

**ANHUI YELLOW MOUNTAIN NEW
COUNTRYSIDE DEMONSTRATION
PROJECT**

Environmental Codes of Practice

(For Appraisal)

Huangshan New Countryside Project Management Office

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1 General

1.1 Project Overview

The construction sites of the Project are distributed in 68 villages in the three districts and four counties of Huangshan City, among which, 3 villages are in Tunxi District, 8 villages are in Huizhou District, 12 villages are in Huangshan District, 20 villages are in Shexian County, 7 villages are in Xiuning County, 6 villages are in Yixian County, 12 villages are in Qimen County.

The construction contents include: rural roads, rural water supply and drainage engineering, small water conservancy facilities, tourism facilities and other infrastructure construction projects; Cultural heritage protection and utilization of project; Characteristic industrial construction projects and capacity building projects.

Total planned investment of this project is estimated at RMB 1018.7637 million yuan. Project period is 5 years

1.2 Purpose of General Environmental Codes of Practice

As the appendix of the environmental management plan, the General Environmental Codes of Practice is aimed to provide a set of general, detailed, technically feasible, financially sustainable and operable environmental countermeasures against the unavoidable potential adverse environmental impact in Huangshan new rural demonstration project, so as to eliminate or make up the adverse impact of the project construction on the environment and society and reduce the impact to an acceptable level as far as possible. This paper will be submitted to the bid-winning project design unit together with the environmental management plan as an important basis for the project design, meanwhile, it will be provided to the project construction unit as the behavior guideline for environmental management during construction, which can effectively guarantee the smooth implementation of environmental mitigation measures proposed.

1.3 Activities subject to the ECOP

All the construction activities under the project are subject to the ECOP.

2 General Requirements for the Environmental Codes of Practice

In the process of project construction, the project contractor will play a key role in environmental management, pollution control and implementation of prevention control measures. In order to implement the Environmental Codes of Practice (ECOP), the contents listed in this chapter are applicable for the general requirements of main institutions in the process of project construction to urge the construction unit to implement various environmental protection measures under the coordination and supervision management of various management institutions.

2.1 Implementation of environmental measures in the process of bid preparation and construction drawing design

When the project enters the implementation stage, relevant purchase activities will be carried out according to the purchase guideline of the WB.

2.1.1 Environmental protection requirements for bid preparation

Project offices of each district and county participating in the project shall require the bid preparation institutions and construction design organization to include the mitigation measures proposed against the potential adverse impact in the technical specifications of bidding document and the construction design of each stage under the coordination, guidance and supervision of WB Financed Huangshan New Rural Construction Project Office. In the bid invitation document, the bid inviter is required to make commitments to the following environmental management requirements in the bidding document and include them into the civil construction contract.

(1) The construction design organization shall propose mitigation measures against the potential adverse environmental impact in each stage of construction design. In the feasibility research stage, it is required to make analysis and evaluation on the environmental impact and prepare the environmental codes of practice; in the preliminary design stage, it is required to implement the environmental protection measures proposed in the environmental impact assessment document and Environmental Codes of Practice and in the construction design stage, it is required to

make design of environmental protection works according to the opinions audited in the preliminary design.

(2) The contractor of each subdivisional work is required to allocate 1 site environment engineer on each construction site to be responsible for the implementation of environmental protection measures in the whole construction period, ensure its works construction activities and construction activities of the subcontractor (if any) meet various requirements of the procedure and ensure that necessary environmental protection measures are taken in the process of construction.

(3) After signing the contract and prior to commencement, the civil engineering contractor must include “on-site environmental management plan” in its construction scheme.

(4) The civil engineering contractor must comply with relevant local regulations on safe and civilized construction.

(5) The civil engineering constructor and construction supervision organization must receive trainings on environmental protection and management.

(6) The civil engineering contractor shall reserve the deposit in environmental management according to the budget of every year in the project contract fund and its proportion shall account for about 3% of the budget fund.

2.1.2 Environmental protection requirements for construction drawing design

According to the general requirements of the ECOP, priority shall be given to the following key points of design in each stage of the design:

(1) For the temporary land occupation of the works (construction production area, construction camp and construction service road, etc.), it is required to fully consider the avoiding of sensitive points in the line and site selection in construction drawing design to reduce the influence of temporary land occupation on the surrounding residential areas, minimize cultivated land occupation and reduce destruction to the existing landscape vegetation.

(2) In earthwork and stonework design, it is required to optimize balance between earthwork and stonework and ensure the balance between excavation and filling as far as possible.

(3) In the process of establishing construction scheme, it is required to arrange the construction period reasonably according to the climate characteristics of the project location, do the flood prevention and drainage work well in rainy season, avoid construction inside river course in flood season and meanwhile take measures to prevent and control the erosion of rainwater washing to the bare subgrade after excavation and filling.

(4) In the construction of water-involved structures and buildings, structures such as bridge and protection bank shall meet the demands for flood discharge and drainage; for the construction wastewater, it is required to design collection treatment measures, which cannot influence the water body quality.

(5) In road design, it is required to consider the characteristics of local climate and rainy season, plan and arrange the construction of road passing channel in advance, strengthen subgrade water interception and drainage measures, set the water diversion such as side ditch and drainage channel to improve water and soil conservation function. According to the specific characteristics of the project and actual condition of the surrounding natural environment, ensure adjusting measures according to the local conditions, protection priority and taking into account of production.

(6) In land acquisition and resettlement, it is required to propose considerable and detailed plan for land acquisition and relocation of migrating residents after the design scheme is determined and negotiated with the local masses in advance according to the resettlement plan to ensure harmonious resettlement and compensation through negotiation.

(7) In construction organization, it is required to emphasize the protection of project to the surrounding sensitive targets such as surrounding residents, in the process of design, it is required to propose feasible pollution prevention and control measures to reduce interference to the sensitive targets.

2.2 Preparation before commencement

After bid awarding and before commencement of the civil engineering, under the coordination, guidance and supervision of WB Financed Huangshan New Rural Construction Project Office, project offices of each district and county shall provide the test of environmental codes of practice to the civil engineering contractor, determine the engineering supervision institution and require it to allocate

environmental supervision personnel.

After completion of bid invitation and bidding and signing contract with the civil engineering contractor, the contractor shall conduct a survey to the construction site prior to project commencement for the purpose of identifying the environmental limit factors of the project area. Before construction of civil engineering, it is required to make and fill in construction site inspection list and inspect the sensitivity of various environmental factors on the construction site as the important basis for environmental protection in the future civil engineering.

The purpose of construction site inspection list is to identify relevant environmental safety problems, identify and screen the sensitive environmental problems that need special protection. See Appendix 2 of the environmental codes of practice for the contents to be included.

According to the inspection of construction site, the civil engineering contractor shall prepare *On-site Environmental Management Plan*, which shall implement the requirements of the environmental codes of practice and get the permission of project supervision organization.

