



June 2024

# CHINA REPORT

CONSTRUCTION PROCUREMENT AND  
COST INTELLIGENCE

RLB  
利比

Rider  
Levett  
Bucknall

# OFFICES AROUND THE WORLD

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### Angola

Luanda

### Botswana

Gaborone

### Kenya

Nairobi

### Mauritius

Quatre Bornes

### Mozambique

Maputo

### Namibia

Windhoek

### Nigeria

Lagos

### Seychelles

Victoria

### South Africa

Cape Town

Durban

Pretoria

Stellenbosch

## MIDDLE EAST

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Doha

### Saudi Arabia

Riyadh

### United Arab Emirates

Abu Dhabi

Dubai

## ASIA

### North Asia

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Chengdu

Chongqing

Guangzhou

Guiyang

Haikou

Hangzhou

Hong Kong

Macau

Nanjing

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Seoul

Shanghai

Shenyang

Shenzhen

Wuhan

Wuxi

Xian

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Bohol

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Ho Chi Minh City

Iloilo

Jakarta

Kuala Lumpur

Laguna

Metro Manila

Phnom Penh

Singapore

Yangon

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Hulhumale

### India Alliance

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Birmingham

Bristol

Cambridge

Cardiff

Edinburgh

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Liverpool

London

Manchester

Newcastle Upon Tyne

Sheffield

Thames Valley

Warrington

### Euro Alliance

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Bulgaria

Croatia

Czech Republic

Denmark

France

Germany

Hungary

Ireland

Italy

Luxembourg

Montenegro

Netherlands

Norway

Poland

Portugal

Romania

Serbia

Spain

Sweden

## OCEANIA

### Australia

Adelaide

Brisbane

Cairns

Canberra

Coffs Harbour

Darwin

Gold Coast

Melbourne

Newcastle

Perth

Sunshine Coast

Sydney

Townsville

### New Zealand

Auckland

Christchurch

Dunedin

Hamilton

Palmerston North

Queenstown

Tauranga

Wellington

## AMERICAS

### Caribbean

St. Lucia

### North America

Boston

Calgary

Chicago

Denver

Hilo

Honolulu

Las Vegas

Los Angeles

Maui

Miami

New York

Phoenix

Portland

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Seattle

Toronto

Tucson

Waikoloa

Washington DC

### America Alliance

Mexico City

# QIANHAI REFORM PILOT PROJECT – EXPERIENCE OF EPC CONTRACT APPLICATION

In order to implement the spirit of documents such as the Plan for Comprehensively Deepening the Reform and Opening-up of Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone issued by the CPC Central Committee and the State Council, the Notice on Several Measures for Promoting High-quality Development of Construction Industry in Guangdong Province issued by the General Office of the People's Government of Guangdong Province, and the Measures for Accelerating High-quality Development of Modern Construction Industry in Shenzhen issued by the General Office of the Shenzhen Municipal People's Government, effectively facilitate the deep integration in construction fields of Shenzhen and Hong Kong, promote the integration of the Hong Kong construction industry into the development of Qianhai, drive the international transformation of the construction service industry of Chinese Mainland, explore and establish a project construction management system that connects with Hong Kong and Macao rules and international prevailing rules on the basis of reasonable consideration of the differences between the institutional environments of the two places, Qianhai Authority hereby formulated the Reform Scheme for Connection of Hong Kong and Macao Rules in Qianhai Construction Project Management System with the consent of the Shenzhen Municipal Government and officially released it in May 2023.

RLB was fortunate to participate in the construction of a school project in Qianhai as a whole-process cost consultant, which is one of the pilot projects of the reform scheme and has applied many reform measures. RLB has gained relevant experience from this.

This document shares the construction experience from the perspective of EPC contract application.



## EPC (Engineering, Procurement and Construction) General Contract

EPC (Engineering, Procurement and Construction) is also known as the turnkey general contracting mode. The Employer signs a general contract with the General Contractor (GC) to entrust the design, procurement, construction and commissioning services of the Project to the GC for implementation. The Employer is only responsible for the overall, principle-based, and objective control. The organization and implementation of the design, procurement and construction shall be subject to the unified planning, organization, commanding and coordination and the whole-process control. However, the Employer can flexibly incorporate surveying content within the scope of the contract or include certain stages of the design within the scope of the contract according to the project's needs.

# QIANHAI REFORM PILOT PROJECT – EXPERIENCE OF EPC CONTRACT APPLICATION

## I. Reform Scheme for EPC Contract Application:

The EPC (Engineering, Procurement and Construction) general contracting mode, which involves contract awarding after feasibility approval, was adopted with reference to the common practices in Hong Kong and internationally, and in accordance with the actual situation of Chinese Mainland. The whole-process cost consultant was introduced to assist the Employer in the whole-process cost consultation and contract management. A design-oriented whole-process engineering consultant was introduced to assist in the preparation of the Employer's requirement documents, complete the conceptual design of the Project (optional), participate in bidding, coordinate with the Surveyor and the Supervisor, and cooperate in construction management. The GC established an architect design team to complete the subsequent preliminary design and detailed design of the Project, give full play to its own advantages in construction technology, design management and overall coordination ability, shorten the construction period, complete the project with high efficiency and quality, and truly bring into play the advantages of the EPC general contracting mode.

## II. Practice in EPC Contract Application:

Unlike projects involving EPC contract application in Hong Kong and internationally, projects in Chinese Mainland still need to be submitted to the government for special approval before bidding under the premise that the budget estimate has not been approved (see Note 1). Therefore, in the early stage of the Project, through coordination between Qianhai Authority and Qianhai Construction & Investment Holding Group Co., Ltd. (the Employer), bidding was approved to be carried out on the basis of conceptual design drawings and the Employer's Requirements after the approval of the feasibility study.

In June 2023, the bidding for the EPC General Contract was completed. Most of the work within the scope of the contract was contracted on a lump sum basis, with the purpose of encouraging the EPC General Contractor to actively manage and achieve the objectives of the construction period and cost management through active control. In view of the high risk of underground foundation works in Qianhai Area, the pile foundation works were still measured and priced as per the tentative bill of quantities.



Note 1: According to Article 39 of the Regulations on Government-invested Projects of Shenzhen Special Economic Zone, the general contracting mode can be adopted for projects with clear construction content and proven technical schemes. For government-invested projects in the general contracting mode, contracts shall be awarded after the preliminary design or the approval of the total budget estimate of the Project is completed. If it is really necessary to award any contract in advance, the approval by the Municipal Government shall be obtained.

# QIANHAI REFORM PILOT PROJECT – EXPERIENCE OF EPC CONTRACT APPLICATION

## II. Practice in EPC Contract Application: (Continued)

The comparison among the EPC mode of the pilot project, the traditional mode, and the design-construction integration mode in Hong Kong is as follows:

