
Building construction machinery and equipment — Terms and definitions

*Machines et matériels pour la construction des bâtiments — Termes et
définitions*



Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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Scope

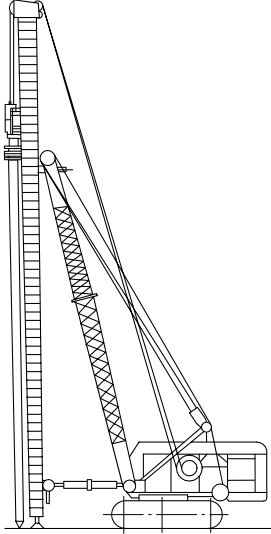
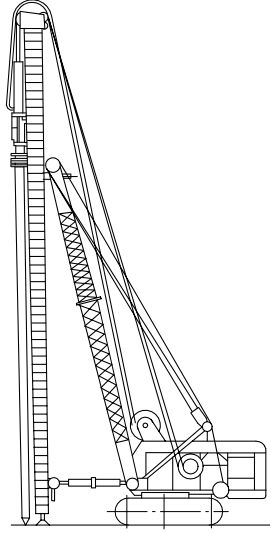
This International Standard specifies terminology for machines and equipment used in the building construction industry, for ease for reference and for use in discussions on standardization activities.

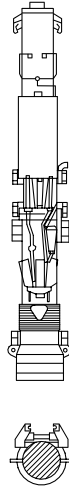
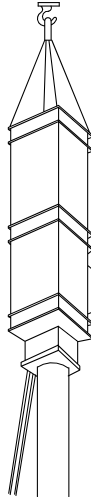
This International Standard refers to machines and equipment used on construction sites. They are divided into five groups:

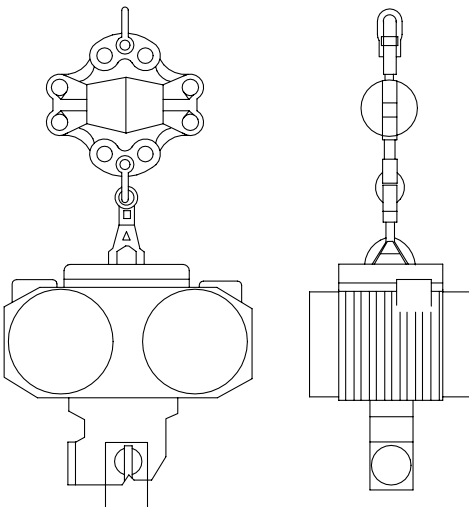
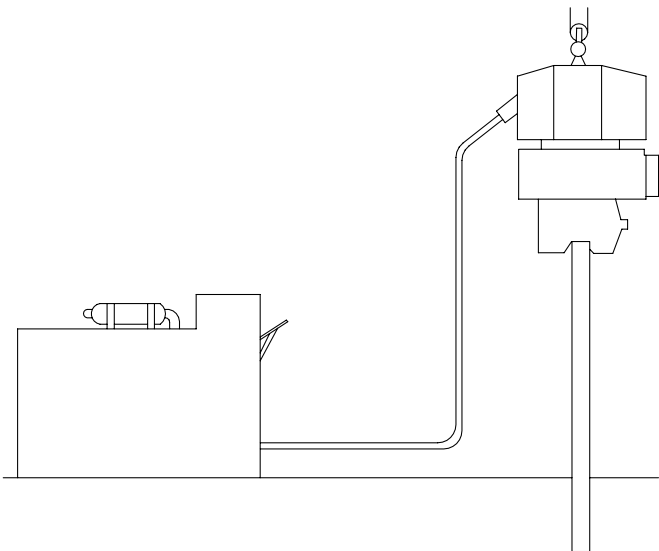
- assembly of machines and components for installation and extraction of piles;
- equipment for preparing, conveying and compaction of concrete, mortar and processing reinforcement and formwork;
- machinery and equipment for aggregate processing;
- equipment for finishing work and maintenance;
- machinery and equipment for general use in construction processes.

