QA & QC In Concrete Construction

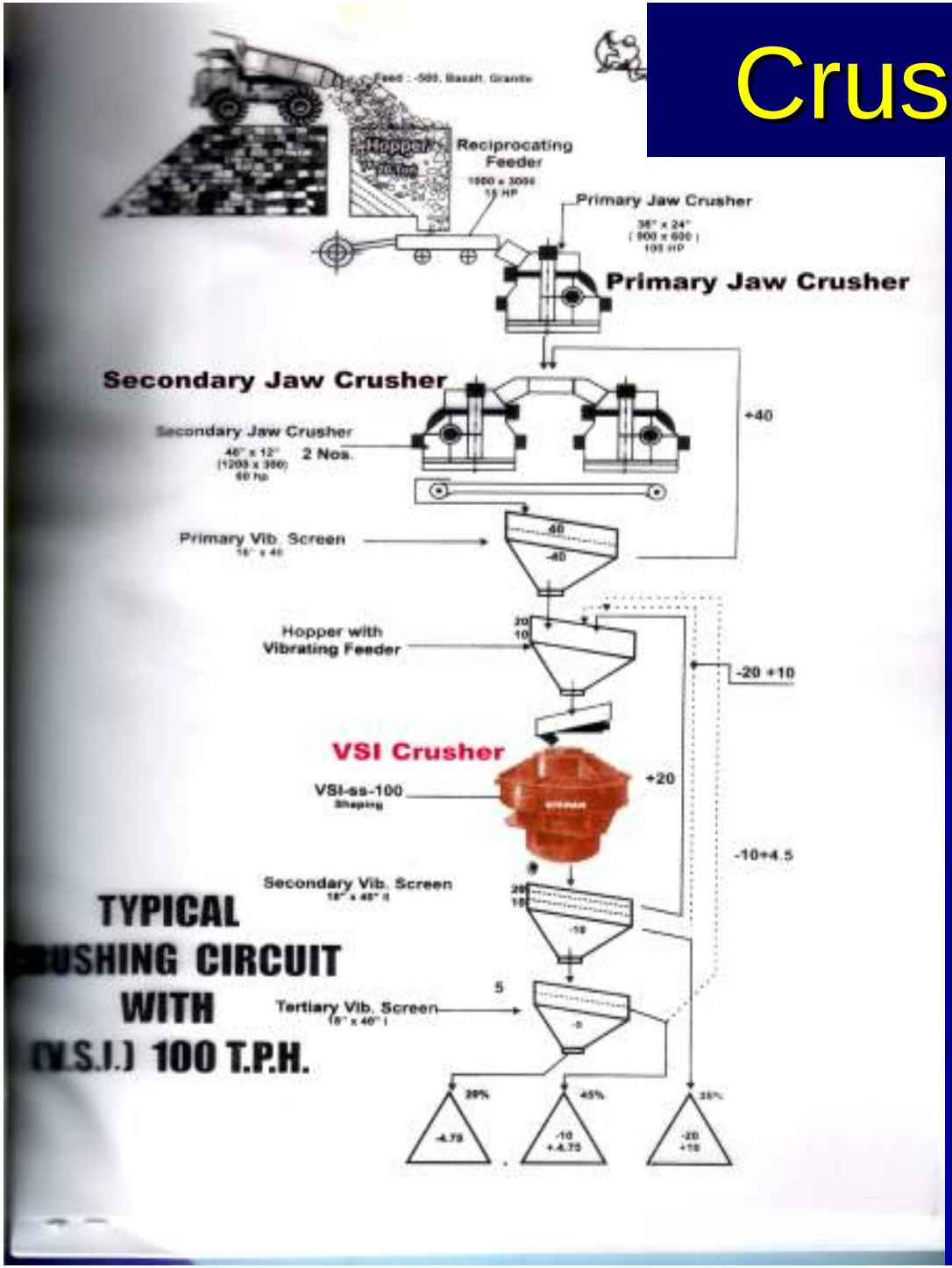
Mechanization In Concrete Construction

S A Reddi

Dy. MD (Retd.) Gammon India Ltd.

Concrete Material Processing Equipment

Crusher System

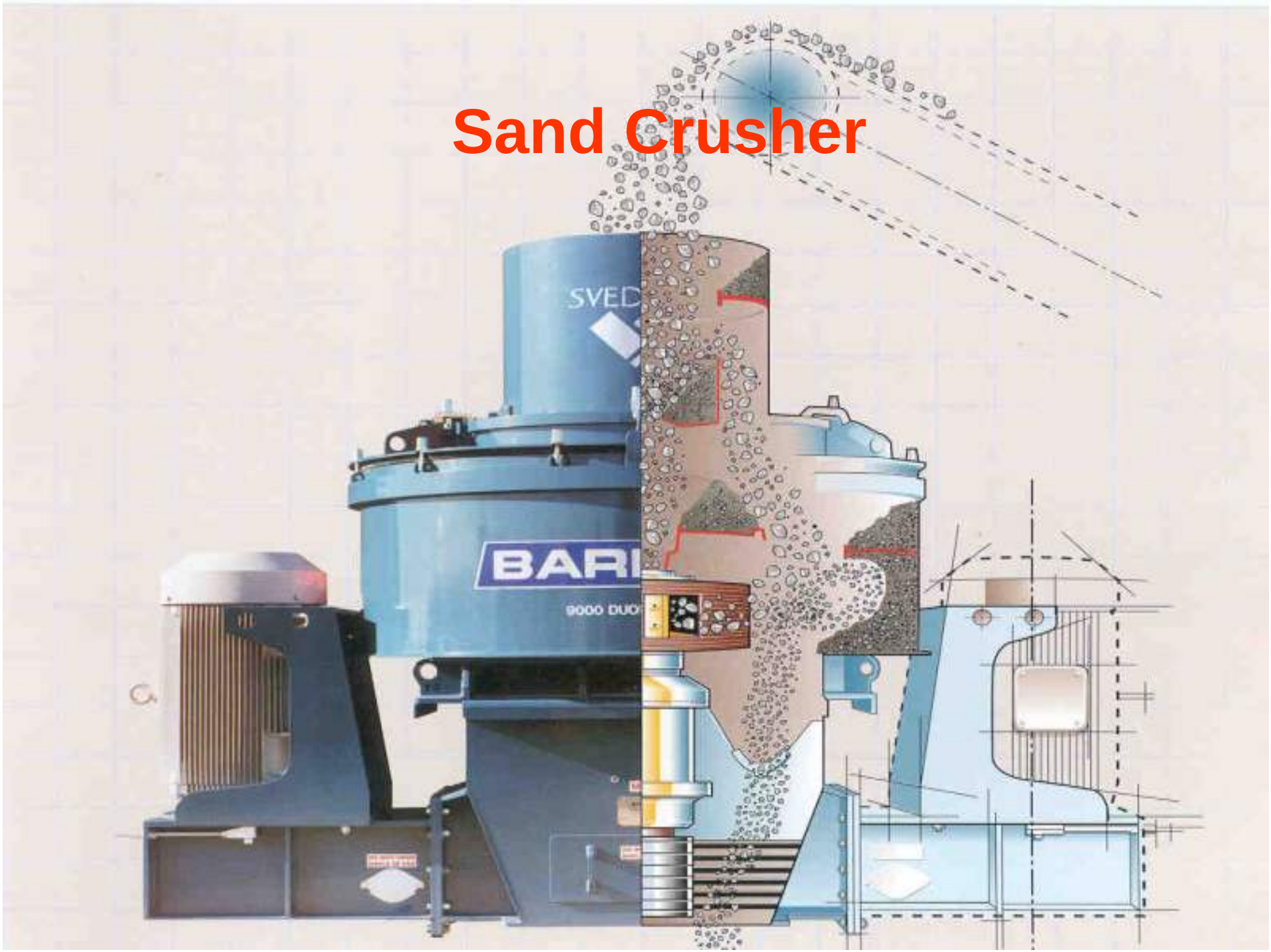


- Classification based on quality (descending)
  - Impact Crushers
  - New technology cone crushers
  - gyratory crushers
  - roll crushers
  - old technology cones
  - Jaw Crushers

Selective Screening and Re-circulating Load

- Selective screening commonly used in Europe. Performed by a split bottom deck on screen
- Material screened on slotted cloth to remove flaky particles. Flaky faction crushed again to improve particle shape & fill voids in the feed.
- Re-circulating load produces better-shaped product, converts non-usable material to usable
- Operating crusher at a larger setting reduces motor power , cutting a major operating cost.

Sand Crusher



Concrete Production Batching Plants

Concrete Construction Equipment Methods Statement

- Prepared in advance
- Quantum of work
- Construction time
- Equipment deployed
- Rated capacity
- Matching equipment
- Maintenance Sch
- Spares inventory
- Access Roads, Layout
- Manpower, Supervision
- Statutory obligations
- Insurance
- POL, maintenance crew
- Repairs, overhaul
- Site / Workshop
- Shifts vs Over time
- Calibration
- Owners approval

Concrete - Batching and Mixing

- **Batching tolerances:**
  - **Cement - 2%**
  - **Aggregates, water, admixtures - 3%**

- **Calibration of batching equipments:**
  - **Initially on installation at site**
  - **Periodically at monthly intervals**
  - **Admixture dispensers on daily basis**

Concrete - Batching and Mixing

Storage of aggregates: Bin bottoms paved. Bin dividers of wooden or concrete planks.

Storage of Cement: Cement store should be laid out close to the batching plant, with concrete floor and minimum number of ventilators. Provide Dust Extractors

The cement hopper should be fixed with top at not more than 0.5 m above floor. The hopper should have a 6 mm mesh screen permanently fitted to the top to avoid lumps.

Concrete - Batching and Mixing

Feeding cement to batching plant

The cement bags shall be emptied in to the hopper inside the cement store and fed to silo thro screw conveyor or cement pump.

Silo should be of standard size, water tight and fitted with air tight gaskets at all joints. A 2nd screw conveyor transfers cement to BP

Drawing should show relative positions of stores, silo, BP & also the elevations, max permitted angles for screw conveyors.

Truck Access to Cement Godown

Concrete - Batching and Mixing Checklist

- Bins marked with aggregate size
- Drainage of aggregate stocks
- Water tightness of silo
- Adequacy of water supply
- Trained operator
- Calibration of BP.
- Isolate electrical system, power supply
- Adequate stock of materials
- Arrange for wash-down at the end.

Concrete – Estimating Hourly Production Assuming Adequate Off-take Capacity

- Rated capacity - 30 m3/hr.
- Operating efficiency – E - 75%
- Mixer capacity - V - 0.5 m3
- Mixing time cycle - 1 minute
- No. of mixes per hr. - N - 60
- Hourly production Vx NxE -0.5 x 60 x 0.75 = 22.5 m^3/hr

Concrete - Batching and Mixing Foundation - BP

Obtain foundation drawings for the particular BP from the manufacturer as soon as orders finalized.

After finalising the location and layout of BP, the foundation shall be constructed immediately, pending arrival of BP.

Foundation should be ready at least two weeks before arrival of batching plant at site. Modular type BP takes only two days to erect.

Concrete - Batching and Mixing Output checks – BP

Maintain records of individual batches, time cycle of production & loading time for each truck mixer, plant down time, power failures, delay in arrival of truck mixers etc. Calculate hourly output every day from the records, compare with planned output.

Concreting operations shall be planned to start early morning. Approvals for starting concrete shall be obtained the previous day day.

Concrete on Site Batching Plant

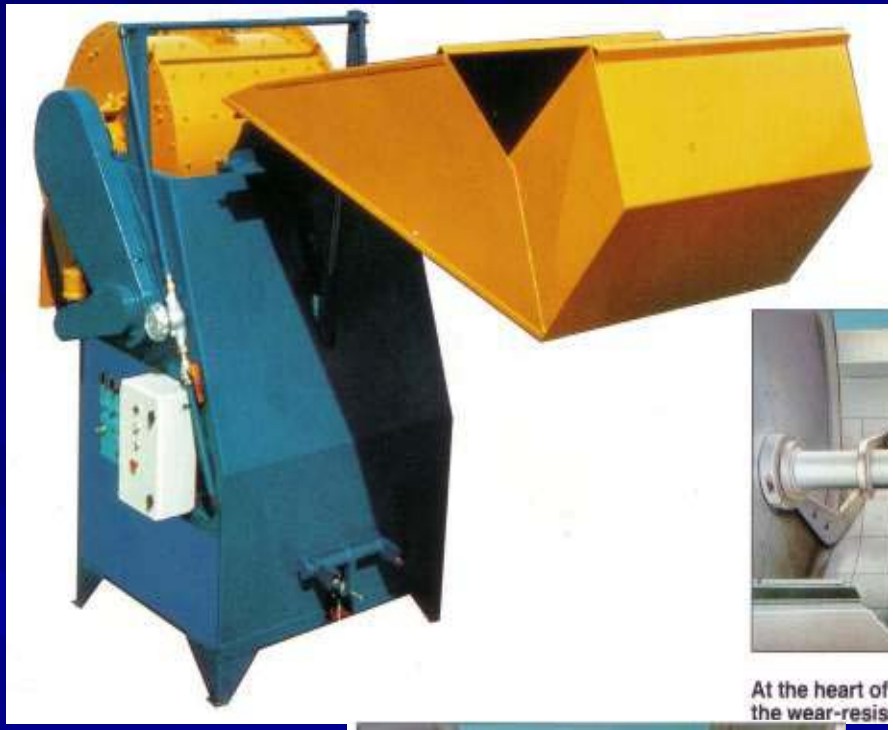
- Install batching plant close to the job site
- Every meter saved in concrete transport distance improves productivity
- Provide adequate water storage capacity
- Locate water storage facility adjacent to B/P
- Decide on generator capacity for batching plant

