SOCIALIST REPUBLIC OF VIETNAM

VIETNAM STANDARD

CODE FOR THE SAFETY TECHNIQUE OF THE CONSTRUCTION

TCVN 5308 - 91

CONSTRUCTION PUBLISHING HOUSE

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CODE FOR THE SAFETY TECHNIQUE OF THE CONSTRUCTION

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Issuance Decision No. 256 BXD/KHKT
Dated 31 December 1990

MINISTRY OF CONSTRUCTION
No. 256 BXD/KHKT

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

Hanoi, 31 December 1990

DECISION OF MINISTER OF MINISTRY OF CONSTRUCTION
On the Issuance of Vietnam Standards

THE MINISTER OF MINISTRY OF CONSTRUCTION

- Based on the rule on the standardization that is issued and enclosed in the Decree No. 141-HĐBT dated 24 August 1982 of the Council of Ministers;

- Based on the Decree No. 1940-KG dated 19 October 1989 of the Council of Ministers on the approval and issuance of Vietnam Standards on the Capital construction;

- In consideration of the proposition of the Ministry of Labor, Invalid and Social Administration that was presented in the letter No. 2958/KTAT dated 12 December 1990, and of the proposition of Director of the Department for Science and Technique of the Ministry of Construction that was presented in the letter No. 103 BXD/KHKT dated 28 December 1990;

Decides that:

DECISION

Article 1: Now to issue the present decision and 01 Vietnam Standard here with enclosed with the name: CODE FOR THE SAFETY TECHNIQUE OF THE CONSTRUCTION – TCVN 5308 – 91.
This standard substitutes for the QPVN 14-79.

Article 2: The above Standard is issued from 01 March 1991 and should be strictly executed for all of concerned sectors and localities.

ON BEHALF OF THE MINISTER
VICE MINISTER
Nguyen Manh Kiem
(Signed)

VIETNAM STANDARD

Group H

CODE FOR THE SAFETY TECHNIQUE OF THE CONSTRUCTION		TCVN 5308 - 91 First Check
–	–	To be in effect from 01 August 1991

The present standard substitutes for QPVN 14-79.

The present standard is generally applied for all state-owned and private organization of all economic sectors making the construction works.

1. GENERAL REGULATION

1.1. The present code defines the requirement on labor safety technique and is applied in following working phases:

Establish the economic - technical justification for construction projects;

Establish the organizational design of the constructions, the design of implementation of construction projects (civil and industrial construction, communication, water resources, hydropower) in case of new constructions, re-constructions, extension of constructions, repairing or demolition of constructions.

Carry out the items of construction projects.

1.2. Besides the meeting the requirements presented in the present code, the design and implementation of construction items should again abide by other prevailing codes and standards related to labor safety, labor hygiene and fire prevention and control .

1.3. In case of insufficiency of dossiers (documents) on organizational design and technical design, it should not carry out the construction works. These documents should give expression to measures to ensure the labor safety, labor hygiene and fire prevention.

1.4. Head of units implementing the works like director, team leaders, production group chiefs, heads of divisions and sections, cadres to be specialized and responsible for labor safety should adequately and strictly execute their responsibility on labor protection according to related prevailing regulations.

1.5. Responsibility to meet the labor safety requirements in running of machines (instruments, working equipment and appliances), including collective and personal labor protection means used by working people is defined as follows:

Technical status of machines and labor protection means are controlled by the units managing them.

Training and supplying guidance on labor safety belong to the responsibility of units managing their working people;

Abiding by regulations on labor protection during the working process belongs to the responsibility of units carrying out the works;

1.6. Within a construction camp, if there are many units combining their simultaneous working, the unit to be responsible for principal works of the B side should co-ordinate the working of other units and promote measures to ensure the common labor safety and they should implement these measures. At working area where are many working units to perform their simultaneous works, it should establish a board for supervising and checking the implementation of common labor safety.

1.7. When the works are performed at areas where is a plant being in running, the director of constructing and assembling units should suggest the head of the plant with different measures to ensure the common safety. The sides should adequately and timely implement the measures to ensure the common safety in the framework of their responsibility.

1.8. Workers practicing their professions within the construction camp should meet following standards:

a) Reach the working age defined by state regulations for each profession.

b) Have the health certificates issued by health care organizations that certified their acceptable health status according to health requirements of each profession. Annually, it should at least one time check their health status. In case of working at high altitude, under water, in tight underground shelters, in hot areas or areas polluted by dust and toxic gas, it should establish a health control regime defined by health care organizations. It should not assign such works to pregnant women, women having children of under 9 months old, patients (cardiac, deaf, poor sight...) or children of under 18 years old.

c) Have the certificates that they have learned the labor safety knowledge and they have passed the examination on labor safety according to requirements of each sector, profession and the certificates have to be signed by directors of units.

d) Be adequately equipped with personal labor protection means according to working conditions defined by their working regime.

1.9. Workers to be provisionally recruited and apprentices should adequately meet the standards defined by regulations prevented in the article 1.8. The director of the enterprise should be responsible for following task:

Assign the guide and supervisor for strict implementation of labor safety.

Check the supplying with personal labor protection means defined by labor safety regulations. Particularly for people participating in working for public interest, or for visitors, they should be made known with internal safety regulations and accompanied by guides.

1.10. It is forbidden to use alcoholic drinks before and during the working. For working at high altitudes, in deep underground cellars, and at dangerous areas, it is forbidden to use alcoholic drinks, beer or to smoke. Workers working at high altitudes or in deep underground cellars should have bags containing their professional instruments. It

is forbidden to throw the types of instruments, professional tools or anything down from high altitudes.

1.11. Only workers who know how to swim are allowed to work under water and they should be adequately equipped with boats, life belt and other first - aid instruments according to defined safety regime.

For divers, they should adequately perform the regulation on regimes of working, feeding up and health protection.

All of boats, life belts and other first aid instrument should be tested for ensuring their quality before using them.

1.12. Workers who work in the construction camp should correctly use personal labor protection means; They should not wear sandals, wooden clog and they should dress in a pleasingly tidy manner.

1.13. Leaders of work-force units should implement the regime on employing and utilizing female labors according to regulations presented in inter-ministerial circular letter No. 09 dated 29 August 1986 of Ministries Labor and Health.

1.14. When the work is performed at the altitudes of 2 m up wards or at altitudes of under 2 m but at working areas are dangerous obstructions, it should equip labor safety belts for workers or protection net if it is impossible to arrange the manipulating plate - form with handrails for safety.

Technicians of the work - force should guide and advice workers to wear their safety belts. Workers are not allowed to work without wearing their safety belts.

1.15. It should not work at the same time at two upwards altitudes in a vertical if the workers who work at lower altitudes are not equipped with labor safety instruments.

1.16. It should not work on the scaffold, chimney, water tower, electric pole, pier or beam of bridges, roof of houses having two upwards floors etc... when it is dark, it rains hard, there are storms, typhoons, or high wind speeds of classes of 5 upwards.

1.17. After typhoons, cyclones or after the working interruption in many days on end, it should recheck the safety conditions before continuing the works, first of all the safety conditions of dangerous areas where are potential accidents.

1.18. For working in deep wells, underground bunkers, tight barrels, it should anticipate adequately the measures and means to prevent toxic gas emissions or land-slips. Before and during the working, it should establish a strict checking regime and assign the members on duty for ensuring the permanent liaison between the members working inside and outside and the timely first-aid in case of accidents.

1.19. Within the construction camp it should arrange an adequate lighting system for road system and night working areas. It is not allowed to work at areas no to be lighted.

1.20. For working at high altitude constructions, it should arrange the lightning - rod system according to related prevailing regulations.

1.21. Within the construction camp, it should arrange an adequate sanitary bases system for working staffs, such as health stations, dining halls, rest house, shelters from the rain, bath rooms, latrines, menstruation sanitation houses, etc...

1.22. It should ensure an adequate supply with drinking water for the people working in the construction camp. The quality of drinking water should be ensured according to related hygienic requirements. The drinking water pot should have the lid to make it tight, the tap or water scoops. It should arrange the cups, glasses or mugs for drinking.

1.23. In the construction phase, the director of the enterprise should supply guidance for implementation of measures to improve the working conditions for workers, lighten hard works and manual labors, prevent and limit the toxic factors provoking negative influences to their health or different professional diseases.

1.24. Cadres and workers working in environmental conditions influenced by the toxicity to exceed the allowable toxicity standard should be on - site fed - up in kind according to the prevailing related regulations.

1.25. For the Construction camp it should keep a labor safety diary which should be adequately kept with the status of break downing of machines, accident, measure to overcome and to treat them in running process, recommendations on labor protection of responsible labor safety cadres, and of labor safety inspecting teams as well as measures to solve labor protection - related problems of the director of construction camp; at the same time, the construction camp should rightly implement the regulations on statistical report to analyze the occurred labor accidents and professional diseases.

2. ARRANGEMENT OF THE LAYOUT PLAN OF CONSTRUCTION CAMP.

2.1. General Requirements.

2.1.1. Around the construction camp area, it should stand the fence and arrange the posts to stop the entrance of people not to have the task within the construction camp. In case that there is the public road crossing the construction camp area, it is possible to open the other roads (after getting the agreement on it of concerned organizations and localities). If it is not possible to open them, it should arrange the signboards at two extremities of the public road section crossing the construction camp in order that the transport and communication means could reduce their speed in going on this road section.

2.1.2. In each construction camp, it should arrange its general layout plan which has to display follows:

Positions of principal, supplementary and temporary construction;

Positions of workshops, warehouses, area used for assembling the building components, machines and equipment used for implementation of construction items;

Areas used for arranging materials, residues, pre-fabricated concrete components;

Dwelling areas, offices, dining hall and sanitary areas of staffs and workers;

Road lines used for going and transporting of mechanized, motorized and manual transport means;

Energy and water supplying systems for implementation of construction items and living;

2.13. On the layout plan of construction camp and its working areas, it should arrange a system of canals to drain stagnant water from the working area surface so that it is still dry and lean. It should not leave the water lying stagnant on the road surface or flowing into the fundament holes of the construction.

For the construction camps located near the sea, river, stream, it should prepare the flood control alternatives to prevent the inundation.

For the construction camps of building the dams, pumping stations, hydropower stations... where are large - scale underground water sources, it should build lasting dykes and prepare measure to drain the water for ensuring the safety in any circumstance.

2.1.4. The auxiliary constructions provoking toxic pollution should be installed at the near end of wind blowing direction and it should ensure the safe distance between them and dwelling areas of workforce and staffs of the construction camp and local population according to the regulations of the Sanitary Rule issued by Ministry of Health.

2.1.5. The layout plan of working area should be neat, tidy and hygienic; wastes and barriers should be tidied.

2.1.6. Wells, cellars, holes located within the layout plan area and pot-holes on the floors of construction camp should be lidded or firmly fenced off in order to ensure the safety for going of people.

Moats, holes of fundament that are located next to roads should be fenced off with the fence of 1 meter high and lighted with red lamp signal in the night.

2.1.7. For transporting the surplus materials and wastes down from an altitude of over 3m, it should use the slip - trough or other carrying instruments. The inferior mouth of slip - rough should be installed at an altitude not to be over 1 meter counting from ground surface. It should not pour down the surplus and waste materials from any altitude if the lower areas to be located below the slip - trough are not fenced and if there is no sign board and guard.

2.1.8. Dangerous downer areas where the things could freely drop down from upstairs should be fenced with signboards and protected with protection roof. Limit of this dangerous areas is defined by the below table 1.

Table 1

Altitude where the things could drop down (m)	Limit of dangerous areas (m)	
	For houses or constructions being under building (counting from their exterior perimeter)	For areas where is the load moving (counting from the horizontal projection of moved load that is measured with its maximal dimension in dropping)
Up to 20	5	7
Over 20 up to 70	7	10
70 – 120	10	15
120 – 200	15	20
200 – 300	20	25
300 – 450	25	30

2.1.9. Areas where are the dismantling framing, scaffolds, old constructions the assembling building components of the construction and large-size equipment; areas where are toxic gas emissions; areas where is the intersection of roads... should be fenced and showed with signboards (the fence should be structured according to requirements of prevailing standards on the fences of construction camp and of constructing - assembling areas). In the night, it should arrange the red light lamps for signal.

2.2. Roads for Going and Transport.

2.2.1. At road intersections within the construction camp, it should arrange the directing map to show clearly every road line for mechanized, motorized and primitive transport means. On road lines within the construction camp, it should install a system of communication signboards according to the regulations defined by prevailing communication safety law issued by the Ministry of Communication and Transport.

2.2.2. At the transport road section intersecting the ditch, it should bridge the ditch with parquetry of 5 cm thick (if the ditch width is under 1,5 m and the primitive transport means are used here). It should rest the extremities of parquetry on the wall of ditches on a parquetry section of 50 cm long at least and these extremities should be firmly kept by stakes.

It should bridge the ditch with bridge or culvert (if the ditch is over 1,5 m or if the ditch is under 1,5 m but the mechanized and motorized transport mean are used there).

2.2.3. Minimal width of road used for motor vehicles should be of 3,5 m for one - direction way and of 6 m for two - direction way. Minimal radius of turning circle should be of 10 m.

2.2.4. At the intersection between railway and roadway, the bed of roads should be built with solid tamped ground, and the top of rails and the road surface should be on the same horizontal. Minimal width of the road section where is the intersection between roadway and railway should be of 4,5 m. Two road sections located at two sides of the point of intersection between roadway and railway should be paved with stone on the length 0f 25 m; and the slope of them should not be over 5%.

The installation of direction posts and guard stations should be carried out according to related regulations issued by the Ministry of Communication and Transport.

2.2.5. When the transport roads are arranged below the constructions located at heights where the work-force are being in working or the machines and equipment are being in running, it should create a protection floor installed below these constructions.

2.2.6. Roads or bridges used for transporting up different building materials should not have the slope to be over 30° and they should be cut with steps. At constructions located at dangerous heights, it should arrange the protection rails.

2.2.7. Entrances into houses or monuments where the work-force are being in working at upper floors should be tight corridors and the corridor section should be determined according to the number of people going through these corridors and the volume of equipment and instruments to be transported through them.

2.2.8. Insulated electric wires crossing the transport roads should be of at least 40 cm deep counting from the earth surface. The water pipelines should be underground installed of at least 30 cm deep counting from the earth surface.

2.3. Arranging the materials, fuels, building components and equipment.

2.3.1. The grounds used for storing and maintaining different materials, building components, equipment should be anticipated on the layout plan of the construction camp with necessary containing capacity required by the working. The location of these grounds should be convenient for transport, loading and unloading.

It should not arrange any thing into unstable or unsteady construction parts.

2.3.2. In the grounds containing raw materials, fuels, building components, equipment, it should arrange the transport roads. The width of transport roads should be suitable to the size of transport means as well as of loading and unloading equipment.

Between the stacks of materials, it should leave the room for going of at least 1 m wide.

2.3.3. Materials, raw materials, fuels, building components, equipment should be installed far away from roadway, railway, transport way of cranes with a distance of at least 2 m counting from the nearest road edge to exterior edge of materials (at the side to be near the road). It is forbidden to arrange the wares on going lines.

2.3.4. Loose materials (sand, macadam, pebble etc...) could be heaped in the grounds bit it should ensure the stability of the side of the heap of sand.

2.3.5. The powder-formed materials (cement, plaster, powder of limestone, etc...) should be packaged or contained in tight buckets, silos, bunkers... at the same time it should prepare measures to prevent dust emissions in loading and unloading. The big buckets containing powder - formed materials should be lidded or protected by protection nets; It is allowed only the workers coming into the silo or bunker under the guidance and supervision of the responsible technician and they should be equipped with special labor protection appliances particularly used for their working, such as windlass, labor safety belt... The side of buckets, silos or bunkers should be adequately lit. When there are people working inside the big and tight warehouse, it should assign the supervisor to stand guard outside it.

2.3.6. Inflammable liquid fuels (gasoline, oil, lubricant, etc...) should be maintained in a particular warehouse according to prevailing regulations on fire prevention.

2.3.7. Acids should be contained in tight pots made from antacid porcelain or glass that should be installed in particular rooms to be adequately ventilated. It should not pile up the pots containing acids. Each acid pot should have its label on which are recorded the acid type and production date.

2.3.8. Toxic substances, explosive materials, pressure - appliances should be maintained, transported and used according to prevailing safety codes concerning chemical substances, explosive materials and pressure - appliances.

2.3.9. For arranging the materials on the bank of deep ditches or holes it should determine the distance between them and the edges of the bank according to regulations defined by Article 12 of the present code.

2.3.10. Stone, bricks used for paving and tiles should be piled up into squares of 1 meter downwards high. Bricks used for building should be piled up with 25 downwards bricks used for building should be piled up with 25 downwards brick strata.

2.3.11. Floor paving slabs, roofing slabs should be piled up into stacks of 2,5 meters downwards high, including the thickness of buffer strata.

Wall slabs should be vertically arranged between supporting frames or A - formed supports. The slabs of partition walls should be vertically installed on supporting frame only.

2.3.12. Foundation blocks, bunker wall blocks and stabs of sanitary and ventilating systems as well as package of garbage discharging tubes... should be piled up into stacks of 2,5 meters downwards high, including the thickness of buffer strata installed between them.

2.3.13. Pillars and beams should be piled up into stacks of 2 meters downwards high, including the thickness of buffer strata installed between them. Beams should range themselves along the positions where they are available and should be arranged on buffer wood pieces installed at a maximal distance between them of one fifth of the length of the beam.

2.3.14. Other blocks and slabs should be piled up into stacks of 2,5 meters downwards high, including the thickness of buffer strata installed between them.

2.3.15. Thermal insulating materials should be piled up into stacks of 1,2 meter downwards high and maintained in dry and tight warehouse.

2.3.16. Steel tubes of diameters of under 300 mm should be arranged into tube strata but the height of a tube stack should not be over 2,5 meters and this tube stack should be firmly kept by stakes.

Steel tubes of diameters of 300 mm upwards and iron tubes should be arranged into strata but the height of a tube stack should not be over 1,2 meter and this tube stack should be firmly kept by stakes.

2.3.17. Steel slabs, shaped steel, V-shaped steel should be piled up into stacks of 1,5 meter downwards high. The small size steel should be arranged on supports of the same height. The weight of steel installed on supports should be smaller than or equal to allowable loading capacity of these supports.

2.3.18. Rough timber should be piled up into the stack which should be installed on a padding stratum but the height of the whole stack should not be over 1,5 meter; the height of the timber stack should be smaller than its width and the stack should be firmly kept by stakes arranged in both two sides of it. Sawn timber should be piled up into stack so that the height of the stack including the thickness of buffer stratum does not exceed a half of its width, if the sawn timber sections are transversally and lengthwise arranged by turns.

2.3.19. Packaged glass slabs should be vertically arranged in supporting frames. They should be arranged into one stratum only; It should not pile up them into a stack with many glass strata.

2.3.20. Equipment, machines, details of appliances should be arranged into one stratum only.

3. ASSEMBLY, INSTALLATION AND UTILIZATION OF ELECTRIC EQUIPMENT FOR IMPLEMENTATION OF CONSTRUCTION WORKS

3.1. For assembling, installing, repairing the electric equipment and network on the construction camp, besides the regulations presented in this section, it should abide by regulations given by the Standard named by "Electricity Safety in Construction" TCVN 4036 - 85.

3.2. Workers electricians as well as workers operating electric equipment should be trained, examined and issued with certificates certifying that they have met the requirements on electric safety techniques. Workers electricians who work in every area of the construction camp should thoroughly grasp the electricity supplying scheme of this area, and workers electricians on duty who operate the electric equipment of voltages up to 1000 volts should reach the class of 3 upwards on electricity safety.

3.3. For supplying electricity to the construction camp, it should establish a general scheme of electric network in construction camp with common and sectioning electric cut-out that are used for cutting off the electric current of the entire construction or a part of it, if necessary. The electric power grid and the lighting grid should be separated into two distinct systems.

Assembling and using the electric network supplying electricity to wireless transmission systems in construction camp should abide by regulations presented in the prevailing code on safety technique of the wireless information - transmission.

3.4. Naked conductive details of electric equipment (wires, bus-bars, contacts of electric cut-out, fuse wires, clamps of electric machines and appliances...) should be insulated by insulating materials or installed at suitable heights that ensure the convenience and safety for manipulating and operating them.

Extremities of wires, uncovered cables should be insulated, tightly covered or hung up at heights.

For conductive details to have to be uncovered according to their design or requirements of the construction, they should be hung up at heights and fenced, indicated with signboards.

3.5. Wires supplying electricity to implementing the works in each area of construction should be insulated ones. They should be hung up on the firm pole or support at a height of at least 2,5 meters counted from working area surface and 5 meters counted from the surface of areas where are vehicles coming and going. For wires hung up at heights of under 2,5 meters counted from the surface of ground or of manipulating plate - form, they should be rubber insulated cables.

Electric cables used for mobile cranes should be wound round the drum or they have to slide on cable groove. It is forbidden to drag the cables on ground surface to lay the cables below the heavy construction and the vehicles are not allowed to run over them.

3.6. Lighting lamps of voltages of over 36volts should be hung up at the heights of at least 2,5 meters counted from working floor surface.

3.7. It is forbidden to use electric networks, electric distribution appliances switchboard and their separate branches that was arranged for assembling and installing phase in order to substitute for temporary electric networks and equipment needed by supplying electricity to the construction camp. It is forbidden to let wires supplying electricity to implementing the construction items and to welding touch electric conductive parts of constructions.

3.8. Electric equipment, electric cables, electricity consuming appliances etc... arranged in the construction (excluding the electric equipment, cables, appliances etc... that are stored in warehouses) should be all considered as to be under the voltages despite the absence or presence of electric connection between them and electric grids.

3.9. Switch gears used for switching on and out the common electric network and its branches supplying electricity to each area of the construction camp should be strictly managed so that the people not to have task can not switch on or switch off the electric current without permission.

Electric cut - out used for supplying electricity to each electric equipment or each group of equipment should be firmly bolted.

Electric switch-gears, electric cut - out, ... should be installed in tight boxes, at dry and safe areas, at areas to be convenient for electric manipulation and occurrence treatment.

During the electricity cutting off, it should ensure that the other electric cut - out or equipment can not automatically switch on the electric circuit. In case of electric interruption, it should switch off electric power for all electric consumers in order to prevent the sudden restarting of motors at the same time when the electric supply is recovered.

3.10. It should prepare measures to prevent the confused switching on and off of electric transmission lines and equipment.

On the outer cover of plugs used for mobile electric equipment, it should clearly record their maximal capacity. Construction of plugs and sockets should ensure their good electric contact, so that, during the making contact, the contact of earthed pole can occur earlier than the contact of phase pole and contrarily, and at the same time, thanks to that, the confused fixing the socket to the plug can be eradicated.

Circuit breakers used for mobile electric equipment (excluding mobile lamps) should be assembled just on their outer covers and they should be capable to cut off all of phases of electric lines. It is forbidden to install circuit breakers just on mobile electric lines.

3.11. All of electric equipment should be equipped with short-circuit and over-current protection. Electric protection equipment (fuse wire of fuse cut-out, relay, automatic current breaker...) should be selected in accordance to the rated voltage and current of protected electric equipment or of equipment groups.

3.12. For all of metallic parts of electric equipment, switch-gears, protection appliances... that can be electrified by the damage of their electric insulation and the people could touch hem, they should be earthed or connected to the neutral point of protection system according to Vietnam Standard TCVN named by "Code for earthing and connecting to neutral point of protection system for electric equipment".

If the reserved independent electric source is used for supplying electricity to electric equipment in case of break-downing of common electric grids, the electric operating regime of neutral point of reserve electric source and its protection measures should be suitable to the operating regime of neutral point and protection measures used for the common electric grids.

3.13. For transporting the large-size things below the electricity transmission electric current of the line if the things can touch the wires of the line or the electric discharge from wires through them into the earth can occur.

3.14. Only the workers electricians who are directly assigned to be responsible for electricity - related works are allowed to repair, connect the electric equipment with electric network. The taking to pieces and opening outer cover of electric machines, connecting or disconnecting the wires supplying electricity to electric equipment, repairing electric conductive details are only allowed after cutting off electricity. It is forbidden to

repair, disconnect or connect electricity and carry out works related to overhead electricity transmission lines being under voltage.

3.15. The electricity connection and disconnection for repairing the axial transmission line and its branches supplying electricity to 2 upwards electric appliances should be realized on the basis of strict implementation of the "working card" regime. It is allowed to reconnect the line or its branches to electric source only after careful checking and reporting it (by text) of the responsible head of the repairing team.

After cutting of the current in repairing each personal electric appliance, it should bolt the electric cut-out and arrange a signboard "Switching on forbidden" or assign worker on duty in order to avoid the switching on electricity when the workers are being in repairing the line.

3.16. It is only allowed to substitute the fuse wire in the fuse cut-out after cutting off the current. In case that it is impossible to cut off the current, this work can be realized only for tube - formed fuse cut-out or lidded fuse cut-out, but it is absolutely necessary to connect the load into electric grid. In substituting the fuse wire of the tube-formed fuse cut-out being electrified, the worker electrician should be equipped with labor protection glasses, rubber-made gloves, insulated instruments and they should stand on insulating carpet or wear insulated shoes.

It should not substitute the fuse wire of plate-formed, fuse cut-out being electrified. When the ladder is used in substituting the fuse wire of fuse cut-out being electrified and located at a certain altitude, it should assign the people on duty standing at the lower side.

3.17. It should not take into pieces and assemble the electric bulb without cutting off the electric current. In case that it is impossible to cut off the electric current, the worker electrician who implements this work should wear insulating gloves and labor protection glasses.

3.18. It is forbidden to use the fixed lighting lamps as mobile hand-held lamps. At areas to be electrically dangerous, it should use the lamps of voltages not to exceed 36 volts. Hand-held lighting lamps should be equipped with metallic net protecting their electric bulbs, their wires should be insulated by rubber made covers and electricity should be got through plugs.

Plugs and sockets used for voltages not to exceed 36 volts should be fabricated with a special form and painted with a special painting color of plugs and sockets used for higher voltages.

Electric lamps lighting the working areas should be installed at suitable altitudes and inclination angels so that the glares emitted directly from them do not dazzle the eyes.

3.19. It is forbidden to use the electric equipment arranged in the construction camp if they are not suitable to their surroundings.

3.20. It is forbidden to use electric sources arranged in the construction camp (working electricity, lighting electricity) for electrifying its protection fences. In special case, it should get the agreement of jurisdictional organizations, if necessary.

3.21. Hand-held electric instruments (electric appliances, mobile lighting lamps, labor safety step-down transformers, frequency regulators...) should be tested at least one time per 3 months on the touch of outer covers of machines to the earth, the status of earthing protection wires; and at least one time per month, the status of the insulating cover of wires and electric source as well as the appearance of the damage to the insulation. Particularly for mobile transformers, besides above tests, it should again test the short-circuit between the high and low voltage windings of transformers that could be provoked by the damage of their insulation.

3.22. Electricity used for lighting lamps and hand-held electric appliances of voltages not to exceed 30volts should be directly provided from mobile labor safety transformers. It is forbidden to use auto-transformers for supplying electricity to these appliances.

3.23. It is only allowed to connect motors, electric appliances, lighting lamps and other electric equipment to electric networks through electric accessories fabricated according to related official regulating. It is forbidden to hook and twist the wires in a casual way.

