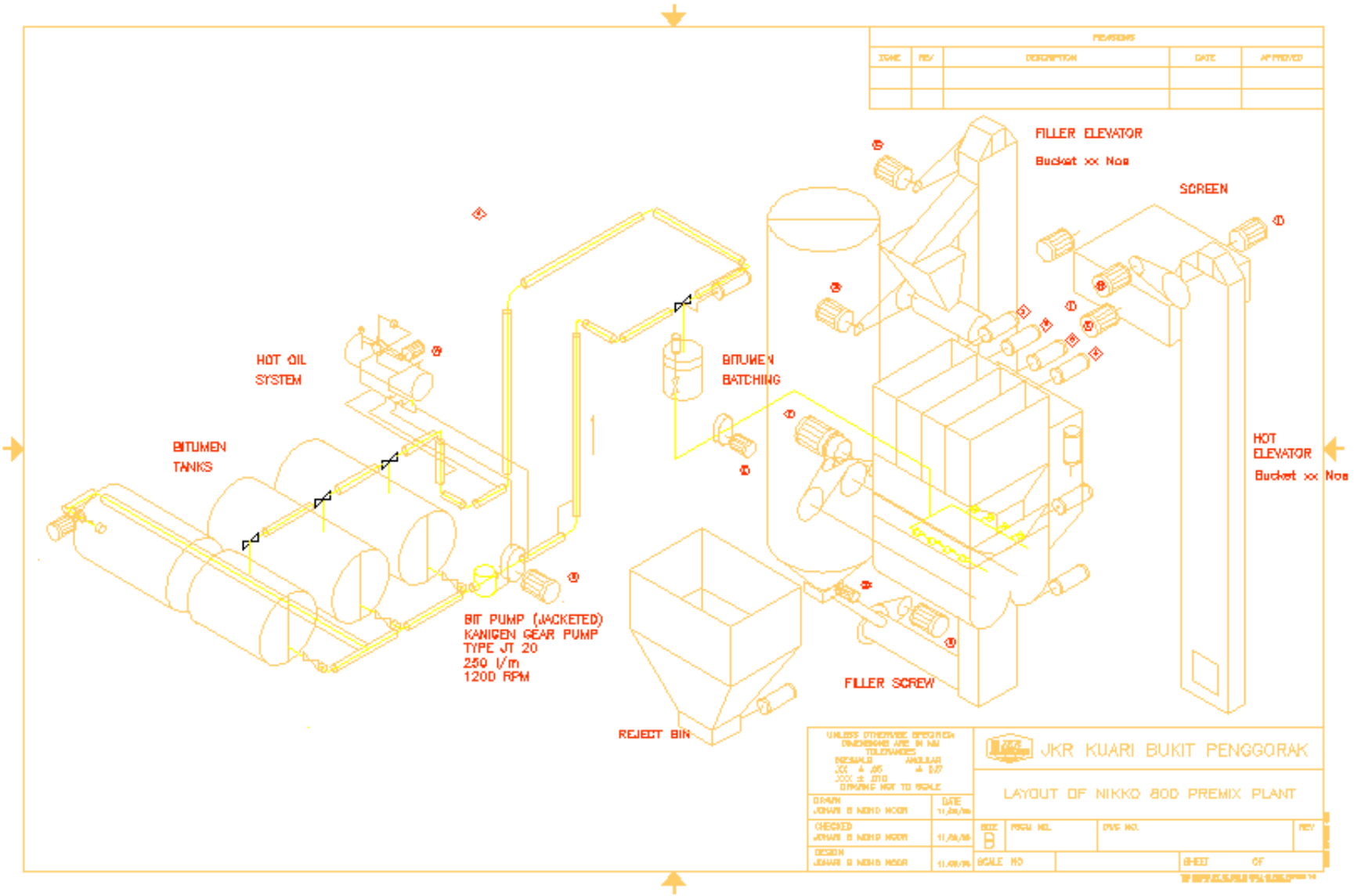
Storing

Crushing

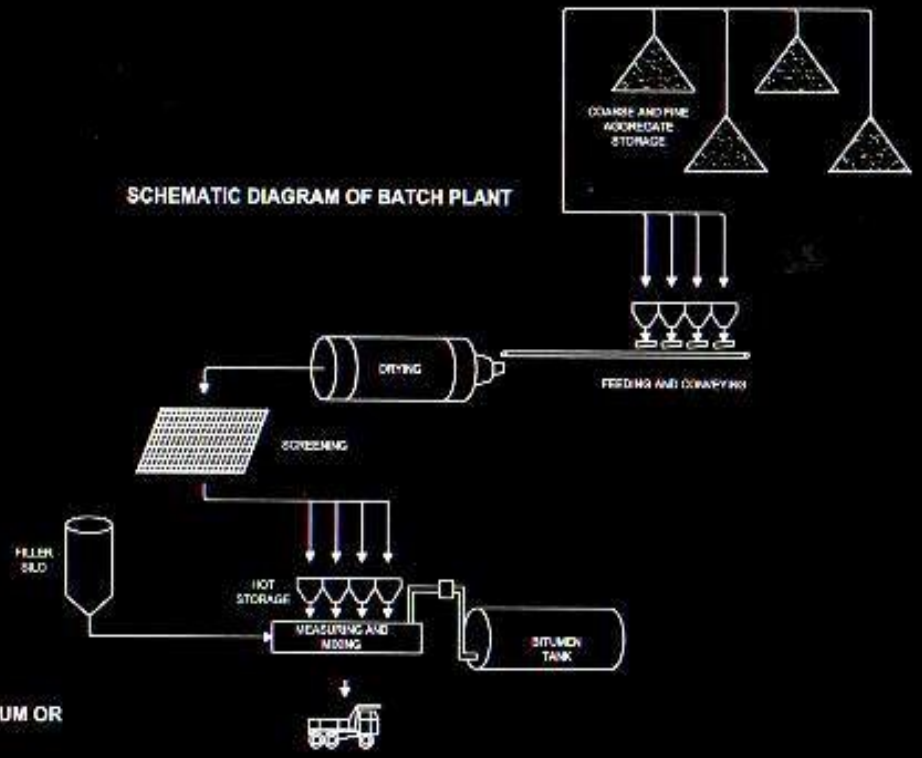
Screening

Premix

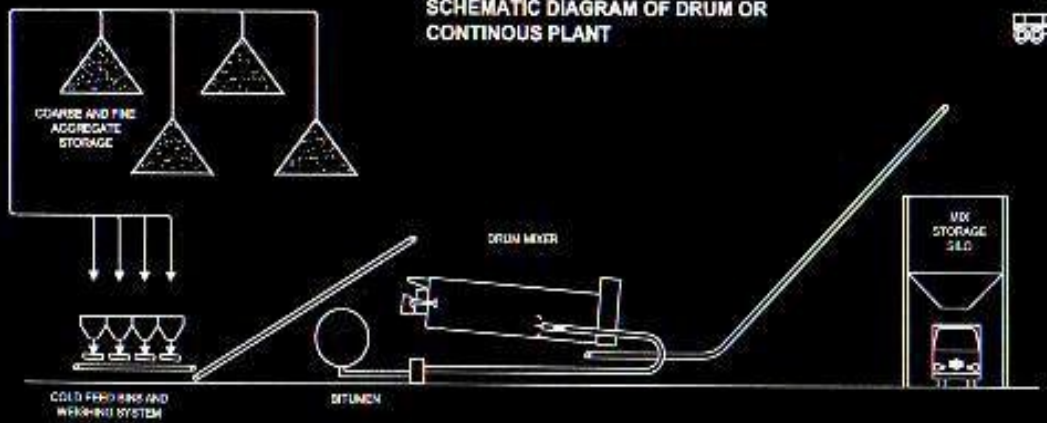
Cawang



SCHEMATIC DIAGRAM OF BATCH PLANT



SCHEMATIC DIAGRAM OF DRUM OR CONTINOUS PLANT



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MM
TOLERANCES
DECIMALS ANGULAR
XX ± .05 ± 0.5°
XXX ± .010
DRAWING NOT TO SCALE