|   | Traditional Mode  | Design-Construction Integration Mode in Hong Kong   | Design-Construction Integration Mode in Pilot Project   |
|---|---|---|---|
| <b>Design and construction</b>                    | <ul style="list-style-type: none"> <li>The design and construction stages are clearly defined. Design-&gt; Bidding-&gt; Construction</li> </ul>   | <ul style="list-style-type: none"> <li>Bidding (Employer's Requirements)-&gt; Bid (Preliminary Design)-&gt; Detailed Design + Construction</li> </ul>                     | <ul style="list-style-type: none"> <li>Bidding (Employer's Requirements + Conceptual Design)-&gt; Preliminary Design + Detailed Design + Construction</li> </ul>  |
| <b>Contractual arrangements</b>                   | <ul style="list-style-type: none"> <li>Employer &lt;-&gt; Design Team</li> <li>Employer &lt;-&gt; GC</li> <li>Employer &lt;-&gt; Independent Contractor</li> <li>Employer &lt;-&gt; Surveyor</li> </ul> | <ul style="list-style-type: none"> <li>Employer &lt;-&gt; GC &lt;-&gt; Design Team + Supply + Construction Subcontracting</li> <li>Employer &lt;-&gt; Surveyor</li> </ul> | <ul style="list-style-type: none"> <li>Employer &lt;-&gt; GC &lt;-&gt; Design Team (Preliminary Design and Subsequent Design Stages) + Supply + Construction Subcontracting</li> <li>Employer &lt;-&gt; Whole-process Engineering Consultation (Conceptual Design + Survey + Supervision)</li> <li>Employer &lt;-&gt; Surveyor</li> <li>Employer &lt;-&gt; Contracts for Engineering Insurance, Other Third Party Consultants, Third Party Monitoring/Inspection, etc.</li> </ul> |
| <b>Designer/ Architect Role</b>                   | <ul style="list-style-type: none"> <li>Design and supervision</li> <li>Project leader</li> <li>Contract administrator/ executor</li> <li>Falling into the scope of the Employer's team</li> </ul>       | <ul style="list-style-type: none"> <li>Design</li> <li>Falling into the scope of the GC's team</li> </ul>   | <ul style="list-style-type: none"> <li>Conceptual design and design supervision falling into the scope of the Employer's team</li> <li>Preliminary design and subsequent design stages falling into the scope of the GC's team</li> </ul>   |
| <b>GC's Engagement</b>                            | <ul style="list-style-type: none"> <li>Construction stage</li> </ul>  | <ul style="list-style-type: none"> <li>DB stage</li> </ul>  | <ul style="list-style-type: none"> <li>Design (starting from the preliminary design) and construction stage</li> </ul>  |
| <b>Responsibilities and risks</b>                 | <ul style="list-style-type: none"> <li>The Contractor shall be responsible for procurement and construction</li> </ul>  | <ul style="list-style-type: none"> <li>Design, procurement and construction shall be undertaken by a single GC</li> </ul>   | <ul style="list-style-type: none"> <li>Design (starting from the preliminary design), procurement and construction shall be undertaken by a single GC</li> </ul>  |
| <b>Work of Quantity Surveyor/ Cost Consultant</b> | <ul style="list-style-type: none"> <li>Bill of quantities</li> <li>Interim payment (according to schedule)</li> <li>Substantial engineering changes</li> </ul>  | <ul style="list-style-type: none"> <li>Interim payment (according to milestone)</li> <li>Minor changes</li> </ul>   | <ul style="list-style-type: none"> <li>Interim payment (design fees paid by milestone/ construction and installation costs paid according to milestone and monthly progress)</li> <li>Minor changes with costs calculable (lump sum for the majority of activities)</li> </ul>  |

## III. Summary of Advantages and Disadvantages of EPC Contract:

The EPC mode is adopted for the general contract of the pilot project, and it has distinct advantages and disadvantages. The detailed analysis is as follows:

### Analysis and Suggestions on Advantages and Disadvantages of EPC Contract and Its Measurement and Pricing Mode

|   |  |
|---|--|
| <p>Advantages: The certainty of the construction period is high, which is beneficial to ensure that the school can deliver on schedule.</p> <ul style="list-style-type: none"> <li>High certainty of the construction period;</li> <li>Incorporating the professional opinions and experience of the contractor at the design stage is beneficial for the implementation of the Project. This enhances the competitiveness of the bidding price, which includes the design aspect.</li> <li>The responsibility is borne by the contractor as far as possible to encourage the contractor to actively manage and facilitate the progress of the Project;</li> <li>Claim disputes on the cost and construction period are reduced, which is conducive to the progress of the Project;</li> <li>Same team for design and construction – partnership facilitating the progress of the Project.</li> </ul> | <p>Disadvantages: High requirements for preliminary preparation and long time are required for bid planning.</p> <ul style="list-style-type: none"> <li>The pre-qualification and the preparation of the Employer's Requirements taking a long time;</li> <li>The bidder invests significant resources during the bidding period; there are few construction contractors with capability and experience to participate in the bid.</li> <li>Relatively high complexity of bid evaluation;</li> <li>It is difficult to define and quantify changes, and there is a lack of detailed description of standards and requirements in the contract. The contractor will complete the Employer's requirements at the minimum cost. Perhaps, the contractor only controls the construction cost without fully considering the lifecycle cost.</li> </ul> |
|---|--|

# QIANHAI REFORM PILOT PROJECT – EXPERIENCE OF EPC CONTRACT APPLICATION

## The key to the success of the EPC mode:

- The Employer's requirements (including design, quality, progress, construction management and cost control) are clearly determined, and the Employer has a high degree of clarity on the quality of specific items.
- Before bidding and bid awarding, the functional orientations of all aspects of the Project, including architecture, structure, M&E, refined decoration, facade decoration, landscape, etc., are very important.
- The Employer's intent and wishes (Employer's Requirements) need to be clearly formulated before bidders are invited so that the proposals submitted by bidders have a common basis. The "Employer's Requirements" are very important, so the preparation period is very long. According to investigation, it usually takes at least four months or even half a year to prepare the Employer's Requirements for the EPC mode in Hong Kong. The more detailed the "Employer's Requirements" are, the lower the chance of disputes arising between both parties during future acceptance.
- Quality of design and engineering is not a primary consideration.
- The construction scope and design requirements are not changed much after bid awarding.
- The Employer's requirements shall be decided as early as possible.
- Experienced organizations shall be found to prepare the Employer's Requirements/Design Specifications/Engineering Specifications.
- Contractors with experience in design and construction shall be found: The Employer shall carefully select bidders, and only enterprises with design and construction strength and high reputations can be shortlisted for the bidder list. Technology and strength alone are not enough. The enterprises shall be familiar with the EPC mode, have a deep understanding of the Employer's Requirements, possess strong cooperation and communication skills, devote itself to work together with the Employer to seek common development, and realize the Employer's requirements in construction products instead of only pursuing economic benefits.

## IV. Summary of Key Points and Difficulties in EPC Contract Application:

### Key points and difficulties in bidding:

#### 1. How to determine the bidding control price?

There is no bidding control price for construction projects in Hong Kong, and the base price is only for reference. The index method is usually used to estimate for design and construction integration projects. However, for EPC general contracting of pilot projects that must be subject to public bidding according to law, the bidding control price must be issued according to regulations.

The preparation idea of the bidding control price determined in the final report of the pilot project is as follows: the bidding control price shall be prepared based on the bidding scheme drawings and the Employer's Requirements (including technical specifications), with reference to the indicators of benchmarking projects, and in accordance with market conditions. The maximum bid price shall be determined by drawing inspiration from common practices in Hong Kong projects, exploring a method not completely relying on quotas, calculating according to drawings, referring to the cost data of similar projects, market inquiry, and comparing feasibility study estimates on the same basis. The benchmarking analysis is very critical. It is necessary to, based on the characteristics of the pilot project, carefully make differentiation analysis on the characteristics and technical parameters of benchmarking projects, and then determine scientific and reasonable benchmarking values as appropriate.

#### 2. The contract unit price is mainly in the form of a unilateral index. How to determine the change unit price? How to adjust the difference?

Due to the limited response time and software format restrictions, the bidder fails to attach detailed breakdown of price components at the time of bid response as planned. At the time of final report, it is determined that an independent backup list without quantities but with unit price will be attached at the time of issuing of bidding documents. The unit price in the backup unit price list will be used to calculate the change cost of the lump sum part (only limited to changes with costs to be calculated according to the special terms and conditions of the contract) and for process cost analysis as instructed by the Employer. The downward floating rate of the unit price in the backup list is the same as that in the contract.