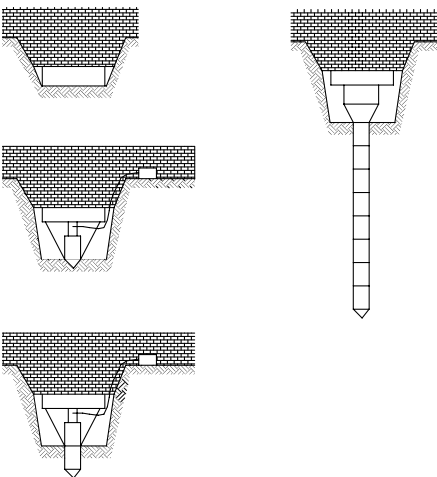
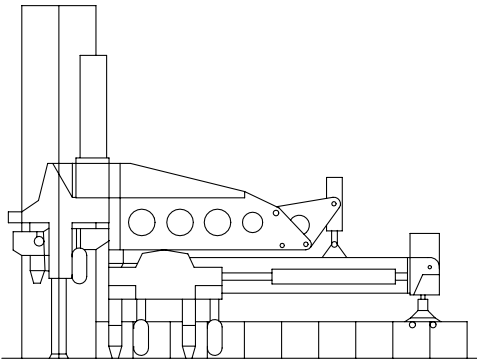
The machinery and equipment presented in these particular groups are used primarily in building processes.

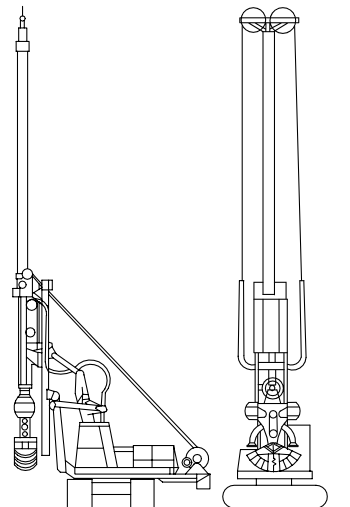
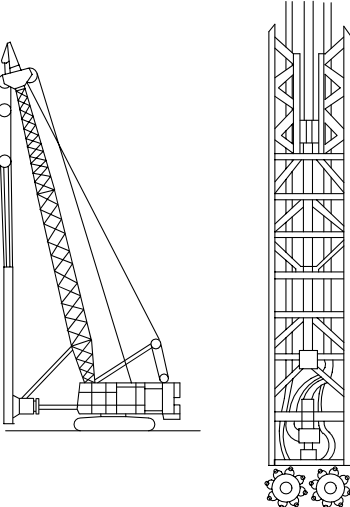
This International Standard does not include groups of building machines such as earth-moving machinery, cranes, lifting and access machinery.

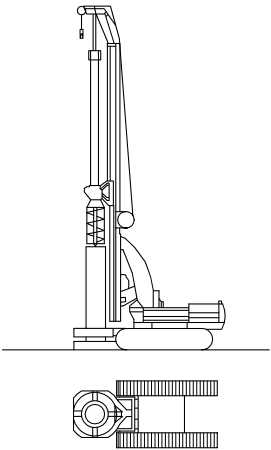
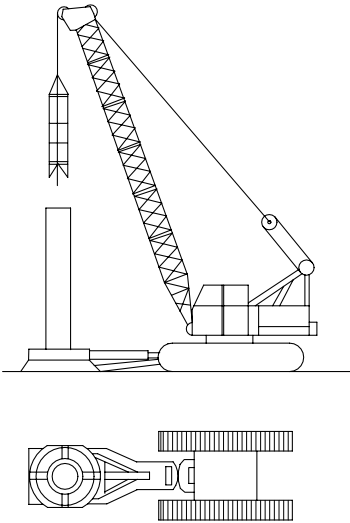
Item	Term	Definition	Illustration
1 Foundation equipment			
1.1	Piling equipment	Assembly of machines and components for the installation and extraction of piles.	See figures 1 to 8.
1.1.1	Piling rig	Carrier machine complete with leader attachment and leader for support of pile installation equipment.	
1.1.2	Impact hammer	Hammer whose striking energy is produced by raising the striking mass; at the end of the subsequent downward motion this mass impacts directly or indirectly on the pile.	See figures 1 to 4.
1.1.2.1	Drop hammer	Hammer whose striking mass is raised by a wire rope roll on a winch or by similar means.	 Figure 1
1.1.2.2	Steam / Air hammer	Hammer whose striking mass is raised by air or steam pressure.	 Figure 2

