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*भारतीय मानक मसौदा*

**बल्क हैंडलिंग उपस्कर हेतु पारिभाषिक शब्दावली**  
**भाग 2 — स्टैकिंग, लोडिंग एवं रिक्लेमिंग उपस्कर**

*( आई एस 10463-2 का पहला पुनरीक्षण )*

**Draft Indian Standard**

**GLOSSARY OF TERMS FOR BULK HANDLING EQUIPMENT**  
**PART 2 — STACKING, LOADING AND RECLAIMING EQUIPMENT**

*( First Revision of IS 10463-2 )*

ICS 53.040.53

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**Earth Moving Equipment and Material  
Handling Sectional Committee, MED 07**

**Last date for receipt of comments is  
17 December 2022**

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**FOREWORD**

*(Formal clause to be added later)*

This Indian Standard was adopted by the Bureau of Indian Standards in 1985, after the draft finalized by the Earth Moving Equipment and Material Handling Sectional Committee had been approved by the Mechanical Engineering Division Council.

This Standard was first published in 1985. The first revision of this standard incorporates modifications found necessary as a result of the experience gained with the use of the standard and to bring the standard in line with the present good practices being followed in the country and abroad.

In this standard an attempt has been made to cover the terms which are especially applicable to stacking, loading and reclaiming equipment, Terms covering components such as systems, electrical equipment (motors, cables, switch gear, etc.) and general engineering terms relating to bearings, structure, etc., have been left out. Users of this standard are advised to refer to related standards, where applicable, covering the corresponding terminologies.

This standard (Part 2) is one of the standards from the series of standards on glossary of terms relating to bulk handling equipment. Other series standard is below:

IS 10463 (Part 6) : 1983      Glossary of terms for bulk handling equipment: Part 6 Cyclic  
loose bulk handling equipment (Non - Stationary)

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**GLOSSARY OF TERMS FOR BULK HANDLING EQUIPMENT**  
**PART 2 — STACKING, LOADING AND RECLAIMING EQUIPMENT**

( *First Revision* of IS 10463-2 )

## **1 SCOPE**

This standard covers the definitions of terms used in connection with stacking, loading and reclaiming equipment.

## **2 REFERENCES**

The standard listed below contains provisions which, through reference in this text, constitute provision of this standard. At the time of publication, edition was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate possibility of applying the most recent edition of the standard indicated below:

<i>IS No.</i>	<i>Title</i>
4240 : 1984	Glossary of conveyors terms and definitions ( <i>first revision</i> )

## **3 TERMINOLOGY**

**3.1 Adaptor Plate** — A fabricated machined plate on which pillow blocks, etc. are mounted for proper alignment of pulleys or wheels.

**3.2 Agitation** — A phenomenon of stirring the cross-sectional surface of the pile of loose bulk material by means of harrow spikes or rods in order that the agitated particles of the pile fall down to the root of pile for reclaiming operation.

**3.3 Agitator** — Set of spikes or rods fixed/attached to the face of harrow structures for agitating the pile surface. *See* also ‘agitation’.

**3.4 Alignment** — A condition in which the particular parts or components of the machine said to be accurately assembled in line with defined tolerances for designed operation.

**3.5 Allowable Stress** — The permissible operating stress determined by the application of a suitable safety factor to the ultimate strength. Allowable stress will be reduced for shock loads and other adverse operating conditions.

**3.6 Ambient Temperature** — The surrounding normal atmospheric temperature at the location of the equipment.

**3.7 Anemometer** — An appliance for indicating wind velocities. An anemometer mounted on top of the machine is used for sensing critical wind velocities and for sending audio/visual control signal for manual/automatic shutdown of entire machine operation.

**3.8 Annular Ring Chute** — A backing plate in the form of circular rim to hold the material till the bucket carries the material to the area of discharge in case of cell-less bucket wheel.

**3.9 Apex of Harrow** — Top point of a triangular shaped harrow.

**3.10 Arching** — The bridging of material between sides of chute or hopper under certain condition and consequently flow of material ceases.

**3.11 Arrangement of Gantry Support Bracket** — Supporting bracket with ball and socket swiveling arrangement for portal gantry.

**3.12 Articulated Counterbalance Boom** — A combined mechanism of boom and counterweight that imparts generally different but balanced articulated movement of the two.

**3.13 Assembly of Head Pulley** — A terminal pulley at head with complete outfits, namely, pillow block, shaft, adopter plates, etc.

**3.14 Attachment** — A part assembled to trolley, trailer or chain with whose connection the trolley, trailer or chain is moved.

**3.15 Automatic Conveyor Scale** — *See 2.168.1* of IS 4240.

**3.16 Automatic Dispatch Control** — *See* IS 4240.

**3.17 Automatic Digging Method** — An automatic controlled method by which programmed adjustment of slewing speed in term of  $\text{Cos } \phi$  law; programmed advanced step-distance of traverse for setting the slice depth; limiting of slewing angle while digging and when proceeding to the next cut and reversal of slewing direction; minimizing all setting up and adjustment times while keeping within permissible acceleration and deceleration values can be achieved.

**3.18 Automatic Lubricator** — *See 2.20* of IS 4240.

**3.19 Automatic Rail Clamp** — A mechanical clamping device operated electrically or hydroelectrically to grip the track rail for preventing any shifting of rail mounted equipment in non-operating condition.

**3.20 Automatic Sampler** — *See 2.519.1* of IS 4240.

**3.21 Automation** — An unmanned automatic operation by which all operations can be controlled centrally, by elimination of human error, damage and mistake achieving maximum efficiency by using electric devices, etc.

**3.22 Back Stop** — A mechanical device to prevent reversal of loaded belt on stack or conveyor or tripper under action of gravity when forward travel is interrupted.

**3.23 Baffle** — A device placed across the belt at head end of boom conveyor to deflect the stream of bulk material discharged from buckets of digging wheel towards the tail end of boom in case of reclaiming operation. This device is actuated with electromechanical actuator which lifts the baffle in case of stacking operation to pass out the material for stock piling.

**3.24 Baffle Plate** — The cross plate used in baffle is termed as baffle plate.

**3.25 Baffle Plate Actuation** — Lifting the baffle plate by electromechanical actuators.

**3.26 Balanced Drive** — A drive so designed that two or more such drives on carriage or trolley traverse of the machine may be synchronized to pull predetermined shares of load.

**3.27 Bale** — Metal ties under tension connected to counterweight structure and holding the cantilever boom by other end to keep the boom in suspension.

**3.28 Ball Bearing Slewing Ring** — A circular rim fitted with one or more rows of ball bearings with or without gear teeth along the periphery of the rim. With the virtue of construction one half could be mounted on fixed structure of the machine with other half attached to the part of structure subject to slewing motion.

**3.29 Barrel** — Fitted with staggered buckets constitutes the rotary and main reclaiming element in bridge type rotary blending/reclaiming equipment.

**3.30 Barrel Type Reclaimer** — A mobile machine comprising essentially of a long hollow barrel having buckets arranged on the periphery of a barrel in a staggered fashion with reclaiming operation covering the entire width of stockpile through a cross conveyor mounted on the machine.

**3.31 Base Portion** — Base construction of plate work of a cone gantry or central column.

**3.32 Bed Blending** — Number of different raw materials of varying quality can be homogenized into one raw material with required characteristics for the process.

**3.33 Benching Operation** — In this operation reclaiming of material takes place along the pile length with constant slice height.

**3.34 Bifurcated Chute** — A chute separating into two branches and with deflector plate or flopper deliver the material to either or both the branches. Thus it can be used to bypass the material and also used to transfer the material on either or both the boom conveyors of stacker machine to make the stock pile.

**3.35 Blending Efficiency** — The ratio of mean standard deviation of material properties of input flow to the pile and mean standard deviation of material properties of output material properties of output material flow from the pile in a bed blending system. It shall be given as a ratio.

**3.36 Block Operation** — In this operation reclamation is conducted across the pile cross-section with variable solving speed of boom and by preset advancing (advanced steps) and reversing the machine. The entire cross-section of pile is thus cut in preset numbers of layers by boom luffing.

**3.37 Bogie** — The box construction of plate work to hold one or more track traversing wheels in position and also supporting the carriage and main structure of the machine.

**3.38 Bogie Assembly** — Bogie fitted with traverse wheels and necessary attachments.

**3.39 Bogie for Portal** — The bogie supporting the portal of stacker bridge for radial blending machine.

**3.40 Bolster** — A pad or support plate incorporating pivot or hinge features for tail end anchorage of stacker or boom conveyor to permit vertical and/or horizontal rotation/movement for anchored unit.

**3.41 Boom** — A cantilevered or overhanging structure that supports or contains the component parts of conveyor. It may be fixed, hinged or pivoted at tail end on the machine structure. In case of boom type reclaimer bucket wheels with its drive assembly is mounted on free end or head end of such cantilevered structure and is capable of luffing and slewing.

**3.42 Boom Cantilever** — The overhanging portion of boom beyond the hinges or pivot point.

**3.43 Boom Centres** — The horizontal distance between the centre of machine or turntable and digging wheel and may also be referred to as boom radius.

