**Central Heating Project**

**Project Proposal**

**2013-8**

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10. District overview

The park is located in Lintong District of Xi’an, north of the Wei River. It is an important step of Lintong District towards its Economic Zone Development Plan. The planned area of the park is ​​51.03 square kilometers. Near-term construction region is ​​about 13 square kilometers, which can accommodate 133,000 people. The near-term construction region includes the supporting service center area, the general special equipment manufacturing industrial area, the noble style community area and the riparian ecological residential area. The north part of the near-term construction region is designed for industry. The central part is mainly designed for residing and commercial use. The southern part is designed for land with entertainment and leisure functions. According to the city’s construction concept and development timing, industrial clusters will be the first area to be built in the park to promote the development of local business and living facilities via aggregation effect.



Figure 1.1 Schematic diagram of the near-term construction region

1. Reference Laws and Regulations

2.1 Policies and regulations

"Guidance on the reform of urban heat supply scheme";

"Concept of Development and Strengthening Environmental Protection by the State Council ";

"Temporary Means of City Heat Supply Price Management";

"Guidance on heat supply and demand related issues in winter seasons";

"Notice on Relevant Value added Tax Issues concerning Heat Supply Enterprises" (Finance Tax [2011] No. 118);

"Urban Central Heating Regulations in Xi'an";

"Announcement by Xi'an Price Bureau on the adjustment of urban central heating price"

2.2 Planning of the park

"Master Plan of Xi'an Weibei (Lintong) Modern Industrial Zone" (2010-2030);

"Controlled Detailed Planning of Xi'an Lintong Modern Industrial Group at Weibei Industrial Zone";

"Special Planning on Heat Supply for Xi'an Weibei (Lintong) Modern Industrial Zone ";

"Twelfth Five-Year Plan for Environmental Protection of Xi'an and Outline Planning towards Year 2020."

2.3 Industrial standards and specifications

"Detailed Rules for Implementation of Methods for Urban Planning Formulation";

"Design specifications for urban heat network " CJJ34-2002;

"Technical specifications for directly buried urban heat pipelines" CJJ/T81-98;

"Construction standards for urban heat plant project" Building Standards 112-2008.

1. Recommendations

3.1 Project Name:

Near-term central heating construction project

3.2 Project Overview:

It is recommended to install 8 × 70MW high temperature hot water boilers, which means a total installed capacity of 560MW. Designed supply temperature and return temperature of the water is 130℃ and 70℃ respectively. The design pressure of pipeline is 1.6MPa.

1. Necessity of construction

1）Conflict between heat supply capacity and heat demand for the near-term construction zone

The built-up area of Lintong modern industrial group covers 45 villages whose current population is about 36,500, and the planned construction area will be ​​about 2.1 square kilometers. Currently only the commercial buildings, schools and hospitals have self-installed small coal-fired boilers and auxiliary heat supply pipelines, the rest buildings in these villages are mainly farm houses which use self-installed facilities for room heating.

According to the “Master Plan of Xi'an Weibei (Lintong) Industrial Park (2010-2030)", the planned Shenhua Thermal Power Plant is located at the north-west of the region, which will provide as much as about 570MW of heat to the park as a CHP project. But the approval and construction of this project face big obstacles. Even if the project successfully passes the evaluation and gets approved, its location is relatively far away from the near-term construction region, which means a huge amount of investment is needed for pipeline networks. Meanwhile, according to current approval process and construction period, it is basically impossible to put the project into operation by 2016.

If those companies within the park use decentralized coal-fired boilers for winter heating, it will be conflict with the implementation of "Blue Sky Project" in Xi'an, and it will cause serious obstacles for the park's development process and its investment environment. Central heating can not only reduce the infrastructure investment and operating cost for the enterprise, but also reduce pollution and energy consumption, which is in line with current national energy and environment policies. Therefore, the requests for central heating and implementation of "Blue Sky Project" project from the park are pretty strong.

1. Construction Plan
2. Construction Conditions

Lintong modern industrial group is located in "Guanzhong - Tianshui" Economic development zone, whose identification is quite clear. Currently, the road network, power grids and other infrastructure constructions in the region have been basically formed, and the construction conditions for central heating project are basically in place. The most important problems to be tackled now are heat sources and the layout of thermal networks for some main roads.

