Gulang County-Shuangta Industrial Park Road Project and Xingminxin Village of Xijing Town -S308 Route Road Project

*Environmental and Social Management Plan*
Foreword

The Third Plenary Session of the 17th CPC Central Committee made it clear that China has entered the development stage of "industry promotes agriculture, and city leads countryside", and it has entered an important period of breaking up the dual-structures of urban and rural areas and forming a new pattern of integration of economic and social development of urban and rural areas. This is a further deepening of our party’s understanding of China’s overall development stage and is the basic basis for formulating a rural reform and development policy. In the guiding ideology of promoting rural reforms and developments, the state has clearly pointed out that the integration of the new pattern of accelerating the formation of urban and rural economic and social development should be regarded as a fundamental requirement. It must adhere to the principle of industrial nurturing agriculture, urban support for rural areas, and the principle of “giving more attention to less and more activities” and must always focus on building a new type of relationship between workers and peasants and urban and rural areas as a major strategy for accelerating modernization.

Wuwei is located in the inland area with a lack of mineral resources as well as slow development. Not only is the gap between the economic development of Wuwei and that of the eastern part of China has been widened, but Wuwei’s economic development has also fallen behind the overall development of the western China and Gansu Province. In a regional development pattern where Wuwei would fall behind if it does not advance, it is imperative to find suitable ways for the development of Wuwei. With the support of the central government and the provincial government, Wuwei City has obtained the opportunity for the loan from the World Bank. The obtained loan from the World Bank will be mainly used to support Liangzhou District and Gulang County to speed up the construction of the internal traffic environment, improve the construction of the planned road network, improve the service functions of the entire road network, divert the border traffic and improve the living and ecological environment of residents along the route.

Gulang County-Shuangta Industrial Park Road Project and Xingminxin Village of Xijing Town of Gulang County-S308 Route Road Project meets the requirements of the World Bank loan support project and meets the requirement of the Party’s 18th National Congress to accelerate the development of new urbanization with Chinese characteristics, as well as meets the requirements of regional economic and social development planning. Through the construction of infrastructure for urban and rural development pilot areas, and to improve the level of equalization, rationalization, and sharing of public basic service facilities in both
urban and rural areas, it can not only create more job opportunities for local people, but also enable local people to share the development of urban and rural public infrastructure and services. The results will play a significant role in improving the regional transportation infrastructure, improving the urban and rural living environment, gradually changing the local people's production and life style, narrowing the gap between urban and rural areas, promoting economic and social leapfrogging development, and promoting the integration of urban and rural development. In general, local construction conditions have been met, construction content, construction scale are appropriate, and funding channels and implementation plans are reasonable and feasible; From the perspective of financial evaluation, various indicators meet the requirements, the social benefits are obvious and the loan risk is small. Therefore, project construction is very necessary.

Commissioned by Transportation Bureau of Gulang County, JTSI Group Co., Ltd. was responsible for the preparation of the Initial Design of Gulang County to Shuangta Industrial Park Road and the Initial Design of Xingminxin Village of Xijing Town of Gulang County-S308 Route Road Project.

In May 2017, the Transportation Bureau of Gulang County commissioned our company (Ningxia Zhicheng Anhuan Technical Consulting Co., Ltd.) to undertake the environmental impact assessment of the project in accordance with relevant laws and regulations in China. After accepted the commission, our company organized the relevant staff to analyze and discuss the environmental issues involved in the proposed project and collected data. With the cooperation and support of related departments, the site conducted environmental investigation and monitoring along the proposed route. On this basis, the Environmental Impact Report and Environmental Management Plan of this project are compiled.

During the preparation of the report, we received help and support from Transportation Bureau of Gulang County, the Executive Office of Infrastructure Project Leading Group of Urban and Rural Development Core Area Built by Wuwei City by Using the World Bank Loan. We hereby express our thanks to all of them!
1. Project Description

1.1 Project Background

The 17th CPC National Congress proposed that "coordinating urban and rural economic and social development, building modern agriculture, developing rural economy, and increasing peasants' income are major tasks for building a well-off society in an all-round way". In the Several Opinions of the General Office of the State Council on Further Supporting Gansu's Economic and Social Development (G.F.B.No. 29 Document), it is required that the relevant departments of the State Council should study specific measures to support the economic and social development of Gansu in accordance with the division of functions, guiding Gansu to further crack down the development problems. With the support of the state, Gansu Provincial Party Committee and the provincial government have established the regional development strategy of “center-driven, all-fledged wings, group development and overall advancement” and the grand goal of achieving leap-forward development.

Wuwei is located in the throat of the northwestern strategic channel and the central section of the Xilonghai Lanxin Line Economic Belt. It has obvious geographical advantages, rich history and culture and great potential for development. The new strategic positioning of Gansu Province requires Wuwei City to make adjustments and deepen its development ideas in terms of ecological protection, industrial development and infrastructure construction. It provided a rare historical opportunity for Wuwei to speed up the construction of the core area for the integration of urban and rural development.

In order to realize the leaps and bounds development of Wuwei's economic society, Wuwei Municipal Party Committee and the Municipal Government have deepened the understanding of the city’s situation and made strategic decisions to build a core urban-rural integration development zone in the Liangzhou District and Gulang County corridors where the population and economic advantages are concentrated. The spatial structure of "Axis (Golden Avenue), Shuangcheng (Liangzhoucheng and Dajingcheng), and three groups (Yongfeng group, Huangyang group and Tumen group)" breaks the boundary between urban and rural areas and accelerates urban and rural spatial integration and coordination. Urban and rural development will explore new ways for the formation of a new pattern of urban and rural economic and social integration in traditional agricultural areas, and achieve new breakthroughs in the spatial development model. Wuwei City seized the opportunity and proposed to use World Bank loan to accelerate the realization of infrastructure construction in
the core area of Wuwei's integrated urban and rural development. Gulang County-Shuangta Industrial Park Road Project and Xingminxin Village of Xijing Town of Gulang County-S308 Route Road Project came into being.

1.2 Project Composition

The Construction Scheme Composition of Gulang County-Shuangta Industrial Park Road and Xingminxin Village of Xijing Town of Gulang County-S308 Route Road Project is shown in Table 1-1.
<table>
<thead>
<tr>
<th>Road Name</th>
<th>Route Direction of Proposed Road</th>
<th>Existing Road Profile</th>
<th>Design Standard</th>
<th>Construction Content</th>
<th>Environmental Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulang County- Shuangta Industrial Park Road Project</td>
<td>The road generally stretches from north to south, starting from East Ring Road and ending at Gulang Industrial Concentration Zone. The route passes through villages of Chenjiazhuang, Donggou, Wangjiazhuang, Zhangjiamo and Shanghuzhuangzi and other villages with a total road length of 6.02km.</td>
<td>Gulang County- Shuangta Industrial Park Road Project is a reconstruction and extension project, the status of the reconstruction and extension road is level III highway technical standards, it is located north from east ring road of the county, south to Gulang-Shuangta road with the roadbed width of 7.5m, the road width of 6m and the pavement type of cement pavement.</td>
<td>The planning for the Gulang County-Shuangta Industrial Park Road Project is the urban main road, with the design speed being 40 km/h, the road width being 26m. The specific layout of the cross-section is as follows: 3m (Non-motorized lane) + 2m (Side strip) + 0.25m (Curb strip) + 7m (Motor vehicle lane) + 0.25m (Curb strip) + 1m (Dividing strip) + 0.25m (Curb strip) + 7m (Motor vehicle lane) + 0.25m (Curb strip) + 2m (Side strip) + 3m (Non-motorized lane) = 26m. Asphalt concrete pavement.</td>
<td>Subgrade engineering, pavement engineering, drainage engineering, bridge engineering, culvert engineering as well as greening and lighting engineering.</td>
<td>The road is reconstruction and extension road. The current status is cement pavement. There are many villages along the two sides and the ecological environment is simple.</td>
</tr>
</tbody>
</table>
Xingminxin Village of Xijing Town of Gulang County - S308 Route Road Project

The north of the road starts from K119+410 of Xingminxin Village on the Golden Avenue and the south of it is at K268+792 of S308 Route. The overall length of the road is 6.424km (including 0.758m of long chain).

There is no subgrade and road, and it is a new road.

Uses the technical standards for the urban secondary roads, with the design speed being 30km/h. The road width being 26m, and the specific layout of the cross-section is as follows: 0.5m (Facilities strip) + 0.25m (Curb strip) + 7.0m (Motor vehicle lane) + 0.25m (Curb strip) + 1.0m (Dividing strip) + 0.25m (Curb strip) + 7.0m (Motor vehicle lane) + 0.25m (Curb strip) + 0.5m (Facilities strip) = 17m. The pavement is asphalt concrete pavement.

The project is mainly composed of single projects such as road, traffic, bridges, culverts, crossings and lighting. There are 1 newly constructed bridge, 5 newly constructed culverts and 3 level crossings (1 level crossing intersecting with the first-grade highway, 1 level crossing intersecting with the second-grade highway, and 1 level crossing intersecting with the village road) along the route.

The road is located on the edge of the desert. The ecological environment along the route is simple and there are no sensitive points like villages.
2. Environmental Standard and Protected Target

According to the division of environmental functional areas along the route of the project, the individual division of environmental functional areas and assessment standard for the project are determined as follows:

2.1 Functional Division and Evaluation Standards for Water Environment

The surrounding water area of the project is Gulang River, and the original functional division of Gulang River is Class III water bodies. According to the survey, Gulang River is now a dry river, and during the rainy season there will be water, and no functional area will be divided.

According to the memo issued by Gulang County Water Bureau and the Water Conservancy Management of Gulang River, Gulang County-Shuangta Industrial Park Road Project and Xingminxin Village of Xijing Town-S308 Route Road Project are all not within the scope of the water source of Gulang County.

2.2 Quality Standards for Ambient Air

There is no atmospheric environment functional division along the route of the project. According to the survey, the construction site of the proposed project is located in the rural area and belongs to the second class area, and the Ambient Air Quality Standard (GB3095-2012) is implemented here. According to the requirements of the standard, the ambient air quality along the proposed project is implemented as a level 2 standard. See Table 2-1 for details.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Serial No.</th>
<th>Assessment Factors</th>
<th>Annual Average</th>
<th>Daily Average</th>
<th>Hourly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB3095-2012</td>
<td>1</td>
<td>SO₂</td>
<td>0.06</td>
<td>0.15</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>TSP</td>
<td>0.20</td>
<td>0.30</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>PM10</td>
<td>0.10</td>
<td>0.15</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>NO₂</td>
<td>0.08</td>
<td>0.012</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>CO</td>
<td>-</td>
<td>4.00</td>
<td>10.00</td>
</tr>
</tbody>
</table>

The discharge standards for air pollutants during the construction period of the project shall implement the level 2 standard in the Comprehensive Discharge Standards for Air Pollutants (GB3095-2012); The asphalt fume shall implement the level 2 standards in the Comprehensive Discharge Standards for Air Pollutants (GB16297-1996). See Table 2-2 for details.
Table 2-2 Comprehensive Discharge Standards for Air Pollutants

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Maximum Discharge Concentration Allowed (mg/m³)</th>
<th>Maximum Discharge Rate Allowed (kg/h)</th>
<th>Monitoring Concentration Limit Point for Unorganized Discharge (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particles</td>
<td>120</td>
<td>Height of Exhaust Tube (m) Level 2</td>
<td>Highest point of concentration outside perimeter 1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40</td>
<td>39</td>
</tr>
<tr>
<td>Asphalt Fume</td>
<td>75</td>
<td>15</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>1.3</td>
</tr>
</tbody>
</table>

2.3 Functional Division and Evaluation Standards for Acoustic Environment

According to the classification method of the noise functional area in the *Acoustic Environment Quality Standard* (GB3096-2008), the main functional area in the area where the project is located is defined as the Class-II noise functional area.

As the Gulang County-Shuangta Industrial Park Road Project of the roads in this project belongs to the urban main road, according to the *Technical Specifications for the Division of Acoustic Environment Functional Areas* (GB/T 15190-2014). For both sides of the urban roads, if the temporary street buildings are above the three stories (including three stories), the area facing the road side of the first row of buildings shall be classified as Class-IVa standard applicable area; if the street buildings are the buildings below three stories (including open areas) and the adjacent area is the Class-II standard applicable area, the area of 35±5m outside the red line of the road shall be classified as Class-4a standard applicable area and the Class-II standard shall be implemented for other areas. According to the field survey, the buildings on both sides of the road of the Gulang County-Shuangta Industrial Park Road Project are single-story buildings. However, considering that there are mostly villages on both sides of the road and the villages were built first, and that the acoustic environment functional area of the villages cannot be changed after the completion of the road construction of this project, therefore the Class-II standard is implemented for the acoustic environment. The end of the project is located in the Shuangta Industrial Park. Therefore, Gulang County-Shuangta Industrial Park Road Project is located in some sections of the industrial park and performs Class-III acoustic functional division.

The Xingminxin Village of Xijing Town of Gulang County-S308 Route Road Project is the secondary urban road, and the surrounding environment is simple, with no villages, schools and other sensitive spots along the line, therefore the Class-II standard is implemented for the noise.
Table 2-3 Acoustic Environment Quality Standards (GB3096-2008)

<table>
<thead>
<tr>
<th>Type</th>
<th>Scope of Use</th>
<th>Daytime</th>
<th>Nighttime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class-II</td>
<td>Residential, commercial and industrial mixed areas</td>
<td>60</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 2-4  Emission Standard for Ambient Noise from the Construction Site Boundary (GB12523-2011)

<table>
<thead>
<tr>
<th></th>
<th>Standard value LAeq(dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime</td>
<td>75</td>
</tr>
<tr>
<td>Nighttime</td>
<td>55</td>
</tr>
</tbody>
</table>

2.4 Solid Waste

The solid wastes implement the relevant standards in the Standard for Pollution Control of General Industrial Solid Waste Storage and Disposal Sites (GB18599-2001). The waste asphalt pavement can be used as subgrade materials after crushing, and it shall not be discharged to the external environment.

2.5 Evaluation Standard for Soil Erosion

The evaluation standard for soil erosion implements the Classification and Level Classification Standard for Soil Erosion (SL190-96), see Table 2-5 for details:

Table 2-5 Level Classification Index of Hydraulic Erosion Intensity

<table>
<thead>
<tr>
<th>Level</th>
<th>Erosion Modulus (t/km²·a)</th>
<th>Level</th>
<th>Erosion Modulus (t/km²·a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion I</td>
<td>&lt;500</td>
<td>Erosion IV</td>
<td>5000～8000</td>
</tr>
<tr>
<td>Erosion II</td>
<td>500～2500</td>
<td>Erosion V</td>
<td>8000～15000</td>
</tr>
<tr>
<td>Erosion III</td>
<td>2500～5000</td>
<td>Erosion VI</td>
<td>&gt;15000</td>
</tr>
</tbody>
</table>

2.6 The Security Policies and EHS Guidelines of the World Bank

The project is an urban road and does not involve dam safety or pest management issues. The World Bank’s business policies involved in this project are shown in Table 2-6 and Table 2-7.

Table 2-6 The Business Policies and EHS Guidelines of the World Bank of Gulang-Shuangta Road

<table>
<thead>
<tr>
<th>Business Policies of the World Bank</th>
<th>Whether It is Involved</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP4.01 Environmental Assessment</td>
<td>√</td>
<td>The project construction and operation period shall have some impact on the surrounding environment, and therefore the environmental impact assessment needs to be conducted.</td>
</tr>
<tr>
<td>OP4.04 Natural Habitat</td>
<td>×</td>
<td>The project is located in the areas that have been disturbed by human activities and the EA has confirmed that no endangered species in the project area will be affected by the project.</td>
</tr>
<tr>
<td>Code</td>
<td>Category</td>
<td>Treatment</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>OP4.09</td>
<td>Pest Management</td>
<td>×</td>
</tr>
<tr>
<td>OP4.10</td>
<td>Ethnic Minorities</td>
<td>×</td>
</tr>
<tr>
<td>OP4.11</td>
<td>Cultural Heritage</td>
<td>×</td>
</tr>
<tr>
<td>OP4.12</td>
<td>Involuntary Resettlement</td>
<td>√</td>
</tr>
<tr>
<td>OP4.36</td>
<td>Forest Protection</td>
<td>×</td>
</tr>
<tr>
<td>OP4.37</td>
<td>Dam Safety</td>
<td>×</td>
</tr>
<tr>
<td>OP4.50</td>
<td>International Waters</td>
<td>×</td>
</tr>
<tr>
<td>OP4.60</td>
<td>Disputed Areas</td>
<td>×</td>
</tr>
<tr>
<td>BP17.50</td>
<td>Information Publicity</td>
<td>√</td>
</tr>
</tbody>
</table>
Table 2-7 The Business Policies and EHS Guidelines of the World Bank of Xijing Town Road

<table>
<thead>
<tr>
<th>Business Policies of the World Bank</th>
<th>Whether It is Involved</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP4.01 Environmental Assessment</td>
<td>√</td>
<td>The project construction and operation period shall have some impact on the surrounding environment, and therefore the environmental impact assessment needs to be conducted.</td>
</tr>
<tr>
<td>OP4.04 Natural Habitat</td>
<td>×</td>
<td>The project is located in the areas that have been disturbed by human activities and the EA has confirmed that no endangered species in the project area will be affected by the project.</td>
</tr>
<tr>
<td>OP4.09 Pest Management</td>
<td>×</td>
<td>The project is an urban road project. The road trees will be planted on both sides, but they are all cultivated in rural areas and have a dry and drier climate in northwestern China. The incidence of vegetation is low and there is no need to spray pesticide on tree species. Therefore, this policy is not involved.</td>
</tr>
<tr>
<td>OP4.10 Ethnic Minorities</td>
<td>×</td>
<td>There are no ethnic minorities living in the project construction site.</td>
</tr>
<tr>
<td>OP4.11 Cultural Heritage</td>
<td>×</td>
<td>The project does not involve any relocation of tombs, the relocation of old trees, etc., and there is no cultural relics protection unit in the construction area, but Disposal Procedures for the Discovery of Cultural Relics is required.</td>
</tr>
<tr>
<td>OP4.12 Involuntary Resettlement</td>
<td>×</td>
<td>The Xingminxin Village of Xijing County of Gulang County-S308 Route Road Project does not involve demolition.</td>
</tr>
<tr>
<td>OP4.36 Forest Protection</td>
<td>×</td>
<td>The Gulang County-Shuangta Industrial Park Road Project does not involve any forests within the scope of the project, and therefore the project shall not have any impact on the health and quality of forests. The forest policy is not involved.</td>
</tr>
<tr>
<td>OP4.37 Dam Safety</td>
<td>×</td>
<td>The project content does not involve any dam.</td>
</tr>
<tr>
<td>OP4.50 International Waters</td>
<td>×</td>
<td>The construction site of this project is located in China and does not involve international waters.</td>
</tr>
<tr>
<td>OP4.60 Disputed Areas</td>
<td>×</td>
<td>The project construction sites are all located in Wuwei City, and there is no disputed area.</td>
</tr>
<tr>
<td>BP17.50 Information Publicity</td>
<td>√</td>
<td>This environmental impact assessment has been publicized twice on the website of Gulang Government Portal and a survey with the public participation on the environmental impact has also been conducted.</td>
</tr>
</tbody>
</table>

2.6 Objectives of Environmental Protection

2.6.1 Objectives of Environmental Protection for Air and Acoustic Environment

After a detailed investigation of the project along the route, the proposed project consists of 2 subprojects. Xingminxin Village of Xijing Town-S308 Route Road Project is located on the edge of the desert, and there is no sensitive points of villages along the route. Sensitive spots are mainly from the villages along Gulang County to Shuangta Industrial Park Route Project.