2.3 Environment management in the construction period

During construction of civil works, the civil works construction contractor shall be under the supervision of project supervision organization authorized by corresponding project office of each district and county.

The civil works contractor shall implement various environmental protection measures according to the requirement of environmental management in the contract agreement and *On-site Environmental Management Plan* approved by the project supervisor. The project supervision organization shall conduct direct full environmental supervision on the implementation of the environmental protection measures of contractor, meanwhile, the external environmental management supervision shall be implemented by local competent environmental protection administrative department in the project location and its environmental monitoring organization and the public related to the project.

During the whole construction period, the civil works contractor shall actively coordinate with the project supervision organization to perform its duties.

The construction unit shall closely cooperate with the local government department and other departments to ensure full compliance with the requirement of Chinese policies and regulations. The specific environment protection measures shall refer to Chapter 4.

2.4 Rectification measures not compliant with the requirements of ECOP

The civil works contractor and its subcontractor (if any) shall comply with the requirement of ECOP and in case of any pollution accident (event) due to noncompliance with the environmental protection measures stated in ECOP,

(1) The civil works contractor shall take measures immediately, launch the emergency plan for environmental pollution accident, eliminate the pollution source and manage the environmental pollution occurred.

(2) The civil works contractor shall inform the project supervision organization and project management organization immediately and the project supervision organization and project office in each district shall assist and guide the construction unit to take remedial actions to reduce or eliminate the environmental impact and report to local competent environmental protection administrative department (or local environment monitoring department) within 24 hours for inspection and guidance to minimize the impact.

(3) The civil works contractor shall record the implementation conditions of pollution control measures, put forward rectification measures and submit it to the project supervision organization and project office in each district for recording. The project office in each district shall report the implementation conditions of remedial measures to the World Bank Financed Huangshan New Rural Construction Project Office.

(4) The civil works contractor shall deeply analyze the cause of environmental pollution, prepare precaution measures and perfect the construction design scheme to avoid occurrence of same accident. The precaution measures shall be approved by the project supervision organization and office in each district and recorded.

(5) The project office in each district shall deal with and punish the civil works contractor according to the provision in the contract agreement and the property, scope and degree of influence of pollution incident as well as the implementation

condition of rectification measures of civil works contractor and report the disposal condition to local competent environmental protection administrative department.

3 The Environmental Codes of Practice during Preparation of Construction Site

3.1 Main construction site types and impact

(1) Main site types

The scope of works construction site includes construction area of main works, construction production area, construction camp and construction service road and relevant construction stockyard.

- a. Construction area of main works: including the land within the red line of road land.
- b. Construction production area: generally including concrete mixing station plant, lime soil mixing station, prefabrication yard and production material storage area.
- c. Construction camp: temporary residential place for the centralized life of worker required by the works construction.
- d. Construction service road: temporary roads to be built for convenience of construction.
- e. Construction stockyard: generally including sand & stone stockyard, borrowing area and waste slag ground etc.

The construction site preparation is mainly to go through the formalities including early land requisition and demolishing, where the construction area of main works is permanent land occupation area and the construction production area, construction camp, construction service road and construction stockyard are generally temporary land occupation.

(2) Main environmental impact

Either permanent land occupation or temporary land occupation will bring the following environmental impact and social impact:

- a. Changing the land utilization mode;
- b. Damaging aboveground vegetation; ;

- c. Aggravating a series of environmental problems including water and soil loss;
- d. Causing adverse impacts on the lives of residents under land requisition and demolition.

3.2 Environmental codes of practice on main construction sites

Consequently, to save land resource and avoid environmental impact due to unnecessary land occupation, the following environmental protection measures shall be taken in the construction site preparation period before construction:

(1) Land occupation formalities

To confirm the scope of works permanent land occupation and temporary land occupation (construction production area, construction camp and construction service road) and go through the formalities related to project land.

Before commencement, the construction supervisor and town-level project organization shall conduct strict inspection of the temporary facilities land occupation planning to ensure that less occupy farmland (especially paddy field) and forest land.

Where the construction site requisition of main works of the project involves demolition, the demolition scheme in the migration settlement plan shall be strictly implemented, the production and living problem of affected resident in the future shall be solved and the reasonable compensation shall be made.

(2) Construction production area

The construction production area mainly includes concrete mixing station, lime soil mixing station and prefabrication yard which shall be settled concentratedly. It is required to first investigate whether there is only municipal concrete mixing station around the project and the concrete shall be selected the commercial concrete preferentially; in case it is hard to operate, the construction production area shall be selected according to the requirements in Table 3-1,

Table 3-1 Requirements for selection of construction production area

Shall not select	Shall select
<ul style="list-style-type: none"> • Land in the upwind direction of sensitive points including residence and school • Land within 200 m in the downwind direction of sensitive points including residence and school • Basic farmland • House site • Forest land • Land within 200 m of the land area of river course • Land within 1000 m at the upstream and within 200 m at the downstream of intake of drinking water source as well as within the protection area of drinking water source • Depression or paddy field • Land with good vegetation cover • Special-purpose land 	<ul style="list-style-type: none"> • Land within the scope of road permanent land occupation • Wasteland • Abandoned land • Block with a relatively high topography • Other inferior land

(3) Construction camp

The construction camp shall preferentially use the existing houses and infrastructures to reduce the impact of construction camp on water and soil conservation and environment; in case it is hard to operate, the construction camp shall be selected according to the requirements in Table 3-1,

Table 3-2 Requirement for selection of construction camp site

Shall not select	Shall select
<ul style="list-style-type: none"> • Land near the residence • Basic farmland • House site • Land within 200 m of the land area of river course • Land within 1000 m at the upstream and within 200m at the downstream of intake of drinking water source as well as within the protection area of drinking water source • Depression or paddy field •Collapsing and landslide hazard area •Susceptible area of debris flow • Special-purpose land 	<ul style="list-style-type: none"> • Wasteland • Abandoned land • Block with a relatively high topography • Other inferior land

(4) Construction service road

The construction road shall use the existing road as far as possible and shall be far

away from the environmental sensitive points including resident, school and hospital.

During the construction of construction service road, the hardening treatment shall be conducted according to its purpose and the site hardening treatment shall be conducted also according to its purpose. For example, the road for overload vehicles can adopt recyclable load-bearing bricks (members) for processing and the general road can be laid with recyclable osmotic bricks. Also the section producing dust shall conduct dust suppression by watering.

(5) Construction stockyard

Quarry: the works construction related to the project is of small scale and it is not suitable to set a quarry independently. According to site survey, the sand & stone resource around the project is abundant and the stone required by construction can be purchased in the local area, so no quarry is set.