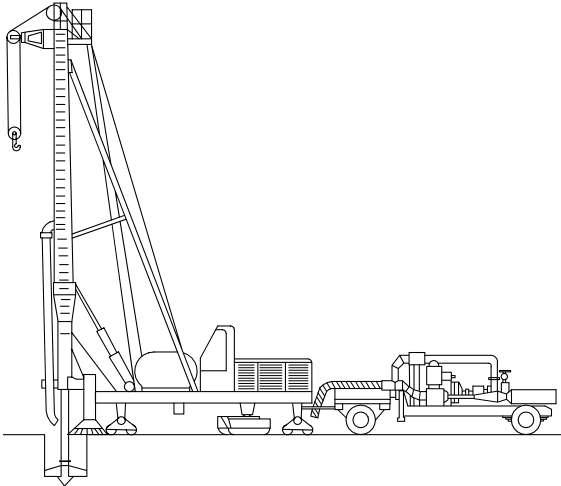
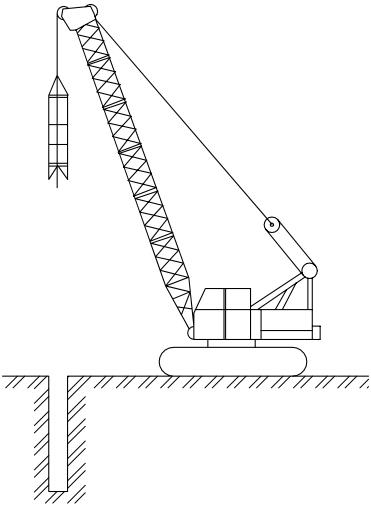
Item	Term	Definition	Illustration
1.1.2.3	Diesel hammer	Hammer whose striking mass is raised by pressure of gases resulting from the combustion of a fuel mixture. NOTE — Normally this is diesel fuel, but other compression ignition engine fuels can also be used.	 Figure 3
1.1.2.4	Hydraulic hammer	Hammer whose striking mass is raised by hydraulic pressure.	 Figure 4
1.1.3	Vibration equipment	Equipment generating unidirectional vibrations, in most instances vertical; these vibrations may be used to install or extract piles. NOTE — Vibration is produced in a vibrator gearbox while a suspension device, placed above the vibrator gearbox, dampens in order to protect the supporting crane. The element to be installed in or extracted from the ground is rigidly held under the vibrator gearbox by means of one or more clamps.	See figures 5 and 6.

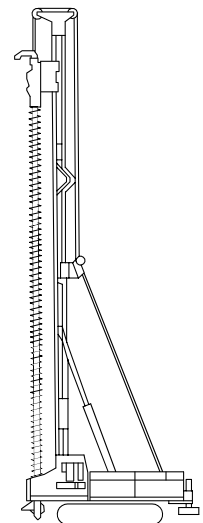
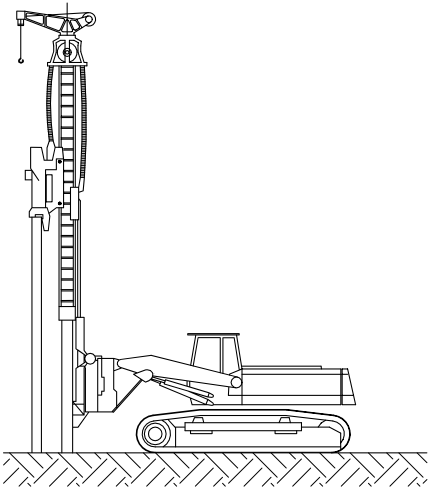
Item	Term	Definition	Illustration
1.1.3.1	Vibrating pile driver (electric type)	Pile driver with electric motor(s) used to generate the vibrations.	 Figure 5
1.1.3.2	Vibrating pile driver (hydraulic type)	Pile driver with hydraulic motor(s) used to generate the vibrations.	 Figure 6
1.1.4	Pile forcing equipment	Equipment for driving jointed or unjointed piles, as well as steel diaphragms or sections into the ground.	See figures 7 and 8.