Batching Plant
Obligatory Components

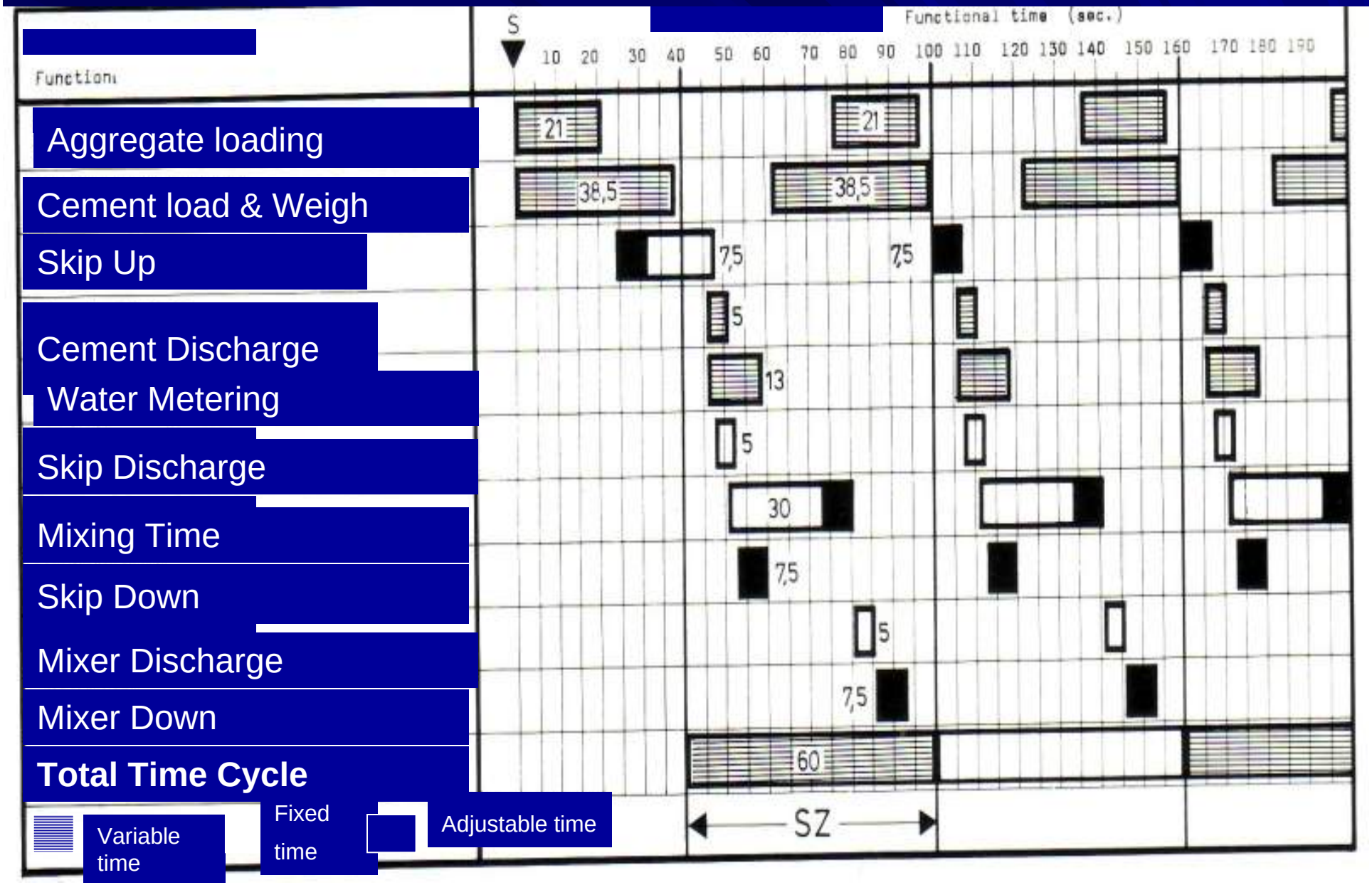
- Batching & mixing unit
- Cement silos
- Screw conveyors or equivalent system for cement feeding
- Admixture dispensers
- Moisture meters

Concrete Batching Plant
Mini Mobile Mixing System - 15 cum

- Twin spiral contra flow compulsory mixer
- Hydraulically driven
- Variable mixing speed for varying slump
- Electro hydraulic power pack, motor 19 KW
- Mixer capacity : 250 lit
- Concrete discharge by hydraulic tipping
- Discharge height : 1.3 m



Concrete BP Cycle Time Diagram



Bigger Capacity Concrete Batching Plants

Output m^3 / hr	45	60	85	105	120
Mixer (lit)	750	1000	1650	2000	
Power (KW)	53	60	104	118	
Discharge ht	4 m	4 m	4 m	4 m	
Weight	14.5 t	15 t			
5 or 6 compartment bins					
Automatic water / sand correction					

Concrete Batching Plant
Twin Shaft Mixers

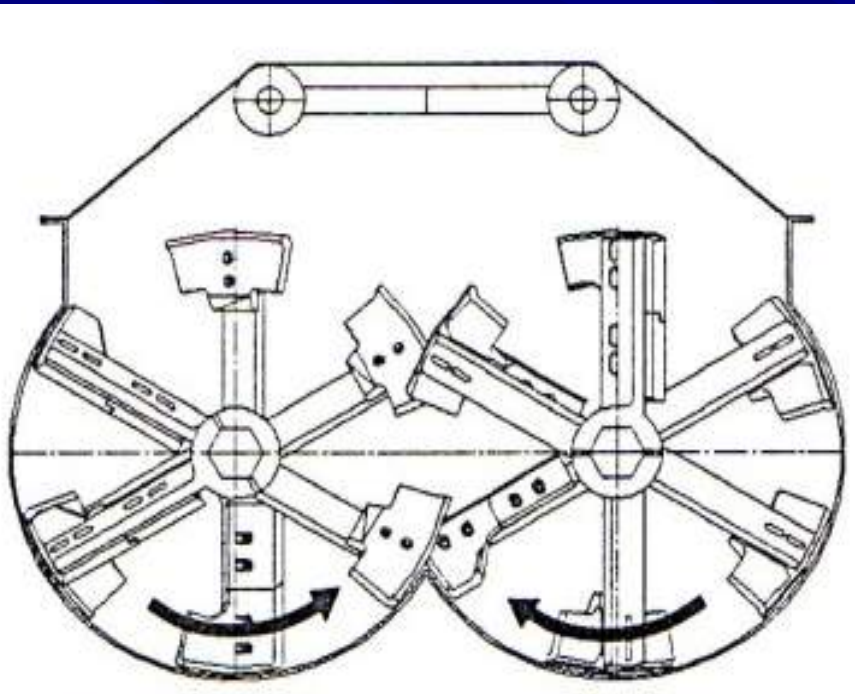
- 1 – 6 cum output capacity
- Mixes 0 – 200 mm slump concrete
- Automatic self lubricating system
- Variable arm positioning for different aggregates; 45^0 for fine grains, 90^0 for standard concrete and 180^0 for large size aggregates

Twin Shaft Mixer With CI Paddles, Anti-wear Tiles

variable arm positioning at 180^0

Stetter Twin Shaft Trough Mixer Direction of Rotation of Mixing Shafts

The synchronously rotating mixing shafts move in counter-rotation and the direction of rotation of both mixing shafts must be such that the mixing tools between both shafts run upward



Stationary Concrete Mixing Plant With Twin Shaft Mixers

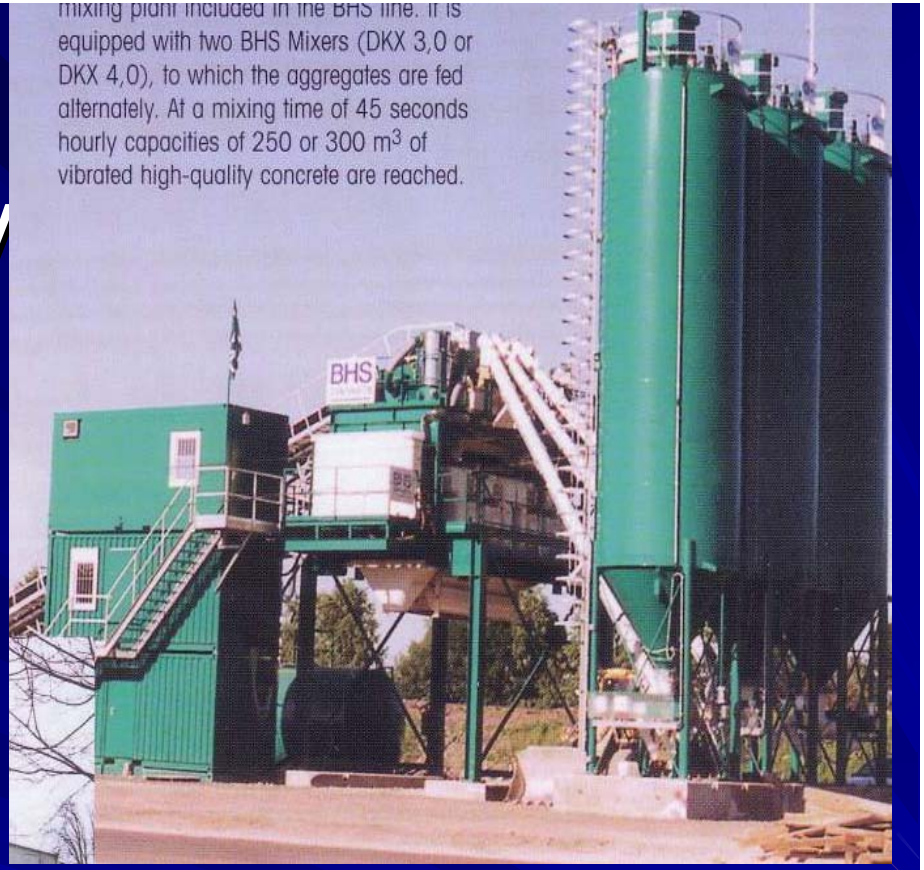
3 cum mixer, 120 cum / hr

Mobile Concrete Mixing Plant 120 cum / hr Capacity

- High level storage bins, of transportable container modules
- Rapid assembly on compacted ground, no foundation required
- Electric & pneumatic pre-assembled parts with plug connections

250 / 300 m^3 capacity

- Mobile mixing plant with two 3 or 4 m^3 mixers
- Aggregates fed alternately



- Capacity : 80 / 130 m^3
- Pre-assembled in containers, maximum width 3 m

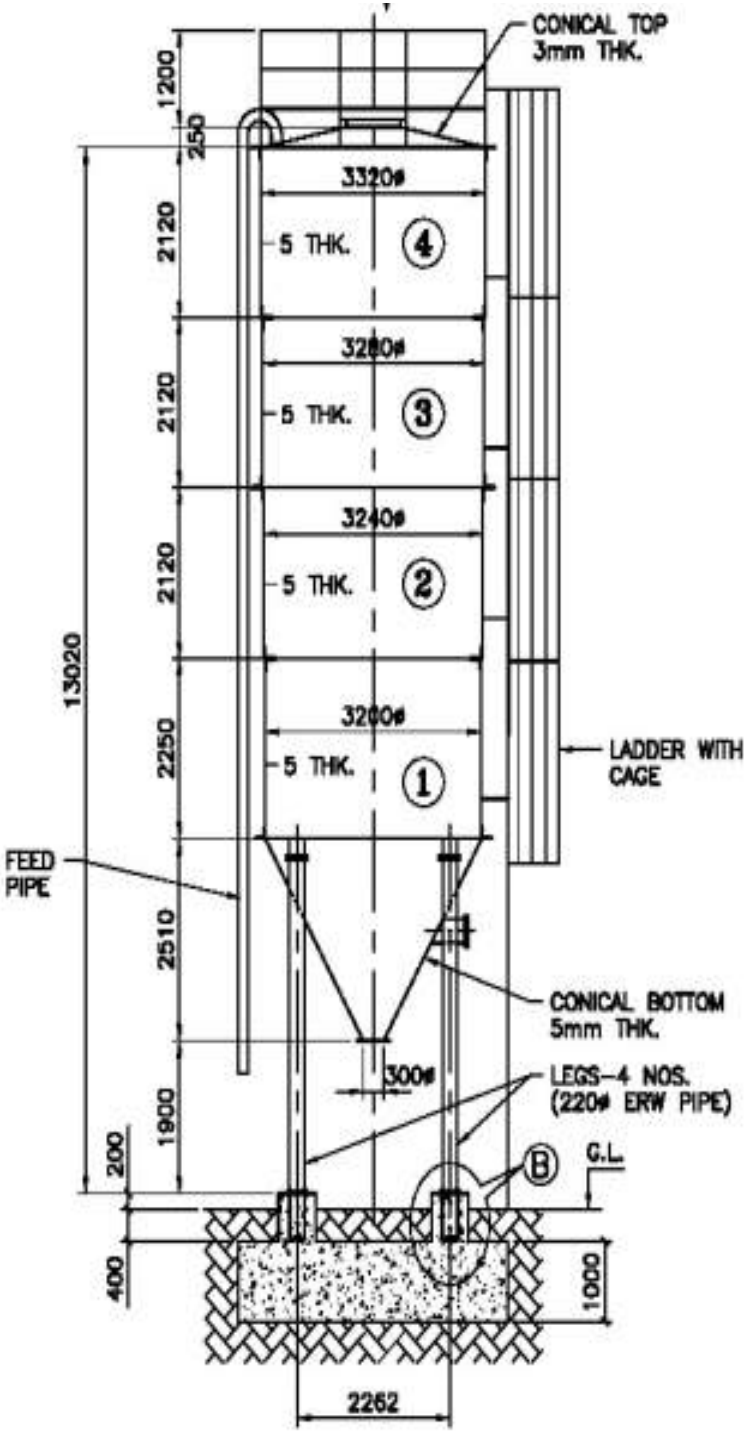
Mobile Mixing Plant, 200 m^3 capacity

Cement Silos

- Capacity range : 50 - 500 t
- Separate silos for different grades / types of cement and for flyash or GGBS
- Moisture proof, provided with de-aerator filters, vibrator pads, dust collector / exhauster
- Air injection system for silo discharge cone

100 t Cement Silo

- Telescopic segments with progressive reduced diameters downwards
- Facilitates transportation; segments telescoped into each other
- Rain water cannot get inside



Concrete Batching Plant Flyash Silo

- Separate color coded smaller silo for fly ash
- Special screw conveyors to handle fly ash
- Maximum moisture content in fly ash should not exceed 3 %; otherwise screws may get damaged

Smaller silo is for fly-ash, but not color coded

Concrete Batching Plant
Aggregate Bins

Inline Bins

Enclosed Star Bins

Star Bins

Concrete Batching Plant
Enclosed Star Bins (Round Silo)

Rotary Distribution Belt

Bins

Round Silo on Top of Batching Plant with 5-6 Bins

Concrete Batching Plant Feeding Round Bins

- Dumpers directly empty the aggregates into feed bin at ground level
- Inclined belt transports aggregates to the round silo’s distribution area
- A conveyor on a rotary distributor feeds the bins
- Aggregates fall into the weighing hopper under the compartments and then into a mixer

Concrete Batching Plants Feeding Inline bins

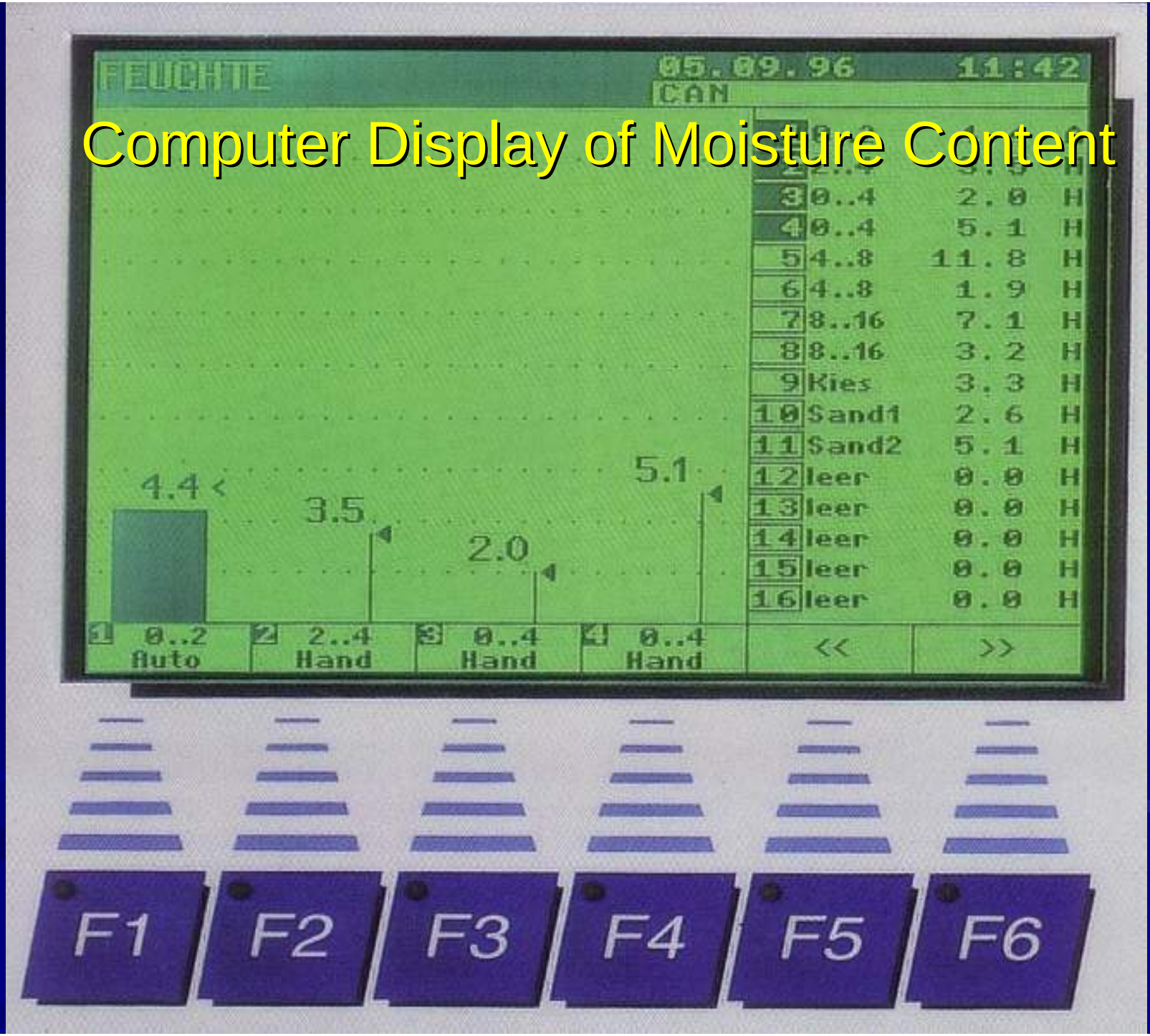
- By dumpers on ramp
- By loaders on ramp
- By radial slewing belt conveyor; inline bins positioned directly over weigh hopper; weighed material discharged via inclined belt conveyor
- Receiving hoppers capacities : 10 / 20 / 30 t