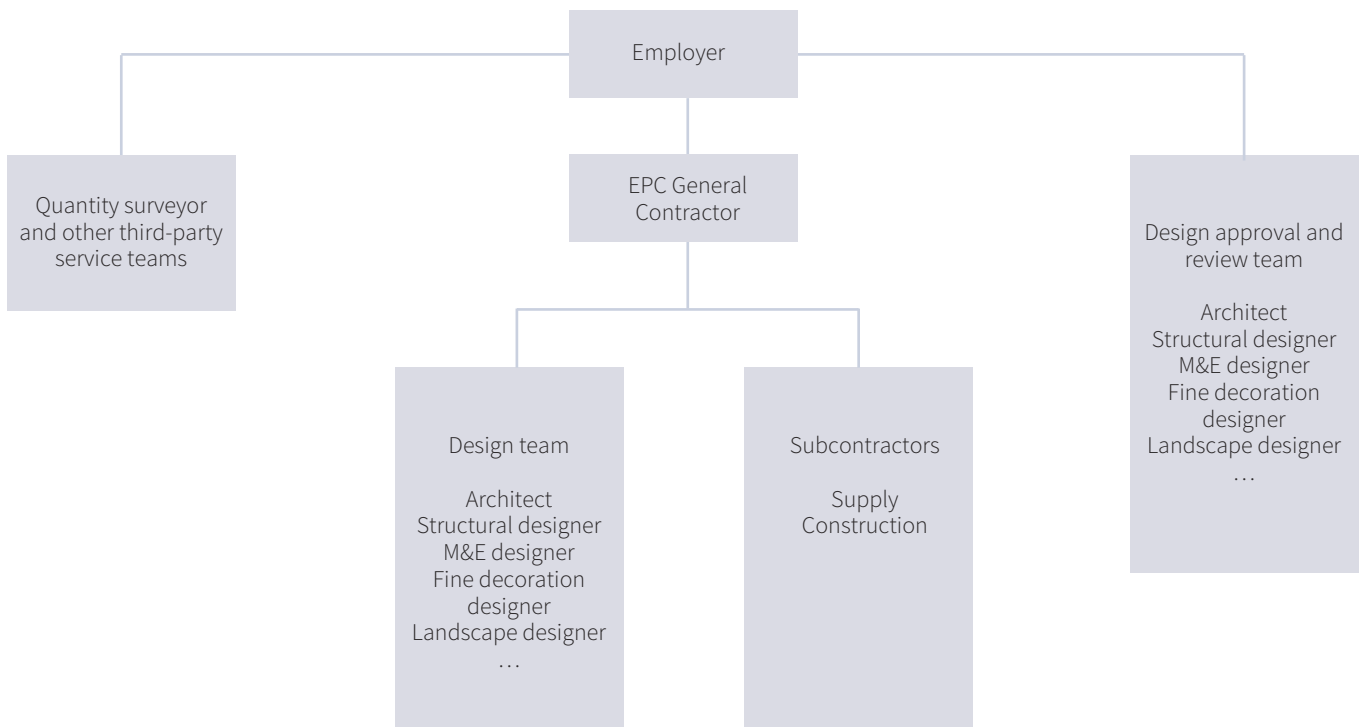
The proportion method shall be adopted for difference adjustments, only suitable for reinforcement and concrete. At the time of issuing of bidding documents, the upper limit of the proportion shall be calculated and set with reference to the design structure scheme and in accordance with the content index determined by benchmarking, and the bidder shall fill in the cost proportion of the materials with difference adjustments within the unilateral index.

# QIANHAI REFORM PILOT PROJECT – EXPERIENCE OF EPC CONTRACT APPLICATION

## IV. Summary of Key Points and Difficulties in EPC Contract Application: (Continued)

### Key points and difficulties in contract management:

1. After the contract was signed, new requirements of the school resulted in a project that must be subject to bidding according to law, which is beyond the scope of EPC general contracting, deviates from the typical EPC contract framework (as shown in the figure below), and is not conducive to giving full play to the advantages of single EPC General Contractor responsibility system for project progress promotion and communication skills, devote itself to work together with the Employer to seek common development, and realize the Employer's requirements in construction products instead of only pursuing economic benefits.



2. The EPC General Contractor tends to complete the Project at a low cost. The Employer and the management consultant team must strictly monitor the performance of the EPC General Contractor in the process according to the Employer's Requirements, so as to reduce the quality loss caused by the EPC General Contractor only focusing on controlling the construction cost without fully considering the lifecycle cost.

It can be seen from the above that the clear determination of contracting scope and construction standards before bidding is very critical to the success in EPC contract application. In the past, EPC contracts were usually applied to some projects with clear functions but little attention paid to decorative effects, such as tunnels, roads and bridges, plants, data rooms, warehousing and logistics rooms, etc. For the pilot school project, on the basis of the details of general scheme drawings, focus will be given to determining the list of delivery interfaces, the list of main decorative materials and the brand list of the school at the bidding stage to ensure that the building quality meets the expectations of the Employer.

# AVERAGE WHOLESALE PRICES OF SELECTED BUILDING MATERIALS IN SELECTED CITIES OF CHINA (RMB)

(All rates described are at 1st Quarter 2024 Prices)

| Building materials |  | Beijing | Chengdu                | Chongqing  | Guangzhou   | Hangzhou  | Nanjing                    | Shanghai  | Shenyang  | Shenzhen   | Tianjin                                   | Wuhan             | Xian   |                            |
|--------------------|--|---------|------------------------|--|---|---|----------------------------|---|---|--|---|-------------------|--|----------------------------|
| 1                  | Reinforcement bar<br>HPB300 10mm   | ¥/t     | 4,913                  | 4,252  | 4,213   | 4,514   | 4,444                      | 4,311   | 4,567   | 4,343  | 4,488                                     | 4,220             | 4,148  | 4,310                      |
| 2                  | Reinforcement bar<br>HRB400E 10mm  | ¥/t     | 4,768                  | 4,250  | 4,193   | 4,569   | 4,315                      | 4,472   | 4,360   | 4,124  | 4,471                                     | 4,070             | 4,192  | 4,147<br>HRB400            |
| 3                  | Reinforcement bar<br>HRB400E 25mm  | ¥/t     | 4,449                  | 4,065  | 4,020   | 4,476   | 4,184                      | 4,322   | 4,215   | 4,004  | 4,285                                     | 3,937             | 4,039  | 4,147<br>HRB400            |
| 4                  | Reinforced concrete Grade C30<br>5-25mm aggregates P8<br>waterproofing (exclude pumping fee) | ¥/m³    | 442                    | 495<br>include pumping<br>fee  | 332<br>include pumping fee,<br>non-waterproof               | 551   | 480<br>include pumping fee | 442   | 645   | 284<br>non-waterproof  | 601                                       | 445               | 466  | 595<br>include pumping fee |
| 5                  | Timber Formwork<br>local commonly used materials   | ¥/m³    | 2,305                  | 4,274  | 1,868   | 1,523   | 1,780                      | 1,869   | -   | 2,011  | 2,614                                     | 2,112             | 2,203  | 2,188                      |
| 6                  | Portland cement<br>Grade 42.5(bulk)  | ¥/t     | 437                    | 397  | 435<br>bagged   | 463   | 378                        | 399   | 447   | 329  | 439                                       | 481               | 336  | 522                        |
| 7                  | Sand<br>Rough/mixed  | ¥/t     | 88                     | 140  | 198<br>extra fine sand                                      | 182   | 146<br>Gross sand          | 220<br>Coarse sand                                  | 190   | 66   | 164                                       | 94                | 143  | 172                        |
| 8                  | Hot rolled equal -leg angle steel<br>45-50x3-6mm   | ¥/t     | 4,648<br>Q235B<br>50   | 4,286<br>Q235<br>L50x50x5  | 4,333<br>Q235B 4-8mm  | 4,550   | 4,461<br>Q235B             | 4,450<br>Equal-leg angle steel                      | 4,252<br>Equal-leg angle steel<br>36-40 x 3-5mm | 3,996  | 4,614<br>Angle steel                      | 3,914             | 4,194<br>Equal-leg angle steel<br>45-50 x 3-5mm                      | 4,270                      |
| 9                  | Galvanized steel sheet<br>1.0mm  | ¥/t     | 5,842                  | 6,855<br>0.5 - 1.2mm   | 5,410<br>Galvanized coil,<br>1.0x1250xC                     | 5,314   | 5,615                      | 4,963<br>Hot dip galvanized<br>steel sheet Q235B    | 4,142<br>Hot rolled steel sheet<br>Q235 δ≥2.0   | 5,259<br>Continuously hot-dip zinc-<br>coated steel sheet<br>1.00-2.5 Z275 (two-sided) | 5,616                                     | 4,977             | 4,843<br>Hot rolled steel<br>sheet Q235 δ≥1.0                        | 5,293                      |
| 10                 | Seamless steel pipe<br>108x3.5-4mm   | ¥/t     | 5,562<br>108 x 6mm     | 7,138  | 5,033<br>108 x 4.5mm  | 5,185   | 6,045<br>108x4-8mm         | 5,187   | 5,867<br>108x3-4.5mm #20                        | 5,010<br>68-159  | 5,648<br>Seamless steel pipe              | 4,841             | 4,896<br>108x4.5-5mm   | 5,010                      |
| 11                 | Galvanized welded steel pipe<br>20mm 26.75x2.75mm  | ¥/t     | 6,053                  | 6,137  | 5,490<br>Hot dip galvanized steel<br>pipe Q235/Q195 DN15-20 | 7,022<br>Galvanized water, gas<br>transportation pipe | 5,642<br>20*2.8mm          | 5,620<br>Hot dip galvanized<br>steel pipe DN15~DN32 | 4,939<br>Φ20 mm                                 | 5,323<br>DN25~DN32   | 5,944<br>Hot dip galvanized<br>steel pipe | 5,245             | 5,617<br>20x2.75mm   | 5,247                      |
| 12                 | Hot-rolled steel channel<br>Grade a steel #16-18mm   | ¥/t     | 4,683                  | 4,217<br>Q235 #16mm  | 4,363<br>Q235B 16-22#                                       | 4,619   | 4,430<br>Q235B             | 4,327<br>Steel channel                              | 4,433<br>Q235 16#                               | 4,068<br>5~30#   | 4,601<br>Steel channel                    | 3,852             | 4,296  | 4,160                      |
| 13                 | Glass<br>FG  | ¥/t     |                        |  |   |   |                            |   | 1,703   |  |   |                   |  |                            |
| 14                 | Aluminium<br>al  | ¥/t     |                        |  |   |   |                            |   | 18,993  |  |   |                   |  |                            |
| 15                 | Copper<br>cu   | ¥/t     |                        |  |   |   |                            |   | 69,397  |  |   |                   |  |                            |
| 16                 | Dry-mixed plastering mortar<br>DPM10   | ¥/t     | 303                    | 421  | 287   | 481   | 338                        | 399   | 404   | 376  | -   | 343               | 316  | 392                        |
| 17                 | Prefabricated laminated slab<br>150kg/m³   | ¥/m³    | 3,293<br>140kg/m³      | 2,267<br>This information<br>price is according<br>to concrete 350<br>yuan /m³,<br>reinforcement<br>3 yuan /kg | 2,570<br>140kg/m³   | 3,310<br>130-160kg/m³                                 | 2,553                      | 3,028   | 3,434   | -  | -   | 3,773<br>140kg/m³ | 2,969  | 4,083                      |
| 18                 | APP Modified Bitumen<br>Waterproofing membrane<br>3mm PY                                     | ¥/m²    | 39<br>SBS II PY PE PE3 | 54<br>APP-I-PY-PE-PE4.0  | 27<br>PY-I-PE/D-3.0mm                                       | 34  | 29<br>PY-I-D-3mm           | 37  | 29<br>APP-I-PY-PE                               | 36<br>SBS 3mm-25°C   | 34<br>SBS 3mm                             | 37<br>SBS 3mm     | 27   | -                          |
| 19                 | JS Cementitious<br>Waterproofing Coatings<br>Type I two-component                            | ¥/kg    | 15                     | 18<br>JS-II  | 9<br>JS-II (two-component)                                  | 14  | 9                          | 8   | -   | 9  | 12  | 14                | 21<br>Noncurable rubber<br>modified asphalt<br>waterproofing coating | -                          |