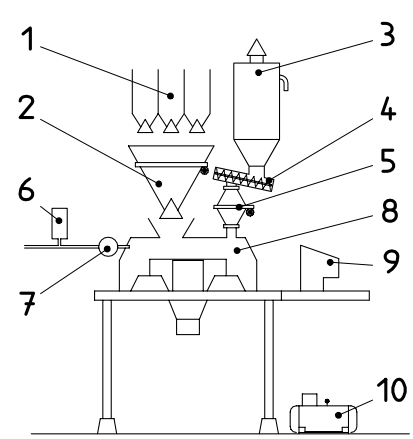
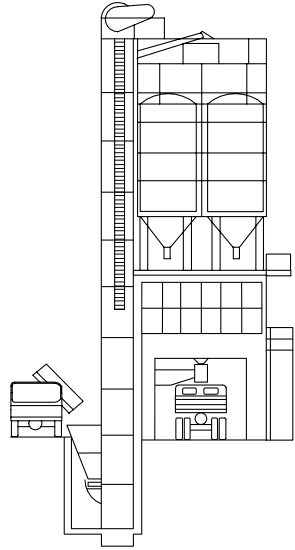
Item	Term	Definition	Illustration
1.1.4.1	Equipment for jacking preformed pile sections into the ground	Equipment comprising a hydraulic power unit and a hydraulic cylinder, used for jacking pre-fabricated pile sections in an excavation under and against existing foundations. NOTE — Such equipment is used in underpinning old foundations in cases where there is insufficient room for other machines.	 Figure 7
1.1.4.2	Static pile pushing/pulling devices	Devices designed for driving or extracting sheet piles by applying a steady force to the piles by means of several vertical hydraulic jacks which are clamped on a number of sheet piles that have been previously installed in the ground.	 Figure 8
1.2	Diaphragm walling equipment	Machines for installation of diaphragm walls, cast-in-place piles of non-circular section piles, and cut-off walls.	See figures 9 and 10.

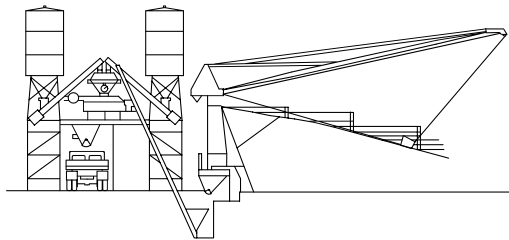
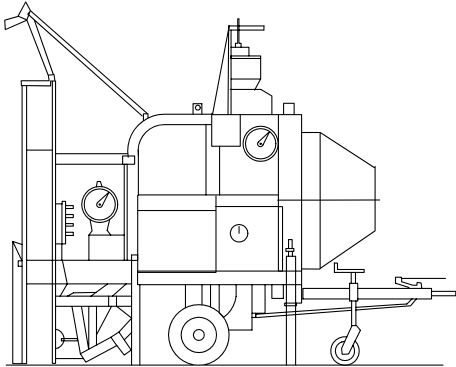
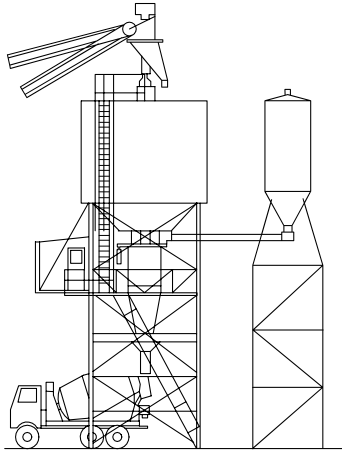
Item	Term	Definition	Illustration
1.2.1	Diaphragm walling equipment using hydraulic grabs and telescopic extension rods	Truck- or crawler-mounted rig, comprising a hydraulically operated grab bucket and a telescopic extension rod. NOTE — Used for making deep, non-circular holes or trenches in the ground, in which concrete piles and sheet piles are formed. Also cut-off walls may be formed in such trenches.	 Figure 9
1.2.2	Diaphragm walling equipment using rope-operated grabs	Truck- or crawler-mounted rig comprising a rope-operated grab bucket mounted directly on a derrick or on a telescopic extension rod. NOTE — Used for making non-circular holes and trenches in the ground, in which concrete piles and sheet piles or cut-off walls are formed. A stabilizing fluid is used as protection during excavating.	
1.2.3	Diaphragm walling equipment using milling cutters	Truck- or crawler-mounted machine equipped with a milling unit to cut a trench in the ground, with a stabilizing fluid as protection during milling; milling dust is removed from the trench by a pumping system incorporated in the milling unit. NOTE — Concrete diaphragm walls or cut-off walls may be formed in such trenches.	 Figure 10
1.3	Pile forming rig	Machine designed for making piles formed in boreholes after rotary and stroke drilling, with or without removal of ground from tube interior where piles are formed with the use of encasing tubes.	See figures 11 to 16.
1.3.1	Drilling pile forming rig	Drilling rig used in forming cast-in-place piles in holes drilled with the use of withdrawable casing.	See figures 11 and 12.