1. Heat load

2.1 Total heat load of the park

According to "Special plan of heat supply for Xi'an Weibei (Lintong) modern industrial zone", the total heat supply area of the park in long term will be ​​33 million square meters in year 2030, and the corresponding heat load will be 1689MW. Planned heat sources are:

1# heat plant with a heat load of 799.5MW will be built recently in the southeast corner to supply heat for the near- term region;

2# heat plant with a heat load of 669.5MW will be built in the future in the northeast corner to supply heat for the near- term region;

The heat demand covered by geothermal, natural gas, electrical heating and other clean energy will be 220MW.

The construction will be divided into several phases according to the development of the park and its heat load.

2.2 Total heat load of the near-term construction region

According to "Special plan of heat supply for Xi'an Weibei (Lintong) modern industrial zone", the integrated volume rate for civil building built-up land is 1.2, while the volume rate for industrial built-up land is 0.6. The planned heat index of space heating area for new buildings is listed in Table 3.1.

Table 3.1 Heat index of heating area for new buildings

|  |  |  |
| --- | --- | --- |
| New civil buildings planned | Residential building | 40 W/m2 |
| Public building | 52 W/m2 |
|  | Integrated heat index for space heating (60% for residential buildings, 40% for public buildings) | 45 W/m2 |
| New industrial buildings planned |  | 65 W/m2 |

According to the data provided by the enterprises which are supposed to settle in the park as well as the built-up area and volume ratio for each land block, the heat demand for near-term construction region can be calculated, as shown in Table 3.2. Detailed load data for each enterprise and land block can be found in Appendix I.

Table 3.2 Heat demand for near-term construction region

|  |  |  |  |
| --- | --- | --- | --- |
| Energy user | Built-up Area (Ten thousand square meters) | Space Heating Area (Ten thousand square meters) | Heat Load (MW) |
| Residential | 384.52 | 407 | 190.69 |
| Commercial | 162.34 | 253 | 113.83 |
| Industrial | 563.13 | 213 | 146.76 |
| Public Service | 32.36 | 23.5 | 10.59 |
| Total | 1142.35 | 896.5 | 461.86 |

The central heating ratio for near-term construction region is calculated as 60%, and the total heat load is calculated as 461.86MW.

2.3 Heat demand of near-term construction region for Year 2015

Table 3.3 Heat demand of near-term construction region for Year 2015

|  |  |  |  |
| --- | --- | --- | --- |
| Project Phases | Project Name | Near-term construction region (ten thousand square meters) | Heat Load (MW) |
| Construction already started | Qin Yu Jia Yuan Community (Resettlement region) | Residential:8.6 Commercial: 2.7 | 4.52 |
| Weibei International Business Project | Office: 3.6 | 1.44 |
| Standardized industrial plant | 20 | 13 |
| China Gold | 20 | 13 |
| Wen Business Properties | 21 | 19.14 |
| Construction progress not confirmed | Xi Gao Electricity | 31 | 20.15 |
| Lijun Steel | 20 | 13 |
| RongDa Huamei Electrical | 8 | 5.2 |
| Yi Si Ling Huatai | 14 | 9.1 |
| Princeton Investment | 7.2 | 4.68 |
| Hang Xiao Steel | 2.2 | 1.43 |
| Total | |  | 104.66 |

2.4 Built-up area and heat load development forecasting for near-term construction region

Table 3.4 Built-up area and heat load development forecasting for near-term construction region

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unit | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Residential | Ten thousand square meters | 8.6 | 141.4 | 274.2 | 407 | 407 | 407 |
| Commercial | 6.3 | 88.53 | 170.76 | 253 | 253 | 253 |
| Industrial | 143.4 | 166.6 | 189.8 | 213 | 213 | 213 |
| Public service | 3 | 9.83 | 16.66 | 23.5 | 23.5 | 23.5 |
| Heat load increase | MW | 104.66 | 119.07 | 119.07 | 119.06 | 0 | 0 |
| Accumulative heat load | 104.66 | 223.73 | 342.8 | 461.86 | 461.86 | 461.86 |

1. Heat sources
   1. Coal source situation

The current project intends to select coalmines produced by Shaanxi Binchang Mine and Tongchuan Mining.

