

**China: Chongqing New Urbanization Pilot
And Demonstration Project
Nan'an District Component**

**ENVIRONMENTAL AND SOCIAL
MANAGEMENT PLAN**

**Chongqing Municipal PMO
CCTEG Chongqing Engineering
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1 General

This Environmental Management Plan (EMP) shall govern the World Bank Funded Chongqing New Urbanization Pilot and Demonstration Project Nan'an District Urban Regeneration Project which is implemented by Chongqing Jiangnan Urban Construction Assets Operation and Management Co., Ltd., Chongqing Huangshan Industrial Co., Ltd., Nanping, Huayuan Road and Nanshan Sub-district Offices, Nan'an District Tunneling Construction Office, the Municipal and Gardening Administration and Nan'an District Branch of Chongqing Urban Planning Bureau.

The environmental impact of the project has been specified in the report of the *China: Chongqing New Urbanization Pilot and Demonstration Project Nan'an District Urban Regeneration Project Environmental Impact Assessment* (EIA). The Environmental Impact Assessment (EIA) Report is prepared by CCTEG Chongqing Engineering Co., Ltd. The EIA Report includes analysis for laws and regulations of environmental policies, project description and engineering analysis, the current situation of natural environment and social environment where the project is located, the current situation of the environmental quality, the project impact prediction and assessment, environmental impact mitigation measures, public consultation and information disclosure, and the environmental management. According to China's existing laws and regulations pertaining to environmental impact assessment as well as OP/BP4.01 (Environmental Assessment) of the World Bank's business policy, this project has been listed as a Category A project and needs carrying out a comprehensive environmental impact assessment study.

The *Environmental Management Plan* meets the requirements of national laws, regulations and technical guidelines, as well as the World Bank safeguard policies, including the *World Bank Group Environmental, Health and Safety Guidelines*. The *Environmental Management Plan* applies the latest available and more economical strategies to achieve the project's impact mitigation targets.

1.1 Project origin

The State Council and the Central Committee of the Communist Party of China issued the "State New Urbanization Plan (2014-2020)" on March 16, 2014 which has been the blueprint for China future urbanization and economic development. The new urbanization in Chongqing has a new path of "people first, spatial layout improvement, urban-rural interaction, city and industry integration, ecological civilization, and cultural inheritance". It is to finally fulfill such four tasks as improvement of urban layout and morphology, improvement of cities' ability of sustainable development, promotion of the number of former rural residents granted urban residency, and promotion of the integrated development of urban and rural areas.

As a main urban district of Chongqing, Nan'an District is located on the south bank of the

Yangtze River in Chongqing, it is bordered by the Yangtze River to the west and north and separated with Jiulongpo District, Yuzhong District, Jiangbei District and Yubei District by the Yangtze River and adjacent to Ba'nán District to the east and south. The entire district covers a total area of 265 km². As of 2016, it has jurisdiction over eight sub-districts and nine villages and towns, with a total permanent population of 873,900.00.

See Figure 1.1-1 for the geographic location of Nan'an District.

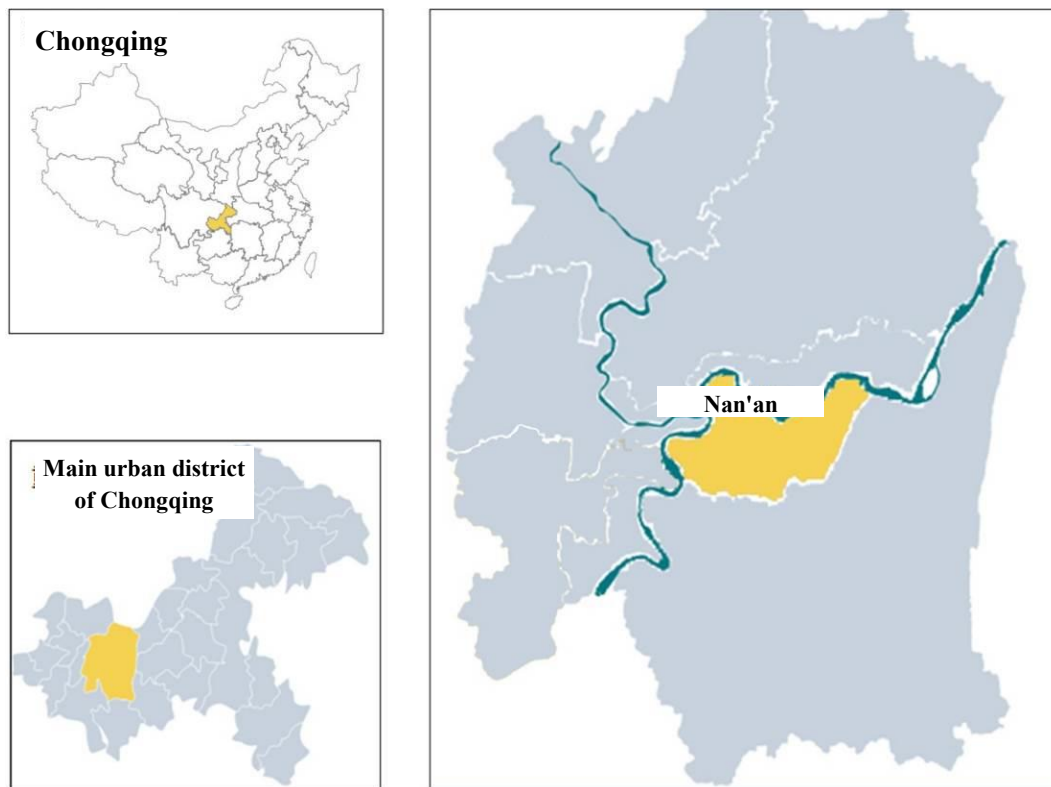


Figure 1.1-1 Nan'an District geographic location map

1.2 Project description

This project at the district level contains the total 9 sub-projects in 3 categories. See Table 1.2-1 for the project content and see Figure 1.2-1 for each sub-project layout plan.

Table 1.2.1 Project content

SN	Sub-project name		Project content
1	Old Neighborhood Rehabilitation	Nanping Street Committee community rehabilitation	It rehabilitates 4 old Communities ¹ (Dongxing Road, Jinzi Street, Yangguang and Xiangshui Road Communities), including 11 blocks, 83 residential buildings, and 4,678 households. The main project content includes rehabilitation and addition of street facilities (e.g. bench, staircase and functional artistic sketch), infrastructure improvements involving water supply and sewage pipeline.
		Huayuan Road Street Committee community rehabilitation	It rehabilitates 4 old Communities (Jinshan Road, Jinyan, Gulouwan and Nanhu Communities), including 8 blocks (communities), 158 residential buildings and 9,715 households. <i>The main project content same as above.</i>
		Nanshan Street Committee community rehabilitation	It rehabilitates 2 old Communities (Huangjueya, Zhenwushan Communities), including 10 blocks (Xiaoqu), 27 residential buildings and 1,740 households in total. <i>The main project content same as above.</i>
2	Public space improvements	Improvements to existing parks	It covers 3 green spaces including Nanhu Community Public Space, Guohuishan Public Greening Space, and Houbao Public Greenbelt Space, with the total area of 7.92ha. The improvements cover resting facilities, pavement, plant and greening space quality, etc.
		Improvements to existing squares	It covers the public recreational spaces of Nanping, the public space of Huigong Road, with the total area of approx. 4.25ha. The improvements cover pavement, resting facilities as well as artistic sketch, etc.
		Idled space utilization	It includes the vacant space utilization under Dafosi Bridge, with the total area of 20ha. It is to build a waterfront space, including footpath, pavement, greening and auxiliary facilities, etc.
3	Pedestrian walkway network improvements	Slow-walking footpath ²	There are 29 slow-walking footpaths with total length of approx. 88.32km and a width of 3m. The improvements cover pavement, street façade, blind sidewalk, signage, resting facilities, dustbins, node greening, crossing facilities, urban furniture and sewage pipes, etc.
		Hiking footpath	There are 16 hiking footpaths in total with the length of approx. 42.31km. The improvements cover trail connection, pavement, resting facilities, power supply pipeline facilities, etc.
		Connection roads	There are 3 road connections, including i) Longhuang road widening: 769m in length, widen from 12m to approx. 2.5m each side; ii) Hugui Road 1,403m long and 12m-24m wide; including existing and new alignments; iii) Tushan Branch Road 647m long, 26m wide, including existing and new alignment.

¹ In the context of the project, Street Committee refers to 街道 (Jiedao) which is an administrative level below district; below Street Committee is Community (社区, Shequ). A Block is not an administrative unit. It refers to a residential area (小区, Xiaoqu).

² A slow-walking footpath is often 3m in width, wider than a hiking footpath (trail) that is 1-2 m wide.

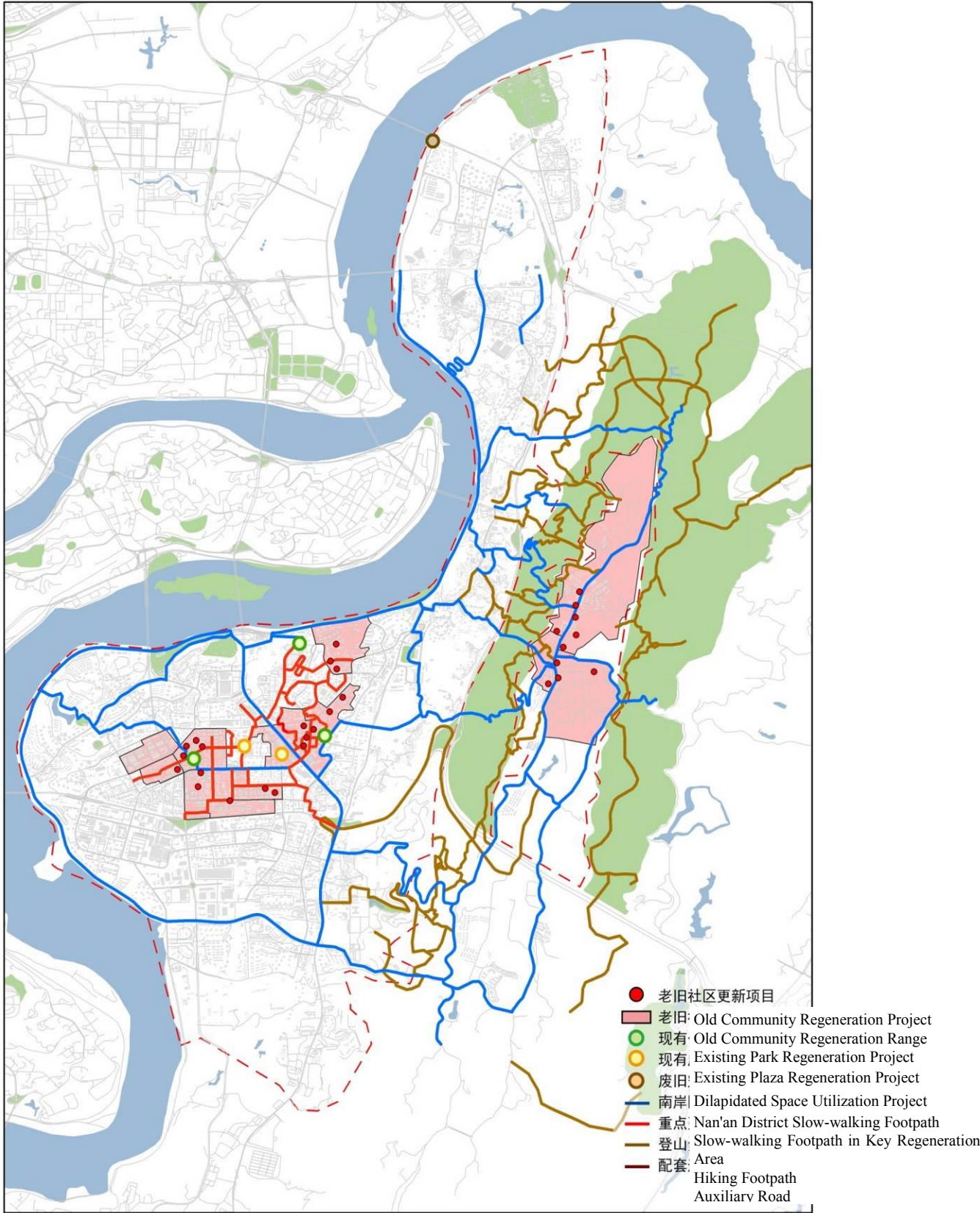


Figure 1.2.1 Layout plan of Nan'an District sub-projects

1.3 Targets of *Environmental Management Plan* (EMP)

The *Environmental Management Plan* is to implement relevant mitigation measures to the identified environment impacts, and supervise the effectiveness of such measures during the project

life cycle. The *Environmental Management Plan* based *Environmental Impact Assessment* is developed in accordance with Chinese laws, regulations and guidelines pertaining to environment, the World Bank safeguards policies and the best practices of similar projects. The *Environmental Management Plan* is designed to guarantee its consistency with the *Environmental Impact Assessment* to reach the standards with regard to environment protection. The *Environmental Management Plan* effectively meet the supervising requirement, and guide the Project Owner to manage the Contractor and subcontractors.