Batching Plant

Moisture in Sand Measurement, Correction

- Set consist of measuring probe and indicator
- Probe : an oscillator & measuring condenser
- Indicator shows sand moisture measurement which will be input into a correction computer or into an automatic water – sand corrector
- Based on amount of sand programmed and the sand moisture measured, the unit calculates the moisture; allowed for by automatically reducing the amount of water and increasing sand

Computer Display of Moisture Content



Batching Plants
Checking Slump in the Mixer

- A slump control device can be fitted to the BP
- Device includes a micro computer control system for controlling the concrete slump
- The system itself makes decisions and takes measures for optimizing the controlling operation
- The micro computer utilizes an integrated contactless keyboard and digital indicators, to program and display data for at least 8 mixes

Batching Plant
Mixer Mind Electronic Software

- Checks slump continuously by monitoring power consumption and adjusts slump required
- Sensors (on the mixer, connected to control cabin) monitor temperature, pressure, condition of motors, gear boxes & lubricating system
- Alarm goes off if preset value exceeded
- Service timers pre-warn maintenance reqd Reduces maintenance time & cost, prolongs life
- Used at Kaiga Atomic Power Project,Karnataka

80 cum SIMEM B/P @ Kaiga Mixer Mind

- The mixer mind is an electronic check control system for concrete mixers of batching plants
- Helps the operator in maintaining the mixer, as it monitors the functioning of main components
- Checks continuously the power consumption and slump level
- Several sensors monitor the temperature, pressure and maintenance of the motors, gear boxes and the automatic lubricating system

80 cum SIMEM B/P @ Kaiga Mixer Mind

- The sensors are placed on the mixer and connected to an electronic control board inside the control cabin so that operator can see if the mixer is functioning properly
- An alarm goes off whenever a certain preset minimum or maximum value is exceeded
- The Mixer Mind has three service timers that indicate when maintenance work is to be done
- Reduces maintenance time & cost, prolongs life

Batching Plant
Moisture Measuring device

- An “intelligent” moisture sensor calculates aggregate moisture level during batching. A microprocessor is fitted for fault compensation
- Sensors are positioned for online moisture measurement in sand, connected back to the display unit in the operator’s cabin by a cable
- Used in bins / silos with bottom opening gates / vibratory feeders / belt feeder / conveyor belt

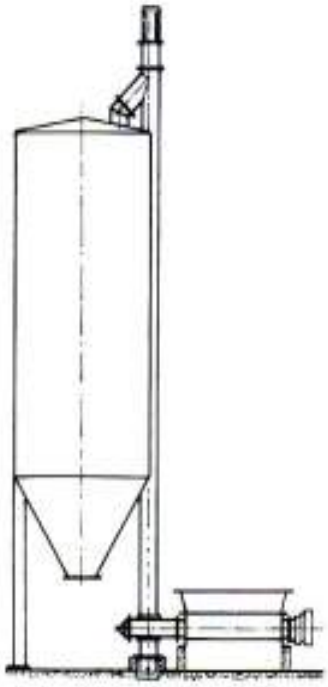
Cement Silos Loading Systems

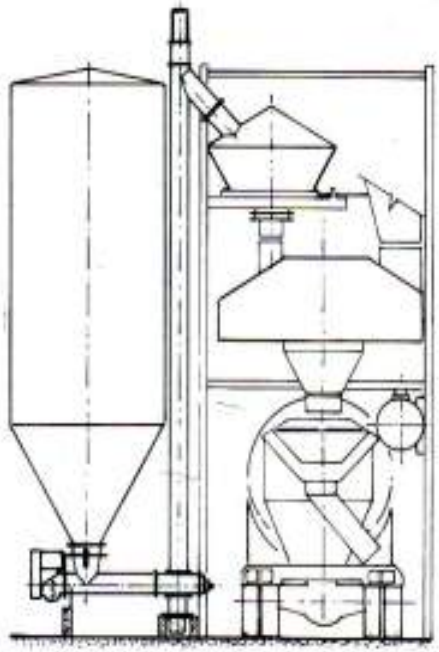
- Screw conveyors
- Bucket conveyors
- Cement pumps
- Dense phase pneumatic conveyors
- Direct feeding by cement bulkers

Screw Conveyors

Vertical

Inclined

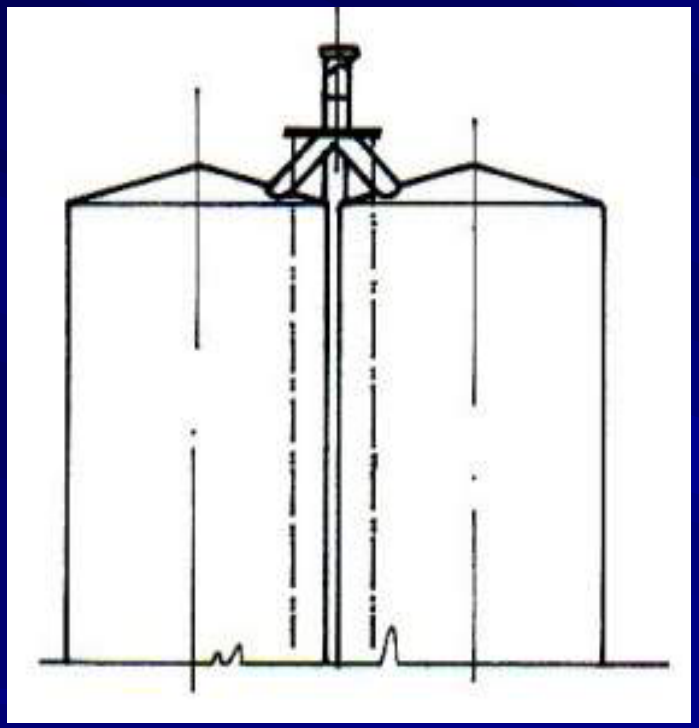




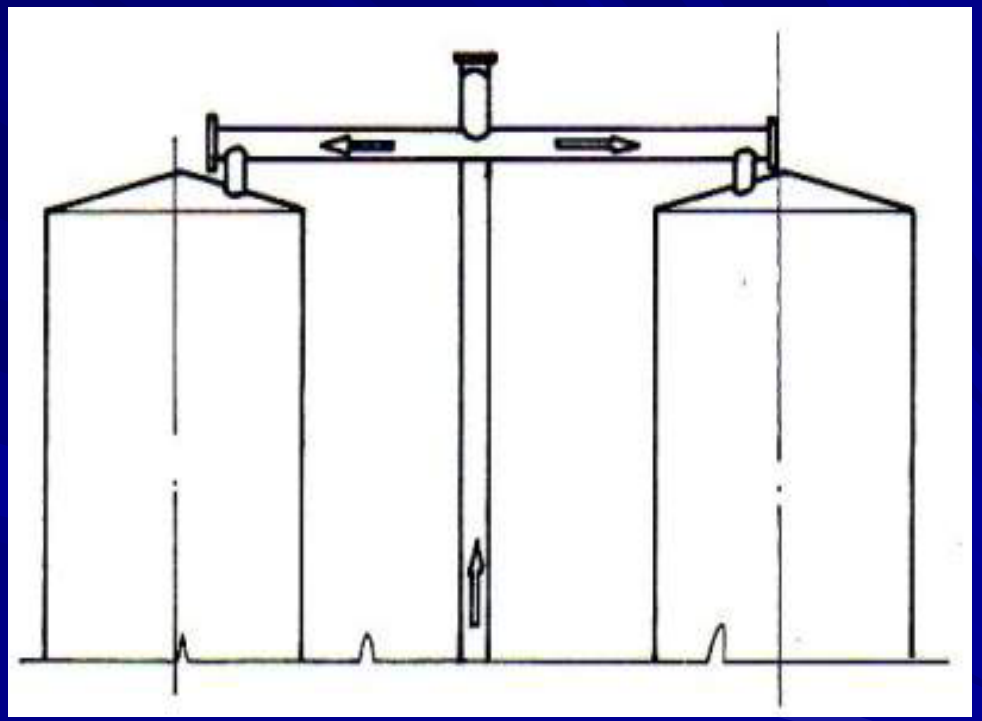
Manual Feed

Silo to Batch Plant Feed

Vertical Screw Conveyors Filling Two Silos

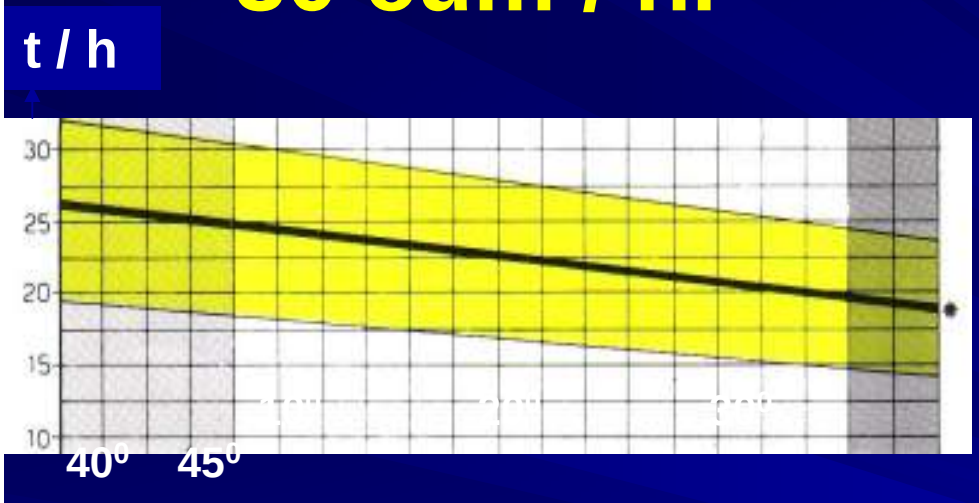


With diverter valve

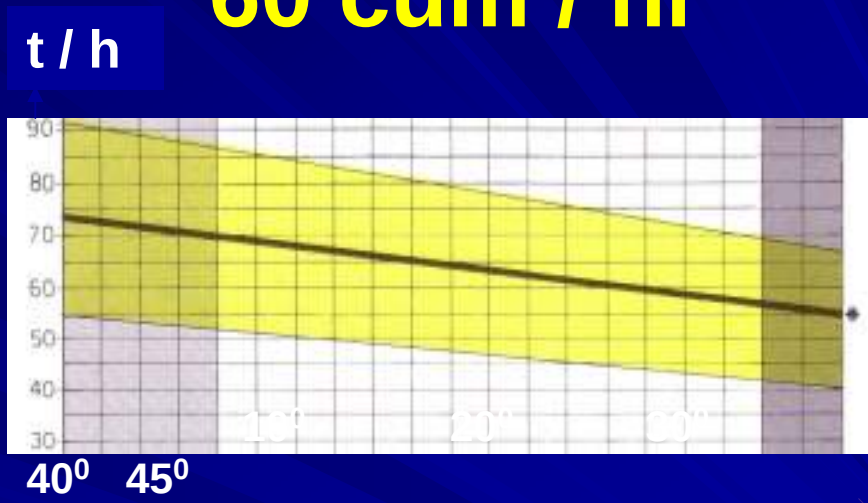


Screw Conveyors for Batch Plant

30 cum / hr



60 cum / hr



Diameter 168 mm

Motor 7.5 kW

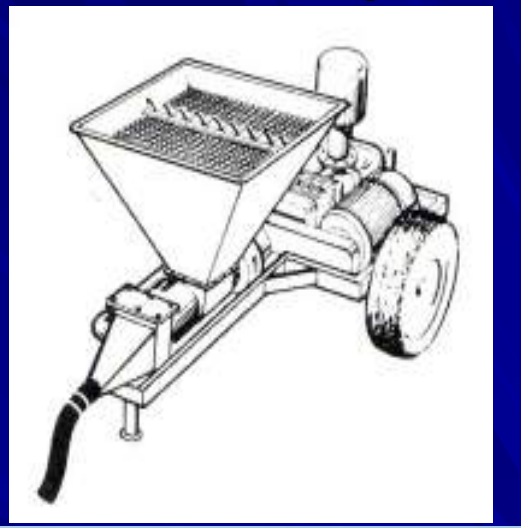
Capacity 20 – 25 tph

depending on inclination

Silo Loading Systems

Dilute Phase Conveying- Cement Pump

- Capacity 10 / 18 / 25 t / hr
- Conveying distance vert / horiz : 20 m + 20 m
- Power 34 / 44 / 60 KW
- Hopper content 180 / 300 / 300 kg
- Available in stationary or mobile version



Cement Pump - Advantages

- No assembly foundation required
- Can feed, empty and transfer
- Mobile unit; can be used on several units
- Equipped with device for tearing open bags

Disadvantages :

- Increased capital cost (Rs 15 lacs) compared to screw conveyor (Rs 3 lacs)
- Increased power consumption (45 KW) compared o screw conveyor (8 – 10 KW)

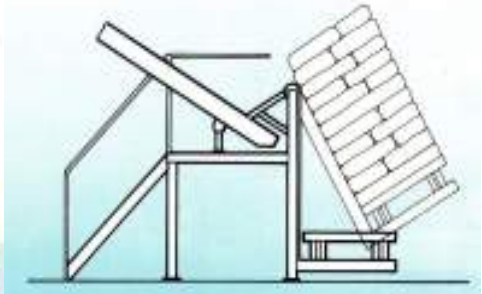
Automatic Bag Splitters

- A belt conveyor feeds bags into inlet port
- The bags dropped on to a spiral screw; ripped open through a scissor effect between the screw and trough; opened bags dropped into a revolving screen; cement falls through a spring mesh into collecting hopper
- Empty bags dropped into a built-in compactor, pushed into polythene hose container which is periodically unbound and cut