Borrowing area: partial projects may need a large number of earthworks. During the construction site preparation, the earthwork resources around the project shall be investigated and the spoil of urban construction project shall be used as far as possible to avoid build a new borrowing area; in case it is hard to implement, the site selection principle in Table 3-3 shall be met.

Table 3-3 Requirement for selection of borrowing area

Shall not select	Shall select
<ul style="list-style-type: none"> • Basic farmland or other farmland, paddy field and economic crop land • House site • Land with good vegetation cover • Land within 200m of the land area of river course • Depression or paddy field • Collapsing and landslide hazard area • Susceptible area of debris flow • Special-purpose land 	<ul style="list-style-type: none"> • Wasteland • Abandoned land • Other inferior land

Waste slag ground: there may be certain construction waste slag during the construction of partial works, mainly including the excavation spoil, abandoned road material, barren rock and sludge during site clearance. During the construction site preparation, the waste slag ground shall be selected reasonably according to the calculation results of balance of earthwork and stonework during design stage and the recyclable area or area for borrowing area vegetation recovery in the region shall be

selected preferentially; in case it is hard to operate, the site selection of waste slag ground shall meet the requirement in table 3-4.

(6) Others

The reconstruction road shall investigate the existing pipeline to avoid any damage to the existing pipeline due to construction.

The construction organization shall negotiate with the project organization of town to determine the appropriate public water source and the municipal running water or existing drinking water source around the village shall be adopted rather than well digging.

Table 3-4 Requirements for selection of waste slag ground

Shall not select	Shall select
<ul style="list-style-type: none"> • Basic farmland or other farmland, paddy field and economic crop land • House site • Forest land • Land within 200m of the land area of river course • Depression or paddy field • Land with good vegetation cover • Collapsing and landslide hazard area • Susceptible area of debris flow • Special-purpose land 	<ul style="list-style-type: none"> • Wasteland • Abandoned land • Other inferior land • Col or low-lying area

4 The Environmental Codes of Practice during Construction

4.1 Construction area of main works

4.1.1 Ecological environment of land

(1) Before carrying out the construction, the construction organization shall determine the scope of the related operating area of the construction and divide the construction boundary; in the work contract, the contractor shall be required to carry out construction strictly within the scope of the expropriated land and reduce damage to soil and vegetation around the operating area as possible.

(2) Because morning, dusk and night are peak periods for the activity of wild animals, when the construction is carried out near the forested, the construction time shall be optimized to avoid the peak period for the activity of wild animals as far as possible; if there is any wild animal accidentally injured in the construction period, shall immediately contact with the local forestry authorities to seek help from the professionals; strictly prohibit hunting wild animals, especially key protected wild animals at provincial level, such as Bufo raddei, Bufo gargarizans and turtle etc.

(3) Bridges and culverts artificially built are similar to passageways for animals, however it takes years for wild animals to accommodate, therefore, in construction, pay attention to protect the natural vegetation under the bridge and reduce the trace of human activity to let weeds and shrubs recover as soon as possible to form a natural landscape consistent with what they looked originally so that wild animals can adapt to it as soon as possible.

(4) Obvious nameplate to protect the ancient trees distributed in Lixi Village, Luxi Village, Huansha Village, Zhangtan Village, etc within the project area shall be set before carrying out the construction to remind constructors pay attention to their protection; meanwhile, rails shall be installed around the trees to strengthen the protection and the distance between the rails and the trunk shall be no less than 3 m to ensure that protective plants and ancient trees are unaffected by the construction.

(5) Excavation construction works shall avoid rainy season to the greatest extent. For

the cultivated land temporarily occupied for all kinds of construction, before carrying out the construction, strip the surface soil in the plowing layer for centralized collection then scarify and flatten the compacted land after the construction is completed. The surface soil collected before carrying out the construction will be used for land improvement and second plowing. Meanwhile, conservation of water and soil shall be properly handled and the irrigation system shall be improved; the temporarily occupied land which is difficult to recover to cultivated land shall be converted into vegetation greening or recover to land for other uses.

(6) Establish a supervisory organization for environmental protection and appoint full-time staff for environmental protection; strengthen construction management and publicity for environmental protection to remind the public to preserve the ecological environment and strictly prohibit construction personnel from wanton felling of trees.

(7) The peripheral greening shall be carried out with trees, shrubs and grass in a certain proportion to remain a certain hierarchical structure. Indigenous species shall be the first choice and reduce the introduction of alien species. After covering soil in the pipeline works, a hardening treatment shall be carried out for those within the area of cities and towns and those located in the field shall be afforested timely. And the key area shall be enclosed by wire entanglement to be managed and protected timely so as to prevent damage from trampling of cattle and sheep or human factors.

4.1.2 Waters ecological environment

(1) Reasonably arrange the operating time. Because morning, dusk and night are peak periods for the activity, breeding and foraging of wild animals, when the construction is carried out on river rapids and wet land, the construction time shall be optimized to avoid the peak period for the activity of wild animals as far as possible.

(2) Protect the wild animals living on river rapids. Do a good job for the publicity of environmental protection during the construction. Strictly prohibit any injury to the key protected animals at provincial level, such as *Bufo raddei*, *Bufo gargarizans* and turtle during the construction period; if there is any wild animal accidentally injured, immediately contact with the local forestry authorities to seek help from the professionals.

(3) Strictly control the occupation of river rapids and prohibit establishing construction camp and storage yard of construction materials on the river rapids.

(4) Give priority to the greening of dike and slope protection after the implementation of dike strengthening and bank protection work. It shall be reasonably combined with cement concrete and stone masonry. The greening of the slope protection shall join with the green belt on shore to form an ecological corridor.

4.1.3 Surface water

(1) Water-related operations such as river course dredging, filling of retaining dam, revetment improvement and pier construction, etc are recommended to be carried out in dry season and the construction time shall be cut short to the greatest extent. Strictly carry out the environmental supervision during the construction to reduce disturbance to the water.

(2) Sludge and muck excavated from river course improvement and foundation construction of the bridge shall not be discarded into the river arbitrarily so as to avoid pollution to the water quality of the river. Setting for mud generated by bridge construction and drilling and then discharged for mud settling sump shall be taken after sedimentation treatment.

(3) The construction of water-related project shall avoid rainy season and carry out a strict casual inspection on construction machinery to prevent oil leaking during the construction period. Earnestly carry out maintenance of equipment to reduce and timely remove abnormal operational states to prevent accidental release. Collect residual oil for centralized collection and disposal and residual oil shall be strictly prohibited from discharging in the water or remaining on water bed.

(4) A temporary settling pond shall be set for subgrade excavation works and a geotechnical cloth fence shall be set at the side outlet of the settling pond to block sediments. When subgrade and draining culvert are paved, bulldoze the settling pond.

(5) The domestic wastewater from construction personnel shall be used for farm irrigation or greening of mountain forest after it has reached the standard rather than discharge randomly. It is recommended to borrow the existing domestic installation from the local villagers.