## Notes:

- The above prices (except items 13, 14, 15) are based on either guiding price from websites or periodicals published by local construction cost management office ;
- Items 13 in the above table are based on closing price by the 10th trading day of month published by Zhengzhou Commodity Exchange ([www.czce.com.cn/cn/index.htm](http://www.czce.com.cn/cn/index.htm)), as a general reference price for all areas;
- Items 14 & 15 in the above table are based on closing price by end of month published by Shanghai Futures Exchange ([www.shfe.com.cn](http://www.shfe.com.cn)), as a general reference price for all areas;
- "-" means local price is not available;
- The unit price in the above table is VAT.



# AVERAGE DAILY WAGES OF WORKERS FOR CONSTRUCTION INDUSTRY IN SELECTED CITIES OF CHINA (RMB)

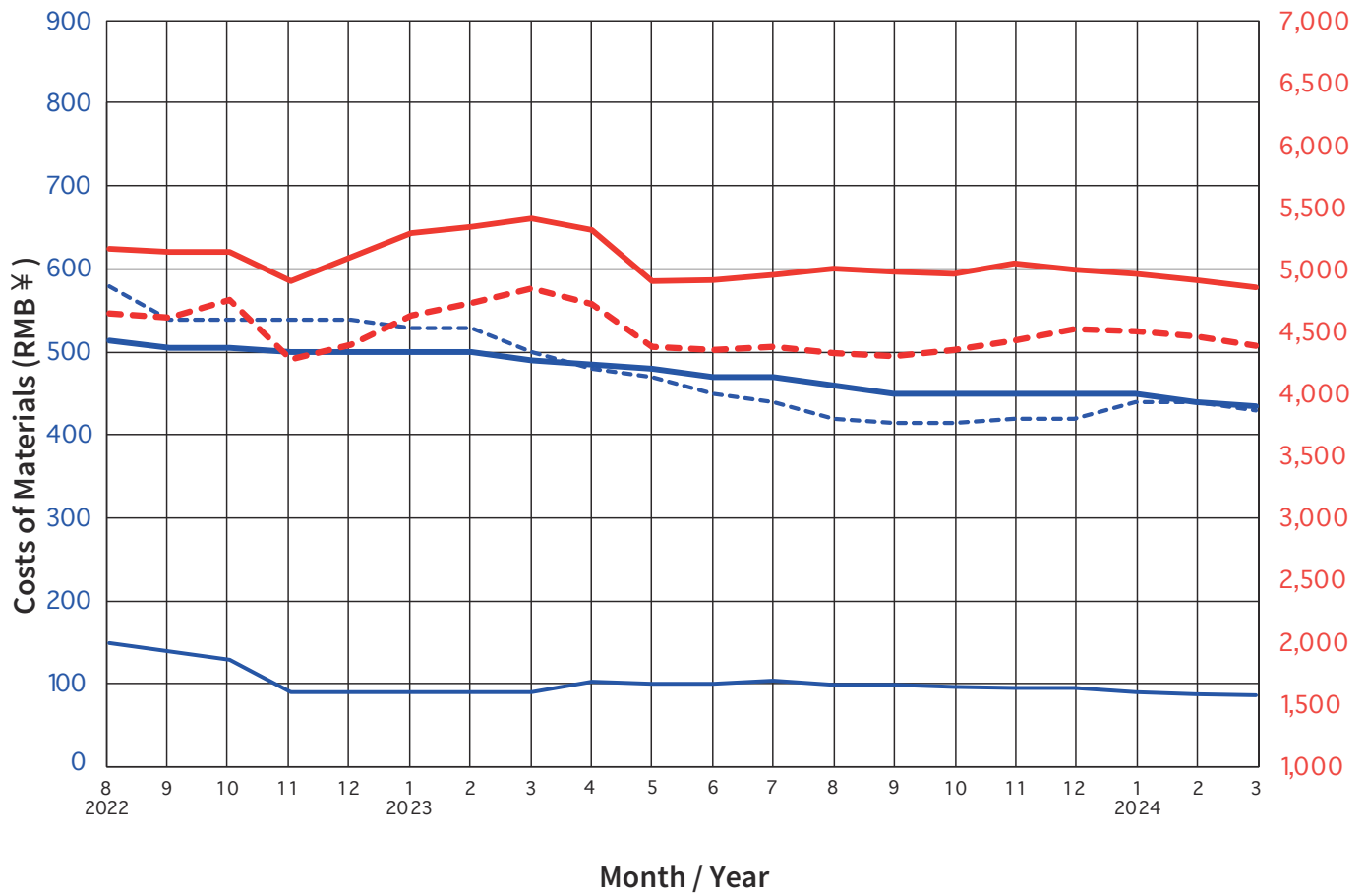
( All rates described are at 1st Quarter 2024 Prices)