JKR KUARI BUKIT PENGGORAK

TYPICAL MIXING PLANTS

DRAWN JOHARI B MOHD NOOR	DATE 11/08/10			
CHECKED JOHARI B MOHD NOOR	11/08/10	SIZE B	FSCM NO.	DWG NO. REV
DESIGN JOHARI B MOHD NOOR	11/08/10	SCALE NO		SHEET OF

ROAD WORK

Road Structure

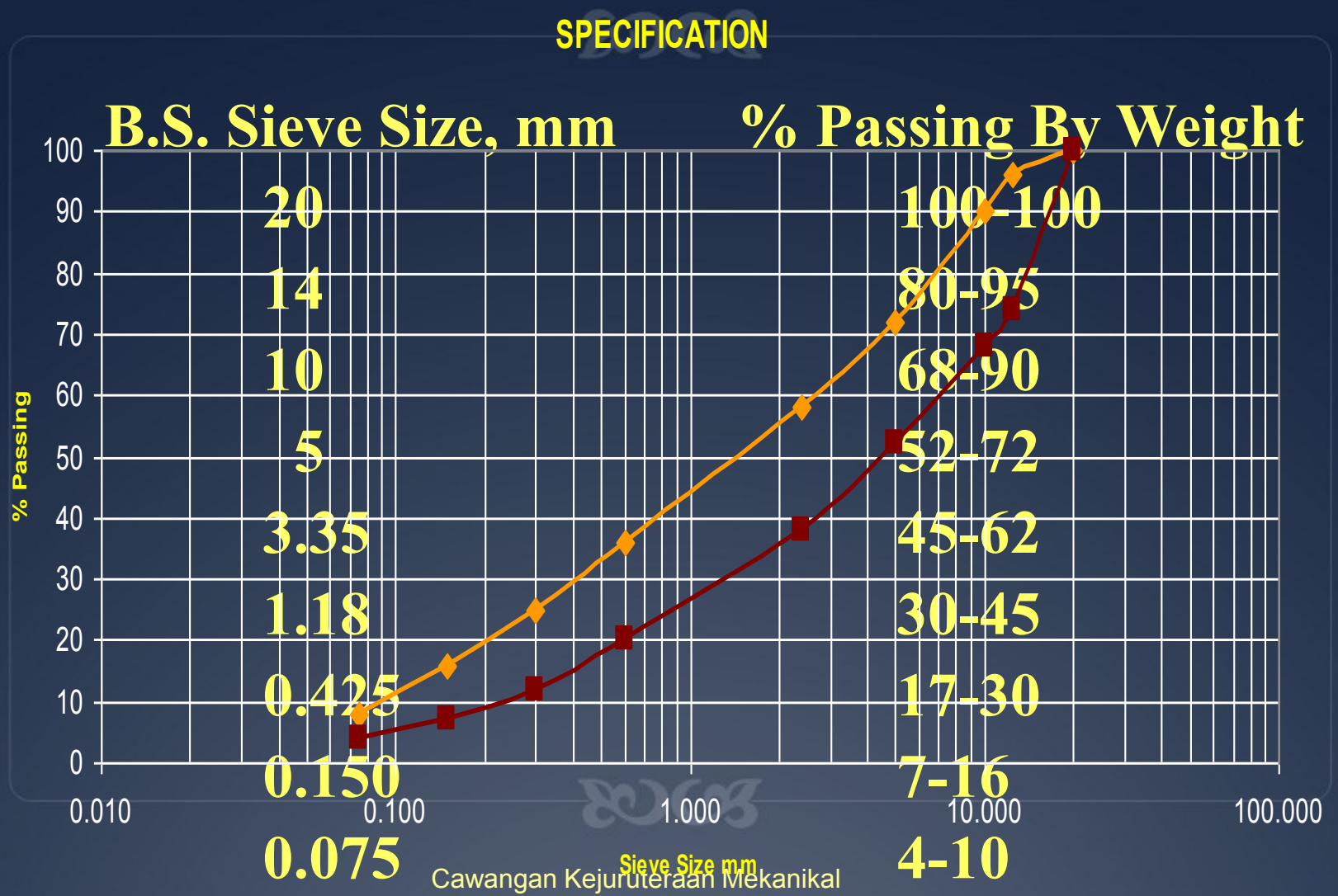
RESURFACING

Quality Control

Quality Control

- Sieve Analysis
- Marshall Test