**3.44 Boom Conveyor** — A conveyor for stockpiling or reclaiming operation mounted on boom is termed as boom conveyor.

**3.45 Boom Conveyor Drive** — Boom conveyor drive is generally fixed at tail end or in some cases at intermediate location at return belt side. Drive is through electric motor, reduction unit coupling, brake, etc.

**3.46 Boom Head End** — The farthest terminal point of the boom from the machine centre.

**3.47 Boom Hinge** — A type of support of the boom at tail end to permit the boom for luffing action.

**3.48 Boom Radius** — The radius generated from the centre of the machine to the tip of discharge pulley or centre of bucket wheel is referred to as the slewing boom radius which may not necessarily be the same as the boom length.

**3.49 Boom Slewing Type Reclaimer** — The reclaimer machine with slewing boom at the head end of which is mounted the digging wheel for reclaiming operation.

**3.50 Boom Structure** — A box or latticed construction for the purpose of a boom.

**3.51 Boom Tail End** — The terminal point of boom resting near or at the centre of the machine or turntable.

**3.52 Bracing** — Diagonal or horizontal member to stabilize the vertical or horizontal running member of the structure is termed as bracing.

**3.53 Brake Drum Coupling** — A coupling with drum flange to suit the brake shoe grip.

**3.54 Braking Time** — Time required in course of deceleration to completely stop the unit on which the brake is applied.

**3.55 Bridge** — The adequately designed structures in the form of box or latticed frame spanning across the stockpile with both ends supported on traversing carriage or trucks or with one end supported on traversing truck and other on fixed central column with slewing ring assembly. On such structure are mounted the reclaiming elements, namely, bucket wheel carriage with harrow structure or chain scraper with harrow structures and harrow wagons all to reclaim the materials in transverse direction of the stockpile.

**3.56 Bridge Conveyor** — The conveyor mounted on the bridge across the stockpile to receive the reclaimed material and carry in a direction transverse to the length of the pile and discharge the material on to a fixed and ground based reclaim conveyor.

**3.57 Bridge Girders** — Sides of the bridge of either plate or latticed construction.

**3.58 Bridge Supporting Section** — The part of structure supporting the ends of the bridge.

**3.59 Bridge Type Bucket Wheel Reclaimer** — In such reclaimer rotary bucket wheel together with or without rake bucket wheel either one number or two numbers are mounted on the carriage in turn mounted on a heavy bridge across the stockpile. Bucket wheel while rotating and traversing with the help of the carriage across the pile reclaim the material at the foot of pile brought down by the rake agitating the pile surface.

**3.60 Bridge Type Scraper Reclaimer** — In such machine the chain cover fitted with scraping blades is mounted across the span of pile to reclaim the material through scraping at bottom or foot of the pile. The material for scraping is brought down to the foot of pile by harrow mounted on the same bridge.

**3.61 Bucket** — Fabricated container mounted on digging wheel, barrel/drum or scraper chain of the respective reclaimers, constitute a vital digging element in such reclaimers.

**3.62 Bucket Lip** — The frontal edge of bucket generally made of tough material to confront the material while digging.

**3.63 Bucket Side** — Sides of bucket in contact with material pressure while in digging operation.

**3.64 Bucket Side Pressure** — In digging operation sides of the bucket coming against the materials of the pile undergo certain pressure which resist the slewing motion of the boom. This side pressure has to be overcome by the slewing drive unit.

**3.65 Bucket Tooth** — Tooth made of hardened material is fitted on the bucket lip to pierce or loosen the materials to be dug in the operation of reclaiming or excavating.

**3.66 Bucket Volume** — Water level capacity of materials content in terms of volume or geometrical volume of bucket is referred to as bucket volume. With the ring volume added to the geometrical volume of bucket is termed as nominal volume of bucket.

**3.67 Bucket Wheel** — A circular shaped sturdy frame having required number of buckets fitted at equal spacing's along outer periphery, constitutes a main element for digging operation.

**3.68 Bucket Wheel Drive** — Bucket wheel is hydraulic or electric driven. Drive unit, consist of hydraulic pump motor/electric motor, reduction unit, fluid coupling, universal coupling with propeller shafts, etc.

**3.69 Bucket Wheel Excavator** — A mobile equipment mounted generally on crawler tracks and having bucket wheel mounted on luffing and slewable boom for excavating hard soil or consolidated material.

**3.70 Bucket Wheel Reclaimer** — A mobile equipment having bucket wheel mounted on boom or bridge carriage as a main element for reclaiming bulk materials from stock pile. *See also* ‘Rail mounted bucket wheel reclaimer’ and ‘Rotary bucket wheel reclaimer’.

**3.71 Bucket-Wheel Shaft** — The shaft on one end of which is mounted the bucket wheel and on other end the-drive unit and it supported on two pillow blocks across the boom at its head end.

**3.72 Buffer** — A cushion-device fitted on the front or rear end of mobile equipment to absorb the shock load in case of collision.

**3.73 Buffering** — This function providing sufficient reserve of blended raw materials to guarantee the continuous operation of the processing plant under all normal circumstances.

**3.74 Buffer Stand** — A vertical stand fitted with cushion pad with spring or wood on any resilient material, generally erected/fixed at the end of track against which the buffer fitted on mobile equipment collide and set the equipment at dead rest without much Jerk.

**3.75 Bypass** — A phenomenon to divert the incoming material from the normal direction of the flow keeping the operation of the machine for which the material was brought in abeyance.

**3.76 Bypass Arrangement** — Coordinated assembly to bypass the incoming material.

**3.77 Bypass Chute** — The chute by means of which the incoming material is diverted or bypassed to desired direction.

**3.78 Cabin Adjustment Actuator** — An electro-mechanical device or hydraulic device which the cabin position always in horizontal position, irrespective of the boom position while luffing.

**3.79 Cabin Controls** — Means of operating the reclaimer, stacker or machine alike from a cabin mounted on the machine.

**3.80 Cabin Stabilization** — The method by which the operator’s cabin mounted on boom is kept stabilized in horizontal plans irrespective of position in luffing operation.

**3.81 Cable** — Power supply to the mobile machine is usually effected via a cable reel with a trailing cable.

**3.82 Cable Reel Drum** — Cable reel drum is used to take the power supply or control cables by being wound or unwound on it, for feeding power and control supply to the mobile machine/equipment.

**3.83 Cable Winder** — A drum on which the multi-core cable is coiled. It may be arranged with fixed or swivel mounting. The current is transferred to the cable through slip ring.

**3.84 Car Loader** — Portable or hinged type of conveyor for loading bulk materials into box cars.

**3.85 Carriage** — A sturdy fabricated frame intended to support all equipment such as sewing structures, boom, etc. In case of bridge type bucket wheel reclaimer, it supports the digging wheel, rake, etc., and is driven at preset traverse speed.



**3.86 Constant Current Regulator (CCR) Drive** — The driving unit for control cable reels to wind and unwind the cable at preset speed.

**3.87 Cell-less Type Bucket Wheel** — In such bucket wheel the buckets are mounted on the outer ring of the wheel body. The buckets have open bottom towards the ring cavity and covered by annular ring chute or back plate attached circumferentially up to the discharge point of the material from bucket wheel.

**3.88 Cell Type Bucket Wheel** — The bucket wheel in which cell-shaped buckets extending right to the centre of the wheel are mounted. In such bucket wheel height available is not sufficient to transfer the material sideways on to the boom conveyor.

**3.89 Central Column** — The stationary circular tower of plate construction at the centre of circular/radial track of radial blending system. One end of stacker and reclaimer bridges are mounted on the tower and also the feed conveyor's discharge end mounted on top of this column.

**3.90 Central Hopper** — A hopper along the periphery of central column to receive the reclaimed material by scraper conveyor and discharging the same onto underground reclaim conveyor.

**3.91 Centralized Lubrication** — A method of lubrication where the lubricant of grease barrel, pump, etc., are placed at convenient point of the machine and lubrication is done for all the adjoining and even farthest points from single such source of lubrication.

**3.92 Chevron** — A pattern of making homogeneous and thin layered preblending pile generally of triangular cross-section.

**3.93 Chevron Pile** — The stockpile where the fine and even grain size bulk material is stacked in numbers of individual layers along the pile length in the form of triangular pile.

**3.94 Chevron Stacking** — The method of stacking where the material is dumped in large layers with a stacker travelling along the pile. The stacker, with the boom in a low position and the discharge point above the middle of pile travels to and fro on the runway between two defined limits. For every next higher pile, the boom is raised to designed height and pile is made by travelling the stacker along the pile.

**3.95 Chute** — A fabricated through enclosure through which bulk materials are guided and lowered by gravity.

**3.96 Chute Through Turntable** — The chute which is mounted on turntable passes through central opening of slewing bearing and extends downward up to impact section or impact carriage. This receives the reclaimed materials from tail discharge of boom belt and transfers the same onto ward belt resting on impact carriage.

**3.97 Circular Pre-Blending** — A system where raw materials of different quality are stockpiled and reclaimed radially for process plant.

**3.98 Circular Rail Track** — The track of rail laid with reference to fixed centre and radius to form a circle. Such track is used for making circular stockpile by radial stacker and pile being reclaimed by radial reclaimer.