Coal analyzing as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Test items | Symbol | Detected value | | Note |
| Designed coal type | Reference coal type |
| 1 | Total Moisture | Mt % | 14.3 | 14.2 |  |
| 2 | Moisture of air-dried coal sample | Mad % | 3.49 | 4.17 |  |
| 3 | Ash | Aar % | 21.1 | 17.24 |  |
| 4 | Volatile | Vdaf % | 33.37 | 34.23 |  |
| 5 | Coke residue characteristics | JTo |  |  |  |
| 6 | Total sulfur | St,d % | 0.73 | 0.56 |  |
| 7 | Hydrogen content | Har % | 2.97 | 3.22 |  |
| 8 | Carbon content | Car % | 52.95 | 56.28 |  |
| 9 | Nitrogen content | Nar % | 0.51 | 0.59 |  |
| 10 | Oxygen content | Oar % | 7.44 | 7.91 |  |
| 11 | Heat | Qgr,arMJ/kg | 20.5 | 22.14 |  |
| Qnet,arMJ/kg | 19.56 | 21.15 |  |

* 1. Selection on heat source equipments
     1. Boiler working fluid

To be consistent with " Special plan of heat supply for Xi'an Weibei (Lintong) modern industrial zone", the closed loop hot water system with double tubes will be used, whose water temperature is 130 ℃, return water temperature is 70 ℃, and pipeline design pressure is 1.6MPa.

* + 1. Boiler type

According to the heat load and boiler capacity, chain grate combustion boiler or circulating fluidized bed boilers can be utilized.

As the current project is municipal infrastructure construction project, and central heating is only for cold seasons, we should try to select equipments with a lower initial investment, lower operating cost, and simpler operation requirements. The project mainly supplies heat for space heating, which has a relatively stable load change and hence does not require the boiler to be with a flexible load. Meanwhile, according to the fuel data, the coal of this project is low-sulfur coalmine, whose sulfur content is only 0.73~0.56% and ash is 21.1 ~ 17.24%, therefore the boiler does not need to have advanced desulfurization functions. Based on the above analysis, chain grate combustion hot water boiler is proposed to be utilized.

* + 1. Sizing the boiler and boiler room

The boiler room is restricted by the constraints of scale, venue, operation and management, therefore a 70 ~ 91MW of rated amount of heat supply for single boiler is considered as reasonable and practical. The current proposal has considered the following rated operating parameters for the boiler:

Rated operating pressure for boiler: 1.6MPa;

Temperature of return water supply for boiler: 130/70℃.

The construction of boilers and boiler room size in accordance with the following two options to consider:

Two options are considered for sizing the boiler and the boiler room:

First option: 8ⅹ70MW high-temperature hot water chain grate boilers;

Second option: 6ⅹ91MW high-temperature hot water chain grate boilers.

Based on our understanding of boiler manufacturers, the 70MW-scale high-temperature hot water chain grate boiler has been produced for hundred sets and implemented in quite a lot of projects, which means that this technology is relatively mature and reliable. On the other hand, although there have been a few projects using the 91MW-scale and 116MW-scale boilers, there are still some technical problems and malfunctions exist for this type of boiler.

The total heat load of the near-term construction region is about 461.86MW, and if we consider the load factor of the heat supply equipments as 88%, then the total heat supply capacity of the heat plant in the near-term construction region should be higher than 525MW. The second option uses the relatively immature boiler technology which will lead to an increased operating cost. The 91MW boiler has the same length as the 70MW boiler but it is 6m bigger than the 70MW boiler in width, hence the installation width of eight 70MW boilers is less than six 91MW boilers. Therefore, in the current proposal we recommend to take the first option to install eight 70MW boilers, and hence the relevant technical and economic data are based on the first option.

* 1. Water Treatment System

The water to start the heat supply system will be city water, and the regular water supply will be deionized water generated by the water treatment workshop of power plant. Packaged filter equipment will be used for oxygen removal.