(6) Inspect the pipeline engineering at a regular basis so as to promptly detect and dispose any leakage in the pipeline and thus avoid any possible ground water pollution resulted from the leakage of sewage pipe network.

(7) The storage yard for building materials shall be prohibited from setting within the highest water level of the river course. The ordinary building materials temporarily piled up on the beach for the need of construction shall be placed far away from the water and covered up and a rail may be set in necessity; construction wastewater from construction site such as mixing unit, precast yard and stock yard (rinsed wastewater for aggregate and wastewater from washing mechanical equipment, etc) shall pass a primary treatment through a grid chamber rather than directly discharge into surface water body or fishpond.

(8) During bridge foundation construction, mud pit shall be excavated near the bridge pier manually, excavated earth shall be piled up within requisition land area under bridge, it shall be covered with colorful bar waterproof cloth in construction period, its foot shall be pressed with bagged earth; during construction, precipitated mud shall be transported to appointed slag yard, and the mud shall be backfilled and leveled after completion of works.

(9) The natural vegetation under the bridge shall be protected in construction and human activities shall be reduced to restore the grass and bush as soon as possible, so that becoming same to original natural landscape and convenient for the adaption of wild animals.

(10) The construction period shall be properly arranged for bridge construction, cofferdam connection work shall be conducted at dry season and conduct bridge foundation under water construction, project environment supervision shall be conducted strictly at same time. during bridge construction, when supervising water body, special attention shall be paid to the change of water quality of cross river, construction shall be stopped once it exceed the specified requirement of state, until the reason for increase of suspended matter concentration is found, if it increased by bridge construction, effective measures shall be taken.

(11) The construction machinery for crossing bridge shall be checked irregularly to prevent leaking oil materials. The residual oil shall be collected and stored and treated, the residual oil is prohibited to be thrown into river or left on river bank.

4.1.4 Air pollution

(1) Strengthen construction management and advocate civilized construction, centralized construction and rapid construction.

Select and use construction machinery and vehicles with low energy consumption and low pollution emission to the greatest extent and exhaust purifiers shall be installed on vehicles with exhaust emission out of limits. Strengthen management and maintenance on machinery and vehicles to reduce air pollution caused by bad condition of machinery and vehicles.

(2) Closed-type vehicles and measures for wind protection and covering shall be adopted in the whole process, including handling, use, transportation and temporary storage of materials laden in bulk that can be easily scatter, such as cement, sand and lime to reduce raising dust.

(3) Frequently watering the construction service road and road to the storage yard to reduce raising dust; the temporary asphalt mixing station shall be installed within the scope of permanent land occupation as far as possible and it shall be located more than 300 m away from the residential area at the downwind direction. The mixing plant in totally enclosed type shall be adopted and its installation shall be carried out on a windy day to disperse the smoke of asphalt as quickly as possible so as to reduce air pollution to the largest extent.

(4) The mud-dumping area is recommended to be located more than 100 m away from the environment-sensitive target such as the residential area at the downwind direction to reduce the influence of stink; the mud-cleaning engineering shall be carried out in dry season and winter is the best time to reduce the influence of stink to the residents around; backfill and transportation of bottom mud and earthwork and any construction which may produce flowing dust pollution shall not be carried out in days with the wind scale exceeding level 4.

(5) Do a good job in the labor protection of construction personnel by wearing dusk mask and the like.

4.1.5 Construction noise

(1) Adopt low-noise machinery to the greatest extent; operate the mechanical equipment according to the rules and during the disassembling of dam-board and holders, the operation regulations shall be followed to reduce noise of impact in loading and unloading of materials; for fixed mechanical equipment and earth cutting and earth moving machineries, such as a bulldozer, the noise can be reduced by an exhaust muffler and segregating the vibrating components of the engine; repair and

maintain the construction mechanical equipment on a regular basis.

(2) Work out a scientific construction plan and reasonably arrange construction time; avoid the use of lots of equipment with strong noise at the same time as far as possible; the construction machinery with strong noise shall be strictly prohibited from using around the sound-sensitive spot along the line at night (22:00—6:00). The reshipment of cast-in-place concrete and large-scale materials shall be reduced at night; while in exceptional cases such as filling construction of water retaining dam that require a continuous operation, noise reduction measures shall be adopted as far as possible and at the same time inform the residents around of the specific construction time and site and report to the environmental protection agency for the record before carrying out construction.

(3) When the construction is carried out in the road section where a school is located, the construction organization shall consult with the school authority to arrange the construction with strong noise in weekend or after school at the same time, pick up the speed to shorten construction period and reduce the time of influence.

(4) When the operation with strong noise lasts for a long time, a mobile sound barrier shall be set for the sound-sensitive spots to reduce the influence from the construction noise.

(5) Equipments with strong noise such as electric saw, electric planer, agitator, fixed concrete pump and large-scale air compressor shall be set up with closed shed and be as far as possible from the residential area in order to reduce the noise pollution.

(6) While transporting the construction goods and materials on existing road, choose proper transport route and try to transport them in the daytime.

(7) The development organization and the construction organization shall consult with the surrounding residents, issue the construction duration and inform the units and residents that are prone to be disturbed before the construction and report to them the construction progress and also the measures adopted to reduce the noise during the construction at any time. Besides, complaints hotline shall be set during the construction period to receive the complaints from the disturbed residents and actively handle their complaints.

(8) During bridge construction, the pile foundation construction will produce high noise and will disturb residents near the sensitive spot, so, such high noise

construction as pile foundation works at night shall be prohibited and noise-reduction measures shall be taken for it, in order to not affect the life and rest of residents adjacent to sensitive spot

4.1.6 Solid wastes

(1) The garbage clearance of various building operations must adopt a closed exclusive garbage channel or closed swing container; throwing on the air is forbidden.

(2) The refuse shall receive reduced, recycling and harmless disposal. The deserted gravels, building materials, steels and packing materials in the construction shall be recycled by specially-assigned personnel, and the working face shall be cleaned timely without collapsing to the channel. The road construction, supporting facilities construction and town and village construction in this project can be combined to level up the homestead and the waste slag can also be made use of.

(3) Closed garbage storage area shall be set on the construction site with the construction garbage and domestic garbage being placed separately.

(4) The domestic garbage caused by the construction shall be classified, centralized and collected, and then transported and dealt with by the sanitation department.

4.2 Construction production area

Construction production area mainly contains concrete mixing station, plaster mixing station, precast yard and material placing yard. Main environmental influences include loose mound, construction waste, gravel and muck produced during cleaning the earth surface. Improper handling will cause flying dust and solid waste pollution as well as water and soil loss. Various flying dust, construction waste water and noise caused by construction equipments during the construction production.