**3.99 Circular Stockpile** — A stock pile made along a radial track or in a circular form by stacker travelling along a radial track or by a boom stacker rotating about a central column.

**3.100 Circular Roller Ring** — A circular ring fitted with set of rollers and mounted on the central column, permits the rotational movement for stacker unit in radial blending system.

**3.101 Circumferentially Covered Back Plate** — The arc shaped plate fixed to the bucket wheel up to the discharge point to hold the reclaimed material inside the bucket.

**3.102 Clevis** — Rear or bottom end of hydraulic cylinder which is connected with the structure of the machine.

**3.103 Cobra Lubricator** — An automatic device of lubrication which is mounted on the reclaimer bridge and lubricates the scraper chain rollers at preset intervals passing through it.

**3.104 Composing** — This is the function of bed blending system consisting of the integration of number of raw materials with different chemical and/or physical characteristics in such weight proportions that a completed pile represents the required composition.

**3.105 Counter Cabin** — A cabin equipped with electrical controllers to control the entire machine, *see also* term 'Cabin control'.

**3.106 Control Cable Reel Drum** — A cable reel drum which permits the cable to be laid for power supply to control the machine.

**3.107 Counter Weight** — Predetermined weight used to balance the cantilevered or overhang boom or harrow/rack or any such structure or part of a machine.

**3.108 Counterweight Arm** — The horizontal distance at which center of counterweight acts from centre of machine for optimum stabilization of machine.

**3.109 Counterweight Leg** — The projected structure from vertical rest of superstructure at the edge of which the counterweight rests.

**3.110 Counterweighted Take-up** — A take-up mechanism or device where the adjustment is made automatically by the potential energy in predetermined weight.

**3.111 Coupler** — A linkage device which connects trailer or trolley to the main driven machine in order that the former may move along with the later.

**3.112 Coupler Link** — A link designed for the connection of coupler.

**3.113 Cover Belt (See Fig. 1)** — A set of belt covered on the stream of reclaimed material on steep hook conveyor with pressed idler roller over it to prevent rolling back of reclaimed materials.

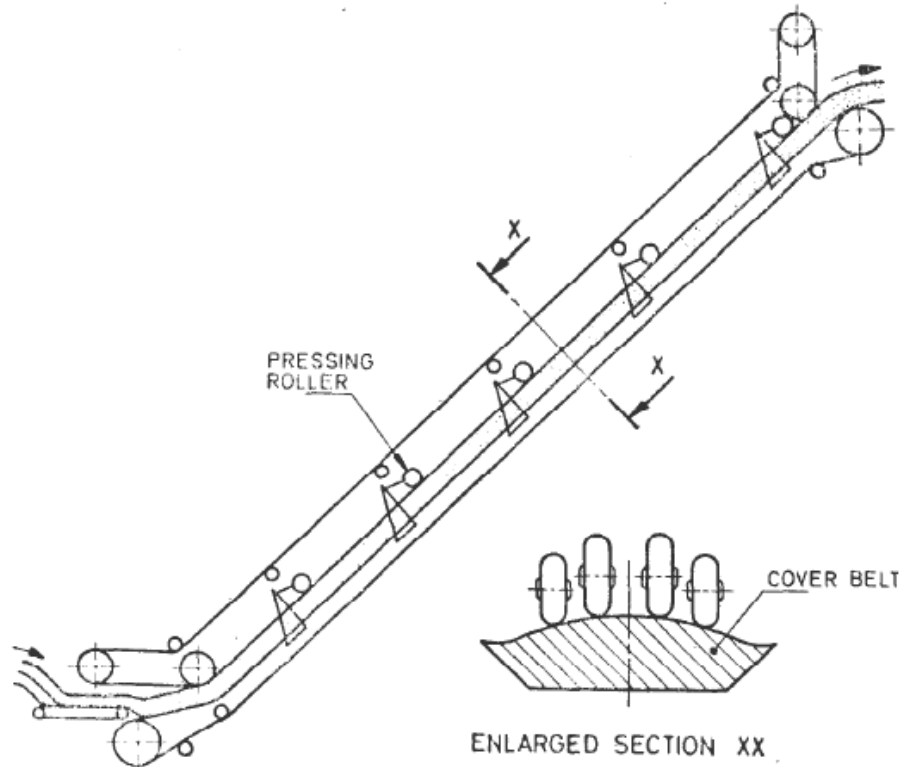


FIG. 1 COVER BELT (ILLUSTRATION ONLY)

**3.114 Crawler** — A set of sturdy roller chain track to support and propel the boom type reclaimer or exclaimer of excavator machine.

**3.115 Crawler Assembly** — A crawler track with complete set of chain, track rollers, wheels, frames and drive unit.

**3.116 Crawler Chain** — One of a pair of roller chains used to support and propel the machine mounted on such track the upper surface providing a track to carry the wheel of the machine and lower surface providing the continuous ground.

**3.117 Crawler Mounted** — A machine mounted on the crawler chain.

**3.118 Crawler Mounted Bucket Wheel Reclaimer** — A reclaimer having superstructure with bucket wheel on its boom head end capable of slewing and luffing and mounted on crawler tracks each consisting of a series of shoes and links. Controlled and powered from the superstructures.

**3.119 Crawler Mounted Excavator** — An excavator having a superstructure capable of slewing and luffing and mounted on crawler tracks each consisting of a series of shoes and links. Controlled and powered from the superstructure.

**3.120 Crawler Mounted Scraper** — A chain scraper having a superstructure and capable of reclaiming material by luffing and mounted on crawler track for mobility and changing direction.

**3.121 Crawler Steering Arrangement** — Part assembly of crawler which permit the crawler track to change the direction.

**3.122 Crawler Track** — The pair of roller chains to support and propel the machine with upper surface providing a track to carry wheels and lower surface providing continuous ground.

**3.123 Crawler Truck** — The frame of track laying type to which the track rollers and idlers are attached.

**3.124 CRD Trolley** — The trolley mounted on track wheels and attached with the main machine supports the control reeling drum to supply power for the main machine, such as stacker and stacker-cum-reclaimer.

**3.125 Cutter Speed** — The speed of a sample cutter passing through the main stream of material to collect the sample.

**3.126 Cutting Depth** — The depth of sickle shaped slice cut of material in digging operation.

**3.127 Cutting Edge** — The specially designed front lip or edge of bucket confronting the material in digging operation.

**3.128 Cutting Force** — Force to overcome the cutting resistance acting normal to bucket lip and tangential to lip circle of bucket wheel in digging operation. This is the product of cutting resistance of material and total cutting length of the slice.

**3.129 Cutting Length (See Fig. 2)** — Total effective length of that part of a bucket edge which scorps the material slice while digging.

**3.130 Cutting Power** — The power required to overcome digging force for slice cut of material.

**3.131 Cutting Profiles** — The shape of slice in which material is cut by digging wheel in combination with its rotation and slewing action.

**3.132 Cutting Resistance** — The force per unit length of cutting blade or lip in contact with the material, this force is constant over a wide range for each type of material.

**3.133 Cutting Speed** — Tangential speed or velocity of buckets along the lip circle in digging operation.

**3.134 Cutting Time** — The time taken for individual slice cut of material in digging operation.

**3.135 Cutting Width** — The width of sickle shaped slice cut off material in digging operation (as shown in Fig. 2).

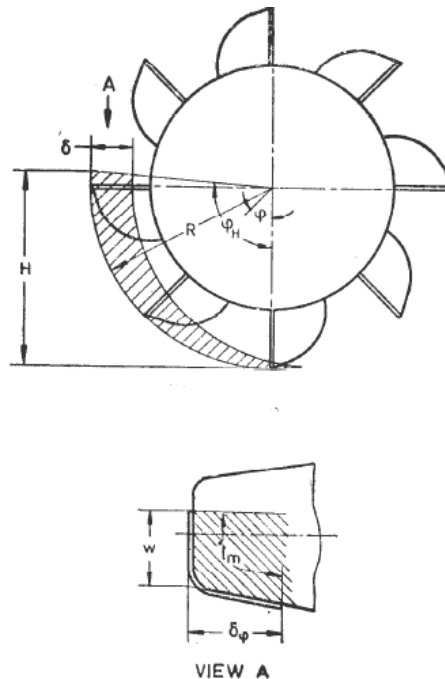
**3.136 Cylinder Equalizer** — In case of four-point support carriage of stacker/reclaimer machine, the carriage equalization for unevenness of track rail is accomplished by two hydraulic cylinders placed under the pair of carriage legs on two rails with common hydraulic pump.

**3.137 Disc Feeder** — A device consisting of a rotating disc in horizontal plane and with a plough resting on top surface of disc divert the materials dropping on the disc from a chute of feed conveyor to down below on the stacker conveyor for stockpiling in radial blending system.

**3.138 Double Boom Stacker** — A liner mobile machine consisting of a pair of boom conveyors on opposite directions which make the linear stock pile on both sides along the track alternatively or simultaneously receiving incoming material from common yard belt conveyor.

**3.139 Down Hill** — The position of boom conveyor when it is lowered below from its horizontal position and material is carried on the belt towards gravitation.