1.4 Structure of *Environmental Management Plan* (EMP)

The key components of the *Environmental Management Plan* (EMP) include relevant procedures for overall environmental management during the project construction and operation phases. The *Environmental Management Plan* mainly includes:

- Environmental management roles and duties;
- Mitigation measures
- Supervision and monitoring program
- Contractor's environmental specifications
- Water and soil conservation plan
- Public engagement program
- Environmental training and capacity-building program
- Budget for implementing Environmental Management Plan (EMP)

The *Environmental Management Plan* provides sufficient information for the Project Owner, the Contractor and Subcontractors to implement the *Environmental Management Plan*, with its focus as follows:

- Meet the environmental requirements developed by China, Chongqing and the World Bank;
- To meet all environmental and socio-economic conditions put forward by the state and the Municipal People's Government for project approval, permission and related policies;
- Cultivate and promote the common responsibility for environmental and social performance during the project implementation;
- Improve environmental awareness and knowledge of regulators and project owners (including their contractors) through training and defining the environmental and social management roles and responsibilities of all parties;
- Monitor environmental and social performance throughout the project cycle, and adopt an adaptive management approach to achieve continual improvement in the environment and minimization of environmental impacts in Nan'an District;
- Work with local communities and affected stakeholders to ensure that they benefit from the project development; Inform, invite and involve local stakeholders to participate in all phases of the project monitoring process.

2 Environment policies, laws and regulations and bases for report preparation

2.1 Laws and regulations of environmental protection

2.1.1 Laws and regulations

- (1) *Environment Protection Law of the People's Republic of China* (January 1, 2015);
- (2) *Law of the People's Republic of China on Environmental Impact Assessment* (September 2016);
- (3) *Regulations on the Administration of Construction Project Environment Protection* (October 2017);
- (4) *Law of the People's Republic of China on Prevention and Control of Water Pollution* (June 2008);
- (5) *Law of the People's Republic of China on Prevention and Control of Atmospheric Pollution* (January 2016);
- (6) *Law of the People's Republic of China on Prevention and Control of Pollution From Environmental Noise* (March 1997);
- (7) *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste* (Amended in November 2016);
- (8) *Law of the People's Republic of China on Water and Soil Conservation* (March 2011);
- (9) *Forest Law of the People's Republic of China* (July 1998);
- (10) *Regulations on Prevention and Control of Geological Disasters* (Decree of the State Council No. 394 in 2003);
- (11) *Land Administration Law of the People's Republic of China* (August 2004);
- (12) *Decision of NPC Standing Committee on Amendment to Twelve Laws like "Law of the People's Republic of China on the Protection of Cultural Relics"* (Presidential Decree No. 5, the People's Republic of China, adopted and released on June 29, 2013 at the Third Session of the Twelfth NPC Standing Committee, and coming into effect as of the day of release).

2.1.2 Departmental rules

- (1) *Administrative Measures on Prevention and Control of Geological Disasters* (Decree of Ministry of Land and Resources No. 4 in 1999);
- (2) *Administrative Measures for Environment Protection of Traffic Construction Projects* (Ministry of Transport Decree [2003] No.5);
- (3) *Catalogue for Guiding Industry Restructuring (2011 Version)* (as amended in 2013) (Decree No. 21 of National Development and Reform Commission, the People's Republic of China);
- (4) *National outline for ecological and environmental protection* (December 2000);
- (5) *Regulations of the People's Republic of China on Scenic Areas* (the State Council Decree No. 474 on September 10, 2006);
- (6) *Administrative Measures for National Forest Parks* (the State Forestry Administration Decree No. 27 on May 20, 2011);
- (7) *Administrative Measures for Forest Parks* (the State Forestry Administration Decree No. 42 on September 22, 2016);
- (8) *List of wild animals of national priority protection* (as amended the State Forestry Administration Decree No. 7 in February 2003);
- (9) *List of wild plants of national priority protection (first batch)* (as amended the Ministry

of Agriculture and the State Forestry Administration Decree No. 53 in August 2001);

(10) *National Ecological Environment Construction Plan* (issued by the State Council in January 1999);

(11) *The 13th Five-Year Plan for Economic and Social Development of the People's Republic of China* (2016);

(12) *List of classified management of environmental impact assessment of construction projects* (September 2017);

(13) *Opinions on strengthening environment protection management of construction projects under the large-scale development of China's western region program* (HF [2001] No. 4);

(14) *Notice of the State Council on protecting forest resources and stopping disafforestation and abuse of forest land* (GFMD [1998] No. 8);

(15) *Notice of the State Council on further implementing the construction of national green channel* (GBF [2003] No. 31);

(16) *Decision of the State Council on implementing the scientific outlook on development and strengthening environment protection* (GF [2005] No. 39);

(17) *Opinions on regulating ecological environment protection of resource development* (HF [2004] No. 24);

(18) *Provisional Methods on Public Participation in Environmental Effect Evaluation* (HF [2006] No. 28);

(19) *Notice on zoning key national areas of water and soil loss prevention and control* (the Ministry of Water Resources Notice [2006] No. 2);

2.2 Local laws and regulations

(1) *Regulations of Chongqing on water pollution control for Yangtze River Three Gorges Reservoir Region and valley* (Chongqing People's Congress Standing Committee Notice [2011] No. 26)

(2) *Regulations of Chongqing on environment protection* (as amended) (Chongqing People's Congress Standing Committee Notice [2010] No. 22);

(3) *The 13th Five-Year Plan for Economic and Social Development of Chongqing* (YFF [2016] No. 6);

(4) *Chongqing ecological function zoning (as edited and revised)* (YF [2008] No. 133);

(5) *The 13th Five-Year Plan for Ecological Civilization Construction of Chongqing* (YFF [2016] No. 34);

(6) *Regulations of Chongqing on scenic areas* (Chongqing People's Congress Standing Committee Notice [2008] No. 6);

(7) *Notice of Chongqing Municipal People's Government on issuing the list of aquatic wild animals of Chongqing priority protection* (YFF [1999] No. 65);

(8) *Notice of Chongqing Municipal People's Government on issuing the list of terrestrial wild animals of Chongqing priority protection* (YFF [1999] No. 94);

(9) *Administrative measures of Chongqing on forest parks* (YLZF [2013] No. 14);

(10) *Regulations of Chongqing on scenic areas* (as amended in accordance with the *Decision on amendment to "Regulations of Chongqing on scenic areas"* adopted on the 13th Session of Chongqing Fourth People's Congress Standing Committee on September 25, 2014).

2.3 Technical specifications for environmental protection

(1) *Technical guidelines for environmental impact assessment --- General principles*

(HJ/T2.1-2016);

(2) *Technical guidelines for environmental impact assessment --- Surface water environment (HJ/T2.3-93)*;

(3) *Technical guidelines for environmental impact assessment --- Groundwater environment (HJ610-2016)*;

(4) *Technical guidelines for environmental impact assessment --- Acoustic environment (HJ2.4-2009)*;

(5) *Technical guidelines for environmental impact assessment --- Ecological impact (HJ19-2011)*;

(6) *Technical guidelines for environmental impact assessment --- Atmospheric environment (HJ2.2-2008)*;

(7) *Technical guidelines for environmental risk assessment of construction projects (HJ/T169-2004)*;

(8) *Technical code on soil and water conservation of development and construction projects (GB50433-2008)*

2.4 World Bank Safeguards Policies and World Bank Group Environmental, Health and Safety Guidelines (WBG EHS Guidelines)

2.4.1 World Bank's Safeguards Policies and their compliance analysis

World Bank has ten safeguards policies socially and environmentally. Based on the construction nature of this project, the engineering layout, and the assessment scope determined by this environment impact assessment and the field investigation, the project has been checked to determine whether it involves such ten policies, with the results shown in following table:

Table 2.4.1 Compliance analysis of relevant World Bank Safeguards Policies relating to the project

SN	Safeguard Policies	Yes or no Applicable	Compliance
1	OP/BP4.01 <i>Environmental Assessment</i>	Yes	Category A project; Prepared full <i>Environmental Impact Assessment (EIA)</i> and <i>Environmental Management Plans (EMPs)</i> ; Prepared Environmental and Social Management Framework for component 1 Technical assistance activity; and Two rounds of public consultation and information disclosure were conducted as per OP4.01.
2	OP/BP4.04 <i>Natural Habitats</i>	Yes	Physical works in Nan'an district involve two forest parks and a scenic area. Thus the policy is triggered. These sensitive areas are for public recreational purpose. Proposed activities are of small scale, upgrading of existing facilities, and will not affect the ecological function or landscape of these sensitive areas. Mitigation measures have been incorporated into the EMP. The project will not cause significant conversion or degradation of natural habitats.
3	OP/BP4.36 <i>Forests</i>	No	The project will not have impacts on the health and quality of forests, or affect the rights and welfare of people and their level of dependence upon or interaction with forests. The policy is not triggered.
4	OP/BP4.09	No	The project will not involve use or procurement of pesticides

SN	Safeguard Policies	Yes or no Applicable	Compliance
	<i>Pest Management</i>		directly or indirectly. The policy is not triggered.
5	OP/BP4.11 <i>Physical Cultural Resources</i>	Yes	Physical cultural resources survey was conducted through desk review, field visit and consultations. Under Nan'an district component, proposed pedestrian walkway improvements are located in the vicinity of several PCR sites. The pedestrian walkway improvements won't affect these historical sites physically. Design has taken into account the landscape and preservation of these historical sites adequately. Pre-cautionary measures have been incorporated into the EMP.
6	OP/BP4.37 <i>Safety Of Dams</i>	No	Such policy does not triggered. The project doesn't involve any dams.
7	OP/BP4.10 <i>Indigenous Peoples</i>	No	No IPs affected in the project. The population of the affected areas of the project are mostly of Han ethnicity, or the ethnic majority population in China. Thus, the Indigenous Peoples OP/BP 4.10 is not triggered.
8	OP/BP4.12 <i>Involuntary Resettlement</i>	Yes	The social safeguard policy OP 4.12 is triggered as current land use of the existing proposals would cover collectively-owned land, land acquisition and physical resettlement that cannot be avoided.
9	OP/BP7.50 <i>Projects on International Waterways</i>	No	Such policy does not be triggered. The project area involves no international waterways.
10	OP/BP7.60 <i>Projects on Disputed Areas</i>	No	Such policy does not be triggered. The project area involves no places of disputes.

According to the analysis of the correlation between the project and World Bank safeguards policy documents, the policy documents relating to this project are OP/BP4.01 (Environmental Assessment), OP/BP4.04 (Natural Habitat), OP/BP4.11 (Physical Cultural Resources) and OP/BP4.12 (Involuntary Resettlement).

2.4.2 WBG EHS Guidelines and relevant provision compliance analysis

The World Bank Group *Environmental, Health and Safety Guidelines* (General Guidelines) and other guidelines apply to this project. The mitigation measures included in the *Environmental Management Plans* of the project are completely in conformity with the requirement of foregoing guidelines. Particularly, the content in such *guidelines* is basically in line with the laws, regulations, guidelines and construction management rules of China.