2.6.2 Objectives of Environmental Protection for Ecological Environment

The project affected area is located in Gulang County, Wuwei City. The ecological and
environmental protection objectives of the project mainly include the soil and water conservation of farmland, woodland, natural vegetation, high-filled deep excavation sections and reclaimed materials and the waste slag yard within the road land area. The specific ecological protection targets are shown in Table 2-8.

### Table 2-8 Main Ecological Protection Targets along the Proposed Project

<table>
<thead>
<tr>
<th>Target Name</th>
<th>Environmental Characteristics and Protection Content</th>
<th>Relationship</th>
<th>Major Influences and Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arable Land</td>
<td>Irrigated land, dry land, etc.</td>
<td>Does not occupy arable land</td>
<td>no influence</td>
</tr>
<tr>
<td>Natural Vegetation</td>
<td>The phytocoenosium is relatively poor, the species composition in the phytocoenosium is very simple, and some are composed of a single species.</td>
<td>Distributed across the route, occupy</td>
<td>Land occupation will cause loss of vegetation; impact period is construction period and operation period</td>
</tr>
<tr>
<td>Soil Borrowing and Spoil Ground</td>
<td>Most of the temporary land occupation is wasteland, and a small part is dry land.</td>
<td>Occupy</td>
<td>Disturb the surface, occupy land and destroy existing vegetation; impact period is construction period and operation period</td>
</tr>
</tbody>
</table>

#### 2.6.3 Objectives of Social Environment Protection

The main objectives of social environment protection of the project are the affected villages along the route and the resettlement households for land acquisition and demolition. See Table 2-9 for the objectives of social environment protection of the project.

### Table 2-9 Objectives of Social Environment Protection and Contents Along the Proposed Project

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Protected Object</th>
<th>Main Protection Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Affected villages and schools along the route</td>
<td>Construction makes their daily travel inconvenient; noise, smoke and dust during the construction period affect their living environment; road construction obstruct the travel; impact of noise during operation period, etc.</td>
</tr>
<tr>
<td>2</td>
<td>Land acquisition and relocation households</td>
<td>Resettlement households’ life quality; the implementation of housing resettlement; the willingness of resettled residents, etc.</td>
</tr>
<tr>
<td>3</td>
<td>Cultural relics along the route</td>
<td>No important protected cultural relics units</td>
</tr>
<tr>
<td>4</td>
<td>Gantang-Wuwei Railway</td>
<td>Underneath pass in two places</td>
</tr>
</tbody>
</table>
3. Institution Arrangement

3.1 Environment Management Institution

In environmental management system of environmental management project, environmental management institutions can be divided into project management institutions, implementing institutions, supervisory institutions, advisory service institutions and monitoring institutions. These agencies together constitute a complete project environmental management system, but each undertakes different tasks, taking different responsibilities. The project is carried out under the organization and leadership of the project office to ensure that the construction of the project meets the requirements of relevant regulations of China and the World Bank in terms of working procedures, implementation of pollution prevention and control measures, etc. The details of the setting of project environmental management institutions are shown in Table 3-1.

Table 3-1 Composition Institutions of Environmental Management System

<table>
<thead>
<tr>
<th>Institution Nature</th>
<th>Institution Name</th>
<th>Institution Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Institutions</td>
<td>Project Office of the City</td>
<td>Responsible for management, assigning dedicated environmental managers to take charge of the environmental protection work during the planning, design and implementation phase of the project, confirming the working procedures to meet the requirements of the China and World Bank on environmental assessment and environmental management, supervising the implementation of the environmental management plan, and ensuring the environmental reduction measures were included in the bidding documents and contracts.</td>
</tr>
<tr>
<td></td>
<td>Project Implementation Office of the County</td>
<td>Assign environmental protection specialists, they major task is to accept the completed environmental protection projects after the implementation of the project. They are responsible for the daily environmental supervision and management during the construction period of the project, so as to minimize the adverse impact of the project on the environment to a minimum or acceptable degree, and at the same time make the project environmental benefits can be fully realized; implement the funds required for the project's environmental protection work, and responsible for the compiling and saving of relevant documents.</td>
</tr>
<tr>
<td></td>
<td>Transportation Bureau of Gulang County</td>
<td>Responsible for routine maintenance of roads after implementing and operating the project</td>
</tr>
<tr>
<td></td>
<td>Housing and Construction Bureau of Gulang County</td>
<td>Responsible for routine maintenance of roads pipe network after implementing and operating the project</td>
</tr>
<tr>
<td>Supervision Institution</td>
<td>Environmental Protection Bureau of Wuwei City</td>
<td>It is the government administrative supervision and management institution, it shall supervise and inspect the project work procedures to meet the requirements of China’s environmental management, ensuring that the pollution prevention and control measures in the implementation process shall meet the needs of China's environmental protection.</td>
</tr>
<tr>
<td>Advisory Service</td>
<td>EIA Consulting Unit</td>
<td>Accept the entrustment, compile the Environmental Impact Assessment Report of the project.</td>
</tr>
</tbody>
</table>
Institutions | Design Consulting Unit | Accept the entrustment, compile the feasible research report and construction design plan, and ensure that the measures and plans in the environmental management plan are implemented in the compilation results.
---|---|---
Environmental Supervision Unit | Accept the entrustment, supervise and manage the daily production activities of the construction unit.

Implementation Institution | Civil Engineering Contractor | Equip the site environmental supervision engineers, implement the environmental protection and soil and water conservation contents specified in the contract terms and bidding documents, meet the environmental protection requirements of the World Bank and local environmental protection administrative departments, and compile and submit environmental monthly reports during the construction period.

Monitoring Institution | Environmental Monitoring Institution | A qualified environmental monitoring institutions, it is responsible for the environmental monitoring of the project during the construction and operation period.

### 3.2 Environmental Management Plan

The implementation of this project can be divided into three stages: feasibility research and design stage, project construction stage and project operation stage. Environmental protection measures and institutional arrangements at each stage are shown in Table 3-2 and Chart 3-1.

**Table 3-2 Project Implementation Environmental Management Plan**

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Engineering Project Type</th>
<th>Environmental Protection Measures at the Design Stage</th>
<th>Execution Institution</th>
<th>Environmental Management Plan during Construction Period</th>
<th>Execution Institution</th>
<th>Environmental Management Plan during Operation Period</th>
<th>Execution Institution</th>
<th>Supervision Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulang County-Shuangta Industrial Park Road Project and Xingminxin Village of Xijing Town of Gulang County-S308 Route Road Project</td>
<td>Road construction</td>
<td>See Environmental Protection Stipulations at the Design Stage</td>
<td>Design unit, project office of the Province</td>
<td>See Environmental Protection Stipulations at the Construction Stage</td>
<td>Construct unit is responsible for it</td>
<td>See Environmental Protection Stipulations at the Operation Stage</td>
<td>Transport ation Bureau of Gulang County</td>
<td>Environmental Protection Bureau of Gulang County</td>
</tr>
</tbody>
</table>
Chart 3-1 Environmental Protection Measures and Institutional Arrangements at Various Stages

- Design Unit and Project Office of the Province
- Environmental measures during design stage
- Supervision institution
- Environmental and water protection measures:
  - Contractor
- Construction stage
- Environmental Protection Bureau of Gulang County
- Management Institution: Project Executive Office
- Operation stage
- Daily maintenance of the road: Traffic Transportation Bureau of Gulang County
- Daily maintenance of the road pipe net: Traffic Transportation Bureau of Gulang County
4 Specific Environmental Protection Measures

4.1 Environmental Protection Stipulations at the Design Stage
See Annex 1

4.3 Environmental Protection Stipulations at the Construction Stage
See Annex 2

4.3 Environmental Protection Stipulations at the Operation Stage
See Annex 3

4.4 Environmental Risk Environmental Protection Stipulations
See Annex 4

4.5 Environmental Protection Regulations on Soil and Water Conservation
See Annex 5

4.8 Social Management Plan and Implementation Stipulations
See Annex 6
5. Ability Strengthening and Training

5.1 Training Purpose

The purpose of environmental management training is to ensure the smooth and effective implementation of environmental management, so as to familiarize relevant personnel with the contents and procedures of environmental management, to improve the environmental management personnel's environmental management capabilities, and to ensure the effective implementation of various environmental protection measures. The main targets of environmental ability building are environmental managers and environmental supervisors. Their training is one of the technical support components of the project. At the same time, training of construction institution and construction worker is required during the implementation of the project. Before the commencement of construction of the project, all construction units, management units and building supervisors are required to participate in compulsory environmental, health and safety training.

5.2 Training Objects

The training objects include: the Project Office of the Province, the Project Implementation Office of the County, the representative of main contractors and other personnel.

5.3 Training Content

(1) The mastery and application of the World Bank's environmental policy, domestic environmental protection laws and regulations and environmental standards;

(2) The environmental management model of the World Bank loan project and the environmental provisions in the loan agreement;

(3) Environmental management plan

(4) Duties and relationships among environmental management personnel, environmental supervision personnel, environmental monitoring personnel and contractors;


5.4 Training Plan

The main adverse impact of this project is the environmental impact during the construction period. When the project is carried out, relevant environmental protection personnel must be trained to improve the environmental management technology level of the
project. The details of the training personnel and costs required for this project are shown in Table 5-1.
<table>
<thead>
<tr>
<th>Training Unit</th>
<th>Organizational Unit</th>
<th>Training Number</th>
<th>Training Stage</th>
<th>Training Time</th>
<th>Training Period</th>
<th>Training Fee</th>
<th>Training Method</th>
<th>Training Objectives and Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Office of Wuwei City</td>
<td>Project Office of Wuwei City</td>
<td>2</td>
<td>Prior to the construction</td>
<td>Prior to the</td>
<td>1 week</td>
<td>5 million yuan</td>
<td>Invite environmental protection experts to conduct unified training</td>
<td>Objective: effectively implement the environmental protection measures proposed in the EIA Report. Content: ① Environmental laws and regulations standards and knowledge of construction project environmental management; ② Basic knowledge of environmental monitoring; ③ Regulations related to environmental supervision and enforcement; ④ Environmental project supervision technology; ⑤ Environmental management standards system and basic quality training for managers.</td>
</tr>
<tr>
<td>Project Implementation Office of Gulang County</td>
<td>Project Office of the County</td>
<td>6</td>
<td>Prior to the construction</td>
<td>Prior to the</td>
<td>1 week</td>
<td>10 million yuan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractors at Each Section</td>
<td>Project Office of the County</td>
<td>16</td>
<td>Prior to the construction</td>
<td></td>
<td></td>
<td>8 million yuan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training Plan of Construction Workers</td>
<td>Contractors at Each Section</td>
<td>16</td>
<td>Prior to the construction</td>
<td></td>
<td></td>
<td>8 million yuan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All construction workers</td>
<td>All construction workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20,000 yuan / section, borne by the construction party, and it should be included in the construction contract</td>
<td>Objective: environmental laws and regulations, environmental codes of conduct and guidelines ② Implementation of environmental protection plan during construction period</td>
<td></td>
</tr>
</tbody>
</table>
6. Public Complaint Mechanism

The project complaint institution includes various stages of project implementation, including resettlement of the project, disturbance of the construction period and supervision of the operation period.

(1) Immigrants resettlement complaints: If the immigrants have any problems, he/she may lodge a complaint to the Project Implementation Office of Gulang County, which will make a decision to handle the complaint within 2 weeks.

If the immigrants are still unsatisfied with the decision of the Project Implementation Office of the county, he/she, after receiving the decision, may file the complaint with administrative organs with jurisdiction level by level for arbitration in accordance with the Administrative Litigation Law of the People's Republic of China.

If the immigrants are still unsatisfied with the arbitration decision, he/she, after receiving the arbitration decision, may file a lawsuit with the civil court according to the Civil Procedure Law.

(2) Public complaints during construction period: The implementation units of the proposed project shall pay close attention to the progress of the project and understand the inconvenience caused to the surrounding people by the construction of the project. A special public reception window shall be set up, and the assigned person shall be responsible for it, and the responsible person's contact number shall be announced so that the people can be known in time. The opinions of the masses through telephone consultation or home appeal should be set up in the Public Opinions Book, and record their name, contact information, and the impact of project on them, understand the opinions of the people, and record it, timely report, request to reply to the questions proposed by the citizens within three working days, and propose the solving scheme and implement them within ten to fifteen working days according to the difficulty of handling, and add the implementing process and the final result of the coordinated solution to the Public Opinions Acceptance Book. In order to better solve the inconvenience caused by the project construction to the citizens, the implementing unit is required to submit the Public Opinions Acceptance Book to Wuwei Municipal Environmental Protection Bureau at the end of each month, and Wuwei Municipal Environmental Protection Bureau will supervise it for timely processing.

(3) Supervision during operation period: During the operation period, if the masses have any questions, which can be directly submitted to the Project Implementation Office of the county. The Project Office will record and discuss the matter, reply within 3 working days,
and propose the solving scheme and implement them within 10 to 15 working days according to the difficulty of handling. The Project Office is required to submit the *Public Opinions Acceptance Book* to Wuwei Municipal Environmental Protection Bureau at the end of each month.

The Environmental Management Department of the Project Office shall establish a tracking and recording system for the public complaints and complaints mechanism to: (1) establish tracking table and tracking procedures to collect information from project personnel and complaining party; (2) assign personnel to regularly update database information; (3) establish an information analysis system, identify the reasons for the complaint, improve the transparency of the complaints handling procedure, and regularly evaluate the overall operation of the mechanism; (4) establish procedures for informing relevant parties of the situation; (5) report the handling of complaints to the Project Office, implementing unit and the World Bank on a regular basis.

The details of the complaint mechanism implemented in this project are shown in Figure 6-1.
Chart 6-1 Illustration of Proposed Project Complaint Mechanism

This complaint mechanism will be open to all local residents, including vulnerable groups such as women. Any affected person, group or institution may appeal through the telephone, letters, e-mails and other media. Before the project is started, the contact person of each appeal acceptance link (such as village committee cadres, contractors, environmental management personnel of the implementation unit, local EPA officials, etc.) will be identified, and their specific contact information (such as phone number, address and email address) will be posted on the construction site's information bar or on the local government's website.
7. Reporting Mechanism

The Project Implementation Office and the Environmental Supervision Unit shall record the progress, the EMP performance and the environmental quality monitoring results of the project during the project implementation and report to the relevant departments in a timely manner. It includes:

(1) After completing the monitoring task, the monitoring unit will timely submit the monitoring report to the county project implementation and environmental supervision engineer.

(2) The environmental supervision engineer of the county project will make a detailed record of the EMP's implementation on a weekly and monthly basis, and submit the weekly and monthly reports to the Project Implementation Office. The weekly and monthly reports shall include the implementation of environmental protection measures, environmental monitoring implementation and monitoring data.

(3) The Project Implementation Office of the county will make detailed records on the progress of the project and the implementation of the EMP on a quarterly basis, and report the quarterly report to the Project Office of the City in time, and also copy the quarterly report to the Wuwei Municipal Environmental Protection Bureau.

(4) The Project Office of the City will report the EMP implementation report to the World Bank every six months. The EMP execution report needs to include the following main contents:
   a. Implementation progress of project;
   b. Under the current progress, the implementation of the Environmental Management Plan (EMP), which includes:
      ① Institution arrangement
      ② Implementation of environmental protection measures;
      ③ The implementation of training programs like ability enhancement;
      ④ Implementation of monitoring plan;
      ⑤ Implementation of supervision work;
      ⑥ Whether there is any public complaints or, if a complaint occurs, the main contents, solutions and public satisfaction of the complaint shall be recorded;
   c. Is there any other environmental issues?

(5) In the event of special non-compliance with environmental protection, the environmental supervision engineer and the Project Office of the county will notify the local
administrative department of environmental protection and, if necessary, will report it to each level.
8. Monitoring Plan

8.1 Monitoring Purposes and Principles

The impact on the environment during the construction period of the project is mainly reflected in the domestic pollution caused by the accumulation of construction workers, the noise caused by construction institution operations, and also in the earthwork operations during construction operations, soil and water loss, dust and other pollution caused by pavement laying. When the project is completed and operated, traffic vehicles will generate exhaust gas, dust and noise. In addition, it is necessary to take into account the serious pollution of local areas caused by sudden pollution accidents. Therefore, in order to comprehensively and timely grasp the dynamics of pollution along the project and understand the changes in the environmental quality of neighboring regions, and thus to serve the construction of regional environmental management projects, it is necessary to implement environmental monitoring on construction projects.

The establishment of the environmental monitoring plan is to supervise the implementation of various measures so that the environmental protection action plan can be timely adjusted according to the monitoring results and provide a basis for the implementation time and implementation plan of environmental protection measures. The development of the monitoring plan is based on the prediction of the main environmental impacts in each period (construction period or operation period), the road sections and indicators that may exceed the standards(exactly considered the main sensitive areas).