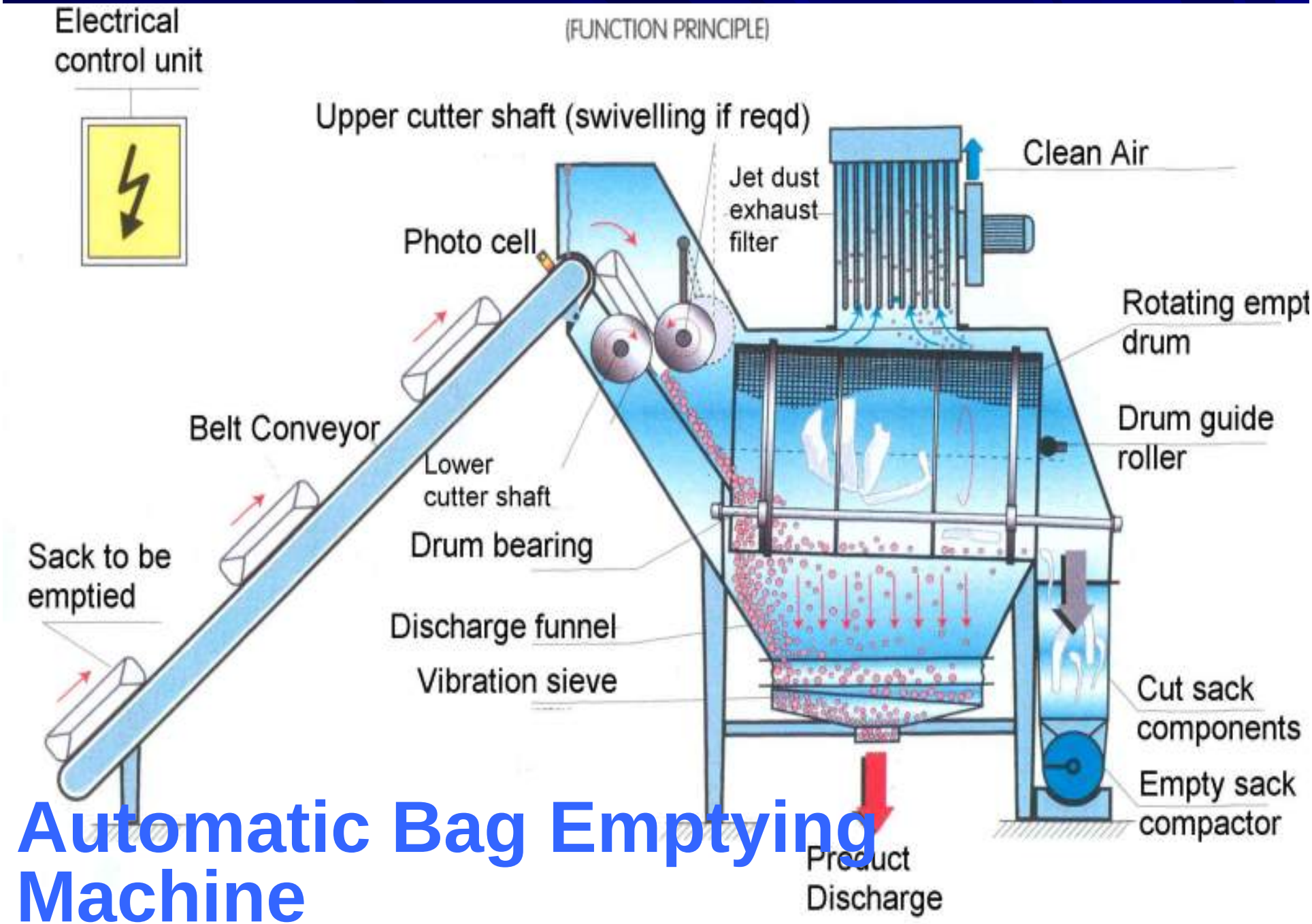
Telschig
Automatic Bag Splitters

General view

General view



Loading bags



Automatic Bag Emptying Machine

Cement Silos Loading Systems
Dilute Phase Conveying- Cement Pump

- Used for emptying bags manually and pneumatic conveying of cement at sites
- Used for
  - charging cement storage silos
  - emptying storage silos
  - charging cement bulkers
  - filling working silos from storage silos

  Built-in-bag cutter strip enables opening the bag and emptying

Feeding by Cement Bulkers

- 40 t cement bulker discharging into silo
- Bulker fitted with compressed air pump
- Cement discharged @ 1 t / min
- Typical capacities – 10 / 20 / 40 t

Batching plant Control Systems

- Program Logic Control (PLC) for automatic operation, using operator software; 99 recipes & 20 materials managed; records cement, aggregates, water & admixtures usage & stock
- Mixing stage displayed on backlit LCD monitor
- Scale values displayed digitally
- Generates delivery notes via a printer

Batching Plant for Scattered Bridges

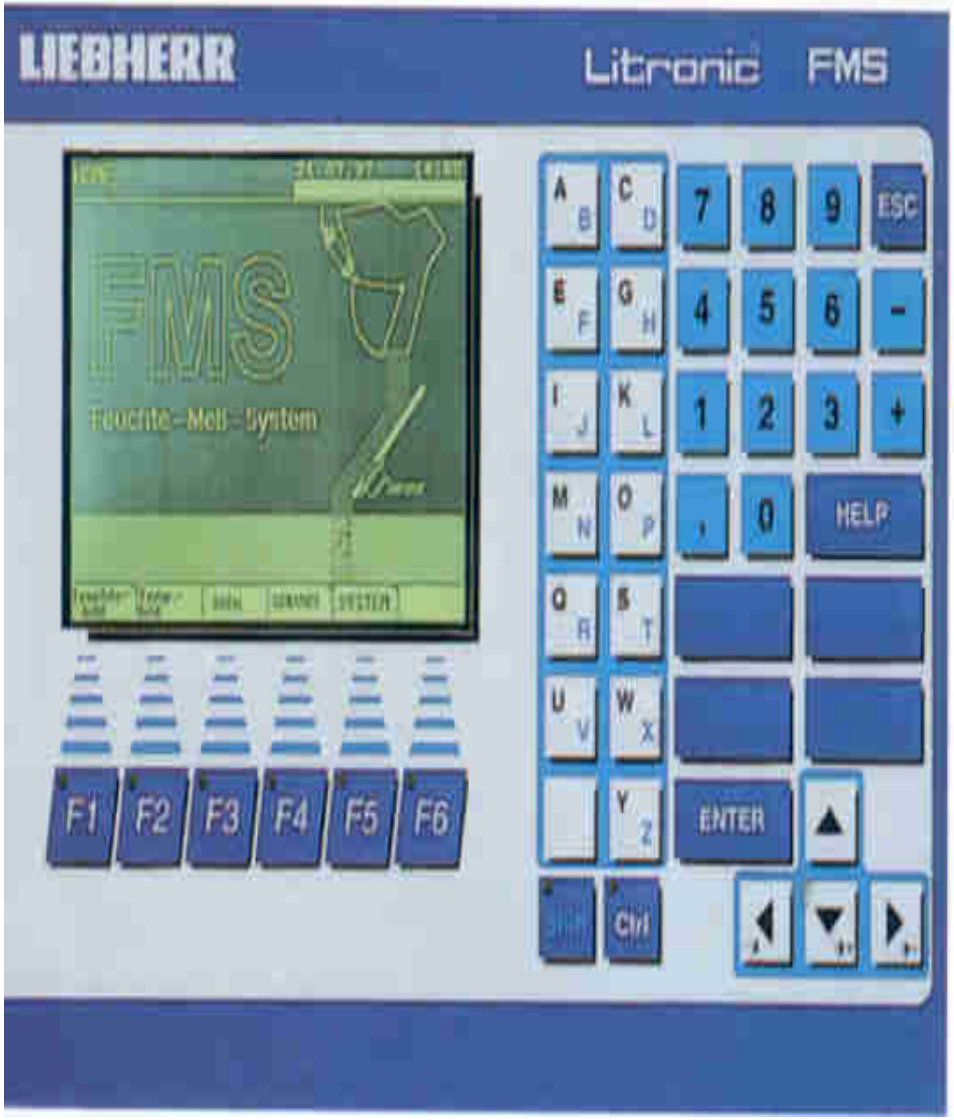
- In Nepal KM bridges (23 nos) spread over 80 km, a mobile Batching Plant was successfully used.

A standard batching plant was mounted on trailer

- Unit hauled, relocated at the next bridge without dismantling the batching plant. Only the cement, aggregate bins to be

Admixture Dispensing pump for B/P

Moisture Meter



Transporting,Placing, Compaction & Curing of Concrete

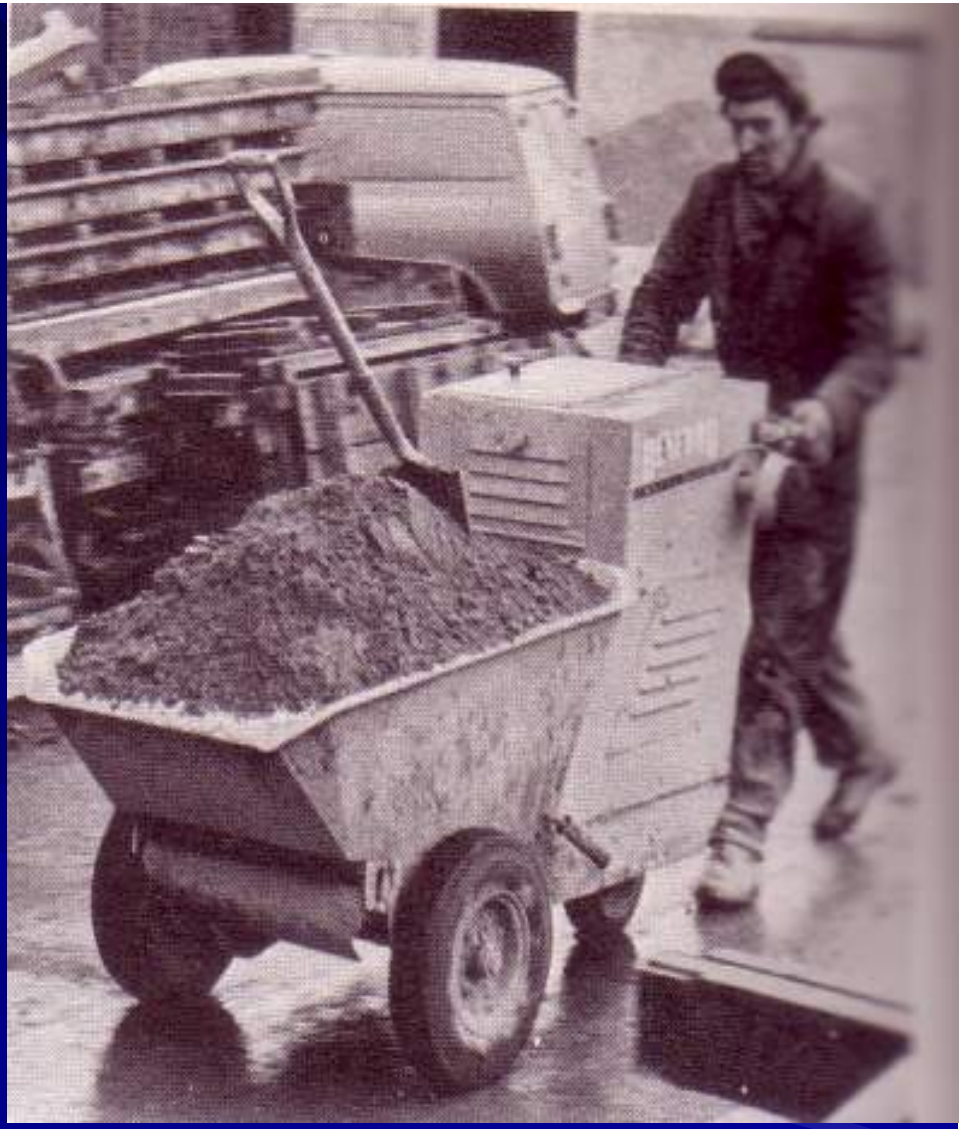
Concrete Transportation Options

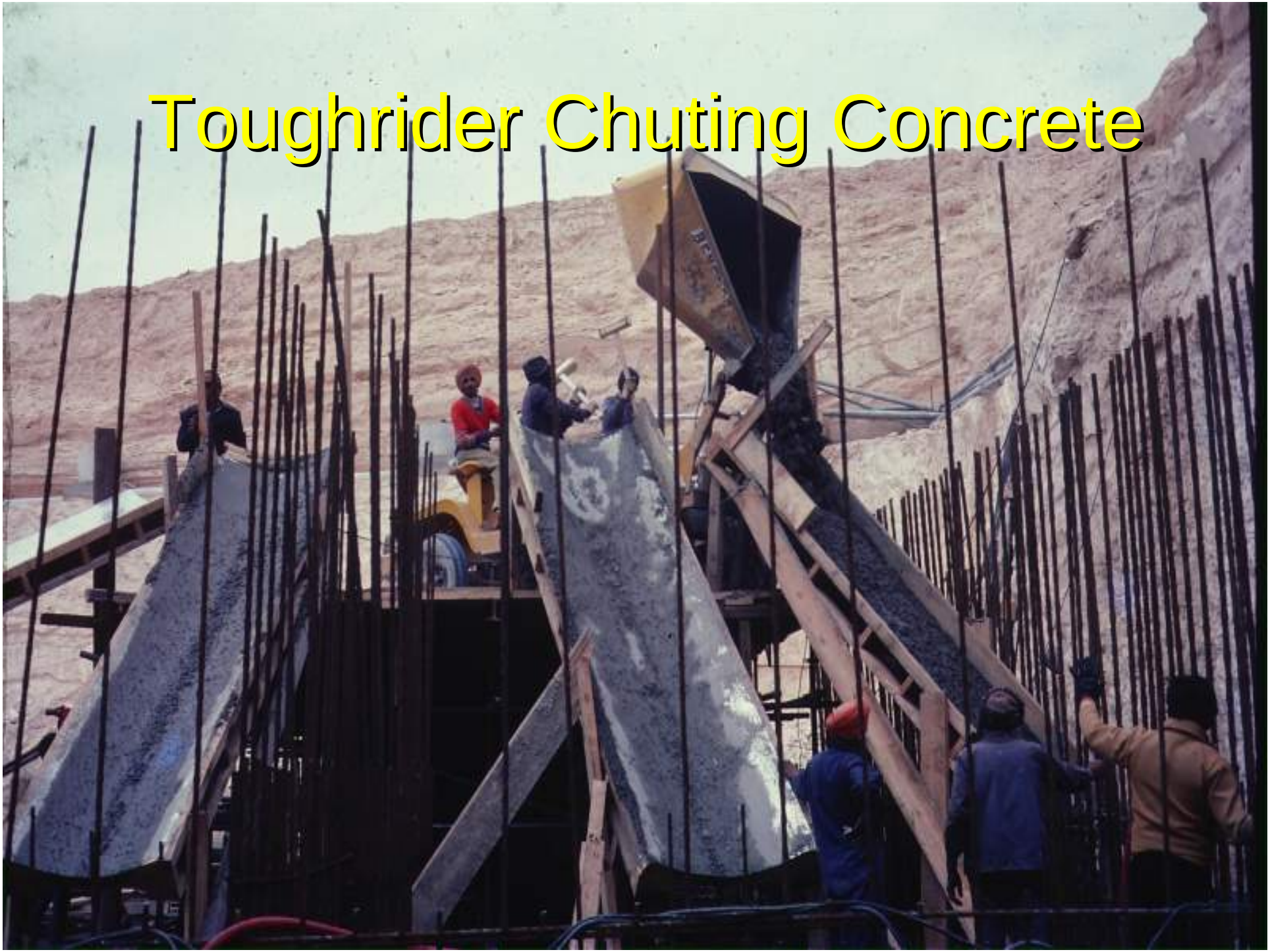
- Head load using pans
- Wheel barrows- manual / mechanized, Chutes
- Though Riders, Dumpers , Tippers, Forklifts
- Truck Mixers
- Hoists, Cranes, Tower Cranes with Buckets
- Concrete Pumps, Pneumatic placers
- Belt Conveyors
- Cable ways

Concrete Handling Equipment for small

Conc Placement Wheel Barrows

Manual




Toughrider Chuting Concrete

Concrete Placement
Direct Discharge by Truck Mixer

- 2 extension chutes provided with truck mixer as standard

Concrete Placement
Direct Chuting for Pile Concreting

23 HP Concrete Dumper 4-wheel drive Capacity - 0.8 m^3

- Swivel: 180^o
- Discharge height: 1.7 m
- Width: 1.7 m
- Rate of discharge control by hydraulic rams operated by PTO from the engine
- Tipping to either side or forward, as required

Truck Mounted Concrete Transporter

- Capacity : 2-3 cum
- Provided with hydraulically driven remix blades across the mouth
- Extension chutes allow direct concrete placement

Truck mixer 6 m^3 capacity

Powered by truck Engine, transmitted by variable axial piston pump to hydraulic motor. Low price, high payload due to low dead wt

Disadvantage : Truck engine runs all the time !