Table 2.4.2 Compliance with WBG EHS Guidelines

General Guidelines	Environmental impact assessment/compliance with Environmental Management Plans (EMPs)
If any facility or project is near a recognized ecological sensitive point (for example, a national park), the pollution level increase shall be controlled as far as practicable; in addition, appropriate mitigation measures can also include the utilization of clean fuel or technology, and the application of comprehensive pollution control measures.	The project involves the ecological sensitive point, so existing municipal facilities shall be used and local residents shall be rented as far as possible during the construction phase, and the clean fuel may be used during the operational phase to reduce the pollution level.
Dust or particulate matter is the most common	The management shall be strengthened, with the

pollutant among irregular emissions. Some operations (for example, transportation and open-air storage of solid materials) and bare soil surface (including unpaved roads) will emit the particulate matter.	wet method operation promoted, barriers erected along the construction site, and the material storage yard fenced and covered; throwing materials from a high place is strictly prohibited. The testing and maintenance of motor vehicles shall be strengthened during the operational phase; automobiles of exhaust exceeding standard shall be prohibited from being on roads; road conditions shall be maintained; the vegetation shall be utilized to purify air.
<i>Environmental, Health and Safety Guidelines for Water and Sanitation</i>	Environmental impact assessment/compliance with Environmental Management Plans (EMPs)
The industrial wastewater, sanitary wastewater and the wastewater from operations of public works or rain water will be discharged to the public or private wastewater treatment system, and the pretreatment and monitoring requirements of the sewage treatment system such wastewater is discharged to will be met.	During the construction phase, the washing wastewater will be reused after the treatment of the oil separation and grit chamber, without being discharged outside; the sanitary sewage will be collected and pretreated by biochemical pools and regularly sucked to the sewage treatment plant by fecal suction trucks, or directly connected to the municipal sewage pipe network; during the operational phase, the sanitary wastewater from the public space will be all discharged to the sewage treatment plant through the municipal sewage pipe network for treatment.
The rain water shall be separated from the industrial wastewater and the sanitary wastewater to reduce the volume of wastewater which can be discharged after treatment;	The diversion of rain and sewage water will be utilized, with rain water conduits and sewage conduits built separately.
At the most sensitive point, if it is predicted that the noise from the project facilities or the operation activities will exceed relevant noise level, the noise prevention and control measures shall be taken.	The low-noise machines will be used during the construction phase; the construction will be appropriately scheduled, with the night-time construction avoided; construction machines and plant will be appropriately arranged inside the site; and the fence will be erected. At the operational phase, the asphalt pavement will be adopted, and trees and grass will be planted; the speed at the road sections along densely populated residential areas and schools will be limited and the signs of no honking will be erected, with acoustic screens built, special funds for noise monitoring and treatment provided and other measures taken to prevent and control the noise.
<i>Environmental, Health and Safety Guidelines for Toll Roads</i>	Environmental impact assessment/compliance with Environmental Management Plans (EMPs)
When appropriate, properly selecting road and supporting facility positions, and utilizing existing traffic corridors to avoid important terrestrial and aquatic habitat (for example, old-growth forests, wetlands and fish spawning habitat);	The region where this project is located is not an important terrestrial and aquatic habitat.
During the construction phase, efforts shall be made to reduce clearing local plant species, and	The construction activities shall be arranged within the scope of the land occupied for the

to replant local plant species at the affected areas	construction; local plants shall be appropriately planted.
Roads shall be paved in dry weather to avoid the loss of asphalt or cement materials;	During the construction phase, pavement construction is prohibited in gale weather, and the construction site shall be appropriately determined;
The oil-water separator must be used during treatment whether there will be a great amount of grease produced;	The oily water collecting container shall be equipped for construction machines at the construction site to collect the oily water produced. The collected oily water shall be delivered to and treated at the capable unit, and any direct discharge without treatment shall be prohibited.
Replacing diesel with vegetable oil to be releasing agent and cleanser to prevent any pollution caused by cleaning asphalt equipment; the cleaning products and polluted asphalt remaining shall be prevented from escape; scraping shall be conducted before cleaning, and the cleaning activities shall be conducted at the place far away from the surface water or drainage facilities.	Contractors shall set forth requirements on "storage of fuels, oil and hazardous and noxious substances" in their specifications, and all fuels at the construction site shall be stored and fenced; the storage area shall be 110% of the fuel storage containers. The fuel storage area shall not be near any source of water (namely, up to 100m from the source of water);
Acoustic treatment shall be made to surrounding buildings (generally, change of windows); The road pavement of less and lower noise from road surface-tire friction shall be adopted, for example, the asphalt mastic crushed stone mixture.	At the operational phase, the speed at the road sections along densely populated residential areas and schools will be limited and the signs of no honking and acoustic screens will be erected, with special funds for noise monitoring and treatment reserved. All the roads of this project adopt asphalt pavement.
<i>Environmental, Health and Safety Guidelines for Waste Management Facilities</i>	Environmental impact assessment/compliance with Environmental Management Plans (EMPs)
Collection and transportation of wastes	They will be delivered to the local waste treatment plant for unified treatment
Garbage cans or garbage bags are encouraged to be used by every family or waste collecting stations around buildings; wastes shall be collected regularly and frequently to avoid waste accumulation; vehicles to collect and transport wastes shall be covered to avoid wastes blown away by wind when driving;	They shall be delivered to a fixed point, and shall be gathered and transported by the sanitation department to Nan'an District municipal solid waste treatment plant for disposal.
Regular waste collection; Developing cleaning plans for garbage collection vehicles and all the garbage collection containers of the enterprises; Advocating the use of garbage bags to avoid polluting the garbage collection equipment.	
The garbage collection routes shall be optimized to shorten the driving distance, and reduce the total fuel consumption and emission; Forwarding stations will be established for small garbage collection vehicles to gather the collected garbage to large vehicles and deliver to the garbage treatment plant;	

2.5 Relevant materials of the construction project

(1) *World Bank Funded Nan'an District Urban Regeneration Project Feasibility Study*

Report (Chongqing University, November 2017);

(2) *Comprehensive Planning for Chongqing Nanshan National Forest Park* (Chongqing Municipal Forestry Planning and Design Institute, June 2006);

(3) *Comprehensive Planning for Liangfengya Municipal Forest Park* (Chongqing Municipal Forestry Planning and Design Institute, September 2002);

(4) *Comprehensive Planning for Chongqing Nanshan-Nanquan Scenic Area* (Chongqing University Urban Planning and Design Institute, December 2003);

(5) Environmental Impact Assessment Work Contract;

(6) Monitoring Report.

3 Environmental management roles and duties;

3.1 Organizations engaged in the environmental management

The implementation of this *Environmental Management Plan* requires the engagement of multiple organizations *and* departments; each organization plays a different but important role to guarantee the effective environment management for the project.

Such two groups of organizations will be involved in the environment management process: as one group of organizations to be responsible for organizing or implementing the *Environmental Management Plan*, and the other group to enforce standards, laws and regulations pertaining to the project, and supervise the implementation of the *Environmental Management Plan* and the overall environmental performance. See Figure 3.1-1 for the project environment management and supervisory organization frame diagram.

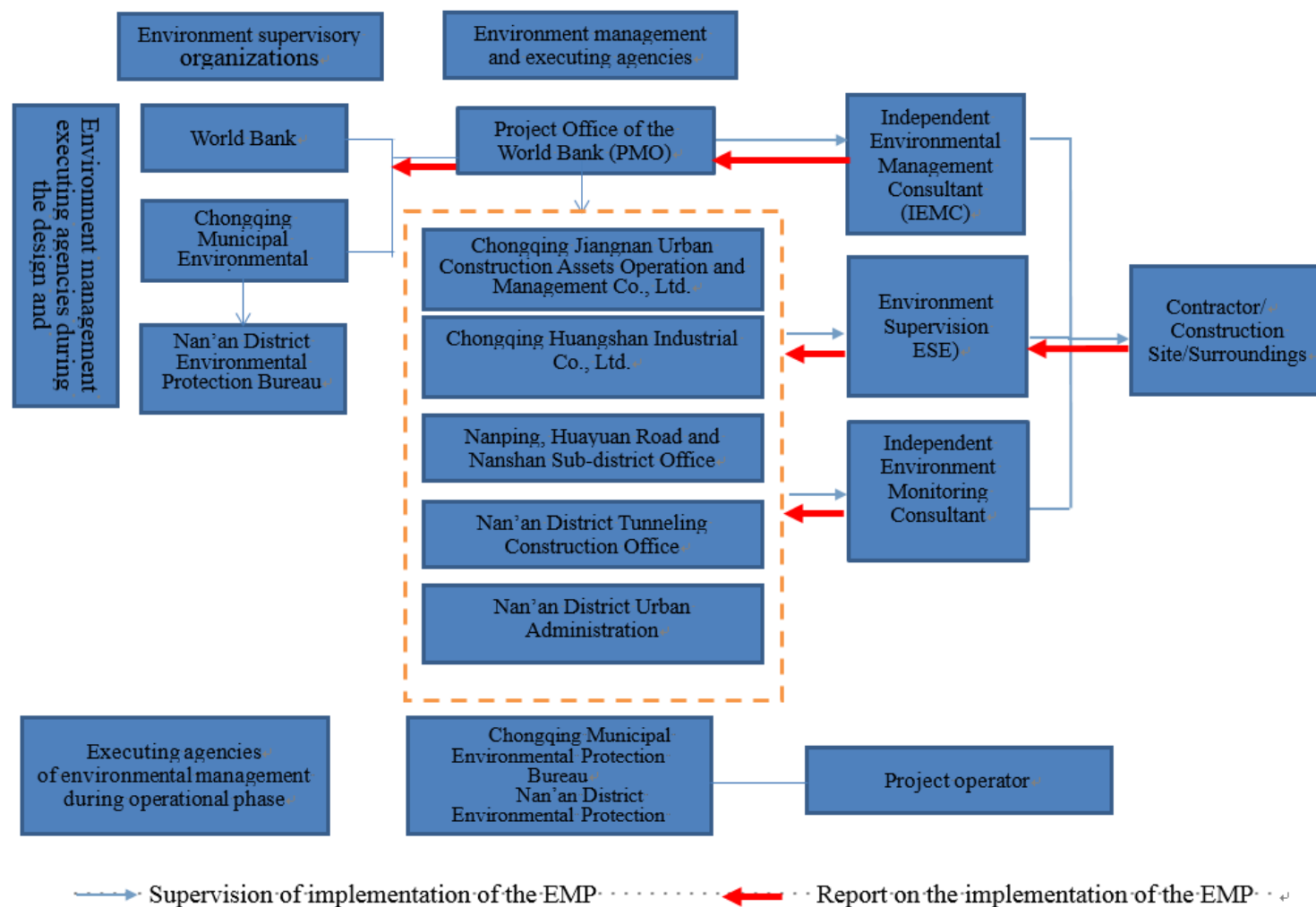


Figure 3.1-1 Environmental management and supervisory organizations

3.2 Duties of environment management organizations

See Table 3.2-1 for key environment management responsibilities of each environment management organization.

Table 3.2-1 Environmental supervision and management responsibility list

SN	Organization/unit	Responsibilities
1	Project Office of the World Bank	Responsible for all the environment management work of the project, including effective implementation of mitigation measures, supervision and monitoring, budget security and report to the World Bank and the local environment bureau; Ensure that measures in the Environmental Management Plan have been included in the bidding documents and the construction contract; Supervise the construction unit to implement the pollution control measures, and timely report any violations to the construction unit; Guarantee that the supervised content of the environmental protection agency is included in the bidding documents and the contract concluded with the Supervision Engineer, supervise and participate in the supervision of the project; Entrust the environment monitoring organization with environment monitoring during the construction phase, and cooperate in the environment monitoring during the construction phase. Organize environmental trainings for the Contractor and the Environment Supervision Engineer.
2	Nan'an District Environmental Protection Bureau	Nan'an District Environmental Protection Bureau is responsible for the environmental management and supervision within the development area. Implementation of the monitoring and supervision over environment protection on behalf of Chongqing Municipal Environmental Protection Bureau during the construction and operational phases. Investigate and address the resident disturbance complaints during the construction and operational phases. Guarantee the "three simultaneous". Guarantee the normal operation of environment protection facilities.
3	Chongqing Jiangnan Urban Construction Assets Operation and Management Co., Ltd. Chongqing Huangshan Industrial Co., Ltd. Nanping, Huayuan Road and Nanshan Sub-district Office Nan'an District Tunneling Construction Office Municipal and Gardening Administration	The Project Owner is going to implement the World Bank funded infrastructure construction, including procurement, construction management, implementation and compliance of safeguards policies, and monitoring and reporting, etc.
4	Project operator	Operation of environment protection facilities, environment management and other activities during the operational phase of the project.
5	Environment Supervision Engineer (ESE)	Review and assess whether the construction design meets the requirement of the environmental impact assessment and the Environmental Management Plan, and in particular review and

SN	Organization/unit	Responsibilities
		assess the site environmental management and the required measures used to mitigate impacts; Supervise the site environmental management of the Contractor and provide accurate guidance; Review the Contractor's implementation of the Environmental Management Plan, and verify and confirm the environment supervisory process, parameters, monitoring locations, equipment and results; Report the implementation of the Environmental Management Plan; Examine and approve invoices or expenditures according to the implementation of the Environmental Management Plan.
6	Contractor	Develop detailed Contractor Environment Protection Plan which shall be a component of the construction contract. Report new environmental issues or any cultural relics discovered during the construction phase to the Supervision Engineer. Conduct ongoing public consultation during the construction.
7	Independent Environmental Management Consultant (IEMC)	Project Office of the World Bank (PMO) will employ the IEMC independent from the Environment Supervision Engineer and the Contractor. The IEMC's task is to assess the implementation of the <i>Environmental Management Plan</i> during the project construction phase, advise the Project Owner on management and finally guarantee that the project conforms with the requirements of the <i>Environmental Management Plan</i> .
8	Environment Quality Monitoring Consultant (EQMC)	The Environment Quality Monitoring Consultant refers to the professional monitoring organization to implement environment quality monitoring in accordance with the Environment Monitoring Plan contained in the Environmental Impact Assessment Report. The Project Owner will employ the Environment Quality Monitoring Consultant to implement the monitoring plan.