Through the implementation of the environmental monitoring plan, it is possible to understand the environmental quality of the project implementation area in a timely manner, help to analyze the impact of the project construction on the environment, and reduce the impact of targeted construction to ensure that the impact of the project construction on the environment is minimized and does not affect the life of the residents, and does not destroy the natural ecological environment. The environmental monitoring plan of the proposed project may be commissioned by the Project Office of the city. The entrusted party shall have the monitoring qualifications, be responsible for the collection and analysis of the monitoring data, issue the environmental analysis report, submit it to the entrusting unit, and submit the copy to the World Bank by the entrusting unit. The monitoring plan organization responsibilities of the project are shown in Table 8-1.
Table 8-1 List of Organizational Responsibilities of Monitoring Plan

<table>
<thead>
<tr>
<th>Implementation Project</th>
<th>Responsible Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring data collection</td>
<td>Entrust local environmental monitoring stations with monitoring qualifications</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Monitoring unit is responsible for collecting and analyzing data</td>
</tr>
<tr>
<td>Preparation of environmental report</td>
<td>Monitoring unit issues analysis report based on monitoring data</td>
</tr>
</tbody>
</table>

The above monitoring plan can be uniformly entrusted by the Project Office of the city. According to the monitoring plan, the entrusted environmental monitoring station will compile and analyze the implemented monitoring data on a quarterly basis, issue an environmental analysis report, submit it to the entrusting unit, and submit the copy to the World Bank by the entrusting unit.

| Management plan                  | After the environmental analysis report is submitted, the Project Management Office of the city shall manage and record the project as a compilation material for environmental impact during the implementation phase of the project so as to prepare for the completion acceptance of the project. |

8.2 Monitoring Institution

It is recommended that the management institution should entrust local qualified environmental monitoring stations to implement the monitoring plan, and at the same time undertake the timely monitoring of the environmental impact of sudden pollution accidents. On the one hand, the existing environmental monitoring units can take advantage of the availability of qualified professional personnel and complete monitoring equipment; On the other hand, the Proposed Project Management Institution can save investment in monitoring equipment and personnel expenses. The construction institution shall sign the monitoring contract for the construction period with the monitoring station before construction, and sign the monitoring contract for the operation period with the monitoring station before the project is put into use.

8. Environmental Monitoring Plan

Table 8-2 List of Project Monitoring Plan

<table>
<thead>
<tr>
<th>Period</th>
<th>Environmental Elements</th>
<th>Monitoring Content</th>
<th>Monitoring Point</th>
<th>Monitoring Time and Frequency</th>
<th>Executive Standard</th>
<th>Monitoring Cost (million yuan)</th>
<th>Daily Monitoring Unit</th>
<th>Regular Supervision Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Atmospheric Environment</td>
<td>TSP, PM10</td>
<td>Chenjiazhuang, Donggou, Weijidazhuang, Zhangjiamo and</td>
<td>1 time per quarter</td>
<td>Quality Standards for Ambient Air (GB3095-2012) Level II Standard</td>
<td>4/year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------</td>
<td>------</td>
<td>----------------</td>
<td>----------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atmosphere</td>
<td></td>
<td></td>
<td>Shanghuzizhuang</td>
<td>Quality Standards for Ambient Air (GB3095-1996) Level II Standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td>20/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SO2, NOx, TSP, PM10</td>
<td></td>
<td>Shanghuzizhuang</td>
<td>Quality Standards for Ambient Air (GB3096-2008) Level II and the World Bank IFC Standards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.2/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. Environmental Supervision Scheme

9.1 Environment Supervision Organization during Construction Period

The environmental supervision during the construction period is the environmental protection measures implemented during the construction period of the project. During the construction period, environmental supervision should be entrusted by the construction unit with a qualified construction supervision institution, and the construction supervision institution should be provided with a full-time environmental protection supervision engineer to be responsible for environmental management and supervision during the construction period.

The Environmental Supervision Unit shall set up an Environmental Monitoring Working Group to carry out the specific work of environmental monitoring and audit.

The Environmental Supervision Work Group shall propose an environmental supervision work plan and submit it to the corresponding environmental management department and construction unit according to the environmental supervision contents in the EIA Report and the actual conditions of the project construction.

9.2 The Scope of Environmental Supervision

(1) The Scope of Environmental Supervision

The project construction area and the area directly affected by the project, including the main project, the construction site of the temporary project, the construction access road and the existing local roads that bear a lot of project transportation.

Supervision content: including all aspects of environmental protection such as ecological protection, greening, prevention of pollutants and social environment.

(2) Project Scope

Construction sites, construction roads as well as areas within the above-mentioned scope that causes environmental pollution to the surrounding area.

(3) Supervision Stage

The engineering environmental supervision stage of this project is divided into three stages: construction preparation stage, construction stage, project acceptance inspection and defect liability period.

9.3 Specific Working Methods of Environmental Supervision

Environmental supervision is an economically independent third party other than the owner and the contractor. It conducts work in a fair and independent manner by strictly following the contract terms and relevant environmental protection laws and regulations. That
is, while safeguarding the interests of the owner, it must also protect the legal rights and interests of the contractor. At the same time, environmental supervision is an important part of engineering supervision. It has close connection with project supervision, and it is also special and relatively independent. Specific environmental supervision work methods are as follows:

(1) To examine whether the environmental protection measures in the preliminary design of the project and the design of the construction drawings have correctly implemented the environmental protection measures proposed in the approved Environmental Impact Statement.

(2) Assist the construction unit in organizing environmental protection training for construction, design and management personnel.

(3) Review the environmental protection clauses of the bidding documents and project contracts.

(4) Put forward suggestions for improvement of environmental protection for the construction organization design, construction technology plan and construction schedule proposed by the contractor, and review the environmental indicators like construction equipment for the construction site.

(5) Measures to protect the ecological, water, gas and acoustic environment during the construction process and reduce the environmental impact of the project. Conduct supervision for the construction quality of the environmental protection project, and acception and signature shall be carried out according to the standard.

(6) Conduct daily inspection and supervision on the construction site, systematically record the environmental impact of the project construction, the effect of environmental protection measures, and the construction quality of environmental protection projects.

(7) Record the environmental problems found during the inspection and supervision, and verbally notify or form a memorandum to require the contractor to rectify within the limited time.

(8) Monitoring of pollution sources with large environmental pollution at the construction site is required. If necessary, the owner is recommended to hire professional personnel and qualified monitoring units to conduct monitoring. According to the monitoring results, the contractor shall carry out targeted treatment of the existing environmental problems. Major environmental issues that require the contractor to solve within the limit time shall issue “Notice of Correcting Environmental Problems” after negotiating with the owner.

(9) Timely report to the environmental supervision leading group on unexpected problems related to environmental protection design and construction, and propose solutions.
(10) Responsible for drafting engineering environmental supervision work plan and summary.

9.4 Environment Supervision Scheme of Project

According to the characteristics of the construction of this project, environmental supervision should implement dynamic management according to the construction process. The work mode of environmental supervision is daily supervision, supplemented with necessary environmental monitoring, so as to timely adjust environmental protection monitoring efforts. The supervision of the entire process of major pollution processes is carried out to ensure that the construction behavior of each contractor conforms to the provisions of environmental protection laws, regulations and environmental protection clauses in the contract.

(1) Construction Preparation Stage

Check the implementation of environmental protection clauses in the construction contract, review the environmental protection measures in the construction organization design, and carry out on-site verification, optimization and review of the construction site together with the construction unit, design unit, project supervision unit and construction unit. Its supervision plan is shown in Table 9-1.

Table 9-1 Key Points of Environmental Supervision in Construction Preparation Stage

<table>
<thead>
<tr>
<th>Construction Activities</th>
<th>Key Points of Supervision</th>
<th>Supervision Method</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Bidding</td>
<td>Prepare environmental supervision work plan of project</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review environmental protection clauses in construction contracts</td>
<td>Review of documents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review on-site environmental sensitive points and protected targets for construction section</td>
<td>Inspection</td>
<td>Site record</td>
</tr>
<tr>
<td></td>
<td>Review environmental protection measures in contractor's construction organization design</td>
<td>Inspection of documents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approve contractor's construction period environmental management plan</td>
<td>Inspection of documents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review the construction plan and corresponding environmental protection measures in the application for sub-projects</td>
<td>Inspection of documents</td>
<td></td>
</tr>
</tbody>
</table>

(2) Construction Stage

The environmental supervision of the construction process shall be carried out in conjunction with the construction process of the project. The most important ones include the
temporary construction site such as the soil borrowing ground and the prevention measures for water and soil loss. The supervision plan is shown in Table 9-2.

Table 9-2 Contents of Major Environmental Supervision during Construction Period

<table>
<thead>
<tr>
<th>Supervision Location</th>
<th>Supervision Content and Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecological Environment</strong></td>
<td>Whether various forms of protective engineering, drainage engineering and greening projects have been implemented in road design;</td>
</tr>
<tr>
<td></td>
<td>Is the location and number of culverts and passages reasonably set?</td>
</tr>
<tr>
<td></td>
<td>Whether it has compensated the loss caused by road construction to forest land by increasing the intensity of greening;</td>
</tr>
<tr>
<td></td>
<td>Are greening measures adopted on side slopes, slope angles, central dividing strip and interchanges, etc.;</td>
</tr>
<tr>
<td></td>
<td>Whether the engineering protection and afforestation measures have been adopted for the soil spoil ground and other temporary land use.</td>
</tr>
<tr>
<td><strong>Accident Risk</strong></td>
<td>Check the development of <em>Contingency Plan for Transportation of Dangerous Goods Risks</em>.</td>
</tr>
<tr>
<td></td>
<td>Check the setting of safety signs, such as warning signs and vehicle speed limit signs at both ends of the section of the drinking water source protection zone, indicating the alarm call.</td>
</tr>
<tr>
<td></td>
<td>Whether the management department has formulated the <em>Contingency Plan for Transportation of Dangerous Goods Risks</em>.</td>
</tr>
<tr>
<td><strong>Acoustic Environment</strong></td>
<td>Is construction prohibited between 22:00 and 6:00? Except for the emergency repairs, emergency operations, and the necessity of continuous operation due to production process requirements or special needs. If the special continuous operation is required, whether the construction unit has a certificate issued by the people's government at or above the county level or its relevant competent authority, and whether it announces nearby residents;</td>
</tr>
<tr>
<td></td>
<td>Whether to consider the study, work and life of the local households during the construction of the road section, whether to avoid construction at night, and to avoid the construction during the examination period.</td>
</tr>
<tr>
<td><strong>Soil Spoil Ground</strong></td>
<td>Examine the Location of the spoil ground and carry out on-site survey of the spoil ground. If it is really necessary to adjust the Location, whether it meets the set principles required by the EIA report, and clearly specify the adjusted Location and the amount of spoil.</td>
</tr>
<tr>
<td></td>
<td>Check the depth and scope of spoil, strictly control the scope of construction.</td>
</tr>
<tr>
<td></td>
<td>Check the implementation of gravel paving and setting up barbed wire fences after soil extraction.</td>
</tr>
<tr>
<td><strong>Construction Shortcut</strong></td>
<td>Check the implementation of the fixed construction shortcut, if pulling the flags on both sides of the shortcut as required, check whether there is the track record outside the road.</td>
</tr>
<tr>
<td></td>
<td>Check the implementation of gravel paving after the completion of construction.</td>
</tr>
<tr>
<td><strong>Prefabrication Field, Mixing Field</strong></td>
<td>No mixing station is set up in this project. Check whether the mixing station is set during the construction period.</td>
</tr>
<tr>
<td></td>
<td>Check the powdery road construction materials, the transportation route of the mixture, and the mode of transportation, such as whether the containers are packed or bagged, and whether they are covered with veils or not.</td>
</tr>
<tr>
<td></td>
<td>No asphalt mixing station is set up in this project. Check whether the mixing station is set during the construction period.</td>
</tr>
<tr>
<td><strong>Construction Campsite</strong></td>
<td>Check the disposal status of solid waste, if setting up the aqua privies, special person shall be responsible for collecting garbage.</td>
</tr>
<tr>
<td><strong>Subgrade Engineering</strong></td>
<td>Check whether the slope protection is timely and whether the slope protection is designed according to the design requirements.</td>
</tr>
</tbody>
</table>
(3) Delivery Acceptance and Defect Liability Period

The work in this stage is mainly the consolidation of relevant information on acceptance of environmental protection for engineering projects, the construction of environmental protection projects, and the supervision of the restoration and maintenance of temporary sites like construction sites during the period of defect liability.
10. Cost Estimation

This project has an investment of 1,540,000 yuan in environmental protection, accounting for 0.54% of the total investment, amounting to 285,621,200 yuan. See Table 7-1 for the specific investment.

Table 10.1 Table of Project Environmental Investment Estimation

<table>
<thead>
<tr>
<th>Project</th>
<th>Content</th>
<th>Cost (million yuan)</th>
<th>Environmental Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Environmental Pollution Control Investment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise control during construction period</td>
<td>Regular maintenance and conservation of power machinery equipment; set movable momentary noise insulation barrier</td>
<td>9.0</td>
<td>Reduce noise during construction period</td>
</tr>
<tr>
<td>Dust control during construction period</td>
<td>Dust-proof hoarding in construction area</td>
<td>11.0</td>
<td>Reduce atmospheric pollution</td>
</tr>
<tr>
<td></td>
<td>Materials and dust cover and dust-proof net</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction area and temporary road sprinkling</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>Waste water control during construction period</td>
<td>Sedimentation tank, drainage ditch and interception ditch</td>
<td>10.5</td>
<td>Reduce environmental pollution</td>
</tr>
<tr>
<td>Construction waste and domestic waste control during construction period</td>
<td>Transport to the urban refuse landfill designated by planning department for disposal</td>
<td>9.0</td>
<td>Reduce solid waste pollution</td>
</tr>
<tr>
<td>Trash can during operation period</td>
<td>The interval of 200m on both sides of the road (30 in total)</td>
<td>9.0</td>
<td>Reduce solid waste pollution</td>
</tr>
<tr>
<td>Noise control during construction period</td>
<td>Speed limit marking, speed limit board, no horn board, etc.</td>
<td>5.0</td>
<td>Reduce noise pollution</td>
</tr>
<tr>
<td></td>
<td><strong>Environmental Protection Investment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil and water conservation</td>
<td>Soil and water conservation measures (road greening, restoration of temporary using land, etc.)</td>
<td>20.0</td>
<td>Prevent soil erosion, beautify the environment, restore the landscape and reduce atmospheric pollution</td>
</tr>
<tr>
<td></td>
<td><strong>Environmental Management Investment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental monitoring costs</td>
<td>Construction period and operation period noise and ambient air monitoring</td>
<td>26.0</td>
<td>Strengthen the monitoring of environmental quality during construction period and monitor the environmental change during the operation period</td>
</tr>
<tr>
<td>Environmental management and supervision costs</td>
<td>Environmental management and supervision during construction period</td>
<td>20.0</td>
<td>Environmental protection during construction stage</td>
</tr>
<tr>
<td></td>
<td><strong>Risk Accident Prevention Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Warning sign and speed limit board</td>
<td>5</td>
<td>All bridgeheads and sections of the road</td>
</tr>
<tr>
<td>2</td>
<td>Rigid collision-prevention barrier</td>
<td>6</td>
<td>Outside the each bridge</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 11. Acceptance Requirements of Environmental Protection

See Table 11-1 for details of the simultaneous acceptance list for the proposed project.

#### Table 11-1 Environmental Protection Acceptance List

<table>
<thead>
<tr>
<th>Type</th>
<th>Name of Environmental Protection Facilities</th>
<th>Location</th>
<th>Acceptance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Period</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Waste</td>
<td>Construction waste and domestic waste control</td>
<td>/</td>
<td>The construction waste shall be transported to the slag yard designated by planning department. The domestic waste shall be sent to the spot designated by city management.</td>
</tr>
<tr>
<td>Dust-proof hoarding, material and dust cover in construction area, watering</td>
<td>/</td>
<td>Hoarding and covers meet the requirements. Watering regularly.</td>
<td></td>
</tr>
<tr>
<td>Waste Water</td>
<td>Waste water control during construction period</td>
<td>/</td>
<td>Sedimentation tank (1), drainage ditch, interception ditch and submersible pump shall meet the requirements and use.</td>
</tr>
<tr>
<td>Ecology</td>
<td>Temporary access road and construction campsite, etc. Ecological restoration engineering</td>
<td>Select site according to the principles of the assessment requirements</td>
<td>The vegetation shall be restored after the completion of the project, land reclamation.</td>
</tr>
<tr>
<td><strong>Operation Period</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Waste</td>
<td>Trash can</td>
<td>The interval of 200m on both sides of the road (30 in total)</td>
<td>Set interval and quantity.</td>
</tr>
<tr>
<td>Ecology</td>
<td>Slope protection engineering, drainage engineering and greening engineering</td>
<td>Along the route</td>
<td>Slope protection, drainage facilities and road greening.</td>
</tr>
<tr>
<td>Noise</td>
<td>Speed limit marking, speed limit board, no horn board, etc.</td>
<td>/</td>
<td>The signboard is clear and complete.</td>
</tr>
<tr>
<td><strong>Environmental Management</strong></td>
<td></td>
<td></td>
<td>The project sets up 1 ~ 2 full-time environmental protection employee.</td>
</tr>
<tr>
<td><strong>Environmental Supervision</strong></td>
<td></td>
<td></td>
<td>The project sets 2 full-time green management employees.</td>
</tr>
<tr>
<td></td>
<td>Acceptance of environmental supervision archives during construction period, including annual monitoring report and annual summary.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Annex 1:

Environmental Protection Stipulations at the Design Stage

1. Main Route Design

According to the natural conditions such as topography, geomorphology, geology, hydrology and rivers along the highway, the road network layout and interchange settings shall comply with the linear design standards, and full consideration shall be given to the coordination of the route and the natural environment along the route. The following principles shall be followed in the design process:

1) According to engineering geological conditions, adopt geological route selection, rationally set the route, and avoid geological hazards to ensure road safety.

2) Make full use of favorable terrain, minimize damage to vegetation, and take necessary engineering measures to achieve less land occupation, especially the occupation of cultivated land.

3) Do a good job in the design of subgrade and earthwork balance and site design of spoil grounds to protect the environment and reduce soil erosion.