Stetter

Truck Mixer 6 cum Capacity Powered by Separate Engine

- Mixer drum driven by an air cooled diesel engine mounted on an anti-vibration support

Truck Mixer

- Capacity range : 4, 6, 8, 10, 12 m^3 mixed concrete
- Mounted on 3 or 4 axle chassis truck / semi-trailer
- In India 6 cum truck mixer most popular; in Europe 8 or 9 cum mixer on 4 axle chassis offer the greatest possible economy
- Mixer driven by direct PTO from the truck engine or by a separate engine mounted behind the cab
-


7129
CESCO
VULCAN
7142
7142
CESCO
VULCAN

Truck Mixer Cum Concrete Pump And Placer Boom

Truck Mixer Cum Concrete Pump

- Transports concrete like a common truck mixer. And - on the construction site - it pumps and places the material like a truck mounted concrete pump - Ideal for small and average-sized construction sites
- Driven and operated by one person
- Truck mixer, pump and placing boom as a compact unit

Pumping Concrete Fed By Two Truck Mixers

Pumping Concrete Flexible End Hose

Plastering Machines

Delivery rate	25 l/ min
Delivery pressure	40 bar
Delivery distance	up to 40 m
Delivery height	up to 15 m
Weight	160 kg

Available for delivery distance upto 300m, height upto 100m and delivery rate upto 120 l / min

Tower Cranes

Tower Cranes
Basic Types

- Static tower - static base
  - rail mounted
  - climbing cranes
- Slewing tower - truck mounted
  - rail mounted
  - crawler mounted
  - wheel mounted
- Self erecting tower cranes

Top Slewing Tower Cranes

- Have fixed towers and a swing circle mounted at the top, allowing only the jib, tower top and operator cabin to rotate
- Setting up and dismantling requires more time, is more complicated and costlier; erection requires the assistance of the other equipments, but the crane can reach extreme heights
- Suitable for high rise buildings on jobs requiring the crane for longer duration

Bottom slewing tower cranes

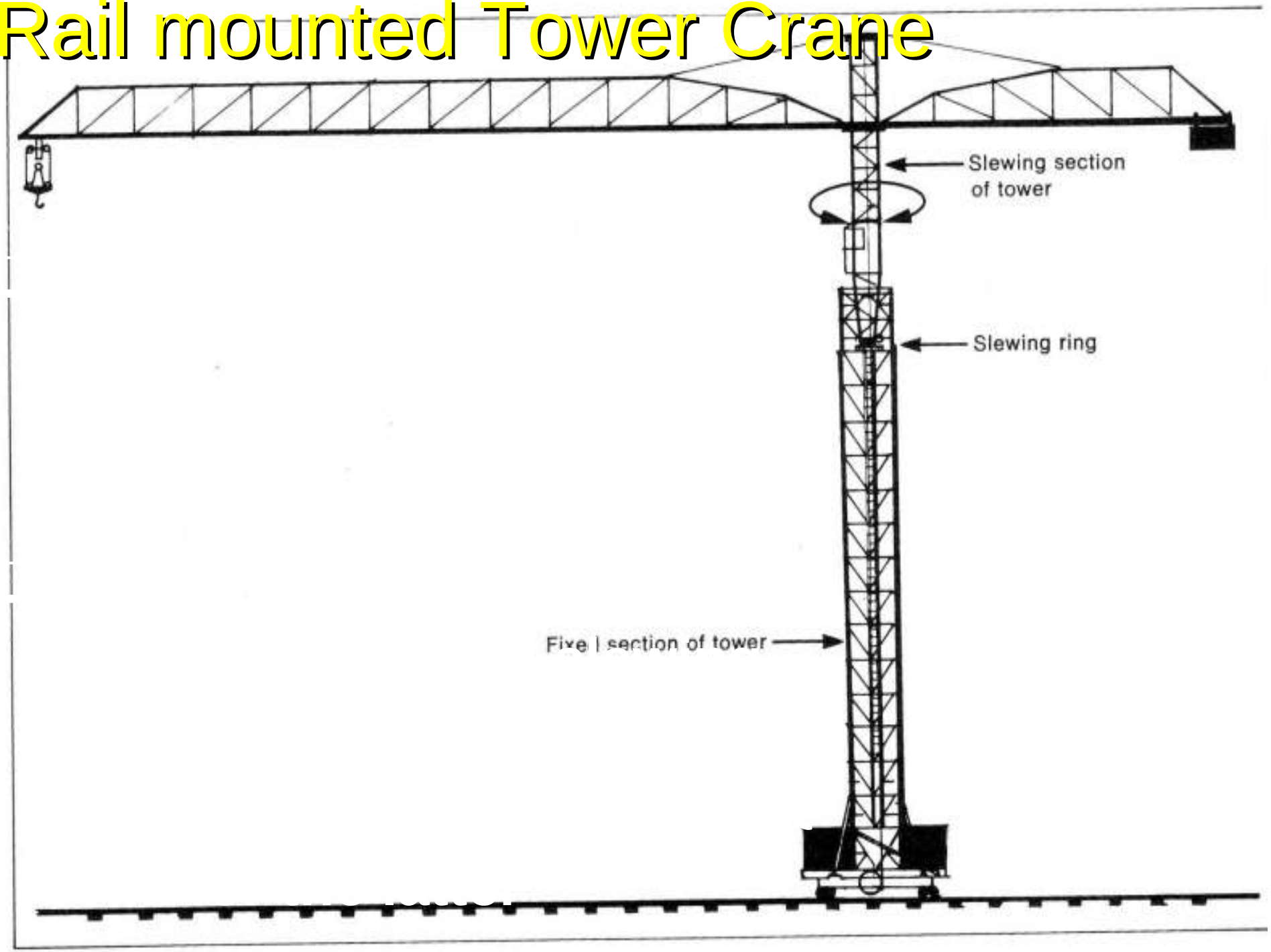
- have the swing circle located at the base, and both the tower and jib assembly rotate relative to the base
- Cranes essentially erect themselves using their own motors in a relatively short, simple procedure
- This is achieved at the expense of service height
- Because of revolving base, the tower can not be braced to a permanent structure

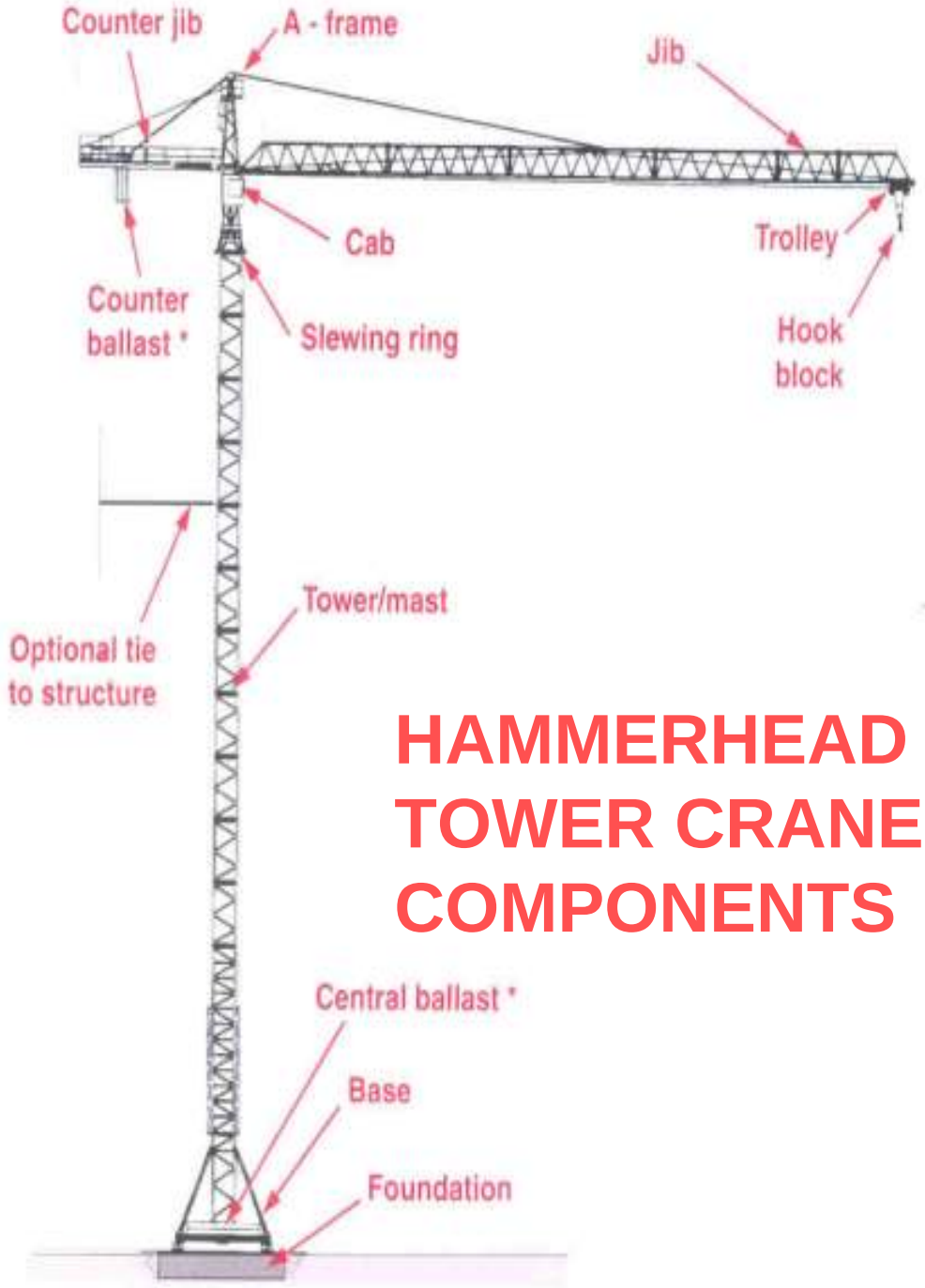
Tower Cranes
Static Base – Static Tower

- No base carriage required
- Tower bottom section concreted to a foundation block; special base mast sections are provided
- Cranes can be ordered with or without base carriages, are capable of use as rail mounted or static base
- Purchasing without a base carriage saves capital expenditure; concrete foundation is a recurring expenditure, more expensive