3.3 Environment management responsibilities during the construction phase

3.3.1 The World Bank Project Management Office (PMO) and Project Owners

Project owners include Chongqing Jiangnan Urban Construction Assets Operation and Management Co., Ltd., Chongqing Huangshan Industrial Co., Ltd., Sub-district Offices, Nan'an District Tunneling Construction Office, the Municipal and Gardening Administration and Nan'an District Branch of Chongqing Urban Planning Bureau.

As the Project Owners of this project, Chongqing Jiangnan Urban Construction Assets Operation and Management Co., Ltd., Chongqing Huangshan Industrial Co., Ltd., Sub-district Offices, Nan'an District Tunneling Construction Office, the Municipal and Gardening Administration and Nan'an District Branch of Chongqing Urban Planning Bureau are the specific organizations to implement the project and are comprehensively responsible for the management and coordination of the project implementation. The World Bank Project Management Office (PMO) will be responsible for the daily management and coordination of the project implementation, and supervision of the project implementation to meet the requirements of the World Bank. The Project Owner should be responsible for ensuring that the project environmental management conforms with the *Environmental Management Plan* and relevant regulatory requirements.

The Project Owner's environmental management responsibilities include but are not limited to:

(1) During the project construction, supervise the implementation of various mitigation measures and environmental measures, including making such measures contained in the tender documents and contract, organize the contractor training, implement other environmental management plan, and periodically inspect the construction site.

(2) Employ and supervise environmental monitoring consultants (such as environmental quality monitoring consultants) to conduct environmental monitoring in accordance with project environmental monitoring plans.

(3) Employ and supervise independent environmental management consultants to provide technical support, including management advice, training, regular field visits and preparation of various reports.

The Project Owner will assign 1 or 2 special environmental workers to take charge of the overall coordination of the implementation of the *Environmental Management Plan*. Such special environmental workers must be familiar with environmental management and environmental regulations and can understand and implement the *Environmental Management Plan*. Their duties include:

(1) Ensure that the project's environmental management meets the requirements of the *Environmental Management Plan* and related regulations. In case of any non-compliance found, appropriate measures should be taken.

(2) Maintain open and smooth communication with the World Bank Project Office (PMO), supervision engineers and contractors on environmental issues.

(3) Review and approve the *Environmental Protection Implementation Plan* of critical project activities, which is prepared by the Contractor and may cause significant environmental impacts.

(4) All the construction areas should be regularly inspected according to the requirements of the *Environmental Management Plan*.

(5) Review and archive various reports of the Contractor and the Environment Supervision Engineer on environmental management.

(6) Report to the World Bank Project Management Office (PMO) on the environmental issues of the construction site every month.

3.3.2 Contractor

At any time, the Contractor and its employees should first try to avoid any negative impact of the project construction activities, and second should follow the *Environment Management Plan* and the mitigation measures stipulated in the contract, so as to minimize the damage to and the impact on the environment and the local communities.

The remedial measures not effectively implemented during the construction phase shall be implemented after the completion of the project but before the completion acceptance.

The Contractor shall establish a strong environmental management system to meet the requirements of the mechanism, site measures, monitoring, training and reporting.

Chapter 6 contains detailed environmental specifications for contractors.

3.3.3 Environment Supervision Engineer (ESE)

The Environment Supervision Engineer is an integral part of the Supervision Engineer's functions. Each supervision engineer company will assign at least one Environment Supervision Engineer to each contract/working group. The duties of the Environment Supervision Engineer include:

(1) Review and ensure that the Contractor's construction organization plans meet the *Environmental Management Plan* and project construction requirements in respect of environmental

protection and impact mitigation.

(2) For key project activities with potential environmental impact, review the *Environment Protection Implementation Plan* and the *Environment Protection Construction Organization Plan* at the Contractor's construction sites before the final approval of the Project Owner.

(3) Conduct daily on-site inspections and ensure that the Contractor's activities comply with the *Environmental Management Plan* and other relevant regulations; and guide the Contractor to take corrective actions within the period specified by the Environment Supervision Engineer when any non-compliance or inconsistency is found.

(4) The World Bank Project Management Office (PMO) will complete relevant work, if necessary, during the implementation of environmental monitoring and supervision.

(5) Regularly monitor the implementation of the Contractor's environmental management system, including environmental personnel, procedures and reports; check and confirm the environmental supervision procedures, parameters, monitoring sites, equipment and results. In case of any discrepancies found, the Environment Supervision Engineer will instruct the Contractor to take remedial actions, including capacity building and the replacement of the Contractor's environmental staff.

(6) Regularly prepare the environmental supervision report and submit it to the World Bank Project Management Office (PMO) for review and filing.

(7) As a Supervision Engineer, approve various invoices or payments according to the implementation of the *Environmental Management Plan*.

3.3.4 Independent Environmental Management Consultant (IEMC)

The World Bank Project Management Office (PMO) needs to employ an Independent Environmental Management Consultant to provide technical support for environmental protection during construction. Independent Environmental Management Consultants will be independent from the Environment Supervision Engineer and the Contractor, and will directly report work to the World Bank Project Management Office (PMO) and the Project Owner. Independent Environmental Consultants will be headed by a person who can independently and professionally examine all records, procedures and processes. He/she can ask for a small team to assist in the inspection of construction sites (namely, the independent environmental management consultant team). Independent Environmental Management Consultants should have a wealth of knowledge and experience in environmental monitoring and auditing, so that they can provide independent, objective and professional advice on project environmental performance (at least five years of experience). By reviewing various reports, Independent Environmental Consultants should be familiar with project engineering, including the project's *Environmental Management Plan*. Specifically, the Independent Environmental Consultant will be responsible for fulfilling the following duties:

(1) Review and audit all aspects of the *Environmental Management Plan* in an independent, objective and professional manner;

(2) Verify and confirm the accuracy of the monitoring results, the monitoring equipment, monitoring sites, monitoring procedures and sensitive points;

(3) Conduct random sampling inspection and review the monitoring data, sampling procedures, etc.;

(4) Conduct on-site inspection at random;

(5) Review the recommendations and requirements of the Environmental Impact Assessment according to the implementation of the environment protection measures;

(6) Review the effectiveness of environmental mitigation measures and the project

environmental performance;

(7) Verify and prove the feasibility of the construction method, relevant design plans and submitted materials in environment protection as required. When necessary, independent environmental consultants should seek the least impacting option with the designer, the Contractor, and Nan'an District;

(8) Examine the findings of any environmental non-compliance;

(9) The effectiveness of quality performance and corrective measures;

(10) According to the non-compliance procedures in the Environmental Management Plan, the review result feedback will be given to the World Bank Project Management Office (PMO), the Project Owner and the Environment Supervision Engineer team, and the Supervision Engineer (Environment Supervision Engineer) will be provided with the advice of punishment, shutdown or other punishment measures;

(11) Provide training to contractors, environmental supervision engineers and workers of the World Bank Project Management Office (PMO) before the commencement of and during the project construction;

(12) Assist in preparing the interim environmental monitoring report submitted to the World Bank.

3.3.5 Environment Quality Monitoring Consultant (EQMC)

To closely monitor the environmental quality of the project area and minimize the environmental impact of the construction and operation phases, the Project Owner will employ a professional environmental monitoring consultant to carry out the plan of environmental monitoring in the environmental impact assessment stage. The duties of the Environment Quality Monitoring Consultant (EQMC) include:

(1) Be familiar with the project engineering and the *Environmental Management Plan*, especially the environmental monitoring plan.

(2) Environmental monitoring is conducted in a timely and professional manner in accordance with the Environmental Management Plan.

(3) Verify and confirm the criteria for the monitoring results, the monitoring equipment, monitoring sites, monitoring procedures and sensitive points.

(4) The monitoring results and suggestions shall be timely submitted to the Project Owner and the World Bank Project Management Office (PMO).

3.4 Contractor management

During construction, the Contractor shall be responsible for the control and reduction of environmental impacts and the thorough implementation of environmental protection measures, including the following measures:

In the pre-qualification stage, the environmental management shall be contained in the certification terms for the qualification of the contractor. Under the same conditions, the bidders with ISO9001 and ISO14001 certification are preferred;

In each construction stage, at least one full-time staff shall be designated to conduct environmental monitoring and monitoring, and the specific environmental protection measures shall be implemented.

During the preparation of the bidding documents, the Owner should have every environmental protection measure contained in the terms of the contract (as specified in the environmental impact assessment and the approved items of the environmental management plan) to ensure environmental protection rules and responsibilities, as well as the corresponding estimate fully understood.

Prior to construction, the Contractor should accept training on environment. Each department should have at least one senior manager and one environmental protection professional to attend the training; such training is provided by experienced consulting agencies well versed in environmental protection and familiar with local management departments. The training shall include:

- (1) Relevant national and local laws and regulations and discharge standards;
- (2) Technical guidance for environmental protection;
- (3) *Environmental Impact Assessment* (EIA) and *Environmental Management Plan* (EMP) of the project;
- (4) Specific requirements, methods and parameters of all monitoring positions;
- (5) Specific requirements for monitoring reports and monitoring data feedback;
- (6) Applicable mitigation measures;
- (7) Public engagement during construction and solutions to public complaints;
- (8) Contractor's responsibility for environmental protection.

The construction supervision engineer company (or companies) shall be designated according to the environmental supervision responsibility and through the appointment of environmental supervision engineer. The requirements for environmental regulation should also be included in the tender documents and should be ultimately included in the contract to the Supervision Engineer's company.

3.5 Environment management organizations during operational phase

3.5.1 Nan'an District Environmental Protection Bureau

- (1) Responsible for the supervision and implementation of the environmental management plan of Nan'an District;
- (2) Responsible for the formulation and development of environmental protection systems and policies for Nan'an District;
- (3) Responsible for the environmental statistics, pollution source files, and other reports of Nan'an District.
- (4) Supervise the operation and maintenance of environmental protection communal facilities in the development zone to ensure their normal and stable operation.
- (5) Supervise, investigate and address the disturbance to residents and the complaints during the operational phase. Guarantee the "three simultaneous". Guarantee the normal operation of environment protection facilities.

3.5.2 Project operator

A special environmental management office will be established to be responsible for the implementation of the environmental management plan during the operational phase. The detailed responsibilities of the Environmental Management Office include:

- (1) Manage the implementation of the environmental protection measures of the project;
- (2) Coordinate environmental issues in connection with environmental supervision and management departments and surrounding residents;
- (3) Comply with the project environmental monitoring plan, and commission qualified monitoring agencies to regularly monitor the three wastes discharged by the project facilities and the regional environmental quality according to the frequency and point distribution requirements of such monitoring plan;
- (4) In case of environmental accidents, the environmental risk emergency disposal can work;
- (5) Responsible for reporting environmental management information to the municipal

environmental protection bureau and the project management office on time;

- (6) Record, file and collate the environmental management files.

4. Environment protection measures

Based on the analysis in *Environmental Impact Assessment*, following chapters summarize some outstanding environmental impact and mitigation measures. Table 4.1-1, 4.1-2 and 4.1-3 list main activities and phases, confirmed potential environmental impact and typical mitigation measures, as well as implementation and monitoring responsibilities.

These mitigation measures are in conformity with waste collection and transportation requirements in relevant national laws, regulations, guidelines, rules, World Bank's policies, the *General Guideline for Environment, Health and Safety*, the *Guideline for Water and Sanitary Environment, Health and Safety*, the *Guideline for Environment, Health and Safety of Waste Management Facilities*; so as to solve various impacts during the design, construction and operational phase.

Chapters 6 through 8 have detailed the management plans pertaining to contractor specifications, water and soil conservation programs, training, capacity building, etc.