4) Taking into account the local economic development, which is conducive to the production and living of the masses, and reasonably choosing road network interface settings interchange.

5) According to the terrain, the technical indicators of plane and longitudinal planes should be reasonably adopted to avoid large-scale excavation, and the establishment of traffic signs, interchanges and service areas along the line should ensure the safety of the road facilities of the project.

6) Route planning shall be subject to the national and Gansu provincial road network planning requirements, taking the major towns, poverty-stricken areas and tourism economic resources in the region into consideration as much as possible, and reflecting the design principles of “near without disturbance, and far without separation” to fully attract traffic and play the project’s social and economic benefits. Taking the town planning of the areas where the route is planned and the locations where the rivers and routes intersect into account, minimizing demolition, minimizing the use of farmland, avoiding easy access to geological hazards, densely distributed road sections and sensitive environmental protection road sections.

7) The main body of the road blends with the natural landscape and the social environment. With the principle of “no damage is the greatest protection”, as many plants as
possible are used to protect the slope of the roadbed, and reasonable selection of bridges, protection and other engineering measures to reduce the impact on the ecological environment. Based on the analysis result of environmental sensitive points, environmental protection and greening facilities, noise reduction and noise reduction facilities, and sewage treatment facilities shall be set up in accordance with the requirements for beautifying roads, and building ecological tourism roads, so that the artificial system of roads will be closely coordinated with natural systems along the route.

In general, the proposed road selection should fully consider the factors such as topography, geological conditions, environmental protection, demolition, land occupation, cultural relics and minerals as well as construction conditions in the area where the project is located, and try to avoid the environmental sensitivities of residents' concentrated areas and schools along the line. And pay attention to reduce the impact on water conservancy and power communication facilities along the line, reduce the amount of demolition of buildings and structures, minimize the use of cultivated land, and combine the overall planning of the main towns along the project line to select the routes so as to coordinate with local development plans.

1.2 **Stockyard and Waste Slag Yard Design**

   See Code of Practice for Environmental Protection of Waste Slag Yard

1.3 **Construction Shortcut Design**

   See Code of Practice for Environmental Protection of Construction Shortcut

1.4 **Drainage System Design**

   See Code of Practice for Environmental Protection of Drainage System

1.5 **Construction Campsite Design**

   See Code of Practice for Environmental Protection of Construction Campsite and Site Construction

1.6 **Bridge Design**

   There is no bridge across the river in this project.

1.7 **Pipe Culvert Design**

   1.7.1 **Culvert Layout Principles**

   ① It shall be economically and reasonably set according to the terrain, geology, hydrology and other conditions along the route by combining with the route drainage system, so as to adapt to farmland irrigation and drainage.

   ② Culverts should be set in crossing over drainage gutters, the place passes farmland irrigation and drainage channels, the plain long-range low-lying or mud-bearing areas, and
runoff and easy-to-concentrate zones during storms along the route, and when drainage drainage is needed. When the terrain conditions permit, technical and economic comparisons can be made to establish culverts.

③ The location and direction of culverts should be aligned with the direction of water flow, avoiding improper layout of culverts, causing high water levels upstream, submerging farmland, villages and embankments, causing excessive downstream flow rates, and accentuating erosion of banks and roadbeds.

④ The setting of culverts shall comprehensively consider the requirements for construction and maintenance, and reduce construction and maintenance costs.

⑤ The density of culverts laid along the route should be determined according to the natural conditions such as topography, landform, hydrology and farmland drainage and irrigation. However, considering the compaction of subgrade construction is convenient, the culvert spacing should not be less than 50m.

⑥ Culverts should be laid at the drainage outlet of the intercepting ditch so as not to flush the road along the long distance.

⑦ The setting of culverts should conform to the direction of water flow as far as possible, and it is not advisable to reduce the length of the culvert to enforce orthogonality. When the flow rate or flow quantity are large, or the lateral gradients of narrow and deep river channels are large, and the direction of river flow is not perpendicular to the route, the culverts should be laid diagonally, and the slope should not be greater than 45.

1.7.2 Technical Specifications for Culvert Design

① The design flood frequency, vehicle load and design safety level of highway culverts at all levels should meet relevant requirements.

② New culverts should adopt pressureless culverts; When culverts are allowed to accumulate water, pressure or semi-pressure culverts can be used.

③ The hole diameter of the culvert should be determined by hydraulic calculation according to the conditions of the design flood flow, the section shape of the riverbed, the geology, and the form of reinforcement for the import and export gully bed.

④ The clearance from the apex to the highest flow surface in a pressureless culvert shall comply with the requirements of Schedule 1-2. The water depth before the culvert shall be less than or equal to 1.15 times of the net height of the culvert, and the impact on the design flow may not be taken into account.

Attached Table 1-2 Pressureless Culvert Clearance Height
The pore diameter checking of pressure-free culverts can be based on the initial pore size of the section of the river channel, and the velocity, depth, and water level before the culvert can be checked.

The position of the culvert should be laid along the route. When it is not subject to the linear layout limit, the culvert should be selected on the river (ditch) section with favorable terrain, good geological conditions, high foundation bearing capacity and stable riverbed.

The culvert entrance and exit should be provided with end walls. The end wall and the hole should be separated by a seam, and the seam should be filled with impervious material.

The culvert hole and the entrance and exit of a certain range of gully bed, embankment slope, and cone filling shall be paved and reinforced. The plane form of the entrance and exit paving shall be determined according to the gully type. For those without obvious gutters, the exit plane should adopt isosceles. Trapezoidal, the angle of its paving is preferably 20; The paving material should be determined according to the maximum flow rate on the paving layer, and the cut-off wall must be provided at the end of paving.

When the gully bed is covered with rocks or boulders that are not flooded, the riverbed may not be paved.

In gullies with steep vertical slopes and large flow rates, if necessary, a rapids trough, falling water, and corresponding energy dissipation measures must be provided, and a cutoff wall should be provided at the bottom of the outer end of the end wall. At the end of the ditch, a cutoff wall should be provided.

The basis of the base culvert should be designed to be monolithic or non-integral depending on the structure of the culvert, the geological conditions, and the conditions of the foundation treatment.

Pipe culverts and other closed section culverts, when the base meets the provisions of Table 12.2-3, and the soil quality is uniform, the amount of subsidence is not large, and baseless culverts can be used. However, the entrances and exits of culverts should be provided with foundations and anti-seepage effects should be considered so as to avoid uneven settlement and leakage of joints between pipe joints.

### Attached Table 1-3 Treatment Methods for Tubeless Bottom of Non-Base Culverts

<table>
<thead>
<tr>
<th>Base Soil Name</th>
<th>Forms</th>
<th>Thickness of Bedding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock</td>
<td>Concrete plastered cushion</td>
<td>Sand cushion</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Concrete plastered cushion</td>
<td></td>
<td>Not less than 0.4m</td>
</tr>
<tr>
<td>Sand cushion</td>
<td></td>
<td>Not less than 0.4m</td>
</tr>
<tr>
<td>Gravel soil, pebble soil</td>
<td>Fill gaps with sand while tamping</td>
<td>Not less than 0.4m</td>
</tr>
<tr>
<td>Gravel, coarse sand, medium sand and fine sand</td>
<td>Surface compaction</td>
<td>Not less than 0.4m</td>
</tr>
</tbody>
</table>

⑭ The entrances and exits of culverts shall be provided with end walls or wing walls, and their style and size shall enable the culverts to have corresponding water-passing capacity and ensure the stability of embankments at the culverts.

⑮ The culvert foundation should be calculated after work settlement, and its post-construction settlement should not exceed 100 mm. When the post-construction settlement of the culvert does not meet the above requirements, foundation treatment should be carried out.

1.8 Road Graphic Design

Main control factors of plane line position: The linear design of roads should make the environment more beautiful and serve as a catalyst for improving the environment based on the overall road network planning structure. The linear design mainly emphasizes the adaptability of the route and the terrain and the environment, as well as the spatial effect of the line itself. It should have a beautiful space-time four-dimensional space, and the appearance should be smooth, continuous and predictable.

① When there are residential areas on both sides of the road, demolition and relocation shall be reduced when the roads are routed to ensure the safe distance between roads and houses.

② Side slope protection treatment: Some sections of roads are affected by rivers along the line and slope protection is required. After on-the-spot investigation and careful analysis and comparison, it is believed that the planned alignment provided this time is actually more consistent except for a few restricted control points. Therefore, this plane orientation is basically arranged according to the planned alignment.

1.9 Road Longitudinal Cross-section Design

Longitudinal cross-section design principles: In order to ensure the safety and comfort of driving, longitudinal slopes should be gentle, and undulations should not be frequent. Longitudinal section design should follow the overall layout of vertical planning, and comprehensive consideration should be given to the requirements along the terrain, underground pipelines, geology, hydrology and climate, so as to satisfy Gulang County road
traffic requirements and flood discharge requirements. Make full use of natural terrain and rationally transform natural terrain. In combination with the elevation of the planning ground, the road elevation will be organically integrated with the planning floor along the route and it shall be rationally designed. When the route with longitudinal cross-section design passes through a poor hydrogeological condition, the elevation of the subgrade should be increased to ensure the stability of the subgrade. The grade of the longitudinal slope, the minimum slope length, etc. shall meet the specifications and make the profile reasonable, smooth and beautiful. The minimum longitudinal grade of the road is ≥0.3%; The main road has a maximum gradient of 5.5% and the secondary road has a maximum gradient of 6%.

1.10 Road Cross-section Design

According to the traffic volume of various roads in the main road network of Gulang County, the width of the integrated pipelines, and the landscape requirements for urban planning, the cross-section of the road is determined in accordance with the principle of saving construction land. Cross-section design should be combined in the near future, making the recent project an integral part of the long-term project and setting aside the pipeline location. The road width and elevation should leave room for development.

1.11 Subgrade Engineering

The subgrade design shall be designed based on the engineering geological, topographic, hydrological and other natural conditions and local materials along the route, as well as the relevant technical standards and specifications of the national urban road engineering. The subgrade design should be adapted to local conditions, and the rational use of local road building materials must be dense, uniform and stable.

The road is located in a residential area and construction waste must be removed; When the road passes through the ditch, the silt layer shall be replaced with gravel soil and layered and rolled; The organic mulch removed through the farmland saves investment in order to reduce the earth's outbound transport. The mulch can be used for greening and filling and try to keep the earth's balance. Backfilling for soil replacement should be layered and rolled. The subgrade is compacted to ensure the subgrade is solid and meets the requirements of the code.
Annex 2:
Code of Practice for Environmental Protection during Construction Period

2.1 Code of Practice for Environmental Construction Site and Site Construction

2.1.1 Code of Practice for Site Environment

The construction site mainly includes construction campsites. According to the different functions, construction campsites can be divided into construction life campsites, construction and production campsites, and construction life and production campsites. Construction life campsites are used for construction workers to live and accommodate; Construction and production campsites are mainly used for stacking of building materials, concrete mixing, and production of bridge prefabricated members; Production campsite Asphalt mixing station is mainly used for mixing asphalt required for road pavement.

2.1.1.1 Site Selection Requirements

Site selection requirements are shown in Attached Table 2-1.

**Attached Table 2-1 Site Selection Requirements**

<table>
<thead>
<tr>
<th>Shall not choose</th>
<th>Shall choose</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Main sensitive spots such as houses and schools and land within 200m of the upwind direction</td>
<td>• Rent houses owned by local residents</td>
</tr>
<tr>
<td>• Basic farmland</td>
<td>• Land within the area used by highway permanently</td>
</tr>
<tr>
<td>• Homestead</td>
<td>• Wasteland</td>
</tr>
<tr>
<td>• Woodland</td>
<td>• Abandoned arable land</td>
</tr>
<tr>
<td>• Land within 200m of river land</td>
<td>• Plots with relatively high altitude</td>
</tr>
<tr>
<td>• Drinking water source shall choose the land within the range of 1000m upstream and 500m downstream, and avoid the scope of the drinking water source protection area; other environmental sensitive areas such as scenic spots, forest parks, etc.</td>
<td>• Other inferior lands</td>
</tr>
<tr>
<td>• Depression or paddy field</td>
<td></td>
</tr>
<tr>
<td>• Well-vegetated land</td>
<td></td>
</tr>
<tr>
<td>• Hazardous areas in risk of collapse and landslide</td>
<td></td>
</tr>
<tr>
<td>• Hazardous area of debris flow</td>
<td></td>
</tr>
<tr>
<td>• Special-purpose land</td>
<td></td>
</tr>
</tbody>
</table>

Through this EIA verification, the project is not located in the above sensitive areas.

2.1.1.2 Analysis of the Impact of the Site on the Environment

The impacts of the construction site on environment mainly include the construction machinery noise, production wastewater and domestic sewage discharge, construction dust and domestic fumes, construction waste and domestic waste. See Attached Table 2-2 for details.

**Attached Table 2-2 Impacts of the Site on the Environment**

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Environmental Elements</th>
<th>Environmental Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production campsite</td>
<td>Water environment</td>
<td>Impact of construction production wastewater discharge on water environment.</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ambience air</td>
<td></td>
<td>Impact of construction dust on the ambient air.</td>
</tr>
<tr>
<td>Acoustic environment</td>
<td></td>
<td>Impact of construction machinery noise on acoustic environment.</td>
</tr>
<tr>
<td>Solid waste</td>
<td></td>
<td>Impact of dumping of construction waste on environment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Life campsite</th>
<th>Water environment</th>
<th>Impact of domestic sewage generated by construction workers' lives and accommodation on the water environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambience air</td>
<td></td>
<td>Impact of residential energy resources, heating, fumes, etc. used by construction workers on the ambient air.</td>
</tr>
<tr>
<td>Acoustic environment</td>
<td></td>
<td>Impact of yo-heave-ho generated by construction workers on the acoustic environment.</td>
</tr>
<tr>
<td>Solid waste</td>
<td></td>
<td>Impact of dumping of construction waste on environment.</td>
</tr>
<tr>
<td>Social environment</td>
<td></td>
<td>Impact of positioning of construction workers on the local social environment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asphalt mixing station</th>
<th>Ambience air</th>
<th>Impact of asphalt fume on the ambient air.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acoustic environment</td>
<td>Impact of noise generated by mixing machinery on acoustic environment.</td>
<td></td>
</tr>
</tbody>
</table>

### 2.1.1.3 Code of Practice for Site Environment

According to the site selection requirements of the site and the actual conditions of the project, the project shall follow the following requirements when selecting the site:

1. Try to rent houses owned by local residents along the project, and set up domestic waste collection points or garbage collection bins; Residential energy resources and heating electric energy or other clean energy.

2. Construction workers should abide by regulations of local village, conduct civilized construction, and handle well the relationship with local residents.

3. The production campsite will set up aqua privies and production wastewater sedimentation tanks. The production wastewater will be returned to the production line and will not be discharged after sedimentation. The domestic sewage (construction worker's entering the toilet) will be treated with aqua privies and used for agricultural irrigation by hiring local farmers. The aqua privies will be covered with soil after construction. The construction waste in the campsite shall be recycled as much as possible, and the construction waste which can not be recycled shall be transported regularly to the designated place without being thrown away.

4. When selecting production campsite, priority should be given to the barren slopes, brushlands and poor-quality lands, and it is forbidden to occupy arable lands; When it is unavoidable to occupy arable lands in the selection of production campsite, it is strictly prohibited to occupy basic farmland; Before the construction, the arable topsoil shall be stripped and temporarily piled up in a flat area within the site. Temporary blockage shall be made with bagged clay bases, temporary drainage ditches and sand setting measures shall be
set up around the site, and shall be covered with dust screens. After the construction, the production campsite shall be covered with soil for recultivation or green planting soil.

⑤ This project does not set up a special concrete mixing station and asphalt mixing station. The required concrete and asphalt are all outsourced.

2.1.2 Code of Practice for Site Construction Environment

2.1.2.1 Regulations of Construction Schedule

① The construction schedule is from 6:00 to 22:00 in the morning, 22:00 to 6:00 at nighttime. The construction shall be suspended from 12:00 to 14:00 at noon. The construction vehicle access time must be consistent with the requirements of the local government.

② Limit construction at nighttime, and notify nearby residents when night-time construction activities cannot be avoided, apply for relevant procedures at the same time, and take measures to reduce the impact on the surrounding residents.

2.1.2.2 Management of Construction Building Materials

The construction building materials for this project mainly include sand, stone, cement, etc. If these building materials are not handled properly in the process of transportation, storage and use, they will impose different impacts on the environment. So appropriate environmental protection measures shall be taken to minimize the impact.

The management measures to be taken in the process of transportation, storage and use of construction building materials for this project are as follows:

① Vehicles shall use low-noise vehicles, strictly follow the daytime transportation shift system, strengthen management, and reduce the number of nighttime transportation in abnormal conditions.

② Transport vehicles shall take speed limit control measures and slow down when passing through objectives of environmental protection (eg. hospitals, residential areas, schools, etc.).

③ There shall be a signboard for vehicles to enter and exit. Car drivers shall be civilized to ensure safe transportation.

④ Powdered materials such as cement, lime, etc. shall be canned or bagged and prohibited from being transported in bulk; Vehicles that transport sand and gravel and construction materials should be equipped with anti-falling equipment. Vehicles should not be loaded too full to prevent them from being blown by strong winds. Scattering of dust during transportation is strictly prohibited and blankets must be covered. And plan the transportation route and time to minimize the impact on the environmental sensitive spots (zones).

⑤ The location of the powdery building materials should be selected 300m downwind of
environmental sensitive spots. The stockpiling volume of building materials shall be reduced, and building materials shall be used in a timely manner. When stockpiling, measures shall be taken to prevent wind and rain, fences shall be set when necessary, water shall be regularly sprinkled to prevent dust, and the felt shall be covered in case of bad weather.

6. The construction vehicles must be inspected regularly. Damaged carriages should be repaired in time to reduce the scattering of building materials and construction waste along the way.

7. Take hardening measures on the surfaces of shortcut (if any), or adopt methods such as watering to control the impact of compaction of vehicle wheels and reduce dust pollution.

8. Strengthen the management of the transportation and use of powdery granular materials during the construction period, and clean the working surface that is likely to generate secondary dust.