* 1. Desulfurization System

Wet FGD with lime purification technology will be used, where calcium oxide slurry is used in the wet absorber to absorb SO2. Desulfurization device consists of absorbent preparation system and the absorption system.

* 1. Thermal control and light-current system

Computer central control system will be used for the thermal control for the chain grate high-temperature hot water boilers, water circulation system, supply-water treatment and oxygen removal system. Control system will be installed in separate phases according to process requirements.

* 1. Location of the boiler room

The boiler room will be located within the China Gold second period land, which is in the southeast corner of the intersection between Qin Wang Er Road and Wei Shui Si Road, same as Energy Island I. The boiler room covers an area of ??? square meters approximately. See Figure 3.1.



Figure 3.1 the boiler room schematic site

1. Heat supply network

4.1 Installation method for heat supply network

4.1.1 Installation method for hot water pipelines

Polyurethane foam is used for insulation of the directly - buried heating pipelines, solid plastic is used as protective layer. Directly - buried high temperature hot water pipeline is currently one of the mature installation technologies, and is also one of the widely used installation methods for heat supply industries. According to the practical situation of this project, it is recommended to use the mature underground directly - buried method to protect the urban aesthetics.

4.1.2 Connection method between heat network and heat exchange station

Primary network and secondary network are connected through an indirect heat exchanger, benefits are as follows: the primary network does not lose water, which can save a large amount of water and electricity operating cost due to water loss; demineralized water will be supplied to the primary network at the power plant, extending the life of pipelines; working conditions of the operating hydraulic is stable, heat supply is effective, and the indirect connection method is reasonable from economic perspective.

4.2 Pipeline material and insulation

Q235-A is used as the material of heat supply pipelines. Double-side spiral welded steel pipes should be used when the pipeline diameter DN ≥ 250, and seamless steel pipes should be used when diameter DN ≤ 200.

Polyurethane foam is used for the insulation of the high temperature water supply pipes. High density pipe is used as the ​​jacket pipe. Steel pipe, polyurethane insulation and the polyethylene protective layer are stick together to form the overall portfolio pipeline, which has very strong compressive strength and corrosion resistance. When temperature of the water supply is 115 ℃ and pipeline is larger than 450mm, the temperature drops for less than 0.1℃ per kilometer. Since the outer protective layer has a high corrosion resistance, it can maintain a good stability under thermal and chemical effect.

4.3 Heat network (primary network) estimation

Major materials for the hot water pipeline network (primary network)

|  |  |  |  |
| --- | --- | --- | --- |
| No | Name and specifications | Unit | Value |
| 1 | Polyisocyanurate acid lipid directly-buried insulating pipe DN1400 | km | 1.462 |
| 2 | Polyisocyanurate acid lipid directly-buried insulating pipe DN1200 | km | 1.962 |
| 3 | Polyisocyanurate acid lipid directly-buried insulating pipe DN1000 | km | 1.128 |
| 4 | Polyisocyanurate acid lipid directly-buried insulating pipe DN900 | km | 7.464 |
| 5 | Polyisocyanurate acid lipid directly-buried insulating pipe DN800 | km | 2.7 |
| 6 | Polyisocyanurate acid lipid directly-buried insulating pipe DN700 | Km | 0.72 |
| 7 | Polyisocyanurate acid lipid directly-buried insulating pipe DN600 | Km | 0.36 |
| 8 | Polyisocyanurate acid lipid directly-buried insulating pipe DN500 | Km | 0.396 |
| 9 | Polyisocyanurate acid lipid directly-buried insulating pipe DN450 | Km | 0.48 |
| 10 | Polyisocyanurate acid lipid directly-buried insulating pipe DN400 | Km | 3.683 |
| 11 | Polyisocyanurate acid lipid directly-buried insulating pipe DN350 | Km | 14.52 |
| 12 | Polyisocyanurate acid lipid directly-buried insulating pipe DN300 | Km | 5.16 |
| 13 | Polyisocyanurate acid lipid directly-buried insulating pipe DN250 | Km | 6.864 |
| 14 | Polyisocyanurate acid lipid directly-buried insulating pipe DN200 | Km | 12.888 |
| 15 | Polyisocyanurate acid lipid directly-buried insulating pipe DN150 | Km | 8.592 |
| 16 | Polyisocyanurate acid lipid directly-buried insulating pipe DN125 | Km | 3.318 |
| 17 | Polyisocyanurate acid lipid directly-buried insulating pipe DN100 | Km | 3.318 |