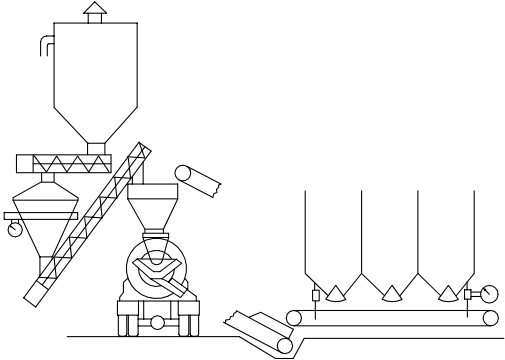
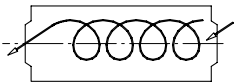
Item	Term	Definition	Illustration
1.3.1.1	Rig for rotary drilling and installation of withdrawable casing	Truck- or crawler-mounted machine, equipped with a guiding tower, a rotary drilling unit and a device for installation and extraction of the casing. NOTE — The equipment is used for making piles by placing concrete in a borehole with simultaneous recovery of the tube employed as casing.	 Figure 11
1.3.1.2	Rig for stroke drilling and installation of withdrawable casing	Truck- or crawler-mounted machine, equipped with a rope-operated or rod-mounted grab bucket for stroke drilling, and with a device for installation of temporary casing. NOTE — The equipment serves to form piles by placing concrete in a borehole, with simultaneous recovery of the tube employed as the casing.	 Figure 12
1.3.2	Rig for uncased drilling for cast-in-place piles		See figures 13 to 15.

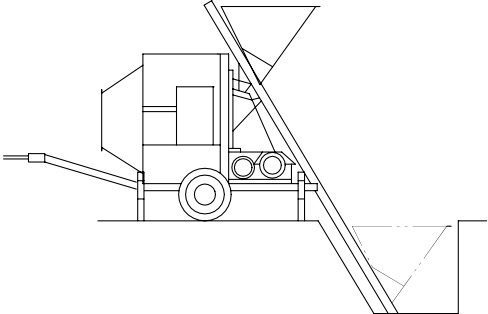
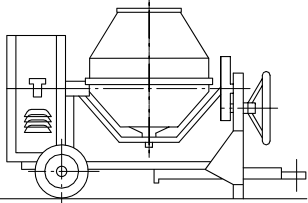
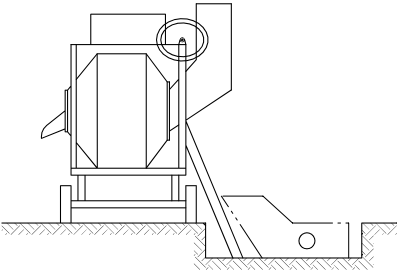
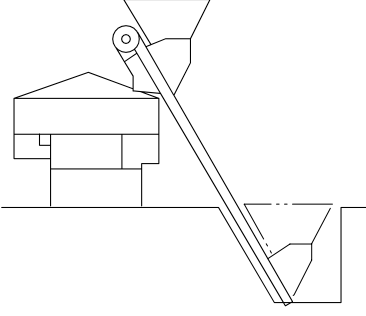
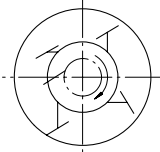
Item	Term	Definition	Illustration
1.3.2.1	Rig for rotary drilling with stabilizing fluid	Truck- or crawler-mounted machine, furnished with a guiding mast, rotary drilling unit, hollow rod and a drilling mud pumping unit for continuous removal of drillings from boreholes. NOTE — The equipment is used for forming piles by placing concrete in holes protected by a stabilizing fluid during drilling.	 Figure 13
1.3.2.2	Rig for stroke drilling with stabilizing fluid	Truck- or crawler-mounted machine, equipped with a rope-operated or rod-mounted grab bucket for stroke drilling. NOTE — The equipment is used to form piles by placing concrete in holes protected by a stabilizing fluid during drilling.	 Figure 14