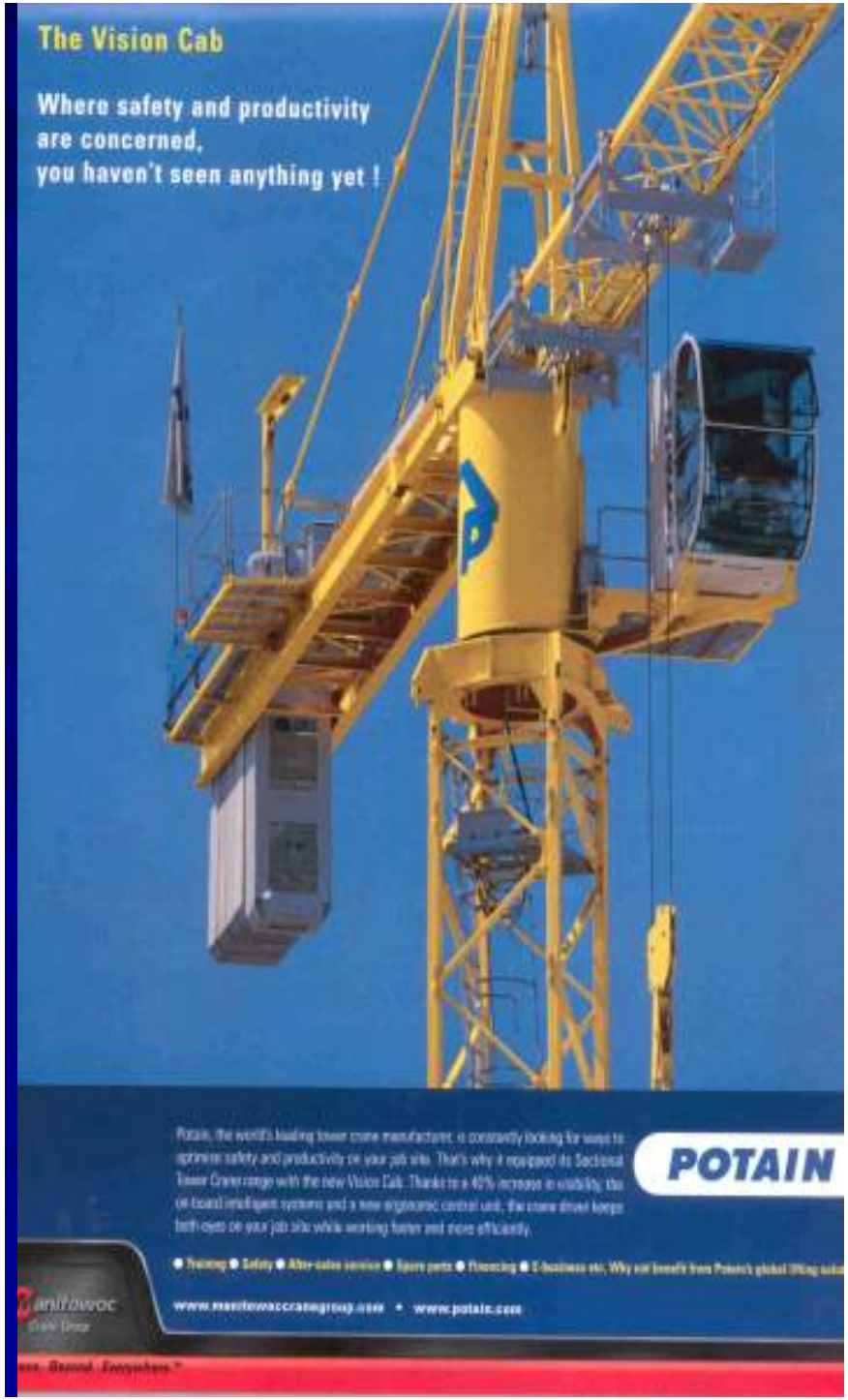
Tower Cranes
Jib Types

Rail mounted Tower Crane

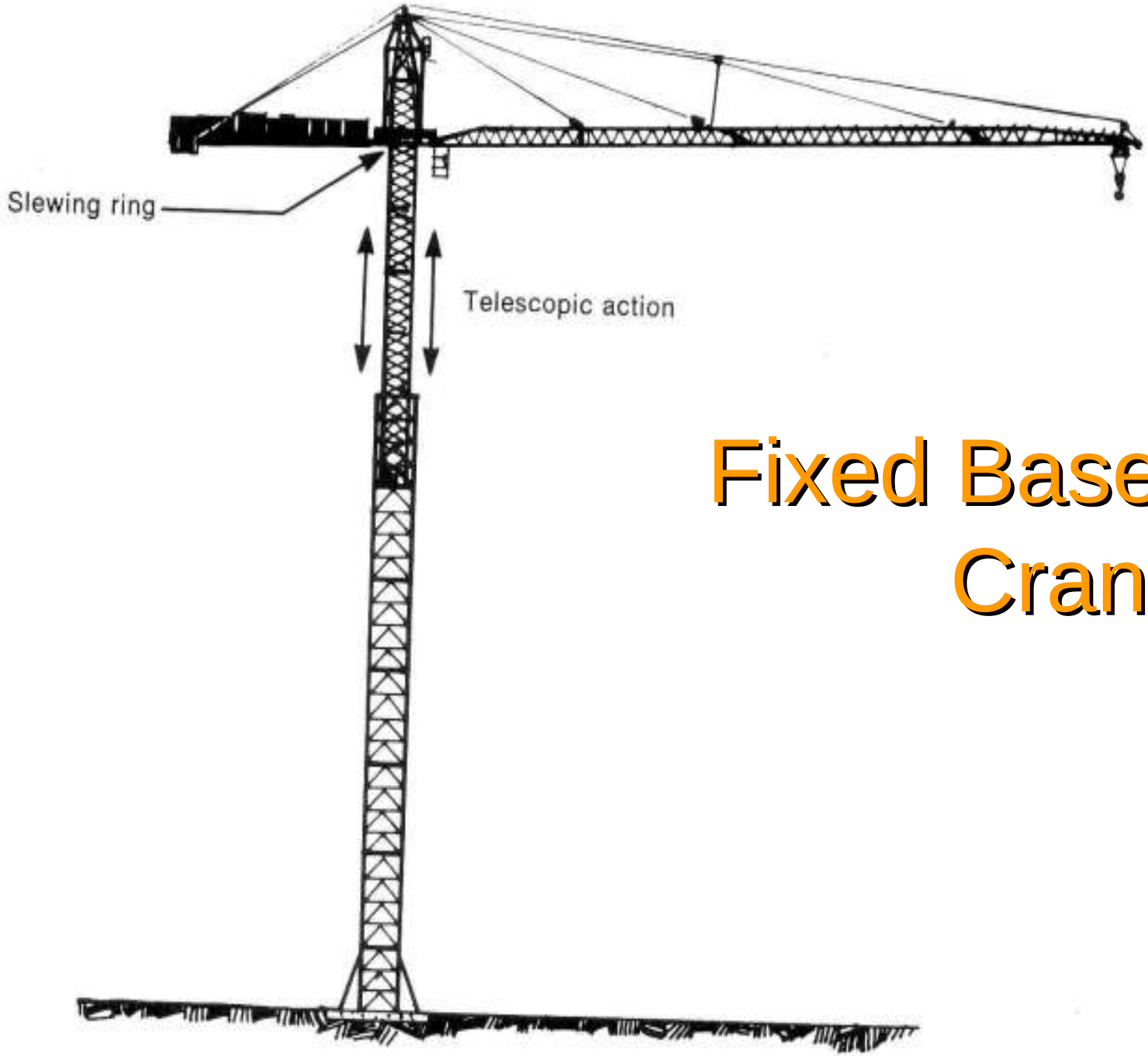




HAMMERHEAD TOWER CRANE COMPONENTS



Flat Top Tower Crane



Fixed Base Tower Crane

Climbing Tower Crane

- Operates from within the structure & is supported by it; as the structure grows the crane is lifted to a higher level and supported by more recently constructed sections
- Initially erected on a static base foundation; height of mast about 20 m
- Construction start around crane; progressively two structural collars assembled two floors apart
- Tower lifted using jacks

Climbing Tower Crane Suitable for Tall Structures

- Saves excessive mast height and tie-in cost
- Dismantling charges are usually higher; these cranes are not self dismantling
- Dismantled at the roof level & lowered over the side of the building to the ground Will not occupy space outside the structure, but being within, may hinder operations internally
- Usually installed in lift shafts; operating height limited only by rope drum capacity, power

Types of Tower Cranes
Climbing-Frame Tower Cranes

- Supported by the floors of the building that it is being used to construct
- Reactions of both the weight of crane and loads lifted are transmitted to host structure
- Crane has short tower because it moves vertically as construction progresses
- Climbing movement is done incrementally; work interrupted during climbing

Climbing-Frame Tower Cranes

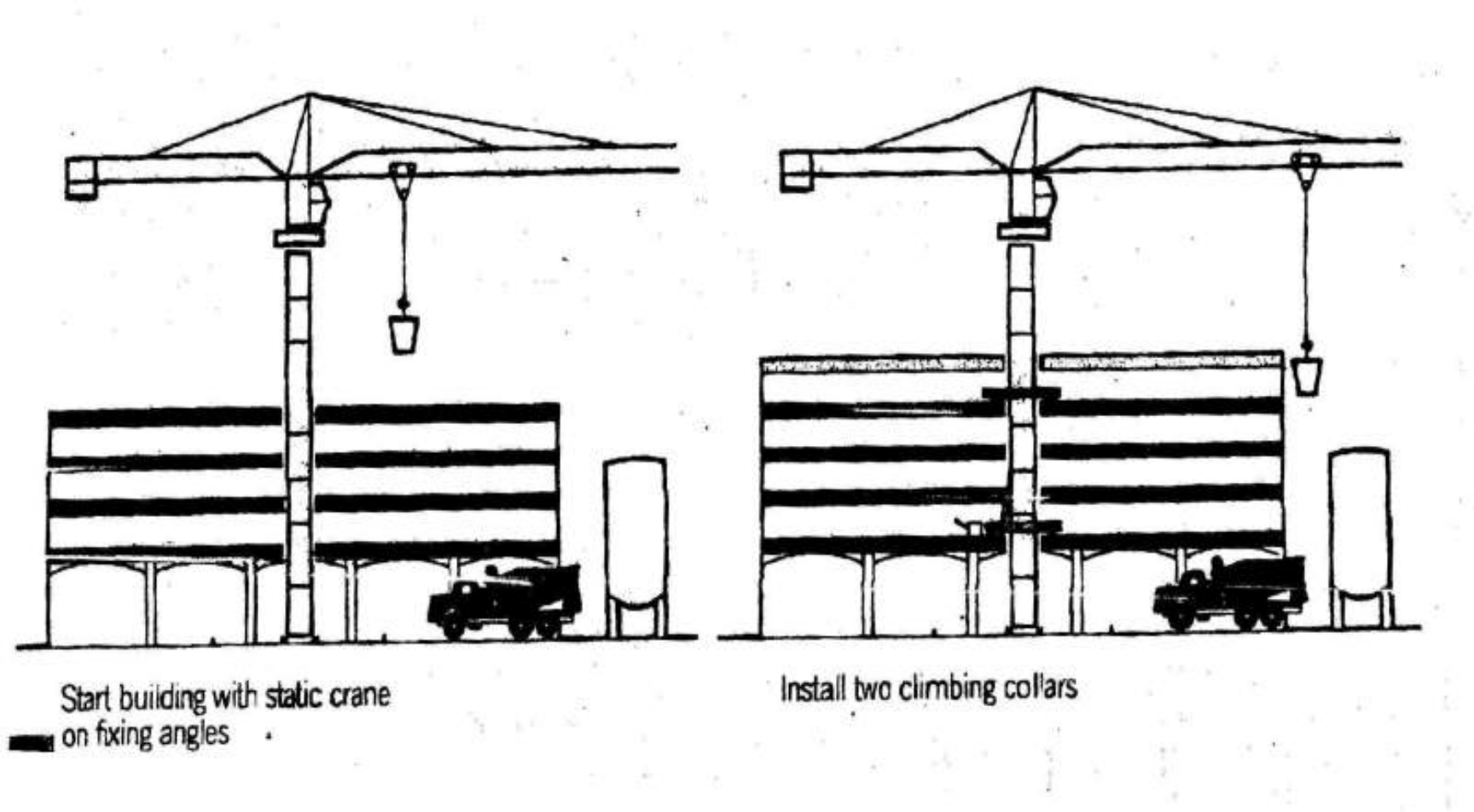
- Vertical movement of climbing crane is by hydraulically activated rams and latching
- Initially the crane is mounted on a fixed base, as the work progresses, it is transferred to the climbing frame mounted on the structure
- Crane Removal by mobile crane or derrick. Because of the heights involved and physical interference of completed structure, dismantling operation must be carefully planned

Climbing Luffing Tower Crane at Taipei Tower

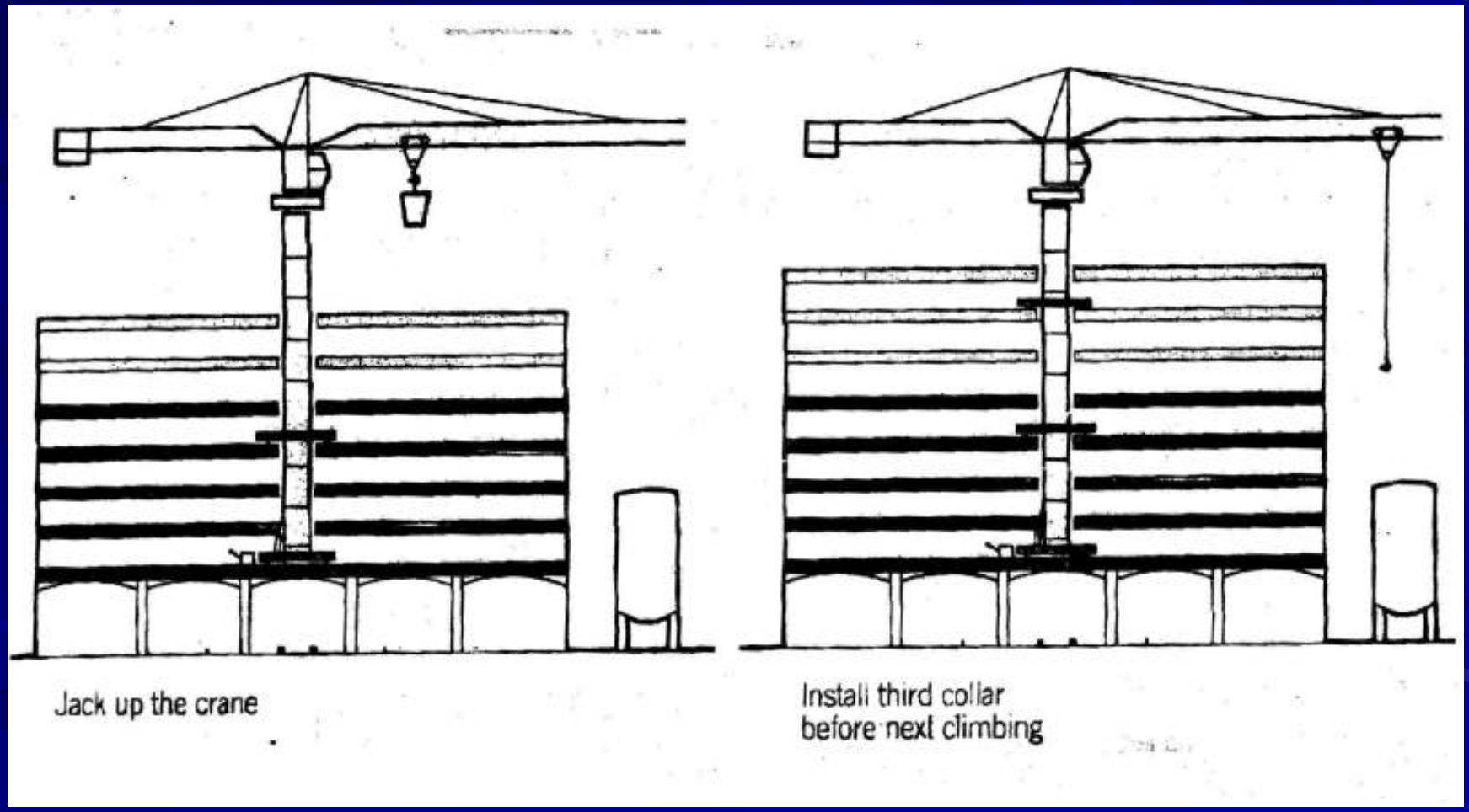
Climbing Tower Cranes Usage

- Used when building structure is high, side area is limited and the structure itself is capable of supporting the crane.
- Height of the crane can be extended by means of climbing ladders attached to the frames as the height of the structure increases
- Cranes are initially mounted on fixed bases and later transferred to climbing frames and ladders