4.1 Environment protection measures and suggestions for the design phase

Table 4.1-1 Design phase environmental impact and mitigation measures list

Links and factors	Potential impacts/issues	Mitigation measures	Implementor	Supervisor	Monitoring indicators	Monitoring frequency
Land acquisition and resettlement of affected residents	Potential impacts on original residents in Nan'an District	Prepare resettlement plan according to national policies and World Bank policies	Chongqing Jiangnan Urban Construction Assets Operation and Management Co., Ltd., Nan'an District Tunneling Construction Office,	The World Bank Project Management Office (PMO), Nan'an District Development and Reform Commission	Action plan for resettlement of affected residents approved by World Bank	Before assessment
Acoustic environment	Impacts on construction workers	Due to a pretty large noise produced during the construction of building works and road works, reasonable noise isolation and reduction measures shall be taken during the project design to mitigate the impact of construction noise on the field construction workers.	Environmental assessment consultant	World Bank PMO, Nan'an District Environmental Protection Bureau	Environmental impact assessment approved by World Bank and Nan'an District Environmental Protection Bureau	Before assessment
	Impact of traffic noise on the life of residents in sensitive sites along the road	It's suggested that the planning department should make reasonable layout of functional areas and not to add sensitive sites in the standard distance.				
Atmospheric environment	Impacts of dust from transportation on surrounding residents	Raw materials shall be purchased locally.	Environmental assessment consultant	World Bank PMO, Nan'an District Environmental Protection Bureau	Environmental impact assessment approved by World Bank and Nan'an District Environmental Protection Bureau	Before assessment
Ecological environment	Impacts of water and soil loss	The new road and community regeneration design should further optimize and adjust the route, try to balance the excavation and filling of earth and stone, and reduce the quantities of the excavation and filling of earth and stone, the surface vegetation damage, and new soil erosion.	Environmental assessment consultant	World Bank PMO, Nan'an District Environmental Protection Bureau	Environmental impact assessment approved by World Bank and Nan'an District	Before assessment

Links and factors	Potential impacts/issues	Mitigation measures	Implementor	Supervisor	Monitoring indicators	Monitoring frequency
	Impacts of land occupation	The project design shall comprehensively consider the surrounding environment and shall further refine the permanent land occupation design to use land reasonably.			Environmental Protection Bureau	
	Impacts of landscape	Road greening works and main works shall be designed synchronously. On the premise of meeting the regional planning requirement, the route of roads shall maintain the natural landscape and harmonize with the surrounding environment as much as possible. To reduce the damage to existing ecological environment, implement greening ecological construction project synchronously during the project design.				

4.2 Environment protection measures and suggestions for the construction phase

Table 4.2-1 Construction phase environmental impact and mitigation measures list

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
Society environment	Cultural relics protection	①In the protection scope of cultural relics protection unit, no construction or blasting, drilling, excavation, etc. shall be carried out. ②Training and awareness raising to contractors must be carried out before and during the construction; ③ Enhance construction supervision near those historical sites to avoid careless construction practices; ④ In the construction process, as per relevant cultural relics regulations, if underground cultural relics sites are discovered, the construction organization shall properly protect the site, notify cultural relics management department for rescue and treatment and ensure safe and smooth construction of cultural relics sites.	Contractor	Environmental supervision engineer, independent environmental consultant	Publicity and training provided; Record of randomly discovered cultural relics	Daily
Ecological environment	All projects	(1) Yielding measures This project mainly considers the possible impact of the construction of slow walking systems and the public space on the ecological environment. The construction should reduce the occupation of ground facilities, and the places with dense vegetation should be avoided at the selection of the construction road, the construction camp, etc. (2) Mitigation measures ① Before the construction, the mellow soil of the	Contractor	Environmental supervision engineer, independent environmental consultant	Filed supervision by the environmental supervision engineer; Specifications are followed;	Daily

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		topsoil layer in the area of the acquired land should be stripped, piled up at fixed points and covered with waterproof membrane. After the completion of the construction, the mellow soil may be used as the surface covering soil to recover the construction slash. ② The disturbance to the surrounding ecological environment can be minimized by appropriately arranging the construction site, trying to confine the construction activities to the area of the acquired and occupied land for construction, and transplanting large and tall trees within the area of the occupied land before construction. ③ The inevitable water and soil loss caused by the construction can be minimized by appropriate design of the construction during the construction phase and excavation and filling by phases and areas. ④ Combined with the construction plan in an organized way, to build facilities of grit chambers, drainage ditches, retaining walls, etc. in advance. In order to ensure the stability of the temporary stacking and prevent the water and soil loss during construction, the necessary fences and covers shall be made for the temporary stacking, and at the same time, drainage ditches will be built in the direction where the water comes. During the construction in the rainy season, woven bags and plastic cloth may be used to cover the slope side of the excavated exposed soil and so on to reduce the earth surface erosion caused by the rainwater. ⑤ It is strictly forbidden to dump waste soil and slags into or clean construction equipment by the natural water bodies. ⑥ Raise the awareness of protection of the construction personnel. The construction method and time should be planned well to reduce the disturbance of the construction noise to the wild animals. Management should be strengthened to avoid direct discharge of sanitary sewage and construction wastewater, so as to reduce water pollution and maximize the protection of animal habitats. (3) Recovery measures ① After the completion of the construction, the				

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		temporarily occupied land should be recovered in time, and the appropriate collocation of trees, shrubs, flowers and grass should be strengthened. ② The tall trees transplanted during the construction phase can be used for afforestation upon the conclusion of the construction. ③ Upon the conclusion of the construction, the bare areas along both sides of the road should be afforested, grass sowing by spraying for soil slopes, and spraying organic matrix for stone slopes. (4) Water and soil conservation measures In accordance with the stipulations of the <i>Law of the People's Republic of China on Water and Soil Conservation</i>, the <i>Regulations for the Implementation of the Law of the People's Republic of China on Water and Soil Conservation</i>, etc., the possible water and soil loss caused by the construction of this project must be protected. The principles and objectives of the water and soil loss control shall meet the general requirements of the state on soil and water conservation and environmental protection. The design of soil and water conservation should be synchronized with engineering design, construction and acceptance. The project construction unit shall bear the cost of controlling the water and soil loss caused by the construction.				
Acoustic environment	Impacts of noise during the construction phase	(1) High-noise construction sites shall be located in areas far away from the environmental sensitive sites; (2) The organization of the construction can be well designed by appropriate layout of construction machines and proper arrangement of the construction intensity. Try to place construction machines far away from surrounding sensitive sites, appropriately position high-noise machines on the construction site, and erect fences around the construction site; temporary machine rooms should be arranged for strong-noise machines on the site like air compressors and diesel engines. (3) Choose low-noise equipment that meets national standards, strengthen the maintenance of such equipment, and avoid the high noise pollution caused by the abnormal	Contractor	Environmental supervision engineer, independent environmental consultant	Filed supervision by the environmental supervision engineer; Specifications are followed;	Monthly

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		working of such equipment; (4) In accordance with the <i>Emission standard of environment noise for boundary of construction site</i> (GB12523—2011), the construction time shall be appropriately arranged and the construction machines with strong noise are forbidden to work near residential areas at night (22:00 to 6:00); where under special circumstances it is necessary to conduct continual construction, the prior approval of relevant departments must be obtained and the prior communication with residents shall be conducted; (5) Night construction operations which may emit noise pollution other than urgent repair and emergent rescue shall be prohibited at the area with dense noise sensitive buildings within 15 days before and during the college entrance examination and the senior high school entrance examination, and the construction operations which may produce environmental noise pollution shall be prohibited within the area of 100m around the examination rooms during the college entrance examination and the senior high school entrance examination; (6) The passing time of the construction vehicles should be coordinated during the construction phase. With busy existing traffic, the construction unit, the construction party and the traffic administration shall strengthen their communication and coordination to avoid traffic jams. During the transportation at night, measures of slowing down and no honking will be taken. Strengthen the maintenance of construction machines; (7) Some existing roads within the project area will be used to transport construction materials, earth and stone during project construction, and attention should be paid to the appropriate arrangement of the construction material transportation time. When vehicles pass the road sections of residential areas and schools, measures of slowing down and no honking should be taken. (9) Minimize the environmental noise hazard caused by the construction by optimizing the construction plan and appropriately arranging the construction period; at the				

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		construction bidding, the measures to reduce the environmental noise pollution shall be listed in the construction organization design and defined in the contract. (10) Operators and construction personnel on site should control working hours and take self-protection measures as per the Occupational Health Standard, for example, wearing earplugs, helmet, etc. (11) The supervision unit shall supervise the noise during the construction phase, be equipped with a certain amount of simple noise measuring instruments and monitor the residential areas near the construction site to ensure that they will not be impacted by the noise exceeding the standard.				
Atmospheric environment	All projects	(1) The construction unit shall, in accordance with the technical specifications for the prevention and control of dust pollution, formulate the prevention and control plan for dust pollution in combination with the actual situation of a specific project, and report to the municipal administrative department and the administrative department responsible for supervision and management of the dust pollution of this project respectively for recording three working days before the commencement of the project; (2) Promoting the wet operation during the construction, erecting the watering for dust prevention supporting devices on the construction site, and strengthening the watering for dust prevention. The entrance and exit for transport vehicles should be properly arranged on the construction site, the tires of the vehicles out of the construction site must be washed for soil at the exit, and the wastewater from such washing should be treated by establishing sedimentation tanks. (3) Building hard enclosed fences before the construction of the road section involving sensitive sites, which shall be not lower than 1.8m. (4) The enclosures of not lower than the height of the stacked materials shall be erected for such materials easy to rise or scatter as cement, mortar and plaster stacked in the open air or the construction wastes which cannot be cleared and transported within 48h, which shall also be covered; it is forbidden to throw construction wastes or materials easy to	Contractor	Environmental supervision engineer, independent environmental consultant	Filed supervision by the environmental supervision engineer; Specifications are followed;	Random sampling during peak construction period

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		rise or scatter from a places higher than 3m; bulk materials (cement, river sand, etc.) shall be enclosed (covered or sheltered) for transportation. (5) The sites that may be idle for more than 3 months should be covered, simply paved or afforested; after the completion of the project, the construction waste shall be removed within 10 days from the date of application for acceptance of the project completion; (6) The construction site should be equipped with the watering cart for watering in dry weather on the construction site, and focus on the communities and sub-districts affected by the project construction; (7) Use commercial concrete, and the construction site shall not be equipped with large concrete mixing stations which are not necessary for the process. Modified asphalt concrete shall be used for road surface, and the construction progress shall be accelerated at paving. The construction machines and plant shall be regularly maintained to keep them in good condition, and reduce the exhaust gas and pollutant emission from construction equipment. (8) Construction personnel use the liquefied gas (LPG) as their living fuel.				
Surface water environment	All projects	(1) Sanitary sewage from constructors The sanitary sewage produced by the constructors is strictly forbidden to be discharged directly into the natural water body. The river beach should be avoided at construction site selection (for example, the beach under Dafosi Bridge). If it is impossible to connect with the existing municipal sewage pipe network, the sewage should be regularly sucked by the fecal suction truck to the sewage treatment plant for treatment after being collected and pretreated by the biochemical pool; if the municipal sewage pipe network can be connected, the sewage shall be discharged to the municipal sewage pipe network after being collected and pretreated by the biochemical pool. It is suggested that the construction unit should try to rent the local residences when constructing the construction camp. If it is indeed necessary to construct temporary	Contractor	Environmental supervision engineer, independent environmental consultant	Filed supervision by the environmental supervision engineer; Specifications are followed;	/

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		construction residences, the construction camp should be arranged within the permanently acquired land. (2) Construction wastewater The wastewater produced by the project is mainly the concrete curing wastewater in the supporting road construction, the wastewater from washing the transportation vehicle tires, the oily wastewater produced by the maintenance of the construction machines, etc. The construction wastewater will be reused or used for reducing dust in the construction site and roads after the treatment of the oil separation and grit chamber erected in the construction site, without being discharged outside. (3) Management measures The environmental protection education as to the construction site and the construction camp should be carried out for the construction personnel to make them understand the importance of water resources protection. Reasonable construction procedures should be developed for efficient organization of construction operations, and the construction management and engineering supervision should be strengthened. Construction machines must be strictly inspected to prevent oil leakage polluting water body. Construction materials such as oil and chemicals should not be piled near the surface water body, and the canvas should be prepared as temporary shelter. During the construction, the plastic film or non-woven fabrics should be applied to cover the excavation and filling slopes without protective measures, topsoil stockpiling location, stockpiling yard and the like, and measures like woven soil bags as fence and intercepting ditches should be taken around the topsoil stockpiling location and the stockpiling yard. Scientific, reasonable, efficient and strict construction management will help to reduce the impact of construction phase on the surrounding surface water environment. (4) Others ① The principles of “water for multiple usages, recycling and water saving” shall be implemented in the process of construction, and efforts should be made to reduce				

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		the discharge of wastewater. ② The management of construction machines should be strengthened to prevent moving, false use, dripping and leaking of the machines.				
Solid waste	All projects	Solid wastes during the construction phase shall be treated under the principles of “gathering together, separate treatment and recycling”. Waste slags will be directly transported to surrounding legal slag disposal fields (for example, Nan'an District Yinglong Slag Disposal Field, Nan'an District Changsheng Refuse Landfill, isolating green belt land reclamation spoil ground, etc.). Transport vehicles for waste earth and stone are prohibited from over-speed and overload; at the same time, fences and covering measures will be taken to prevent the waste slags from falling on the road to intensify the impact of the rising dust. The project plans to take measures of collection at fixed points and regular clearing and transportation for the municipal solid wastes during the construction phase. At the construction camp, the management of municipal solid waste sorting will be adopted. Special people will be employed to regularly clear up the waste which will be delivered to the nearby refuse treatment station for treatment, and shall be prevented from scattering on the way to the station. At the same time, special attention should be paid to the maintenance and management of the temporary dump sites, and prevention of the wastes from scattering everywhere caused by stacking wastes randomly, and at the same time, spray germicides and pesticides to the stacking point to reduce the breeding of mosquitoes and germs.	Contractor	Environmental supervision engineer, independent environmental consultant	Filed supervision by the environmental supervision engineer; Specifications are followed;	Daily