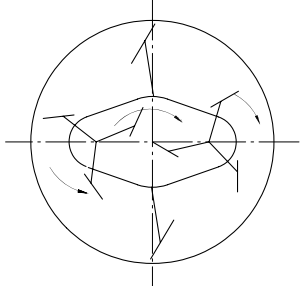
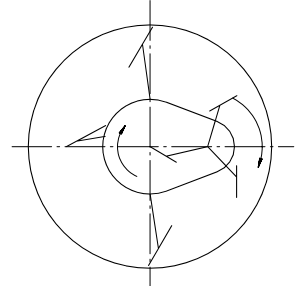
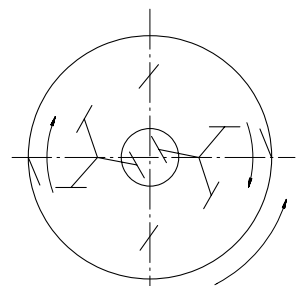
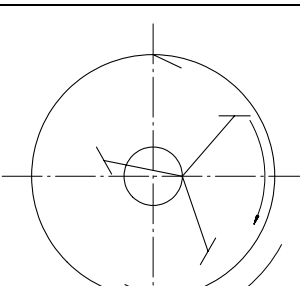
Item	Term	Definition	Illustration
1.3.2.3	Rig for rotary drilling with a continuous-flight auger	Truck- or crawler-mounted machine, with a guiding tower and drilling unit moving along the guides. NOTE — The equipment is used for drilling of holes by a single passage of long auger and for formation of piles by placing concrete in the holes. Concrete is fed through the drilling head and hollow auger, filling the hole while the auger is being withdrawn.	 Figure 15
1.3.2.4	Multipurpose pile driving and extracting equipment	Hydraulic carrier machine (usually hydraulic excavator) equipped with telescopic leader system designed to fix quickly the following attachment: — vibratory pile drivers, — static pile pushing and pulling device, — rotary drilling with continuous flight auger, — impact hammer (hydraulic or diesel).	 Figure 16

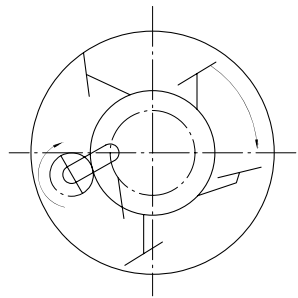
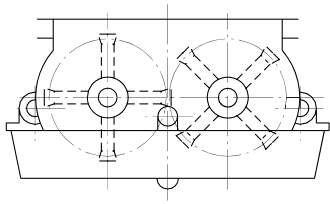
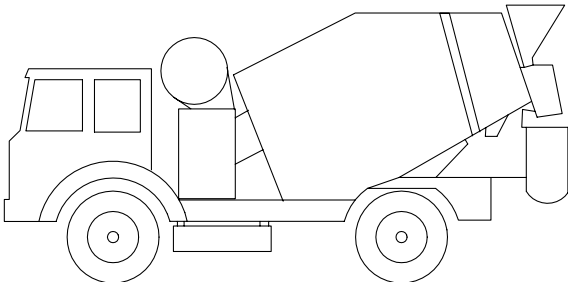
Item	Term	Definition	Illustration
2 Equipment for preparing, conveying and compaction of concrete, mortar and processing reinforcement			
2.1	Machines and equipment for concrete mix production	Machines and equipment designed for storing, proportioning and mixing concrete.	See figures 17 to 27.
2.1.1	Concrete mixing plant	Set of equipment for concrete mix production. NOTE — Aggregate storage bins are located at the side of the mixer. Key 1 Aggregate storage bins 2 Aggregate weighing unit 3 Cement silo 4 Cement conveyor 5 Cement weighing unit 6 Admixture dosage unit 7 Water dosage unit 8 Mixer 9 Electric control system 10 Pneumatic system	 Figure 17
2.1.1.1	Vertical (tower) concrete mixing plant	Equipment for the production of concrete mix, characterized by the location of aggregate storage bins above the mixer.	 Figure 18