3.24. Workers electricians who work in the construction camp should be adequately equipped with insulated working instruments and labor protection tolls according to prevailing regulations.

On all labor protection instruments, it should annotate the date of their testing. The time span between two consecutive periodical tests should be defined by prevailing related standards and codes.

Rubber-made labor protection instruments should be carefully maintained in ware houses and installed far from gasoline, oil, lubricant and other substances which can damage these instruments.

Before utilizing the rubber-made labor protection instruments it should examine and clean them. In case that their outer surfaces are wet, it should wipe and dry them.

It is forbidden to use the protection instruments not to be tested, checked or to be holed, torn, cracked...

4. WORKS OF LOADING-UNLOADING, ARRANGEMENT AND TRANSPORT

4.1. General Requirements.

4.1.1. In transporting the wares for the construction, besides meeting the requirements presented in this section and in depending on the transport mean type, it should implement the communication rules of roadway, railway that are issued by the Ministry of Interior and the Ministry of Communication and Transport.

Workers serving the loading-unloading, arranging and transporting the wares should have good health according to health regulations defined for each type of works.

4.1.2. Grounds used for loading-unloading and arranging the wares should be even and flat, on that the route should be separately defined for people and transport means so

that their going is convenient and safe and it should arrange a good stagnant water drainage system.

4.1.3. Before loading-unloading and arranging any ware type it should carefully examine its label, size, mass and transport route section in order to define the transport mean type and equip with concrete transport means so that the ware transport can ensure the safety for people and wares.

4.1.4. In transporting large-size and heavy ware types, it should use transport means specially made for them and prepare and submit for approval the measures of loading-unloading and transporting so that they can ensure the safety for people and equipment.

4.1.5. In transporting explosive, radio-active and toxic substances as well as pressure equipment and inflammable wares, it should use the transport means specially equipped with transport appliances to meet the requirements of concerned prevailing codes.

4.1.6. For loading-unloading and arranging the goods in the night or at dark areas and in areas not to have adequate natural lighting, it should ensure an adequate lighting for these areas. It should not use the torch for lighting in case of loading-unloading and arranging inflammable and explosive materials and in these cases, it should use anti-fire and anti-explosive lamps specially made for them.

4.1.7. For transporting heavy ware types or trunks containing heavy equipment, it should use lever and it should not use manual labor for implementation of these works.

For loading-unloading and arranging the heavy sphere-shaped or cylinder-shaped materials (barrel, cable drum, wire coil...), if the inclined plane is used for rolling them down, it should anchor them with ropes so that the wares do not freely roll down. Worker directing the transportation of wares is allowed to stand only aside or at upper extremity of the inclined plane.

4.1.8. It should use the transport means specially made for transporting liquid materials contained in pots, bottles which should be firmly checked to avoid the breaking them.

It should not transport etyl-gasoline together with other ware types.

4.1.9. Workers loading-unloading and arranging powder-formed raw materials (cement, limestone powder, plaster...) should equipped with protection instruments according to prevailing labor protection regime.

4.1.10. It is forbidden to suck out gasoline through mouth or to use hand-held instruments for direct scooping out the gasoline; it should use instruments specially made for this work.

The scooping out different acids should be slowly and cautiously implemented so that acids do not drop to people standing aside; it is forbidden to pour water into acids; it is only allowed to pour acids into water during the mixing them.

4.1.11. Wares arranged in wagons, lorries should be firmly wedged with chocks and tied in order to avoid their fall and moving in transporting them.

It should not overload the transport means and transport the wares having their size to exceed the allowable ware size defined for these transport means.

4.1.12. Workers drive transport means like lorries, tractors, wagons, etc... within the construction camp should abide by not only the prevailing communication law but also the internal regulations of the construction camp.

4.2. Transportation by Primitive Transport Means.

4.2.1. Before loading-unloading and arranging the wares, it should:

a) Control the means and instruments like hanger, shoulder pole and other details of vehicles (shaft, wheel, body, blocking, backboard, reins...) so that they are not damaged such as rein snapping reins, shaft breaking... in the transport process.

b) Control the transport lines and loading-unloading areas in order to ensure the labor safety for workers serving the transport.

4.2.2. For carrying and transporting heavy things by 2 upwards persons, it should entrust one of them with the responsibility to direct and command the work. For carrying the long slats by many persons, they should have similar heights and they should carry them on their same shoulders.

4.2.3. Before loading for improved wheel barrows, hand carts, it should:

a) Chock their wheels and firmly support their shafts;

b) Determine rightly their loading capacity and it should avoid the overloading them;

4.2.4. For loading the vehicles:

a) The wares like bricks, stone, sand, pebble... should be reasonably piled up so that the top of ware piles is lower than the wall of vehicle body of 2 centimeter and it should use the blocking backboards at two extremities of the vehicle.

b) The wares to be contained in soft bags like cement, limestone powder... can be reasonably piled up to the height to exceed the height of the wall of vehicle body but it should not exceed the height of two bags and these wares should be firmly tied.

c) The cumbrous wares should not be piled up to the heights not to exceed 1,5 meters counted from the road surface (for vehicles to be manually pulled or pushed) and these wares should be firmly tied.

d) The steel slabs, shaped steel slats, concrete building components that have the lengths to exceed the length of vehicle body should be firmly tied with steel cords.

4.2.5. Workers pushing the hand carts, improved wheel barrow, should go at two side of walls of vehicle body and they should not press their hands against the piled wares for pushing the vehicle. When the workers park their vehicles on slopes, the wheels of these vehicles should be firmly wedged with chocks .

When the vehicle going down on slopes to exceed 15 degrees, the workers should turn back the vehicle shafts and they should keep the vehicle so that it can slowly roll down.

4.2.6. For vehicles to be pulled by animals traction, workers directing them should go in left side of animals, they should not go aside the vehicle body or sit down on it. The vehicle (pulled by animal traction) should be equipped with braking system and for night transportation it should be equipped with signaling lamp.

4.3. Transportation by lorries, tractors.

4.3.1. In loading up the vehicle with wares, it should select the measures arranging them in depending on ware types so that the safety will be ensured in the transportation process.

4.3.2. For discharging the materials from the pouring mouths of bunkers, silos... to vehicle body, it should park the vehicle so that the center of vehicle body is located under the center of the material current flowing from the mouths of bunkers, silos...

4.3.3. For transporting wares like bricks, tiles, sand, pebble..., they should be arranged or piled up in vehicle so that the top their piles is lower than the wall of vehicle body of about 10 cm. In case that the workers want to enhance the top of piles of wares, they can enhance the height of the walls of vehicle body, but it should not overload the vehicle.

4.3.4. For transporting light and spongy wares, it is allowed to arrange them at heights to exceed the height of walls of vehicle body, but these wares should not be the oversize ones and they should be firmly tied. It should abide by regulations defined by the prevailing communication law.

4.3.5. For transporting long slats or cumbrous blocks like: rafter, pole, floor slabs, wall slabs, equipment, machines, they should be firmly wedged with chocks and tied.

If the wares have their length to exceed 1,5 time of the length of vehicle body, it should connect a trailer to the vehicle, the floors of trailer and body of vehicle should be located at the same height counted from ground surface. The connection between the trailer and vehicle should be firm, should not be broken during the going of vehicle. It is not allowed to use tipper lorries for transporting wares having their lengths to exceed the length of vehicle body or to connect the trailer to the tipper lorries.

4.3.6. It is forbidden to transport people on crane vehicles, lorries, tipper lorries not to be fabricated for transporting the people. People should not stand at steps of entrances and exits of vehicle, at the connection of trailer and semi-trailer with vehicle, on bull-bar of vehicles, on the top of vehicle, as well as, stand or sit down in the room between the vehicle body and cabin. It is forbidden to transport people in the vehicle body where are toxic, explosive and inflammable wares as well as pots containing compressed gas or cumbrous and unsafe wares.

4.3.7. Before running the vehicle, the driver should do follows:

Test the braking system;

Check the steering-wheel system, transmission and direction levers, fastening screw-nut and safety pins;

Check the lighting system, signaling lamps and hooters;

Check the coupling between trailer, semi-trailer and vehicle and tractor;

Check the system of ligaments used in vehicle.

4.3.8. For tipper lorries, besides the testing their details according to regulations defined by the Article 4.3.7, it should again check following details:

Fastening bolt to keep the tipper vehicle body;

Pressing capability of fastening bolt to keep the tipper body and crane;

Quality of fastening bolts installed at the back of vehicle body;

4.3.9. Within the construction camp area, the vehicle speed should not exceed 10km/h. At turning route area or turning circle, the vehicle should run with speeds not to exceed 5 km/h. If on a route section, there are many vehicles running in a same direction, the distance between two consecutive vehicles should be minimally of 20 meters.

4.3.10. Drivers are allowed to drive only the vehicle type defined by their driving diplomas. When the drivers do not have enough health according to the regulations of health organizations or they are tired, drunk with alcohol, beer... they should absolutely not drive.

4.3.11. Before leaving the vehicles, drivers should switch off the engines, draw the hand-brake, pull out the electric key and key of door of cabins. When drivers stop the vehicles (but their engines are being in running), they should not leave the cabin for other sites. People who do not have any task related to the vehicle are forbidden to come in its cabin.

4.3.12. Do not park the vehicle on the slope. In special case, if it is necessary to park the vehicle on the slope, it should firmly chock the wheels of the vehicle.

4.3.13. The transporting workers by busses within the construction camp should strictly abide by prevailing roadway regulations; at the same time, it should define the vehicle stops for workers going up and down the bus, and appoint the safety supervisor for vehicles transporting people. It is forbidden to hang onto the vehicle and go up and go down the vehicle when it is being in running.

4.3.14. Distance from the position where the vehicle pours materials into holes (counting from the edge of the back of vehicle) to the edge of natural slope side of the material heap (where is the limit of potential landslide) should not be under 1 meter; and it should establish a blocking dyke to prevent the overstepping backwards of the vehicle. When the driver parks the vehicle on the dry bridge for pouring the materials into fundament holes, it should arrange the intermediate piers for the bridge in order to protect it.

4.3.15. For cleaning the tipper body of lorries workers should stand on the ground and use the hoes or shovels having long shafts for grating it; it should not bang at the bottom of vehicle body.

4.3.16. For turning back the vehicle, the driver should hoot the vehicle horn and carefully examine the surroundings of vehicle in order to prevent the going and coming of people and other vehicles.

4.3.17. In using tractors to pull the wares, it [illegible] to up the slope of over 30° or go down the slope of over 15°.

4.4. Transportation by Train, Wagons.

4.4.1. For the construction of the railway for trains and [illegible] well as for the transportation by trains, wagons, it should abide by prevailing railway re[illegible].

The slope of railway and wagon way which [illegible] or wagons or hand-[illegible] wagons should not be over 2%.

4.4.2. The construction camp should organize the strict control for r[illegible] lines, their switches and turning circles. The control results should be recorded in diary [illegible] patrol.

4.4.3. The bridges arranged on road lines should be equipped with protection rail in both two side of them. The distance counted from the wall of wagons to protection rails should not be under 1 meter. The bridge floor should be covered with parquetry on which it should arrange transversal strengthening laths in order to avoid the slip of workers pushing wagons.

4.4.4. The distance between two consecutive hand-pushed wagons going in one direction on the same rail line should not be under 20 meters for the horizontal way and under 30 meters for slope way.

Wagons should be equipped with good braking pedal and bolts. It is forbidden to brake wagons by means of wedging with chocks their wheel or any other measure. Daily, before putting wagons to run, the workers directing them should test their braking equipment.

4.4.5. Hand-pushed wagons should be still installed under the control of drivers. It is forbidden to stand on wagons when they are being in running or to put them in free going.

4.4.6. When the wagons are pulled by steel cable for going up the slope, it should prepare measures to check the people going and coming at foot of slope or at both two side of the pulling cable.

4.4.7. The speed of hand-pushed wagons should not be over 6 km/h. When the wagons approach the turning tray or by-road, it should gradually reduce their speed.

When the driver runs the wagon, he should hoot the wagon horn in order that the people avoid the wagon rails. In case of occurrences (the wagon overturned etc...), it should signal it to the next wagons.

When the wagons go in the night or through the tunnel, it should ensure the adequate lighting for them.

4.4.8. Before loading and unloading the wares transported by wagons, the wheels of these wagons should be braked and wedged with chocks . The wagons equipped with tipper body should be firmly wedged with chocks .

Wares arranged on wagons should be firmly tied. For powder-formed wares, they should be piled up into wagons so that the top of material heap is lower than the wall of the wagon body of about 5 cm.

4.5. Transportation by Waterway.

4.5.1. The transportation by waterway should abide by prevailing waterway regulations.

4.5.2. Before loading or unloading of boats and ships... they should be firmly anchored.

The loading, unloading and arranging the wares should be installed under the guidance and supervision of captains or people to be delegated by them.

4.5.3. Inclined planes used for gong up and going down of boats and ships should have their slopes not to exceed 30° and they should be strengthened by transversal strengthening laths and their width should not be under 30 cm for one-direction going and 1 m for two-direction going. One extremity of the inclined plane should be firmly connected to the boat or ship; and the other extremity should firmly lean against the bank. When the length of inclined plane is over 3 meters, it should arrange the intermediate piers for it.

4.5.4: Anchored boats or ships should be registered by the waterway register of shipping. They should have registration boards on which are clearly noted their allowable carrying capacity. When they transport people, they should be allowed to do it by the waterway register of shipping.

4.5.5. Workers carrying out the waterway loading-unloading, arranging and transporting should enough meet the health standards defined by regulations and it is absolutely necessary that they should know to swim.

4.5.6. All of waterway transport means should be adequately equipped with first-aid instruments according to related regulations.

4.5.7. For the transportation of absorbent goods like soil, sand, cement, limestone... it is absolutely necessary to equip the boats or ships with canvas carpets or roof to cover goods against the rain.

4.5.8. Before loading-unloading, arranging the goods it should check and repair the loading-unloading instruments, transporting means and cranes and labor protection appliances.

4.5.9. It should not pile up the goods into boats or ships with the height of goods heaps to exceed the heights of the deck of ships or of the sides of boats. For light goods, it is allowed to pile up them with the height of goods heaps to exceed the heights of the deck of boats or of the sides of ships, but the goods should be firmly tied and it should prevent the capsizing of boats or ships.

4.5.10. For the wind speeds from the classes of 5 upwards, it should steer the boats or ships to take their safe shelters.

5. USING THE HAND-HELD INSTRUMENTS

5.1. Wooden shafts, bamboo shafts of hand-held instruments should be made of hard and flexible wood and bamboo; they should not be cracked and eaten by wood-borer and they should be smooth and firmly wedged.

5.2. Hand-held instruments used for banging, chiseling should meet the following general requirements:

Points of instruments should not be cracked or damaged by any reason.

Shafts of instruments should not be cracked, broken they should not have sharp edges and they should have suitable lengths for a safe manipulation.

5.3. Pincers used for forging should be selected so that their sizes can be suitable to the sizes and the forms of forged things and they should be fabricated [illegible] the hoops to press against their shafts.

5.4. Keys should be selected in accordance with the sizes of nuts. Mouth of keys should be precisely fabricated so that the central axis of the key is perpendicular to the lengthwise axis of the nut.

It is forbidden to turn the nut by means of the key having the size to be [illegible] the size of the nut through inserting a buffer piece between the edge of the nut and the mouth of the key It is forbidden to lengthen the key through using other keys or tube sections (excluding the keys to be specially fabricated).

5.5. Hammers used for wedging, chiseling... should have shafts of 0,7 meter long. Workers chiseling metals by means of hand-held instruments should wear protection glasses. At narrow working areas where are a lot of people going and coming should be shielded by protection panels.

5.6. Instruments or sharp-pointed details to be carried by handle or moved should be covered or installed in bundles.

5.7. Workers who use the electricity-motorized or compressed air-motorized hand-held instruments gun types, and other hand-held instruments should adequately meet the regulation define by the Article 1.8 of the present code. At the same time, they should know the specifications, performances of these instruments and they should be skilled at manipulating each instrument type before entrusting them with it.

5.8. The electricity-motorized or compressed air-motorized hand-held instruments should be strictly controlled, maintained and timely repaired for ensuring their safe running in the course of using them.

The types of guns and bullets used for implementing construction works should be laid by in special wardrobe to be firmly locked and it is absolutely necessary to define the internal regulations for maintaining and using them. The using them should be followed by team leaders.

5.9. It is only allowed to connect the electricity-motorized or compressure air-motorized hand-held instruments into the clamps or to disconnect them from these clamps as well as to adjust and to repair these instruments after cutting out the electricity and compressed air current.

5.10. In using the electricity-motorized or compressed air-motorized hand-held instrument, the workers should not stand on steps of ladder for manipulating them, but they can stand on platform of supports. For heavy hand-held instruments, it should arrange hangers or other means for ensuring labor safety for workers.

5.11. In case of stopping the works, of interrupting the supply of electricity or compressed air, of moving the instruments or of sudden occurrence, it should immediately cut out the energy supply (turn off the compressed air valve, or switch off the electric circuit breaker).

It is forbidden to leave the hand-held instruments being supplied with electricity or compressed air without on duty worker watching them.

5.12. It is forbidden to pull or to fold the pipes conducting compressed air and electric cables of instruments being in operating. It is forbidden to install electric cables and electric welding wires as well as pipes conducting compressed air overlapping in an irregular way.

5.13. When the mobile electricity-motorized hand-held instruments are used in open air, they should be protected by earthing. Workers using these instruments should wear insulated boots and gloves.

5.14. When the electricity-motorized hand-held instruments are used in areas to be threatened with electric dangers, it should use the electric voltages not to exceed 36 volts. At areas of inconsiderable electric dangers, it is possible to use voltages of 110 volts or 220 volts but the workers to use these instruments should wear insulated boots, shoes and gloves.

5.15. It should not directly connect the pipes conducting compressed air into the principal axial pipe and it is only allowed to connect it through intermediate valves installed at compressed air distribution boxes or at auxiliary branches.

5.16. Before the connection of pipes conducting compressed air, it should control and unclog these pipes. It is only allowed to connect the auxiliary pipe into the principal axial pipe or to disconnect them from this principal pipe after cutting off the compressed air supply.

5.17. All of joints of compressed air pipes should be tightened by steel hoops. It should not use steel wires to tighten them.

5.18. When the hand-held drills are used, it should:

Run and test the drill (without its drilling rod) in order to control the whole pipeline, to ensure that the compressed air is not escaping somewhere in the whole pipeline, and the drill is adequately lubricated according to related regulations.

It is forbidden to use the hand for adjusting the point of drilling rod when the drill is being in running.

Cut off immediately the compressed air line when the drill is wedged with chocks up or its safe running is not ensured, then it is possible to disconnect the drilling rod from the drill and carry out the controlling and repairing them.

It is forbidden to let out compressed air for playing or blowing dust in clothes.

5.19. After the pneumatic hammer is adequately assembled with its parts and charged with compressed air, it should firmly keep the coupling of the hammer and it should not leave the hammer head on the side of its operator.

5.20. During the riveting process, it should ensure that the distances between the person throwing rivets and the person catching rivets are not over 20 meters. Within the dangerous room where is throwing and catching rivets, the people are not allowed to going and coming or working there (in the radius of 3 meters at least counted from the center of this room, it should anticipate the necessary measures to prevent the dropping down of rivets).

5.21. When the guns are used for implementing the works, it should anticipate measures to prevent the going through constructions of concrete pieces, bricks, stone and other materials that are shot out in all directions to people standing in surroundings.

When these guns are used, it should meet the requirements presented in the guide books given for each type of the gun.

6. USING THE CONSTRUCTION VEHICLES AND MACHINES/

6.1. All of construction vehicles and machines should be transferred and used with their adequate technical dossiers in which are presented their basic technical parameters, the guidelines for assembling, installing, transporting, maintaining, using and repairing them, the shift hand-over book and technical diary on their technical status.

6.2. Construction vehicles and machines should meet the requirements on safety throughout their using process.

6.3. Construction vehicles and machines should be technically maintained and periodically repaired according to concerned regulations defined by their technical dossiers. The construction, repair and substitute their important parts should be implemented on the basis of their calculations and designs as well as approved according to prevailing design procedures.

6.4. Cranes used in the constructions should be managed and used according to TCVN 4244 - 86 and regulations defined by this section.

6.5. In case that the construction vehicle and machines are pressure-equipment or have pressure appliances, they should meet the regulations defined by the Code QPVN 2 - 1975 named by "Code for Safety Technique for Pressure Equipment" and the regulations defined by this section.

6.6. Electricity-motorized construction vehicles and machines should be:

Insulated or tightly covered in their electric conducting bare parts;

Earthed in their metallic non-electrified parts;

6.7. Moving parts of vehicles and machines that could provoke dangers for workers should be shielded or equipped with protection means;

In case that the moving parts can not be shielded or equipped with other protection means due to they realize the function of a working tool, they should be equipped with signaling appliances.

6.8. The constructing design of vehicles and machines should ensure that their abnormal working regimes should be signaled and if necessary, it should equip with protection appliances to stop and switch off - automatically the vehicles and machines or to eradicate their dangerous occurrences.

6.9. Construction vehicles and moving machines should be equipped with acoustic and light signaling appliances. Within the moving area of construction vehicles and machines it should arrange signboards.

6.10., The constructing principle and installing positions of directing gears (of construction vehicles and machines) should be selected so that they can eradicate the automatic or haphazard switching off or switching on the construction vehicles and machines.

6.11. It is forbidden to use vehicles and machines or their personal parts for utilization and functions not to be defined by regulations of enterprises fabricating them.

6.12. Construction vehicles and machines should be assembled and installed according to the guidelines of enterprises fabricating them and the measures to implement the safety technique in assembling and installing vehicles and machines of working teams.

6.13. It is only allowed to carry out the technical maintaining, adjusting, repairing vehicles and machines after stopping motors as well as after the depressurization of hydraulic and compressed air systems, excluding special cases that are defined by regulations presented in guideline documents of fabricating enterprises.

6.14. Areas where the vehicles and machines are assembled and installed should be arranged so that the safety for equipment and people can be ensured throughout the duration of using them.

6.15. Vehicles and machines running near the electricity transmission lines should be sited so that the distance from the edge of vehicles and machines or their loads to the nearest electricity transmission line is not smaller than the values presented in the table 2.

Table 2

Voltage of electricity transmission line (KV)	1	1÷20	35÷110	154÷220	330	500÷700
Horizontal distance (m)	1,5	2	4	5	6	9

6.16. Vehicle and machine working on the side of hole and ditch should be sited so that the distance from the nearest fulcrum of vehicles or machines to the hole or ditch is not smaller than the values presented in the table 3.

Table 3.

Depth of holes (m)	Soil type			
	Sand	Mixed sand	Mixed clay	Clay
	Horizontal distance counted from nearest fulcrum of vehicles or machines to the foot of bank of ditch of hole (m)			
1	1,5	1,25	1	1
2	3	2,4	2	1,5
3	4	3,6	3,25	1,75
4	5	4,4	4	3,0
5	6	5,3	4,75	3,5

In case that it is impossible to satisfy the above requirements due to unfavorable topographic conditions of working area, it should anticipate measures to strengthen the banks of ditches or holes against the land-slips provoked by biggest loading of construction vehicles and machines.

6.17. When the condition vehicles and machines run below the electricity transmission line being in operation, they should ensure the necessary distance counted from their highest point to lowermost point of the line so that this distance is not smaller than the values presented in table 4.

Table 4.

Voltage of electricity transmission line (KV)	1	1÷20	35÷110	154÷220	330	500÷700
Horizontal distance (m)	1	2	3	4	5	6

6.18. It is forbidden to use vehicles and machines in following cases:

Ending of the time limit of using vehicles and machines, that is recorded in the permit to use cranes and pressure equipment;

Damage or absence of safety protection equipment;

Damage of important parts of vehicles and machines;

6.19. For the vehicles and machines being in operation, the responsible operator is not allowed to leave them for other areas or entrust them to others.

6.20. Workers operating construction vehicles or machines should ensure the satisfying the regulations defined by Article 1-8 of the present code.

For using vehicles and machines, the workers should adequately implement the regulations defined by their safe operation process. Before putting vehicle and machines into running, it should control the technical status of these vehicles and machines. It is only allowed to use vehicles and machines if their technical status is ensured well. If the construction vehicles and machines are broken down, the drivers of these vehicles and machines should repair it by themselves or report it to their immediate head and propose him for concerned repairs. Only after overcome these break-downing one can put the vehicles or machines into using.

7. DRILLING WORK

7.1. The use of drill types should abide by regulations defined by prevailing "Code for Safety Technique for Geological Drilling-Sounding Work".

7.2. The assembling, installing, repairing, transporting and dismantling the drilling machines should be installed under the direct guidance and supervision of technician or working team leaders; at the same time it should anticipate measures to ensure the labor safety for workers like: make know measures to lift and lower the drilling rod, provide the safety belts for workers, install the shields protecting workers from dropping down of materials...

When there is heavy rain, storm, typhoon or the wind speed is of class 5 upwards, it is not allowed to carry out above works. When it is dark or in the night, it should arrange adequate lighting for working area.

7.3. During the lifting and lowering or repairing the drilling tower, the people who do not have the task should leave the working area for a distance of 1,5 time of the tower height counted from the tower center.

7.4. For directing the manual windlass, it should assign experienced workers who have know-how on drilling, who can anticipate the works for each drilling steps and measures to treat rapidly occurrences during lifting and lowering the drill.

7.5. For moving the drill, it should lower the drilling rod, excepting the case that the drilling machine is moved on an even and flat road with a moving length not to exceed 100

meters and the moving of drilling machine is not performed below electricity transmission lines.

For moving the drill having the height over 12 meters it should use steel cables to fasten the drilling tower in four tower sides and the cables are connected to the altitude from 2/3 to 3/4 of the tower height. The minimal distance counted from tower to worker directing the windlass should be equal to the tower height plus 5 meters. In temporary interrupting the moving of drilling tower, it should anchor the fastening cables.

7.6. The distance between drilling machine and the wall of drilling tower should not be smaller than 1 meter. If it is not possible to ensure this distance, it should arrange the protection shields.

7.7. The distance between drilling tower and other constructions should be determined according to project technical design. The distance between consecutive drilling towers should be minimally equal to 1,5 time of the height of the highest drilling tower.

7.8. In surroundings of drilling tower frame, it should arrange the support to prevent the fall of drilling rod and the working area should be paved with parquetry. It should arrange the staircase for workers going up and going down the tower. For staircases and manipulating platforms arranged on drilling town, it should arrange the protection rail of 1 meter high. If it is not possible to arrange such a protection rail, the workers should wear safety belts.

7.9. After finishing the assembling and installing the drilling tower, it should fix the anchoring cables. These anchoring cables should be firmly fixed to anchors according to the requirements of project technical design.

It is only allowed to adjust the drilling tower after adequately arranging all anchoring cables according to above requirements.

7.10. Before carrying out the drilling, it should control the drilling tower and equipment according to following requirements:

Strength of joints of anchoring cables and anchoring details; mechanical stability of drilling tower frame;

Mechanical sustainability of manipulating platforms and supports;

Slant of drilling tower that is determined before and after installing the drilling machine;

When the supporting pillars or drilling tower frame are deformed (concave, curve, warped, cracked...) or anchoring joints are damaged, it should repair them so that the safety is ensured and only after that one can carry out the drilling.