4.3 Environment protection measures and suggestions for the operational phase

Table 4.3-1 Operational phase environmental impact and mitigation measures list

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
Surface water environment	All projects	The wastewater during the operational phase is mainly the sanitary sewage produced by urban residents at the public space, which will be discharged into the municipal sewage pipe network. The management of the drainage facilities of the project road should be strengthened, with regular inspection and maintenance maintained, and warning signs of “slow down and safe driving” are erected along the road.	World Bank PMO, the Owner	Nan'an District Environmental Protection Bureau	Specifications are followed;	/
Atmospheric environment	All projects	(1) Afforestation: the construction of green belts of the project should be improved. The points, lines and planes should be integrated and trees, shrubs, flowers and grasses should be appropriately matched. The function of absorption of the vegetation should be used to mitigate the impact of the exhaust gas on the two sides of the project. (2) Reducing road damage: the specifications and load of vehicles on the road shall comply with relevant regulations. The dust prevention measures should be taken for damaged road surface in time which should be repaired within a month. (3) The vehicle exhaust emission inspection system will be implemented and the vehicles with their emitted exhaust gas exceeding standard will be controlled for being on road. (4) The public toilet management should be strengthened. Public toilets should be timely cleaned and kept sanitary and ventilated. Afforestation should be made around public toilets to reduce the escape of the bad smell. (5) Biochemical pools should be equipped with exhaust funnels to lead the bad smell above the ground for emission, with the emission height of 1m, in the form of shutter type, and surrounded by enclosed green space.	World Bank PMO, the Owner	Nan'an District Environmental Protection Bureau	Specifications are followed; Environmental monitoring plan prepared	Quarterly
Acoustic environment	Link road	(1) Traffic management measures ① The road should be maintained regularly to improve the pavement smoothness and reduce the road traffic noise. ② Strengthen the management and maintenance of vegetation in green belts. In case of unrecoverable dry and dead plants, additional planting should be made timely to guarantee the noise reduction effect of the isolation bet. (2) Engineering measures	World Bank PMO, the Owner	Nan'an District Environmental Protection Bureau	Specifications are followed; Environmental monitoring plan prepared	Quarterly

Links and factors	Potential impacts/issues	Mitigation measures	Implementation responsibilities	Monitoring responsibilities	Monitoring indicators	Monitoring frequency
		① Plant protective forest belts of trees along both sides of the road, reserve special noise monitoring and treatment funds, and strengthen monitoring during the operational phase. If the noise of the operational phase disturbs people, the residences and schools affected by excessive noise should be additionally equipped with sound insulation windows which can reduce noise by 15 to 20dB (A) and thus the impact of the traffic noise of the operational phase on residents and schools can be reduced greatly. ② The areas at two sides of part road sections of the road project of this project have been planned to be residential land and commercial & residential land. The Assessment requires that the installation conditions of noise barriers along both sides of such sections should be reserved so as to determine whether noise barriers should be erected according to the actual impacts when new buildings are planned along both sides of the road. ③ All the road surfaces of the road sections in Nan'an District are made of porous asphalt pavement, to further reduce the impacted scope of traffic noise.				

5. Environmental supervision and monitoring program

5.1 Goals, scope, and stages

Environmental supervision is an important means to ensure the effective implementation of the environmental management plan. The goal of environmental supervision is to fulfill the obligation of environmental supervision, and serve the project independently, fairly, scientifically and effectively; implement all environmental regulations; and ensure that the project is in accordance with Chinese domestic laws, regulations and policies, the World Bank's technical standards and specifications, and approved design documents, tender documents and supervision and the construction contract, and complies with all the environmental protection and management requirements in the design, construction and operation.

As contracted, every engineering supervision company shall appoint at least one professional environment supervision engineer to supervise the Contractor's work on environmental protection in stages.

The environmental supervision and regulation covers the construction area of the project and the densely populated areas of the project. The environmental supervision and regulation covers the whole process of the construction, including: Construction preparation stage, construction stage and completion stage.

5.2 Environmental management content

5.2.1 Environmental supervision before construction:

Prior to construction, the Environment Supervision Engineer should ensure the following work:

Evaluation of the pollution control mechanism: review of treatment and disposal measures for sewage, wastes and solid wastes discharged during construction, including technical options and feasibility.

Review the Contractor's construction land plan to ensure that it contains the following measures:

- (1) Measures to keep roads passable;
- (2) Other measures to interfere with and impair minimization.

Review the environment protection clauses in the construction contract: according to the contract, the Contractor shall meet all requirements for environment protection. During construction, the Contractor shall ensure that supervision, inspection and testing are performed to minimize the pollution during construction.

5.2.2 Environmental supervision during construction.

The Environment Supervision Engineer shall supervise the site by stages; for example, whether the construction is carried out in accordance with the provisions of the environmental protection, and whether any provisions have been changed without permission. By monitoring check whether the operation during the construction meets the requirements of environment protection, and whether the project meets the standards of environment protection, and guarantee the effective implementation of such measures. Main content includes:

Supervision over the transportation of the remaining materials, the transportation management, the Contractor's construction plan to ensure the access to the communities or commercial shops, and pedestrian safety measures, etc.

Soil conservation measures should be supervised and water pollution should be minimized during construction. Measures include:

- (1) Soil conservation;

- (2) Spoil disposal;
- (3) Implementation of temporary and long-term erosion control measures;
- (4) Reduce precipitation measures (sedimentation tanks and sediment walls);
- (5) Ensure that the designed runoff control measures can be used at appropriate places;
- (6) All sewage treatment facilities are in good condition.

Supervision over production and sanitary sewage treatment: Inspect the production and sewage sources and the progress of sewage treatment and disposal, verify the treatment procedures and final treatment sites, and check and monitor the compliance of the treatment measures with the approved emission standards.

Environmental supervision of air pollution: the air pollution in the project area is mainly caused by the emission of the vehicle exhaust and the dust produced during the construction. Ensure that the Contractor has strictly implemented the dust control measures.

Environmental supervision of noise: Noise reduction measures shall be based on engineering design parameters and permissible noise values.

Environmental supervision of solid waste disposal: the disposal of solid wastes must meet the local requirements of solid waste disposal; take effective cleaning measures to ensure clean and tidy construction site. The Environment Supervision Engineer will also supervise the process of waste slag transportation by the construction waste transportation agency.

Environmental supervision of greening programs: Vegetation protection measures, especially the protection of trees and the implementation of the transplanting measures, and greening programs should also be implemented.

Environmental supervisions pertaining to safety and sanitation: ensure that there are adequate safety and sanitation measures in compliance with relevant laws and regulations.

5.2.3 Supervision during the stage of completion

The Environment Supervision Engineer shall supervise and manage the environmental recovery and the operation of all the pollution prevention and control equipment, including:

Supervise the prepared documents of construction completion;
Organize the first inspection;

Assisting the World Bank Project Management Office in organizing the project completion acceptance;

Prepare final report of project environmental supervision;

5.2.4 Environmental management during operational phase

The project owner is responsible for the organization and implementation of the environmental monitoring during the operation period.

5.3 Environment monitoring plan

5.3.1 Purpose

The purpose of the environmental monitoring plan is to: monitor the surrounding environmental quality and pollution emission, inspect the implementation of the measures, and provide evidences for environmental mitigation and corrective actions.

5.3.2 Implementation responsibilities

Environmental monitoring during the construction and operation phases will be carried out by a qualified environmental monitoring agency commissioned by the Project Owner.

5.3.3 Environment monitoring plan

As per characteristics of the Project and all construction and operational phases, Table 5.3-1 lists monitoring plan during the project construction and operational phase.

Table 5.3-1 Implementation of the environmental monitoring plan during the construction and operational phases

Category	Item	Monitoring plans by phases	
		Construction phase	Operational phase
Acoustic environment	Monitoring location	The operation site with a large amount of operating equipment, especially in the area near the main sensitive sites.	Guoji Xincheng of Yangguang 100, Yangguang lvzhou, Danzishi New Street, Dormitory Buildings of No. 11 Secondary School, Teaching Buildings of Longmenhao Primary School, R&F Modern Plaza, Xingxin Jiayuan, Shangxin Shanshui, Shenghuiyuan, etc.
	Monitoring factors	Equivalent continuous sound level (L_{Aeq})	Equivalent continuous sound level (L_{Aeq})
	Monitoring frequency	Once/Month	Once/Quarter
Air quality	Monitoring location	The operation site with a large amount of operating equipment, sensitive areas or non-paved road or open space near sensitive environment.	Nanping Regular Monitoring Point, Chongwen Road
	Monitoring factors	PM ₁₀	NO ₂ 、CO、PM ₁₀
	Monitoring frequency	To perform random sampling during the peak construction period	1 day per quarter
Surface water environmental	Monitoring location	500m downstream of the Dafo Temple Bridge of Yangtze River	/
	Monitoring factors	SS , petroleum, pH, BOD ₅ , COD	/
	Monitoring frequency	Once/Month	/

5.3.4 Environment monitoring report

(1) Environment monitoring report during the construction phase

The construction period of the project is about 32 months, according to the different stages of construction. As per Chinese environment management regulations and business policy requirements of World Bank, the Owner shall prepare Environment Monitoring Report and submit it to World Bank and Nan'an District Environmental Protection Bureau. The purpose of the report is to make environmental protection department confirm that all environmental protection measures are implemented as per relevant requirements of approved environmental monitoring plan so as to control adverse environmental impact in the project plan.

Environmental monitoring report shall include:

- ① A brief description of the project progress;
- ② Setup and duties of environment management organizations;
- ③ The content and methods of the main construction, the environmental impact caused and mitigation measures, and the implementation of the measures;
- ④ Environment monitoring report;

⑤ Public complaints and solutions.

According to construction management provisions, the Contractor and (Environmental Supervision Engineer) ESE shall submit the periodic environmental report to the Owner during the construction phase.

(2) Environment monitoring report during the operational phase

After the proposed project is put into operation, as per the monitoring plan, World Bank Loan Project Office shall entrust environment monitoring station with qualification to perform environment monitoring. Meanwhile, the annual environmental monitoring report is prepared, and its contents include: The establishment of the environmental management organization, operation status of the project, the implementation of environmental prevention measures as required by the Environmental Protection Bureau, environmental monitoring (date, frequency, locations, methods, applicable standards, etc.), statistical analysis results of monitoring data and necessary follow-ups. The prepared environment monitoring report shall be submitted to Nan'an District Environmental Protection Bureau and World Bank.

6 Contractor's environmental specifications

Note: This Contractor Environmental Specifications will be included in the bidding documents and civil works contracts. As the standard bidding documents (SPD) for national competitive bidding (NCB) is being revised when the ESMP is being prepared. In case the standard SPD has been officially adopted when procurement of civil works starts, relevant provisions in the SPD, such as employers' requirement will be adopted.

The *Contractor Environmental Specifications* provides a set of guidelines, processes and procedures to ensure that the ecological environment is not to be impacted by the Contractor's activities during the implementation of the project. The Contractor shall follow the guidelines set forth in the document. General environmental issues in connection with the Contractor's activities include:

- (1) Site management
- (2) Storage and handling of fuel and materials
- (3) Dust and noise hazard control
- (4) Sewage management
- (5) Waste management

For details of environmental issues related to specific project activities (for example, water and soil conservation plans), see the following sections.

6.1 Contractor's environment protection plan

The Contractor shall hold copies of the *Environmental Management Plan* and shall include the *Environmental Management Plan* in the tender documents. Prior to the commencement of construction, the Contractor shall submit an *Environment Protection Plan* for the construction site and pertaining to its operations to the Environment Supervision Engineer, external environmental management consultants and the Owner for review. Such environment protection plan should cover general environmental impact mitigation measures (as well as specific mitigation measures for response to emergencies), mainly including (but not limited to) the following:

- (1) The general plan of the construction should indicate the operation area, material storage area, fuel storage area and fuel supply area, parking lot, equipment maintenance area and camp area;
- (2) Waste management plan;
- (3) Dust control plan;
- (4) Noise control plan;

6.2 Site facilities

Make sure the construction camp is separated from the surrounding industries. The Environment Supervision Engineer shall be responsible for the production and approval of the construction plan.

6.2.1 Labor employment

- (1) If appropriate, local labors should be given priority.
- (2) The Contractor shall disclose the locations of its operations to the sub-districts and communities in Nan'an District.
- (3) Construction workers and the other staff members should have legal employment contracts.

- (4) The Contractor shall provide construction workers with education and training in environment protection and occupational health and safety.

6.2.2 Requirements of construction camps

- (1) The Contractor shall provide the construction workers with safe and suitable accommodations.