5. Staff

Table 3.6 Staff Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Job | First phase | Final phase | Note |
| Non-production staff | | | | |
| 1 | Manager | 1 |  |  |
| 2 | Assistant Manager | 1 |  |  |
| 3 | Chief Engineer | 1 |  |  |
| 4 | Security and Technology Department | 3 | 1 |  |
| 5 | Factory Office | 3 | 1 |  |
| 6 | Production and Operation Department | 3 | 0 |  |
| 7 | Financial Department | 2 | 0 |  |
|  | Total | 14 | 2 |  |
| Production Staff | | | |  |
| 1 | Shift foreman | 1×4=4 |  |  |
| 2 | Storker | 2×2×4=16 | 6×6×12=32 |  |
| 3 | Pumper | 1×4=4 | 0 |  |
| 4 | Cleaner | 1×4=4 | 0 |  |
| 5 |  |  |  |  |
| 6 | Coal transport system | 3×3=9 | 3×1=3 | Two shifts |
| 7 | Alternating electric operator | 2×4=8 | 0 |  |
| 8 |  |  |  |  |
| 9 | Water treater | 1×4=4 |  |  |
| 10 | Maintain staff | 3 | 0 | Day Shift |
| 11 | Electrician | 2 | 0 | Day Shift |
| 12 | Plumber | 2 | 1 | Day Shift |
|  | Total | 56 | 20 |  |

4. Construction Schedule

**1） Construction progress**

1.1 Year 2015

If heat load is 104.66MW, load rate of heat supply equipment is considered as 88%, then the heat supply capacity should be greater than 119MW.

The project scale will be 140MW by 2015, 70MW × 2 boilers will be installed to meet the heat demand in 2015.

1.2 Year 2016

If heat load is 223.73MW, load rate of heat supply equipment is considered as 88%, then the heat supply capacity should be greater than 254MW.

The increased capacity of this project will be 140MW in 2016, 70MW × 2 boilers will be installed, and the total heat supply capacity will be 280MW, which is able to meet the heat demand of the near-term construction region in 2016.

1.3 Year 2017

If heat load is 342.8MW, load rate of heat supply equipment is considered as 88%, then the heat supply capacity should be greater than 389.5MW.

The increased capacity of this project will be 140MW in 2017, 70MW × 2 boilers will be installed, and the total heat capacity can reach 420MW, which is able to meet the heat demand in 2017.

1.4 Year 2018

If heat load is 461.86MW, load rate of heat supply equipment is considered as 88%, then the heat capacity should be greater than 525MW.

The increased capacity of this project will be 140MW in 2015, 70MW × 2 boilers will be installed, and the total heat capacity will be 560MW, which is able to meet the heat demand in 2018.

**2） Schedule of the project construction**

2.1 September 2013 to February 2014

Project approval, project construction, franchise agreements, feasibility study, environmental assessment, safety assessment, land related procedures, mapping, geological survey and other preliminary work.

2.2 February 2014 to October 2014

Confirm design companies and sign contract, equipment selection research, master plan validation, construction design, determination of external large municipal  
program ( power and water supply, drainage, roads, etc.).

2.3 October 2014 to May 2015

Complete the civil construction, chimney and main plant structure construction, sign the equipment purchase contracts, organize equipment purchase.

2.4 May 2015 to October 2015

Complete all the installation tasks of the first phase project, heat equipment commissioned after trial operation.

5. Economic & Benefit Analysis

1） Investment Estimation

1.1 Reference for investment estimation

"Investment Estimation Index for National Municipal Engineering Project" (2007);  
"Methodologies for Municipal Engineering Investment Estimation" (2007);  
"Investment Estimation Index for Urban Heat Supply Projects" (1999);  
"Budget quota for national municipal engineering project - Shanxi Province" (2001);  
"Fixed other cost for engineering project construction in Shanxi Province" (1999);  
Labor cost is in accordance with the salary standards indicted by Shanxi Construction and Development [2007] Document No. 232;

1.2 Investment Estimation

Equipments, plant construction, ancillaries and the primary heat networks are included.