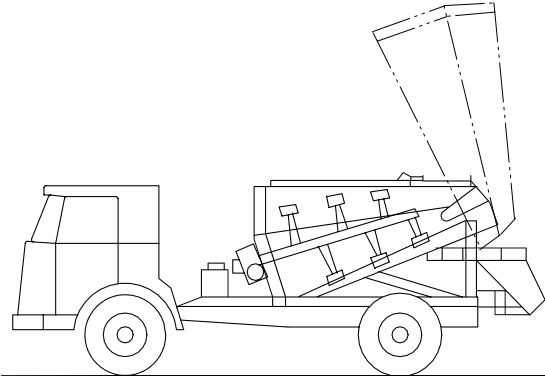
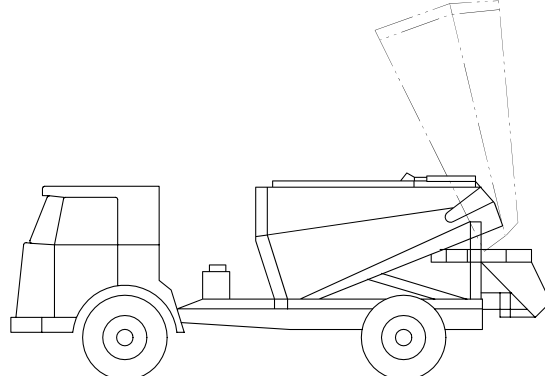
Item	Term	Definition	Illustration
2.1.1.2	Horizontal concrete mixing plant	Set of machines and equipment for the production of concrete mix, characterized by the location of aggregate storage bins or an active storage arrangement at the side of the mixer. NOTE — In some types of the horizontal concrete mixing plant, the aggregate feeding skip also serves as a weighing hopper. Instead of an aggregate storage yard with a retaining wall, there may be aggregate bins with a belt or a scraper conveyor feeding aggregate directly to the batcher.	 Figure 19
2.1.1.3	Stationary concrete mixing plant	Concrete mixing plant constructed for permanent location.	See figures 18 and 19.
2.1.1.4	Transferable concrete mixing plant	Concrete mixing plant capable of relocation by dismantling for transportation and reassembling.	See figures 18 and 19.
2.1.1.5	Mobile concrete mixing plant	A trailer-mounted concrete mixing plant. NOTE — Only the horizontal types of plant appear in this group.	 Figure 20
2.1.2	Concrete mix batching plant	Machines and equipment for proportioning of aggregate, cement and water, or for dry constituents only and for loading them on road transport.	See figures 21 and 22.
2.1.2.1	Vertical concrete mix batching plant	Machines and equipment for proportioning the constituents and for loading mixed concrete into transport vehicles. NOTE — Aggregate storage bin is located above the batcher and the vehicle being loaded.	 Figure 21

Item	Term	Definition	Illustration
2.1.2.2	Horizontal concrete mix batching plant	Set of machines and equipment for proportioning constituents and for loading concrete mix into transport vehicles. NOTE 1 — The aggregate storage bin is located at the side of the charging (feeding) hopper. NOTE 2 — The horizontal batching plant may also be designed: — in a layout similar to the horizontal concrete mixing plant, including storage yard with a retaining wall (see 1.1.2); — with direct aggregate feed to the batcher by a scraping conveyor, i.e. without aggregate storage bins.	 Figure 22
2.1.2.3	Stationary concrete batching plant	Concrete mix batching plant without capability for relocation.	See figures 21 and 22.
2.1.2.4	Transferable concrete batching plant	A plant for proportioning concrete mix constituents, capable of relocation by stripping for transportation and reassembling.	See figures 21 and 22.
2.1.3	Concrete mixers	Machines designed for the production of concrete by mixing of measured (by mass or volume) proportions of water, cement, aggregate and possibly chemical additives, within a certain time limit. NOTE — A concrete mixer may be furnished with the following accessories: charging skip hoist, fixed or wheeled supporting frame, mechanical shovel, water dosing equipment, and a skip weighing system.	See figures 23 to 27.
2.1.3.1	Batch-type concrete mixer	Mixer in which charging with concrete constituents and discharging of the drum are carried out periodically, in batches.	See figures 24 to 27.
2.1.3.2	Continuous-type concrete mixer	Mixer in which charging with concrete constituents and discharging of the drum are carried out continuously as an uninterrupted flow.	 Figure 23
2.1.3.3	Gravity concrete mixer (Free-fall concrete mixer)	Machine where mixing is effected by repeatedly elevating the mixed concrete and dropping it from a certain height, inside a mixing drum, during its rotation.	See figures 24 and 25.