(2) Construction camps should be equipped with separate and complete bath facilities (toilets and shower rooms) respectively for male and female workers. Toilets must be well supplied with water, soap and toilet paper. All these facilities are required to be clean, sanitary and available. Toilets must be labeled with “men” and “women” .

(3) The kitchen in the construction camp should be supplied with clean water and have good sanitary conditions.

(4) The sanitary sewage of the camp shall not be directly discharged to any water. If it is impossible to connect with the existing municipal sewage pipe network, the sewage should be regularly sucked by the fecal suction truck to the sewage treatment plant for treatment after being collected and pretreated by the biochemical pool; if the municipal sewage pipe network can be connected, the sewage shall be discharged to the municipal sewage pipe network after being collected and pretreated by the biochemical pool.

(5) Construction camps should be equipped with emergency medical facilities. First-aid equipment shall be provided for all camps and managed by special personnel. The first-aid personnel should receive complete first aid training, obtain relevant qualifications, and are able to transfer the injured or patients to the local hospital in time. The above medical and health facilities should be replenished as soon as they are used.

6.3 Code of conduct

The *Code of Conduct* for construction workers should be developed to emphasize the appropriate behavior, prohibit the drug abuse and alcohol and comply with relevant laws and regulations to reduce the impact on society. The publicity and notice of the *Code of Conduct* should be communicated to every worker. Local communities should also be informed of the *Code of Conduction* of the construction workers. Anyone who fails to observe the Code of Conduct shall be subject to disciplinary measures. The *Code of Conduct* includes but is not limited to the following measures:

- (1) All staff members shall comply with national laws and regulations;
- (2) Dangerous goods and dangerous weapons are prohibited on the construction site;
- (3) Pornographic materials and gambling activities are prohibited on the construction site;
- (4) Fighting is strictly prohibited;
- (5) Not to hinder the living and production of neighboring areas and local people;
- (6) Local traditional culture, customs and traditions should be respected.
- (7) No smoking unless in designated areas;
- (8) Appropriate dressing and personal sanitation standards;
- (9) Proper accommodation and sanitary conditions;
- (10) Follow the relevant *Code of Conduct* when visiting neighboring areas and local people.

The following behaviors are prohibited in the construction site and its surrounding areas:

- (1) Harming the wildlife and villagers' livestock in adjacent areas;
- (2) Capturing protected animals or picking protected plants;
- (3) Buy and eat protected animals;
- (4) Impact or destroy objects of historical or architectural value;
- (5) Outdoor fire;
- (6) Drinking during working hours;
- (7) Maintain machines (oil and lubricant supply) outside the designated area;
- (8) Dumping rubbish outside the designated areas;
- (9) Reckless driving on local roads;
- (10) No safety clothing during construction (for example, safety shoes and helmet);

- (11) Having an impact on the people nearby;
- (12) Leakage of pollutants like oil;
- (13) Incineration of garbage.

If any contractor, office worker or other staff member is found to have violate the above rules, the person concerned shall be given different levels of disciplinary punishment from verbal criticism to the termination of labor contract.

6.4 Health and safety

- (1) The Contractor shall ensure that the project meets all national and local safety regulations and other damage prevention measures;
- (2) Prior to construction, the Contractor should provide safety training for the workers;
- (3) There should be adequate lighting both in the daylight and at night;
- (4) The enclosure should be built around the site to prevent disturbance and checked and maintained during construction.
- (5) Without the approval of the Contractor's managers, people without fixed duties shall not enter the construction camp;
- (6) Construction camps should be equipped with fire extinguishers and other fire protection equipment;
- (7) The Contractor shall provide enough personal safety protection devices for the construction workers (for example, goggles, protective gloves, protective masks, dust guards, safety helmets, ear protectors, helmets, etc.), and ensure they are used in the construction site;
- (8) Safety procedures, emergency plans and emergency contact information should be displayed on the construction site bulletin board;
- (9) All places with possible danger should give warnings explicitly;
- (10) The safety protection distance shall be determined according to relevant regulations;
- (11) The Contractor shall take all appropriate measures to prevent risks and ensure that fire protection equipment is provided for the construction site and all camps;
- (12) Any engineering requiring open fire may only be carried out at the place as approved by the Environment Supervision Engineer and under his supervision. At the same time, the corresponding fire protection equipment should be put in place;
- (13) The Contractor shall provide physical examination to the construction workers every year;
- (14) The Contractor shall also provide trainings in basic personal hygiene and epidemic prevention, including respiratory and infectious diseases;
- (15) The Contractor shall carry out education activities on disease prevention and treatment (especially the protection of AIDS and venereal diseases), including the publicity at the construction site and adjacent areas in the form of notices and training classes;
- (16) The Contractor shall provide the construction workers with basic first-aid services and emergency measures;
- (17) The Contractor shall erect necessary warnings and road speed reduction devices on the construction roads near local communities (if any) to ensure the traffic safety of the nearby residents.

6.5 Storage of fuel, oil and hazardous and noxious substances

- (1) All the fuel at the construction site shall be stored and fenced; the storage area shall be 110% of the fuel storage containers. The fuel storage area shall not be near any source of water (namely, up to 100m from the source of water);
- (2) Dangerous goods should be stored in a designated storing device. Provisional storage regulations should be developed for dangerous goods like fuel, oil and paint.
- (3) Such storage area is for personnel concerned only;
- (4) Such storage point should also be protected from vehicle damage and regularly checked

for leaks, damage and contamination;

(5) The maintenance of machines and equipment shall be conducted only in the Contractor's camp. The operating surface (the concrete floor within the enclosed area) must be properly designed to ensure that oil and fuel are collected in the right containers. In case of oil/fuel leakage, the contaminated soil must be moved to the duly approved site for disposal;

(6) To prevent soil and water pollution or erosion by grease, oil, fuel, solvents and chemicals, corresponding preventive measures must always be taken;

6.6 Waste management

(1) During the construction, the Contractor must dispose of the site waste from time to time to the approved waste disposal equipment in an appropriate manner. Construction waste stacking should be minimized as far as possible.

(2) The municipal solid wastes generated by the activities at the Contractor's Camp shall be completely placed in the garbage can (210L steel drums or plastic drums) or the garbage dump car. The Contractor shall ensure that such containers are emptied once a week or when necessary.

(3) All wastes should be placed in the trash can or the waste dump car immediately. No littering in the working area or the Contractor's camp.

(4) Construction wastes must be stored in the Contractor's camp and handled by the Contractor. The contaminated construction scrap must be treated separately.

(5) Incineration of garbage is prohibited on the construction site.

6.7 Wastewater and storm water management

(1) The wastewater from the construction site and camps should not be discharged directly into the surface water body;

(2) If it is impossible to connect with the existing municipal sewage pipe network, the sewage may be regularly sucked by the fecal suction truck to the sewage treatment plant for treatment after being collected and pretreated by the biochemical pool; if the municipal sewage pipe network can be connected, the sewage may be discharged to the municipal sewage pipe network after being collected and pretreated by the biochemical pool.

(3) Rainwater shall not be discharged into the river unless its energy dissipation is measured;

(4) The storm runoff water from the construction sites (temporary drainage facilities) should be distributed equally as far as possible; and its flow rate should be reduced by using gabion boxes, the ripple beds and the low-lying areas.

6.8 Noise control

(1) Limit the construction time in the daytime;

(2) When the construction near local communities is conducted on weekend, only those activities without noise are permitted;

(3) Site workers, visitors and construction workers must be equipped with appropriate hearing protection devices to avoid the impact of the noise on hearing;

(4) The Environment Supervision Engineer must regularly inspect the site to ensure that it is in conformity with the *Occupational Health and Safety*.

6.9 Information communication with the public during the construction phase

Public engagement and complaint registration:

(1) During the construction, the Contractor should maintain open communication with the local government and the people of relevant communities;

(2) Prior to construction, the Contractor shall disclose the project information to the affected parties (for example, local governments, businesses and residents) in the form of a community meeting;

(3) All construction sites shall be marked with relevant project information, including but not limited to:

- ① Project overview
- ② Construction program:
- ③ Major construction activities:
- ④ Major environment problems and mitigation measures;
- ⑤ The name and telephone number of the Project Manager, Supervision Engineer and environmental protection personnel;

(4) The Contractor and the Environment Supervision Engineer shall communicate with the main sensitive receivers regularly to minimize the adverse effects on them;

(5) All contractors shall provide workers with training in relation to the maintenance of neighboring relationship, communication, local customs and codes of conduct.

(6) Information on complaint channels should be posted at the site entrance;

(7) The office of the construction site shall have a complaint register. All complaints, problems and related issues should be included in the feedback report and shall be reviewed by the Environment Supervision Engineer and the Project Owner units;

(8) Complaints that need to be corrected must be communicated to the parties concerned to ensure that the complainant is satisfied.

6.10 Physical cultural resources

(1) It is to provide workers with education of historical relics and the training pertaining to the discovery and protection procedures of historical relics.

(2) If relevant resources are found;

① The Contractor shall immediately stop construction and protect the site;

② Report to the Environment Supervision Engineer and the Owner as well as local culture and resource authorities;

③ During the investigation of local authorities, the Contractor shall take appropriate measures to protect the sites of historical relics and shall implement weather protection measures;

The Contractor may not resume construction unless the relevant authorities have approved.

7. Information disclosure and public engagement

7.1 Public engagement

Public engagement has been extensively promoted during the preparation of the Environmental Impact Assessment (EIA) and the Resettlement Action Plan (RAP), whereby public concerns have been reflected in EIA/the Environmental Management Plan/ the Resettlement Action Plan.

To minimize the impact, communication activities with the affected groups of people will continue throughout the project. The purpose of communication is to provide a two-way information channel, through which the project progress and the implementation of the Environmental Management Plan can be promoted to the affected groups of people, so that the feedback from these groups about the projects under construction can be communicated to the Contractor and the Project Owner unit in a timely manner.

The Contractor shall disclose the information with regard to the content of the project, the main environmental issues and mitigation measures, according to the contact information of the recipient in the project construction site.

The *Resettlement Action Plan* also establishes a grievance mechanism to address public concerns about land acquisition and livelihood compensation.

7.2 Complaint handling procedure

During the land acquisition and relocation, the following measures should be taken to reduce the complaints of the relocated people: 1) widely publicizing the policies on land acquisition and relocation, with project implementing units, demolition agencies and local governmental departments interpreting details of such policies to the affected people in the form of meeting, discussion and household surveys to make them know the relevant principles, regulations, relocation and resettlement compensation standards, etc.; 2) intensifying information disclosure, through relevant media, bulletin boards, etc., trying to disclose the data pertaining to loss, the resettlement agreement conclusion, the granting of resettlement compensation, basic information on the resettlement housing, the relevant information of resettlement institutions and other related information to the affected people to accept their supervision; and 3) strengthening communication and consultation with the affected people. Project implementing units, demolition agencies and local governmental departments should seriously listen to the opinions and requirements of the relocated people, sincerely communicate and negotiate with them, help them to solve their difficulties and problems during the demolition and relocation in a timely manner, meet their reasonable requirements as far as possible, and address the conflict in the bud.

During the preparation and implementation of the resettlement plan for the affected people in this project, the engagement of the affected people and the relocated units will always be emphasized, and the grievance mechanism is to be developed. When those affected by the project are not satisfied with the compensation, or they suffer unreasonable and unfair treatment in the process of the resettlement, they may seek redress by relevant procedures.

7.2.1 Complaint handling procedures in land acquisition and resettlement

Because the affected people have participated in the relocation and resettlement work, enormous controversy over land acquisition and resettlement may not occur. Nevertheless, in order to guarantee the affected people have channels to lodge a complaint on all aspects of the land acquisition and resettlement, this project has developed grievance mechanisms respectively for different types of land acquisition and resettlement projects during the preparation and the implementation of the Resettlement Action Plan (RAP).

(1) Rural collective land acquisition and relocation (including houses with limited property rights) grievance procedure

The complaint process will have five phases:

Phase 1: If any affected person has any complaints about the compensation and relocation for the land acquisition and demolition, he may lodge a complaint to the units implementing the land acquisition and relocation (Nan'an District Land Acquisition Office and Tushan Town Construction Management Office). The land acquisition and resettlement implementing unit shall address the complaint within 2 weeks;

Phase 2: If the affected person is not satisfied with the decision of Phase 1, he may apply for mediation to the Town People's Government (or the Sub-district Office). Officers of the sub-districts or towns should resolve the complaint within 2 weeks after the complaint is submitted to the sub-districts.

Phase 3: If the affected person is not satisfied with the decision of Phase 1, he may lodge an oral or written complaint to the superior competent unit for the land acquisition and relocation (Nan'an District Administration of Land, Resources and Housing), or Nan'an District Visiting People Reception Center. In case of oral complaints, they shall be handled and recorded in writing by relevant units. Relevant units shall resolve within 2 weeks;

Phase 4: If the affected person remains unsatisfied with the decision of Phase 3, after receiving the decision, he can lodge a complaint with Nan'an District Administration of Land, Resources and Housing according to the relevant laws and regulations of Chongqing, and request the administrative arbitration, and the administrative arbitration agency shall make an arbitration award within 4 weeks.