2.1.2.3 Management of Construction Equipment

The construction equipment of the project mainly includes loaders, road rollers, excavators, mixers, vibrators, and tampers. The noise, tail gas, and possible run-offs that these construction equipment generate during the construction period will affect the environment of the project area. In order to minimize these adverse effects, the following management measures are proposed:

1. The construction equipment shall be stored within the areas designated for construction and shall not be randomly parked outside the construction site, which will increase the area of temporary land occupation and destroy vegetation and soil.

2. Construction equipment shall use low-noise equipment as much as possible.

3. Muffler shall be installed at the noise source of the equipment, that is, mufflers shall be installed at appropriate positions of the various inlet and outlet pipes of air exhausting devices; at the same time, basic damping or damping supports can also be used.

4. The construction machinery and vehicles that burn fuel must be used under normal conditions to ensure that the omission of exhaust gas meets the standards.

5. Reasonably use the equipment, strengthen the maintenance and repair of the equipment to prevent the equipment from running, emitting, dripping or leaking, which will affect the surface water environment, soil environment, etc. of the project area.

2.2 Environmental Code of Practice for Site Clearance

2.2.1 Site Clearance Content
Site clearance includes vegetation clearance, topsoil excavation, old subgrades, subgrade ditches, concrete pavement, concrete structures and garbage, waste residue, and other impediments as specified by the supervisor. The scope includes the surface of all areas that need to be cleaned up for construction sites such as permanent and temporary projects, stockyards, and abandoned slag yards.

2.2.2 Environmental Code of Practice of Site Clearance

(1) The vegetation clearance of the surface of the main construction site must extend to a distance of at least 5m from the maximum excavation line or outside of the basic side boundary of building as shown in the construction drawings.

(2) For vegetation clearance of the main project, the extent of root removal shall be extended to a distance of 3m from the maximum excavation line, filling line or outside of the building foundation as shown in the construction drawings.

(3) Care should be taken to protect the natural vegetation in the vicinity of the clearance area. Due to improper construction, the destruction of the forest resources near the clearance area and the adverse impact on the environmental protection occur, the contractor shall be responsible for compensation.

(4) Within the scope of site clearance, the timber that were cut by contractor or materials with commercial value that were cleaned by contractor shall be returned to the employer. The contractor shall transport the above materials to the designated place and pile it according to the instructions of the supervisor.

(5) All worthless combustibles shall be burned as soon as possible. The necessary fire protection measures shall be taken during the burning and responsible for the consequences of burning.

(6) Any cleanings that cannot be burned out or seriously affects the environment must be buried in the area designated by the supervisor. The buried objects must not interfere with natural drainage or pollute the river.

(7) The cultural relics and historic sites found during site clearance shall be handled in accordance with the cultural relics protection provisions of this Regulation.

(8) Excavation of topsoil shall be conducted according to the excavation depth of topsoil as instructed by the supervisor and the excavated organic soil shall be transported to the designated area for stacking. Prevent soil from being washed away. The piled organic soil should be used for the environmental protection of the project. The organic soil should be used properly according to the requirements of the contract or the overall environment of the contractor.
(9) Rubbish, organic residue and humus, turf, roots, and crop roots on the earth surface (100-300mm) of the pits shall be removed and piled centrally at the place designated by the supervisor or stacked in soil spoil grounds; After the site clearance is completed, the pits within the subgrade site will be fully filled and compacted to make its density meet the specified requirements.

(10) Demolition of existing structures or obstacles requires blasting or other operations. If it is possible to damage new structures, the above operations must be completed before the new project. All available materials shall avoid unnecessary losses, and shall be stored properly in the designated location. All demolished pits shall be backfilled and compacted to make its density meet the specified requirements.

(11) When dismantling old subgrade ditches, culverts, road surface and other obstructions, they should be removed after proper arrangements for normal traffic and drainage. As for the underground part of the original structure, the depth and scope of excavation shall meet the requirements of the supervisor's instructions.

2.3 Environmental Code of Practice for Construction Shortcut

2.3.1 Site Selection Requirements for Construction Shortcut

For the construction shortcuts, the site selection principles in Table 2-2 should be followed when selecting the site.

**Attached Table 2-3 Site Selection Requirements for Construction Shortcut**

<table>
<thead>
<tr>
<th>Shall not choose</th>
<th>Shall choose</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Basic farmland or other farmland, paddy fields, and economic crop fields</td>
<td>• Highways at county level, town level and village level</td>
</tr>
<tr>
<td>• Land within sensitive areas such as water conservation areas, scenic spots,</td>
<td>• Wasteland</td>
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<tr>
<td>and forest parks</td>
<td>• Abandoned arable land</td>
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<tr>
<td>• Homestead</td>
<td>• Other inferior lands</td>
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<tr>
<td>• Woodland</td>
<td></td>
</tr>
<tr>
<td>• Land within 200m of river land</td>
<td></td>
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<tr>
<td>• Depression or paddy field</td>
<td></td>
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<tr>
<td>• Well-vegetated land</td>
<td></td>
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<tr>
<td>• Hazardous areas in risk of collapse and landslide</td>
<td></td>
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<tr>
<td>• Hazardous area of debris flow</td>
<td></td>
</tr>
<tr>
<td>• Special-purpose land</td>
<td></td>
</tr>
</tbody>
</table>

2.3.2 Environmental Impact Analysis of Construction Shortcut

The environmental impact brought by construction shortcut is mainly reflected in:

(1) Road dust pollution occurs when vehicles and equipment are in operation.

(2) Noise pollution during vehicle operation.

(3) Temporary land occupation destroys the surface vegetation and causes soil and water loss.
2.3.3 Environmental Code of Practice for Construction Shortcut

(1) Make use of existing county-level, town-level, and village-level roads as construction of shortcut, and at the same time reform the town-level and village-level roads.

(2) If new construction shortcut are required, high-fill and deep excavation shall be minimized, and soil and water conservation shall be done at the same time to reduce soil and water loss and ecological damage; When new construction shortcuts are constructed, the construction shortcut shall be hardened. For example, reusable load-bearing tiles (members) can be used on the roads that allow overload vehicles to pass; Reusable water-permeable bricks can be laid on the roads.

(3) Before the construction shortcut, the arable topsoil shall be stripped and temporarily piled up in a flat area within the site. Temporary blockage shall be made with bagged clay bases, temporary drainage ditches and sand setting measures shall be set up around the site, and shall be covered with dust screens. After the construction, it shall be used for ecological restoration of the shortcut.

(4) Construction shortcut should be combined with the construction campsite shortcut to reduce the number of shortcut.

(5) Construction shortcut shall be regularly maintained and cleaned every day, and dust-producing section of road shall be watered to prevent dust.

(6) Reduce the impact of noise on the environment by controlling the speed, no-honking, 12:00 to 14:00 in the daytime and 22:00 to 6:00 in the night.

(7) Before the completion of the construction, the new construction shortcuts shall be ecologically restored, at least to the pre-construction state.

(8) Occupied or destroyed local roads shall be relocated or protected after the completion of the construction, and the restoration and afforestation of the road surface shall be carried out, and the local government shall be compensated to a certain extent so as to safeguard the legitimate interests of local governments and residents.

2.4 Environmental Code of Practice for Sand and Gravel Stockyards

This project does not set up special stockyards and plans to purchase materials from the surrounding stockyards and put forward the following requirements for the purchase of sand and gravel:

(1) Sand and gravel shall be purchased at government-approved sand and gravel stockyards with legal mining procedures.

(2) The quality of sand and gravel shall meet the road-related indicators.
(3) The implementation and operation of sand and gravel stockyards shall be in compliance with relevant national environmental requirements, including site selection, soil and water loss conservation and maintenance measures, etc.

2.5 Environmental Code of Practice for Spoil Yard

2.5.1 Site Selection Requirements for Spoil Yard

The site selection of spoil yards shall follow the principle of site selection in Attached Table 2-5.

**Attached Table 2-5 Site Selection Requirements for Spoil Yard**

<table>
<thead>
<tr>
<th>Shall not choose</th>
<th>Shall choose</th>
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<tbody>
<tr>
<td>• Basic farmland or other farmland, paddy fields, and economic crop fields</td>
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<td>• Wasteland</td>
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<tr>
<td>• Abandoned arable land</td>
<td></td>
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<tr>
<td>• Other inferior lands</td>
<td></td>
</tr>
<tr>
<td>• Cols or low-lying depression</td>
<td></td>
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</tbody>
</table>

2.5.2 Analysis of environmental impact factors of spoil yard

A certain amount of construction waste slag may be generated in the course of highway construction, mainly including excess earthwork, abandoned road building materials, waste rock and silt of site clearance. If the disposal is unreasonable, the following environmental impacts will result:

(1) The bare surface of the waste slag yard will cause more serious dust pollution if no measures are taken.

(2) If the waste slag yard is not well-blocked or waterproof temporary projects are not taken, the soil and water loss will be caused.

(3) The destruction of surface vegetation will have adverse effects on the ecological environment.

2.5.3 Environmental Code of Practice for Spoil Yard

(1) The generated digging soil shall first be considered for use in situ or for transportation to the remaining sections of the project, or be used for vegetation restoration of soil borrowing grounds, to avoid setting separate soil spoil ground, and to remove the impact of soil borrowing ground on the environment.

(2) When it cannot be used, it should first investigate whether there is a designated
elimination place for construction muck in the local area. If there is, the formalities for removal and transportation of mucks shall be handled in accordance with the regulations and the muck shall be transported to designated elimination place.

(3) The waste slag yard shall be layered and compacted to effectively suppress the generation of dust.

(4) Watering and dust suppression methods shall be adopted to reduce dust pollution caused by bare surface.

(5) In order to prevent soil and water loss, intercepting and drainage ditches shall be installed at the slag yard to avoid the lost sediment during the construction and operation period directly discharging into the surface water, which will affect the water quality.

(6) Before the entering of waste slag yard, the arable topsoil shall be stripped and temporarily piled up in a flat area within the site. Temporary blockage shall be made with bagged clay bases, temporary drainage ditches and sand setting measures shall be set up around the site, and shall be covered with dust screens. After the construction, it shall be used for ecological restoration of the waste slag yard.

(7) Follow the principle of conciseness and easy conservation, the greening form of combining trees with shrubs and grasses, the phytocoenosium landscape will be formed to restore the natural ecology of the spoil (slag) yard, and reduce soil and water loss.

(8) It is strictly forbidden to dispose of the spoil at random.

2.6 Environmental Code of Practice for Drainage System

2.6.1 The Importance of Drainage System to Highway

If there is no good drainage system, the road will be immersed in water, and the subgrade will be destroyed, roads will be threatened, and traffic will be blocked. At the same time, the subgrade will uplift, sink, appear pits, and roads will be loose and full of pits, affecting the accessibility of vehicles. If the road has a good drainage system, the subgrade will be more stable, solid and dense; smooth roads, moderate road arches, safe and comfortable driving will be achieved; service life of the road and social efficiency will be improved.

2.6.2 Environmental Code of Practice for Drainage System

2.6.2.1 Road Surface Water Drainage Scheme

(1) Pavement drainage

① Cross slope

If the design function of the highway intends to be given full play, the surface of the road must clean the pavement water by setting a reasonable road camber, which will help reduce
the accumulation of water. Therefore, slopes slightly higher than the minimum road camber shall be used on possible road sections. The specific methods are as follows: (a) For mountain roads, road cambers shall be provided where no subgrade ditch is installed on both sides of the road, so that the road surface shall be inclined to one side, and the water on the surface of the lane will be drained to the subgrade ditch; (b) when the road is located on a slope limited by a minimum specified road camber, a more appropriate method is to set the road camber not less than 50% of the longitudinal gradient, which is very important to ensure that the surface water of the road quickly flows to the shoulder.

② Longitudinal Slope

The longitudinal gradient not only plays a role of natural drainage of rainwater accumulating on the surface of the highway, but also can be used for the internal drainage of the surface layer. The purpose of drainage can be achieved by taking a longitudinal slope of 0.3%.

(2) Slope drainage

① Intercepting drains of natural slope

When the surface runoff from the natural slope into the road boundary above the cutting or embankment slope is large, an intercepting drain that intercepts surface water is required. For the county-level and township-level roads in the mountainous areas, one or more generally parallel intercepting drains shall be set on the slope where the convergence length is large. The setting of the intercepting drains shall be consistent with the surrounding terrain and parallel to the contour. The intercepting drains is located about 5m away from the cutting slope or about 2m above the foot of the embankment. If the soil is in good condition and the cutting side slope is not high, the former can also be no less than 2m.

② Slope subgrade ditches of side slope drainage ditch

A slope subgrade ditch of side slope shall be provided at the foot of the slope to receive water from the surface of the road and the surface of the slope. The cross-section of subgrade ditches is often trapezoidal, U-shaped, triangular and canal-shaped.

Drainage ditches are also called drain ditches. They are used mainly to drain the stagnant water from subgrade ditches, intercepting drains, borrow pits or subgrades to depressions or natural rivers other than bridges, culverts and depressions. The cross-section of the drainage ditch is generally trapezoidal, and the width and depth of the ditch shall not be less than 0.5 m. The longitudinal slope of the drainage ditch generally takes 0.3% to 0.8%, not more than 3%, or less than 0.12%; Drainage ditches shall not be too long, usually within 500m.

③ Vertical drainage ditch (hanging ditch)
On the slopes of high embankments and deep cuttings, vertical drainage ditches (hanging ditch) shall be provided when draining vertically and intensively from the slope top or a slope surface platform. Hanging ditch often is paved by using mortar flag stone or rectangular or trapezoidal cross-section grooves composed of concrete components. Such drainage facilities shall be equipped with energy dissipation measures (such as drop wells, energy-dissipating bucket, etc.) at the exit to prevent water from flushing the subgrade ditches through.

4 Drop and rapids trough

For low-grade highways in mountainous areas, areas where the rainwater is relatively rich or where the side slope gradient is steep, the slope surface water is liable to cause erosion on the slope vegetation. Even if the slope surface is protected, sometimes the slope body is unavoidably eroded, thus causing collapse and soil and water loss, and a major impact on the surrounding ecological environment. The rapids trough is a kind of steep artificial gutter. It is usually installed in the steep slopes and the inlet and outlet sections of culverts that are not allowed to be scoured by geological conditions. The purpose is to reduce the energy of the water flow and reduce the flow rate after the water flows through the steep slope. When designing the rapids trough, measures such as increasing the roughness of the bottom of the trough may be taken to dissipate the water energy and slow down the flow rate, or adopting single-stage and multi-stage water drop methods to dissipate energy.

2.6.2.2 Road Underground Drainage Plan

The main source of groundwater: The upper retained water that infiltrates from the ground and has not yet reached the lower layer; Frequent underground phreatic water: The fissure water flowing along fractures in rock formations; Static interlayer fissure water in fractured sedimentary rocks.

The drainage facilities under the subgrade gather the water flow mainly by seepage, and discharge the water beyond the subgrade. For the county-level and township-level highways, there are blind ditches and sewers. For the emergence of new materials, geotextiles can also be used to exclude groundwater from an economical point of view.

1 Blind ditch

When the embankment encounters individual springs (outflows of springs) and the route cannot be bypassed, trenches may be excavated between the spring and the outlet, and blind ditches or subsurface drainage pipes shall be built in order to drain the spring water to the slope foot of the filling or the excavation subgrade ditches. The height of blind ditch is about 20cm and the width is 20~30cm. The well depth shall ensure that the filling height of the top surface of the cover plate is ≥ 50cm, and the longitudinal slope of the ditch is recommended
to be ≥ 1%.

② Sewer

Gather the groundwater into the ditch through penetrating method, and drain the water through the ditch channel to the designated place. The sewer has the function of draining the surface soil and increasing the stability of the slope, and it can cut off and drain the groundwater, reduce the groundwater level, and prevent the subsurface fine-grained soil from being washed away. Commonly used stone-filled seweres (blind drains), with a longitudinal slope of 5%, depending on the trench depth. If the ditch depth is 2 m, the width shall be 0.6~0.8m; If the ditch depth is 3~4 m, the width shall be ≥1 m. The gravel filler used for drainage and seepage in the ditch shall be screened and cleaned.

③ Horizontal drains (holes)

In order to release the hydrostatic pressure in the slope and increase the stability of the slope, horizontal drains can be used to insert drainage into the aquifer. Generally, perforated plastic drain with a diameter of 50mm shall be drilled into the slope, the gradient is generally set as 10% to 15%. The hole diameter of perforated drain is 10mm, with the vertical spacing of 75mm. Along the circumference of the pipe, three row of grains are evenly arranged. Within the length of about 1~10 m near the outlet, a plastic drain without holes shall be provided. In the range of at least 60 cm near the outlet, the clearance between drill hole and drain hole shall be blocked with clay.

④ Blind drain

In order to avoid cutting off the flow of groundwater due to subgrade construction, resulting in the difference in water table on both sides of the route and keeping the seepage field unchanged in the subgrade, horizontal and vertical blind drain shall be set in the subgrade. When vertical blind drain is arranged, a inverted filter can be provided on the side of the upstream face, and a aquiclude can be provided on the other side; Both sides of the horizontal blind drain need to be provided with aquicludes so that the groundwater can pass the route without affecting the stability of the subgrade.

2.6.2.3 Route Transverse Drainage

Using drainage facilities such as subgrade ditches and intercepting drains, the slope water and subgrade surface water flowing to the subgrade will be intercepted in sections, that is, the surface water above the road boundary (or subgrade) will be discharged to the natural valleys, wasteland, borrow pits or low depressions below the road boundary through horizontally crossing the subgrade. The unsoomth drainage will cause the foot of the subgrade to be washed away and the road surface to be destroyed. Therefore, it is necessary to set a
horizontal drainage structure - culverts. For the selection and design of culverts, factors such as the height of filling at the top of the cave, design flow, foundation conditions, vehicle loads, existing waterway conditions in the upper and lower reaches, road grades, and topography shall be considered.

2.7 Environmental Code of Practice for Pipe Culverts

2.7.1 Classification and Applicable Conditions of Pipe Culvert

(1) According to building materials, culverts are divided into stone culverts, concrete culverts, reinforced concrete culverts, and steel corrugated pipe culverts.

(2) According to the structural form, culverts are divided into pipe culverts, slab culverts, arch culverts, box culverts, etc.

(3) According to filling height, culverts are divided into open culverts and buried culverts. When the height of the culvert filling is less than 0.5m, it is called open culvert; and when the the height of the culvert filling is greater than or equal to 0.5m, it is called the buried culvert.