Before beginning the formal drilling, it should carryout the drilling test and establish a procès-verbal to certify the technical status of drilling machine.

7.11. During the drilling process at least one time per week it should assign the responsible people to control the working status of drilling tower in order to discover the abnormal phenomenon of its unsafe running, and carry out measures to repair and overcome them. Besides the above periodical control, it should again control the drilling tower in following cases:

Before and after moving the drilling tower;

Before and after overcoming the occurrences;

After interrupting the works by storms, typhoons and high wind speed of class 5 upwards;

After the appearance of the eruptive oil/gas current;

7.12. It should define by clear regulations the limit of the height of lifting the drilling rod in order to avoid the bump of drilling equipment with sliding beams and pulley.

It should not carry out the drilling if the bolts of drilling machine was not strictly tightened.

7.13. When the drilling rod is being in lifting or lowering process, the people should not carry out any work on drilling tower. Only after receiving the order of commanders, the lifting or lowering drilling rod can be carried out.

Orders should be clearly defined and made known to all people before carrying the works.

7.14. Drilling should be equipped with lightning rod system. Electric equipment should be protected by earthing.

7.15. It should carry out the wet drilling. In case that it is impossible to carry out the wet drilling, it should supply the workers with adequate protection instruments against dust emissions according to prevailing labor protection regimes.

In the drilling area, it should arrange sheds to protect workers from rain and sun.

7.16. After stopping the drilling, the drilling well should be firmly covered. On the covering slab or the fence of drilling wells, it should hang the signboard and signaling lamp.

8. ERECTING, ASSEMBLING, USING AND DISMANTLING THE TYPES OF SCAFFOLD AND SUPPORT.

8.1. General Requirements.

8.1.1. In implementing the works of construction and assembly, it should use the types of scaffolds and supports which are fabricated according to designs and calculations to be approved by responsible organizations. In erecting, assembling, using and dismantling the scaffolds and supports, it is absolutely necessary to abide by related regulation, technical requirements presented in their designs (including the guidelines,

regulations technical requirements to be enclosed in passports given by enterprises fabricating special scaffold).

It is forbidden to erect and use any type of scaffold and support in case of the insufficient satisfying above presented conditions.

In erecting, assembling and dismantling the scaffolds and supports on rivers, it should provide the workers with first-aid instruments according to regulations presented in the Article 1-11 of the present code.

8.1.2. It is forbidden to use scaffolds, supports, cradles, ladders for duties not to be defined for their functions.

It is forbidden to use scaffolds, supports, cradles to be assembled on the basis of combining different types of them or to be fabricated on the basis of using different types of their parts without personal designs.

8.13. It is prohibited to use the scaffolds, supports, cradles in following cases

a) They do not meet the technical requirements and labor safety conditions presented in their designs or passports, especially, in case of insufficient supply with anchoring instruments or in case that they are anchored to unstable parts of construction, such as rails, roofs, balconies etc... as well as to anchoring point not to be calculated for bearing the anchoring force.

b) They are deformed, cracked, corroded or incomplete;

c) The clearance between their working floors and walls of houses or constructions is over 0,05 meter during the building and over 0,20 m during the perfecting of constructions.

d) The distance from the marginal edge to limit the working areas of scaffolds, supports, cradles to the contiguous marginal edge of transport means is under 0,60 meter.

e) The pillars of scaffolds and supporting frames are installed on unstable ground (weak ground, poor stagnant water drainage, soil sinking level to exceed the allowable sinking limit defined by designs; pads under foots of pillars and frames are made of unstable materials like bricks, stones, waste materials of constructions...) with great threat of landslide, land-slip, or on the parts of the houses and constructions not to be adequately considered, calculated, therefore, they are not capable to sustain the loading force acting upon these pillars of scaffolds and supporting frames.

8.1.4. It is prohibited to load the scaffolds, supports in the positions located outside the positions defined by regulations (in that are installed signboards to mark their allowable loading capacity) or to overload them according to their designs or passports.

It is prohibited to arrange or stone any load on staircases of scaffolds or their working platforms.

8.1.5. If the scaffolds are higher than 6 meters, it should arrange at least 2 working platforms, namely upper and lower working platform. For simultaneous working in both

two these platforms, it should arrange an intermediate platform or protection net in the room between two working platform.

It is forbidden to work simultaneously on both two working platforms and in the same room between them if there is no measure to ensure the safety.

8.1.6. If the scaffold is higher than 12 meters, it should arrange the staircase in a separate room of this scaffold. The slope of the staircase should not be over 60°.

If the height of scaffold does not exceed 12 meters, it is possible to use ladder or ratline. The using these ladder types should abide by regulations defined by Articles 8.7.1 and 8.7.5 of the present code.

Around the gaps of working platform that are used for going down, it should erect the protection rails at three side of them.

8.1.7. The width of working platform arranged on scaffolds and supports should not be smaller than 1,00 meter. When the transporting materials on working platform is carried out by wheel barrows, the width of platforms should not be smaller than 1,5 meter. The going line for wheel barrows should be strictly fixed into working platforms.

8.1.8. Parquetry used for paving the working platforms should be of 3 cm wide at least and they should not be rotten, cracked or broken. The parquetry should be strictly joined one another and their surfaces should be even and flat. The gap between parquetry slabs should not be over 1 cm. When the parquetry slabs are lengthwise installed they should be long enough so that it is possible to install their extremities on the beam with parquetry sections jutting out from the beam of 20 cm at last and they should be firmly tied or nailed up into this beam.

After joining parquetry slabs, they should be strengthened by strengthening laths in order to avoid their slide on the beam.

8.1.9. The working platforms which are fabricated according to the regulation defined by the article 2.2.6 should be equipped with protection rails. The rails should be of 1 meter high at least and they should have at least two cross-bares in order to avoid the falling down of people.

8.1.10. The going ways located under scaffolds and supports should be shielded and protected in the upper side.

8.1.11. Scaffolds, supports located next to hole, road, working areas of cranes should be protected from landslide of hole walls or knocking of transport means or cranes against those scaffolds and supports.

8.1.12. For erecting, assembling, using and dismantling the scaffolds, supports, cradles located next to electricity transmission lines (the distance between them is of under 5m, including low voltage lines), it should implement the strict measures to ensure electric safety for workers. These measures should be agreed and signed by electric management boards through concerned agreement text (for measures like cutting off the electric-current, arranging wood box, shielding net etc...)

8.1.13. For scaffolds, supports, cradles to be equipped with electricity lighting system and electricity consuming appliances and devices, it is absolutely necessary to abide by regulations defined by sections 1,3,5 and 21 of the present code.

8.1.14. Scaffolds, supports having the heights up to 4 meters are only allowed to be put into using if the team leader checked and took over them as well as recorded the reception contents into the working diary; As for scaffolds and supports having the heights over 4m, they are only allowed to be put into using if the technical council assigned by leaders of assembling and installing units checked and took over together with establishing a reception prôcès-verbal which should be introduced into the technical dossiers of working units. In the organizational structure of technical council, a representative of the labor safety board or a cadre to be responsible for labor safety should participate in it.

The content of checking and taking over of the constructions is based on technical requirements defined by designs or passports of scaffolds, supports and related regulations presented in this section. It is necessary to check the geological stability of the ground, the joints linkages, working platforms as well as to control the implementing related labor safety measures applied for working at high altitudes and using electricity.

8.1.15. Before daily working, the technician to be responsible for implementing the works or the team leaders should control the technical status of all parts and construction linkages of scaffolds and supports. Only after controlling them (with recording them into working diary) the workers car starting their works. In the course of working, in case of discovering any damage of scaffolds, supports that cold provoke dangerous accidents, the workers should stop their works and report these damages to their technician to be responsible for working or to their team leader for carrying out necessary supplementary repairs. Only after finishing these repairs and establishing the procès-verbal according to regulations defined by the Article 8.1.14, thus, the workers can continue their works.

8.1.16. After long stopping the works on scaffolds, supports (over 1 month), if the teams want to continue their works, they should again carry out the checking and taking over these constructions as well as establishing the reception procès-verbal according to regulations defied by the Article 8.1.14.

8.1.17. The dismantling scaffolds, supports should be carried out according to the reasonable order and the guideline presented in their designs or passports.

In areas where are being the dismantling the scaffolds, supports, it should arrange fences and signboards in order to prohibit the crossing of the people and vehicles. It is forbidden to dismantle scaffolds by means of pulling them on the ropes.

8.1.18. It should not erect, assemble, dismantle the scaffolds, supports or work on them if there is heavy rain, storm, typhoon or wind speed of class V upwards.

When it has stopped raining, if it is necessary to continue the working, it should recheck the scaffolds, supports according to regulations defined by the Article 8.1.15 and prepare measures against slipping while walking.

8.2. Bamboo made scaffold, wood made scaffold.

8.2.1. Bamboo used for making the scaffolds should be over - mature one which is not rotten or cracked. Scaffold details to sustain the load should be made of bamboo of class I.

Wood used for making the scaffolds should be good one of group V upwards which is not rotten or cracked

8.2.2. Wood made scaffold to have the heights over 4 meters or to sustain heavy load should be constructed with bolting linkages. Bamboo made scaffolds should be tied with strong cords not to be rotten.

It is forbidden to use nails for linking the details of bamboo made scaffolds.

8.2.3. Foots of stakes of bamboo made scaffolds should be fixed in the ground with fixing depths of 0,5 meter and strictly stuffed.

8.2.4. After finishing of the erecting and assembling bamboo made scaffolds, it should check following technical status:

Anchoring capability of linkages of scaffolds;

Quality of materials used for making scaffolds;

Technical status of details of scaffolds (rails, staircases, parquetry).

8..2.5. In dismantling the scaffolds, it should not cut the knots, it should undo them and take into pieces the scaffolds and gradually move each part severally down to the ground.

8.3. Steel scaffold.

8.3.1. Steel tubes used for making the scaffolds and steel hoops used for their linkage should not be belt, flattened, cracked, holed and deformed by other defects.

8.3.2. Legs of scaffolds should be inserted in pedestals and installed stable and strong buffer pieces according to the regulations presented by the article 8.1.3, point 2 of this section

8.3.3. It should erect scaffold section for scaffold section and after finishing the erecting each scaffold section it should firmly anchor it into the construction. The positions of anchoring points should be arranged according to relation design. When the anchoring point coincided with the wall hole, it should create an inside linkage system at which to set up the new anchoring points; and the steel hoops should be firmly linked with the construction in order to avoid the slide of horizontal beams on vertical pillars of scaffolds.

8.3.4. For erecting assembling and dismantling steel scaffolds located next to electricity transmission lines (with the distances between them are under 5 meters) it should abide by the Article 8.1.12 of this section.

8.3.5. For erecting the steel scaffold to be higher then 4 meters, it should arrange a lightning system for it according to the related guideline presented in its design, excepting the case that the scaffold is erected and assembled within the area protected from lightning by an existing lightning protection system

8.4. Suspension scaffold, suspension cradle.

8.4.1. The section of suspension cords should be selected according to the design and should ensure the safety coefficient not to be smaller than 6.

For the suspension of scaffolds, their suspension cords should be made of round section steel or cables. For the suspension of cradles, their suspension cords should be made of flexible cables.

8.4.2. Suspension scaffolds and suspension cradles should be erected and assembled with a minimal intermediate distance of 10cm between them and the parts jutting out the construction.

8.4.3. Consoles should be fixed to strong linkage parts of the construction. It should not to arrange consoles leaning against the roofs.

8.4.4. Suspension scaffolds should be strongly anchored and tied to the construction in order to avoid their swaying.

8.4.5. Workers going up and down the suspension scaffolds should use the ladder cord to be strongly fixed to consoles or through wall holes.

8.4.6. Before using the suspension scaffolds, I should test them with tested static loading capacity to be higher of 25% than the calculated one.

As for the suspension cradles, before using them, before testing them with tested static loading capacity as above presented, it should test them again with following types of loading capacity:

a) Dynamic loading capacity of suspension cradles being in lifting and lowering, that is higher of 10% than the calculated one;

b) Loading capacity of suspension hooks sustaining the loads, that is of two times of calculated loading capacity with their tested suspension time span of 15 minutes at least.

After finishing the testing them wit above types of loads, it should establish the procès-verbal of checking and taking over them.

8.4.7. In order to lift and lower the suspension cradles, it should use the windlass equipped wit automatic braking systems. Free dropping of suspension cradles is prohibited. When the work is stooped, it should lower - down the suspension cradle.

8.5. Movable lifting tower

8.5.1. The going line of movable lifting tower should be even and flat in lengthwise as well as transversal direction.

8.5.2. After installing the movable lifting tower in its fixed position, its wheels should be firmly wedged with chocks and its braking jacks should be fixed.

Movable lifting towers should be equipped with a lightning protection system according the related design.

8.5.3. The moving of movable lifting towers should be light without shocks. It should not move the movable lifting towers when the wind speed is from class V upwards or when there are peoples or materials to be on their working areas.

8.6. Console - formed support.

8.6.1. The frames of supports should be installed on the stable, even and flat ground. When the building of floors is not finished, it should use the parquetry to form temporary floors on which are installed the frames; it should not install these frames directly on the beams of incomplete floors.

8.6.2. It is only allowed to construct the supports by means of superposing two supporting frames. In case of superposing 3 supporting frames, it should limit the weight of loads installed on their working platforms or strengthen them. In both two cases, it should recalculate the carrying capacity of these supports.

The superposed upper frames should be anchored in firm construction parts.

8.6.3. Workers going up and down the manipulating platform should use ladders. It is forbidden to lean hands on the frame for going up and down the platform.

8.6.4. Consoles should be firmly anchored and tied into construction parts.

8.6.5. In order to lift the materials up to working floors, it should use the carrying ladders or other cranes. It should not anchor and tie the lifting equipment or cranes into consoles.

Workers going up and down the manipulating platforms of console-formed supports should go from the inside of the construction through its wall holes to working areas .

8.7. Ladder:

8.7.1. Ladder should be installed on even, flat and stable ground and firmly wedged with chocks .

It is prohibited to install the ladder leaning against the wall with inclination angles to be over 60° or under 45°. In case that the installing ladders can not be realized according to the regulations, it should assign people to keep the ladder and the ladder legs should be firmly wedged with chocks .

8.7.2. For lengthening the ladder, it should use the strong cords to link the ladder section and the upper end of ladder should be tied into the construction.

8.7.3. Before working on the step ladder, it should anchor two ladder branches in order to avoid the spreading.

8.7.4. Before using the ladder, it should control its general safety status. For the new ladder or the ladder not to be used for a long time, before using them, it should retest them with a carrying capacity of 120 daN.

8.7.5. Before allowing people going up and down the ladders, it should control their chocks as well as the positions of ladders leaning against the wall.

8.7.6. It should not hang the things on the ladder if their weights exceed the allowable carrying capacity of the ladder and when there are people working on this ladder.

It should be use the step ladder in the function of scaffolds or supports.

9. WELDING WORK.

9.1. General requirements.

9.1.1. If the electric and oxy- acetylene welding are carried out on the upper floor while the lower floor is not protected from fire by an intermediate fire prevention platform, it should clear explosive - inflammable substances from an area of a radius not to be smaller than 5 meters of this lower floor; as for the materials and equipment to be capable to explode, they should be also moved from this lower floor to another sites.

9.1.2. In cutting the parts of the construction, it should realize measures to prevent the collapse of the cut parts.

9.1.3. It is not allowed to use the bare gas burner for cutting the equipment being under pressure or containing explosive, inflammable and toxic substances.

9.1.4. For electric or oxyacetylene welding to be carried out in tight barrels or rooms, it should carry out the good ventilation for these areas. The wind speed of the ventilation should be from 0,3 to 1,5 meter/ sec. At the same time, it should assign people to stand outside and observe the inside works in order to treat timely the dangerous occurrences. In case of welding to use LPG (propane, butane, oxide of carbon), the sucking nozzle of ventilation system should be oriented towards the lower side.

Before welding in tight barrels or tanks containing toxic gas, it should control the concentration of this gas. Only after ventilating them and confirming that the toxic threat was eradicated it is possible to let the people work inside these barrels and tanks.

For using the welding to cut the equipment, that have formerly contained toxic substance it should clean and dry them so that the concentration of toxic substances become smaller than the dangerous one; only after that the cutting works may be carried out.

9.1.6. Before the welding in areas where are explosive, inflammable, toxic gases, it should control the concentration of these gases. If it is necessary, it should carry out the ventilation in order to ensure that the threat of fire, explosion and toxic environment is eradicated and only after that it is possible to begin the works.

9.1.7. It should not to carry out simultaneously the electric and oxy-acetylene welding in tight barrels.

9.1.8. For welding in tight barrels, it should arrange the electric lamps installed outside the barrels or hand - held mobile electric lamps of voltages not to exceed 12 volts. It should use the separate transformers installed outside the barrels for providing these lamps with electricity. It is prohibited to use the auto- transformer in function of the step - down transformer in order to provide these lamps with electricity.

9.1.9. Electric or Oxy- acetylene welders, including welder's mates should wear the mask or dark glasses appropriate to welding. Before welding, the welder should adequately control the conditions on labor safety.

9.1.10. It is only allowed to weld at high altitude after carrying out appropriate measures to prevent the fire and to ensure the safety for people working and going in lower side.

9.1.11. For using the welding to cut the parts of electric equipment or the electric equipment being in running, it should carry out the appropriate measures to prevent the getting electric shocks.

9.2. Electric welding:

9.2.1. The metallic parts of electric welding appliances as well as welded constructions and products (outer cover of alternative and direct current welding appliances) should be earthed according to the regulations defined by the Vietnam standard TCVN named by "Code for earthing and connecting to neutral point of electric equipment".

9.2.2. In order the conduct the electric current to welding pincers, soldering- iron, it should use the flexible electric cables with sections to be appropriate to greatest electric current of the welding appliance and the duration of a welding cycle.

9.2.3. The joint of electric cables should be done by means of welding and then it should be insulated. The connection of cable to appliance welding appliance should be realized to joining cable box which will be then welded with tin.

9.2.4. In moving or installing the welding electric wires, it should prevent the bumps to damage their insulated outer cover. It should not let the electric cable touch water, oil, steel cables, hot tubes. The distance from welding electric wires to hot tubes, oxygen bottles, acetylene tanks, or other appliances containing fuel gas should not be smaller than 5 meters.

The length of wires conducting electricity to welding machines should not be over 15 meters.

9.2.5. It is possible to use metallic slats of any section for making neutral wires conducting the electric returning current if their smallest sections can ensure a safe heat emission in condition of the presence of electric welding current. The joints between sections of neutral wires conducting the electric returning current should be strong, bolted or welded.

For welding inside the rooms to be threatened with fire and explosive occurrences, the neutral wire conducting the electric returning current should be insulated like the principal wires.

9.2.6. Shafts of welding pincers should be made of good electric and heat insulating materials. Welding pincers should be firmly clipped to soldering - sticks; For electric welding current of intensity to be 600A upwards, it should not use the welding pincers with electric welding wires to be threaded through pincers shaft.

9.2.7. The voltage at the clips of direct or alternative current welding machines during their arc- emission process should not exceed 110 volts for DC generators and 70 volts for AC transformers.

9.2.8. For welding machines fabricated with fixed contacts, it should use mono-phase transformers which are connected to alternative electric current network of frequency of 50 Hz and voltages not to exceed 50 volts. Without the electric load, this voltage level should not exceed 36 volts.

9.2.9. It is only allowed to get the electric arcing source from AC welding machines, DC welding machines, electric rectifying appliances; It is prohibited to get electricity directly from electric networks.

9.2.10. It should connect the network to welding machines through the fuse cut - out with fuse wires. Welding machines should be equipped electric supply to welding machines.

9.2.11. Only workers electricians are allowed to make the electric connection from electric grids to welding machines or to take into pieces and repair them. It is prohibited to connect and disconnect the output wires of welding machines being electrified.

9.2.12. When the welding is carried out inside tight metallic barrels, the welding machines should be outside installed, the welder should be equipped with rubber made hat, shoes or insulating carpet and rubber made gloves.

9.2.13. Welding machines installed in open air should be shielded from the rain; it is prohibited to weld in open air in stormy and rainy weather.

9.2.14. For welding at areas where are many people simultaneously working or going, it should arrange shields made of non-flammable materials in order to protect them from scalding.

9.2.15. Electric welders working at high altitudes should be equipped with bags to contain instruments, soldering sticks and superfluous sections of soldering sticks.

9.2.16. On contacting welding machines it should arrange transparent shields made of glass for observing welding process.

9.2.17. It is only allowed to carry out the cleaning electric poles of electric or locomotive welding machines after cutting off the electricity.

9.2.18. The locomotive welding machines cooled by water should be equipped with gutters to collect the cooling water. During the working, the welders should stand on platforms covered by insulating rubber carpets.

9.2.19. On electric or locomotive welding machines it should arrange the shields made of glass to cover electric poles located in the side of welders to stand and to work.

9.2.20. Only welders who know how swim and have a thorough grasp of properties of their works and working areas are allowed to carry out the under water welding.

9.2.21. Before underwater welding, it should carefully investigate the construction to be welded, and establish an organizational design for implementing the works and this design should be cautiously approved.

9.2.22. Before diving into water, the welder should re-control the welding equipment and all of personal labor protection instruments brought by himself.

9.2.23. Before underwater welding, it should assign people who have a thorough grasp of safety techniques and stand ashore in order to supervise it and communicate with the underwater welder through telephoning. Telephones, fuse cut - outs and circuit breakers should be installed at favorable sites in order to treat timely the occurrences. First aid instruments and forces should be ready for first aid activities.

9.2.24. If on the surface of water at welding site there are oil or lubricant, it should not assign welder to carry out the underwater welding.

9.3. Oxy - Acetylene Welding

9.3.1. Oxy- acetylene welding and cutting the metallic constructions by means of oxy- acetylene welding should abide by not only the regulations defined by this section but also the regulations defined by "Code for safety techniques and hygienic of the production and utilization of acetylene and oxygen for processing the metals "TCVN 4245-85".

9.3.2. The calcium carbide should be maintained and contained in iron barrels which have to be installed at dry and good ventilated areas and they should be protected from fire. To open these calcium carbide barrels it should use the instruments specially fabricated for opening them.

9.3.3. For using the acetylene digesters, it should not:

- Let the gas pressure exceed its allowable values defined by related regulations

- Remove their automatic regulators and security valves as well as manometers;

- Use damaged or inaccurate safety appliances.

- Open the compartment containing acetylene in digesters while not to let out the gas volume remained inside them;

- Install the digesters at going way, next to staircases, in ground floor where are many people without carrying out measures to protect them from the explosive of digesters.

9.3.4. Acetylene digesters should be equipped with fire - extinguishers. Before each time of using them and at least two times per shift, it should control the water level of fire - extinguishers.

9.3.5. Before cleaning the acetylene digesters, it should open all of its holes (spout, doors...) for the good ventilation.

9.3.6. In grinding the calcium carbide into powder, the workers should wear glasses and gauze mask. In taking the remained calcium carbide from the digester the worker should wear rubber gloves.

9.3.7. It should classify and split the bottles containing gas from the empty bottles. Bottles containing gas should be vertically installed on supports and fixed by chains, hooks or belts.

9.3.8. It is only allowed to receive maintain and entrust the bottles to be adequately equipped with security gears and appliances.

9.3.9. Bottles containing acetylene should be painted white while the script "ACETYLENE" on the outer cover should be set in red type. The bottles containing oxygen should be painted blue while the script "OXY" on the outer cover should be set in black type.

9.3.10. The bottles containing oxygen and acetylene used for welding should be installed in areas to be good ventilated, dry, shielded from rain and sun and located far from the electric bare wires or hot things. In transporting these bottles, they should be installed on supports of special vehicles.

The distance between oxygen bottles and acetylene bottles (or acetylene digesting pot) as well as the distance between them and the welding areas, where are the bare gas burners or the fire emissions should be of 10 meters minimally.

9.3.11. In transporting and utilizing the oxygen bottles:

a) It is prohibited to carry them on the shoulder or to roll them on the road;

b) It should use the special transport means which are equipped with shock absorbers. If the bottles are transported for a long itinerary, they should be installed in transversal orientation of the vehicle and each of them should be equipped with 2 buffer hoops made of rubber cords or ropes of their section diameter of 25 mm.

c) It is prohibited to lubricate the screw thread. Hands sticky with oil and grease should not touch the bottles;

9.3.12. In using the bottles, in dependence on temperatures of the outside atmospheric environment, it should let following minimal oxygen or acetylene pressures in the bottles:

0,5 atm for bottles containing oxygen;

2 - 3 atm for bottles containing acetylene;

9.3.12. Opening the valves of acetylene or oxygen bottles and assembling their pressure regulators should be carried out be means of instruments specially made for these works. It is prohibited to use their pressure regulators without manometers or with inaccurate manometers. If the manometers have been used in a time span to exceed the defined one, it should re-control them.

9.3.13. Before acetylene welding or cutting the metals, welders should control the ends of gas conducting tube, gas burners, gas bottles, manometers and gas digesting pots.

9.3.14. For lighting the gas burners, it should open oxygen valve first, then the acetylene valve second. For stopping the welding, it should open the acetylene valve first, then the oxygen valve second.

9.3.15. When the welding is carried out inside the constructions being in building or inside the rooms where are equipment being in assembling, it should carry out the partial ventilation for them.

9.3.16. In the course of welding, if the soldering-iron is wedged with chocks up, it should use the copper wire to unclog it; it should not use the hard steel wire for this work.

9.3.17. It is prohibited to repair the pipes conducting acetylene and oxygen or to tighten the screws of bottles if they are being under pressure and the manometer hand does not indicate ZERO.

10. USING THE MACHINES OF AUXILIARY WORKSHOPS

10.1. The use of machine-tools of auxiliary workshops should abide by regulations defined by "Code for Safety Technique of Mechanical Manufacturing Enterprises".

10.2. All of materials, machines-tools and products manufactured by the workshops should be neatly arranged at defined sites.

10.3. It is only allowed to use the constructions to be newly built in function of auxiliary workshops after tidying up them from superfluous materials as well as machines and instruments used in the process of building these constructions.

10.4. It is prohibited to carry out any work which can kindle a fire at inflammable areas. At these areas, it should arrange the signboard "Fire prohibited"

10.5. It should permanently tidy up the workshops from superfluous materials, waste materials of the production process. These materials should be arranged in areas to be specially defined for them.

10.6. It is prohibited to discharge acid and base solutions into public sewerage system; these solutions should be discharged into special pipelines.

10.7. The floor of workshops should be high, dry, clean with water drainage system to be arrange around it. The mechanical engineering workshops which discharge waste water during the production process should be built with their floor having a certain slope for draining the stagnant waste water.

10.8. At the positions where workers stand and work permanently and if the environment around them is permanently wet, it should arrange woody platforms.

10.9. Lighting of workshops should be adequately ensured according to related prevailing regulations.

10.10. The ways between areas inside the workshops should be of 0,80 meters wide at least. It is prohibited to let any thing to obstruct these ways.

10.11. It should arrange an adequate lighting system for ways, staircases and working areas when it is dark.

Lamps should be arranged so that their light does not dazzle the workers, not to be too bright, does not quiver and the lighting intensity should be unchanged in order to avoid their negative influences on the manipulation of workers.

10.12. In the workshop or at each working site of workers it should ensure the natural or artificial ventilation according to the related prevailing standard.