| Selected Trades<br>(according to the<br>general public standards) |                          | Beijing | Chengdu | Chongqing | Guangzhou | Hangzhou               | Nanjing                | Shanghai | Shenyang | Shenzhen                                  | Tianjin | Wuhan | Xian |
|---|--------------------------|---------|---------|-----------|-----------|------------------------|------------------------|----------|----------|---|---------|-------|------|
| 1   | Joiner<br>(construction) | 391     | 351     | 278       | 322       | 307                    | 299                    | 378      | 281      | 400<br>Decoration<br>Joiner               | 345     | 271   | 360  |
| 2   | Painter                  | 351     | 257     | 247       | 307       | 276                    | 275                    | 403      | 265      | 351                                       | 308     | 216   | 350  |
| 3   | Formwork<br>erector      | 400     | 326     | 294       | 327       | 316                    | 302                    | 378      | 269      | 403                                       | 324     | 271   | 380  |
| 4   | Plasterer<br>(normal)    | 353     | 277     | 238       | 307       | 267                    | 249                    | 398      | 281      | 351                                       | 328     | 190   | 290  |
| 5   | Bar Bender               | 378     | 307     | 277       | 327       | 307                    | 292                    | 388      | 235      | 376                                       | 322     | 258   | 320  |
| 6   | Bricklayer<br>(masonry)  | 362     | 281     | 239       | 312       | 316                    | 268                    | 378      | 276      | 357                                       | 325     | 242   | 280  |
| 7   | E&M worker               | 340     | 252     | 237       | 307       | 263<br>Metal<br>worker | 255<br>Metal<br>worker | 394      | 260      | 360<br>Average<br>plumber/<br>electrician | 297     | 227   | 290  |
| 8   | Concretor                | 323     | 273     | 244       | 307       | 260                    | 263                    | 378      | 187      | 347                                       | 300     | 226   | 284  |
| 9   | Waterproofing<br>worker  | 376     | 239     | 232       | 297       | 278                    | 270                    | 388      | 264      | 329                                       | 321     | 214   | 320  |
| 10  | Plasterer<br>(Surface)   | 436     | 286     | 264       | 317       | 282                    | 275                    | 422      | 309      | 403                                       | 345     | 232   | 310  |
| 11  | Scaffolder               | 394     | 312     | 284       | 327       | 328                    | 276                    | 437      | 289      | 402                                       | 333     | 259   | 350  |
| 12  | Welder                   | 374     | 311     | 242       | 312       | 309                    | 270                    | 437      | 267      | 364                                       | 322     | 227   | 310  |
| 13  | Rigger                   | 317     | 252     | 201       | 302       | 271                    | 260                    | 379      | 279      | 337                                       | 276     | 211   | 280  |
| 14  | Glazier                  | 353     | 252     | 222       | 307       | 261                    | 252                    | 388      | 233      | 350                                       | 277     | 190   | 340  |
| Average daily wage<br>(1-14)                                      |                          | 368     | 284     | 250       | 313       | 289                    | 272                    | 396      | 264      | 366                                       | 316     | 231   | 319  |

## Notes:

1. Various types of daily wage are based on construction market price, which are updated in real time. The data covers commercial, residential and industrial development project; the rate is based on the weighted daily rates received from 2-4 contractors;
2. Labour costs include: basic wage, allowances, benefits, etc. i.e. all expense payable to workers;
3. Daily rate is based on 8 hours per day, excluding overtime allowance;
4. All trades are based on general labour.

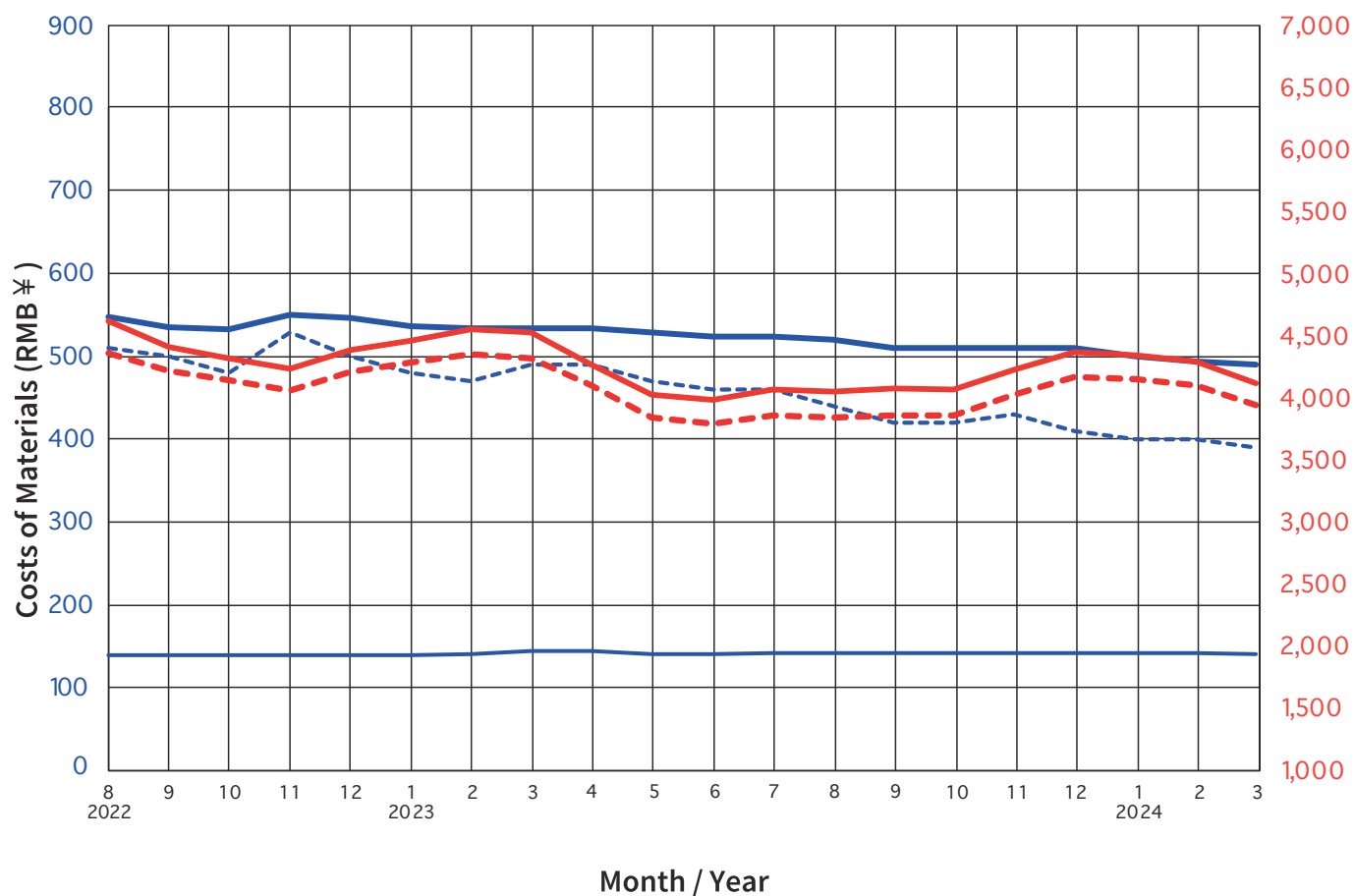
## Wholesale Prices of Selected Building Materials in Beijing



| Building Materials  |                  | Wholesale Prices of Selected Building Materials in Beijing |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
|---|------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
|   |                  | 2022   |       |       |       |       | 2023  |       |       |       |       |       |       |       |       |       |       |       | 2024  |       |       |  |  |  |
|   |                  | Aug  | Sep   | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   |  |  |  |
| Reinforcement bar<br>HPB300 10mm  | ¥/t              | 5,166  | 5,140 | 5,143 | 4,910 | 5,096 | 5,290 | 5,346 | 5,413 | 5,320 | 4,910 | 4,913 | 4,960 | 5,010 | 4,983 | 4,966 | 5,053 | 4,996 | 4,966 | 4,913 | 4,860 |  |  |  |
| Reinforcement bar<br>HRB400E 25mm   | ¥/t              | 4,649  | 4,612 | 4,756 | 4,279 | 4,396 | 4,632 | 4,729 | 4,849 | 4,726 | 4,376 | 4,356 | 4,382 | 4,326 | 4,302 | 4,352 | 4,429 | 4,519 | 4,502 | 4,459 | 4,386 |  |  |  |
| Portland cement Grade<br>42.5 (bulk)  | ¥/t              | 580  | 540   | 540   | 540   | 540   | 530   | 530   | 500   | 480   | 470   | 450   | 440   | 420   | 415   | 415   | 420   | 420   | 440   | 440   | 430   |  |  |  |
| Reinforced concrete<br>Grade C30 5-25mm<br>aggregates P8 waterproofing<br>(exclude pumping fee) | ¥/m <sup>3</sup> | 515  | 505   | 505   | 500   | 500   | 500   | 500   | 490   | 485   | 480   | 470   | 470   | 460   | 450   | 450   | 450   | 450   | 450   | 440   | 435   |  |  |  |
| Sand (rough/mixed)  | ¥/t              | 150  | 140   | 130   | 90    | 90    | 90    | 90    | 90    | 103   | 101   | 100   | 104   | 99    | 99    | 97    | 96    | 95    | 90    | 88    | 87    |  |  |  |