**3.140 Idle Time** — All such time during which the machine is idling to the assigned performance in each operating cycle and for which due consideration is taken in design to meet the rated average capacity of the machine.



Cutting length for a particular position of bucket is given by  $\delta\phi + w$ , which is same as  $\delta \sin \phi + w$  for a sharp cornered bucket,

where

- $\delta\phi$  = Slice depth at angle,  $\phi$ ;
- $w$  = Slice width; and
- $\delta$  = Slice depth or advance of the bucket centre.

Average cutting length ' $l_m$ ' considering all the buckets engaging the sickle and applying correction factor for rounded corners of bucket knives;

$$l_m = \frac{1}{\phi H} [K_m \delta (1 + \cos \phi) + B. \phi H]$$

where

- $\phi H$  = Angle in radians between bottom and top of the cut sickle;
- $K_m$  = Correction factor for rounded knife corner;
- $H$  = Slice height; and

$W$  = Slice width.

FIG. 2 CUTTING LENGTH AND WIDTH

**3.141 Drive Base Plate** — A fabricated and top machined base on which drive units in complete assembly is mounted for perfect alignment.

**3.142 Drive Bogie** — A bogie whose all the wheels are connected with drive units imparting travelling motion.

**3.143 Driven Bogie** — A bogie whose connected wheels are propelled by those of drive bogie.

**3.144 Drum Type Reclaimer** — A mobile machine having cylindrical drum spanned across the pile and rail rack with number of buckets staggered mounted along the outer periphery of drum to reclaim the materials. A conveyor mounted the pile and rail track with number of buckets staggered mounted along the outer periphery of drum to reclaim the materials. A conveyor mounted inside the drum or by the side of it receives the reclaimed material from buckets and carries it in the transverse direction of the pile and discharge to a ground based conveyor along the track.

**3.145 Dummy Shaft** — A hollow fabricated shaft which is placed in position prior to inserting the slewing drive pinion shaft in turntable for sake of alignment.

**3.146 Eccentric Disc** — In harrow reciprocating drive, a disc mounted out of centre on a shaft converting rotary motion to reciprocating motion.

**3.147 Eccentric Pin** — The pins used to hold the buckets on bucket wheels permitting the buckets adjustment to maintain uniform lip circle.

**3.148 Electric Slewing Drive** — A slewing drive by means of electric motor.

**3.149 Electric Mechanical Actuator** — A device which gives actuating motion through the combination of electric motor and mechanical elements.

**3.150 End Carriage** — Structures supporting the ends of the reclaimer bridge which in term is supported on single or multi wheel bogie travelling on rail track.

**3.151 End Cones** — In process of making stockpile, the bulk material at ends of pile forms the shape of inverted semicircular cone at its natural angle of repose in which volume of material content is not uniform at different cross-section.

**3.152 End Frames** — The fabricated structure holding both ends of reclaimer bridge and resting on end carriage or traversing truck frame.

**3.153 End Stops** — The stands with cushion pads placed at the ends of rail tracks to stop by buffer action the mobile machine from further movement.

**3.154 Equalizer** — A mechanical or hydraulic device which compensates/equalizes movements of forces.

**3.155 External Gear Rim** — A gear cut along the outer periphery of slewing bearing to slew the boom in mesh with pinion with required reduction in slewing speed.

**3.156 Feeder Conveyor** — A short belt conveyor mounted across the boom to transfer the reclaimed material on to the boom belt, receiving from bucket wheel discharge zone, in case the direction discharge slope from bucket wheel to boom belt is not available.

**3.157 Festooned Cables** — Means of supplying electric current to carriage traversing on bridge girder for runways of limited length on straight tracks, through the medium of flexible cables running parallel with the track. The flexible cable is suspended from a light auxiliary track or taut wire and the festooning is taken up as the carriage travels away from the fixed end of the cable.

**3.158 First-in First-Out** — When reclaiming of the pile is started from the edge that has been at the beginning of stock piling.

**3.159 First-in Last-Out** — When the reclaiming of the pile is started from the edge that has been at the end of stock piling.

**3.160 Flanged Wheel** — A travelling wheel with single or double flange(s) on outer periphery to act as guide on the rail track.

**3.161 Flat Top Harrow** — A harrow having its top structure flattened in order to approach the entire top area of radial stockpile while agitating the cross-sectional pile surface with reciprocating motion.

**3.162 Fleeting Sheave** — A sheave that floats axially with the rope to provide a fair lead into a winch drum.

**3.163 Flexible Coupling** — A mechanical device that connects two shafts to transmit torque without slip accommodating misalignment between axially oriented driven machine members,

**3.164 Flight** — plane or shaped plates in the form of blades attached at equal spacing's with conveyor chain to push the materials.

**3.165 Flight Attachment** — The elements assembled to the flights and are used to connect them to the conveyor chain(s).

**3.166 Flight Conveyor** — A conveyor comprising one or more endless propelling chain(s) to which flight are attached to push or drag the materials.

**3.167 Flop Gate** — A hinged or pivoted fabricated plate operated manually or with remote control to direct the material flow in selective direction generally in case of bifurcated chute.

### **3.168 Forward Speed**

- a) A travelling motion of truck/carriage in forward direction of controlled speed to reclaim the stockpile at rated capacity of reclaimer; and

- b) A travelling speed of stacker truck in forward direction fixed in relation with the tripper/triller belt speed in the same direction in order to stock the uniform volume of material on the pile along the pile length.

**3.169 Four Point Support** — Consists of four independent supports not inter-equalized between each other although each support independently could consist of one, two or more equalized wheels.

**3.170 Gantry Cone** — A plate fabricated structured in the shape of a cone used as a superstructure for boom type bucket wheel reclaimer.

**3.171 Gear Casing** — An encloser around a gear train to protect from dust ingress and retain lubricants.

**3.172 Gear Guard** — A covering fully or partly for the safety purpose.

**3.173 Grade Line** — The base line from which the elevation of various points of machine structures are referred for measurement.

**3.174 Gradient** — The rate of incline or decline in terms of degree in the rail track on which stacker or reclaimer, etc., travels.

**3.175 Grizzly** — A device made up of bar mesh placed below discharge point for coarse screening or scalping of bulk material.

**3.176 Ground Contact Area** — Area of crawler track in contact with the ground which depends on load, penetration, ground material, etc.

**3.177 Ground Load** — Load out of dead weight of machine structures or dynamic force of its operation being transferred onto the foundation through anchorage.

**3.178 Ground Pressure** — The weight or load of a machine per unit area of ground contact.

**3.179 Guide Angle** — A device made up of angle section or fabricated channel shape and hung from reclaimer bridge supports and also guides the chain rollers of scraper chain conveyor.

**3.180 Hand Winch** — A worm wheel type winch operated manually for harrow hoisting.

**3.181 Harrow** — A set of fabricated frame projected below the reclaimer bridge to hold guide angle or channel track through which scraper conveyor chain moves in the set direction.

**3.182 Harrow Base** — The bottom structural part of harrow which is connected with reclaimer bridge with hinged connection,

**3.183 Harrow Frame** — The structure which links the harrow with travelling carriage on reclaimer bridge with hinged connection.

**3.184 Harrow Reciprocation** — Harrow mounted at the side of reclaimer bridge on guide shaft with roller achieves reciprocating motion across the pile face — through reciprocating drive unit.



- 3.185 Harrow Structure** — The fabricated body of harrow on which spikes are fitted.
- 3.186 Harrow Teeth** — Set of sized steel rods or bars fitted at the face of harrow structure projecting downwards to agitate the pile surface.
- 3.187 Harrow Travel** — Harrow mounted on travelling carriage (harrow wagon) gets travelling motion across the pile face.
- 3.188 Harrow Travel Speed** — The travelling speed of the carriage at which harrow moves across the pile.
- 3.189 Harrow Wagon** — A travelling carriage on which a pair of harrow is mounted through frame structure and imparts motion to the harrow by its travelling to and fro over the reclaimer bridge. Also supports the pylon through which rope winch mechanism is operated for harrow hoisting.
- 3.190 Head Discharge** — Discharge of material taking place at head end (pulley) from boom conveyor.
- 3.191 Head End** — The farthest end of the cantilevered boom structure at which conveyor pulley, bucket wheel, drive unit of bucket wheels, etc., are mounted.
- 3.192 Head Room** — The vertical distance needed to make possible a workable arrangement of a specified piece of equipment or portion thereof on machinery floor.
- 3.193 Head Sprocket** — Any sprocket mounted on driving shaft for scraper chain conveyor.
- 3.194 Height of Pile** — The vertical distance of pile top from bed or ground level on which pile is stacked.
- 3.195 Hinged Boom** — When the tail end of the boom is supported on the pivoted or hinged bracket. On the turntable or machine body.
- 3.196 Hinged Joint Type Chain** — A chain made up of links with a hinge type joint.
- 3.197 Hinged Support** — When the cantilevered structure such as boom, harrow, etc., are supported on one end with the bracket with pin connection.
- 3.198 Hoist** — Pneumatic, hydraulic or rope winch type luffing arrangement for boom or harrow, etc.
- 3.199 Hoist Device** — Wire rope winch mechanism, hydraulic cylinder, etc., giving hoisting motion to boom or harrow.
- 3.200 Hoisting** — The motion of lifting or lowering of boom, stacker conveyor or harrow in vertical plane by means of hydraulic cylinder or rope winch mechanism.
- 3.201 Homogenizing** — In preblending system pile surface is stirred with harrow spikes then reclaimed by scraper conveyor or bucket wheel consequently the material of different quality gets mixed which is termed as homogenizing.