10.13. If the machines installed in the workshop provoke great noises or vibrations to exceed their allowable limits, it should carry out measures to isolate them in order to avoid their negative influences on people working in the surrounding.

10.14. In the workshop area, it should adequately provide the workers with drinking water, bath rooms, latrines according to prevailing hygienic standards.

10.15. In working sites where is the dust emission, it should arrange the vacuum cleaners in order to ensure a dust concentration not to exceed its allowable limit.

10.16. It should arrange machines and materials according to the order of the chains of production of supplying materials, by-products and products so that these chains are installed in a same direction on a shortest line.

The machines-tools that require concentrating the attention of workers should be installed at particular positions to be located far from areas where are many people crossing.

10.17. All regulations and control panels of machines should be installed at favorable and safe positions with ease of manipulation.

10.18. Positions of installing the machines should be selected so that the taking into pieces and repairing them do not influence upon the adjacent machines or the manipulation of workers.

10.19. At positions where the workers can sit down to work, it should adequately arrange chair and other necessary means for them.

10.20. All of safety-gears of machines should be adequately assembled and they should ensure a good running.

It is prohibited to test and operate the machine-tool when it is not adequately equipped with safety-gears.

10.21. Before repairing the belt-drive gear, it should separate the transmission belt from the driving wheel.

10.22. The motor driven machines to be installed at high altitudes and to require permanent watching and regulating should be placed on the manipulating platform of at least 0,90 meter wide with the protection rail of 1 meter high.

10.23. The electric motor driven-machines or machines equipped with electric lighting should be protected by earthing.

10.24. It should periodically control the movable gear of the machine with at least two times per year and the control results should be recorded to the diary of watching the machine.

10.25. It is prohibited to lubricate the machine being in running.

10.26. It is prohibited to dismantle or assemble manually the driving belt from the machine being in running.

10.27. The joint of two ends of the driving belt should be strong.

10.28. On the platform of the machine, it is only allowed to install the things being processed and necessary instruments required by this work.

10.29. It should cut the electricity supplying of the machine in following cases:

Stop the work, even in short time.
Interrupt the electricity supply.
Wipe or lubricate the machine.

10.30. It should stop the running of the machine in following cases:

Take the processed thing from the machine if this machine is not equipped with a gear to expel automatically this thing from the machine being in running.

Change the instruments or equipment.

10.31. The machines that can provoke metallic shavings or fire emissions should be shielded by the nets. If it is not possible to arrange the shielding nets, it should provide the worker with adequate labor protection appliances according to prevailing regulations.

10.32. Before starting the machine, it should control its gears in order to ensure the it is in good technical status and is equipped with adequate safety appliances.

10.33. When the machine is being in running, if the operators discover any abnormal occurrence, they should immediately stop the machine and inform that to the head of workshop.

10.34. If the electric equipment have a breakdown, it should cut off the electricity and inform this breakdown to the worker electrician to repair it; It is prohibited to repair the machine in a casual way.

10.35. After ending the work, the operators should switch off the machines after careful wiping and controlling them.

11. USING THE BITUMEN, PUTTY AND ISOLATING LAYER

11.1. Bitumen, Putty -Preparation and Transportation.

11.1.1. Areas where the bitumen and putty are prepared and boiled should be located far from inflammable constructions at least with a distance of 50 meters, at the same time they should be adequately equipped with fire extinguishing means.

11.1.2. Before taking the bitumen from barrels for boiling, it should tilt the barrels to empty the stagnant water.

11.1.3. Workers who carried out the works touching bitumen and putty should be professionally trained with these works.

11.1.4. Workers who carried out the works touching melted bitumen and putty should be certified by health certificates issued by health care organizations that they are healthy enough for carrying out these works. Workers getting the dermatological or respiratory diseases and women being in giving suck to baby should not carry out these works.

11.1.5. For preparing and boiling the bitumen, putty, it should satisfy the following requirements:

a) Boiling barrels should be equipped wit lids made of inflammable materials and tightly covered. It should not pour the bitumen, putty into the boiling barrels with their volumes to exceed 3/4 of barrel capacity.

b) It is prohibited to use leaky barrels for boiling bitumen, putty.

c) Raw bitumen to be poured into the barrel should by dry; and in the course of preparing and boiling the bitumen, putty, it should not let the water fall down the boiling boiler.

d) In case that the liquid fuels (kerosene, diesel oil etc...) are used for boiling the bitumen to be directly used as an unabsorbed materials for the flat-roofs, it is allowed to install the boilers on these roofs if there is no fire danger to threat the houses or constructions.

11.1.6. The transportation of melted bitumen, putting should satisfy following requirements:

a) Instruments to scoop and contain melted bitumen, putty, like scoop with long shaft, bucket, barrel... should be dry and good;

b) Transporting the melted bitumen, putty to working areas should be carried out by motorized transport means; and the melted bitumen, putty should be contained in metallic barrels to be tightly covered as well as the volumes of melted bitumen, putty contained in the barrel should not exceed 3/4 of barrel capacity

c) It is only allowed to transport bitumen, putty barrels by manual transport means if it Is not possible to use the motorized ones for this work.

d) It should use the long shaft scoops to scoop melted bitumen, putty

11.1.7. In order the lift the barrels containing melted bitumen, putty, it should use motorized lifting means.

11.1.8. It is prohibited to pour wet raw bitumen into the barrel being in containing the hot melted bitumen.

11.1.9. When it is necessary to dilute bitumen with gasoline or other oil products it should satisfy following requirements:

a) Workers making the dilution should stand at wind-swept place and they should slowly pour bitumen into the oil products, slightly stir them by a wood slat. It is prohibited to pour oil products into melted bitumen.

b) Temperature of bitumen in the course of dilution should be lower than the inflaming temperature of solvent of at least 30°C.

c) Areas where is prepared the bitumen should be good ventilated and sited far from the bare fire of at least 20 meters.

11.2. Isolating layer

11.2.1. In the course of laying the bitumen, it should go backward slowly against the wind blowing direction. Workers should wear adequate labor protection instruments: gauze mask, gloves, rubber boots. People not to be responsible for any task should not touch at the areas where is the laying of bitumen.

11.2.2. In the course of laying the bitumen on flat-roof, it should carry out the measures to prevent the falling down of melted bitumen to people standing in lower side.

11.2.3. Before beginning the installation of isolating layer for technological equipment, it should fully cut off the electricity of electric motors driving these equipment, at the same time, the mouths of the pipes providing steam and technological solutions.. should be tightly corked up. At these positions, it should hang the signboards to announce that there are people being in working

11.2.4. The placing of isolating layers for technological equipment and pipelines should be carried out directly on the layout plane before installing them or after fixing them according to their design.

11.2.5. It is prohibited to open the valves, splitting shields, cocks or to keep down them in the course of placing the isolating layer for technological equipment and pipelines.

11.2.6. Workers laying the isolating layers made of paints, smelted bitumen in tight rooms, wells, ditches.. should use masks, protection glasses and rub special balm on bare parts of their human body.

After the temporary interruption or ending of above works, it should install the signboards to prohibit the people touching these areas. It is only allowed to continue the work within these areas if there is the order of responsible technician or team leaders and if the concentration of toxic substances has been reduced down to their allowable values defined by hygienic standards.

11.2.7. Workers laying the isolating layers made of mineral cotton, glass cotton or similar materials should wear protection glasses, gloves, gauze mask. Working clothes should be tightly fastened.

11.2.8. For placing the isolating layers made of glass cotton and located next to electricity transmission lines being in operation, it should cut off their electricity supply.

12. EARTH WORKS

12.1. General requirement.

12.1.1. The regulations presented in this section are in effect for digging the holes for foundation, open - air ditches with or without wall propping systems in the constructions.

For the construction specially made for various sectors, such as communication, water resources, energy... besides carrying out the regulations defined by the part 12 and related other parts of this code, it should again, implement specific regulations on safety techniques used for professional activities of these sectors (like code for safety technique for constructing the bridges, code for safety technique for making the road foundations...)

12.1.2. It is only allowed to dig the foundation hole, the ditches... if the digging is realized in accordance with its approved design, on the basis of documents on topographical, geological, hydrological investigations and measures to ensure the safety technique that are applied in the course of digging.

12.1.3. For earth digging within the areas where are underground lines (underground cable line, water conducting pipeline, steam conducting pipeline...) it should get the permission by text of organizations that are responsible for managing them and the schemes showing the positions, the depth of these constructions as well as the agreement by procès-verbal of these organizations on related alternative earth works, measures to protect the constructions and to ensure the safety for them.

The units implementing earth works should install signboards, appropriate signals in areas where are underground lines and assign technician to supervise the whole earth works process.

12.1.4. It is prohibited to dig the earth at areas located next to underground line by means of digging machines and instruments that could provoke strong shock like crow-bar, grub-hoe, chisel, compressed air-driven digging equipment.

When the diggers discover strange underground lines or underground lines not to be identical to related showing schemes as well as underground barriers like bombs, bullets, mines... it should stop immediately the working in order to consider them and prepare appropriate treating measures. Only after getting measures to treat these barriers and ensure the safety for the people and constructions it is allowed to let the workers continue their works.

12.1.5. For digging the earth at areas located next to the underground cable line being in operation, if it is not allowed to cut the electricity supply to these areas, it should get measures to ensure the electric safety for diggers (using the electric insulated instruments, insulated labor protection equipment...) and the digging should be installed under the direct supervision of organizations managing the cable line in the course of digging.

12.1.6. In the course of digging the earth, if the toxic steam or gas appear, it should immediately stop the earth works and the diggers should leave the dangerous areas until getting the measures to eradicate these toxic steam and gas.

Workers working in these areas should understand the measures to ensure the labor safety and should be adequately provided with antitoxin masks.

12.1.7. For digging the foundation holes, ditches... at areas sited next to communication lines, populated zones... it should erect the fences and hang the signboard as well as arrange the red lamp signaling in the night for showing and protecting the digging areas.

The fence should be installed with a distance not to be smaller than 1 meter counted from it to exterior road edge.

12.1.8. Within the areas where is the earth digging, it should get the measures to drain the stagnant water (even if when there is heavy rain) in order to avoid the in-flowing of water to digged holes that provoke the slip of walls of these digged holes.

In the course of earth digging, it should use the pump to drain the water stagnant in foundation holes, ditches in order to prevent the earth collapse. When the level of earth digging was just touching the underground water level, it should temporarily interrupt the works, then it should get measures to stabilized the walls of digged holes and only after that the digging will be continued (to lower the underground water level is considered as a measure to stabilize the walls of holes...)

12.1.9. For digging the foundations hole, ditches at areas where the soil has a certain natural humidity and there is no underground water spring, it is possible to create the vertical walls for these holes and ditches (no using the wall propping system) if the depths of digging are follows:

Digging depths not to exceed 1 meter at areas where is the soft soil the digging can be realized by means of fields hoe;

Digging depths not to exceed 2 meters at areas where is the hard soil and the digging has to be realized by means of crowbar, grub-hoe, chisel..

12.1.10 For all of other earth digging types that are realized in the digging conditions presented in the above article 12 - 1.9, it is necessary to create slopes or propping systems to stabilize the walls of digged holes and ditches.

12.1.11. In the course of earth digging, if due to the natural conditions and ambient environment, the state of earth is changed like the soil absorbs rainy water for a long time, the soil is too humid or saturated with water..., the digging unit should control the walls of digged holes, the slopes. If it is not possible to ensure the stability of the walls and the safety, it should get measures to strengthen them in order to avoid the land slide and the sudden land-slip (reduce the wall slope, interrupt temporarily the transporting dry soil or strengthen the wall propping system...). These proposed measures should be considered and approved by the commander of construction camp.

12.1.12. For digging the foundation holes, ditches with slope- shaped walls or with walls to be stabilized by propping system, it is not allowed to install the loading kinds not to be arranged by this technical design, such as to arrange materials, to pour the digged soil, to install machines, to park vehicles, to install the rails for wagons, to move cranes used for erecting the electric poles...in a casual way unlike the way defined by regulations of the design.

When it is necessary to install a new load, it should recalculate its influences and impacts to the safety of implementing the works concerning the foundation holes, ditches (so that this new load can not provoke land slide, land-slip, violation of the construction of wall propping system...) and his installing new load should be accepted by designers through a related procès-verbal.

12.1.13. It is prohibited to dig the earth with a vaulted entrance like frog's jaw or if the diggers discover any strange underground thing they should immediately stop their works and leave their working positions to other safe sites. It is only allowed to continue the work after destroying the vaulted entrance (like frog's jaw) or this underground thing.

12.1.14. In every day it should assign people to control the state of the walls or slopes of holes. If any lengthwise crack is discovered on the walls or slopes of foundations holes, it should immediately stop the works. People as well as machines, equipment should be moved to safe sites. Only after getting appropriate measures to treat it, the diggers can continue their works.

12.1.15. For digging the underground tunnels crossing the roads where are the vehicles going and coming, it should abide by following regulations:

Before digging them, it should inform it to fire fighter units on duty and communication police units on duty of digging areas.

Digging the underground tunnel crossing the road should be divided into 2 stages, in each of those it is only allowed to dig a half of the width of the road.

12.1.16. For digging the foundation holes, ditches within the areas to be influenced by vehicles, machines and equipment that could provoke strong vibrations, it should get measures to prevent the destroying their slopes by these vibrations.

12.1.17. If in the digging areas there are trees and plants, it should cut them and dig them foots in a safe manner.

Before cutting these trees and plants, it should emit the acoustic signal to inform the people with leaving this dangerous areas.

When the machines are used for digging the foots of trees, it should get measures to prevent the break of pulling cables.

12.1.18. If the explosive materials are used for destroying underground stone blocks or foundations of old houses as well as very solid soil volumes, it should abide by prevailing regulations defined for using the explosive materials.

12.1.19. The way used for going up and down the foundation hole should be cut steps in the earth of at least 0,75 meter long and 0,40m wide. When the dig holes are narrow and deep, it should use the ladder (for going up and down). It is prohibited to hang on to sticks propping up the walls or to lean on the bank of the hole for going up and down it.

12.1.20. When the scoops, buckets,... are used for taking soil from foundations holes and ditches, it should arrange the shielding roofs or protection nets in order to ensure the safety for diggers. For lifting and lowering the scoops, buckets... it should emit appropriate signals (acoustic, light...) in order to avoid accident.

12.2. Digging the earth with slopes.

12.2.1. In digging condition differing from the conditions defined by articles 12.1.8, 12.1.9, it should create slopes for the walls of holes and ditches (if the wall propping system is not carried out). The inclination angles of these slopes should not to exceed the values defined by the table 5.

12.2.2. It is prohibited to dig the sandy soil, the sandy-clay soil to be saturated with water if there is no wall propping system.

Table 5.

Type of soil	State of soil					
	Dry		Humid		Wet	
	Sloping degree of wall slope (degree)	Tangent value of sloping degree	Sloping degree of wall slope (degree)	Tangent value of sloping degree	Sloping degree of wall slope (degree)	Tangent value of sloping degree
Gravel	40°	1:1,20	40°	1:1,20	35°	1:1,45
Big size grain sand	30°	1:1,75	32°	1:1,60	25°	1:2,15
Medium size grain sand	28°	1:1,9	35°	1:1,45	25°	1:2,15
Small size grain sand	25°	1:2,15	30°	1:1,75	20°	1:2,77
Impure clay	50°	1:0,84	40°	1:1,20	30°	1:1,75
Organic soil (humus soil)	40°	1:1,20	35°	1:1,45	25°	1:2,15
Humus soil without roots	40°	1:1,20	25°	1:2,15	15°	1:3,75

Table 6

Type of soil	Mode of propping up the wall to prevent its collapse and land slide		
	Digging depth up to 3m	Digging depth from 3 m to 5 m	Digging depth from 5 m upwards
Soil getting natural humidity	Discontinuous horizontal propping	Continuous horizontal propping (strict)	Designed propping
Soil getting high humidity; Soil powder	Continuous horizontal propping (strict)	Vertical propping	Designed propping
All types of soil of areas where are strong underground water spring	To drive boards deep into the round of the hole bottom of at least 0,75 m deep;		Designed propping

12.2.3. For the slopes getting the length to exceed 3 meters and the tangent value to exceed 1:1 or for the slopes getting the tangent value to exceed 1:2 but their soil is humid, the workers work here should wear safety belts that should be fixed to solid anchoring stake.

12.2.4. It should permanently clear away the soil, stone, and materials being around the mouths of foundations holes, on the slopes in order to avoid the rolling down of them.

12.3. Digging the earth with the wall propping system.

12.3.1. For digging the foundations holes, ditches without creating their slopes according to regulations defined by article 12.2.1, it should create the wall propping systems for preventing the wall collapsing according to the regulations defined by the table 6.

12.3.2. In using the wall propping systems for ditches, foundations holes of under 5 meters deep, if the fabricated propping boards are not available, it should make the propping boards according to following regulations:

Woody boards should be of at least 5 cm thick, 20 - 25 cm wide and they should be put very close to the walls of digged holes;

Props or propping slats to keep the woody boards should be separated with a distance between them from 1,5 to 2,0 meters in dependence on the specifications of soil and the depths of digged holes.

The vertical distances between horizontal props should not be over1 meter. Upper and lower extremities of horizontal props should be kept by strengthening laths. Horizontal props should be arranged in the same plane in the vertical as well as horizontal directions.

Propping woody boards should emerge from the digged ground surface at least of 15 meters.

12.3.3. For large foundations holes, it should carry out the concrete calculations for their wall propping system (propping woody boards and props).

12.3.4. For digging the foundations holes, ditches at areas where are wet or sandy soil that are easy to be collapse, it should use woody boards to be joined each other by well fitted tenons and drive them into the bottom of digged holes of at least 0,75 m deep.

12.3.5. For digging the foundations holes, ditches at areas where is unstable sandy soil, it should calculate and design the special wall propping system that includes the measures to strengthen and stabilize the walls (of foundations holes, ditches...) and to lower the underground water level.

12.3.6. For digging the foundations holes, ditches at areas sited next to old holes that are recently filled with unstable soil, it should get measures to strengthen the walls solidly and in the course of digging, it should permanently observe the status of propping boards.

12.3.7. It should dismantle the propping boards from bottom up to top and assign the technician to supervise this work. It should not to dismantle concurrently 3 propping boards sited in a vertical orientation. At areas where are wets soil and unstable sandy soil, it is only allowed to dismantle board for board. People not to have the task are prohibited to stand at bottom or round the mouth of digged holes in the course of dismantling the wall propping system.

12.3.8. Wherever the propping board is dismantled, the props used at this position should be immediately strengthened until the last of them is dismantled.

In the course of dismantling the props, moving them from the hole and finishing the works it should carefully prevent the accidents provoked by sudden land-slips.

12.3.9. For dismantling the wall propping system at areas where are the soil types being easy to be collapse or at areas located next to the old constructions, these works could provoke the geological instability for the walls of digged holes or old constructions, therefore, it should dismantle propping board for propping board or leave the whole propping system on the spot.

12.3.10. For digging the earth by means of machines, it should use the special wall propping system without props, or if it is not possible to use such a wall propping system, it should create the slopes for the walls of digged holes according to regulations defined by the article 12.2.1.

12.4. Manual Digging.

12.4.1. Before manual digging the earth, the responsible technician should consider the state of earth in order to get appropriate digging measures.

Diggers should be adequately equipped with instruments according to prevailing labor protection regimes.

12.4.2. When the hoe, shovel or any hand-held instrument for digging are used, it should abide by regulations defined by the section 5 of the present code. It is specially necessary to pay attention to the article 12.1.5 of this section.

12.4.3. Digged soil to be moved from the bottom of foundations holes, ditches should be poured into areas or positions defined by the technical design, but these areas or positions should be at least 0,5 m distant from the mouths of digged holes. Digged soil to be poured to the mouthy of digged holes should be heaped with the inclination angles of heap sides of at least 45° counted from the horizontal plane.

For digging earth at areas sited next to mountain and hilly sides, it should get measures to prevent the sudden rolling down of soil and stone on these mountain and hilly sides.

12.4.4. The works like stagnant water drainage, controlling the state of the walls or the slopes of digged holes, cutting the steps for going up and down for the digged holes should be carried out according to the regulations defined by articles 12.1.8, 12.1.11 and 12.1.19 of this section.

After each rain, if the diggers return immediately to work, it should lay a sand layer on steps in order to avoid their sliding and falling down.

12.4.5. It is prohibited to sit down next to digged holes or on the sides of soil heaps.

12.4.6. For digging the foundations holes, ditches of over 2 meters deep, it should assign at least two diggers working simultaneously, but they should separately stand in order to be able to carry out the first aid if the sudden accidents occur.

12.4.7. In areas where is being the earth digging, if there are many people to work together, it should select an appropriate distance between two consecutive working positions so that it is possible to ensure the labor safety for them.

It is prohibited to assign people to work at the sites located on the mouth of digged hole when there are other people working at the bottom of this hole and the digged soil or stone could be collapse or run down to them.

12.5. Digging by means of machines.

12.5.1. Digging the earth by excavators.

12.5.1.1. For earth digging by means of excavators running inside the foundations holes, ditches with wall propping system, it should get measures to prevent the impact of digging machines that could provoke the damage to this wall propping system.

12.5.1.2. If the earth digging is carried out through terracing the soil, the width of each terrace should not be bigger than 2,5 m in dependence on specifications of digging machines, and the height of each terrace should not exceed the maximal lifting height of the lifting rod of the machine.

12.5.1.3. The stone blocks moved from hole bottom up should be put into defined areas so that they do not obstruct the moving of the machines in case of occurrences.

12.5.1.4. In the time of running the machine, the people are prohibited to go up and down on natural slopes of dipped holes, ditches as well as within the area of running radius of the machine. This area should be indicated by signaling boards.

12.5.1.5. Ground on that is installed the digging machine should be stable, even and flat. In case of soft soil, the ground should be paved with sleepers. Wheels of the digging machine should be solidly wedged and wedged with chocks .

12.5.1.6. In operating and moving the excavator, it should adequately implement the general regulations defined by the part 6 of the present code (controlling the technical state of the machine, the positions to install the machine, its safety gears like braking gear, light and acoustic signaling appliances, running in without loading the machine, taking over the technical status of the machine in ending each shift, moving the machine under high voltage electricity lines...).

12.5.1.7. People who are not responsible for any task are prohibited to climb the excavator being in running.

12.5.1.8. Machinist's mates should implement their right task that is defined by their entrusted responsibility.

12.5.1.9. It is prohibited to change the inclination of the excavator when its bucket is being in loading.

12.5.1.10. It is prohibited to adjust the braking system of the machine when its bucket is being in loading or in rotating. It is prohibited to brake suddenly.

12.5.1.11. It is prohibited to let the excavator to run when the driver is being in manual fixing the cable. It is prohibited to use the hand to rectify the cable when the driver is being in using the windlass to wind it.

12.5.1.12. It should permanently control the state of the cable. It is prohibited to use the joined cables.

12.5.1.13. After stopping the work, it should move the machine from the terrace and lower its bucket down to the ground.

It is only allowed to clean the bucket after lowering it down to the ground.

12.5.1.14. It is only allowed to let the excavator run in the night or in foggy weather if the lighting is adequately ensured there.

12.5.1.15. In any case, the distance between the cabin of excavator and the wall digged holes should not be smaller than 1 meter.

12.5.1.16. For moving the excavator on a road section with an inclination degree of over 15^0, it should reinforce the traction of excavator through using the tractor or windlass.

In the course of moving the excavator, it should not let its bucket be in loading and the bucket should be installed along the moving direction, at the same time, the lifting rod of the machine should be lowered down to the altitudes from 0,50 m to 0,90 m counted from the ground surface.

12.5.1.17. In case of using the excavator for many shifts, the worker operating it in the shift before is not allowed to leave the machine if the worker operating it in the shift after does not come. The taking over the running status of the machine in the shift before to the shift after should be recorded to the shift diary of this machine.

12.5.1.18. In the course of directing the bucket to pour soil into the lorry body, it should turn the bucket to the backward side of this lorry body and halt it at the heart of lorry body. After that, it should slowly lower the bucket for pouring the soil.

It is prohibited to direct the bucket to cross the lorry cabin.

Drivers of lorries are prohibited to sit down in the cabin when the excavator is being in pouring soil into lorry bodies.

12.5.2. Digging the earth by means of bulldozers.

12.5.2.1. Before working, the worker driving bulldozer should control all of gear of the machine.

12.5.2.2. For earth digging by means of bulldozers, it should define their running area.

People are prohibited to go and work on the moving road of the machine, even in case of provisionally interrupting the running of the machine.

12.5.2.3. It is prohibited to use the bulldozer for earth digging on slopes to exceed 30°. It is prohibited to stick the bucket out of the edge of foundation holes, ditches (in the course of pouring soil).

12.5.2.4. It should not use the bulldozer for earth works at muddy areas.

12.5.2.5. On the moving way of the machine, if there are barriers faced by it, it should immediately stop the machine. Only after getting measures to treat these barriers, it is possible to let the machine rerun.

12.5.2.6. Workers driving the machine should still implement following regulations:

When the machine is on move, driver should observe its front side;

In the night or when it is dark, it is not allowed to work with bulldozer if the lighting of working area is not adequate;

After stopping the work, it should lower the bucket down on ground;

It is only allowed to wipe, lubricate the gears of bulldozer that are defined by regulations.

12.5.2.7. Minimal distance between two bulldozers (counter from their nearest marginal points) that are being in working on the same layout plane should be of 2 meters.

12.5.3. Digging the earth by means of edging machines.

12.5.3.1. For earth digging by means of edging machines, these machines should be appropriately arranged so that the distance between them and the edges of foundations holes, ditches is not smaller than 0,50 m or between them and slopes - not smaller than 1,00m.

12.5.3.2. It is prohibited to dig the earth by means of edging - machine at slopes to exceed 30°.

12.5.3.3. It is prohibited to pour soil contained in the bucket of the machine when this machine is on move.

12.5.3.4. It should not use the edging - machine for implementing the earth works at muddy areas.

12.5.3.5. When the machine is on move, people are prohibited:

To stand in the room between the bucket of machine and the tractor;

To cross the coupling located between the bucket and the tractor;

12.5.3.6. In moving the edging - machine, it should lower the bucket down to the altitude of at least 0,35 m counted to ground surface.

12.5.3.7. When the machine is on running, it is prohibited to repair, to lubricate any gear of it.

12.5.3.8. It should dismantle the bucket of machine from the tractor when the worker repair the gears located under the bucket.

12.5.3.9. It is prohibited to use the edging - machine for earth digging at areas not to be cleared from trees plants, stone blocks and other barriers.

12.5.3.10. It should pay attention to the directing the machines running on the slopes.

12.5.3.11. For using different type of earth digging machines like excavators, bulldozers, edging - machines..., besides above regulations, it should abide by regulations presented in the chapter 6 of the present code.

12.6. Digging the Well and Sounding Hole.

12.6.1. For digging the well and sounding hole in geological conditions to be different from the conditions defined by the article 12.1.9 of this section, it should carry out the wall propping system for them.

12.6.2. In digging the well and sounding hole, it should abide by following regulations:

At the mouths of the holes, it should arrange the shield made of steel nets to prevent the fall of soil, stone... from the hole mouths down to hole bottoms.

The buckets used for transporting soil and stone from hole bottoms up should be solidly tied to the extremity of pulling cables. When the stone blocks are lifted from bottom up, workers should not stay at hole bottoms. It should not overload the bucket, so it brimming over with materials.