- Mechanical Properties
- Coring

Gradation Limits For Asphaltic Concrete



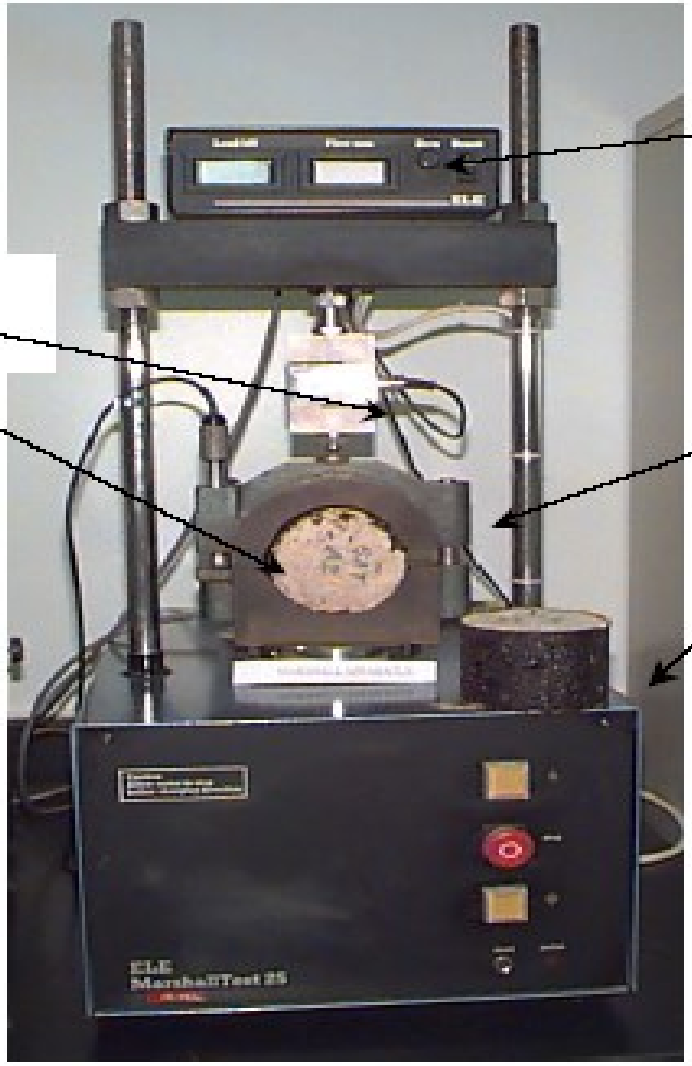


Figure 11.1 Marshall Stability & Flow Test Setup

Cawangan Kejuruteraan Mekanikal

Pollution

- Air Pollution
- Rivers And Water Ways
- Erosions

Noise

- Air Blast
- Vibration Not More Than 5 mm/s PV
- Sound Level Not More Than 120 dB