**3.202 Hopper** — A sort of container with wide top and narrowed bottom to receive material of different quality gets mixed which is termed as homogenizing.

**3.203 Hopper Car** — A mobile equipment consisting of a hopper body mounted on carriage receives reclaimed bulk material from pay loader, shovel or boom conveyor and loads on to yard belt placed under its carriage.

**3.204 Hurricane Anchor** — Used for anchoring a mobile machine to the ground at a predetermined location by means of either guy ropes or mechanical devices in the eventuality of critical high velocity winds.

**3.205 Hydraulic Bucket Wheel Drive** — Where the bucket wheel is driven through hydraulic motor, pump, etc.

**3.206 Hydraulic Cylinder for Cabin Stabilization** — When the cabin is kept horizontal irrespective of boom position through hydraulic cylinder.

**3.207 Hydraulic Cylinder for Skirt Lifting** — When the tail skirt on boom conveyor is lifted to pass out the reclaimed material through hydraulic cylinder.

**3.208 Hydraulic Drive** — A drive through hydraulic motor and pump.

**3.209 Hydraulic Lifting Mechanism** — The device where liquid pressure is applied for luffing the boom, harrow, etc., such as hydraulic cylinder.

**3.210 Hydraulic Luffing** — When a cantilevered structure or boom with one end hinged or pivoted is rotated up and down in vertical plane by means of hydraulic cylinder(s) is referred to as hydraulic luffing.

**3.211 Hydraulic Slewing Drive** — Where the boom slewing operation is achieved through hydraulic motor, pump, etc.

**3.212 Impact Carriage** — Normally used with all reclaiming equipment and consists of a separate structural frame fitted with rubberized impact idlers and intended for the protection of belting (on long yard conveyor) against direct impact and avoiding spillage in course of such material transfer.

**3.213 Inner Ring** — Inside ring of slewing bearing.

**3.214 Interlocking Control** — A system of electrical remote control which starts and stops the various drives of different components of the machine in predetermined sequence.

**3.215 Intermediate Conveyor** — A loop conveyor introduced in boom type reversible reclaimer to transfer the incoming material from yard belt on to the boom conveyor for stacking and remains idler in case of reclaiming when yard belt is reversed to carry the reclaimed material.

**3.216 Intermediate Drive Shaft** — A drive shaft mounted on truck frame in between two wheels and drive the wheels through a pinion mounted on it and in mesh with gear rims fitted on driven wheels.

**3.217 Internal Gear Rim** — Slewing bearing consisting of inner rim with gear teeth along its Periphery.

**3.218 Jack** — An adjusting support with levelling feature.

**3.219 Jack Shaft** — A secondary or intermediate shaft supported on independent bearings and pillow blocks and placed between drive shaft of carriage, etc., and the source of power.

**3.220 Jib** — A structure mounted with pivoted bracket on superstructure connects the boom through bale suspension and held the counterweight on other end for balancing the boom.

**3.221 Jib Bracket** — Pivoted or hinged bracket on through which jib is mounted on superstructure.

**3.222 Jogging** — The quickly repeated closure of an electric circuit to start a motor from rest for the purpose of accomplishing small movements of the driven machine.

**3.223 Keeper Plate** — A plate used to retain the pin, sprocket, hub, etc., from shifting against lateral force.

**3.224 Lagging Chain Scraper** — In series the preceding chain conveyor which reclaims the material from pile and pushes it to the reach of succeeding one for on-ward scraping.

**3.225 Leading Chain Scraper** — In portal type reclaimer, the chain scraper which drags the material brought in its reach by preceding chain scraper and discharges on to the ground based conveyor at one side along the track.

**3.226 Length of Boom** — Total length of the boom measured along its axis from center line of bucket wheel/discharge pulley to its articulated/support at the tail end.

**3.227 Level Indicator** — An electric or electronic device to control the pile height as well as to ensure a safe distance between the stacker boom and top pile in course of stock piling.

**3.228 Level Luffing** — A luffing motion during which the boom, stacker conveyor or harrow is maintained at a constant height during its operation.

**3.229 Lifiable Skirt Board** — The skirt board at tail end of boom conveyor subject to lifting for passing out reclaimed material for tail discharge.

**3.230 Lifting Power** — Power required lifting the material from bottom digging zone up to the final discharge point by the digging wheel.

**3.231 Lifting Mechanism** — The device, be it hydraulic cylinder, rope winch, etc., to effect the lifting of boom or harrow.

**3.232 Lifting Tackle** — Various elements, namely sheaves, pulley blocks, pins, thimbles, etc., that constitute the parts of rope winch luffing mechanism for harrow or boom hoisting.

**3.233 Lifting Work** — The amount of work done in lifting the material from bottom digging zone up to the discharge point by the digging wheel.

**3.234 Lip Circle** — The periphery generated by lip radius of bucket wheel.

**3.235 Lip Diameter** — The distance between two bucket lips measuring through the centre of bucket wheel.

**3.236 Lip of Bucket** — The front edge of bucket used for cutting the material.

**3.237 Lip Radius** — The distance of any bucket lip from centre of bucket wheel.

**3.238 Lip Speed** — The tangential speed of bucket wheel along its lip circle.

**3.239 Linear Blender** — The bridge type scraper reclaimer travelling on linear track for blending (*see* 3.313).

**3.240 Linear Blending** — The process in which the linear pile of several layer of different material composition is agitated by harrow across the triangular cross-sectional surface and reclaimed by scraper chain conveyor mounted on the bridge and travelling on the two rails each laid along the outer edges of the triangular pile.

**3.241 Linear Rail Track** — Rail tracks laid in straight line for stacker or reclaimer travelling on it.

**3.242 Linear Speed** — Carriage, bogie, etc., travelling on rail track at predetermined speed is referred to as linear speed.

**3.243 Linear Stacker** — Single or double boom stacker travelling on straight rail track used to stock pile the bulk material along the track.

**3.244 Linear Stacking** — Stockpiling of bulk material in triangular cross-section in a straight line parallel to rail track by traveling type boom stacker.

**3.245 Linear Plate** — Removable plate of abrasion resistance lines on abrasion prone area of chute plate or back plate to protect the mother plate from wearing fast.

**3.246 Lubrication** — The process of greasing the wear prone surfaces of various parts of the machine either by group or centralized lubrication method.

**3.247 Luffing** — Angular movement of boom, stacker conveyor or harrow in a vertical plane.

**3.248 Luffing Angle** — The inclined position of the stacker conveyor (boom) at which it is kept to stack the material.

**3.249 Luffing Conveyor** — The cantilevered belt conveyor hinged at tail end and hoisted up and down from its horizontal position in vertical axis to stockpile the bulk material.

**3.250 Luffing Hoist** — Hydraulic or rope winch device used to rotate the stacker conveyor (boom) in upward or downward direction from horizontal position in vertical plane.

**3.251 Luffing Range** — The angle between two extreme inclined positions of the stacker conveyor with respect to its horizontal position when it is hoisted.

**3.252 Maintenance Speed** — The speed at which the machine travels or is moved to reach parking place for maintenance. This speed is generally higher than the operational speed.

**3.253 Manual Rail Clamp** — A mechanical device fitted with travelling bogie or truck to hold the track rail being operated by hand wheel.

**3.254 Maximum Angle of Inclination** — Permissible limit of boom conveyor inclination beyond which rolling back of bulk material takes place while stacking.

**3.255 Maximum Lip Speed** — Permissible limit of peripheral speed of bucket wheel beyond which the material in bucket may be thrown beyond the discharge-passage in wheel causing spillage over the structure.

**3.256 Maximum Number of Bucket Discharge** — The permissible limit over which the bucket may pass over the discharge zone before the material content inside the bucket may be fully emptied. Such limit varies from material to material in digging operation.

**3.257 Neoprene Buffer** — The buffer made of neoprene material.

**3.258 Nominal Volume of Bucket** — The theoretical volume of material inside the bucket and in the ring space of bucket wheel.

**3.259 Non-Drive Bogie** — The bogie whose connected set of traversing wheel(s) is (are) propelled by the wheel(s) of drive bogie.

**3.260 Non-Driven Shaft** — The shaft of wheel fitted with non-driven bogie.

**3.261 Non-Driven Wheels** — Set of traversing or travelling wheel(s) those are fitted with non-driven bogie.

**3.262 Non-Operating Wind** — Wind at high velocity during which the mobile equipment is not operated for safety reasons.

**3.263 Open Gear** — Auxiliary gear mounted on traversing wheel shaft or on winch shaft for further reduction of speed already accomplished by reducer in the sequence.

**3.264 Open Gear Ratio** — The amount of reduction in speed by the use of a pair of open gears.

**3.265 Operating Wind Velocity** — The range of wind velocity up to which the equipment is permitted for operational and due consideration of pressure arising out of such wind velocity is taken into account in design of machine structure and driving components.