Workers should leave the hole bottom when the soil and stone are moved from bottom up if there is no shielding roof to protect them.

12.6.3. If there are people being in working at digged hole bottom, it is prohibited to carry out any work to be able to provoke fire emissions inside the digged holes.

12.6.4. Workers who go down the deep holes should use ladders or lifting buckets. The pulling cables should be selected with a safety coefficient of 9 times of the real loading capacity, and the reserved length of the pulling cable should be not smaller than 6 times of perimeter of the cable drum's section. At the same time, the windlass should be solidly fixed.

12.6.5. Before letting workers go down the digged holes, it should control them and ensure that there is no toxic gas inside these holes. In case of getting toxic gasses there, it should not let workers go down the holes and it should get measures to eradicate these toxic gases.

12.6.6. When the lifting bucket is used for lowering workers down to wells or sounding holes, it is only allowed to use manual windlass with its moving speed not to exceed 1m/second, at the same time, it should get the supervision of the team leader for lifting and lowering workers inside the well or sounding hole.

The windlass should be adequately equipped with automatic braking gears. It should control the windlass before each working shift and at least two times per shift.

12.7. Earth Digging by means of hydraulic mechanizing system.

12.7.1. Earth Digging by means of hydraulic mechanizing system should be only entrusted to workers who have adequate know-how on this work.

12.7.2. It is only allowed to connect the water ejecting gun into the water supply system after controlling the valves of water supplying sources and ensuring that they are in good working.

12.7.3. It should not let the water ejecting gun run without people on duty to watch it.

12.7.4. In the course of temporary interrupting the work, it should direct the water tap down to ground and towards the side where are no people going and coming.

12.7.5. Distances between the site where is installed the water ejecting gun and terraced earth seam should be not smaller than the height of this seam.

12.7.6. It should permanently examine the state of the water pipeline conducting water from pumping station to water ejecting gun.

12.7.7. Areas where is installed the water ejecting gun should be fenced and indicated with signboards "crossing prohibited".

12.7.8. Before letting the water run ejecting gun, it should control the state of valves.

On the water pipeline section to be installed within the areas of radius not to exceed 10 m counted from the working site of worker directing the water ejecting gun it should get the valve for cutting the water supply in case of occurrences.

12.7.9. People not to get task are prohibited to enter the pumping station. Only responsible workers are allowed to start the water pumps.

12.7.10. It is prohibited to go on the water pipeline. It should create a particular going way for people.

12.7.11. It is only allowed to change the ejector, tighten the joints of water pipelines, or repair the damaged gears of water ejecting guns after turning off the electric motor.

12.7.12. In the night, the running area of the water ejecting gun should be adequately lighted.

12.7.13. Between workers directing the water ejecting gun and workers operating the pumping station it should get a good communication through acoustic or light signals.

12.7.14. Within the running area of the water ejecting gun, if there is the high voltage electricity transmission line, it should prevent the touch of water current on electric wires or electric poles. In case that it is not possible to avoid it, it should move the electricity transmission line to other safe sites.

12.7.15. It is prohibited to install the water conducting pipeline on supports that are sited next to the high voltage electricity transmission line.

12.7.16. The gutter conducting muddy soil that are installed on supports should be solid and stable and in two sides of the gutter it should get manipulating platform of 0,70 m wide with protection rails of 1,00 m high.

It is only allowed to clean the navel of the muddy earth tank after stopping the water ejecting gun and mud sucking machine.

12.7.17. People and vehicles are prohibited to go under mud conducting gutters and water conducting pipelines.

12.7.18. It is only allowed to dismantle the mud conducting gutter and water conducting pipeline if there is responsible technician who direct and supervise these works.

12.7.19. Canals conducting mud and holes containing mud should be solidly walled. People are prohibited to go on their protection walls.

12.7.20. It should permanently consider the state of shielding walls and if they are threatened by collapses, it should get measures to repair them.

12.7.21. After stopping the working, it should:

Signal for closing the pumping station;

Turn off the valve of water ejecting gun;

Suck the mud and conduct it to the tank;

12.7.22. When there are many working shifts per day, it should get the shift diary in that is recorded the state of machines and equipment.

13. WORKS OF LAYING THE FOUNDATIONS AND LOWERING THE SUNK WELL

13.1. Casting the foundations of the wall.

13.1.1. It is prohibited to pour or throw materials (brick, stone...) from the mouth of hole down to its bottom. It should use mechanized means or gutters to give them down to the foundations hole; the lower extremity of the gutter should be installed with a distance not to exceed 0,5 m counted to the bottom of foundations hole.

13.1.2. Ways for going and transporting materials should be located outside the unstable area of collapsing prism of the foundations hole.

13.1.3. Before letting workers go down the foundation hole, the responsible technician should control the state of stability of walls of the foundations hole.

In the course of implementing the works of laying the foundations, if the threat of collapse of walls of the foundation hole is discovered, it should rapidly let all people leave dangerous areas.

13.1.4. Going up and down the foundations hole should be carried out with special ladders. People are prohibited to go up and down by means of swinging, jumping or using the wall propping system for going up and down.

13.1.5. Materials used for casting the foundations should be installed with a distance of 1 meter counted to the mouth of foundations hole and they should be protected by shielding boards.

13.2. Casting the foundations of stakes:

13.2.1. Workers directing the stake driving machine should be professionally trained with the directing them while the other workers are only allowed to carry out supplementary works and they should abide by the guidance of technician or team leaders to be responsible for these works.

13.2.2. When the working is organized by shifts, it should get the shift notebook that is used for handing over the concrete state of driving the stakes as well as the technical status of machines and equipment. Responsible technician or team leaders should control, treat the problems recorded in the shift notebook before letting their workers to begin the works.

13.2.3. Stakes should be reasonably arranged so that their positions and their hooks used for tying the cables to them are favorably sited in accordance with their - design.

13.2.4. Cables that are used for mechanized pulling the stakes should be selected with the safety coefficient not to be smaller than 6-and for manual pulling the stakes - not to be smaller than 4.

13.2.5.Before erecting the stake, it should control the quality of the stake in order to eradicate the unsafe stake. People who get no task should stand outside the area where is the erecting of stakes with a minimal distance to be equal to the stake height plus 2 meters.

13.2.6. It is only allowed to pull the stake by means of the cable to be threaded through pulley that is fixed to the machine - supporting frame on the vertical orientation, while the stake is placed in the vision of the people directing the machine.

13.2.7. After finishing the erecting stakes, it should use the instrument to keep the stake to be inside the tower so that it does not collapse or be inclined from the vertical orientation. It should permanently ensure that the vertical axis of the stake coincides with the vertical axis of the hammer. The upper extremity of the stake should touch well to the head of hammer.

13.2.8. After installing the stake into its position. it should carefully control the position of vertical axis of the stake (if the stake is vertically driven) or the inclination degree (if the stake is obliquely driven) according to the requirements of its design, and only after that one can lower the hammer to touch the upper extremity of the stake.

13.2.9. Auxiliary stakes that are used for deep driving the principal stake should be able to bear the driving force of the hammer.

13.2.10. For using the stake driving machine for pulling out the stake, it should strengthen the machine support trough anchoring and tying it by means of solid cables.

13.2.11. When it is necessary to repair or adjust the stake, it should stop the beat of hammer and lower the hammer down to touch the upper extremity of the stake. When it is necessary to repair the extremity of the stake it should lift the hammer up to a distance not to exceed 0,3m counted from the extremity of the stake, at the same time. it should keep the hammer by means of anchoring or bolting it with anchoring cables or bolts.

13.2.12. In the course of cutting the superfluous sections of concrete stakes. it should carry out safety measures to protect the workers from shot or collapse of superfluous sections of stakes or their concrete pieces.

13.3. Lowering the sunk well.

13.3.1. Works of lowering the sunk well should be carried out according to the guidelines of the design. In the course of casting and lowering the sunk well, it should be permanently kept equilibrium and stable.

13.3.2.When there is an incremental load to be piled on the wall of the well, it should ensure the safety for people working inside the well.

13.3.3.The tempo of earth digging, the order of dismantling the wedging slabs should be selected so that the lowering the sunk well can be equilibrium and monotonous. It is prohibited to extract manually the barriers located under the walls of sunk well in the course of lowering it.

13.3.4. It should get the means to ensure the safety for people going up and down the well, the measures to escape rapidly in case of sudden land-slip. It should get two electricity sources to supply the drainage pumps of the well (one source is in supplying while the other is in reserving).

13.3.5. When the bucket is used to bite the soil and give it out of the well, it should use the manual windlass for this work.

13.3.6. People are prohibited to stand inside the well when the bucket of the machine bites the soil and give it out of the well.

If it is necessary to assign people to stand and signal inside the well, they should stand outside the moving area of the bucket and they should be shielded and protected from upper side.

13.3.7. When the crane is used for lifting the soil and giving it out of the well, it should install the cabin of crane in a mobile protecting cage that is equipped with the light signal.

13.3.8. If there are people working in the area of well bottom, they should be shield from their upper side.

13.3.9. Bridges, scaffolds, supports and linkage details of the pipes conducting mortar should be fabricated according to the regulations defined by the part 8 and the part 16 of the present code.

14. WORKS OF PRODUCING PASTY CONCRETE

14.1. General Requirements

14.1.1. For working inside the store house where are dusty materials (cement, lime, plaster..) and at the positions where are installed threshing machines, grinders, screening machines, raw materials and by -products, it should satisfy the requirements on the ventilation and labor protection from dust.

14.1.2 The transporting screw should be shielded by steel nets. When the-dusty materials (cement, lime, plaster ...) are transported by transportation means, their body-containing these materials should be tightly covered.

14.1.3 Workers getting into touch with dusty materials should pass the periodical health control, at least one time per six months.

14.2.Hole containing lime, slaking the lime.

14.2.1. In slaking the lime, it should not pour to much lime into slaking tank, it should ensure that the lime level does not exceed one third (1/3) of the height of slaking hole or slaking tank. Around the lime hole, it should erect the protection fence. The fence should be erected with a distance of 50cm counted to the mouth of slaking hole and with a height of 80cm at least; at the same time, this fence should be strengthened by two horizontal slats to prevent the fall down of people into the slaking hole. Stakes of fences should be solidly driven deep into ground.

14.2.2 In pouring limestone into the slaking holes or tanks and stirring the lime pieces, it should stand in a wind - swept place and use stirring instruments having long shafts for stirring the lime.

14.2.3. When the works are carried out in the night and at dark sites, it should ensure a lighting intensity from 100 to 300 lux for on-the-spot lighting and from 30 to 80 lux for public lighting.

14.2.4. Around the lime hole it should erect the protection fence or put the lid on this hole and arrange a signboard to indicate it. If the lime hole is located at areas where are people going in the night, its should arrange a red lamp to signal this hole.

14.2.5. It should not dig the lime hole next to the way where are many people or vehicles going.

14.2.6 In order to take the slaked lime from the hole, it should use instruments specially made for this work. It should not manually take slaked lime from the hole or wade into it.

14.3 Mixing the pasty concrete.

14.3.1. It is only allowed to clear scattered materials in the hole where is installed the mixing machine after lifting and mixing it. It is only allowed to cross this hole after fixing the bucket of mixing machine.

14.3.2 When the mixing bucket is being in operating or repairing it should lower down it to safe position.

14.3.3. It should not use the shovel or other hand-held instruments for taking the pasty concrete from mixing bucket being in operation.

14.3.4. Areas where are people going and transporting materials to the mixing bucket should be cleaned and cleared of barriers and they should not be slippery.

14.3.5. During the pouring additives to the mixture of building materials, it should get measures to prevent the burning, trauma...

14.3.6. Workers who mix the pasty concrete by means of mixing machines or hand -held instruments should be adequately equipped with labor protection instruments.

14.4. Transportation of pasty concrete.

14.4.1 The transportation of pasty concrete by means of wheel-barrows carts cranes, lifting machines... should abide by regulations defined by the part "works of loading, unloading and transporting " and the part: "Using the building vehicles and machines".

14.4.2 At two extremities of the working flyover through which the lorries transport and pour the pasty concrete into the foundations hole, it should arrange two control barriers. The speed of lorries running on the flyover should be of 3km/hour downwards. In two sides of the working flyover, it should arrange the ways of 1,2m wide at least and at the exterior side of these ways, it should erect the rails of 1 meter high.

14.4.3. It is only allowed to drain the pasty concrete when the mixing bucket was fully stopped and it should slowly discharge the pasty concrete from the bucket. The distance from bucket bottom to the surface of constructions where is the working platform should not be over 1 meter. If this distance is over 1 meter, it should use gutters or pipes (for conducting pasty concrete from the bucket to the casted concrete construction)

14.4.4. When the pump is used for pumping the pasty concrete (to casted concrete construction), it should abide by the regulations defined by the part" Using the construction vehicles and machines"

14-4.5. It is prohibited to use the mixing buckets for transporting the past concrete if they are not tightly covered or their hangers are not solid.

14.4.6. When the crane is used to transport the buckets containing pasty concrete, it should abide by the regulations defined by the chapter "Using the construction vehicles and machines" and the workers should stand far from the areas to be threatened by dangers provoked by the load.

15. BUILDING WORKS

15.1 Building the foundations.

15.1.1. Before and during the building the foundations, the responsible technician and team leaders should permanently control the state of the walls of the foundations holes. Especially in rainy season, it should pay attention to the collapse of the slopes or the damages of wall propping boards.

15.1.2. Workers go up and down the foundations holes should use ladders or cut steps in earth. When it rains, it should get measures to prevent the slide.

15.1.3. The pouring of building materials into foundations holes should be carried out by means of mechanized or improved instruments like: gutters, inclined planes or buckets. The level of materials contained in the bucket should be lower the bucket mouth of at least 10cm. It should not stand at the mouth of the foundations hole in order to pour materials into the hole.

15.1.4. The building works to be carried out within the area of foundations of old constructions should be abide by the technical-design, at the same time, it should assign responsible technician or team leader to supervise these works.

15.1.5. People are prohibited to work or to transport materials on the mouth of foundations hole if there are other people to work at the hole bottom and if there is no appropriate measure to ensure the safety.

15.1.6. In the course of building, if the foundations hole is flooded, it should use the pump to suck and drain water before continuing the works.

People are prohibited to stay at the bottom of foundations holes during the break.

15.1.7. During the course of building the foundations hole at the depth of over 2m or at the foot mountain and hilly, if it rains, it should immediately stop the works.

15.1.8 The Foundations hole should be equally filled up at both two sides of its, at the same time, they should be tamped in dependence on the building level of foundations. It is only allowed to fill up the soil into one side of foundations hole if the concrete of cast foundations reaches its designed strength.

15.2 Building the wall.

15.2.1 Before building the wall, the responsible technician or team leader should consider the state of foundations or of the wall part that has been formerly built as well as the stale of scaffolds, supports, at the same time it should re-control the classifying and arranging materials and the positions of workers to stand and work on the working platform.

15.2.2. When the height of built wall part reaches the level of 1,5 m counted from the ground or the floor surface of the house, it should erect the scaffold or supports according to the regulations defined by the part 8 of the present code.

For building the wall of 330mm upwards thick, it should erect scaffolds in both two sides of the wall.

15.2.3. The moving materials (brick, mortar...) up to working platform that is sited at the altitude of over 2 m (counted from the ground), it should use the transporting crane for these works. The lifting platform of the crane should get rails to protect the bricks from dropping in the course of lifting them. It is prohibited to lift and move bricks by means of throwing them into the air up to the altitude of over 2m.

15.2.4. If the working platform is established inside the house for building, in the outside of the house it should erect the fence or signboard to prohibit the crossing, that are arranged at a distance of 1,5 meter counted from the foot of built wall in condition that the height of built wall does not exceed 7 meters and at distance of 2 meters counted from the foot of built wall in condition that the height of built wall exceed 7 meters.

The wall hole that is arranged from the second floor upwards should be tightly covered so that people could not creep through it.

15.2.5. It is not allowed

To stand on the border of the wall in order to build it

To go on the border of the wall

To stand on verandah's roof in order to build;

To lean the ladder against the wall that was most recently built in order to go up and down;

Let the instrument or building materials be on the border of the wall, that is being in building;

15.2.6. It is prohibited to build the wall with its height to exceed the height of to floors while between these two floors there is no provisional intermediate floor or no beam system of the provisional floor.

15.2.7. In the course of building, if it get heavy rains, storms or wind speed of class VI upwards, it should carefully cover, shield and prop the built construction blocks and protect them from collapse or crumbling by erosion, at the same time, all people should leave the building area to safe shelters .

15.2.8. After ending the building independent pillars or gable's walls in rainy season, it should immediately roof them.

15.2.9. When the building the wall is carried out while the paving it with paving tiles is done, it is only allowed to stop the building when the wall building level exceeds the upper edge of these paving tiles.

15.2.10. For building the verandah's roof that juts out from the wall of over 20 cm it should arrange the consoles to support it. The width of supporting consoles should be greater than be width of verandah's roof of 30cm.

It is only allowed to dismantle the supporting consoles when the concrete of verandah's roof reached its designed strength.

15.2.11. The building vaults or thin outer cover of construction should be carried out on the basis of a special technical design to be particularly done for these works.

The dismantling the framing slabs used for building the vaults should be done according to regulations defined by the part 16 of the present code.

15.2.12. For building the stone walls, if the building is interrupted, it should carefully smooth the mortar by means of trowel at the stone pieces located in two extremities and on the surface of the stone wall.

15.2.13. The shaping of stone blocks used in building should be carried out in a fenced particular area. People not to have the task are not allowed to enter this area.

If the distance between working positions of workers shaping the stone blocks is smaller than 3 meters, it should erect the protection shields between these positions.

15.3. Building the chimney.

15.3.1. In the area where is the building of chimney and within a radius of 10 meters counted from the foot of chimney it should erect the fence protecting this area and install the signboard indicating it.

The entrances to this area should be roofed and it should install the signboard indicating them there.

15.3.2. The lengthening of supporting axis of lifting machine should be based on the level of building the chimney.

The use of lifting machine for building the chimney should abide by the regulation defined by the part 6 of the present code.

15.3.3. Workers going up and down the chimney should use working ladders that are specially made for implementing the building of chimney or steel staircase having foots to be fixed of 25cm at least deep in to the trunk of chimney.

It is prohibited to use the lifting platform to escort workers going up and down.

15.3.4. In the surroundings of the trunk of chimney and from the altitude of over 3m counted from the ground, it should arrange the protection platform or shielding net of 2 ÷3 meter wide. If the protection platform is arranged, it should be fabricated by the parquetry of at lasts 4 cm thick. If the shielding net is arranged, it should be made of steel wires with their section diameter of 3mm and mesh size of 20x 20mm. The platform (or net) should be appropriately installed angle so that they sloping towards the trunk of chimney with a minimal inclination angle of 15^0.

15.3.5. The electric lighting lamp installed inside the truck of chimney and the signaling lamp should get the voltage level not to exceed 36V.

15.3.6. It is only allowed to check the vertical axis of the chimney by means of plumb-line if the lifting cage of lifting crane was lowered or moved out from lifting crane.

15.3.7. At the working site, on the working platform as well as on the shielding protection slabs, it should permanently clear superfluous materials and wastes.

Works of building the chimney should be carried out according to the regulations defined by the articles 1-12; 1-14; and 1-15 of the present code.

15.4. Building the boiler.

15.4.1. For building the boiler, it should use the suspended scaffold or frame-formed scaffold according to the regulations defined by the part 8 of the present code.

Scaffolds should be erected and assembled in a minimal distance of 5 cm counted to the build construction block.

15.4.2. In order to lift materials up to working platform to be located at the altitude of over 2 m, it should use the lifting machine that is installed outside the built construction block.

Movable gears and anchoring cables of lifting machine should be solidly covered and fenced. The electric fuse cut-out should be installed at loading and unloading area in order to interrupt the electricity supply in case of occurrence.

Workers who stand on working platform, implement the task to load and unload materials on lifting platform of lifting machine and worker who direct the running of lifting machine on the ground should communicate each other on acoustic or lighting signals.

15.4.3. For implementing the building works at areas where are potential toxic gas emissions (next to high furnaces, cleaning towers...) it should assign people on duty for first aid in case of sudden accidents.

It is prohibited to open automatically the valves, keys and regulating doors of the gas pipeline without related orders of responsible technician or team leaders. At the sites of above gears it should hung the prohibiting signboards.

15.4.4. For using the brick grinding machine, it should abide by regulations defined by the part 6 of the present code.

15.4.5. Whittling, cutting or grinding the brick should be done outside the construction area. It is only allowed to carry out these works inside the construction area if necessary, but it should get measures to reduce the dust emission and prevent the shooting of brick pieces to people being in the surroundings.

Workers should use gauze mask, protection glasses according to prevailing labor protection regimes.

15.4.6. The lighting for narrow and dark construction sites should be arranged according to the regulations defined by the part 5 of the present code.

15.4.7. For working at extremities of pipes conducting gas to boilers and gas filters, it should get measures to prevent the escaping of gas to working areas, at the same time it should get measures to carry out in time the first aid in case of sudden accidents.

Responsible technician should guide and control the implementing measures to ensure the safety for these works.

15.4.8. When the works are carried out at areas to be sited next to the gas pipeline of boilers, it should close all doors and windows that are sited in a same side in order to prevent the draught.

16. WORKS CONCERNING THE FRAMING; STEEL BONES AND CONCRETE

16.1. Processing, erecting and assembling the framing.

16.1.1. The framing used for supporting the concrete construction should be fabricated, assembled and erected according to requirements of their approved technical design.

16.1.2. Framing boards to be joined into blocks or large size slabs should be solid in the course of moving and assembling, and during the lifting, moving and assembling them it should avoid the shock of framing boards into different parts of constructions to be formerly assembled.

16.1.3. It is only allowed to install the framing of upper floor after fixing the framing of lower floor.

16.1.4. For erecting, assembling the framing at the altitude not to exceed 6 meter, it is allowed to use supports for standing and manipulating platform for these workers.

16.1.5. For erecting and assembling the framing used in building the vault-like construction and thin outer cover it should get the working platform with protection rails. The distance from the framing to the working platform should not be over 1,5 meter. At areas where is the inclined framing, it should made terraced working platform of at least 40cm wide.

16.1.6. Suspended hangers should be solidly linked up into the construction. It is only allowed to install the suspended hanger on the supporting frame after the parts of this frame was strongly linked each other.

16.1.7. It should not install the materials or equipment not to be defined by the construction design on the framing. Even if the people not to participate in concretion are not allowed to stand on the framing.

16.1.8. It is prohibited to install and to pile framing slabs and the framing blocks on the steps of staircases, on balcony, on inclined surface, on the ways located next to holes or exterior edges of the construction, vertical or inclined position if the framing is not anchored.

16.1.9. Before concretion, the responsible technician should control the framing, if there is any damage it should immediately repair it. The repairing area should be fenced and indicated with signboards.

16 - 2. Sliding - framing.

16.2.1. Working area where the sliding-framing is used should be fenced and indicated by signboard.

16.2.2. The assembling the parts of sliding-framing and suspended scaffold should be carried out in accordance with their designs and regulations defined by the part 8 of the present code.

16.2.3. During the moving of sliding-framing it should control the tying and anchoring gear (if the mode of discontinuous permuted sliding of framing parts is used) and the lifting gear (if the mode of continuous sliding of framing parts is used).

16.2.4. Workers to work at upper positions and workers to work at lower positions should communicate each other through acoustic or lighting signals.

16.2.5. At manipulating platform, it should present into maximal allowable loading capacity and it is only allowed to arrange materials on manipulating platform at positions that are defined by the design. It should clear superfluous and waste materials on manipulating platform.

16.2.6. The parts of sliding-framing should be maintained at dry, even and flat storing areas and they should be roofed.

The wall framing should be vertically erected and solidly anchored in order to avoid the capsizing;

The similar parts of manipulating platform should be piled into stacks; the height of each stack should not be over 1,4 m.

The metallic parts of the framing are classified and piled into stacks; The height of each stack should not be over 0,8 m. The distance between stacks should not be smaller than 0,8 m.

16.2.7. Lifting machines, equipment used for making the sliding-framing should be equipped with an acoustic signaling system; and it is only allowed to let the framing slide after checking and taking over it and after getting related order of the responsible technician.

16.2.8. During the sliding, strange peoples and workers who do not have the related task are not allowed to climb the manipulating platform.

Workers should not assemble on manipulating platform of sliding-framing.

Each person severally is allowed to go on this manipulating platform.

In order to go from the floor of exterior framing to manipulating platform of sliding-framing it should use the fly-over having its width not to be smaller than 0,8 m.

It should not jump from upper manipulating platform down to lower manipulating platform of sliding-framing. The going up and down between two platforms should be carried out through a gap reserved for a special ladder. After going up and down, this gap should be covered.

16.3. Large slab-formed framing.

16.3.1. The parts of large slab-formed framing should be maintained in dry and roofed storing field.

The blocks of large slab-formed framing should be piled; the height of each pile should not exceed 2,5 meters. Between framing slabs are woody buffers that should be installed by turns on a same axis; The distance between two piles should not smaller than 0,8 m.

For going up and down the framing piles of over 1,5 m high, it should use ladders specially fabricated for these works.

16.3.2. When the lifting equipment are used for moving the large slab-formed framing, they should be equipped with acoustic signaling gears.

16.3.3 It is only allowed to use the parts of large slab-formed framing, special consoles, scaffolds, working platforms... if they was controlled by responsible technician.

16.3.4. It is not allowed to lift simultaneously with to move by crane two upwards parts of large slab formed framing, excepting the case of assembling several parts according to their design.

16.3.5. The room reserved for assembling the steps of staircases should be fenced and protected by the rails.

16.3.6. It is prohibited to lift and to move the wall framing slabs of large slab-formed framing if the surface of the slab is of 12 m^2 by wind speed of 10 m/sec and if the surface of slab of over 12 m^2 by wind speed of 7,5 m/sec.

16.3.7. In the course of assembling the parts of large slab-formed framing, people who do not have related task are prohibited to enter dangerous areas that are threatened by the load fall during the lifting, moving and lowering the framing.

16.3.8. People are prohibited to go and to work on assembled wall framing slabs of large slab-formed framing if there are no manipulating platform and protection rails.

16.4. Processing, Erecting and Assembling the steel bones.

16.4.1. The preparing the embryos and processing the steel bones should be carried out in a particular area that is fenced and indicated by signboards.

16.4.2. Cutting, bending, stressing the steel bones should be carried out by means of machines or other equipment specially fabricated for these works. The using machines for processing the steel bones should abide by regulations defined by the chapter "Using machines in auxiliary processing workshop". It should get measures to prevent the impacts of steel bone sections of over 30 cm long that was shoot out in surroundings during the cutting them.

16.4.3. The platform used for processing the steel bones should be solidly fixed, especially for processing the steel wires with section diameters of over 20 mm. If there are workers to work at two side of processing platform, it should arrange protection net of at least 1 meter high between them and this platform. Processed steel bones should be installed at particular sites defined for them.

16.4.4. For rectifying the rolled steel bones by means of machines, it should:

Cover the extremities of axis of the steel bone roll before starting the machines;

Stop the motor in order to thread the extremity of steel bone into axis of bone rolls;

Fence two sides of the steel bone wire counted from axis of the roll to the drum of rectifying machine;

16.4.5. Axis of the steel bone roll should be installed in a distance of 1,5 - 2 m counted to the drum of rectifying machine and at a level not to exceed 50 cm counted from the ground surface; The surrounding area of rectifying machine should be fenced. Between the steel bone roll and the drum of rectifying machine it should arrange a gear to limit the move of steel bone wires. It is only allowed to thread the extremity of steel bone wire to rectifying machine if the machine was stopped.