(1) Set clear boundary for temporary ground to control unreasonable occupancy of ground outside the temporary ground. Material placing yard, construction camp, etc can be arranged in the permanently requisitioned land under the bridge. After construction ends, level the construction site under the bridge and sow Bermuda grass seeds in time to prevent soil erosion. If the occupancy of land for agricultural and forestry production is unavoidable, avoid influence on ecologically sensitive place (area) at least. There shall be good drainage system around. Set separation fence and settling pond;

(2) Preserve the stripped and excavated soil. Arrange special storing and preserving field before soil recycle.

(3) Mixing site (precast yard) shall be equipped with dust control unit; decrease the falling height to the greatest extent during loading and unloading gravel. Construction personnel shall have dust mask. Sprinkle water on the construction ground of mixing station and construction road to keep the ground surface wet for reducing flying dust; the concrete mixing machine shall be equipped with dust guard and a road of a minimum length of 50 m and a minimum thickness of 0.2 m shall be paved under the discharge opening for convenient transportation and clean site; in windy days (or before heavy wind's coming), cover the material to reduce flying dust.

(4) Cement, lime and mineral powder shall be stored in designated place and shall be sealed to control flying dust; apply hardening treatment to the storing ground, strip and preserve the mellow soil on the ground surface before hardening treatment and be stored centrally. The material warehouse and temporary stock dump shall prevent the materials from leaking and causing pollution. Drainage ditch system is required around the warehouse so as to prevent soak and material loss. Asphalt, oil-bearing materials, chemicals etc. shall not be stored next to the civil wells or rivers and lakes, and measures are required to prevent them from entering the water body due to rain wash.

(5) Because the suspended solids content of wastewater used for washing sandstone is large, the multistage settling pond and necessary drainage ditch shall be set, and the SS and PH of water quality of settling pond shall be in accordance with the requirements of *Integrated Wastewater Discharge Standard*. Part of wastewater after defecation can be used to spray water on the construction site for dust suppression. The inlet and outlet of the construction site shall set facility of cleaning vehicles, the vehicles leaving the site shall be cleared, and the concrete, asphalt or broken brick hardcore shall be laid on the road between cleaning equipment and export of site without sand leaving the site. The mixer truck shall be cleaned at fixed point, set temporary settling pond to treat the cleaning water for discharge, and try to employ wastewater recycling treatment and cyclic utilization as far as possible.

(6) Noise discharged from the mixing site and precast yard shall be in accordance with the discharge standard of construction field. When it fails to reach the specified value, adjust the operation time or install a sound-proof wall. Strong light exposure

will interfere with the life rhythms of vegetations and animals during construction at night; if there are protected animals nearby, it is required to shorten the construction time at night, and if necessary, the retaining facility higher than the light source shall be set around the construction area; it is also required to avoid the strong light shines the residential areas and affect rest of the residents.

(7) It is required to timely clear and transport the waste on the site after the construction ends, and burning waste on the construction site is not allowed. In principle, the hardening surface of the site (station) shall be demolished and be restored according to the conditions before use. It also can be restored in accordance with the requirements of the government and timely handed over to the local government after restoration ends.

4.3 Construction camp

The construction camp includes living quarters and working sections, and the main environmental requirements for the construction include:

(1) Reasonable arrangement of construction camp

Plan arrangement design shall be made for a new construction camp which shall be equipped with necessary garbage collection and storage facility, independent toilet, kitchen and dining room. The living room area shall be separated from above facilities and an oil separator shall be set for catering wastewater. In order to be convenient for recover, the newly established construction camp shall employ assembly type mobile houses and build walls to separate from the outside. If the construction camp is got by renting existing houses, it is required to coordinate with surrounding residents, inform them of use and lease time of the construction camp, ensure flat road, and avoid the vehicle noise and flying dust from disturbing the residents. Bulletin board of the construction camp shall be set so as to develop popular science propaganda on environmental protection and epidemic prevention. Regular disinfection (2 months) is required for the toilet, garbage collection and storage facility, living rooms, kitchen and dining room in the construction camp. The public toilet shall be in accordance with the requirement of Health Standard for the Design of Industrial Enterprises issued by the Ministry of Health and State Labor Bureau, and shall be of tap water and illuminating system. The contractor and construction management unit shall arrange a special person to publicize the prevention and treatment knowledge of

enteric infectious disease as dysentery and typhoid fever and vaccination knowledge of planned immunity by use of lecture, blackboard newspaper etc., improving the health knowledge level and health protection awareness, and reducing the morbidity for construction personnel. Health quarantine is required before the construction personnel enter the site, the carrier and patient of infectious disease shall not enter the construction area, preventing cross-infection and prevalence between the local residents and construction personnel. 2 spot checks of 10% construction personnel are required during construction.

(2) Proper collection, storage and treatment of household garbage

The household garbage shall be classified for storage and each construction camp shall set garbage can and temporary dumps. The specially-assigned person shall be responsible for clearing and treating garbage. Hardening treatment is required for the surface where the garbage can is placed which shall be far away from the river, fishpond and ditch, and have no direct channel collecting with surrounding land. The domestic sewage shall not be charged to the garbage point. Contact with the local sanitation department, and regularly transport the household garbage to the landfill nearby for sanitary landfill. Waste battery belongs to hazardous waste which shall be properly stored and not be thrown away at will, especially in the drinking water body and water well. Hand it over to the qualified unit for recovery treatment.

(3) Construction of temporary sewage treatment facility

Temporary sewage treating pond with proper capacity shall be built properly on the construction camp where the septic tank or other systems shall be built, which shall be managed until the end of contract. It is advised to employ the integrated FRP septic tank for large construction camp with over 100 people. Sewage and car wash water on the construction camp shall not be discharged into I-type and II-type water areas; when discharged into other water areas, it is required to be in accordance with the requirement of corresponding Comprehensive Sewage Discharge Standard (GB8978-1996). Special cleaning place and repair shop of machinery and vehicles shall be set for cleaning and repair.

(4) The construction noise shall be in accordance with the requirement of Noise Limits for Construction Site (GB12523-90). The diesel generator shall be placed indoor. Enhance sound insulation for doors and windows, and install silencer at air

intake and air outlet. Such as combined construction of living area and production area, sound insulation, noise elimination and vibration attenuation measures for air compressor and fan in the production area.

(5) Set exhaustion system in the kitchen, install smoke purifier to eliminate lampblack which shall be discharged in the height higher than surrounding buildings; the smoke purifier shall be installed in the interior. It is required to strengthen the supervision and management of dietetic hygiene aiming at the feature of having meals on the site for the construction personnel during operation, preventing poisoning accident. The workers engaged in the catering industry shall have the health cards. The domestic water shall be in accordance with the National Management Method of Health Supervision for Domestic Drinking Water and Health Standard of Domestic Drinking Water. Detect the water intake well and set a supply center of boiling water in the construction site.