(Source: www.bjzj.net)

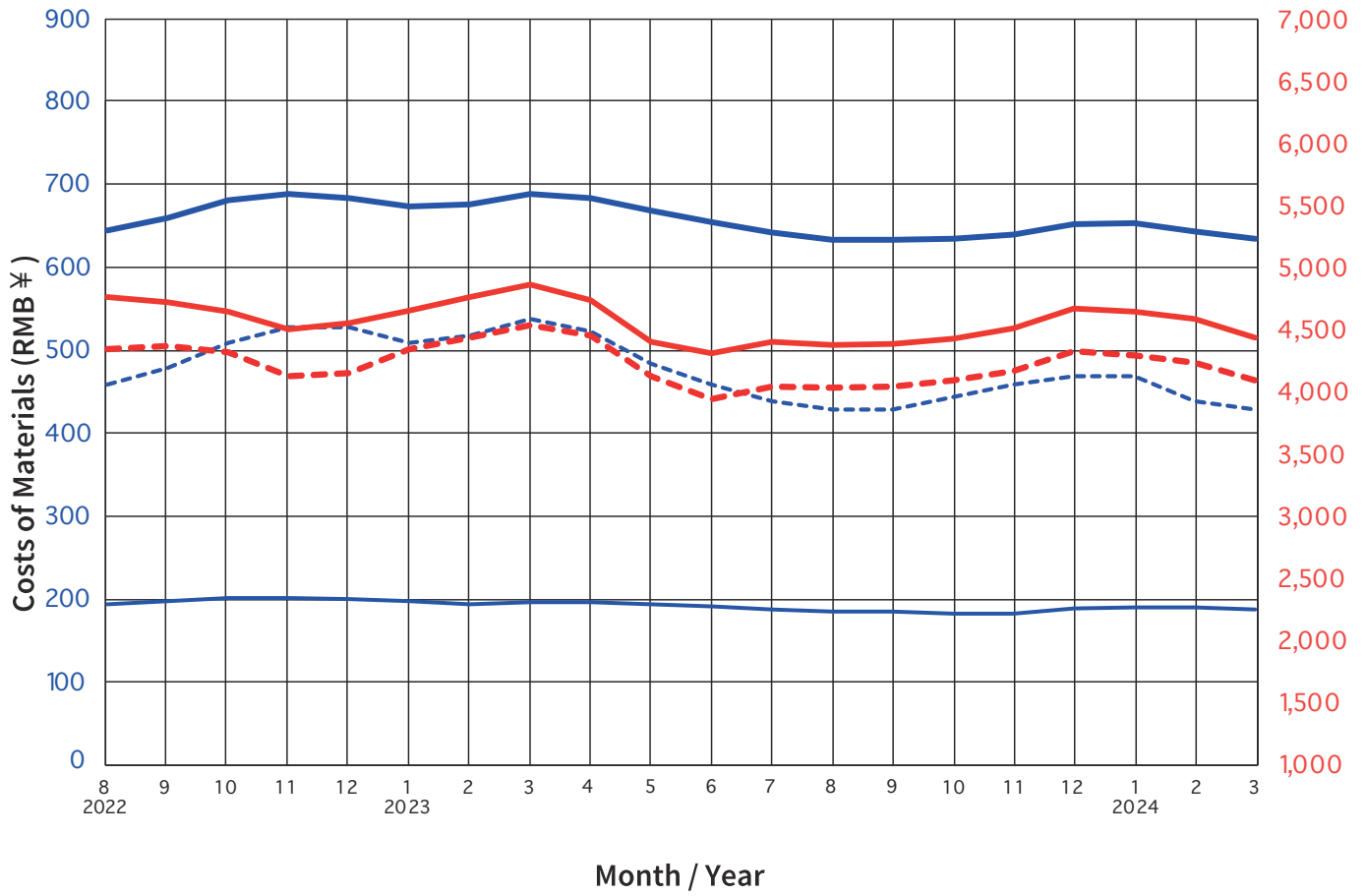
## Wholesale Prices of Selected Building Materials in Chengdu



| Building Materials  |                  | Wholesale Prices of Selected Building Materials in Chengdu |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
|---|------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
|   |                  | 2022   |       |       |       |       | 2023  |       |       |       |       |       |       |       |       |       |       |       | 2024  |       |       |  |  |  |
|   |                  | Aug  | Sep   | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   |  |  |  |
| Reinforcement bar<br>HPB300 10mm  | ¥/t              | 4,623  | 4,416 | 4,322 | 4,238 | 4,390 | 4,465 | 4,554 | 4,527 | 4,270 | 4,031 | 3,982 | 4,071 | 4,053 | 4,077 | 4,070 | 4,226 | 4,373 | 4,343 | 4,294 | 4,118 |  |  |  |
| Reinforcement bar<br>HRB400E 25mm   | ¥/t              | 4,363  | 4,217 | 4,142 | 4,061 | 4,207 | 4,287 | 4,355 | 4,319 | 4,100 | 3,841 | 3,788 | 3,861 | 3,843 | 3,862 | 3,861 | 4,026 | 4,173 | 4,152 | 4,104 | 3,939 |  |  |  |
| Portland cement Grade<br>42.5 (bulk)  | ¥/t              | 510  | 500   | 480   | 530   | 500   | 480   | 470   | 490   | 490   | 470   | 460   | 460   | 440   | 420   | 420   | 430   | 410   | 400   | 400   | 390   |  |  |  |
| Reinforced concrete<br>Grade C30 5-25mm<br>aggregates P8 waterproofing<br>(exclude pumping fee) | ¥/m <sup>3</sup> | 548  | 536   | 533   | 550   | 547   | 537   | 534   | 534   | 534   | 529   | 524   | 524   | 521   | 510   | 510   | 510   | 510   | 500   | 495   | 490   |  |  |  |
| Sand (rough/mixed)  | ¥/t              | 138  | 138   | 138   | 138   | 138   | 138   | 140   | 143   | 143   | 140   | 140   | 141   | 141   | 141   | 141   | 141   | 141   | 141   | 141   | 139   |  |  |  |