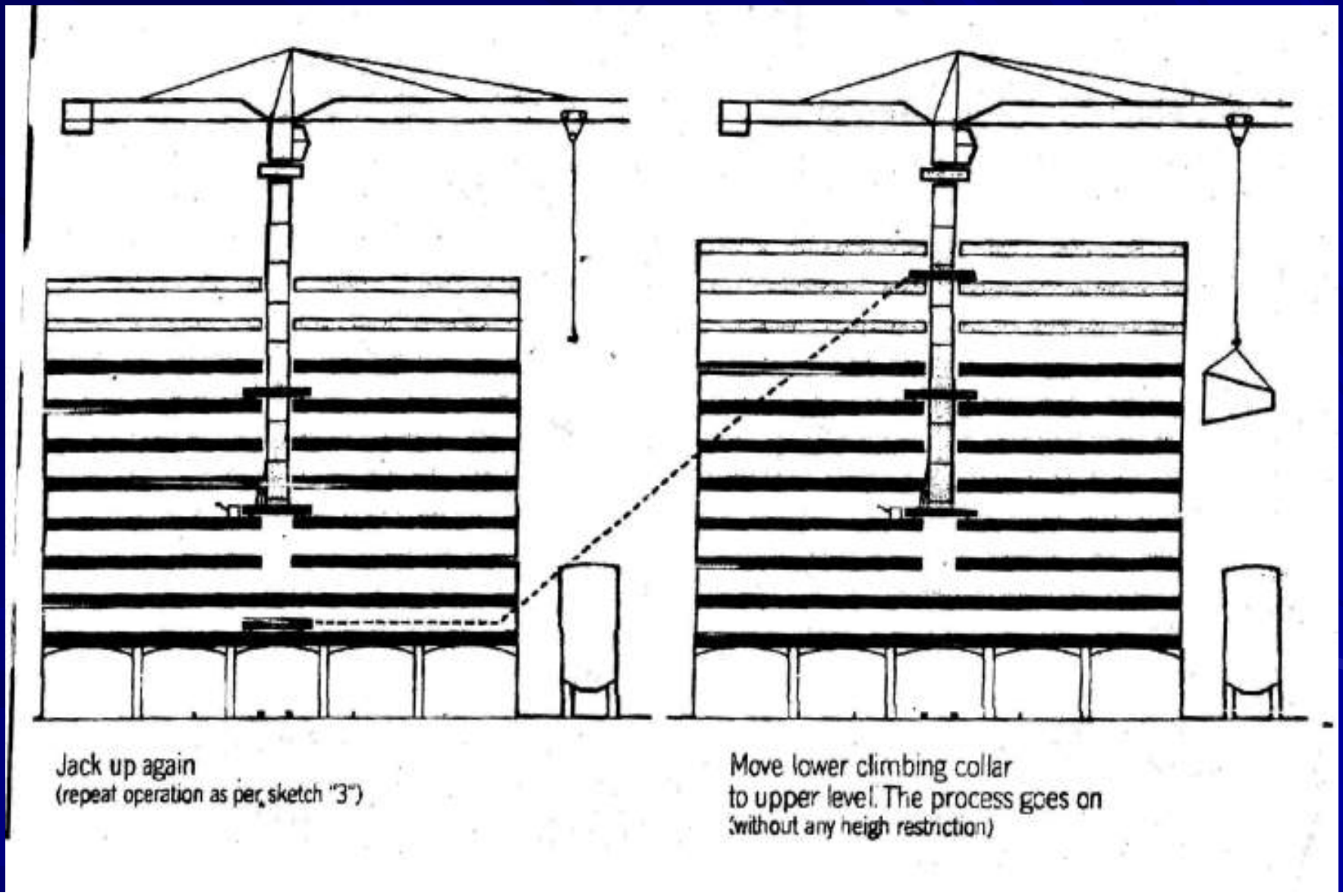
Climbing Crane Configuration-1



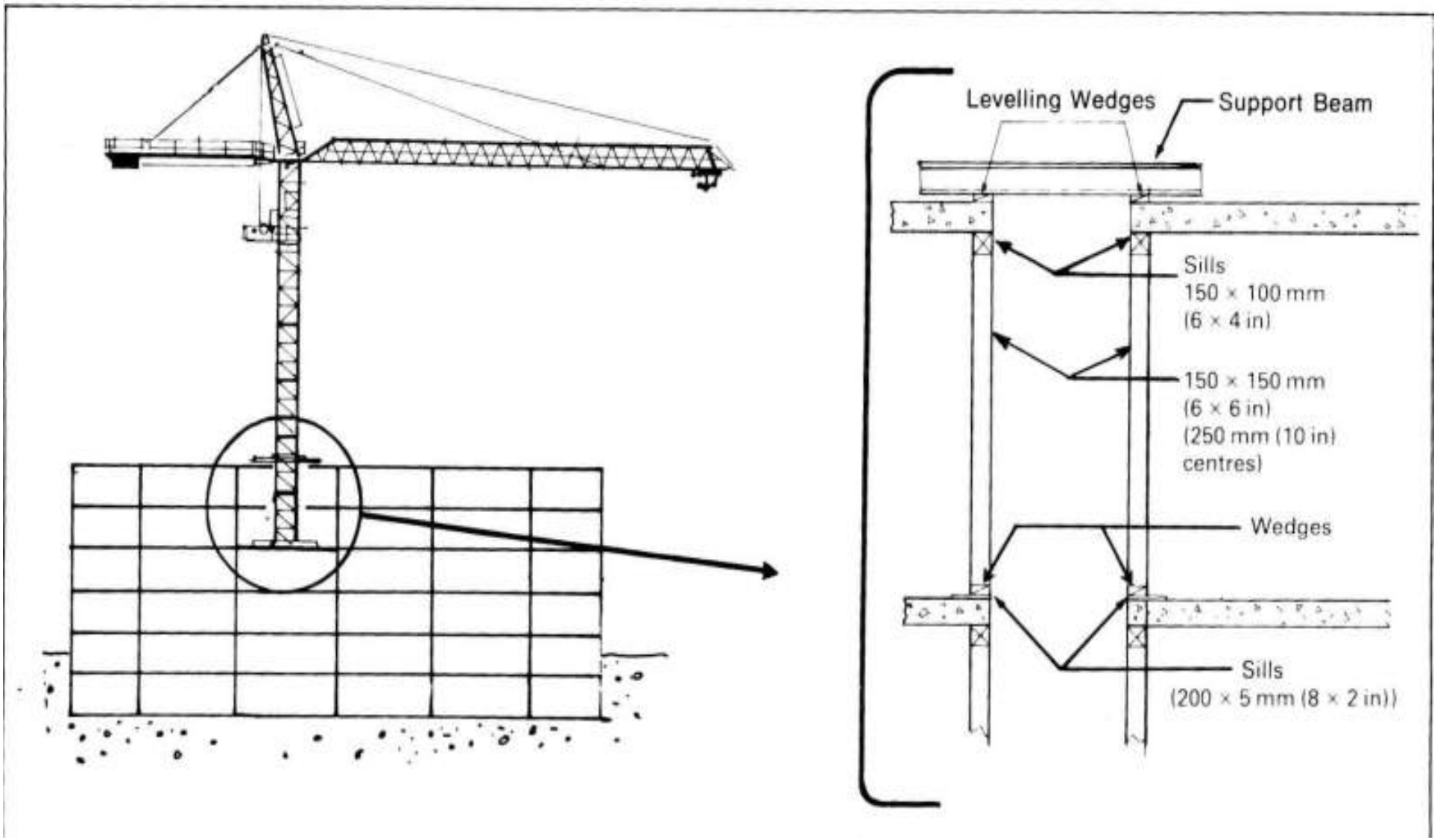
Climbing Crane Configuration-2



Climbing Crane Configuration-3



Shoring under the floors



Concrete Skips & Buckets

Concrete Skips & Buckets

- They are the most used – and abused !
- Often taken for granted; very little thought given to the selection & operation efficiently
- Available in capacities : 0.25 to 6 cum
- Check ratio of skip wt to weight of concrete
- Typical standard weight of 1 cum skip is 280 kg; site made skips of same capacity weighs 700 kg, reducing concrete carrying capacity
- One m^3 skip of magnesium weighs only 110 kg!

Concrete Skips - Types

Flexible pipe skip

Side chute skip, flexible pipe

Tower Crane for handling concrete skips

Concrete bucket with

← side discharging arrangement

↓ Fork lift arrangement

chute

Direct ↴

Tower Crane Concreting Roller Conveyor for Handling Skips

- Skips mounted on roller conveyor; the empty one positioned after crane lifts the full one

Adavinainar Koil Dam - TN
Accident to Tower crane-April 2001

- Adavinainar Dam contract value Rs 550 m
- Four tower cranes installed at site
- Mast height : 60 m; Boom : 65 m
- CPM policy for all equipment in force; insured for 214 lacs
- The tower crane functioned for 6 months before raising the mast height by 5 m

Adavinainar Koil Dam - TN
Accident to Tower crane-April 2001

- While the height of the mast was being raised using self climbing jacks a sudden high wind resulted in collapse of tower crane; wind speed was within permissible limit when the work was started
- Claim under CPM policy; insurance surveyor visited site on 21st April 01
- Loss assessed as total; tower crane manufacturer recommends scrapping

Adavinainar Koil Dam - TN
Accident to Tower crane-April 2001

- Forecast repair cost > replacement cost
- Insurance rep visits site again in May 01
- Joint inspection and discussion between divisional manager of insurance company, equipment supplier and rep of contractors
- Original cost of crane Rs 121 lacs
- Claims settled for Rs 93 lacs on June 2002
- Replacement cost Rs 143 lacs

Tower Crane Collapse

JNPT Silo

Tower crane collapse during erection

JNPT Silo

Tower crane collapse during erection

JNPT Silo
Tower crane collapse during erection

Earthquake Topples Tower Cranes
News from Taiwan May 02

- Taipei Financial Center (TFC), will be the world's tallest building (507 m) when completed
- Fatal crane accident at TFC; 2 cranes were dislodged during an earthquake of 5 on Richter scale in Taipei in April 02
- The cranes plunged 53 floors to the street, killing the drivers in each and killing 3 other workers; another 23 site workers injured, kid by falling debris. Three cars crushed


earthquake struck

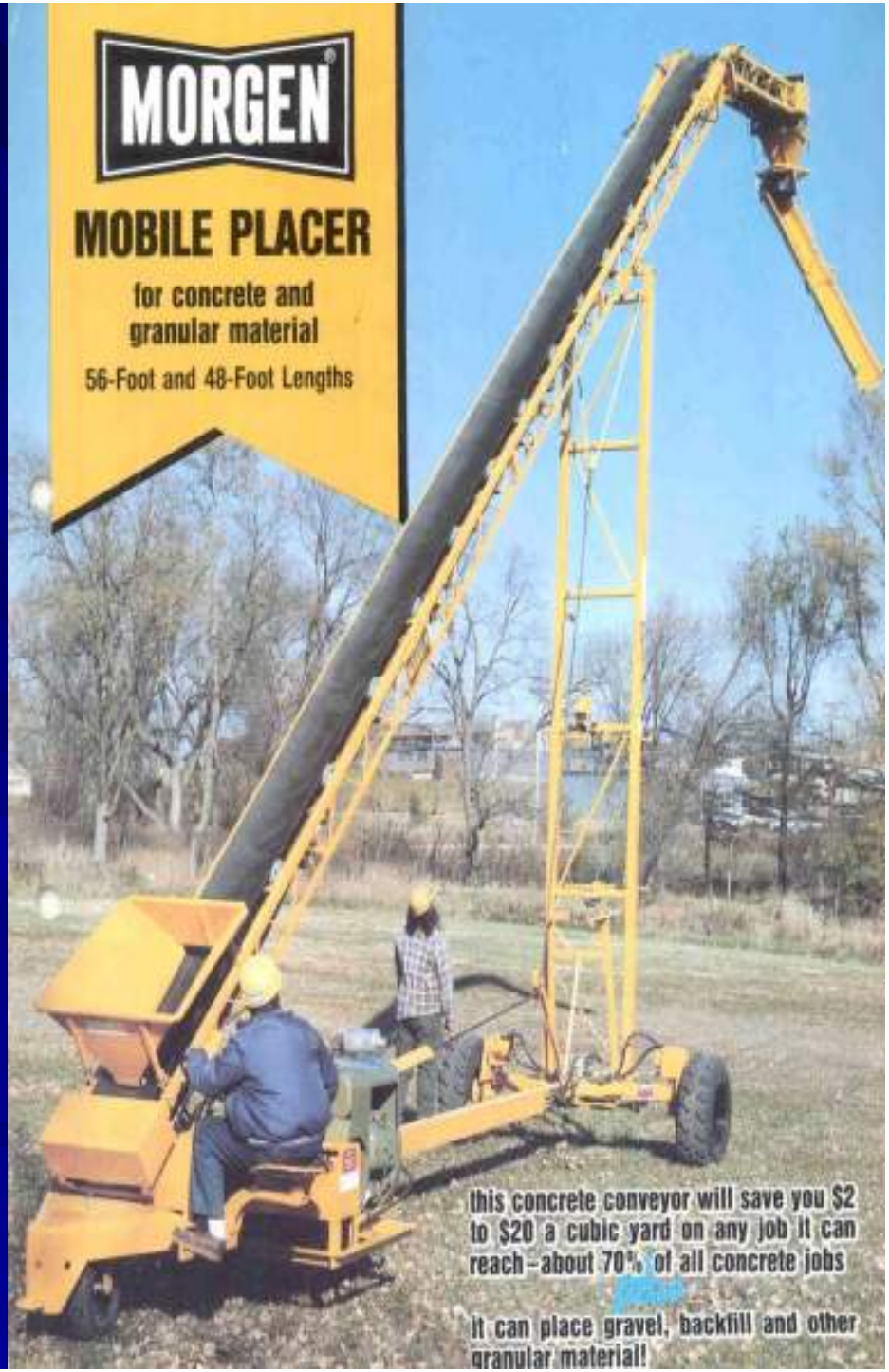
Concrete Placement
Direct Discharge into Job

- Extension chutes + inclined conveyor+ traveling horiz conveyor used for discharging conc
- Both conveyors mounted on rails, can be manually pushed forward during concreting

Concrete Construction Equipment

Morgen Mobile Concrete Placer

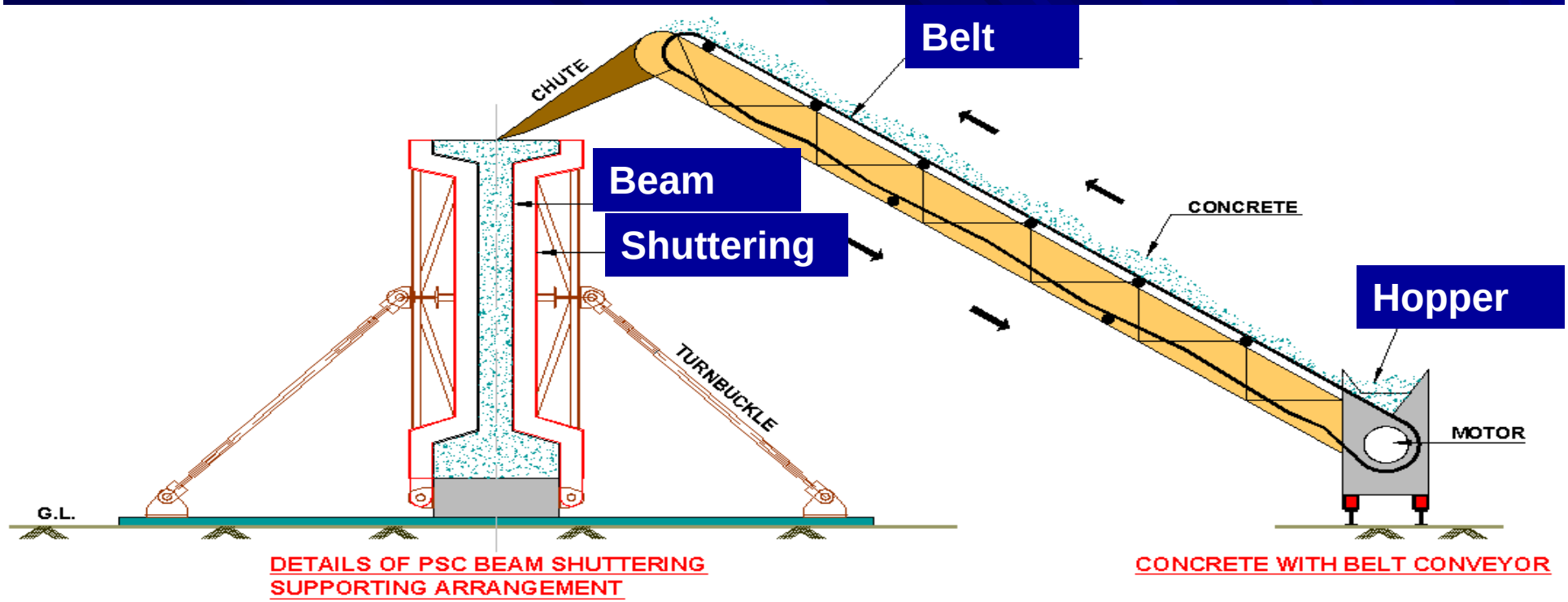
- Lower equipment cost – 1/5th the cost of concrete pump of same capacity
- One man operation
- Lower operating cost
- 98 % availability for work
- Average useful life:10 yrs, double that of conc pump
- reaches under obstructions, into wall, column forms, slabs 10.7 m vertical or 18.5 horizontal



Site made belt conveyor system mounted on a truck trailer used for placing concrete in retaining walls at JNPT (Mumbai) silo project (1987)

- **Unit progressively moved forward;pulled**

Concrete Conveyor : Sutlej Bridge



Local made concrete belt conveyor used for concreting 36 m pre-tensioned beam at Sutlej bridge

- **Beam concreted in 2 hrs against 5 hrs manually**

Mobile Crushing Plant

Skid Steer Loaders

- Versatile machines with variety of attachments. Mounted on wheels or tracks
- Attachments in small sizes and maneuverable allowing operation in tight spaces
- Light weight machine; allows towing by a pick-up truck. Flexibility due to wide range of tools
- Used to dig & move materials, grade and level the ground etc. Powered by hydraulic pump
- Machine fitted with quick coupler system; allows fast, secure, mechanical work tool change