16.4.6. For rectifying the steel bone by means of electric or manual windlass, it should get measures to avoid the impact of steel wire to slip out of machine or to be broken for people standing there.

The extremity of cable of windlass that is joined with the extremity of rolled steel bone wire should be rectified by rectifying equipment specially fabricated for these works. It should not join them by means of tying the cable (of windlass) and steel wire (of bone rolls) should be installed in a same groove during the pulling and this groove should be shielded.

It is only allowed to dismantle or assemble the joints between the extremity of steel bones and the extremity of cables if the windlass was stopped.

16.4.7. It is prohibited to use driving gear for cutting steel wire sections of under 80 cm long if there is no safety equipment.

16.4.8. It is allowed to move the position of bent steel bone on the platform of machine when the rotating disk of this machine was stopped.

16.4.9. For processing the steel bone and scraping the corrosion layer it should adequately provide the workers with personal labor protection means.

16.4.10. It should not rectify the rolled steel wires by means of stretching them at the sites not to be fenced and safe in the construction camp.

16.4.11. It should not use the scissors to cut the steel slats of under 30 cm long.

16.4.12. The steel bone nets should be solidly installed so that they do not collapse or drop before assembling the framing for them.

16.4.13. For assembling and erecting the steel bone for independent frames, beams, pillars, walls and similar constructions it should use the platform of 1 meter upwards wide.

16.4.14. Before moving the steel bone nets of the frame to assembling sites it should control the welds and knots. For cutting and eradicating the superfluous sections of steel bones to be installed at high altitudes, workers should wear safety belts and it should arrange the signboard on the ground.

16.4.15. The ways for going on steel bone frame should be paved with boards of 40 cm upwards wide.

16.4.16. When the steel bones are processed in the workshop or on-the-spot and in the night, it should ensure an adequate lighting so that the partial lighting intensity is from 100 to 300 lux while the public lighting intensity is from 30 to 80 lux.

16.4.17. The welding steel slats to the frames or nets should abide by regulations defined by the part 9 of the present code.

16.4.18. The tying steel bones should be done by means of instruments specially made for this work; The manual tying them is prohibited.

16.4.19. It should not pile steel bones on working platforms or on framing boards with their weight to exceed the designed allowable carrying capacity of these platforms.

16.4.20. When the steel bones are erected and installed at areas located next to electricity transmission lines, it should cut off electricity; In case that it is not possible to cut of electricity, it should get measures to prevent the touch of steel bones into the electric wires.

16.5. Pre-stressed steel bone.

16.5.1. Before stressing slats or bunches of steel bones used for pre-stressed concrete constructions, it should control the technical state of pumping jacks and other related equipment. The steel bone slats that will be stressed should not get defects like traces of cutting, folding, breaking...

16.5.2. Area where the steel bones are stressed should be fenced. The fence should be of at least 1,5 m high and they should be erected in two extremities of stressing platform and in the middle of stressing equipment; (excluding the case that the stressed steel bon is installed in the steel pipe).

When the steel bone is stressed, it should emit acoustic signal or switch on the red lighting signal.

16.5.3. The operating and maintaining of the jacks and other equipment that are used for processing or stressing steel bones should abide by regulations defined by the part "Using the construction vehicles and machines".

16.5.4. When the steel bone is stressed through electric heating, it should satisfy following requirements:

Prohibit people from standing or approaching the steel slats being in cooling down in a distance of about 1 meter.

Cover the anchoring ends of the framing during the moving it to maintaining rooms.

Fence and arrange the prohibiting signboards for the area where the steel bone slat are heated outside their casts.

16.5.5. Workers who scrape the corrosion layer of steel bones and workers who participate in stressing steel bones should be adequately equipped with personal labor protection means.

16.6. Casting and tamping the concrete.

16.6.1. Before concretion, the responsible technician should control the installing and assembling the framing, steel bone, scaffold, working platform, transportation way. It is only allowed to concrete after getting a procès-verbal to certify the good state of them.

16.6.2. For concretion of the construction part sloping with inclination angles of 30° upwards, the related equipment should be solidly anchored and tied. Worker should wear safety belts.

16.6.3. For concretion of the constructions located at deep holes, tunnels or narrow sites, workers should stand on manipulating platforms and it should ensure an adequate ventilation and lighting for these sites so that the partial lighting

intensity is from 100 to 300 Lux and the public lighting intensity is from 20 to 80 Lux.

16.6.4. For open-air concretion, it should erect the shelters against raining and sunshine, and in the night it should get adequate lighting with the public lighting intensity from 40 Lux to 80 Lux (maximally 150 Lux).

16.6.5. When the concretion is carried out at the depths of over 1,5 meter, it should use the gutters or trunks that are solidly fixed to framing parts or working platforms.

16.6.6. For using the vibrant trunk to pour the pasty concrete into the casts, it should:

Fix solidly the vibrator to the trunk;

Prohibit the people to stand under the trunk that is being in pouring the pasty concrete;

16.6.7. For using the vibrant tamping machine to tamp the pasty concrete, it should:

Earthing the outer cover of the vibrant tamping machine;

Using the insulated wire to connect the distribution panel to the motor driving the tamping machine;

Cleaning the vibrant tamping machine, wiping it and rolling up the wire after stopping the works;

Interrupting the running of vibrant tamping machine in an interval from 5 to 7 minutes after each continuous running duration from 30 to 35 minutes.

Workers who operate the machine should be equipped with insulated rubber made boots and other personal labor protection means;

16.6.8. The way for going under overhead areas where the concretion are being done should be fenced and indicated with prohibiting signboards. In compelling cases, if people have to go on these ways, it should arrange the shielding slabs in upper side of them.

16.6.9. People who do not have related tasks are prohibited to stand at the floor to which the pasty concrete is poured. Workers who have the task to direct, regulate and dismantle the buckets of mixing machine should wear gloves and boots.

16.7. Maintaining the concrete.

16.7.1. For maintaining the concrete it should use the scaffolds or supports. It should not stand on props or edges of framing. It should not lean the ladder against the concrete parts being in maintaining.

16.7.2. When the concrete is maintained in the night or at the construction components to be hidden from view, it should get lighting lamps there.

16.8. Dismantling the framing.

16.8.1. It is only allowed to dismantle the framing if the concrete reached its defined strength according to the certifying of responsible technician.

16.8.2. The dismantling the framing should be done according to a reasonable order; it should get measures to prevent the fall of framing or the sudden collapse of constructions. Areas where is the dismantling the framing should be fenced and indicated by signboards.

16.8.3. Before dismantling the framing, it should clear the superfluous materials and equipment installed on construction parts where will be the dismantling the framing.

16.8.4. During the dismantling of framing, it should permanently observe the state of construction parts, if any deformation of cast concrete is discovered, it should stop the dismantling and report it to responsible technician.

16.8.5. Dismantling the parts of slide framing and related slide equipment should be installed under the guidance of responsible technician.

16.8.6. After dismantling the framing, it should cover the gaps of concrete constructions. It should not install the dismantled framing on the working platform or throw it down to lower areas. After dismantling the framing it should pull out the nails on it and arrange it at defined sites.

16.8.7. For dismantling the framing of ferroconcrete vaults of great apertures it should adequately satisfy the requirements presented in the design on their temporary propping system.

17. ASSEMBLING WORKS

17.1. General Requirements.

17.1.1. The using different types of cranes and other equipment for assembling the building components should abide by the regulations defined by "Code for safety technique of lifting machines" TCVN 4244 - 86 and the part 6 of the present code.

17.1.2. In the technical design it should clearly present the following:

Arrangement of working areas, order of carrying out the works, and list of equipment to ensure the labor safety;

Measures to ensure the safety during the assembling process;

Arrangement and running area of machines, equipment to be used for the assembling process;

Arrangement of building components in the store house, stone plain and warf for ensuring the convenience and safety for loading and unloading process;

Measures to ensure the safety for assembling areas;

17.1.3. During the assembling process, it should assign the responsible technician or team leaders to guide and supervise it.

17.1.4. Workers who carried out the assembling should be people to be experienced and to perceive the measures ensuring the safety for assembling works.

Assembling workers should be adequately equipped with personal labor protection means according to the prevailing regulations.

17.1.5. In order to use the electric or compressed air driving instruments for cutting, chiseling, welding, riveting... in assembling at high altitudes, it should erect the scaffold according to the regulations presented in the part 8 of the present code.

It is prohibited to lean the ladder against the details being in assembling for carrying out any work.

17.1.6. During the assembling process, it should use different types of scaffold or support according to the regulations of technical design (of the construction).

If the implemented assembling works are different from those of the design, it should get the permission of responsible technician.

17.1.7. Building components and construction parts should be reasonably arranged so that it is possible to ensure the ease and convenience for tying, hooking them and to avoid their collapse, slide during the loading and unloading them.

17.1.8. The details that are specially made for suspending, hooking the construction part and building components should be solid and they should not be broken, deformed in the lifting process.

17.1.9. Construction parts, building components not to be equipped with special tying and hooking details should be carefully calculated so that their

positions and tying and hooking manners are reasonably determined in order to ensure the safety for the lifting and moving process.

17.1.10. Construction parts, building components that could turn round their axis during the lifting process should be solidly tied and anchored by means of flexible cables.

17.1.11. For construction parts, building components that are easy to be deformed and to provoke supplementary stress in the lifting and assembling, it should strengthen them before lifting them.

17.1.12. The lifting and assembling (construction parts, building components) should be installed under the unique command through an unique signaling system.

17.1.13. During the lifting and assembling construction parts and building components, it should not let people stand or hang onto them. At the same time, it should not let the construction parts, building components crossing overhead.

17.1.14. After tying and hooking the loads, it should lift them up to an altitude of 20 cm, them come to a halt in order to control the level of their equilibrium and stability. If it is not possible to keep the suspended loads in equilibrium, it should lower them to ground for adjusting it. It is prohibited to adjust the position of loads when they are being in suspending state.

17.1.15. It should stop the lifting and assembling the construction parts and building components when the wind speed reached the class 5 upwards or it is dark.

17.1.16. People who receive the lifted things at high altitudes should stand on the manipulating platform of scaffolds, on supports and wear the safety belt. Their safety belts should be hooked onto stable construction parts or onto the cable to be stretched and solidly fixed to a stable part of the construction.

It is prohibited to stand on construction parts, building components that are not solid and stable. It is prohibited to reach hand up to lifted load, pull and turn it when it is being in suspending state.

17.1.17. It is only allowed to free the hook of crane from the construction parts or building components after anchoring and tying them according to regulations defined by their design (eternal or temporary fixing them). It is not allowed to move assembled construction parts, building components after freeing the hook crane from them, excepting the cases to be defined by their technical design.

17.1.18. It should not stop the works when the construction parts, building materials are not assembled and installed onto their stable positions.

17.1.19. It is prohibited to pile or to place provisionally the lifted things onto the floor, manipulating platform or other construction parts if their weight exceeds the allowable load carrying capability to be defined by the design of these construction parts.

17.1.20. Ways for going on assembled construction parts should be arranged according to the guideline defined by their design.

17.1.21. It is only allowed to assemble the upper construction parts after fixing the lower construction parts according to their design.

17.1.22. If it is necessary to assign people to work in the lower side of the equipment and construction parts that are being in assembling (including in their upper side), it should implement the special measures to ensure safety for these people.

17.1.23. For lifting and assembling the loads at areas that are sited next to the electricity transmission line being in operation, it should ensure a safety distance between them according to the regulations defined by the part 6 of the present code.

17.2. Assembling the pre-fabricated building components.

17.2.1. It should mark the lifting them line and the lifting height onto the building components before lifting them by means of the crane.

For similar building components that could be confused one another during the assembling and lifting (slabs, beams...), it should mark the positions of hooking, assembling and installing them.

17.2.2. It should not place horizontally the wall slabs during the lifting and assembling.

17.2.3. For assembling the pole, it should use the supporting and conducting frame; In case there is no such frames, it should fix the pole by means of fastening cables and wedges.

Works of welding and concretion of the linkage of ferro-concrete building components that was fixed should be carried out by workers standing on manipulating platform, suspended platform or movable scaffold specially made for these works and equipped with protection rails.

17.2.4. It is only allowed to assemble the slab of floors and roofs if the beams or frames was solidly fixed and the manipulating platforms have been solidly assembled and they could ensure the safety for workers.

17.2.5. It is only allowed to assemble the upper walls and floors if the lower walls and floors was completely assembled and fixed. The gaps of the floors should be covered in order to ensure the safety for people.

17.2.6. The slabs that are used for making the steps of staircases should be assembled simultaneously with the assembling the building components of houses or constructions.

17.2.7. After assembling the stepping slabs of staircases, if their rails are not timely assembled and fixed, it should erect the provisional rails to ensure the safety for workers going up and down the floor. It should synchronously assemble the stepping slabs of staircases before continuing the assembling staircases of the upper floor.

17.2.8. For assembling the slabs of wall, it should arrange an adequate anchoring cable system or an adequate wall propping system for them in order to implement the related regulations defined by their design.

17.2.9. For assembling the slabs of balcony or penthouse, it should use the temporary props before eternal fixing these slabs. In fixing the slabs of balcony or penthouse and assembling the rails for balcony, the workers should wear their safety belts.

17.3. Assembling the steel constructions.

17.3.1. Large-size steel constructions should be strengthened by means of the temporary fastening and propping equipment in order to ensure their mechanical stability during the assembling and lifting them.

17.3.2. The way for going from one rafter trellis to other trellis should be paved with woody boards and protected with rails.

It is prohibited to go on cross-bars, inclined beams and tie-beams or on slats located at upper side of rafter trellis.

It is only allowed to go on slats located at lower side of rafter trellis if there is the cable that s stretched along this trellis and used for hooking the safety belt.

The ways for going on the roof or on the slats located at upper side of rafter trellis should be of at least 0,5 m wide and they should be equipped with protection rails of 1,00 high.

17.3.3. Before lifting and assembling the large-size construction parts, it should organize the training course for workers so that they will be skilled to manipulate and control the running state of machines and equipment.

17.3.4. Before lifting and moving the steel constructions, it should carefully control the positions of hooking and tying them so that all of cables are equally stretched. It should not tie and hook the steel constructions onto linkage slats and joining slabs.

17.3.5. It should not assemble the frame of air-shafts, simultaneously with rafter trellis. For assembling the frame of air-shafts, workers should stand on the manipulating platform and wear the safety belts.

The assembling works should be carried out according to defined order.

17.3.6. It is only allowed to free the hook of crane from the assembled construction parts that was installed in their positions after ensuring the mechanical stability of construction linkage with satisfying the following requirements:

a) For each pole, it should get at least 4 bolts used for anchoring it at 4 sides or it should keep it stable by means of conducting frames and fastening cables.

b) For each rafter trellis, after ending the assembling tie-beams, fastening beams with assembled and fixed trellis;

c) For beams of the crane, after ending the tightening at least 50% of total number of bolts or rivets according to regulations defined by their design;

d) For welded constructions, to tighten the provisional bolts into all bolt holes. If there is no bolt holes, it should use special details to tightening these bolts.

e) For riveted thin slabs of the construction, after tightening the bolts into at least 20% of total number of bolt holes on the perimeter;

f) For conducting pipe, after tightening the bolts or welding for 20% of total number of bolts or total length of welding line according to related regulations defined by their design.

g) For roofing constructions, it should implement the works according to the related regulations defined by the section 8 of the present code.

17.3.7. For assembling the constructions like tanks, steam conducting pipes at altitudes of 2 m upward, it should use the manipulating platform.

18. ROOFING WORKS

18.1. Workers are only allowed to carry out the roofing works if the responsible technician or team leaders have carefully controlled the state of the construction parts sustaining the loads of the roof and other means to ensure the safety for workers.

18.2. For working on inclined roofs of 25° slope upwards, workers should wear their safety belts. The site onto that the belt got hooked should be indicated by responsible technician or team leaders.

18.3. Workers to work on inclined roofs of 25° slope upwards should use stepladders that are installed crossing the edge of the roof in order to ensure the safe going for them. The stepladders should be solidly fixed onto the constructions; the width of stepladder should not be smaller than 30 cm, the rungs should be equally arranged with the distance between them of about 40 cm.

18.4. It is only allowed to install materials on the roof at the positions that are defined by the technical design. It should lift each large-size roofing slabs severally up to the roof and they should be installed at defined positions and temporarily fixed according to the requirements of their design. In case that it is necessary to lift simultaneously many roofing slabs up to the roof, it should get special lifting equipment and arrange the position of installing them on the roof so that the safety could be ensured.

18.5. For installing materials, instruments on the roof, it should get measures to prevent the rolling, slide along the sloping roof, including the case that they are influenced by the impact of the wind.

18.6. It is only allowed to go on the roof formed of fiber cement slabs or foamy concrete insulated slabs but it should use the ladder for the going and pave the way with paving wood boards.

18.7. For assembling the verandah's roof, water collecting gutter, chimney, shielding slabs of roof, air-shaft, edge of roof, air ventilating pipe, water draining pipe etc... it should use the scaffolds or supports according to the regulations defined by the part 8 of the present code.

18.8. Within the area where are people to work on the roof, it should fence it and erect the prohibiting signboards at the lower side in order to avoid the falling of materials from the roof down to people going there.

The separating fence should be erected along and outside the perimeter of the over-ground area to be limited by the projected horizontal section of the roof; the distance between the fence and the perimeter of this area is of 2 m if the roof is constructed at the altitude not to exceed 7 m and of 3 m if this altitude exceeds 7 m.

18.9. If the roofing is done with using bitumen, putty it should abide by the regulations defined by the part 11 of the present code.

18.10. It is only allowed to stop the working on the roof after fixing the roofing slabs and clearing all materials and instruments.

19. PERFECTING WORKS

19.1. General Requirements.

19.1.1. For loading, arranging, maintaining, unloading and transporting the materials, using the construction vehicles, machines, working platforms, scaffolds,

cradles, ladders for carrying out the perfecting works like: plastering, painting, wood working, glass-working, paving the floor..., it should abide by regulations defined by the parts 4, 6 and 8 of the present code.

19.1.2. For using the scaffolds, working platforms or cradles for carrying out the perfecting works at high altitudes, it should abide by the guide of responsible technician or team leaders.

It should not use ladders for carrying out the perfecting works at high altitudes, excepting the perfecting works to be implemented inside the tight room with their heights not to exceed 3,5 m.

19.1.3. It is prohibited to carry out the perfecting works simultaneously in two or many floors in a same vertical orientation if between these floors there are no protection shielding platforms.

19.1.4. Responsible technician should ensure the complete cutting off the electricity before plastering, painting, sticking decoration paper or paving the walls with slabs.

For electric lighting to serve above works (if any), it should use the voltage level not to exceed 36 volts.

19.1.5. It should dry the rooms by means of hot air if in these rooms there are potential threat of toxic and explosive gas emissions. It should not use the bare fire, coal-fire cooking stoves, wood-fire cooking stoves or other cooking, heating and drying appliances.

19.1.6. The drying the rooms by means of gas-fired or oil-fired dryers should be done by trained and experienced workers.

Dryers should be solidly fixed.

Worker who directing the dryers should not continuously work in this room in a working duration to exceed 3 hours.

19.2. Plastering.

19.2.1, For plastering the inside and outside of the houses as well as of parts and details of other constructions, it should use the scaffold, or support according to the regulations defined by the part 8 of the present code.

19.2.2. It is prohibited to use toxic coloring substances like leaded minium, leaded chrome powder... for making colored plastering mortar.

19.2.3. For lifting the mortar up to working platform that is located at the altitudes not to exceed 5 m, it should use small-size mechanized gears or improved instruments. For working platforms located at altitudes to exceed 5 m, it should use lifting machines or other cranes.

It should not reach the hand up to the bucket containing mortar and move it up to working platform that located at high altitudes to exceed 2 m.

19.2.4. Barrels, buckets containing the mortar as well as others instruments and tools should be installed at solid positions in order to avoid their dropping, slide, falling, collapsing. If the working is interrupted, it should clear materials, instruments and install them at an defined site.

After each shift, it should clean the instruments from sticky mortar.

It is prohibited to throw materials, instruments from upper positions down to lower ones.

19.2.5. The plastering by means of mortar ejecting machines should abide by regulations defined by the part 6 of the present code.

Workers who direct the mortar ejector should wear boots, gloves, protection glasses.

19.2.6. Electricity used for plastering work to be done inside the tank, tight tunnel should get voltage levels not to exceed 36 volts.

19.2.7. Areas where is the mixing mortar to be diluted with chlorine should be arranged at well-ventilated zones and they should be sited far from populated areas with a distance between them of at least 0,5 km.

It is prohibited to plaster with mortar to be diluted with chlorine in the rooms, underground shelters, covered ditches if there are not well ventilated.

Workers who carry out the works to touch the mortar to be diluted with chlorine should be equipped with adequate personal protection means and they should be provided with feeding up allowances related to baneful influences according to prevailing feeding up regime.

19.3. White washing, painting.

19.3.1. White washing, painting and decorating the outside of the houses should be carried out with scaffolds according to related regulations defined by the part 8 of the present code.

19.3.2. Painting the frame of air-shaft should be carried out with scaffolds specially made for this work and workers should wear safety belts.

It is prohibited to go on the frame of air-shaft.

19.3.3. It is only allowed to use the ladder for white washing, painting a small surface located at altitudes not to exceed 5 m counted to the ground of houses or to the floor. At altitudes to exceed 5 m, if workers use the ladder, the

extremities of this ladder should be fixed onto stable parts or components of the constructions. It should not lean the ladder against the frame of window.

19.3.4. The using white washing machines or oil painting machines should abide by related regulations defined by the part 6 of the present code.

19.3.5. When the painting is carried out inside the house or the paint is diluted with baneful substances, it should provide the workers with antitoxin masks and ensure the standardized feeding up allowances for them according to prevailing feeding up regime.

19.3.6. When the painting is carried out inside the room with the paint types to be diluted with baneful substances, before beginning the works about 1 hour it should open all doors and windows and start the ventilating equipment of this room.

19.3.7. It is prohibited to smoke or to carry out any work that use the fire or provoke the sparks at the area where the nitro-paint is used. Workers should not continuously work there in a duration to exceed 2 hours.

If in this area there are electric lines or electric equipment being in operation, it should cut off the electricity.

19.3.8. People are prohibited to enter the room that was white-washed or painted with a type of paint to be diluted with baneful substances and that was not good ventilated.

19.3.9. The house where is the diluting of the paint should be good ventilated. The electric lamps and other equipment that are installed inside the diluting house should be protected from fire and explosion.

The barrels containing the paint should be labeled with the name of material, trade-mark, type of solvent, numerical code of product, data of production and weight.

It should not use carbonate lead as a chemical component of paint for painting works as well as it should not use the benzene and ethylene gasoline as a solvent.

19.3.10. It is only allowed to assign the workers who have passed the professional training course and get enough health for carrying out the diluting the paints with baneful and inflammable substances.

19.3.11. When the oil is used for diluting the paint, it should get preventing measures so that oil is not shot out of buckets.

The volume of oil contained in each bucket should not exceed three fourths (3/4) of the bucket capacity. Areas where the oil is cooked should be separately arranged according to prevailing regulations on fire prevention and extinguishing.

19.3.12. For burning the old paint layers it should get measures to ensure a good ventilation there.

19.3.13. If the old paint layers are wiped out by means of chemical substances, the workers who can carried out this work should wear rubber-made glover and use the scoops having long shaft to scoop and sprinkle this solution. The waste solution discharged from wiping process should be collected and conducted to a particular barrel that should be burned or buried deep into the ground of at least 30 cm deep.

19.4. Sticking the poliizo-butylene.

19.4.1. The room that is used for washing, dismantling the poliizo-butylene and making the glue should be separated from other production rooms; It should get particular lock and be equipped with a good ventilating and lighting system as well as be protected from explosions.

19.4.2. It should not use the ethylene gasoline to clean the surface. In the workshop the ethylene gasoline reserve should not exceed the per day ethylene consumption.

19.4.3. Buckets containing the gasoline and glue should be tight and installed in steel or wood barrels that are strengthened by solid hoops, locked and their edges should be covered with a rubber layer.

19.4.4. For transporting the glue and gasoline, it should use the pots made of aluminum, plastic or covered with a thin zinc layer and tightly lidded.

For scooping the sticky glue it should use the scoop made of aluminum with long shaft.

19.4.5. For sticking poliizobuthilene into equipment installed in open-air, it should earth them; it should get a good ventilation system and an explosion preventing system as well as it should use the hand-held lamps of the voltage level of 12 volts.

19.4.6. Workers sticking poliizobuthilene on covered equipment are only allowed to work continuously there in a duration not to exceed 1 hour.

19.4.7. It is prohibited to carry out any work that could provoke sparks in areas of sticking poliizobuthilene within a radius of 25 m.

19.4.8. When the worker stick poliizonbuthilene inside the equipment, it should assign people on duty to stand outside them. Areas where is the sticking of poliizonbuthilene should be fenced and indicated with signboards.

19.5. Using the vulcanized cement and ardemit paint.

19.5.1. Workers who carried out the works to touch the antacid cement should apply the ointment or Vaseline.

19.5.2. Barrels used for cooking the vulcanized cement should arranged at the area to be distant of at least 25 m counted from the working area; If the cooking barrels are installed inside the tight rooms, it should arrange the ventilating funnel in upper side of these barrels. When the cooking barrel are installed in open-air, they should be roofed.

19.5.3. For equal heating the substances to be contained in cooking barrels, and preventing the partial burning of sulfur, it should get the sandy buffer to separate them into strata.

19.5.4. Before pouring the vulcanized cement into cooking barrels it should dry these barrels. It is not allowed to let the volume of cement contained in the barrel exceed three fourths (3/4) of barrel capacity.

19.5.5. If the sulfur caught fire, it should get measures to extinguish it immediately and to lid tightly the barrel.

19.5.6. For pouring the vulcanized cement into the veins of the lining stratum of boiler's wall, the workers should wear antitoxin masks.

19.5.7. The ardemit powder should be contained in barrels to be tightly lidded and installed in a separated room.

19.5.8. For mixing the ardemit powder, workers should wear antitoxin masks and rubber made gloves.

19.5.9. Workers who carried out the works to touch the ardemit solution in tight rooms are only allowed to work continuously in duration not to exceed 1 hour. If the ventilation system is not good, it should provide the workers with antitoxin masks and personal oxygen respiring pots.

19.6. Paving the surface of walls.

19.6.1. Areas where the stone is processed should be fenced and indicated with prohibiting boards.

19.6.2. Workers who whittle the stone should be sit down with a distance from one another of at least 3 m; if it is not possible to ensure such a distance, it should erect a shielding board between them. It should not let workers sit facing one another. Workers who smash; whittle the stone should wear protection glasses and gauze masks.

19.6.3. For processing the heavy large-size stone blocks, it should solidly wedge and chock them.

19.6.4. Areas where is stone sawing should be paved with wood boards and they should get good water draining ditches. The floor should be tidied up and it should get measures to prevent the slide.

19.6.5. Rooms where is the stone sawing with dust emissions should be good ventilated and workers carrying out works there should wear protection gauze masks.