**3.266 Operational Speed** — Predetermined and controlled movement of carriage, bridge or bogie on rail track when the machine is operated to reclaim the material from pile.

**3.267 Operator's Cabin** — Strategically mounted on the equipment for equipment control from a centralized location to enable the operator to coordinate machine operation along with signals from other ground based equipment in the total system.

**3.268 Outer Ring** — The circular plate work on the outer face of the bucket wheel which makes the room for material inside bucket till it reaches the discharge spot.

**3.269 Output Pinion** — Pinion mounted on reduced output shaft for power transmission.

**3.270 Overload Release** — A mechanism of electrical equipment to disconnect driven component from motive force in case of overload on digging wheel, harrow, scraper conveyor, etc.

**3.271 Pad (Shoe or Plate)** — Ground contact part of crawler type track.

**3.272 Paddle** — Constructed of steel and suitably lined blades constitutes the major rotating and reclaiming element on underground reclaiming equipment.

**3.273 Paddle Feeder** — An underground reclaiming equipments consisting of truck carriage for its mobility on rail track and paddles as reclaiming element. Rotating set of paddles extract the material from longitudinal slot of the hopper along the track and feed the material on to the underground conveyor belt passing over impact section fitted with the machine underneath.

**3.274 Pass** — A working trip of passage of digging wheel across the stockpile face, in case of rotary type bridge reclaimer.

**3.275 Pay Loader** — A crawler mounted earth moving equipment consisting of a picking bucket and link mechanism to pick up recommended quantity of material and load it on to the hopper car, etc.

**3.276 Permissible Slewing Speed** — The maximum speed of boom slewing, in relation with the predetermined bucket wheel lip speed up to which the material content in each sickle cut by bucket wheel may remain consistent in view of uniform reclaim capacity.

**3.277 Pillow Block** — A bearing block or housing with flat mounting surface to accommodate and guide the bearing and transfer the load through anchorage.

**3.278 Pivot Bracket** — A hinge support.

**3.279 Planetary Drive** — A gear drive consisting of a ring gear, a set of planet gears and a sun gear generally used for digging wheel drive.

**3.280 Portal Scraper** — The equipment consists of a portal as a main body spanned across the stockpile. Portal supports one or two chain scraper for reclaiming the pile from its surface. Both ends of portal are mounted on bogies travelling on rail tracks for the portal movement.

**3.281 Power Pack Hydraulic** — A hydraulic package unit consisting of hydraulic motor, pump, container valve and other accessories for hydraulic drive.

**3.282 Power Pack Electrical**

**3.283 Pre-Blending** — A combined function of stockpiling the incoming material of different composition in layers.

**3.284 Pre-Blending System** — An arrangement of feeding and stacking operation in sequence for pre-blending.

**3.285 Primary Sampler** — The sampling device used to analyses the incoming material of stockpile for pre-blending system.

**3.286 Propeller Shaft** — A drive shaft that connects the gear box mounted on digging wheel shaft to prime mover mounted at a distance on boom structure in non-axial plane or at different level with the help of universal coupling.

**3.287 Pylon** — A vertical structure on harrow wagon or travelling carriage on which rope winch assembly is mounted for harrow hoist.

**3.288 Rack and Pinion Gate** — A gate fitted under reclaim hopper having gate plate operated by means of a rack and pinion gear set to adjust the bottom opening of hopper for controlled flow of material on to the reclaim conveyor.

**3.289 Radial Blending** — Combined function of stockpiling the material of different composition in layers by radial stacker and reclaimed from the stockpile across cross-sectional surface by scraper reclaimer in combination with harrow or rake.

**3.290 Radial Rail Track** — Rail laid along the specified outer periphery of circular pile with reference to central column on which the radial stacker or reclaimer travels for desired operation.

**3.291 Radial Stacker** — The machine having a boom conveyor mounted on a superstructure capable of slewing around a fixed central column and stockpiling the material in a circular form or triangular cross-section.

**3.292 Radial Stacking** — The function of stockpiling the material in circular shape by radial stacker.

**3.293 Rail Centres** — The exact distance between centre lines of pair of rails of a track.

**3.294 Rail Clamp** — A manually, electrically or electro-hydraulically operated device to clamp the equipment to rails during high wind. The electrically operated rail clamps can sometimes be made operable by direct signals from the anemometer.

**3.295 Rail Fixtures** — Insert plates, holding plates, anchorage, etc., by which rail bottom is anchored with track foundation.

**3.296 Rail Foundation** — Ballasted or fully concrete work on which rail track is laid.

**3.297 Rail Cap** — The space between two rail edge in a track which is kept to cater for linear thermal expansion.

**3.298 Rail Misalignment** — Deviations from the specified dimensions of track with respect to vertically or parallelity of the rails.

**3.299 Rail Mounted Bucket Wheel Boom Reclaimer** — A reclaimer having a boom conveyor mounted on superstructure capable of slewing in either direction. Superstructure consisting of vertical mast (tower), jib and counterweight, etc., supported on under carriage of truck wheels. A bucket wheel mounted at head end reclaims the materials by slewing and luffing action of boom from stockpile on either sides of rail track.

**3.300 Rail Mounted Double Boom Stacker** — A stacker similar to **3.357** but having two boom conveyors and capable to create stockpile on either sides of track length.

**3.301 Rail Mounted Single Boom Stacker** — A stacker having a boom conveyor mounted on structure in a direction perpendicular to rail track and a carriage of wheel trucks capable to create triangular stockpile on one side of track length by means of boom luffing and travelling to and fro on the rail track.

**3.302 Rail Mounted Slewing Boom Stacker** — A stacker having a boom conveyor mounted on a superstructure capable of slewing in either direction of rail track and mounted on a carriage of wheel track, treat trapezoidal pile on either sides on rail track length by means of boom luffing and slewing and travelling to and fro on the rail track.

**3.303 Rail Stop** — A stop mounted at the ends of rail track of mobile equipment to stop the travelling wheels from further movement.

**3.304 Rail Sweep** — A device attached with front and rear bogies of mobile machine to clean the rail for smooth travel of wheels.

**3.305 Rail Track** — Parallel rails laid at specified centre distance of gauge along the length of stock pile on which the mobile stacker reclaimer, etc., travel for designed operation.

**3.306 Raking Face** — The bottom surface of a rake fitted with spikes in contact with materials while stirring the cross-sectional surface of the pile with traversing or reciprocating motion.

**3.307 Raking Wheels** — A set of wheels under the raking carriage to travel on a rail track to provide motion to the rake.

**3.308 Reclaimer** — A equipment capable of reclaiming material from stockpile by means of bucket wheel/scrapper/drum or any other device as its main reclaiming element.

**3.309 Reclaiming Conveyor** — A belt conveyor mounted on bridge, drum, underground or ground based to carry reclaimed material from bucket wheel, bucket drum or scraper conveyor and discharge to a further location along the system.

**3.310 Reclaiming Equipment** — An equipment capable of reclaiming material from storage.

**3.311 Reclaimer Hopper** — An underground hopper to receive reclaimed material and guide its flow on to underground reclaim conveyor.

**3.312 Reclaimer Bridge** — A latticed or box constructed frame spanned across the stockpile. By supporting chain scraper together with harrow or bucket wheel with harrow to reclaim the pile.



**3.313 Reclaiming Capacity** — The volumetric capacity of reclaiming equipment is the quantity of material in terms of volume reclaiming equipment is rated to reclaim from a defined pile in an hourly period.

**3.314 Regenerative Drive** — A drive, when the operation of conveyor results in power being produced and absorbed by prime mover.

**3.315 Regulating Gate** — A gate fitted below the reclaim hopper or bypass hopper to vary size of opening in order to control the flow of material through the hopper bottom opening.

**3.316 Reversible Stacker-cum-Reclaimer** — A combined stacker and reclaimer machine used in conjunction with a bidirectional yard conveyor permitting the reclaimed material to be conveyed back in the same direction from which it was initially brought for stockpiling.

**3.317 Ring Space** — Space available below the bottomless bucket covered by backing plate inside the outer ring of cell-less bucket wheel.

**3.318 Ring Volume** — Material content held by backing plate inside ring space in the cell-less bucket wheel.

**3.319 Rollers Guide** — Set of rollers fitted with bracket capable to guide the movement of bogie, harrow or bucket wheel on bridge carriage.

**3.320 Roller Guide Bracket** — An attachment fitted with truck harrow or carriage frame to hold or support the rollers for guided movement.

**3.321 Rope Equalizer** — A device which offset the difference of stretches in two parallel running ropes employed for harrow or boom hoisting.

**3.322 Rope Pulley Support** — A fabricated construction to mount the rope sheaves.

**3.323 Rope Type Raker** — A raker or harrow having spike-edges connected with tar steel ropes in longitudinal direction of pile surface such that with the movement of raker, the tar steel ropes wipe the material on the pile surface dropping the material to-the root of pile for reclaiming.