(4) According to hydraulic properties, culverts are classified into three types: non-pressure type, half-pressure type, and pressure type.

The reinforced concrete soil pipe culvert has better adaptability and mechanical performance to the foundation and the structure is simple. It is generally advisable to use the single hole, and when using multi holes, it should not exceed 3 holes. The small-span buried culverts with enough filling height shall be set in areas lack of stones; Reinforced concrete slab culvert are suitable for open culverts or buried culverts without stone area and with have a large area of water. Arch culverts are suitable for crossing deep trenches or high embankments; Reinforced concrete box culverts are suitable for soft soil subgrade; the stone slab culverts are suitable for small culverts with rich stone materials and small amount of water. The inverted siphon pipe culverts are suitable for irrigation canals where the excavation height of the cutting can not meet the clearance requirement for setting the aqueduct and be not suitable for flood discharge channels. Steel corrugated pipe culverts are suitable for subgrades with low foundation bearing capacity or large subsidence and deformation.

2.7.2 Analysis of the Impact on the Environment during the Construction Stage of Pipe Culverts

(1) The design of culverts is unreasonable, and their discharge capacity, etc., cannot meet the requirements, resulting in flooding of roads, road damage, and damage to the subgrade.
(2) The impacts on environment of construction machinery noise, dust, sewage and wastewater, earthwork, and surface excavation.

(3) Poor maintenance or neglected conservation of culverts lead to clogging of culverts and loss of their discharge capacity, resulting in the destruction of subgrades, flooding of roads and road damage due to long-term immersing in water.

2.7.3 Environmental Code of Practice for Construction Phase of Pipe Culverts

2.7.3.1 General stipulations

① Each culvert shall be assessed as a sub-project. During the construction process, the construction quality of each site and each process must be strictly controlled.

② The filling requirements on the culvert are the same as those of the subgrade.

③ For the passage that meets the culvert standard for span or overall length, refer to the standard of this chapter for quality assessment.

④ The culverts with rapids troughs can be assessed separately for culverts and rapids troughs, and averaged straight shall be then taken.

⑤ Prefabricated concrete components (such as pipe joints, cover plates, etc.), pile foundations for culverts, and box culvert rebars shall be evaluated according to relevant standards.

⑥ Strictly control the construction schedule. When there are residents in the construction sites, construction work is prohibited from 12:00 to 14:00 in the daytime and 22:00 to 6:00 at night.

⑦ Watering shall be conduct at the construction site to prevent dust pollution.

⑧ The sedimentation tank shall be built on the construction site, and the production wastewater shall be be discharged after sedimentation.

⑨ The earthwork produced shall be excavated and filled as far as possible, and the excess earthwork shall be transported to designated sites for stacking and shall not be handled at random.

⑩ The excavated topsoil on the surface shall be piled up and blocked by taking blocking measures. After the completion of the construction, backfill the topsoil and restore the vegetation.

2.7.3.2 Code of Practice for Pipe Culverts

① The quality of purchased finished products of reinforced concrete round pipes must meet the design requirements stipulated in the construction specifications, and can only be
installed after acceptance at the site. The prefabricated pipe joints must be qualified according to the relevant standards before they can be installed.

① Pipe joint width and filling material should be strictly handled according to design and specification requirements.

② The bearing capacity of the foundation must meet the design requirements.

**2.7.3.3 Slab culvert, box culvert**

① The prefabricated slabs must be qualified according to the relevant standards before they can be installed. The concrete quality of the box culvert must meet the design requirements specified in the specification.

② Settlement joints, waterproof layers and backfilling behind abutment shall be constructed in accordance with the construction specifications and design requirements.

③ The bearing capacity of the culvert foundation must meet the design requirements.

④ When used as a channel, its clearance must meet the design requirements.

(3) Arch culverts

① The arch ring masonry or pouring shall meet the requirements of the specification.

② When the arch ring reaches the strength required by the design, the frame can be removed and the soil can be backfilled. When there is a crack in the arch ring, it must be identified and handled.

③ Settlement joints, waterproof layers and backfilling behind abutment shall be constructed in accordance with the construction specifications and design requirements.

④ The bearing capacity of the culvert platform foundation must meet the design requirements.

**2.8 Environmental Code of Practice for Prevention and Control of Soil and Water Loss**

Soil and water loss in highway construction projects shall implement the principles of “combination of water and soil conservation engineering with highway main engineering, main engineering and subsidiary engineering, and temporary engineering shall be of the same importance, major prevention, effective comprehensive treatment, treatment of both manifestation and root cause and combination of prevention and treatment”. At the same time, the water and soil conservation facilities shall be reasonably arranged, adjust measures to local conditions, focus on practical results, highlight water and soil conservation during construction period, and pay attention to afforestation and reclamation of soil-borrowing and soil spoil grounds for road engineering. Soil spoil grounds should be blocked and then
abandoned.

2.8.1 Soil and Water Conservation Measures Deployment and Construction Arrangement

(1) Deployment of Prevention and Control Measures

The possible soil and water loss in the project construction mainly occurs in the subgrade and soil spoil ground areas, in which the construction time of the subgrade construction area is the longest, and the prevention and control emphasis shall be the treatment of side slope and the drainage engineering arrangement. Prevention and control emphasis in the soil spoil ground area is mainly temporary blocking, drainage facilities and vegetation restoration measures.

(2) Construction Scheduling

The possible soil and water loss in the project construction mainly occurs during the construction period of the project. The erosion type is dominated by water erosion, and the prevention and control focus is on dredging rainwater. The main project is designed with a relatively perfect rainwater system. Therefore, some rainwater systems shall be implemented in advance and shall be connected to natural channels and existing drainage facilities to play its soil and water conservation function early.

2.8.2 Main Project Prevention and Control Area

The possible soil and water loss mainly occurs at the stage from subgrade filling to the construction of the road surface. In the process of subgrade filling, there is a large amount of earthwork to be handled, and loose earthwork can easily fall off; In the later stage of construction, road surface runoffs will cause erosion of the subgrade side slope as the road surface is compacted and the production flow is increased. The type of soil erosion is mainly gully erosion, accompanied by a large number of surface erosion and raindrop splash erosion. Therefore, the prevention and control of water and soil loss in this area focus on the drainage on both sides of the subgrade, side slope protection, and temporary protective measures during the construction period.

2.8.2.1 Construction Requirements:

① The subgrade ditches shall be filled before the subgrade, reducing the impact of subgrade filling on both sides;
② Side slope protection shall be carried out in time after the subgrade is formed;
③ During the rainy season, drainage ditches and desilting basins shall be regularly dredged, and silt shall be tiled on the fill slope and be compacted.
④ For irrigation canals occupied by subgrades, they shall be diverted and dredged as soon
as possible to avoid affecting normal agricultural production.

2.8.2.2 Prevention and Control Measures:

① Topsoil stripping and protection

Topsoil stacking principle: Must not be stacked on surface runoff pools; Must not be stacked in roads or river sensitive areas near the project; must not be stacked in areas that affect construction or roads; shall be stacked on a low-lying free plot to reduce the amount of protective measures. The topsoil temporarily piled up is the topsoil that strips arable land before the subgrade filling and will be used for greening and covering the side slope in the later period. The topsoil is temporarily piled up on the land expropriated on both sides of the subgrade. In order to avoid earthwork slipping, temporary woven soil bags are set around the stacked soil.

② Shoulder water retaining and temporary rapids trough

After the subgrade has been filled and shaped, a ridge shall be installed at the shoulder of the road, a rapids trough shall be installed on the side slope to lead the road surface runoffs into the rapids trough, thereby avoiding the erosion of the side slope by runoff. The ridge can be made up of the excess soil on the road shoulders during the subgrade filling, with a width of 0.2m and a height of 0.1m. The rapids trough shall be set at every 100m. The cross-section shall be dish-shaped, with a width of 0.3m and a depth of 0.15m. The range with 1m from the inlet shall be made of mortar, with a thickness of 0.05m and a slope of 2%. For the surface cover methods for the rapids trough, mortar can be used to polish the surface (3cm), and color stripe cloth surface cover or woven bag soil protection surface can also be used. After investigation, mortar plastering has the characteristics of simple construction, long-lasting protection, and easy removal. Although the color stripe cloth is less expensive to invest in, it is not easy to stick the ditch, and the protective effect is unstable, so it is needed to be maintained; It is difficult to conduct the surface cover by using woven soil bags, and the woven bag is easily weathered and loses the effect of water separation. Therefore, it is recommended to use a mortar-plastering rapids trough.

③ Sedimentation measures

Set desilting basins at the exit of the subgrade drainage ditch.

2.8.3 Concrete Mixing Station Prevention Zone

2.8.3.1 Construction Requirements:

① The layout of the concrete mixing station shall be based on the principle of "reduce the distribution points and concentrate on construction" to minimize the area of temporary land occupation;
2. The site of the concrete mixing station shall select a plot with a relatively high terrain so as not to be washed by the surrounding water.

3. Concrete shall be hardened with cement except for the mixing station surface;

4. The concrete mixing station shall take the necessary dust-prevention and dust-reduction measures, such as adding dust-proof devices to cement tanks;

5. On sunny days (dry weather), the concrete mixing station shall be watered to reduce dust;

6. The desilting basin shall be dredged in time, and the silt cannot be randomly stacked around the desilting basin.

2.8.3.2 Prevention and Control Measures

The prevention and control of concrete mixing stations focuses on surface water in the field. Due to the frequent traffic of vehicles and the need for stockpiling, it is recommended that all the site be hardened with cement. Due to the accumulation of sand and gravel in the site, there are many sediments in surface water in rainy days. In addition, the waste water from cement tankers and mixing equipment contains much cement and contaminate the water by directly discharging. Therefore, it is proposed to set up one set of desilting basin for each concrete mixing station. The surface water in the yard is comprehensively utilized after being settled by the desilting basin.

In the later stages of the project, land reclamation shall be carried out. The main task is to dismantle the construction facilities, clean up the stone, sand and other building materials scattered during the concrete mixing process, and at the same time afforest or rehabilitate the land where it is located to restore the original appearance as much as possible.

2.8.4 Prevention Area of Construction Shortcut

The construction shortcut of this project is the transportation channel for construction materials and spoil (slag). If it is really necessary to build a new construction shortcut, the land occupation type will be preferred to be waste and dry lands. At the same time, the scope of construction shortcuts shall be reduced as much as possible to reduce the impacts of temporary land occupation of the shortcut on the vegetation and soil.

2.8.4.1 Construction Requirements:

1. The construction shortcut shall select the existing road. And after consultation with the local government, it should be invested by the local government in widening and hardening to achieve a win-win situation.

2. The newly opened shortcut shall avoid large excavation and plots along the river;

3. Watering shall be carried to suppress in regular days and windy days.
2.8.4.2 Prevention and Control Measures Design:

Drainage ditches shall be provided on both sides of the construction shortcut, and a trapezoidal cross-section of type II shall be adopted for the cross-section.

2.8.5 Prevention and Control Area of Temporary Spoil (Slag) Yard

(1) Pay attention to the selection of the location of the spoil (slag) ground; When the spoil (slag) ground destroys the original surface vegetation or changes the slope of the original surface to form a bare slope, it should be green or reclaimed.

Temporary spoil (slagging) ground shall be selected from depressions with large reserves and low terrain, or wastegully, wasteland, or lands that are not easily washed by currents. No temporary spoil (slag) ground shall be set up in the basic farmland areas, woodlands, and areas that may cause geological disasters or subgrade diseases; It is forbidden to set up the spoil (slag) ground in the debris flow ditches and the upper edge of the landslide body.

(2) After the spoil is finished, it is advisable to timely green, cover the land, or consider other comprehensive utilization. The remediation requirements are as follows:

Before the spoil, the topsoil shall be piled up. After the spoil, the topsoil shall be used again; The soil spoil ground after rectification or rehabilitation shall be rationally determined based on its land quality, irrigation conditions, climate characteristics, production functions, and planning conditions.

(3) The slag blocking and slope protection engineering in the soil spoil ground shall be reasonably determined according to the factors such as the location of the spoil, the nature of the spoil, and the expected spoil height. When dumping the spoil in the trench, a slag dam shall be built.

(4) The soil spoil ground drainage system shall be based on the topography, geology and hydrological conditions of the soil borrowing ground and the ditch, irrigation and other facilities comprehensively, so as to prevent the erosion of farmland and sloping land caused by the erosion of the soil or the change of surface runoff conditions. Soil spoil grounds in valleys and slopes must be provided with perfect drainage facilities. When there are confluence conditions around the soil spoil ground, cut-off and drainage measures can be taken to drain the water.

In addition, after the completion of the project, local vegetation shall be used to prevent the introduction of alien species in the vegetation restoration of the main project prevention and control areas, construction shortcut control areas, concrete mixing plant prevention and treatment areas, and temporary spoil (slag) grounds.

2.9 Social Environmental Impact Protection Measures
Social interference during the construction of the project mainly includes the connectivity of the water conservancy system, the connectivity of the branch lines, construction noise, dust, construction waste, and domestic waste, etc., which affect the production and living of residents along the route.

During the construction period of the project, a reasonable construction plan shall be formulated, a half-width construction plan shall be adopted, a warning sign shall be set up on the construction section, and two traffic management personnel shall be arranged to divert traffic so as to reduce the adverse effects of road construction on the traffic capacity along the route. At the same time, the construction shall avoid the impact of the construction of the entire roadway on traffic. In order to implement a full-width construction road section, temporary roads shall be built in advance of construction.

2.10 Environmental Code of Practice for Noise Impact

At different stages of the construction period, each noise source will have different degrees of impact on the acoustic environment quality of the project area. The management shall be strengthened and corresponding environmental control measures shall be taken to minimize the impact.

(1) Select advanced and reliable low-noise equipment in equipment selection;

(2) Construction time shall be from 6:00 am to 22:00 pm. Construction is prohibited from 12:00 to 14:00 at noon. The night-time construction shall be prohibited. Where it is necessary to continue construction at night, it shall be issued by the administrative department of construction and shall be approved by the administrative department of environmental protection, and the residents shall be announced;

(3) Reasonably arrange the construction period to avoid simultaneous operation of multiple large-scale high-noise machines at the same construction site and at the same time. During the construction, the progress and hurry shall be grasped, and the noise impact time shall be shortened so as to minimize the impact of construction noise caused by the operator.;

(4) For the mechanical equipment that generates loud noise shall be equipped with basic shock absorption or damping mounts and damping material;

(5) Vehicle transportation noise may have a certain impact on acoustic environment sensitive points along the line. Therefore, the construction unit must strengthen the environmental protection awareness of construction workers, timely understand the local folk customs and living habits, and reasonably arrange the transportation time. In the sensitive areas such as residents' residential areas, they shall consciously adopt speed limits and bans
on construction machinery such as vehicles so as to achieve the effect of preventing and mitigating the effects of noise;

(6) Machinery equipment that generates loud noise shall be set as far away as possible from the side of the residential area in the construction site, and a building with a noise-reduction function shall be installed at a construction site that is less than 5m away from buildings such as houses and schools;

(7) It is recommended that the construction unit reasonably arrange the construction workers and reduce the operating time of high-noise mechanical operators. The construction workers may be equipped with earmuffs to reduce the impact on the construction workers;

(8) Regular and effective maintenance and repair shall be conducted on all mechanical equipment, so that the equipment maintains a good state and to achieve noise reduction and extend the use of the equipment;

(9) Strict requirements must be imposed on the management of construction strength, machinery and vehicle operators, and operating procedures.

2.11 Dust Management Measures

(1) Simple roads with gravel roads shall be used for construction roads, and regular watering shall be used to reduce dust;

(2) The fine-grained granular material piled up on the construction site shall be sealed or covered. And the watering shall be carried out on the surface of the material pile according to the nature of the material. This can effectively suppress dust production;

(3) Fences shall be used when road construction passes through environmental sensitive spots (zones);

(4) The removal and transportation of construction wastes shall be carried out in closed containers and prohibited from being thrown. Construction waste shall be classified and stored in accordance with the relevant regulations for the classification and management of urban waste, and shall be promptly cleared and transported; When clearing and transporting, appropriate amount of water shall be sprayed ahead of time;

(5) Strengthen the management of transport vehicles, and vehicles that generate dust shall be covered with tarpaulin;

(6) Watering and dust-reduction measures shall be taken for demolishing project construction. The muck shall be cleared within 3 days from the completion of the construction demolition and shall comply with the relevant provisions of the demolition project management;
(7) Measures such as sheltering or watering to reduce dust shall be taken in the dust flying area of the construction site;

(8) Earthwork at the construction site shall be piled up and covered. Vehicles shall not be overfilled so as to avoid vibrations and scattering during transportation;

(9) The entrance and exit of the construction site shall adopt measures to ensure the cleanliness of the vehicle. Before the vehicle goes out of the site, the dirt adhering to the surface shall be removed;

(10) The storage sites for materials and the large moulding at the construction site must be flat and solid;

(11) Watering and cleaning the construction site in time;

(12) Taking into account the predominant wind direction and the surrounding objectives of environmental protection, lay the main dust sources such as the dumping grounds for fine-grained granular materials in the downwind direction 300m away from the surrounding objects of environmental protection;

(13) It is forbidden to burn all kinds of waste.

2.12 Solid Waste Management Measures

2.12.1 Solid Waste Management

(1) The construction wastes shall be used in combination with the small-scale civil engineering projects and road engineering that are carried out simultaneously. The remaining parts shall be stacked and placed in a designated storage yard on the construction site. According to the progress of the construction, they shall be timely cleared and transported to the refuse landfill where each project is located;

(2) The removal and transportation of construction wastes shall be carried out in closed containers and prohibited from being thrown by air. Construction waste shall be classified and stored in accordance with the relevant regulations for the classification and management of rubbish, and shall be promptly cleared and transported;

(3) When clearing and transporting construction waste, appropriate amount of water shall be sprayed ahead of time;

(4) Domestic waste shall be collected through the rubbish cans and transported to the landfill of the domestic waste where the project is located.

(5) The spoil includes partially mellow soil which shall be used for reclamation and afforestation of the wasteland in the project area. The remaining earthwork can be used as landfills for road engineering and fills on both sides of the channel.
(6) No toxic or hazardous substances shall be burned at the construction site. Disposal of toxic and hazardous substances shall be handled in accordance with relevant regulations.