J K R K U A R I B U K I T P E N G G O R A K

LAPORAN BULANAN UNTUK BULAN FEBRUARI, 2000

PERBELANJAAN		JUMLAH HARGA	OVERHEAD (1)	WEIGHING (2)	STOCK AND LOAD (3)	BATU BLOK (4)	PRIMARY (5)
A. BATU BLOK DARI PEMBORONG		67,007.98	0.00	0.00	0.00	67,007.98	0.00
B. POL		26,740.86	613.11	0.00	1,035.85	79.67	1,600.00
C. PENYELENGGARAAN KUARI		16,161.00	0.00	0.00	0.00	3,426.00	0.00
D. PENYELENGGARAAN WOKSYOP		1,085.00	450.00	0.00	0.00	0.00	0.00
E. ELEKTRIK		15,503.22	620.13	155.03	0.00	576.72	2,013.87
F. AIR		370.70	370.70	0.00	0.00	0.00	0.00
G. TELEFON		606.15	606.15	0.00	0.00	0.00	0.00
H. BITUMEN & SIMEN (M t)	0.00	127,038.01	0.00	0.00	0.00	0.00	0.00
I. COLPAVE		4,839.60	0.00	0.00	0.00	0.00	0.00
J. ALAT GANTI		25,904.80	140.66	0.00	130.84	496.70	999.45
K. GAJI,LMASA & ELAUN (IMG)		41,677.96	12,025.99	629.68	2,123.99	534.90	754.68
L. GAJI,LMASA & ELAUN (STAFF)		18,695.12	14,380.30	1,098.54	0.00	0.00	0.00
M. PELBAGAI		0.00					
N. BAKI KEHADAPAN 2000		0.00					
O. JUMLAH		345,630.40	29,207.04	1,883.25	3,290.68	72,121.97	5,368.00
P. PERPECAHAN BAHAGIAN 1 KEPADA					RM	4,088.99	4,088.99
Q. PERPECAHAN BAHAGIAN 2 KEPADA					RM	263.66	263.66
R. PERPECAHAN BAHAGIAN 3 KEPADA					RM	460.70	460.70
S. PERPECAHAN SEMULA BELOK 6" - 9"	0.00 TAN METRIK				RM		
T. HARGA BATU DALAM PREMIX					RM		
U. JUMLAH HARGA BAHAGIAN					RM	76,935.31	10,181.33
V. PENGELUARAN					TAN METRIK	11,553.10	11,553.10
W. UNIT HARGA PENGELUARAN					RM	6.66	0.88

PERPECAHAN

BAHAGIAN	OVERHEAD %	OVERHEAD AMAUN	WEIGHING %	WEIGHING AMAUN	STOCK & LOAD %	STOCK & LOAD AMAUN
4	14.00%	4,088.99	14.00%	263.66	14.00%	460.70
5	14.00%	4,088.99	14.00%	263.66	14.00%	460.70
6	14.00%	4,088.99	14.00%	263.66	14.00%	460.70
7	14.00%	4,088.99	14.00%	263.66	14.00%	460.70
8	16.00%	4,673.13	16.00%	301.32	16.00%	526.51
9	14.00%	4,088.99	14.00%	263.66	14.00%	460.70
10	14.00%	4,088.99	14.00%	263.66	14.00%	460.70
JUMLAH	100.00%	29,207.04	100.00%	1,883.25	100.00%	3,290.68

UNIT HARGA PENGELUARAN (RM

BIL	BAHAN
1	BATU BLOK
2	BATU 4"
3	BATU PILIH
4	BATU 2"-1"
5	SISA KUARI
6	PREMIX

UNIT KOS PENGELUARAN (RM)

BIL	BAHAN	BULAN INI	KOS PURATA SEMASA

JUALAN (M TAN)

BULAN INI	JUMLAH SEMASA	BIL	JENIS BATU
		1	BATU BLOK

STOCK PILE BATU PILIHAN

M TON

Cawangan Kejuruteraan Mekanikal

Make Your Client Happy

A Happy Quarry Manager Improves Production


ANY QUESTIONS ?
3 6 2003