**3.324 Rope Winch Mechanism** — A device in which a set of wire rope passing over set of sheaves is connected with boom or harrow and wrapped round a grooved or plain drum. The drum is driven through a prime mover and reduction units and rope being wound or unwound over the drum impact the movement to the boom or harrow in vertical plane for hoisting operation.

**3.325 Rotary Reclaimer** — A reclaimer having a large bucket wheel capable to rotate around a bridge spanned across the stock pile and mounted on two end carriages of truck wheels on rail tracks laid along the length of outer edges of pile. Bucket wheel and harrow together mounted on a traversing carriage on the bridge length, reclaim the pile and discharge the material on a reclaim belt conveyor mounted on the bridge which carry the material in transverse direction of the pile and discharge onto the ground based conveyor by the side of track.

**3.326 Rotating Cone** — A plated construction of conical shape constituting as the superstructure of digging wheel boom reclaimer capable to rotate in either direction on slewing bearing for digging (reclaiming) or operation.

**3.327 Rotating Chute** — A chute rigidly attached with stacker boom and mounted on a carriage frame fitted with rollers capable to rotate along with stacker boom on a circular rail track around central column, such that the chute receives the materials from feed conveyor and transfer on to stacker conveyor for stockpiling.

**3.328 Safety Ladder** — A ladder provided with safety cage to climb on high level platform of equipment.

**3.329 Sampler** — A device having a reciprocating cutter element for periodically collecting samples from main stream of material flow to analyze the chemical composition of materials incoming to or outgoing from a pile.

**3.330 Scraper Bridge** — A plate, box or latticed construction spanned over the cross — section of stockpile supporting chain scraper for reclamation.

**3.331 Scraper Reclaimer** — A portal or bridge type reclaimer having chain scraper as a main reclaiming element.

**3.332 Scraper Teeth** — The set of teeth made of hardened material fixed on either side edges off scraper blades to loosen the materials on the root of the pile for easy scrapping.

**3.333 Screw-Cage Reclaimer** — A mobile machine comprising essentially of a latticed, tubular structure carrying the buckets arranged in the form of a screw with reclaiming operations covering the entire width of the stockpile through a cross conveyor mounted on the machine.

**3.334 Sectional Stacking** — The operation in which a rail mounted slewing stacker creates a stockpile covering the entire width of trapezoidal cross-section from one end to the other along the track length.

**3.335 Semi-Cell Type Bucket Wheel** — Buckets, with back open, are mounted on outer edge of the wheel and a radial guide plate on the inside of the wheel is connected to the back of the buckets. The inside of the wheel has a conical shape in order to convey the material on to the boom conveyor belt.

**3.336 Semi Portal** — An inclined portal with the end resting on a set of truck frames mounted on one rail near the base of pile and other end resting on set of truck frames mounted on an adjacent rail a level higher than the top of pile and does not completely encompass the traverse dimensions of the stockpile.

**3.337 Semi-Portal Scraper** — An equipment having chain scraper supported on semi-portal for reclamation of a pile.

**3.338 Service Factor** — The amount by which rating of unit is reduced to compensate for increased service requirement over the rated condition.

**3.339 Ship Loader** — A rail mounted travelling portal type machine having a cantilevered shuttle stationary conveyor for loading or trimming of vessels or ship holds.

**3.340 Shuttle Conveyor** — A belt conveyor in a self-contained structure capable of travelling to and fro in defined range of rail track mounted on wagon loader structure for loading the rake of wagons.

**3.341 Side Scraper** — A chain scraper that reclaim the material from one side surface of a stockpile.

**3.342 Single Boom Stacker** — A stacker machine having one boom conveyor capable of luffing (and slewing in case of slewing stacker) to create stockpile.

**3.343 Skip Width Chain** — A chain having one row of links.

**3.344 Skip Hoist (inclined/Vertical)** — An equipment with multi wheeled bucket or car operating up and down a definite path, through wire rope receiving and discharging bulk material on an inclined/vertical track carved at the top to tip and empty the skip automatically for loading or stacking piling.

**3.345 Skirt Board** — A plate construction to form a trough guide on receiving loading zone of a conveyor to guide the stream of material.

**3.346 Slewing Angle** — Amount of angular displacement of the boom (along with digging wheel) in horizontal plane in either direction with respect to centre line of rail track or crawler track.

**3.347 Slewing Arrangement** — Clamp or king pin and roller or geared slewing bearing design to permit the slewing of a boom or an entire superstructure subject to slewing.

**3.348 Slewing Bearing Gear Rim** — A slewing ring bearing with gear rim fitted on its external or internal face to get engaged with driving pinion for slewing motion of the superstructure.

**3.349 Slewing Boom** — A boom supported on and suspended from a superstructure subject to slewing in its horizontal plane.

**3.350 Slewing Drive** — Means of driving slewing arrangement such as electric motor in combination with reduction unit or hydraulic pump motor.

**3.351 Slewing Range** — Pre-determined amount of angular displacement in horizontal plane that the boom, (along with digging wheel) undertakes in either direction with respect to centre line of rail or crawler track.

**3.352 Slewing Ring** — The circular ring fitted with rollers or antifriction bearing on which one end of boom, stacker portal or reclaimer bridge is mounted for slewing movement.

**3.353 Slewing Ring Bearing** — A large circular ring fitted with row(s) of ball or roller bearing that supports the superstructure permitting slewing movement.

**3.354 Slewing Speed** — The speed at which the boom (along with digging wheel) rotates in horizontal plane.

**3.355 Slewing Stacker** — A stacker having a boom conveyor mounted on slewing structure capable of rotating in either direction of rail track (in case of rail mounted) or of rotating all around the vertical axis of the stacking structure (in case of fixed ground mounted) to create linear trapezoidal or circular conical stockpile.

**3.356 Slewing Structure** — A sturdy structure accommodating boom, counter-weight, tower, luffing hoist, etc., capable of slewing through a pre-determined arc (in either direction) by means of a power drive unit driving the slewing arrangement.

**3.357 Sliding Base** — A support providing controlled movement.

**3.358 Slide Gate** — A type of gate in which the gate plate slides in guides to adjust the hopper opening for controlled flow of material.

**3.359 Slide Ring for Portal** — A circular ring fitted with guide rollers mounted along the periphery of central column through which one end of portal is supported on column for its radial movement.

**3.360 Slide Ring for Scraper** — Similar to **3.330** except that the scraper bridge is mounted through it for radial movement.

**3.361 Slinger** — A device mounted at the bottom of the discharge chute to permit high speed aligning of material and maximum loading in a ship, especially in case of handling relatively low density material like coal.

**3.362 Slope** — The inclination or angle at which the cross-sectional face of pile stays while being reclaimed. Also the rate of incline or decline in terms of degrees from the horizontal or percentage rise from horizontal for a rail track or pile bed in a yard.

**3.363 Span** — Length of the bridge or portal encompassing across the pile to be mounted on the parallel rails close to outer edges of the pile base.

**3.364 Speed Reducer** — A power transmission mechanism designed to provide either a constant or variable speed for the driven equipment less than that of prime mover. Normally totally enclosed for lubrication and prevention of entry of foreign material.

**3.365 Spring Take-up** — A take-up mechanism where adjustments are made automatically by the potential energy of spring.

**3.366 Sprocket** — A wheel with suitably shaped and spaced kegs or teeth on its circumference to engage with the link of a chain.

**3.367 Sprocket Ratio** — The ratio between number of teeth of driven and driving sprockets respectively and indicating the change of speed existing through a chain drive.

**3.368 Stability Factor** — A ratio of the stabilizing moment and the overturning moment for any given equipment.

**3.369 Stable Slope** — The condition of cross-sectional surface of a stock pile where the materials stay firm even at higher slope than natural angles of repose in case of cascading underneath by digging wheel.

**3.370 Stacker** — The mobile equipment that creates the pile of bulk materials (*see also* **3.243** and **3.291**).

**3.371 Stacker Conveyor** — A belt conveyor mounted on boom capable of luffing and slewing and creating stockpile.

**3.372 Stacker Portal** — The portal supporting the stacker conveyor for creating stockpile.

**3.373 Stacker Portal** — process of stockpiling the material by liner or radial stacker (*see also 3.243 and 3.291*).

**3.374 Stack Rate** — A combined stacking and reclaiming machine comprising two separate booms—one with chain and flights for reclaiming and the other a conveyor boom for stacking—all mounted on a common carriage supported on wheeled track running on rail track along the stockpile.

**3.375 Starting Time** — Duration of time taken by a driven component of equipment to pick up its full running speed.

**3.376 Stringers** — The longitudinal supporting members normally of angle or channel sections for idlers mounting between the head and tail terminal supports of a conveyor.

**3.377 Superstructure** — A set of sturdy structured construction consisting of vertical tower, job, counterweight, etc., and supported on under carriage through rotating element (slewing bearing).

**3.378 Support for Disc Feeder** — A ring with roller, etc., mounted along the periphery of central column supporting the disc plate for its rotation in horizontal plane,

**3.379 Surge Hopper** — A properly shaped container to receive surge flow of material and pass it on to succeeding element of equipment.

**3.380 Suspension** — The state in which the boom or harrow is held at certain angle against gravity by a counter balancing weight through bale ropes or strut ties.