2.13 Code of Practice for Water Environmental Protection

2.13.1 Types of Sewage in Highway Construction

The wastewater generated during the construction of the highway mainly includes production wastewater (foundation pit wastewater, waste water during watering mechanical vehicles and building materials, waste water when mixing and washing concrete), domestic sewage, and road surface runoff wastewater.

2.13.2 Code of Practice for Water Environmental Protection

(1) The storage area for construction materials such as oil, chemicals and other harmful substances shall be equipped with hoarding and be covered with tarpaulin to reduce the pollution caused by rain erosion.

(2) The sedimentation tank shall be built on the construction site, and the construction wastewater shall be reused after sedimentation.

(3) Use advanced equipment and machinery as much as possible to effectively reduce the frequencies of running, emitting, dripping and leaking, and the number of mechanical maintenance, thereby reducing the amount of oily wastewater. In the process of unavoidable running, emitting, dripping and leaking, solid oil absorption material (such as cotton yarn, sawdust, oil absorption paper, etc.) shall be used as far as possible to convert the waste oil collected into solid materials, avoiding excessive generation of oily sewage. The greasy dirt seeping into the soil from the soil shall be collected and sealed by a scraping device in time, and transported to a qualified disposal site for centralized treatment.

(4) The maintenance of machinery, equipment and transport vehicles shall be conducted on the maintenance points at each road section as far as possible so as to facilitate the collection of oily sewage; In the case where it cannot be carried out intensively, since the amount of oily sewage generated is generally not more than 0.5m3/d, it can be completely absorbed and mixed with a solid oil absorption material and transported outside.

(5) Settling sedimentation tanks and oily sewage are collected in the sedimentation tanks at construction sites and machinery maintenance sites. After simple treatment such as acid and alkali neutralization, sedimentation, oil separation, and slag removal, the concentration of other pollutants such as oil will be reduced. After the construction, the sedimentation tank shall be buried.

(6) After the collected oil-impregnated wastes are packaged and sealed, together with
other hazardous solid wastes from the construction campsite, they shall be transported outside the site. The location of the outbound transport site shall be a nearby disposal site with such waste disposal qualifications.

(7) The construction workers' dining and washing are managed in a centralized and unified manner, such as centralized dining, washing, etc., to minimize the amount of domestic sewage generated. The amount of detergent shall be controlled during the washing process to reduce the detergent content in the sewage.

2.14 Code of Practice for Cultural Relics Protection

During the construction period, the disposal procedures for the discovery of the material cultural heritage shall be adopted. If there is cultural relics and historic sites, the construction unit shall immediately protect it in accordance with the Law of the People's Republic of China on the Protection of Cultural Relics (2007.12.29) and the requirements of the World Bank’s material cultural resources policy. The scene shall be protected immediately and reported to the local cultural relics bureau for processing, and the construction work can be resumed after the cultural relics bureau has processed it. The cultural heritage reporting procedure is shown in Figure 2-1.

During the construction process, if there is cultural relics and historic sites. The construction unit should:

(1) The construction shall be immediately stopped when the cultural relics are found, and the site shall be protected;
(2) The contractor shall promptly report to the police and cultural relics authorities for handling;
(3) Once they are defined as cultural relics by an expert, the scope of protection is immediately delineated;
(4) It is necessary to rescue and excavate the cultural relics due to the urgent construction period or the danger of natural damage;
(5) Rescue and excavation of cultural relics must be carried out by specialists using special equipment. No excavation by the contractor is allowed;
(6) Once it has been judged as a major cultural relic discovery, the project will have to make an argument for whether or not to choose another site for construction.
Figure 2-1 Processing Procedures for Discovering Cultural Relics during Construction Period

2.15 Environmental Code of Practice for Safety and Health

2.15.1 Construction Safety and Health Analysis

It is the responsibility of the construction unit and the regulatory institution to take all reasonable measures to protect the safety of workers' lives and the safety of nearby buildings so as to protect them from accidental damage. Companies shall hire contractors who have the ability to manage the occupational health and safety of their employees and, through formal purchasing agreements, allow contractors to implement corporate risk management rules. The construction safety and health of this project includes the design and operation of general facilities, communication and training, human hazards and supervision.

2.15.2 Construction Safety and Health Measures

The construction unit is responsible for complying with all national and local safety requirements and other measures capable of avoiding accidents, ensuring the safety and health of construction workers.

(1) Ensure the integrity of all buildings in the construction site; Temporary buildings shall be structurally safe and reliable, able to properly resist the severe weather in the area,
and have adequate light to block part of dust and noise;

(2) The construction unit shall ensure that it can provide first aid that meets the requirements. Suitable emergency tools shall be provided at the construction site; Remote locations shall have written emergency procedures so that patients can be transferred to a suitable medical facility;

(3) Occupational health and safety training shall be provided for all new construction workers. They shall be introduced to the basic working rules and personal protection rules of the construction site and how to prevent other employees from being injured;

(4) The correct signboards shall be hung in dangerous areas (distribution rooms, compressor rooms, etc.), devices, materials, safety measures, emergency exits, etc.;

(5) Check all wires, cables, and electric tools on the hand to see if there are broken or exposed wires, and determine the maximum allowable working voltage of the hand tools according to the manufacturer's recommendations;

(6) Eliminating the danger of clamping during the design of the machine to ensure that the machinery's protruding part will not cause harm to the human body under normal operating conditions;

(7) Place warning signs on all energized electrical devices and wires; Check all wires, cables, and electric tools on the hand to see if there are broken or exposed wires, and determine the maximum allowable working voltage of the hand tools according to the manufacturer's recommendations; Dual insulation/ground handling of all electrical equipment used in wet (or possibly wet) environments;

(8) Provide appropriate eye protection devices (such as welding goggles and/or masks) to all operators involving or assisting in welding;

(9) Install protective guardrails on the edge of the vulnerable area (should have a middle bar and peripheral baffle). At the same time, the construction workers use fall prevention devices (including belts and distance limiting lanyards);

(10) The construction unit shall determine and provide suitable personal protective equipment for construction workers so that they can fully protect the workers themselves, other workers, and occasional visitors, and will not cause unnecessary inconvenience to users;

(11) The construction unit shall establish procedures and systems for reporting and recording occupational accidents and diseases, accidents in hazardous situations;

(12) Health education for construction workers, such as implementing information communication strategies, enhancing face-to-face consultation work, addressing systemic issues affecting individual behavior, encouraging individuals to take protective measures, and
avoiding the spread of disease to others through the use of condoms; In addition, mosquito repellents, clothing, mosquito nets, and other blocking methods are encouraged to prevent mosquito bites from spreading diseases.
Annex 3 Environmental Management Procedures during Operation Period

3.1 Environmental Code of Practice for Pipe Culverts during Operation Period

(1) If there is any damage, deformation or subsidence in the paving layer at the bottom or outlet of the culvert, timely repairs are required. The upstream and downstream trenches must be renovated to ensure that the slope of the water flow is relatively smooth.

(2) If cracks occur at the joints of the drop slope and the rapid-flow slope at the culvert or at the outlet of the culvert, dry oakum after impregnating the asphalt can be used to fill. This can allow it to be integrated tightly with the outlet of culvert.

(3) Crackly, leaking inverted siphons require special inspection. If wet spots are found, they should be promptly discontinued and dug and repaired. For example: Replace softened subgrade fills and broken pipe joints. In short, joints should be tightly packed.

(4) When the joints at the joints of pipe culverts and joints of quadri-hinge-pipe culvert come off, they cannot be repaired by using mortar, and the dry oakum after impregnating the asphalt shall be used to fill.

(5) If there is a leak in the top of the arch culvert of masonry, it is necessary to excavate and fill. The soil must use high-strength cement mortar, and then coat cement waterproof layer or linoleum waterproof layer with a thickness of 10 to 15 cm. The whole construction process should be careful and detailed to prevent further leakage.

3.2 Ambient Air Protection Measures

1) Vehicle management should be strengthened. The environmental protection and traffic police departments should strengthen supervision and monitoring and strictly implement the vehicle emissions inspection system. Vehicles that seriously exceed the current national vehicle exhaust emission standards shall be prohibited from going on the road or providing their driving routes.

2) The management of transport vehicles shall be strengthened, and vehicles that can generate dust shall be prohibited from going on the road without any covers.

3) Strengthen road management and pavement conservation, keep the highways in a good state of operation, and reduce congestion.

4) Plant trees and grow grass on both sides of the road. This will not only purify the pollutants in the vehicle tail gas, but also beautify the environment and improve the landscape along the highway.

5) Implement the ambient air monitoring plan and determine the corresponding
environmental protection measures based on the monitoring results.

3.3 Acoustic Environment Protection Measures

3.3.1 Management Measures

1) Strengthen traffic management and reduce noise sources.

As traffic noise is one of the main sources of noise in urban areas, the management of motor vehicles and road traffic shall be further strengthened, and the quality of vehicles must be strictly monitored during the annual audit of vehicles. At the same time, speed limits and no-horn signs shall be set up near important sensitive spots (such as schools, villages near roads) to reduce noise impact. The roadblocks shall be cleared in time to ensure the smoothness of the lanes and sidewalks, maintain the smoothness of the road surface, and avoid the increase of traffic noise due to bumpy vehicles caused by poor road conditions. Motor vehicles shall be driven on the road in a civilized manner, reduce the number of horns, and reduce the intensity of mobile noise, thereby reducing the impact of traffic noise.

2) Through publicity, let the public consciously participate in the prevention and control of ambient noise pollution.

The environmental protection department shall vigorously publicize the noise pollution prevention and control law, sound environmental quality standards and relevant laws and regulations and systems in various forms, and use public opinions to support the public in participating in the prevention and control of ambient noise pollution. Through publicity, citizens' awareness of the dangers of noise pollution is raised and they consciously reduce or resist strong noise sources.

3) Plant road trees on both sides of the road in time for effective maintenance and management to form a green barrier, which can effectively reduce noise pollution and beautify the environment.

4) When building houses on both sides of the road, the impact of the traffic noise of the proposed project shall be taken into consideration to ensure that the traffic noise of the project will not affect the life of the people along the route.

3.3.3 Control Requirements for Planning and Construction of Villages and Towns along the Line

The distribution of villages is relatively fragmented. It is recommended that when planning for residents’ housing sites, local governments should effectively consider the
impact of the traffic noise of the proposed project, and refer to the distance shown in the noise prediction scope on both sides of the highway in the Chapter 4 of this Environmental Impact Report, and do not plan the construction of new residential buildings, schools, and other sensitive buildings within the scope of overreaching on both sides to ensure that the traffic noise of the project will not affect the life of the people along the line. When the residents along the route build their own houses, they shall try to stay away from the road.

3.4 Solid Waste Treatment Measures

(1) Through the formulation and promotion of laws and regulations, passengers and pedestrians are prohibited from throwing away rubbish on highways to ensure traffic safety and cleanliness on both sides of highways.

(2) Rubbish containers or rubbish bins are set up on both sides of the bus stop and highway to facilitate passing passengers. It is forbidden to build an exposed rubbish dump.

(3) Strengthen management, timely carry out rubbish removal and transport, and transport wastes that have been piled up in a centralized manner to a domestic waste landfill for centralized disposal. Disposal at random is prohibited.
Annex 4: Environmental Protection Regulations on Environmental Risks

4.1 Hazardous and Chemical Waste Management Measures

The construction of this project involves the storage and transportation of some hazardous wastes and chemical wastes. If they are not handled properly, they will have a great impact on the environment. The hazardous and chemical waste management measures are as follows:

1. Chemicals should be properly stored and labeled;
2. The storage of dangerous goods should meet the requirements of storage types and data in the storage certificate;
3. During the maintenance of mechanical equipment, oil stains and the like should be collected in special containers;
4. Tool materials such as antifouling emergency kits/sand/sawdust for absorbing the chemicals leaked should be provided.

4.2 Risk Prevention Measures and Contingency Plans

4.2.1 Risk Prevention Measures

1. Establish an emergency network, set up an emergency incident leading group, and designate an emergency commander;

   The project organization unit on the project site should take the lead to form an emergency network with other units such as the Environmental Protection Bureau, Public Security Bureau, fire brigades, environmental monitoring stations and water conservancy departments, and the persons concerned in the units who are capable of dealing with accidents should form a dangerous goods transportation accident handling team for emergency processing of dangerous goods transportation accidents.

2. Formulate strict management rules and regulations for the transportation of oils and chemicals based on the investigations and strengthen the management and prevention of sudden environmental pollution accidents on highways;

3. Strengthen the management of dangerous chemicals transportation, formulate contingency plans for dangerous goods traffic accidents, register the transportation of all dangerous goods in the public security and transportation departments, and ensure relevant managerial staff and practitioners receive the on-the-job training and certificates so as to avoid leakage accidents;

4.2.2 Risk Contingency Plans

The construction institution should compile detailed contingency plans, coordinate
emergency actions, and clarify the responsibilities of emergency persons in charge and relevant departments to ensure that the accidents are controlled in the shortest possible time so as to reduce the damage to the environment. The contingency plan of this project should be integrated into the regional contingency plans and a dangerous chemicals accident emergency rescue command, responsible for the unified organization and command of dangerous chemicals accident rescue within its jurisdiction, should be established to carry out the rescue work as fast as possible in the event of a dangerous chemicals accident so as to reduce the damages and the losses caused by the accident. The plan should mainly include:

1. Alarm and communication modes;
2. Hierarchical response procedures;
3. Emergency environmental monitoring, rescue and control measures;
4. Emergency evacuation of personnel and evacuation organization plans;
5. Restoration measures;

The restoration measures of an accident are mainly for the restoration of the contaminated soil. For the heavily contaminated soil, the contaminated topsoil must be scraped and sent to a hazardous waste center for disposal.

Annex 5: Environmental Protection Regulations on Soil and Water Conservation

5.1 Soil Erosion Prevention and Control Scheme

5.1.1 Prevention and Control Objectives

The project area is a provincial-level key area for soil erosion control. According to the *Control Standards for Soil and Water Loss on Development and Construction Projects* (GB50434-2008), the secondary water and soil loss control standards for construction projects should be implemented. Besides, based on the precipitation, topography and other natural environmental conditions, and factors such as soil erosion intensity in the project area, and corrected according to the actual situation of the project, practical soil erosion prevention and control objectives that are easy to achieve are determined. The soil prevention and control objectives are shown in Attached Table 5-1.

### Attached Table 5-1  Soil Erosion Prevention and Control Objectives

<table>
<thead>
<tr>
<th>Administrative district</th>
<th>Prevention and control index</th>
<th>Standard value</th>
<th>Corrected value according to the precipitation</th>
<th>Corrected value according to the soil erosion intensity</th>
<th>Adopted value after the correction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Construction period</td>
<td>Trial operation period</td>
<td>160, 352.3mm</td>
<td>Mild</td>
<td>Construction period</td>
</tr>
<tr>
<td>Gulang County</td>
<td>Treatment percentage of disturbed land (%)</td>
<td>*</td>
<td>95</td>
<td>*</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Controlled percentage of erosion area</td>
<td>*</td>
<td>85</td>
<td>-3</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Controlled ratio of soil erosion modulus</td>
<td>0.5</td>
<td>0.7</td>
<td>+0.3</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Percentage of dammed slag or ashes (%)</td>
<td>90</td>
<td>95</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Recovery percentage of the forestry and grass (%)</td>
<td>*</td>
<td>95</td>
<td>*</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Percentage of the forestry and grass coverage (%)</td>
<td>*</td>
<td>20</td>
<td>*</td>
<td>1</td>
</tr>
<tr>
<td>Project area</td>
<td>Treatment percentage of disturbed land (%)</td>
<td>*</td>
<td>95</td>
<td>*</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Controlled percentage of erosion area</td>
<td>*</td>
<td>85</td>
<td>-4</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Controlled ratio of soil erosion modulus</td>
<td>0.5</td>
<td>0.7</td>
<td>+0.3</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Percentage of dammed</td>
<td>90</td>
<td>95</td>
<td>90</td>
<td>95</td>
</tr>
</tbody>
</table>
5.1.2 System of Soil Erosion Prevention and Control Measures

A practical, reasonable and feasible soil erosion prevention and control scheme is made on the basis of the analysis and evaluation of the existing soil and water conservation functional engineering of the main project, according to relevant requirements of the technical specification of soil and water conservation, and based on the project characteristics, natural conditions, and soil erosion characteristics. In the overall arrangement of measures, the whole and the part should be unified and the emphasized should be coordinated with the general without any duplication and omission. New water and soil conservation measures in this scheme mainly include engineering measures, plant measures and temporary protective measures. The engineering measures are mainly arranged on both sides of the subgrade, temporary soil storage yard, waste slag yards and construction site; the plant measures mainly include planting road trees on both sides of the urban roads. Temporary measures are mainly taken for retaining and covering the temporary soil storage yards with the stripped topsoil and for watering and dedusting on the construction area. The system of prevention and control measures is shown in Figure 5-1 and Figure 5-2.

<table>
<thead>
<tr>
<th></th>
<th>Recovery percentage of the forestry and grass (%)</th>
<th>95</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of the forestry and grass coverage (%)</td>
<td>20</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>slag or ashes (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Note: In the block diagram, □ means the existing measures of the main project and □ means the new measures in the water conservation scheme.

**Figure 5-2 Block Diagram of the System of Soil Erosion Prevention and Control Measures in Gulang County**
5.1.3 Overall Arrangement of Soil Erosion Prevention and Control Measures

   (1) Subgrade engineering area: In the main project, the rainwater drainage engineering is designed for the urban roads, and the subgrade ditches, drainage ditches and other drainage engineering are designed for the urban and rural roads.

   New prevention and control measures in this scheme mainly include: ①Engineering measures: Land reclamation on both sides of the subgrade; ②Plant measures: Planting road trees on both sides of the urban roads. ③Temporary measures: Topsoil stripping.

   (2) Bridge and culvert engineering area: Land reclamation and watering measures are added in the scheme.

   (3) Temporary soil (slag) storage yard: The following measures are added in the scheme ①Engineering measures: Slope cutting, retaining engineering, drainage, land reclamation and gravel spread; ③Temporary measures: Temporary retaining wall and cover.

   (4) Construction site and road area: The following measures are added in the scheme ①Engineering measures: Land reclamation; ②Temporary measures: Watering.