19.6.6. When the electric hand-held instruments are used for processing the stone, it should abide by the related regulations defined by the part 5 of the present code.

19.6.7. The classifying and piling processed stone in the stone house or store plain should abide by the related regulations defined by the part 2 of the present code.

19.6.8. The paving the surface of walls of the construction with stone pieces should be carefully done. For paving with large-size stone pieces, it should get measures to prop or to keep them solid. The paving should be done in order from bottom up.

19.7. Glass.

19.7.1. It should cut the glass in separated rooms. The superfluous or broken glass pieces should be permanently cleaned and poured into a defined site. Do not cut the new glass slabs that are given from cold open-air areas and the humid or dew-covered ones.

19.7.2. For lifting, lowering, moving and assembling the glass slabs at high altitudes, it should make shielding floors to protect the positions located directly under the moved glass slabs and these positions should be fenced and indicated with prohibiting boards.

19.7.3. For assembling the glass into the frame of air-shaft doors, windows that are permanently closed and located at high altitudes, it should use the scaffolds and working platforms.

19.7.4. It is prohibited to lean the ladder against the glass surface or the frames of doors or windows that was equipped with glass.

19.7.5. For moving the glass by bale for bale or slab for slab as well as for clearing the broken glass pieces after cutting them, the workers who carried out these works should wear gloves made of canvas.

19.7.6. The moving large-size glass slabs should be done by at least two workers who should use gloves made of canvas, ropes with rubber-made lining. During the moving large-size glass slabs, they should be installed in the vertical orientation.

19.7.7. In decorating the surface of glass by means of sandy ejectors or of acids, it should provide the workers with protection glasses and gloves... according to prevailing labor protection regime.

19.7.8. The cooking putty for gluing the glass should abide by related regulations defined by the part 11 of the present code.

19.8. Wood works.

19.8.1. The assembling windows, doors to balcony should be done from the inside of the rooms.

20. WORKS OF ASSEMBLING THE TECHNOLOGICAL EQUIPMENT AND PIPELINE.

20.1.1. General Requirements.

20.1.1. All works related to the using electric equipment, lifting appliances should be carried out with abiding by regulations defined by the part 5, part 6 of the present code and "the code for safety technique of lifting appliances" TCVN 4244 - 86.

20.1.2. For assembling the technological equipment and conducting pipeline it should abide by the technological order of assembling works. The transporting the equipment to store plains or to machine halls, assembling and installing the equipment onto their foundations should be done with abiding by defined order of assembling each gear of them.

20.1.3. Ditches, hole that are located at areas where are foundations of equipment and going ways of workers should be covered.

20.1.4. For wiping off the protecting layer on the outer surface of technological equipment and pipes it should use the antitoxin alkalinized solution.

Before lifting and installing the equipment onto high altitude, it should scrub the soil, and other wastes sticky to these equipment.

20.1.5. It is only allowed to use the broom to sweep, but not to blow by mouth the metallic shavings and filings generated by the sawing, cutting, grating, carving and cleaning the metals.

20.1.6. The using different ferro-concrete or metallic components of the construction for lifting and assembling the equipment is only allowed in condition that these components was controlled and calculated with their carrying capacity; at the same time, the use of these construction components should be allowed by designing organizations and construction and assembling companies. For using the construction parts of workshops being in running for these purposes, it should be allowed by their management boards.

20.1.7. When it has to implement the works at areas sited below the equipment being in assembling or below the equipment being temporarily wedged on the jacks or being suspended by cables, it should protect the workers by means of installing the supports below these equipment, but these supports should carefully calculated so that they can sustain the weight of equipment.

20.1.8. The static balancing of the rotor, air compressor, turbine, pump... should be realized when they are installed on supporting pillars that are fixed to solid supports. The sustaining capability of these supports and supporting pillars should not be under 1,5 time of the equipment weight (rotor weight). The

supporting pillars should have the same height and they should be carefully protected in order to prevent the sudden rolling and slide of rotors.

20.1.9. For assembling the cylinder-formed equipment and barrels, it should chock them in order to prevent the sudden rolling of these equipment.

20.1.10. For assembling the equipment, pipelines by means of lengthening or heightening them, they should be firmly fixed and it should not let them in unstable suspending state.

20.1.11. Equipment that are assembled and erected in vertical direction, if the frames of these equipment have not got enough mechanical stability, it should tie and keep them according to working measures and they should be anchored by at least 3 anchoring cables. It is only allowed to free the anchoring cables from equipment after solid fixing these equipment to stable constructions.

20.1.12. It is prohibited to assemble the details, coupling of equipment, the pipeline conducting gas, oil, water to equipment or other pipelines if they are being in running.

20.1.13. For assembling equipment, pipelines at areas located next to electricity transmission lines, the technician should be responsible for implementing necessary measure to protect the workers (as well as equipment, pipelines) from impacts of the electric current.

20.1.14. For carrying out the controlling, assembling, repairing or dismantling the equipment, pipeline in the environment where are toxic steam or gas emissions or the equipment, pipelines that have contained toxic steam and gas, it should carry out measures to ensure the safety; it should control them and ensure that they was wiped out from these baneful substances.

Workers who work in such baneful environment should be provided with appropriate antitoxin means and they should abide by the guidance of responsible technician and first aid organizations.

20.1.15. For assembling the equipment, pipelines in condition of presence of fire and explosion threat, it should ensure that:

- The using instruments and tools made of colored metals or plated with copper is not able to generate sparks. It is only allowed to heat the machines (if necessary) by means of hot water or steam;

- It is prohibited to use clouts to be soaked in oil for wiping out the equipment. Clouts soaked with oil, lubricant should be collected and poured into iron barrels. After ending the works, it should bring them out from the room.

- It is prohibited to throw the details of machines, metallic things that are able to generate the sparks;

- It is prohibited to wear shoes having soles to be driven with nails or iron tips;

20.1.16. For assembled the oxygen containing equipment, it is prohibited to use clouts to be sticky with oil, lubricant for wiping their wedging beams. The instruments should be carefully wiped.

20.1.17. It is prohibited to let instruments, materials, clothes and other things be inside equipment and pipelines after each working shift.

20.1.18. After dismantling equipment, pipelines, it should ensure that the remained groups of equipment and pipelines are kept stable in their running. It should permanently watch the stability level of the running of these remained groups of equipment and pipelines.

It is only allowed to begin the dismantling the equipment groups and pipeline sections if they was fully disconnected from the outside electric circuit as well as from other clues to equipment groups and pipeline sections that need to be dismantled.

The lifting and lowering the dismantled groups of equipment and sections of pipelines are only allowed after ensuring that these works are not hindered by any barrier.

20.2. Assembling the technological equipment.

20.2.1. The assembling the lifting appliances should abide by TCVN 4244 - 86 "Code for safety technique of lifting appliances" and the part 6 of the present code.

20.2.2. The assembling thermal equipment should abide by QPVN 23 - 81 "Code for safety technique of steam boilers".

20.2.3. It is prohibited to assemble and install technological equipment without their technical passports, guidelines for assembling and operation; These above documents should be transferred to people to be responsible for organizing or directing the assembling works of these equipment.

20.2.4. For using the cradles for assembling and installing technological equipment the keeping and anchoring the hooks as well as the tightening bolts of cradles into equipment that need to be assembled and installed... should be done at store plaines or grounds before lifting them up.

20.2.5. For assembling the technological equipment having electric driving gears, the technician should realize all measures to prevent the automatic starting of their electric motors.

20.3. Testing the technological equipment.

20.3.1. Testing the technological equipment should be carried out under the guidance of responsible technician of assembling units with the presence of the representative of the major management unit.

20.3.2. Testing the technological equipment should be done according to the requirements of their design, the testing process of each type of equipment and the prevailing state code.

20.3.3. Before testing the equipment (with and without loading), it should:

Present to people participating in testing the approved requirements, order of testing works, measures to ensure the labor safety. Inform to people working at areas located next to the testing area the time of beginning and ending the testing;

Erect the fence or install the protection barriers to check the strange people to enter to the testing area;

Re-control the link between equipment and their foundations, the state of insulation and earthing of the electric part, equipment, appliances. Re-control the starting system, braking system, controlling measuring and protecting instruments.

Ensure an adequate lighting for working area;

Clean the testing area and clear strange things from the equipment;

In necessary case, it should arrange the occurrence alarming system and first aid organization.

20.3.4. The testing pressure used for testing the equipment should be slowly and harmonically increased and should not exceed the pressure level defined by the guideline on testing similar equipment. It should permanently control the indicator of testing manometer and the running of the whole equipment system being in testing.

20.3.5. All of pipelines and accessories conducting water or gas from the pump, hydraulic compressor, air compressor to the tested equipment system should be hydraulically tested before their connection.

20.3.6. Before the running in of the whole equipment, it should let the motor run without loading and with gradual loading.

For first testing the equipment, it is absolutely necessary to run these equipment without loading, then to control comprehensively the equipment after fully stopping them.

It is only allowed to let the equipment run with loading after testing them without loading and it should abide by the guideline of the manufacturing enterprise.

20.3.7. After stopping the testing mechanical parts, during its pause or during the controlling and considering the mobile parts of equipment, it should cutting off the energy supplying source for them.

20.3.8. In the testing the technological equipment, it is prohibited:

Let people standing before the door, lid, linking system of accessories like joints of the equipment sustaining the pressure;

Dismantle the shielding and protection slabs;

Start the equipment without permission of commander of testing and without foreshadowing for testing participants.

Open the lid, door... and lean and lubricant the equipment.

Lean the body against mobile parts of the equipment;

Carry out works in upper and lower side of equipment;

20.3.9. The repairing defects and damages that are discovered after testing should be realized by assembling units and it is allowed only after fully stopping the running of equipment and cutting off the electricity supply.

20.4. Assembling the pipelines.

20.4.1. Assembling the pipelines.

20.4.1.1. Loading, unloading and transporting the pipelines should be abide by the regulations defined by the part 4; the pipes installed on transporting vehicles should be solidly fixed and they should not move into both two sides of the vehicle.

20.4.1.2. Pipes to be transported to working area should be installed at a distance of at least 1,5 m counted from the edge of the ditch. Welded pipe sections should be installed on supports specially made for these works or installed directly on ground and wedged in order to avoid theirs rolling and slide.

20.4.1.3. The support used for supporting the pipe sections that will be welded and assembled each other should be fabricated according to their approved design. The sustaining surface of this support should be even and flat. Scaffolds and supports on which the workers stand and manipulate should be fabricated according to the regulations defined by the part 8 of the present code.

20.4.1.4. When the pipe is processed in the processing workshop, it should satisfy the following conditions:

For repairing or processing the pipe or carrying out other preparing works related to the pipe, this pipe should be wedged and fixed at both two ends of it;

The rotating details of the support on which the pipe section is installed and welded each other should be equipped with solid braking gears.

In order to rotate the pipe sections installed on the support, it should use the rotating keys specially made for this work. It should not stand on the pipe in order to roll it;

In cleaning the ends of pipe section or removing the corrosions of it, the worker should wear protection glasses;

In bending the pipe by heating method, the worker should wear protection glasses. For bending the long pipe section, it should use the support (on which the pipe section is installed). If it is necessary to water the heated bent pipe section for cooling it, it should use the scoop having long shaft.

20.4.1.5. For controlling the tightening level of the bolts of joints between pipe sections, it should use the instruments specially made for this work; it is prohibited to tight manually these bolts.

20.4.1.6. For assembling and installing the pipeline on fly-over, it should use supports or ladders for going up and down the constructions, it is prohibited to use the construction parts of fly-over for going up and down.

20.4.1.7. When the pipeline is assembled at areas located next to the electricity transmission lines that are being in operation, if the longest pipe section could touch the electric wires, it should cut off the electricity.

20.4.1.8. It should not anchor the scaffold, support, machine and equipment into the pipe.

20.4.1.9. It is prohibited to assemble and weld the pipes that are being suspended at high altitudes if under these suspended pipes there is no overhead shielding slab.

20.4.1.10. Areas where are the welding, cleaning, tightening the joints of pipelines should be roofed with shielding slabs against rains and sunshine. Working areas of welders should be overhead shielded against the sunshine if the atmospheric temperature exceeds 30°C as well as against rains and cold wind.

20.4.1.11. For scraping and washing the pipe, it should use the supporting platforms. The number and the arrangement of these platforms should be defined according to the technical specifications and the diameter of the pipe as well as the type of scraping machine.

20.4.1.12. For carrying out the painting work or the works related to bitumen, gasoline, putty, it should abide by the regulations defined by the part 11 and the part 19 of the present code.

20.4.1.13. Huts and camps used for washing the pipe with chemical solutions should be equipped with the good ventilating system and sited far from areas where the people work. People who do not have the task should not enter to these areas. Workers should be adequately equipped with personal labor protection means according to prevailing labor protection regime.

20.4.1.14. When there are storms, typhoons, it should leave their working positions to other safe sites.

20.4.1.15. It is only allowed to lower the pipe sections and their accessories down to the bottom of ditch sections when the people have gone up and left these ditch sections. It should not use the stick or crowbar to prize up and roll the pipe down to the ditch bottom. It should not use the props of wall propping systems of ditches as a beams to support the pipe.

If there is the land-slip during the lowering pipe sections it is only allowed to clear the crumbly soil in the ditch after supporting and wedging the pipe in a solid manner. The length of the carrying poles that are used for supporting and wedging the pipe should exceed the width of the ditch where the pipe is installed of about 2 meters. These works should be carried out under the strict guidance of responsible technician or team leaders.

20.4.1.16. Before lowering the pipe down to the ditch bottom, it should control the equipment, instruments; It should ensure that they are quantitatively and qualitatively adequate according to the requirements of implementing the assembling works. Cables, ropes, pulleys... should be first tested. The strength of cables and ropes should be calculated with the safety coefficient of 6.

20.4.1.17. The pipe installing machine should run along the pipeline and within the area of natural soil, but its moving way should be located in the limit of the prism of natural land-slip and this moving way should be in a distance of at least 2 m counted to the edge of the ditch.

20.4.1.18. If the pipe installing machine is used at areas of slopes to exceed 10^{0} (hilly side, slope of canal...), it should control its mechanical stability.

20.4.1.19. When the carrying pole and wedging slab are used for rolling ad sliding the pipe, they should be solidly installed so that the walls of ditches can be kept stable.

20.4.1.20. For opening the lids, covers of the sounding well, it should use the instruments specially made for this work; it should not manually open them.

20.4.1.21. For lifting the pipe, dust filter, tank containing the waste, as well as other equipment, it should continuously carry out this work until they are fixed

and installed into their designed positions and the carrying out this work should be installed under the supervision and guidance of responsible technician or team leaders.

20.4.1.22. For working inside the well or tank, it should assign people on duty to stand on the mouth of the well or at the entrance of the tank.

20.4.1.23. For carrying out the assembling works for underwater pipelines, it should provide the first aid instruments according to regulations defined by the article 1.11 of the present Code.

For underground pipelines crossing the rivers where are boats or ships going, it should install a signaling system during implementing the assembling works, at the same time, it should get the permission of water way management organizations and it should abide by regulations on water transport of Ministry of Communication and Transport.

20.4.1.24. Water transport and communication means to be used for installing the underwater pipelines should be adequately equipped with communicating appliances so that the people working at these means could communicate with people working at the river bank through wireless, signal, loud speakers or hooters. People who have no task are prohibited to climb these transport and communication means.

20.4.1.25. It is only allowed to carry out above works and to let drivers dive into water if the wave speed does not exceed the class 3.

Boats, ships crossing areas where the drivers work underwater should reduce their speed and they should ensure that the distance between them and diving boats is at least of 50 m.

20.4.1.26. Before pulling and then installing the pipe into the bottom of rivers, lakes, it should brake and chock solidly the wagons transporting this pipe. The windlass to pull the pipes should be solidly anchored by cables. The order of pulling the pipe should be defined by regulations in its technical design.

20.4.1.27. During the pulling pipes, it should emit the signals and arrange the commanding means in order to ensure the continuous communication between the commander to direct the work and the workers to implement each particular work.

20.4.1.28. All water transport means are prohibited to cross the areas where is being the pulling the pipes.

20.4.1.29. When the second pipe is installed parallel with the first one that is being in running, their related technical design should anticipate measures to protect the pipe being in running.

20.4.1.30. For installing the pipe to cross the roadway, it should erect the fence and signboard there. In the night it should arrange the red signaling lamps there.

20.4.1.31. For installing the pipe to cross the railway, it should assign people on duty to inform timely the arrival of trains to all people working there. All people should leave the working area to safe sites during the crossing of trains.

20.4.1.32. When the pipe installing machine is used for lifting the long pipe sections, it should install the isolating slabs for the pipes in order to avoid their transversal moving into two sides of the ditch.

20.4.1.33. People are prohibited to stand and go on the overhead pipe sections.

20.4.2. Assembling the technological pipeline.

20.4.2.1. It should install the fixed assembling means (like support, console, ferro-concrete or metallic construction, wall pillar, hanger...) before beginning the assembling technological pipelines.

20.4.2.2. For marking the positions where are installed the support, console, hanger... as well as for assembling the pipeline, it should use the scaffolds and abide by regulations defined by the part 8 of the present code.

20.4.2.3. For chiseling the holes of walls or the gaps of floors in order to conduct and fix the pipeline, workers should wear protection glasses. If necessary, it should erect the shielding slabs in surroundings.

20.4.2.4. Sections or group of pipe that was installed onto the supporting points should be fixed by means of linking and joining details according to their design.

20.4.2.5. During the installing technological pipelines, it is prohibited to dismantle the construction details sustaining the load (supporting point, hanger, console).

20.4.2.6. For installing the pipe groups, it should fix the branches of these pipe groups by means of linking and joining details according to their design.

20.4.2.7. Before installing the pipe groups into their installing and welding positions it should clean the contacting surfaces of ends of pipes sections that will be joined together (by welding or by bolting).

20.4.2.8. It should use the keys specially made for turning the pipes during the assembling them.

20.4.2.9. It should equally tighten the bolts of the joints of the pipe, it should tighten nut for nut according to symmetric radial direction and it should ensure that two contacting faces of the joint between two pipe sections are parallel fixed.

When these two contacting faces are not parallel, it is prohibited to treat this defect through unequal tightening the bolts of joints or through wedging the packing material into the clearance between these two contacting surfaces.

20.4.2.10. For assembling the pipeline made of glass, porcelain, ferro-silic it should get measures to prevent their breakage that can result injuries to workers.

20.4.2.11. In the workshop being in running, it is only allowed to dismantle the pipeline after fully disconnecting this pipeline from the machine groups or pipelines being in running.

It is only allowed to dismantle particular pipe sections or pipe groups after fixing the remained ones.

It is prohibited to assemble simultaneously the pipelines located at different altitudes counted in a same vertical direction.

20.4.2.12. It is only allowed to assemble the old pipelines and their accessories that was formerly used if it get the procès-verbal to certify that inside these old pipelines there is no technological products and that the using them is allowable.

20.5. Testing the pipeline.

20.5.1. Hydraulic testing the pipeline should satisfy following requirements:

The pipe section joining the pump into the pipe that need to be tested was recently and hydraulically tested;

At covered ends, lids, lidded doors, joints... of the pipes, it should arrange appropriate signboards or signaling systems to indicate them during the testing;

People who participate in testing should stand at safe positions that are shielded by protection slabs for preventing the shooting of lids if the joints of pipe sections are damaged.

It is prohibited to increase the pressure inside the pipe during considering and discovering the damages of this pipe.

It is only allowed to test hydraulically simultaneously many pipes to be installed on the same support or fly-over if these constructions was calculated for sustaining the corresponding loads.

20.5.2. The compressed air-used testing the pipes is only allowed if the hydraulic testing proved unreasonable.

20.5.3. For compressed air-used testing the pipes and their accessories made of cast iron (excepting the accessories made of forged iron), it should use the testing pressure not to exceed 4 kg/cm^2.

Accessories made of cast iron should be hydraulically tested in preliminary steps in order to determine its strength in advance.

20.5.4. The compressed air-used testing should satisfy following requirements:

Air compressors, measuring equipment and appliances used for testing should be arranged in a distance at least of 10 m counted to the pipe that need to be tested.

Security valves of testing equipment should be adjusted with corresponding testing pressure; It is prohibited to knock at the weld during the compressing air;

Connecting and disconnecting the pipe conducting compressed air from the compressor to the pipe section that need to be tested is only allowed if the air compressor was stopped.

20.5.5. It should not use the compressed air for testing the pipe in the workshop being in running or in case that this pipe is installed on the same support and same fly-over or in the same ditch with other pipes being in running.

20.5.6. During the hydraulic testing or the compressed air-used testing the pipes sustaining the pressure, it is prohibited:

Tighten bolts of the joint between two pipe sections;

Stand facing the join between two tested pipe sections;

Knock at welds;

Use the imperfect manometers;

Let people stay in areas located at ending of tested pipes during the compressing air.

20.5.7. The testing the pipe should be organized and implemented in day.

In case that above requirements are not able to be satisfied, it is allowed to test the pipe in the night but it should arrange an adequate lighting for the tested pipe section with a lighting intensity not to be smaller then 50Lux.

20.5.8. Dangerous areas by testing the pipes are determined according to the table 7.

Table 7

Type of material used for making the pipe and testing pressure	Diameter of the pipe (mm)	Radius of dangerous areas (m)
1. Steel-made pipe with testing pressure of 1.0 kG/cm^2	Up to 300 300 – 1000 Over 1000	7 10 20
2. Cast iron-made pipe with testing pressure of 1.5 kG/cm^2 (testing the pipe before assembling it).	Up to 500 Over 500	10 20
3. Cast iron-made pipe with testing pressure of 6 kG/cm^2.	Up to 500 Over 500	15 25

21. WORKS RELATED TO USE UNDERGROUND CONSTRUCTIONS

21.1. General Regulations.

21.1.1. For implementing the works related to underground constructions, besides abiding by regulations defined by this chapter, it should again abide by the prevailing Code for safety technique works related to coal pits and schist pits".

21.1.2. Before implementing the works related to underground constructions, it should get the following related documents: technical design, geodesic map, geological document, hydrological document, scheme of old constructions within the working area, procès-verbal of taking over on conditions on safety ensuring.

21.1.3. For implementing the works related to underground constructions, it should get follows:

Technical passports to instruct the order of implementing the works and measures to establish a propping system for ensuring a safe assembling and installing equipment in the underground constructions;

Measures to face the underground water

Measures to protect different types of pipeline, the communication lines between the tunnels that was or are being in the construction as well as other over-ground constructions to be located next to working areas;

Alternatives to eradicate the occurrences that could occur in the underground constructions;

Measures to establish the ventilation an lighting system, to control toxic gas emissions to ensure the hygienic during the implementation of works (related to underground constructions).

21.1.4. For implementing the works related to underground constructions that are located under or next to other constructions, it should get the permission of the organizations managing these constructions, at the same time, it should get measures to prevent and supervise strictly the state of geological stability of them before and during the constructions should process.

21.1.5. Workers who work in underground constructions should pass a health control with health certificates that their health is enough for these works; at the same time they should pass the periodical health control (at least one time per year).

21.1.6. All people working in underground constructions should be equipped with personal protection means according to the prevailing labor protection regime.

21.1.7. For using all of machines, equipment, means to serve the works related to underground construction, besides abiding by regulations defined by chapter 6 of the present Code, it should abide by the particular regulations to be appropriate to the concrete safety conditions of implementing the works related to underground constructions.

21.1.8. It should establish the pit first aid team specialized or semi-specialized for these works and equipped adequately with first aid means for giving the first aid to intoxicated casualties, to save people from land-slip, to extinguish fire etc... as well as to treat the sudden accidents. The first aid team of coal pits should be permanently trained according to approved first aid alternatives.

21.1.9. Before implementing the works, the responsible technician should instruct the workers about learning and perceiving measures to ensure a safe working and examine them; if they pass the related exam, it is possible to entrust them with the works (related to underground constructions).

21.2. Safety for implementing the works.

21.2.1. The leader who is responsible for the technique of implementing the works related to underground constructions should perceive the geological and hydrological conditions of the construction to be under his management. If there is any change in these conditions that could provoke occurrences, this leader should temporarily interrupt the working and carry out the measures to overcome them.

21.2.2. For working in the underground construction, it should assign at least two people or more to carry out these works and organize the strict controlling the number of people going and working before and after each shift. For each change of shift, the shift head should carefully control the number of workers of his shift, the state of safety of working area and record that into the shift diary in an adequate manner.

21.2.3. Before working, all people should prepare adequately chocks, props, for a production shift. The team leader of production shift should reconsider the propping rafters located from the entrance of only way mine - shaft to the coal seam being in mining, safety appliances, state of implementing the safety technique, and poke the high and dangerous small stone pieces remained in working areas and if the safety is ensured, their working could be continued.

21.2.4. During the implementing the works (related to underground construction). it should organize a strict controlling the propping rafters, digging mirrors, as well as the geologico-hydrological conditions according to requirements of their designs and defined regulations on safety.

21.2.5. Anybody who discovers the sign of dangers that could provoke labor accidents or occurrences should report immediately to all people being there in order to escape from dangerous areas, at the same time to the shift head or responsible technician for treating them in time.

21.2.6. The digging, propping the underground constructions should seriously abide by approved technological process (Digging and propping passport). If there is any change in geological, hydrological conditions, the digging and propping passports should be reconsidered and appropriately modified.

It is prohibited to carry out works (related to underground constructions) without approved passports.

21.2.7. Before implementing the works at areas to be next to underground electric lines, pipelines sustaining the inside pressure, it should cut the electricity or turn off the valves of these pipelines.

21.2.8. For implementing the works at underground areas that are located under the railway, it should permanently observe the geological state of railway foundations. If any soil deformation appeared on the railway foundations it should stop immediately the working and all people should leave to safe sites. At the same time, it should immediately inform it to the manager of this railway section for treating it in time.

21.2.9. In implementing the works related to underground constructions if anybody discovers the emissions of methane, dioxide carbon or other toxic gas or doubts that they could occur, it should carry out control, measure and determine the concrete gas concentration and it should prepare measures to reduce this gas concentration down to the allowable one, at the same time, to prevent and face the intoxication, fire and explosion.

21.2.10. Drilling and mining in underground constructions should abide by the prevailing "Code for safety technique of maintaining, transporting and using the explosive materials".

21.2.11. During the digging of tunnels it should pay attention and observe the tunnel mirror in order to discover the landslide and land-slip there.

If any, it should immediately stop the working and report these occurrences to responsible technician and project manager for treating them. The digging should be continued according to a particular passport to be approved by technical vice-director.

21.2.12. If the propping rafters are deformed, it should strengthen them by the new ones.

21.2.13. When the propping rafters are deformed, it should dismantle rafter for rafter. Before dismantling the damaged rafters, it should strengthen solidly the propping rafters that are sited before and after this damaged propping rafter. In only way pits, when the propping rafter is changed or the pit section is enlarged, it should carry out the propping continuously along the pit mirror; and during this propping process, the people are prohibited to enter and work in the inner pit section (counted from the site where is the propping of pit mirror).

If at the three way crossroad there is an only way tunnel branch, thus, in the distance of 5m counted from this crossroad, all works related to propping and drilling in this branch should be stopped.

The repairing the pit tunnel of slopes of over 25° should be done by top down order (in case of only way upper pit, these works should get measures to apply the safety technique to be approved by technical vice-director).