Item	Term	Definition	Illustration
2.1.3.3.1	Reversing (drum) concrete mixer	Gravity mixer with a reversible direction of rotation of the mixing drum; discharge of mixed concrete is by reversing the rotation of the drum.	 Figure 24
2.1.3.3.2	Tipping drum concrete mixer	Free-fall mixer with a tipping mixing drum, open at one end for charging and discharging of the concrete mix; discharging is carried out by tilting the drum.	 Figure 25
2.1.3.3.3	Discharging chute concrete mixer	Free-fall mixer, with a mixing drum open at both sides; charging is carried out from one side and discharging from the other by means of a chute entering the drum.	 Figure 26
2.1.3.4	Compulsory concrete mixer	Machine with mixing effected by the action of one or more agitators moving inside a mixing chamber with either a vertical (pan) or horizontal axis (trough). NOTE — The illustrations of individual compulsory mixer types shown in figures 28 to 34 depict the pattern movement of the agitators.	 Figure 27
2.1.3.4.1	Turbo concrete mixer	Compulsory concrete mixer with an agitator rotating about the vertical axis of a stationary pan, charged from the top and discharged by opening a segment of the pan bottom.	 Figure 28

Item	Term	Definition	Illustration
2.1.3.4.2	Planetary concrete mixer	Compulsory mixer with vertically mounted agitators having a planetary type of motion, inside a stationary pan; the mixer is charged from the top, and discharged by opening a segment of the pan bottom.	 Figure 29
2.1.3.4.3	Turbo planetary concrete mixer	Compulsory mixer having one agitator rotating about the vertical axis of a stationary pan in addition to other agitators in planetary motion; the mixer is charged from the top and discharged by opening a segment of the pan bottom.	 Figure 30
2.1.3.4.4	Counter-current operation concrete mixer	Forced-action mixer with one or more agitators rotating about the vertical axes in a counter-rotating pan; the mixer is charged from the top and discharged by opening a segment of the pan bottom.	 Figure 31
2.1.3.4.5	Concurrent operation concrete mixer	Compulsory mixer with one or more agitators rotating about vertical axes in a pan rotating concurrently; the mixer is charged from the top and discharged by opening a segment of the pan bottom.	 Figure 32

Item	Term	Definition	Illustration
2.1.3.4.6	Concrete mixer with high-speed stirrer (activator)	Compulsory mixer with one or more agitators rotating about vertical axes including one high speed agitator (activator); the mixer is charged from the top and discharged by opening a segment of the pan bottom.	 Figure 33
2.1.3.4.7	Paddle mixer	Compulsory mixer with one or two paddle agitators rotating about horizontal axis in a casing (trough); the mixer is charged from the top and discharged by opening a segment of the pan bottom. NOTE — The paddles may be straight or helix-edged.	 Figure 34
2.2	Machinery and equipment for transporting concrete mix	Machinery and equipment designed for conveying concrete mix from the production to the construction site.	See figures 35 to 50.
2.2.1	Means of wheeled transport of concrete mix	Revolving or open-top containers with or without agitators, mounted on trucks or trailers.	See figures 35 to 37.
2.2.1.1	Truck mixer	Concrete mixing unit mounted on a self-propelled chassis or trailer and capable of producing and delivering homogeneously mixed concrete. NOTE — It is usually a free-fall, reversing gravity mixer with a pear-shaped drum inclined at angle of approximately 15° to the horizontal. Additional equipment includes a water tank and water dosage unit, charge hopper and discharging chute.	 Figure 35

Item	Term	Definition	Illustration
2.2.1.2	Concrete transport skip (agitating equipment)	Equipment normally mounted on a self-propelled chassis and capable of maintaining fresh concrete in a thoroughly mixed and homogeneous state during transport.	 Figure 36
2.2.1.3	Concrete transport skip (non-agitating equipment)	Equipment used for transporting concrete without agitation; for example, dump truck or transport hopper.	 Figure 37