5.2 Soil and Water Conservation Monitoring Scheme

5.2.1 Monitoring Purpose and Significance

   According to the provisions and requirements of the laws and regulations on water and soil conservation, the construction unit must implement feasible prevention and control measures for soil erosion caused during the development and construction process and carry out the soil and water conservation monitoring over the entire process including the construction preparation and construction implementation. Through the soil and water conservation monitoring, the original soil erosion situation in the project area can be understood, the type, strength, and harm of soil erosion in the construction process can be monitored in real time, the changing trends of the occurrence and development of soil erosion newly arising can be timely known, the protective effect of soil and water conservation measures can be learnt; the prevention and control measures can be adjusted and the soil erosion can be reduced effectively after the monitoring results are provided for the design unit.

5.2.2 Monitoring Scope, Period, Content and Frequency
(1) Monitoring scope

The monitoring scope is the responsibility scope of soil erosion prevention and control. Based on the characteristics of the project, water erosion prediction, prevention and control zones, and the overall arrangement of water and soil conservation prevention and control measures, subgrade engineering areas and waste slag yards are identified as the key areas for soil and water conservation monitoring during the construction period of the project.

(2) Monitoring period

As a construction & production project, its monitoring period starts from the construction preparation period to the end of the design level year according to relevant provisions of the technical specification of water and soil conservation for development and construction projects. According to the construction progress of the main project, the monitoring period determined by this scheme is from August 2017 to December 2020.

(3) Monitoring content

According to relevant provisions of the Technical Specification of Soil and Water Conservation Monitoring (SL277-2002) and the Ministry of Water Resources’ Opinions on Regulating Water and Soil Conservation Monitoring of Production and Construction Projects (Soil and Water Conservation [2009] No. 187), this project aims to achieve six prevention and control objectives of water and soil conservation monitoring. The soil and water conservation monitoring of this project includes: The construction progress of the major project, disturbed land area in the project construction, hidden disasters of water erosion, water erosion and its damage, soil and water conservation project construction, soil erosion prevention and control effects, soil and water conservation engineering design, and water and soil conservation management.

1) Monitoring the ecological environment of soil and water conservation

The monitoring includes ① precipitation days, intensity and duration; ② the area of the land occupied by the construction project and the area of the disturbed land surface; ③ earthwork excavation, filling amount and area of the temporary soil storage of the construction project; ④ the surface structure and the percentage of the forestry and grass coverage of the project area.

2) Monitoring the dynamic changes of the soil erosion

(1) Area changes of the soil erosion; (2) Changes of the soil erosion amount; (3) Changes of the soil erosion degree; (4) Monitoring the damages to the surrounding areas and the trends.
3) Monitoring the water and soil conservation prevention and control effects
   (1) The quantity and quality of prevention and control measures;
   (2) The survival rate, preserving rate, growth conditions and coverage of forest and grass measures;
   (3) The stability, integrity and operation of the retaining engineering and drainage projects;
   (4) The erosion reduction effect of various prevention and control measures.

4) Monitoring the background values of water erosion in the project area
   It mainly includes: (1) The usage, area and type of the existing land in the project area;
   (2) The vegetation types and coverage in the project area; (3) The current status of the soil erosion;
   (4) The quantity and area of the water and soil conservation facilities.

5) Monitoring major water erosion events
   It is mainly to investigate whether the construction of this project causes significant soil erosion such as landslide, floods and sandstorms in the project area and its surrounding areas.

   (4) Monitoring frequency
   1) Monitoring must be conducted throughout the entire construction period;
   2) The construction of soil and water conservation measures such as of waste slag yards and subgrades should be monitored and recorded once every 10 days;
   3) The waste slag yards, the disturbed surface area of the subgrades, and the retaining effects of soil and water conservation engineering measures should be monitored and recorded once every month;
   4) The construction progress of the main project, the impact factors of soil erosion, the growth of soil and water conservation plant measures should be monitored and recorded once every 3 months;
   5) In case of winds above scale 8 (wind speed ≥ 17m/s), the monitoring should be carried out timely;
   6) The monitoring should be completed within 1 week after the occurrence of a soil erosion disaster.

5.2.3 Monitoring Focus

   The soil and water conservation monitoring focus in this scheme is:
   (1) The implementation of soil and water conservation scheme;
   (2) The usage of the soil spoil grounds and the soil borrowing grounds, and the
implementation of the safety requirements;

(3) The disturbed lands and occupation of the vegetation-covered areas;

(4) The implementation of the water and soil conservation measures (including temporary protective measures);

(5) The implementation of the responsibility system for the soil and water conservation.

### 5.2.4 Monitoring Points

According to the characteristics of the project, there are 16 temporary monitoring points for water and soil conservation, that is, 8 in Liangzhou District and 8 in Gulang County; for details of the monitoring points, content and frequency of soil and water conservation during the construction period of this project, please see Table 5-3. For details of the arrangement of the monitoring points of water and soil conservation, please see the Arrangement Plan of the Monitoring Points of Water and Soil Conservation.

**Table 5-3 Table of Monitoring Points, Content and Frequency during the Construction Period**

<table>
<thead>
<tr>
<th>Location</th>
<th>Monitoring content</th>
<th>Monitoring methods</th>
<th>Monitoring points</th>
<th>Monitoring frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subgrade and side slope</td>
<td>Disturbed surface area, implementation of engineering measures, vegetation survival rate, coverage, growth, soil erosion amount, and side slope stability.</td>
<td>Field investigation method, sample plot method and position monitoring method.</td>
<td>JC1, JC2</td>
<td>The construction of soil and water conservation measures should be monitored and recorded once every 10 days; the disturbed surface area and the retaining effects of soil and water conservation engineering measures should be monitored and recorded once every month; the construction progress of the main project, the impact factors of soil erosion, the growth of the soil and water conservation plant measures should be monitored and recorded once</td>
</tr>
<tr>
<td>Waste slag yard</td>
<td>Waste slag amount, disturbed surface area, integrity and stability of slag retaining facilities, soil erosion amount, arrangement of protective measures, vegetation survival rate, coverage, and growth.</td>
<td>Field investigation method, sample plot method and position monitoring method.</td>
<td>JC5, JC6</td>
<td></td>
</tr>
<tr>
<td>Temporary soil storage yard</td>
<td>Temporary soil storage amount, disturbed surface area, integrity and effects of protective measures, and soil erosion amount.</td>
<td>Field investigation method and position monitoring method.</td>
<td>JC9, JC10</td>
<td></td>
</tr>
<tr>
<td>Constructio n road</td>
<td>Disturbed surface area, implementation of protective measures and soil erosion amount.</td>
<td>Field investigation method and position</td>
<td>JC11, JC12</td>
<td></td>
</tr>
<tr>
<td>Construction site</td>
<td>Disturbed surface area, implementation of protective measures and soil erosion amount.</td>
<td>Field investigation method and position monitoring method.</td>
<td>JC13, JC14</td>
<td></td>
</tr>
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<td>------------------------</td>
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<td>--------------------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Original topography</td>
<td>Soil erosion amount</td>
<td>Position monitoring method.</td>
<td>JC15, JC16</td>
<td></td>
</tr>
</tbody>
</table>

### 5.2.5 Monitoring Management and System

(1) Monitoring Organizations and Management

The construction unit should entrust the unit having water and soil conservation qualification above class B with the water and soil conservation monitoring of this project. The monitoring unit should compile *Water and Soil Conservation Monitoring Implementation Scheme* in accordance with the *Technical Specification of Soil and Water Conservation Monitoring* (SL277-2002) and the *Opinions on Regulating Water and Soil Conservation Monitoring of Production and Construction Projects* (Soil and Water Conservation [2009] No. 187), and complete the monitoring of this project. The monitoring unit entrusted should appoint the monitoring personnel with licenses to carry out the monitoring. The monitoring results should be regularly reported to the construction unit and the local water administrative department as one of the basis for the supervision, inspection, and acceptance.

A systematic and complete monitoring file should be created for the monitoring data obtained, such data should be analyzed, and scientific evaluations should be made for the soil and water conservation prevention and control measures to provide a reliable basis for analogy analysis.

(2) Monitoring system

1) Before the monitoring, the instruments and equipment to be used should be overhauled and calibrated.

2) The statistics, contrastive analysis and brief assessment should be made for all the monitoring results during the construction period; the problems found should be reported timely and remedial measures should be taken to keep the water and soil conservation facilities in good condition.
3) Before the start of the project (including the construction preparation period), the construction unit shall submit the *Water and Soil Conservation Monitoring Implementation Scheme for Production and Construction Projects* to the water administrative department approved by this scheme and the county-level water administrative department where the project is carried out. During the construction period of the project, the *Quarterly Report on Soil and Water Conservation Monitoring for Production and Construction Projects* of the previous quarter shall be submitted in the first month of each quarter. Severe soil erosion and hazardous events due to rainfall, strong winds or human causes shall be reported within 1 week. After the completion of the soil and water conservation monitoring task, the *Summary Report on Soil and Water Conservation Monitoring for Production and Construction Projects* shall be submitted within 3 months. The above-mentioned reports shall be affixed with the official seals of the production and construction unit and the monitoring unit.
Annex 6: Social Management Plan and Implementation Regulations

6.1 Social Management Plan

By fully understanding relevant rules and policies, and fully discussing with major stakeholders such as affected residents/villagers, relevant administrative departments in charge, passenger & freight drivers, and enterprises in the proposed project area of Wuwei City and based on field investigations and statistic analysis of data, the social assessment team identifies the major social risks which are associated with the project design and implementation and may affect the project construction and the realization of development goals, and puts forward the following action plans and suggestions to mitigate or avoid social risks.

(1) Strengthen the project construction quality supervision to ensure that the roads and their infrastructure construction meet the requirements of the masses

The demands of the local residents/villagers may be neglected during the project construction. As a result, the project may not maximize its social and economic benefits, or it may even harm the interests of special groups. The following measures are proposed to avoid such problems and ensure the roads and their infrastructure construction meet the requirements of the masses. ① The Project Office and the Traffic Management Bureau need to carry out technical monitoring over the project quality in the project implementation process to ensure that the project construction meets the design standards and satisfies the masses’ quality demands for roads and their infrastructure. ② The Project Office and other relevant departments should involve women and representatives of vulnerable groups in the project management and ensure the characteristics and needs of women and other vulnerable groups can be taken into consideration in the project construction. ③ The feedback channels should be set up for the masses to accept their opinions and supervision in the project construction process and fully meet their daily transportation needs.

(2) Reduce the negative impact of project construction on the daily life of residents

It is inevitably that the project construction will affect the daily social life of local residents/villagers, so the following measures should be taken to reduce the negative impact of project construction. ① Half range of the road can be closed during the construction and the construction should be carried out when the flows of people and vehicles are small (especially not on the market days) so as to minimize the adverse impact of the road construction on the residents’ daily travel. ② During the construction period, appropriate safety measures shall be
taken for the construction sections. For example, the prompt message, "The road ahead is under construction, please make a detour", should be shown at the intersection near the construction sections and obvious safety warning signs shall be set up at the construction sections to avoid posing threats to the personal and property security of the local residents. ③ Appropriate measures should be taken to mitigate the pollution of noise, dust and solid waste, and the adverse effects on the daily life and production of local residents. During the road construction, noise reduction measures should be taken and the construction at night near the residential and living areas in villages and towns should be avoided; Measures should be taken to reduce the dust and construction on windy days should be avoided to reduce the adverse effects of dust on the life of nearby residents and the growth of crops near roads; The solid waste generated should be cleaned and transported in a timely manner so as to avoid affecting the normal daily life of the residents and causing secondary pollution.

(3) Strengthen information publicity and public participation

The following measures should be taken to make the project information open, involve the people in the affected areas in the design and construction of the project, ensure the project results can meet the requirements of the masses as much as possible, and achieve the maximum social and economic benefits: ① The government websites, television, bulletin boards and leaflets/handbooks should be used to release relevant information of project design, implementation progress, and construction results to enable the masses to know the project progress and supervise the project implementation. ② The government websites, television, bulletin boards, village committee notices should be used to release recruitment information such as looking for the non-technical workers during the project implementation, and cleaning workers and road maintenance workers after the completion of the project to enable the public to obtain the recruitment information and actively participate in the project construction.

(4) Strengthen the traffic safety education and publicity

In view of the lack of traffic safety knowledge and the weak awareness of traffic safety among residents/villagers in the project area, it is necessary to strengthen the publicity and education of traffic safety knowledge while the construction of road infrastructure is improved to reduce traffic safety accidents caused by human factors. To this end, the following four suggestions are made: ① Set up a traffic safety propaganda team to be responsible for traffic safety propaganda. ② Carry out the traffic safety propaganda to the masses in the project area in the way they would like to see and hear during the slack seasons. And make efforts to encourage women, the elderly and children who lack traffic safety
knowledge to take part in the propaganda activities. On holidays and market days, the propaganda cars should be dispatched and booths should be set up on the market to popularize the traffic safety knowledge, provide consulting service, and give out traffic safety brochures and leaflets. Go into schools to provide publicity and education of traffic safety for the primary and middle school students by holding safety education conferences and giving out greeting cards. ③ Give out the Handbooks on Traffic Safety Knowledge for Migrant Workers to migrant workers to supplement their traffic safety knowledge. ④ Make efforts to the assess the traffic safety knowledge of motor vehicle drivers (especially passenger and freight drivers) and cultivate their traffic safety awareness. The Transport Administration Bureau and passenger & freight companies can jointly conduct the traffic safety education and assessment for passenger and freight drivers.

(5) Pay attention to the management and conservation of roads after they are built

The phenomenon of "Much importance is attached to building roads and less is attached to maintaining them" is common in the proposed project area in Gulang County, Wuwei City, resulting in serious damage and shortened service life of roads. Residents/villagers in the project area generally request that there should be responsible units and funds for the daily management and conservation of roads after they are built. In this regard, the following three suggestions are made: ① Recruit workers for road maintenance from the residents/villagers in the project area to build a rural road conservation team. The residents/villagers in the project area should be employed in priority as road conservation workers, which will not only make them more responsible in the road management but also increase their economic incomes. ② Specify the responsibilities, assessment methods and job subsidy schemes of the road conservation team. Specify the responsibilities and assessment methods of the road conservation workers and provide job subsidies to ensure they spare no effort for road conservation. ③ The road conservation team should take charge of the management and conservation of the newly-built and reconstructed roads in the course of use, carry out the routine maintenance of the road infrastructure such as street lights, guardrails, traffic safety warning signs, green belts and drainage channels, stop and report the acts of destruction of roads, and report to relevant departments to repair the severely damaged pavement and facilities.

(6) Provide livelihood support for residents affected by the project

The project may have a certain impact on the livelihood activities of the residents/villagers in the project area, especially the land-expropriated and relocated
households. For the purpose of mitigating the negative impact of the project construction on their economic incomes and making the project construction give play to its positive energy to promote the development of disadvantaged groups, the following four suggestions are made accordingly to promote non-farm employment and increase economic incomes of residents/villagers (especially women, the poor, and the land requisitioned and relocated households) in the project area. ① 30% of the temporary or permanent non-technical jobs created in the project construction should be preferentially provided for the women and poverty groups in the project area. ② After the completion of the project, the service industry can be developed in the areas at both sides of the roads and those with tourism resources. Relevant departments should encourage women, poverty groups, and land-expropriated farmers to start their own businesses nearby and offer entrepreneurial support and preferential treatment accordingly. ③ Provide skill training for the land-expropriated farmers, women and poverty groups in the project area and provide intellectual support for their employment transfer or non-agricultural employment in the local area. ④ Formulate preferential policies and encourage the local companies to preferentially recruit the people affected by the project, especially the land-requisitioned farmers.

In order to ensure that the above recommendations are effectively implemented and promote the ultimate realization of the project goals, the social assessment team has formulated the social management plans and information disclosure & public participation plans for the project on the basis of further consultation with various stakeholders. See Attached Table 8-1 for details.

6.2 Complaints and Monitoring Assessment

6.2.1 Complaint Procedure

In the process of project preparation, construction and operation, in order to timely understand and resolve the impacts and problems that the project brings to the stakeholders, meet the residents' demands of information publicity and ensure the widest possible community participation, diverse and effective complaint channels should be established in the proposed project based on the current status of complaints of residents in the project area. The basic processing procedure is as follows:

Phase 1 If the rights of the residents in the project area are infringed during the phase of project implementation, they may report to the village committee. The village committee or
the residents may directly negotiate with the township government for settlement. Upon receipt of the complaints, the township government will record them and work with the village committee and the residents to study and solve the problem within two weeks.

Stage 2 If the complainer is unsatisfied with the decision in Stage 1, he/she may file a complaint with the Gulang County Project Office which will make a decision to handle the complaint within 2 weeks.

Stage 3 If the complainer is unsatisfied with the decision in Stage 2, he/she may file a complaint with the Wuwei City Project Office which will make a decision to handle the complaint within 2 weeks.

Stage 4 If the complainer is still unsatisfied with the decision of the Wuwei City Project Office, he/she, upon receipt of it, may file a complaint with administrative organs with jurisdiction level by level for arbitration in accordance with the Administrative Litigation Law of the People’s Republic of China.

Stage 5 If the complainer is still unsatisfied with the arbitration decision, he/she, upon receipt of it, may file a lawsuit with the civil court according to the Civil Procedure Law.

6.2.2 Monitoring & Evaluation

Monitoring & evaluation are important steps for ensuring that the project is implemented in accordance with the its objectives, ensuring the project information publicity and public participation, and ensuring that the social management plans designed and proposed in the social impact assessment report can be valued and implemented, and they are also important error correction and participation mechanisms for the proposed project. To this end, a monitoring & evaluation mechanism, including internal supervision and external monitoring & evaluation, is established for the proposed project.

Internal supervision is carried out by the World Bank Project Office over the implementation progress of the proposed project, the implementation of social management plans, the progress of information publicity and public participation plans, the usage of project funds, and the implementation of rules and regulations.

The external independent monitoring & evaluation will be conducted by an independent monitoring agency on the implementation of the social management plans, which is employed by the Project Office and approved by the World Bank, and has monitoring and evaluation experience in the World Bank projects. Independent monitoring and evaluation agency will regularly conduct follow-up monitoring and evaluation on the implementation activities of the
social management plans, put forward consulting opinions and submit monitoring and evaluation reports to the World Bank.