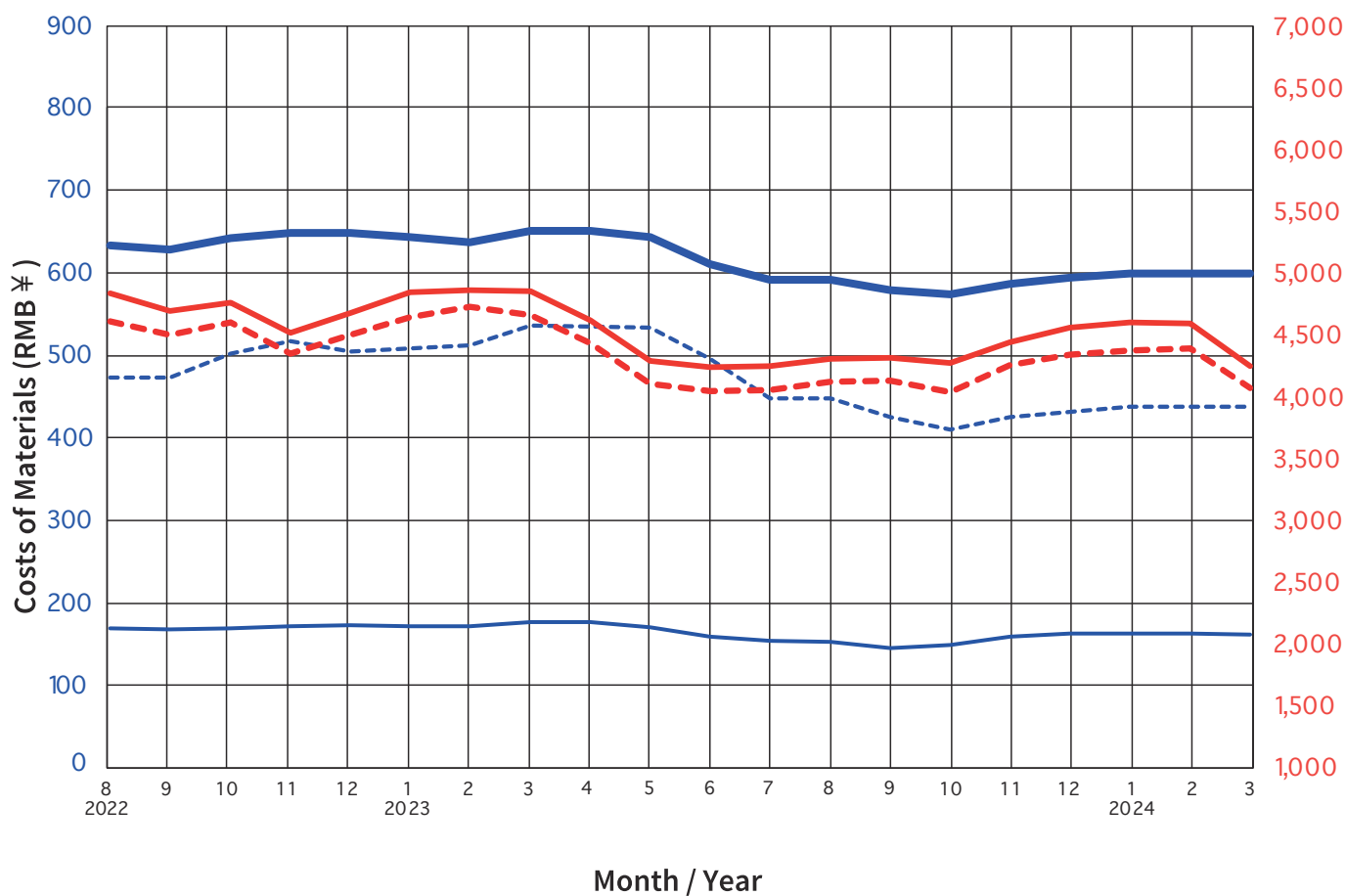
(Source: www.sceci.net)

## Wholesale Prices of Selected Building Materials in Shanghai



(Source: <https://ciac.zjw.sh.gov.cn/>)

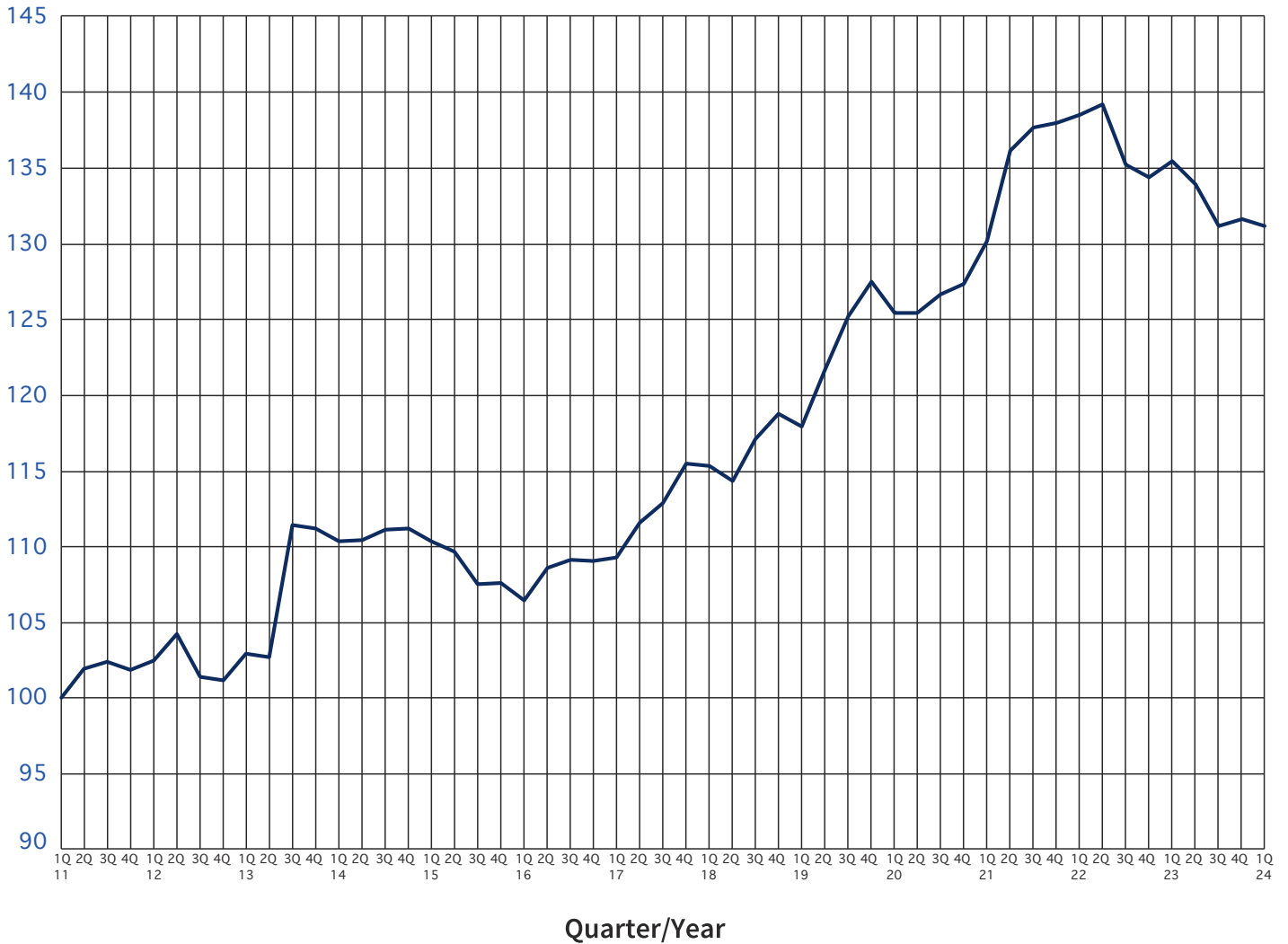
## Wholesale Prices of Selected Building Materials in Shenzhen



| Building Materials   |                  | Wholesale Prices of Selected Building Materials in Shenzhen |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
|--|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|  |                  | 2022  |       |       |       |       | 2023  |       |       |       |       |       |       |       |       |       |       | 2024  |       |       |       |  |
|  |                  | Aug   | Sep   | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   |  |
| Reinforcement bar HPB300 10mm  | ¥/t              | 4,845   | 4,700 | 4,770 | 4,523 | 4,685 | 4,851 | 4,873 | 4,864 | 4,624 | 4,302 | 4,247 | 4,255 | 4,311 | 4,326 | 4,278 | 4,449 | 4,563 | 4,605 | 4,604 | 4,256 |  |
| Reinforcement bar HRB400E 25mm   | ¥/t              | 4,620   | 4,506 | 4,609 | 4,354 | 4,511 | 4,647 | 4,739 | 4,664 | 4,439 | 4,116 | 4,057 | 4,059 | 4,133 | 4,139 | 4,048 | 4,266 | 4,346 | 4,380 | 4,395 | 4,079 |  |
| Portland cement Grade 42.5 (bulk)  | ¥/t              | 475   | 475   | 504   | 519   | 506   | 510   | 513   | 538   | 536   | 535   | 497   | 449   | 449   | 427   | 411   | 427   | 433   | 439   | 439   | 439   |  |
| Reinforced concrete Grade C30 5-25mm aggregates P8 waterproofing (exclude pumping fee) | ¥/m <sup>3</sup> | 634   | 630   | 643   | 650   | 650   | 645   | 638   | 652   | 652   | 645   | 612   | 593   | 593   | 580   | 576   | 588   | 595   | 601   | 601   | 601   |  |
| Sand (rough/mixed)   | ¥/t              | 171   | 170   | 171   | 174   | 174   | 173   | 173   | 178   | 178   | 172   | 161   | 155   | 154   | 147   | 151   | 161   | 164   | 164   | 164   | 163   |  |