Skid Steer Loaders Attachments

- Grader
- Angle broom
- Vibratory roller
- Backhoe
- Sweeper
- Bucket
- Auger
- Breaker
- Fork lift
- Trencher
- Tiller

Telescopic Handlers

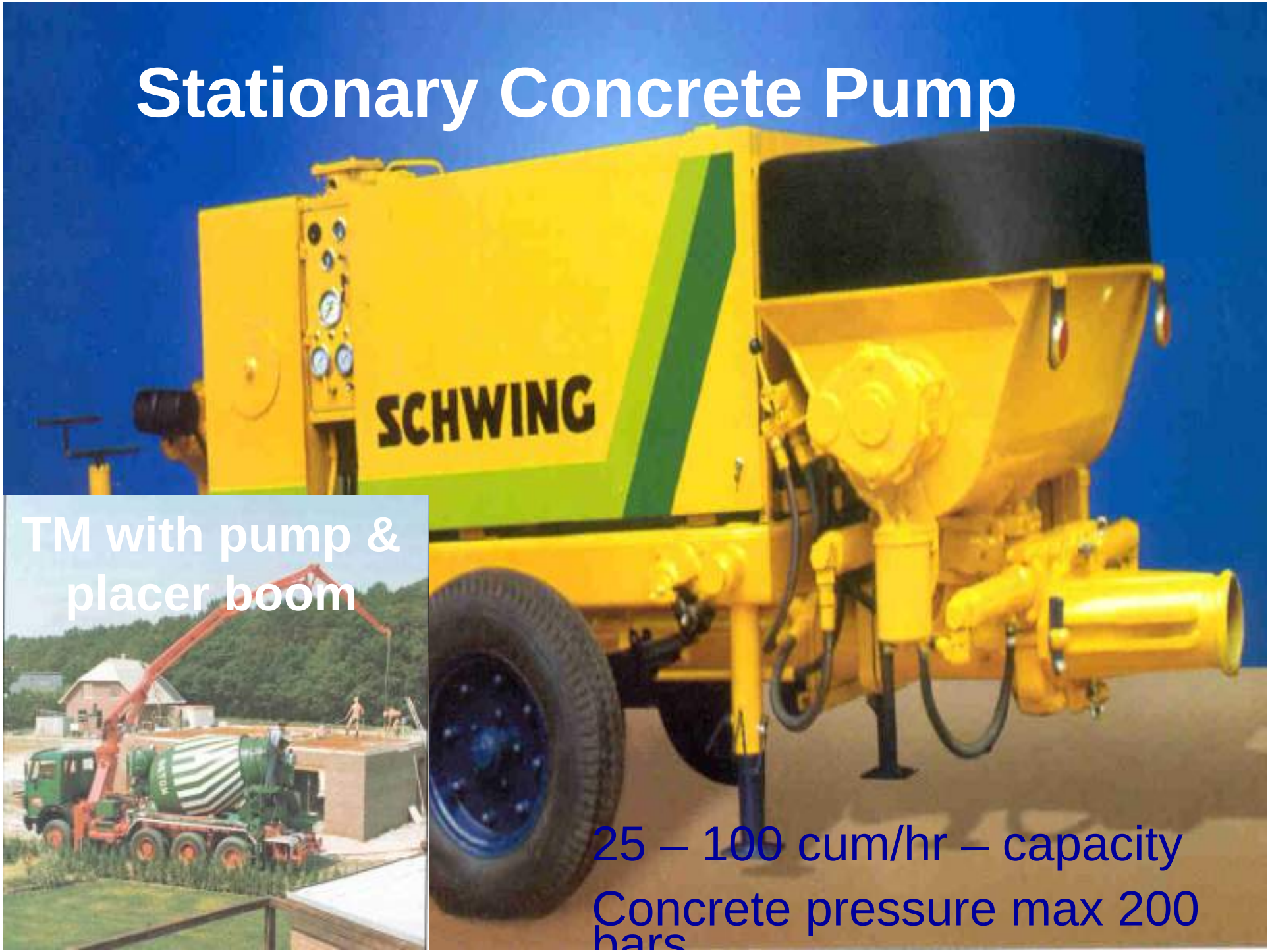
- Support machines, use buckets for site works other attachments - augers/hydraulic breakers
- Useful for handling pelletized materials, to elevate roof trusses & large awkwardly shaped materials. They can also off-load trucks & move materials quickly across the sloppy terrain
- Machine boom extension used to deliver loads horizontally over barriers such as freshly poured concrete slabs. Also available in four wheel drive

Telescopic Handlers

Pumping Concrete Equipments

- Stationary concrete pump with pipeline
- - do – with separate placing boom
- Placing booms on crane masts
- Truck mounted concrete pump
- Trailer Mounted Pump
- - do - with placing boom
- Climbing placing boom
- Separate Placer Booms
- Placer Booms mounted on Slip form.
- Floating Concrete Pumps.
- Floating Placer Booms

Stationary Concrete Pump



TM with pump & placer boom

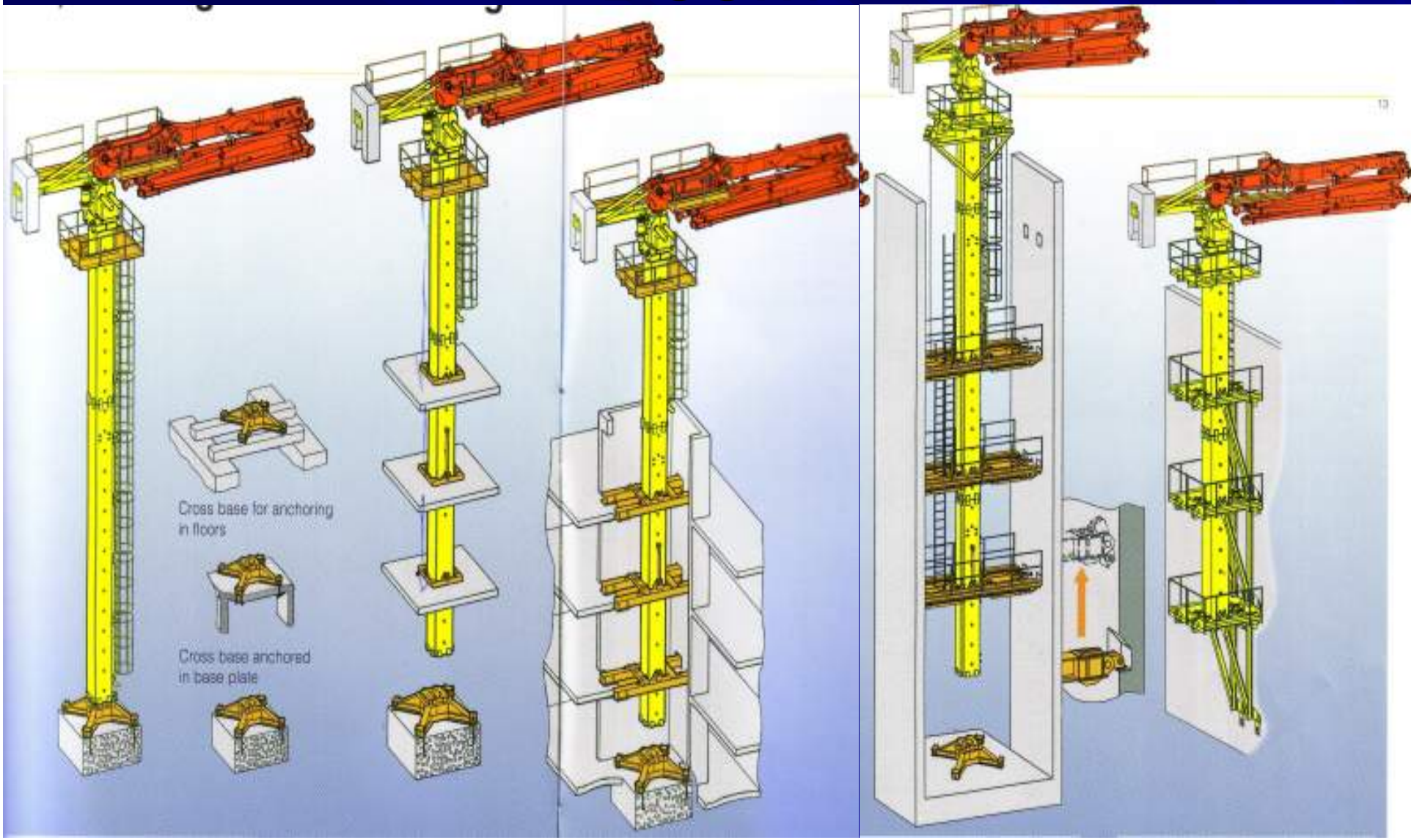
25 – 100 cum/hr – capacity

Concrete pressure max 200 bars

Climbing Placer Boom

- Useful when the reach of truck mounted placer boom is no longer adequate
- Consists of a sub structure and a boom; works in combination with a trailer concrete pump
- The climbing boom moves up progressively through the floors and shafts to the higher floors that still have to be beat

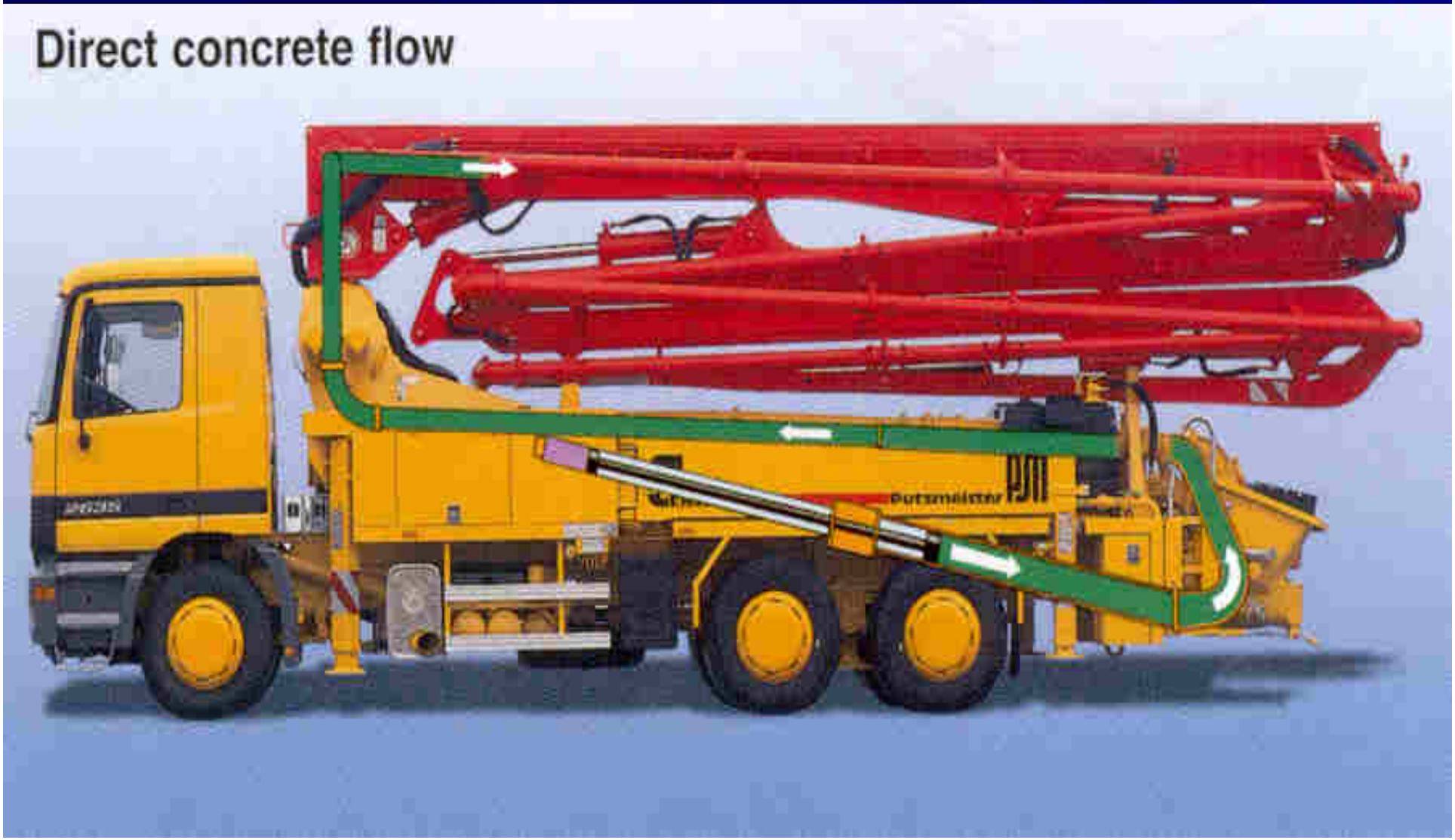
Operation of Climbing Placer Boom



Truck mounted concrete pump

- Boom length up to 52 meters
- Most popular boom length 32 m
- Boom with 3 or 4 joints
- Remote control operation
- Can be moved around the building as required
- The unit should be stabilized on outriggers during pumping

Truck Mounted Concrete Placer Boom




Deck slab concreting using truck mounted placer boom

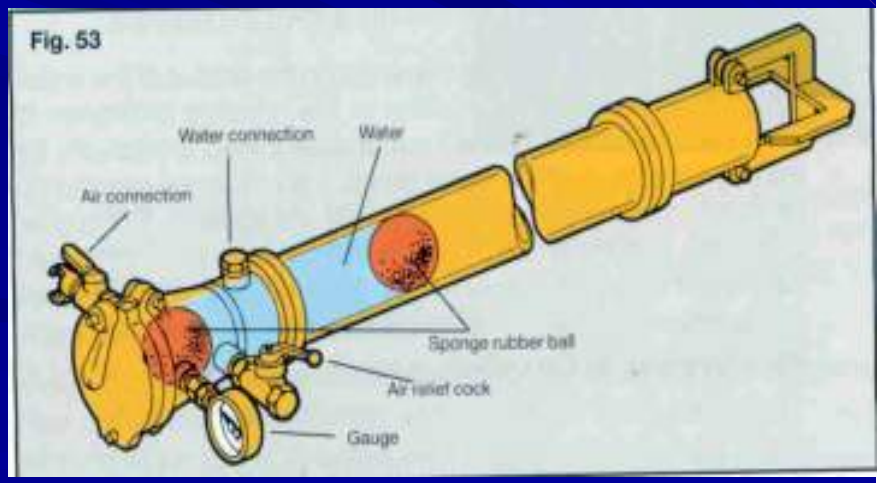
Deck slab concreting using truck mounted placer booms

Concrete Pumping Pipeline

- Steel pipes of various wall thicknesses used
- Individual pipe sections with lengths 1,2 or 3 m
- Pipes connected by quick action couplers
- Bends of 90^0 , 60^0 , 45^0 , 30^0 and 15^0
- 125 mm ID pipes widely used; suitable for 20 mm and 40 mm size aggregates
- Pipe wall thickness: 4 mm for normal use; for pressures of more than 100 bars, wall thickness exceeds 7 mm

CONCRETE PUMPS
Pipeline and accessories

- Pipes in 2-3 m lengths.
- Quick action couplers.
- Flexible end hose pipe.
- Bends and Elbows,15 ° to 135 °.
- Shut-off Valve.
- Sponge Rubber Ball.
- ‘Y’ Junction



Quality of Construction Equipment

Quality is like buying Oats,

If you want nice, fresh, clean oats,

You must pay a fair price.

However if you can be satisfied with

Oats that been through the horse..

That comes a little cheaper.


Thank You
SAR 4 Y2k