**3.381 Swivel Leg** — The bracket fitted with ball and socket or cup and cone through which the stacker portal or reclaimer bridge is mounted on truck carriage to cater for radial thrust and help maintain radial movement.

**3.382 Table Diameter** — The diametrical dimension of the circular horizontal disc plate of table (disc) feeder.

**3.383 Tail Discharge** — Material transfer taking place at tail pulley of boom conveyor being reversed when reclaiming.

**3.384 Tail Drive** — Drive unit connected to the shaft of tail pulley of boom conveyor.

**3.385 Tail Shafts** — The shaft supporting tail pulley or sprockets of boom conveyor, reclaim conveyor and chain scraper.

**3.386 Tail Skirt Board** — Skirt board fitted at tail end of boom conveyor.

**3.387 Tail Sprockets** — Sprockets mounted on tail shaft of chain scraper.

**3.388 Telescopic Chute** — Consists of a number of collapsible square or circular tubular members which are lift able or made collapsible by means of a rope hoist, commonly used for stacking equipment and ship loaders to minimize dust nuisance.

**3.389 Torque Arm Drive** — A type of drive incorporating a shaft mounted gear box (speed reduced) in which the developed torque is resisted by a pivoted connecting link between the gear box and a fixed anchor point on structure or frame.

**3.390 Tow-Bar** — Interconnecting element between driven and non-driven equipment such as between stacker/reclaimer and its trailer tripper.

**3.391 Tower** — The vertical structure of box or latticed construction forming the part of superstructure and resting on turntable supports the jib and counterweight for balancing cantilevered boom structure.

**3.392 Tow Pins** — Set of pins to hold the bar with the bracket fitted on stacker/reclaimer and trailer frame.

**3.393 Trailer (Tripper)** — Consists of a mobile structure fitted with discharge pulley and a set of idlers in an inclined disposition, with a main belt of the yard conveyor reeved about the discharge pulley and a separate bend pulley mounted on the structure. The material on the yard conveyor is elevated and discharged either to a separate intermediate (loop) trailer or directly to the boom conveyor for stock piling. The unit is attached to the main driven machine through interconnecting tow-bar or coupler to be propelled to and from on main rail track along with the main machine.

**3.394 Trailer (Tripper) Discharge Chute** — A chute that transfer the material from trailer (tripper) onto the boom conveyor or stacker conveyor for stockpiling.

**3.395 Transfer Car** — An independently mobile platform used for relocating stackers, reclaimers or the like from one pair of rails to another pair of rails tracks to enable rails a given stacker or reclaimer machine to handle more than one pile. The unit moves (travel) rails in a direction transverse to the length of the stockpile.

**3.396 Transfer Chute** — A chute mounted on transfer trolley orienting the material discharge from yard belt trailer onto the tail end of intermediate conveyor.

**3.397 Transfer Trolley** — Structure mounted on wheeled truck frames supporting the junction of yard belt and intermediate (loop) belt trailers where material is transferred from yard belt to intermediate conveyor belt for onward discharge onto the boom conveyor for stockpiling.

**3.398 Trapezoidal Pile** — A linear pile of bulk material with wide base and flat top and whose cross-section is in the shape of a trapezium.

**3.399 Traveling Mechanism** — A set of mechanical device equipped with pinion and rack or chain driven by prime mover through speed reduced imparting motion to harrow wagon or trolley for back and forth travel on rail track.

**3.400 Traverse Drive Unit** — A torque arm drive arrangement where one or more traversing wheel(s) fitted with truck frames or bogies is (are) connected to electric motor through shaft mounted speed reduced;

coupling, brake, etc., for travelling motion on rail track. In some cases, besides speed reduced, a set of pinion and gear rims are employed to drive the set of traversing wheels.

**3.401 Traverse Wheels** — Set of flanged or flanged-less (or flat) wheels fitted with bogies or carriage to roll on rail track imparting travelling or traversing motion to carriage or bridge in predefined path.

**3.402 Trench** — A long-narrow ditch below the base floor or normal grade to lay the power supply cables.

**3.403 Triangular Harrow** — A harrow structure made in triangular shape to cater for triangular pile surface in blending system.

**3.404 Triangular Pile** — A linear or circular pile of bulk material with wide base and zero width at top and whose cross-section is in the shape of a triangle.

**3.405 Trimmer** — A conveyor or other means to level or shape a bulk load in a bin, rail road car or ship's hold.

**3.406 Trolley** — A wheeled frame or carriage supporting associated components/equipment of main machine either self-driven or propelled by main equipment (*see also 3.180*).

**3.407 Truck** — A set of wheeled truck frames or bogies connected in series to support the carriage or main structure of the equipment.

**3.408 Turntable** — A horizontal frame subject to rotational movement with the help of slewing drive, such that boom or superstructure mounted on it is rotated or slewed along with in horizontal plane in the desired slewing range.

**3.409 Twin Boom** — A pair of boom structure equipped with conveyors mounted on a stacker at opposite direction (that is, at 180°) such that both the boom conveyors receiving material from trailer belt, it can stackpile the material simultaneously or alternatively along the track length.

**3.410 Twin Bucket Wheels** — A pair of bucket wheels-whether cell type, semicell or cell-less, mounted on a common shaft and independently driven simultaneously reclaim the materials against all sides of a ship hold ensuring no fouling of material with feeder conveyor on to which pair of wheels drop the materials.

**3.411 Under Carriage** — A sturdy box framed carriage that supports the turntable (slewable) through slewing bearing mounted on horizontal top surface and itself resting on truck frames through four or three-point supports.

**3.412 Under Carriage Beams** — The beams of box construction connecting the series of wheeled truck frames and supporting under carriage through combination of fixed and equalizer legs forming four-point or three-point supports.

**3.413 Uni-directional Reclaiming** — Stockpile being reclaimed with uni-directional movement of the machine. The reverse movement is meant for transposition of machine only.

**3.414 Valley Angle** — The angle to the horizontal subtended by the line of intersection of two inclined planes or two adjacent sides of a hopper or chute.

**3.415 Variable Speed** — The speed of slewable boom, travelling harrow or rotating digging wheel that varies or changes infinitely or in preset number of steps within designed limit.

**3.416 Vibrating Rake (Oscillating Rake)** — A taking device consisting of a tube fitted with excavator teeth and in addition with toothed traverse is mobile support at the carriage and at the top by hinged guide, thus capable of circular oscillating movement arising out from upward and traversing motion for cutting and dislodging the pile surface.

**3.417 Volumetric Capacity** — The rate of stacking, reclaiming or loading of bulk material in, terms of volume per hour ( $m^3/h$ ) by equipment.

**3.418 Wagon Loader** — A special machine specifically meant for loading wagons.

**3.419 Walkway** — A narrow platform with side hand railings along boom conveyor or bridge to provide access to various components.

**3.420 Wearing Bar** — A replaceable bar attached to a runway that protects the main member from wear or damage.

**3.421 Wearing Plate** — A replaceable plate that is placed at point, of wear, due to discharge of material, to protect the main member from wear or damage.

**3.422 Weigh Idler** — The conveyor idler mounted on the carriage of a belt conveyor scale.

**3.423 Weighing Device** — A hydro mechanical, pneumatic or electrical device that registers and/or control the amount of material being handled by batch or continuous weighing. It can be equipped with either visual indicators or automatic registering equipment of both. Can also be arranged to control speed to-compensate for lag in processing or non-uniform material load on conveyor.

**3.424 Weigh Lorry** — A travelling hopper for receiving, weighing and loading bulk materials on to the wagon. Remote control device for operating the bunker or bin gates is mounted on the lorry chassis.

**3.425 Weight Control System** — A weighing system in which the weight measurements are used to control the flow of material.

**3.426 Wheel** — A flanged or flange-less circular disc may be solid, built up or formed capable of turning (rolling) about its central axis or on integral ball bearings.

**3.427 Wheel load** — Load of the machine including all static, dynamic, wind or seismic forces transferred to rail through wheels under operating or non-operating condition.

**3.428 Wheel Truck** — A set of fabricated frames fitted with rolling wheels that supports the main structure or carriage or bridge of an equipment imparting motion to the supported member by revolutions or wheels.



**3.429 Winch** — A plane or grooved drum that can rotate so as to exert a storm pulls while winding in a line.

**3.430 Winch Assembly** — Winch equipped with worm wheel or gear and pinion, etc., for its rotation for hoisting of harrow or boom (stacker) conveyor.

**3.431 Winch Drum Shaft** — A shaft on which winch drum is mounted in such assembly where gear and pinion are employed for winch's rotation.

**3.432 Wind Row Pile** — A pile of bulk materials having different grain size and bulk densities that is made of number of short comes through entire cross-section of pile.

**3.433 Wind Row Stacking** — The stacking method in which the stockpile is made covering entire cross-section of pile in number of layers of small heights, by travelling the stacker to and fro with various hoist positions of boom being coordinated with particular slew positions, that is, combining travelling, hoisting and slewing motions simultaneously.

**3.434 Yard Conveyor** — A ground based conveyor running along the length of the stockpile that discharge the incoming material, namely, a tripper (and/or trailer) onto the mobile equipment meant for stacking or loading.