21.2.14. For digging the tunnel in areas of hard and stable soil, if it is possible to keep unchanged the dimension, the form of the tunnel according to its approved passport, thus, the tunnel propping is temporarily not needed, but it should carefully calculate the stability of the tunnel and it should get the permission of technical vice-director and the higher management organization.

21.2.15. For digging and propping the vertical mine shaft:

In the distance counted from the mirror of mine shaft to eternal propping rafter it should arrange the temporary propping rafters. In case of hard and stable stone, this distance should not be over 1 m.

It should arrange the shielding platform to protect the workers from the things falling down to the floor to be located at the height not to exceed 4 m counted to the bottom of mine shaft;

The distance between the edge of protection platform to the wall of propping rafter of mine shaft should not exceed 50 mm;

When the platform is moved, the workers work at mirror of mine shaft should go up to the ground.

Responsible technician should supervise on site the moving of protection shielding platform and other mechanical equipment to be hung inside the mine shaft.

For using the suspended platform, it should arrange a roof located in upper side of this platform in order to protect people working on it.

Before mining the earth, the suspended platform should be lifted up to the altitude at least of 15 - 30 m counted from the mirror.

If the cradle is used for transporting soil and stone up, the mouth of mine shaft is only opened when the cradle goes up through it.

21.2.16. When the well is built with stone, brick or concrete, the clearance between the wall of digged hole and the wall of the well should be chock with building materials. It is prohibited to use wood to chock this clearance.

21.2.17. Around the mouth of the well it should erect the fence of at least 2,5 m high, the entrance of this fence should be equipped with the iron door. When the working is stopped, this door should be closed and carefully locked.

At all of mouths of mine shaft, it should arrange iron doors or iron pales.

21.2.18. Digging the tunnel by means of digging shield:

The transporting accessories of digging shield down to assembling and working areas in the tunnel should be carried out under the direct guidance of responsible technician through an unique order.

It is only allowed to put them into use when the procès-verbal of taking over of these accessories was completely prepared.

It is only allowed to dig the earth within the area limited by the verandah of the digging shield;

It is prohibited to move the digging shield in a space to be longer than the length of the propped vaulted tunnel section.

The moving of the digging shield should be installed under the supervision of responsible technician or team leader.

21.2.20. Digging the tunnel by means of horizontal pipe-press method.

People are allowed to work inside the pipe if the inner diameter of pipe is of 1,2m upwards;

The pipe of over 7 m long should be compulsorily ventilated with the clean air flow calculated for one person not to be smaller than 4 m^3/minute. It is only

allowed to dig manually the earth inside the pipe when the toxic gas, the water stagnant in mirror was eradicated;

It should arrange the two-direction communication information for workers working inside the pipe; It is prohibited to dig the earth outside the edge of the pipe.

21.3. Going and transporting in the underground construction

21.3.1. At entrances of underground constructions it should arrange an announcement on the internal regulation that define the going, transporting inside the tunnel.

The building components used for strengthening the mouth of the well that leads into the underground construction should be higher than the mouth of well at least of 0,5m. The mouth of well should be lidded by a solid wood slab; it should not let anything on this slab or in surroundings within a radius of under 0,5 m.

21.3.2. The old tunnel sections that are unusable or temporarily unusable should be fenced and marked by signboards or red lamps.

21.3.3. The old tunnel sections that are unusable or temporarily unusable should be fenced and marked by signboards or red lamps.

Deep holes, ditches on the ground where the people go should be carefully covered.

21.3.4. For going along the tunnel where the materials are transported by windlass and crane it should get the agreement of the worker operating the windlass or crane.

People are allowed to go along this tunnel when these transportation means have gone out from the lifting line and the drum of lifting windlass was bolted.

21.3.5. The way used for going up and down the underground construction and for bypassing the vertical and inclined well should be managed according to the concrete regulations and the steps of this way should be cut according to the slope of the pit.

If the slope is under 45°, it should erect the solid protection rails;

If the slope is over 45°, it should use the lifting cage, the ladder with protection rails or lift.

At vertical well, the slope of ladder should not over 80° and it should arrange one resting platform per 8 m high.

21.3.6. During the going up and down the ladder, the working instruments like hammer, pincers... should be contained by solid bags.

21.3.7. In the tunnel where are transportation means that are being in running, it should reserve the way for people with following widths:

At least of 0,7 m wide (counted from exterior edge of transportation means to exterior edge of propping rafter) for tunnels where the transport is carried out by wagons.

At least of 1,5 m wide for tunnels where the transport is carried out by lorries;

21.3.8. It is prohibited to cross the room between two vehicles, climb the convoy or stand on the buffer of wagons.

21.3.9. It is prohibited to use the transportation means in underground constructions if there is no adequate lighting according to related regulations.

21.3.10. It is prohibited to transport simultaneously people and materials in a same lift.

It is prohibited to transport people by skips or other tipper transportation means.

21.3.11. For transporting by means of wagons, it should abide by regulations defined by the part 4 of the present Code and satisfy following requirements.

The slope of wagon way should not exceed 7%;

The speed of hand-pushed wagon should not exceed 4 km/hour;

The speed of cable-pulled wagon should not exceed 3,6 km/hour;

The hand-pushed wagon should be equipped with light signal;

Prohibit the standing facing the wagon for braking or pulling it;

21.3.12. Windlass used for puling wagons should be installed on the frame to be solidly fixed. It should get communicating signal for marking the running of windlass.

People are prohibited to go or work along two sides of pulling cable of windlass when it is being in running.

21.3.13. It is prohibited to free the cable hook when the convoy does not come to a halt. It is prohibited to stick the head into the room between two wagons for connecting or disconnecting them.

21.3.14. For transportation by means of lorries in the underground construction, besides abiding by regulations defined by the part 4 of the present code it should again abide by following regulations:

The speed of vehicles should not exceed 5 km/hour;

People are prohibited to stand on the body of vehicle or outside the cabin of the vehicle; The braking system, hooter, headlight, signaling headlight... of the vehicle should be adequate and in good running;

It is prohibited to park the vehicle for taking a rest in the tunnel;

It is prohibited to use gasoline engine - powered vehicles in underground constructions.

21.4. Using the electric equipment and lighting.

21.4.1. For Assembling, installing and using the electric equipment, besides abiding by regulations defined by this section, it should abide by regulations defined by the part 3 of the present Code and the "Code for earthing and nought connecting of electric equipment".

21.4.2. Electric equipment should be equipped with automatic protection relay to cut off electricity in case of occurrences. Every month it should strictly control the state of electric insulation of electric gears that are easy to leak electrically. Every day it should control the running of relay protecting the electric equipment from electric leaking.

21.4.3. It should prepare the scheme of electric network in that it should annotate the electric power grid, the electric lighting grid, the sites of installing electric equipment and their installed capacities, the transformers, the distribution equipment, the signaling and telephoning systems.

If there is any change, the electro-mechanic master of unit should record this change into the electric scheme.

21.4.4. For underground construction to be threaten by dangers caused by toxic gas emissions, dust, explosion, it should use appropriate safe electric equipment that are protected from the explosion.

21.4.5. Circuit breaker, fuse cut-out should be installed at safe and favorable sites. It shout arrange the indicating board for each appliance.

21.4.6. Headlights used in underground constructions should be equipped with dim glass.

21.4.7. The ways, staircases should be permanently lit.

21.4.8. Electric power stations installed in underground constructions should be adequately with appropriate fire preventing and extinguishing means.

21.4.9. For electric wires installed in underground constructions, it should satisfy following requirements:

It should use the electric cables to be insulated by rubber; these cables should get metallic protection outer cover if they are the fixed ones;

If they are mobile cables, it should use the flexible cables with outer cover to be made of rubber;

The electric cables should be overhead hung in order to avoid the bump that could damage them.

21.4.10. For the electric lighting system inside underground constructions, it should use the voltages not to exceed 127 volts. If the fixed fluorescent lamps are used it is allowed to use the voltages not to exceed 220 volts.

21.4.11. For the electric regulation grids that are used for fixed and mobile machines it is allowed to use the voltage of 24 volts for bare electric wires.

In underground constructions without methane emissions, dust and explosive danger, it is allowed to use the voltage of 24 volts for bare electric wires.

21.4.12. It is prohibited to use the uncovered regulating transformers in underground constructions.

21.5. Ventilation.

21.5.1. For underground constructions it should ensure a good ventilation by means of appropriate ventilating equipment. The only way pit line of over 10 m deep should be compulsorily ventilated.

21.5.2. The ventilation of underground constructions should ensure follows:

The oxygen percentage in air should not be under 20%.

The concentration of toxic gas should be under the allowable one;

The air flow needed by the respiration per capita should not be under 4 m^3/hour. The maximal atmospheric temperature should not exceed 30°C.

21.5.3. The electricity used by the principal ventilating fan should be provided from two independent electric sources (one is in running while the other is in reserving).

21.5.4. The principal ventilating fan should ensure follows:

The fan should be equipped with a gear that is able to reverse its wind direction in a duration around 10 minutes in case of occurrences and it should ensure 60% of standardized wind flow in conditions of normal running.

It should arrange the reserved motor, and in case of present of methane, it should arrange the reserved fan.

21.5.5. If there is potential appearance of toxic gas, methane, the workers should be adequately equipped with protection means and instruments according to the defined labor protection regime and other controlling and measuring appliances.

21.5.6. During the working if a lot of toxic gas appeared or the air ventilating system is damaged, it should immediately stop the works, all people should leave their working positions to the safe sites. Only after ending the treating these occurrences and confirming that the safety was ensured, they can continue their works.

21.5.7. Drilling stone should be carried out in combination with watering or applying other protection measure against dust.

21.5.8. The welding in underground constructions should be calculated according to the concrete ventilation in order to ensure a local toxic gas concentration to be under allowable one.

21.5.9. Entrances to underground constructions should be permanently cleared from wastes, superfluous materials as well as unused propping construction, scaffolds and equipment.

21.5.10. The water draining system of underground constructions should permanently ensure a good water drainage.

22. WORKS OF ASSEMBLING AND INSTALLING THE ELECTRIC EQUIPMENT AND NETWORK.

22.1. General Requirements.

22.1.1. Workers who transport, assemble and install electric equipment should grasp thoroughly the regulations on safety of transporting, assembling and installing the electric equipment.

22.1.2. Moving, lifting, assembling, installing the electric motors, electric end-using machines, electric switching gear,... are only allowed if they are not electrified.

22.1.3. Moving, assembling, installing the electric equipment should be carried out by means of using the instruments specially made for anchoring and tying them. It should not use steel cables, chains for tying the insulating parts,

and contacts of the supports of equipment. It should prepare measures to prevent the collapse of equipment.

If the transportation is carried out by means of vehicles, it should implement measures to prevent the break and bump that could deform the equipment and to protect them from rain and sunshine, especially for appliances of high accuracy it should implement measures to prevent the bump, vibration and shake.

22.1.4. After transporting the electric equipment to their assembling positions, it should get measures to maintain and protect them from rain, sunshine, high atmospheric temperature, steam, or harmful chemical substances.

22.1.5. Before assembling and installing the electric equipment, it should control the position and stability level of the supports, the construction parts on that the equipment are installed.

During the assembling and installing the transformers it should make a short circuit for their output poles and an earthing protection for them.

22.1.6. If the electric equipment are assembled by means of cranes, the electricity supply for bare electric wires, electric lighting circuits and electric power lines should be cut and they should be fenced.

22.1.7. For electric signaling lamps that are used for controlling and indicating the simultaneous switching off and on of contacts of electric equipment as well as for electric portable lamps that are used for lighting inside the barrels, it should use the voltages not to exceed 12 volts.

22.1.8. In areas where is the centrifugal oil filtering machine and oil containing instruments as well as oil supplying equipment it should hung the board "Fire prohibited".

22.1.9. The assembling and installing mono-phase circuit breakers should be reliable and it should ensure a simultaneous contact of their switching gears.

22.1.10. For adjusting the circuit breakers it should get measures to prevent the sudden switching on of the driving gear of them by any reason, that could conduct to a sudden turning electric equipment on.

22.1.11. The fuse of fuse cut-out of the electric line to supply the assembling equipment with electricity should be disconnected from this fuse cut-out during the working time. It is only allowed to reconnect the fuse wire to electric line for adjusting the electric equipment when the people was in their safe positions.

22.1.12. Before switching on the electricity for testing the electric grids and equipment, it should stop all related works, at the same time, the people working inside the electric distribution room should leave dangerous areas.

22.1.13. Before tele-testing the driving gears to be powered by electric working current or by compressed air, it should hung the signboard "Electricity dangers" on these gears.

22.1.14. When the related works are carried out inside the commutator it should bolt the valve of the pipe conducting compressed air to driving gears and hung the board "Switching on prohibited".

22.1.15. The security valve of the compressed air collecting pot should be adjusted and tested with testing pressure to be higher than the allowable one of 10% downwards.

22.1.16. The providing electricity to testing the relay, automatic circuit breaker, and other instruments should be done according to the working order and guidance of responsible technician or team leader.

22.1.17. The uncovered part of electric distribution equipment should be shielded; if there is no paving slabs on the ditches where are installed the electric cables it should temporarily use the woody boards to cover them. It is prohibited to let the electric testing wires touch the electric power wires of the constructions.

22.2. Assembling and installing the electric power wires of the constructions.

22.2.1. When the oil, gasoline... are used for wiping the details of electric equipment, it should ensure a good ventilation, carry out the fire prevention and provide the protection instrument according to prevailing regulations.

22.2.2. Before measuring the electric resistance of electric rotating machines it should cut their electric current. It should assign at least two people to implement and control this work so that there is no voltage on these machines.

After ending the assembling them, it should make a short circuit for output clamps of wire of machines and an earthing for them.

22.2.3. For using the drying or heating method for controlling the state of electric rotating machines and transformers, it should use the non-inflammable insulating materials.

The electricity - powered fan to provide hot air for drying the transformers and electric rotating machines should be equipped with appliances specially made for preventing and avoiding electric sparks.

22.2.4. Before drying the electric machines and transformers by means of electric heating, it should protect the outer cover of machines and oil barrels by earthing them.

22.2.5. For drying the transformers by means of electric induction method, it should get measures to prevent the earth touching of wires. It should eradicate the possibility that the people could touch the inductive bobbins.

It is prohibited the uncovered fire for flashing light and seeing the thermometer.

22.2.6. It is allowed to repair the damage gears after cutting the electric current. It is prohibited to repair the gears of electric equipment being in operation.

22.3. Assembling and charging the batteries.

22.3.1. Workers who assemble and charge batteries should pass the professional training course and grasp thoroughly the related safety technique.

22.3.2. It is prohibited to carry out any work that could generate sparks in the battery room. In the battery room, it should use the electric lamps of voltages of 36 volts upwards and they should be enveloped with glass. Besides enveloping them with glass, they should be protected from break with steel net. Electric wires should be installed in metallic pipes and they should be permanently controlled and protected from short-circuits.

22.3.3. The battery room should be good ventilated; besides using the continuous ventilation for this room during the working process, it should again ventilate it before and after the working shift in a time span of at least 30 minutes.

22.3.4. In Areas where the acids and alkaline are maintained as well as in areas where are the bending and welding the leaded plates, it should not let food, drinking water and other food-stuffs be there.

22.3.5. In the room where the electrolytes are prepared, it should not carry out any work. In battery room, it should arrange the water taps and barrels. Barrels containing washing water and neutral solutions should be installed on supports and painted with special colors in order to distinguish easily the washing water used for neutralizing the acids that should not be used for other works and for drinking.

The support on that acid and alkaline batteries are installed should be installed on a rubber carpet. Workers should be adequately equipped with protection instruments according to prevailing labor protection regime.

22.3.6. The acid electrolytes should be diluted in pots specially made for this purpose; it is prohibited to dilute the acid solution in basins made of glass. Areas where are acids, electrolytes, alkaline should be neutralized and washed by boric acid solution if they are the alkaline solution.

It is prohibited to suck the electrolyte solution by mouth through a conducting pipette.

22.3.7. Rooms used for carrying out the works like: scraping sulfates from leaded plates and bending them should be good ventilated.

For scraping the sulfates from leaded plate, it should use the brush or rag. It is prohibited to scrape manually these leaded plates.

22.3.8. It is prohibited to lift, move, wedge, jack the supports as well as to change the buffer slabs installed under the acid and alkaline pots and barrels that are brimful with electrolyte.

22.3.9. For controlling the clamps of poles of batteries, it should wear the gloves made of rubber insulating materials.

During the tightening the nuts for connecting batteries each other, it should not let the tightening key touch different poles of the machine.

22.4. Assembling and installing the electric network.

22.4.1 The rectifying metallic wires by means of windlass and other instruments should be done at a particular area that is fenced in its surroundings and appropriately selected so that it is possible to ensure a safe distance between this area and the electricity transmission line as well as electric equipment being in operation.

22.4.2 It should not stand on the ladder, on stepladder in order to stretch horizontally the conducting wires sections of over 4 mm^2.

22.4.3 Appliances arranged on electric panels should be clearly marked that to which gear they belong.

22.4.4 It should not fasten together many fuse wires of small rated intensity instead of one fuse wire of great rated intensity. It is prohibited to assemble one or two fuse cut - out into three phase network.

22.4.5. Electric power lines and electric lighting line should be split.

22.4.6. All details of electric machines and equipment should be equally earthed if these details could be electrified when their insulation is damaged.

22.4.7. Before beginning the rotating the drum for pulling the underground cable, it should pull out the nails from the drum and press solidly the cable ends that jutted out the outside of this drum.

22.4.8. When the cable, drum and other instruments or tools are installed on the edges of the ditch, it should abide by the regulations defined by the part 12 of the present code.

At the area where are installed the drum and equipment to release the cables, it should get measures to prevent to land-slip of walls of the ditch.

22.4.9. During the releasing cables from the drum by means of windlass or machine, it should get a braking instrument for cable drum.

22.4.2.10. During the installing cables, it should not stand or keep manually the cable at turning points of the cable line.

22.4.11. For releasing the underground cable by means of windlass through pulley it should arrange an acoustic and lighting signaling system at cable well or cable room in different floors.

22.4.12. For assembling the cable joining boxes that are painted with ebonite mix, it should get measures to prevent the fire provoked by the burning of this mix.

Workers carrying this work should be carefully trained with safety technique to prevent and avoid baneful impacts these substances.

22.4.13. During the stopping the cable ends and cable funnels or during the using gasoline for washing the outer cover of cable in tight rooms, it should ensure a good ventilation and fire prevention for them.

22.4.14. The turning the welding burner on, the smelting bitumen and welding additives should be carried out in open air. She smelted bitumen and welding additives should be contained in tight boxes and transported to underground shelter by instrument specially made for these works.

22.4.15. The building overhead electricity transmission lines should abide by regulations defined by prevailing "Code for building the electric construction".

22.4.16. It should not anchor and tie the lifting equipment onto the electric poles or other similar works. The assembling and installing the equipment at areas sited next to electric lines being in electric voltage should abide by the regulation defined by the part 6 of the present Code.

22.4.17. For erecting the heavy and complicated poles by means of lifting and pulling instruments and equipment, it should use cables for adjusting their position. The erecting electric poles in complicated conditions or at areas sited between two electric lines being in operation should be installed under the supervision of responsible technician.

22.4.18. If the areas where the poles are erected is located next to the roadway, it should not let the lifting and anchoring cables obstruct the communication.

It is prohibited to slip down from insulator string onto ground or to sit down on insulators for working.

22.4.19. During the pulling or dismantling the cables, it should not let people or vehicles cross the area where is the assembling electric lines; at this area it should arrange the prohibiting boards.

In case that it has to ensure the normal communication, it should get the measures to ensure the safety there.

22.4.20 During the pulling of electric wires, it should not climb the poles sited at turning points of the electric line.

22.4.21. The using the lifting tower or mobile ladder should abide by the regulations defined by the part 8 of the present Code.

22.4.22. Before dismantling and assembling the overhead electricity transmission line it should cut off the electricity supply for them and use the mobile earthing gear to earth two ends and the middle of electricity transmission line so that the distance between these earthing gears is not over 3km; only when there is none staying at the pole top, it is allowed disconnect the mobile earthing gear from the line and this work should be installed under the supervision or the team leader to be responsible for assembling this electric line section.

22.4.23. The overhead electric line and the lifting cable should be installed at an altitude not to be smaller than 4,5m; and at areas where the vehicles cross, this altitude should not be smaller than 6m.

22.5. Working in the electric substation being in running.

22.5.1. It is only allowed to repair and assemble electric equipment in the electric substation being in running if there is working card and the electricity supplying was cut off at these equipment

22.5.2. For repairing and assembling the transformer in the substation, it should cut the electric current at lower voltage side in order to avoid the heat emissions from this transformer.

22.5.3. At the side where is the connection of the covered and uncovered distribution equipment with the earthing protection wire, it should use the clamp to press the mobile earthing wire into these distribution equipment.

For assembling the earthing wire, it should first connect this wire to earthing pole, then connect the earthing pole to outer cover of equipment that need to be earthed . For dismantling the earthing wire, the works are done in contrary order.

22.6. Taking over, putting into operation of electric substations.

22.6.1. Only after getting adequate dossiers, passports of equipment and procès-verbal to certify the adequate implementing the assembling technique as well as the satisfying requirements of safety technique, thus, the electric equipment could be put into testing.

The testing the electric substation with electric switching on should be installed under the supervision of responsible technician.

22.6.2. In first time to switch the electric equipment on at high voltage side, it should announce it to all related assembling and operating organizations.

22.6.3. Only after applying the normal operation regime for electric substation, it is allowed to carry out the last stage of electric adjusting works and these works are carried out before switching the electric substation on.

For testing the insulator and cable as well as for testing and adjusting the functioning of rectifying gears of the voltage transformer and the current transformer, it should abide by the regulations defined by prevailing code for operation technique and safety technique in using the electric equipment of enterprises.

22.6.4. Before testing with switching electric distribution equipment on, it should control the stale of the locks of doers, of shielding slabs, of signboards. of fire preventing and extinguishing appliances, of lighting, of communication and telephoning and of earthing protection.

22.6.5. For testing and switching electric equipment on inside the workshops being in running, it should erect the fence and signboard in surroundings of testing areas.

22.6.6. For testing the driving motor of the machine, it should get agreement of assembling organization, in presence of its representative.

22.6.7. For carrying out the adjusting new electric equipment for taking them over, it should get measures to ensure the safety for people. In order to observe the equipment, it should stand far from the gears to be stopped but to be electrified, at the same time it should erect the shielding slabs and signboards to indicate these areas.

23. WORKS OF DISMANTLING, REPAIRING, ENLARGING THE HOUSES AND CONSTRUCTIONS:

23.1. Before dismantling, repairing, enlarging any house or construction, it should adequately investigate and evaluate the state of their foundations, pillars, walls, beams, floors, ceilings and other building components.

Results of the investigation should be synthesized in proces-verbal that is the base for their technical design.

23.2. The houses and construction that are damaged and threaten by the sudden collapse, but it is not possible immediately repair them should be strengthened, propped, fenced and marked by signboards in order to prohibit people to work and to cross these dangerous areas.

23.3. Before dismantling them, it should:

Control and dismantle bombs and munitions at constructions that was bombarded;

Re-control the whole electric system and if the electric safety is ensured, it is possible to use it. In case that it is not possible to treat the damages, it should eradicate the old bombarded electric system and use the new one for the construction.

Carry out the measures to prop and support the constructions that could suddenly collapse during the dismantling the constructions or the components related to this construction;

Carry out measures to limit the vibrations provoked by cutting, pulling, dismantling the constructions;

23.4. The areas where is the dismantling constructions should be fenced and it should arrange there the signboard to prohibit people and vehicles to cross these areas; in the night it should arrange there the red signaling lamps.

2.3.5. For dismantling the constructions located within the areas of enterprises, the plants that are being in running, it should prepare measures to ensure the general safety.

23.6. For dismantling the constructions in the night or at dark areas, it should arrange an adequate lighting system there.

The electric wires should be hung onto particular poles, it should not hang them onto the constructions that are being dismantled.

23.7. It is prohibited to dismantle the constructions in following cases:

The wind speed is of class V upwards;

Dismantle simultaneously the constructions to be allocated at 2 or more floors in the same vertical direction. If there are people working under the area where is the dismantling and there is no measure to shield them and to ensure the safety for them;

23.8. For dismantling the construction at high altitudes, the dangerous areas sited under this dismantled construction should be fenced and it should arrange a prohibiting signboard there;

23.9. During the dismantling process it should prepare measures to prevent the threat of sudden collapse of the construction component. When the construction is cut into small parts, it should get measures to prevent the sudden collapse of remained construction components, at the same time it should get measures to prevent and avoid the fall of construction components that was cut and split.

23.10 For dismantling the verandah or high and dangerous construction components, it should erect the scaffold. In case that it is necessary to stand on other construction components for dismantling the high and dangerous construction components, it should get measures to ensure the general safety.

23.11. For dismantling the cylindrical vault, it should carry out this work by "top down" method. For dismantling the spherical vault or fan vaulting, it should destroy band for band of a length not to exceed 0,5m along the circle by means of "top down" method.

23.12. For dismantling the vault, it should erect the supports and the vault propping system according to regulations defined by the part 8 of the present code.

23.13 For dismantling the vault of boilers, it should stand on the scaffold. It is prohibited to stand on boiler vault for dismantling it. During the dismantling the boiler vault, it should spray water against dust.

23.14. For dismantling the chimney, brick made pillars as well as large pieces of walls of over 1,5 m high that was seriously damaged, it should not use hand-held instruments (crowbar, hammer...) for chiseling and destroying; it should use the appropriate equipment and special measures for these works.

It is prohibited to pulling the wall for destroying it on the floor.

It is prohibited to destroy the chimney, brick-built wall by means of chiseling their foots.

23.15. For dismantling the constructions by means of mechanized instruments, it should prohibit people to enter the way of machines and to go along two sides of pulling cables.

Machines or equipment to be used for dismantling the constructions should be installed outside the fields that are threaten by the collapse of these dismantled constructions.

If the machine or equipment are used for pulling and destroying the construction, they should be installed far from this construction with a distance to be at least equal to 1,5 time of the height of the construction.

23.16. For destroying the construction by means of mining method, it should get concrete design for it and it should abide by regulations defined by the prevailing "Code for safety technique of maintaining, transporting and using the explosive materials".

23.17. For treating the damaged construction components, especially the high and dangerous ones, it should create the measures to ensure the safety for implementing this work and it should provide the workers with necessary labor protection instruments.

23.18. For repairing the construction, components or gears on the floor, it should pave or fence the areas where are gaps at this floor; it should erect the rails between these gaps.

23.19. In order to repair the pipes conducting compressed air, gas, steam... that are being in operating, it should get the agreement of the organizations to mange these equipment. Before repairing them, it should control the airtight level, the watertight level and the steam-tight level of the valve system and it should strictly manage this valve system during the repairing process.

23.20. For implementing the repairing works at areas to be sited under the vault, this vault should be paved with framing slabs and appropriate propping system. The repairing area should be fenced and people are prohibited to cross there.

23.21. For repairing the furnace that is being in operation, it is absolutely necessary to erect the provisional separating wall for avoiding the heat radiation and toxic gas emissions.

23.22. Before heightening the supplementary constructions, the weight of added building components, gear, construction parts can increase the total weight of the whole construction, therefore, it should control all related construction components.

If necessary, it should carry out the appropriate strengthening them in order to ensure the general safety.