Phase 5: If the affected person remains unsatisfied with the arbitration award from the administrative arbitration agency of Phase 4, upon receipt of the decision of the administrative arbitration, the affected person may bring an administrative lawsuit to the people's court on any aspect of the relocation in accordance with the Administrative Procedure Law.

(2) Grievance procedure for acquisition of houses on state-owned land

Phase 1: If any affected person has any complaints about the appraisal price of the house or other aspects, he may lodge a complaint to the units implementing the land acquisition and relocation (Haitangxi Housing Management Office and Danzishi Housing Management Office). In case of complaints about the evaluated house price, the land acquisition and resettlement implementing unit shall inform the evaluation company to jointly interpret the evaluation standards and evaluation results within 2 weeks after receiving the complaint; in case the affected person do not accept the evaluation results, review for evaluation can be conducted; in case of complaints about other aspects, the land acquisition and resettlement implementing unit shall give reply within 2 weeks;

Phase 2: If the affected person dissents from the review result of the housing evaluation of Phase 1, he may apply to Chongqing Municipal Real Estate Price Assessment Committee for appraisal. The Real Estate Price Assessment Committee should give solutions within 4 weeks. If the reply of other aspects is not satisfactory, oral or written complaint can be made to the competent authority of the land requisition and resettlement (Nan'an District Housing Administration). In case of oral complaints, they shall be handled and recorded in writing by relevant units. Relevant units shall resolve within 2 weeks;

Phase 3: If the affected person remains unsatisfied with the decision of Phase 2, after receiving the decision, he can lodge a complaint with Nan'an District Administration of Land, Resources and Housing according to the relevant laws and regulations of Chongqing, and request the administrative arbitration, and the administrative arbitration agency shall make an arbitration award within 4 weeks.

Phase 4: If the affected person remains unsatisfied with the arbitration award from the

administrative arbitration agency of Phase 3, upon receipt of the decision of the administrative arbitration, the affected person may bring an administrative lawsuit to the people's court on any aspect of the relocation in accordance with the Administrative Procedure Law.

The relocated people may sue for any aspect of the relocation and resettlement, including compensation standards. The relocated people will be informed of such channels to lodge a complaint by meetings and other ways so that the relocated people can fully understand their rights to complain. At the same time, media tools will be utilized to enhance publicity and reporting, and the opinions and suggestions of all parties on the work of relocation will be collated and included into documented information, which will be handled by the relocating agencies at all levels in a timely manner. Agencies will accept the complaints and grievance of the affected persons for free, and the reasonable costs arising therefrom will be paid from the unforeseeable costs in the relocation budget.

See Figure 7.2-1 for the complaint flow.

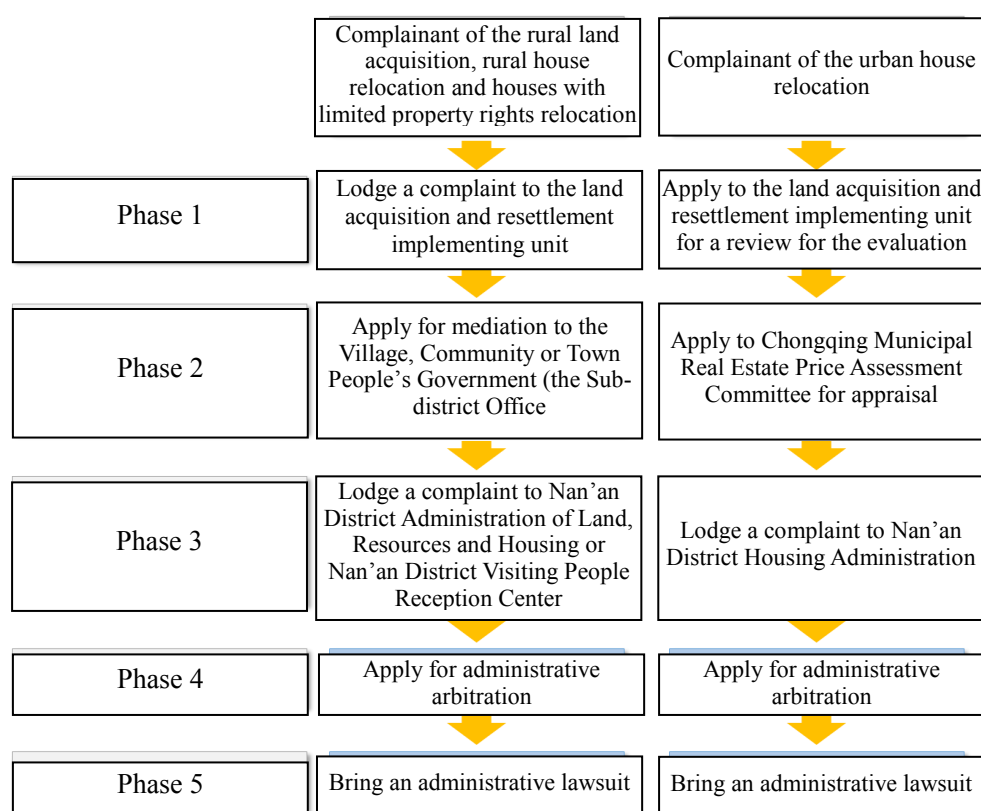


Figure 7.2-1 Complaint flow chart

See Table 7.2-1 for the detailed contract information of the principal of the departments in connection with land acquisition and resettlement.

Table 7.2-1 Key contact of each relevant department

Department	Name	Title	Tel
Nan'an District Land Acquisition Office	Mr Tu	Principal for the land acquisition and resettlement project	15310321520
Danzishi Housing Management Office, Nan'an District Housing Administration	Miss Huang	Civil servants	18725879769
Haitangxi Housing Management Office, Nan'an District Housing Administration	Ran Linjie	Civil servants	13594299423

Department	Name	Title	Tel
Tushan Town Government	Chen Jinzhong	Principal for the regeneration and relocation project of houses with limited property rights	13330222566
Longmenhao Sub-district	Mr Tan	Civil servants	15023201005
Shanghao Community	Miss Liu	Director	15178834794
Lianhua Village	Wu Hengzhong	Director	13883506996
Luozybao Community	Yao Chun	Director	15023382387
Nan'an District Administration of Land, Resources and Housing	Director Hu	Office Director	62803003
Nan'an District Housing Administration	Director Li	Office Director	62980355
Nan'an District Visiting People Reception Center	Director Xu	Principal of the Center	62980355

7.2.2 Complaint handling procedures in project construction.

During the project implementation, if the public has any complaint, they can directly communicate with the Project Owner or the construction unit, and the Project Owner or the construction unit should address such complaint in the shortest time; in case of any difficulty, such time period can be extended accordingly, but the extension should not be more than 2 weeks. At the same time, the Project Owner or the construction unit shall make a written record after the completion of the complaint handling for assessment in later monitoring and assessment.

8 Environment protection training

8.1 Environmental techniques and skills training

(1) In-service training for environmental management personnel

The purpose of in-service training for environmental management personnel is to enhance environment management during the construction phase and operational phase, ensure quality of environmental monitoring and practical and effective environmental management, so as to improve the whole project quality. After participating in position training, environmental management personnel can tell apart main environmental issues during the construction phase, and have a better understanding of existing problems and deficiencies on environmental management, and report to the engineering environmental protection office (department) in time in order to take necessary prevention and control measures as soon as possible. During the construction phase, the project management organization shall invite environmental protection experts or environmental management personnel with similar management experience to explain possible environmental issues and solutions.

(2) Training for construction responsible personnel and construction workers

Before the construction, for the bid winner, the systematic environmental professional knowledge training shall be organized for the responsible personnel and construction workers responsible for construction in order to avoid environmental damages due to misoperation during construction. For contract responsible personnel, the purpose of training is to define the environmental protection responsibilities of the Contractor; for construction workers, the purpose is to ensure the proper construction operation during the construction phase in order to avoid some construction behaviors having unnecessary adverse impacts on the environment. The training is helpful for the project responsible personnel to understand their obligations in environmental protection needed to be assumed and possible consequences of the environmental damage. The construction workers have a better understanding of the protection level and methods for environmental sensitive sites. Based on the actual situation of the Project, the training for construction workers shall last one week.

(3) During the operational phase of Project, the project management organization shall regularly hold environmental protection knowledge training to facilitate the staff to identify possible environment issues of respective posts and take necessary measures. Each personnel shall hold the idea of environmental protection.

8.2 Training methods and training expenses

Table 8.2-1 Environment protection training program

SN	Training objects	Training content	Organizer	Number of trainees	Training and study time	Venue	Budget (RMB 10 thousand)
1	Staff of project office and project environmental protection office (department)	Knowledge in environmental protection management	Construction unit	2 persons	15 days	Chongqing	0.6
2	Staff of project office and project environmental protection office (department)	Visit similar domestic project sites so as to learn the mature environmental management	Construction unit	2 persons	5 days	/	0.2

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SN	Training objects	Training content	Organizer	Number of trainees	Training and study time	Venue	Budget (RMB 10 thousand)
		experience.					
3	Staff of project office and project environmental protection office (department)	Acquire comprehensive knowledge in environmental protection and management and understand the contents of environmental impact report of the Project.	Construction unit	2 persons	15 days	Chongqing	0.3
4	Site responsible personnel from the supervision organization and environmental supervisor of the project	Knowledge in environmental supervision, content of environmental impact report of the Project and corresponding environmental protection design documents of the Project.	Construction unit and supervision organization	1 person	15 days	Chongqing	0.3
6	Main technical leaders and construction responsible personnel of the Contractor	Knowledge in environmental protection and environment management	Construction unit and Contractor	3 persons	15 days	Chongqing	0.9
7	Construction workers	Knowledge in environmental protection of the Project	Construction unit and Contractor	150 persons	5 days	Chongqing	7.5
Total				/	/	/	9.8

9 Environmental protection investments

Budget has been made for implementing *Environmental Management Plan* during the construction and operational phase, as shown in Table 10.1-1. Total budget of environmental investment includes environmental mitigation measures, environmental protection monitoring and management and main works, as well as mitigation and elimination of negative impacts on environment. Notes that many mitigation measures are management practices, and the budget is included in the whole contract and not indicated specifically.

The environmental protection investment estimate of the Project is totally RMB 8.5 million and the total investment of the Project is RMB 1,942,460,000 so the environmental protection investment occupies 0.44% of total investment. See the table below for environmental protection project and investment estimate of the Project:

Table 9.1-1 List of Environmental protection investments

SN	Phase	Environmental factors	Pollution sources	Environmental protection measures	Environmental protection investment (RMB 10 thousand)
1	Construction phase	Sewage and wastewater	Flushing wastewater	Set oil separation and sand settlement pond, and recycle wastewater after treatment rather than discharging out.	50
2			Domestic sewage	Biochemical pools will be set up for collection and preliminary treatment. The construction camps with conditions may be directly connected with the municipal sewage pipe network, and those without conditions can adopt the method of regular suction by fecal suction trucks to the sewage treatment plant for treatment.	30
3		Atmosphere pollutants	Dust	Enhance management, promote wet method operation, set baffle, materials storage yard fence and cover it along the construction site; prohibit throwing materials from high places	60
4		Noise	Noise	Select low-noise equipment; reasonably arrange construction schedule, avoid night construction; reasonably arrange construction machinery and equipment in the site; and set a fence	30
5		Solid waste	Spoil Domestic garbage	Transport spoil to specified slag disposal pit; collect domestic garbage at fixed points and regularly clean it	40
6		Ecological environment	Ecological environment	Arrange construction activities at construction land	40

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SN	Phase	Environmental factors	Pollution sources	Environmental protection measures	Environmental protection investment (RMB 10 thousand)
				scope; before construction, strip surface in the land scope and use it as greening soil after construction.	
7			Water and soil conservation	Excavated materials shall be transported for backfilling; set retaining wall, drainage ditch, ecological protection slope, intercepting drain, sand settlement pond and plant trees and grass	Included in investment for main works
8	Operational phase	Air pollutant	Dust, off-gas	Enhance detection and repairing of motor vehicle, prohibit passage of vehicle with off-gas exceeding standard, maintain road conditions and use plants to purify air	20
9		Noise	Noise	Build asphalt pavement, plant trees and grass, limit speed in residential area and school road sections, set honking prohibition signs, set acoustic screen, reserve noise monitoring and allocate special fund for governance	500
10		Risk prevention measure	/	Speed limit and formulation of emergency plan	/
11	Environmental management	/	Environmental supervision during the construction phase, environmental management maintenance during the operational phase, etc.		80
12	Total				850

Note: the investment is only the environmental assessment estimate, and the actual investment depends on project estimation.