(6) Restoration after construction: after completion of construction, scarify and level the compacted land for the newly established construction camp outside the scope of land occupation of engineering, properly lay out the bank of earth and recover the arable land; and meanwhile recover the damaged drainage system and irrigation system; the recovery may also conducted in accordance with the requirement of the government, but a comprehensive disinfection is required, and hand it over to the local government after completion of recovery. For construction camp by renting local houses, the houses shall be cleaned and tidied after completion of construction, and return the houses to the employer after disinfection of kitchen, dining room, garbage storage facility and toilet.

4.4 Construction service road

The potential impacts on surrounding environment that the temporary construction service road has are mainly land use, water and soil loss and flying dust pollution. For example, the development and construction of temporary road and operation of transport vehicles will destroy the surface vegetation, including arable land, land occupation, forest land and grassland etc. The main environmental requirements are:

(1) The setup shall pass the examination or approval of environmental supervision engineer; the development and construction of temporary road and operation of transport vehicles will destroy the surface vegetation, including arable land, land

occupation, forest land and grassland etc. for this purpose, the route of temporary construction road shall be planned, make vegetation deterioration deduction as the first principle, try best to use the existing country road, and properly strengthen the pavement and drainage system; if there is no ready-made road for use, strict control for the border of construction road is required, and the running direction of the route shall steer clear of various ecology-sensitive spot (area);

(2) Newly established construction service road shall steer clear of the sensitive area as far as possible, such as natural conservation area, scenic area, forest park, basic farmland, dense village, residential area etc., and consider making it as the collection path between the local village and remote village; if widening is required, try best to harden the pavement and enhance maintenance, caring and side slope rectification;

(3) The construction service road in the mountain area shall comply with the terrain and avoid large excavation and fill. Temporary protecting facilities are required for the side slope with exposed soil on the border of construction road; in the area with necessary conditions, it is better to use ecological protection measures, and green recovery is required during construction of construction road; in the area with bad climate conditions, engineering protection measures are required to prevent natural soil erosion.

(4) Construction service road is temporary and easy to be damaged because the motor lorries come and go frequently, full-time personnel for construction road caring shall be set, timely repair it and keep it smooth, reducing flying dust pollution;

(5) Equip with watering cart to often watering the construction service road. Generally, twice watering is OK every day, separate one in the morning and in the afternoon, so as to reduce the flying dust. The flying dust produced due to the drive of transport vehicles affects the normal breeding and development of plants (field crops), it is required to suppress the flying dust by hardening treatment for pavement, regular cleaning, and watering, and keep the pavement moist all the time. Speed limit for construction vehicles is required, the slower the driving speed is, the little the flying dust is. The discharge of construction waste gas and dust shall be in accordance with the requirements of *Environmental Air Quality Standard* (GB3095-96) prescribed the state;

(6) The contractor shall timely clear various materials dumped on the construction

road due to vehicle failure so as to ensure the road unblocked and clean;

(7) Construction design and scientific management. Notify the construction of relevant road, and the notified vehicles may choose proper road to make a round; Set corresponding signs, labels and temporary signal lights at road junctions; Strengthen the traffic scheduling and management for transport vehicles, select reasonable traffic route, and avoid the rush hour, preventing traffic jam due to construction vehicles; Strengthen the education for drivers that overload is not allowed and the scattered materials shall be timely cleared.

(8) In order to protect the villagers' rest at night, the contractor shall control the traffic noise of construction vehicles, and strengthen vehicle management when getting through the village, such as reducing speed, no tooting etc. Operation at night for construction service road next to the residential area is not allowed, is necessary, it is required to report it to the local sanitation department for approval and announce the residents;

(9) After construction ends, the contractor shall conduct a comprehensive maintenance and caring for the construction road by use of original road, and the quality shall not be lower than that of the original road; for the new-built construction service road which will be reserved after consultation with the local government, the subgrade and pavement, protective engineering and drainage facility for the construction service road shall be repaired; for the construction service road that will not be used any longer, recover it to the conditions before temporary land occupation.

4.5 Borrow area/ waste slag ground

4.5.1 Borrow area

The original landform is destroyed and the confluence conditions of the surface runoff is changed due to the excavation of the borrow area, which make the side slope even more steep and add to the possibility of landslide and collapse and water and soil loss. Therefore, during the earth borrowing process, corresponding preventive measures shall be taken to prevent water and soil loss.

(1) Before excavating: to perfect the drainage system around the borrow pit, to set sectional water drain in the borrow pit where larger runoff may flow into so as to prevent the slope from being washed by the storm runoff and waterflood. As required,

a temporary storage site that used as stack temporarily humus topsoil shall be set around the borrow pit and guardrail shall also be set, thus facilitating the backfilling of the topsoil after the excavation and restore the ecology;

(2) During excavating: separate excavation is required. First, the humus topsoil of Zone 1 shall be stripped and be stored temporarily on the temporary escorial with proper protection and block; then, the earth material of Zone 1 shall be excavated. Try to restore the earth and the ecology of one zone after the excavation there, in order to prevent the surface from being exposed in large area and avoid water and soil loss. The excavation area shall strictly abide by the requirements of the designed side slope. If the height of the excavated section is more than 4 m, then the slope drive level shall be cut and preventive measures shall be taken to avoid water and soil loss;

After excavating: after the excavation ends of the borrow pit, the land shall receive overall reclamation and the humus topsoil shall be backfilled; relevant vegetation shall be restored there according to the land conditions; if to restore agricultural land, then the necessary irrigation canals shall be deployed. If the borrow area is used as the evaporation pond or fish pool for subgrade drainage, then the area shall be planned and designed to meet this need.

4.5.2 Waste slag ground

The soil of the surface plough layer shall be separated from the land, removed and then stored collectively. After this, reclamation, grass planting and landscaping shall be conducted in accordance with the actual conditions.

Owing to the fact that the waste slag ground is loose with large porosity, so rainwater is easy to infiltrate, thus causing water and soil loss. Therefore, For large Numbers of soil, a specialized storage place for piled up collectively or the pit, low-lying land along the construction area for piled up nearby could be adopted to place the enormous waste soil, and necessary measures shall be taken to protect and block the waste, and ensure safe storage of these waste.

