QA & QC In Concrete Construction

Mechanization In Concrete Construction

S A Reddi
Dy. MD (Retd.) Gammon India Ltd.
Concrete Material Processing Equipment
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 nonusable material to usable.
- Operating crusher at a larger setting reduces motor power, cutting a major operating cost.
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 into the hopper inside the cement store and fed to the silo through a screw conveyor or cement pump. The 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 \( V \times N \times E = 0.5 \times 60 \times 0.75 = 22.5 \text{ m}^3/\text{hr} \).
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.
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

- Aggregate loading
- Cement load & Weigh
- Skip Up
- Cement Discharge
- Water Metering
- Skip Discharge
- Mixing Time
- Skip Down
- Mixer Discharge
- Mixer Down

Total Time Cycle

- Variable time
- Fixed time
- Adjustable time
# Bigger Capacity Concrete Batching Plants

<table>
<thead>
<tr>
<th>Output $m^3$/hr</th>
<th>45</th>
<th>60</th>
<th>85</th>
<th>105</th>
<th>120</th>
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<tr>
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<td>750</td>
<td>1000</td>
<td>1650</td>
<td>2000</td>
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<tr>
<td>Power (KW)</td>
<td>53</td>
<td>60</td>
<td>104</td>
<td>118</td>
<td></td>
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<tr>
<td>Discharge ht</td>
<td>4 m</td>
<td>4 m</td>
<td>4 m</td>
<td>4 m</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>14.5 t</td>
<td>15 t</td>
<td></td>
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</table>

- 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° for fine grains, 90° for standard concrete and 180° for large size aggregates
Twin Shaft Mixer With CI Paddles, Anti-wear Tiles

variable arm positioning at 180°
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 m³ capacity

- Mobile mixing plant with two 3 or 4 m³ mixers
- Aggregates fed alternately

- Capacity: 80 / 130 m³
- 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 the 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.
- 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.
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.
The mixer mind is an electronic check control system for concrete mixers of batching plants. It helps the operator in maintaining the mixer, as it monitors the functioning of main components. It 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

Silo to

Feed

Batch

Plant

Feed
Vertical Screw Conveyors
Filling Two Silos

With diverter valve

With reversible screw conveyors
Screw Conveyors for Batch Plant

**30 cum / hr**

- Diameter: 168 mm
- Motor: 7.5 kW
- Capacity: 20 – 25 tph depending on inclination

**60 cum / hr**

- Diameter: 219 mm
- Motor: 11 kW
- Capacity: 50 – 70 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 to 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

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
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
Motorised Wheel Barrow (5-8 HP)

Tough Rider

Concrete Handling Equipment for small jobs

2t Forklift, 15HP handling concrete bucket
Conc Placement
Wheel Barrows

Manual

Powered Capacity
0.17 cum
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 m³

- Swivel: 180°
- 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 m³ 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!
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.
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

<table>
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<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>Delivery rate</td>
<td>25 l/min</td>
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<tr>
<td>Delivery pressure</td>
<td>40 bar</td>
</tr>
<tr>
<td>Delivery distance</td>
<td>up to 40 m</td>
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<tr>
<td>Delivery height</td>
<td>up to 15 m</td>
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<tr>
<td>Weight</td>
<td>160 kg</td>
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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

Horizontal Jib

Articulated Jib

Luffing Jib

Tower Cranes Jib Types
Rail mounted Tower Crane

Ballasted base; rail mounting allows the crane to move along rails with a load; gives increased coverage of work area.

It can be either of the top-slewing or bottom-slewing type, with heights not exceeding 90 m for the former & 60 m for the latter.
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

Start building with static crane on fixing angles

Install two climbing collars
Climbing Crane Configuration

Jack up the crane

Install third collar before next climbing
Jack up again
(repeat operation as per sketch “3”)

Move lower climbing collar
to upper level. The process goes on
(without any height restriction)
Shoring under the floors

- Sills: 150 x 100 mm (6 x 4 in)
- 150 x 150 mm (6 x 6 in)
- 250 mm (10 in) centres
- Sills (200 x 5 mm (8 x 2 in))

Support Beam

Levelling Wedges

Wedges
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

Direct chute
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 21\textsuperscript{st} 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.
Concrete Placement
Direct Discharge into Job

- Extension chutes + inclined conveyor + traveling horizontal conveyor used for discharging concrete

- 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 m 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
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
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
- Scarifier
- Laser
- Angle blade
- Mixer
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

Cross base for anchoring in floors
Cross base anchored in base plate
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

Direct concrete flow
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°, 60°, 45°, 30° and 15°
- 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