Table 3.1 Project investment budget

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Item | Funds(10000 RMB) | Note |
| 1 | Pre-project fee |  | Feasibility study, construction plan and supervision fee, etc. |
| 2 | Project management fee |  | Supervision, tendering, temporary construction and management, etc. |
| 3 | Land cost |  |  |
| 4 | Civil construction |  | Plant, chimney, ash pond, and all the civil construction facilities |
| 5 | Equipment cost |  | 8 × 70MW boilers and ancillary equipment |
| 6 | Installation cost |  | Mechanical and electrical equipment, internal piping system, commissioning and testing, etc. |
| 7 | Primary heat network |  | About 18 ~ 20km, 4.5 million RMB per kilometer |
| 8 | Production, organization and construction |  | Recruitment, training cost, office facilities |
| 9 | Production cash flow |  |  |
| 10 | Project contingency cost |  | Power and water supply |
| 11 | Total |  |  |

2） Operation cost estimation

Heat supply operation cost (unit: RMB / square meter per building / heating season):

3） Income objectives estimation

Table 3.3 Project income estimation

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Standard | Income  (billion RMB) | Note |
| Heat supply engineering fee | Resident: 60 RMB / square meter | 0.2442 | 4,070,000 square meters |
| Non-resident: 80 RMB / square meter | 0. 3912 | 4,890,000 square meters |
| Financial subsidies for central city urban infrastructure | Project feasibility study budget 30% | 0.09-0.011 |  |
| Price of heat | Residential: 5 RMB / m2 month;  Ordinary industrial and commercial users: 7 RMB / m2 month |  |  |
| Total |  | 0.7656-0.7856 |  |

6. Risk Analysis

1）Park development is behind schedule

If the construction and development of the park is slow, then its heat demand might not be able to meet our expectations.

The project benefit depends on the development of its heat users. If there are not enough heat users, it will cause waste and project loss.

2） Planning of the heat pipeline network

Unreasonable planning and construction of the heat pipeline network will cause great obstacles to the operation of this project.

3） Heat fee collection

Residents in the park are primarily resettled farmers, whose income level and ability to pay are both pretty low, therefore it might be difficult to collect the heat fees.

4）Price increase for raw materials

Coal price accounts for a big proportion in the heat supply cost. Currently the market price of coal is always changing. If coal price increases, it will significantly reduce the project income.

7. Comprehensive benefit

1） Social benefit

This project will improve the living conditions of local people and provide support for the enterprises in the park. It will also provide some job positions for the original surplus rural populations, which in turn can promote regional economic development and social stability.

2） Ecological benefit

This project will use large capacity and high efficiency boilers, hence the coal consumption and emissions will reduce quite a lot.

By using the high-efficiency dust removal and desulfurization devices, it can reduce soot and sulfur dioxide emissions, therefore reduce air pollution. The expected ash removal rate is more than 95%, and the desulfurization rate is expected to be more than 90%.

Ash storage is relatively concentrated, which reduces secondary pollution.

Compared to the heat supply by distributed small coal-fired boilers, this project can save approximately ten thousand tons of standard coal per year with annual electricity saving of about ten thousand KWh. Through high efficient dust removal and desulfurization, flue gas emissions will reduce by about 35.55 million Nm3, and the dust emission will be reduced by about 900t/a, while SO2 reduction is expected to be about 810t/a, waste reduction about 3150 t/a.