(1) Before placing the waste slag: try to choose bottom land, deserted pool and wasteland; try to choose the placing waste slag area around the construction site, so as to avoid inconvenience and pollution caused by long distance transportation. Before placing the waste, interception and drainage ditches shall first be set on the upstream of the waste slag ground along the contour line and a lead ditch shall be set on both

sides in order to avoid the direct washout of the upstream water on the spoil and waste slag. If necessary, a grit chamber shall be set before the drainage ditch is imported into the downstream river course, so as to detain the mud and sands carried in the runoff. The cofferdam of the mud-dumping area shall all be dealt with anti-seepage treatment by geomembrane. The temporary storage place that temporarily stacking surface humus soil shall be set nearby the waste slag ground and measures shall be taken to prevent and block the waste slag, in order to backfill the topsoil and restore the ecology;

(2) When placing the waste slag: the waste slag shall be abandoned by layering be compressed to ensure that the compactness of the slag and reduce the water and soil loss of the slag;

(3) After placing the waste slag: after this process, the land shall receive overall reclamation and the surface humus soil shall be backfilled to the land surface; relevant vegetation shall be restored according to the land conditions; the waste slag ground, mainly spoil, shall be restored to be used as agricultural land as possible and the necessary irrigation canals shall be deployed. In order to prevent the waste slag from sliding, and maintain the stability of the slope toe, the slag-blocking dams shall be installed on the slope toe of the spoil and waste slag muck slope.

4.6 Construction equipment management

4.6.1 Pollution control measures to reduce oil dripping and leaking

(1) Try to select the advanced equipment and machinery, so as to effectively reduce the oil spilling, dripping, and leaking and machinery maintenance times as well as reduce generations of the oily sewage.

(2) Try to adopt the solid oil absorption materials (such as the cotton yarn, sawdust, oil-absorbing paper, etc.) in case of unavoidable oil spilling, dripping, and leaking; the waste oil shall be collected and converted to solid substances to avoid generating excessive oily sewage.

(3) The repair and maintenance of the machinery, equipment, and transportation vehicles shall be concentrated at the maintenance points to bring a convenient oily sewage collection.

(4) The machinery maintenance points shall be equipped with the flow-setting

sedimentation basin; the oily sewage shall be discharge after having been collected by the sedimentation basin and subjected to simple processing including the acid-base neutralization, sedimentation, oil removal, and slag removal; the sedimentation basin shall be covered with soil after the construction completion, and the afforestation shall be made as well.

(5) The ground of the equipment maintenance points shall be subject to hardening and anti-seepage treatment to avoid soil pollution due to oil dripping and leaking.

(6) Keep the equipment repair and maintenance records; the periodical maintenance shall be performed based on operation conditions of the equipment.

4.6.2 Pollution control measures for the equipment operation noise

(1) The construction unit shall select the construction tools and transportation vehicles up to relevant national standards and low-noise construction machinery as much as possible.

(2) The fixed mechanical equipment with larger vibration shall be equipped with the vibration engine seat. The fixed strong noise source shall be equipped with the soundproof shield (such as the generator car, etc.) or fixed indoors for operation.

(3) The repair and maintenance of the construction equipment shall be reinforced to keep normal operation and reduce the intensity of the noise and vibration source fundamentally.

4.6.3 Pollution control measures for the equipment taigas and waste gas

The construction unit shall select the construction machinery and equipment and transportation tools up to relevant national health protection standards, so as to ensure the waste gas discharge meets relevant national standards.

4.6.4 Pollution control measures for the solid waste

(1) As the waste oil and chemical solvent are regarded as the hazardous wastes, which shall be subjected to concentrated storage by different natures. In addition, the temporary pile yard for hazardous wastes shall be erected with obvious marks and relevant constructions shall be made in accordance with requirements in the *Hazardous Waste Storage Pollution Control Standard* (GB18597-2001); the qualified unit shall be entrusted for relevant processing affairs and random dumping is

not allowed.

(2) In principle, the hazardous and toxic wastes (such as the oil barrel, etc.) in need of recycling shall be recycled by the material supplier; the due obligations shall be defined in the material procurement contract.

(3) The scattered toxic wastes (oily gloves, oily yarn waste, etc.) shall be entrusted to the qualified unit for recycling and disposal by the project department.

(4) The oil stain into the soil shall be timely collected and sealed by the scraping device and conveyed to the qualified processing plant for concentrated treatment.

(5) When the repair and maintenance of the machinery, equipment, and transportation vehicles can't be concentrated at the maintenance points of road sections, the container or solid oil absorption materials shall be used to absorb oily wastewater from the equipment. After having been collected and sealed, the oily wastewater shall be transported outwards to the adjacent qualified waste disposal site for treatment.

4.7 Chemicals storage and risk prevention

The chemicals used in the construction process are mainly gasoline and diesel oil, engine oil and coating, etc. If oil leakage happens, the land soil and the surface water bodies will be polluted and fire accidents may be caused. Therefore, the GECP has specified the management requirements from the two aspects, namely the storage of the chemicals and contingency plan for the risk of the chemicals; if there are such chemicals, they shall be managed according to the requirements of the GECP.

4.7.1 Requirements for the storage of chemicals

(1) Facilities for the storage of the chemicals shall be placed within the construction and production area, and its site selection shall decide in accordance with the regulations of "Requirements for the choice of the site in the construction and production area" in Table 3-1.

(2) When the coating, gasoline and diesel oil are being sent to the construction site, the person in charge of the inspection and acceptance shall check whether the packaging is intact; if there is leakage problem in the packaging, then the goods shall be sent back.

(3) The oil materials and chemical solvent stored in the construction and production

area shall have specialized storeroom with warning mark on it; the floor shall be dealt with antiseep and materials such as adsorption bag/grit/sawdust shall be prepared in order to deal with the contingency accidents.

(4) To formulate contingency plan for accidents and shall train the working staff before entering the construction site.

4.7.2 Requirements for risk prevention

The construction organization shall formulate contingency plan for risks and accidents in advance and appoint corresponding principals. Once there is an accident, the construction organization shall report the case to the environment supervision organization and the project organization of Town. The contingency plan for risk accidents shall contain the following:

(1) Management measures to prevent fires

a. To faithfully implement the laws, regulations and rules about fire safety management issued by our country and government and abide by the working standards established by enterprises.

b. To rigorously enforce the approve system for flame operation and flame operation without certificate is not allowed.

c. To rigorously enforce the management method for dangerous chemical goods and adopt effective and safe measures to guarantee safety.

d. To strengthen education for safety utilization of electric power and forbid disordered connection of electric circuits.

e. The storage place for the dangerous chemical goods shall be equipped with fire extinguishers of corresponding types.

(2) Rescue measures for fire accidents on the site

a. Once there are fire accidents, rescue actions shall be organized on the site according to the contingency plan for fire accidents. The staff entering into the site shall be equipped with relevant protection tools and irrelevant personnel are not allowed to enter into the site.

b. To be fully aware of the cause of the fire accident, and choose proper fire extinguisher.

c. Once the fire is extinguished, to assign people to watch out the site from catching fire again, and if necessary, extend the time for rescue.

d. To timely clean the site of aaccident, and deal with the burned materials and goods.

4.8 Control of influence on landscape

The influences caused by the project construction on the ecology and landscape lie in that the excavation of the main construction, the earth excavation of the borrow area and the piling up of muck in waste slag ground have destroyed the vegetation and the natural landscape, which contradict with the surrounding landscape; in order to control the influences on the ecology and landscape brought about by the project construction, the GECP has put forward the following control measures:

In order to strengthen the intergration and coordination between the project and the surrounding landscape, the side slope of the filling and excavation shall be connected with the natural ground; a side slope in circular arc can be designed to achieve a better visual effect. The surface of the side slope shall keep a certain rough surface to ensure that protection and grass planting measures can adopted on the surface. Shrubs and evergreen trees can be planted to hide the retaining wall, and climbing plants can also be planted for better visual effect.

Since the most of the construction service roads are laid along the both sides of the main road, it is suggest that the publicity of environmental protection shall be strengthened and the environmental awareness of administrative staff and construction personnel shall be enhanced; casual discard of domestic and industrial wastes is forbidden.

As for the waste slag ground and the temporary storage yard for building materials, work shall be conducted within prescribed areas and causal discard of pollutants is not allowed in order to protect the landscape.

After the works ends, it is required to timely clean the oil stain and garbage in the waste slag ground, the stock yard, the construction service road and the construction camp, etc. and leveling the ground; try to restore the original landform and the vegetation so as to make the works construction be in harmony with the surrounding natural environment.

4.9 Social environment control

4.9.1 Mitigation measures for traffic impact

In order to effectively reduce the impact of the works construction on the traffic, the effective measures shall be required, including:

(1) Reasonably set construction service road;

- a. Use existing country road as far as possible and appropriately reinforce the pavement and drainage system;
- b. Avoid passing through the densely populated residential area;
- c. When planning to build a construction service road, it shall be considered as the link road between the local village and remote village;
- d. Avoid sensitive area, such as natural conservation area, scenic zone, forest park and basic farmland, etc.
- e. The road damaged by construction vehicles shall be repaired timely to ensure that the road is in good condition. The narrow road may be widened combining with the road planning.

(2) Construction design and scientific management

- a. Notify vehicles of the construction of relevant road to make them choose the proper driving direction as appropriate
- b. Set corresponding signs, labels and temporary signal lights at road junctions during the construction;
- c. Strengthen the traffic scheduling and management for transport vehicles, select reasonable traffic route, and avoid the rush hour to prevent traffic jam and safety accident.
- d. If there are many residents within 50 m of the construction service road, transporting construction material is not allowed at night.
- e. The construction vehicles shall drive on the specified driveway, and it is strictly prohibited to change the driven route privately to avoid damages to the farmland and forest land.

(3) Strict site management

For along the construction site shall strictly manage and the boundary of construction site shall be demarcated, reasonably stack the muck, sand and material, as well as park vehicles and machinery to reduce traffic barrier. Meanwhile, set temporary service road and warning signs with specially-assigned person directing the traffic.

(4) Education for related personnel

Educate the construction personnel, and make them pay attention to their own behavior so as not to interfere with the traffic. Strengthen the education for drivers that overload is not allowed and the scattered materials shall be timely cleared.

4.9.2 Protective measures for public health

(1) Public health

In order to prevent and control various infectious diseases epidemic in the construction area, it is required to clear and disinfect on the centralized activity place for construction personnel, original toilet, cesspit and garbage depots before leveling the construction site in accordance with Article 19 of *Law on the Prevention and Control of Infectious Disease of PRC*. The public toilet shall be constructed in accordance with the requirements in *Health Standard for the Design of Industrial Enterprises* issued by the Ministry of Health and State Labor Bureau, and shall be equipped with tap water and illuminating system.

(2) Epidemic prevention

Health quarantine is required before the construction personnel enter the site. The carrier and patient of infectious disease shall not enter the construction area to prevent cross-infection and prevalence between the local residents and construction personnel. 2 spot checks of 10% construction personnel are required during the construction.

(3) Dietetic hygiene management

It is required to strengthen the supervision and management of dietetic hygiene, based on the feature of having meals on the site for the construction personnel during the operation to prevent poisoning accident. The workers engaged in the catering industry shall have the health cards. The domestic water shall be implemented in accordance with the *National Management Method of Health Supervision for Domestic Drinking Water* and *Health Standard of Domestic Drinking Water*. Detect the water intake well and set a supply center for boiling water in the construction site.

(4) Health propaganda

Strengthen the health propaganda in construction area (such as prevention and control of HIV/AIDS). The contractor and construction management organization shall arrange a special person to publicize the prevention and treatment knowledge of enteric infectious disease as dysentery and typhoid fever and vaccination knowledge

of planned immunity by use of lecture, blackboard newspaper etc. to improve the health knowledge level and health protection awareness in the crowd of construction area so as to reduce the morbidity for construction personnel.

4.9.3 Protective measures for occupational health

(1) The warning signs or warning instructions shall be set for the post and equipment as well as place where it is easy to cause occupational hazard.

(2) Regular occupational health training and physical examination are required for the operating personnel engaged in poisonous and harmful operation. It is also required to instruct the operating personnel to correctively use the protective equipment of occupational disease and individual labor.

(3) The construction unit shall prepare the safety helmet, safety belt and matched safety shoe and work clothes for the construction personnel.

(4) The low noise equipment is required for the construction site. It is promoted to use automatic and airtight construction process to reduce the mechanical noise. The operating personnel shall wear ear plug for hearing protection during operation.

(5) The operating personnel in places with hazardous gas shall wear antigas mask or protective respirator.

(6) Watering measure is required to reduce the dust concentration in the workplace with dust and the operating personnel shall wear dust mask; the operating personnel shall wear the personal protective equipment such as protective mask, goggles, gloves etc. during welding operation.

(7) The construction site shall be equipped with summer cooling products with reasonable work and rest time during high-temperature operation.

4.10 Chance find procedure

There are still some potential chances to discover ancient cultural relics during the construction of this project. In order to minimize the adverse impact or damage on accidental discovery for cultural relics, it is recommended to employ the following procedure and make it integrate with the standard operating procedure of the contractor:

(1) When the cultural relic is discovered accidentally on the construction site, it is

required to stop immediately all construction activities on the site.

(2) The workers and site management personnel are in duty bound to take necessary measures to protect the cultural relics discovered accidentally from damage relating to the construction or other activities, such as landslide, flood, mechanical damage, others' contact, be stolen etc.

(3) The contractor shall notify the project office and cultural relics administration department immediately.

(4) The archaeological professionals shall conduct site survey to determine the nature, value, condition and discovery site, etc. of the cultural relics. On this basis, the professional team shall provide the steps for follow up to decide whether the scene is kept or not.

(5) The construction shall not be recovered before getting the professional investigation report and official reply of cultural relics administration department.

(6) If the cultural relic is of high value, because of expert recommendation and at the request of ancient cultural relic site authority, the project owner shall have necessary design change to adapt to the request and keep the scene well.

All contractors and construction supervision companies shall be trained by the specialist as to know the procedure and understand how to identify a potential archaeological opportunity finds.