**Appendix 1: Heat demand of different corporates in near-term construction region**

|  |  |  |  |
| --- | --- | --- | --- |
| **Energy user** | **Area(10 000 sq.m)** | **Built-up area (10 000 sq.m)** | **Heat demand (MW)** |
| **Residential land block** | | | |
| **Qin Yu Jia Yuan community (Resettlement region)** | 39.57 | 71.6 | 19.33 |
| **Housing industry park** | 52.9 | 63.48 | 17.14 |
| **Xi’an Dong Fang Technology Co.** | 220.34 | 173 | 46.71 |
| **Shanxi Blowers Group** | 47.3 | 20.1 | 12.88 |
| **Residential block 1** | 19.17 | 23.004 | 6.21 |
| **Residential block 2** | 8.9 | 10.68 | 2.88 |
| **Residential block 3** | 13.08 | 15.696 | 4.24 |
| **Residential block 4** | 11.81 | 14.172 | 3.83 |
| **Residential block 5** | 11.49 | 13.788 | 3.72 |
| **Residential block 6** | 11.49 | 13.788 | 3.72 |
| **Residential block 7** | 8.9 | 10.68 | 2.88 |
| **Residential block 8** | 13.08 | 15.696 | 4.24 |
| **Residential block 9** | 11.81 | 14.172 | 3.83 |
| **Residential block 10** | 11.49 | 13.788 | 3.72 |
| **Residential block 11** | 11.49 | 13.788 | 3.72 |
| **Residential block 12** | 17.3 | 20.76 | 5.61 |
| **Residential block 13** | 15.08 | 18.096 | 4.89 |
| **Residential block 14** | 14.63 | 17.556 | 4.74 |
| **Residential block 15** | 25.55 | 30.66 | 8.28 |
| **Residential block 16** | 39.95 | 47.94 | 12.94 |
| **Residential block 17** | 19.44 | 23.328 | 6.3 |
| **Residential block 18** | 8.29 | 9.948 | 2.69 |
| **Residential block 19** | 6.45 | 7.74 | 2.09 |
| **Residential block 20** | 12.65 | 15.18 | 4.1 |
| **Total** | 652.16 | 678.64 | 190.69 |
| **Commercial land block** | | | |
| **Weibei International Business Project** | 12.2 | 33 | 8.91 |
| **Qin Yu Jia Yuan community (Resettlement region)** | 39.57 | 48.3 | 13.04 |
| **Xi’an Dong Fang Technology Co.** | 220.34 | 40 | 10.8 |
| **Commercial block 1** | 10.58 | 21.16 | 5.71 |
| **Commercial block 2** | 16.93 | 33.86 | 9.14 |
| **Commercial block 3** | 9.23 | 18.46 | 4.89 |
| **Commercial block 4** | 17.72 | 35.44 | 9.57 |
| **Commercial block 5** | 22.46 | 44.92 | 12.13 |
| **Commercial block 6** | 18.45 | 36.9 | 9.96 |
| **Commercial block 7** | 22.44 | 44.88 | 12.12 |
| **Commercial block 8** | 32.33 | 64.66 | 17.46 |
| **Total** | 422.25 | 421.58 | 113.83 |
| **Industrial land block** | | | |
| **Shanxi Blowers Group** | 47.3 | 13 | 13.55 |
| **China Gold Group Construction Co., Ltd.** | 55.4 | 20 | 7.8 |
| **Xi’an Wen Business Real Estate Investment Co.** | 153.3 | 180 | 70.2 |
| **Xi'an Orient Technology Co., Ltd.** | 220.34 | 60 | 23.4 |
| **Xi'an High-Energy Group Ltd.** | 15.8 | 31.1 | 12.13 |
| **Shaanxi RongDa gorgeous Electric Co., Ltd.** | 7.5 | 8 | 3.12 |
| **Xi’an Yi Si Ling Huatai Automobile Seat Co., Ltd.** | 20 | 14 | 5.46 |
| **Xi'an Princeton Investment Co., Ltd.** | 9 | 7.2 | 2.81 |
| **Xi’an Hang Xiao Steel Works Ltd.** | 6.7 | 4.6 | 1.79 |
| **Industrial block 1** | 11.1 | 6.66 | 2.6 |
| **Industrial block 2** | 16.69 | 10.01 | 3.91 |
| **Total** | 563.13 | 354.574 | 146.76 |
| **Public Service Block** | | | |
| **Administrative & Office** | 19.17 | 23.39 | 6.31 |
| **Medical and Health** | 13.19 | 15.83 | 4.27 |
| **Total** | 32.36 | 39.22 | 10.59 |