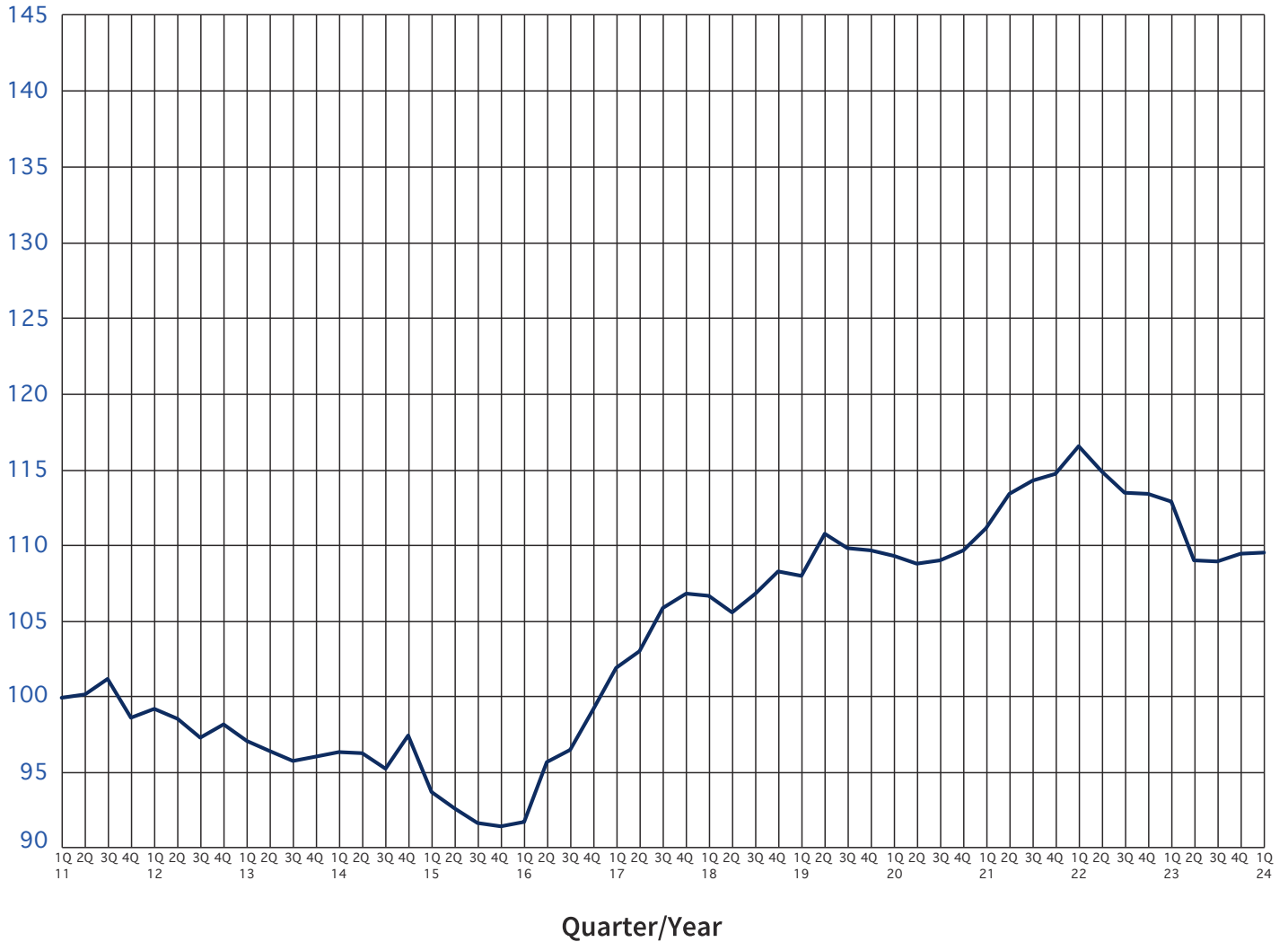
(Source: www.szcost.cn)

## Construction Cost indices in Beijing

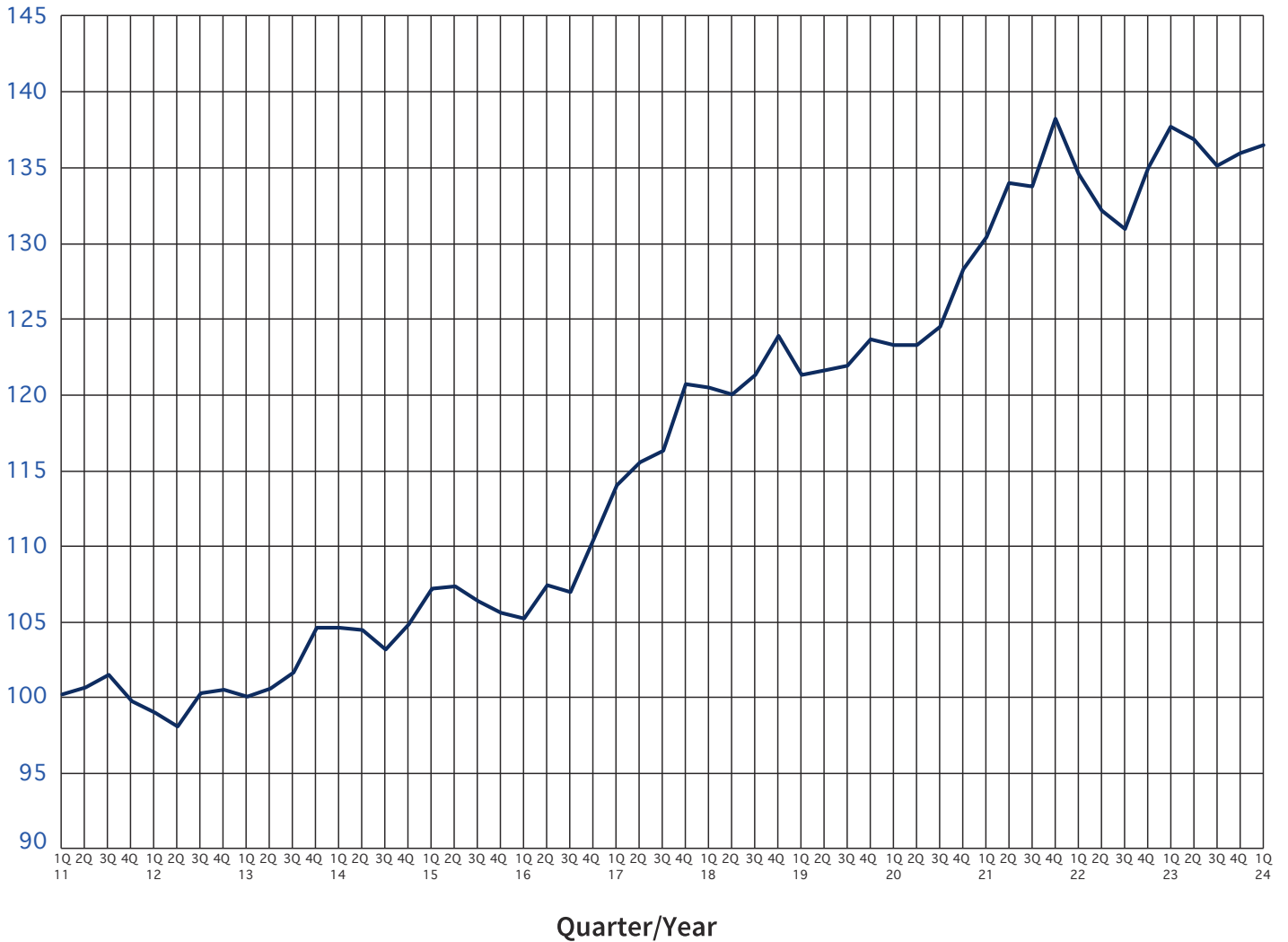


| Quarter | 2011   | 2012   | 2013   | 2014   | 2015   | 2016   | 2017   | 2018   | 2019   | 2020   | 2021   | 2022   | 2023   | 2024   |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1       | 100.00 | 102.41 | 102.86 | 110.31 | 110.35 | 106.41 | 109.21 | 115.32 | 117.90 | 125.38 | 130.11 | 138.45 | 135.37 | 131.15 |
| 2       | 101.88 | 104.19 | 102.64 | 110.43 | 109.61 | 108.56 | 111.55 | 114.29 | 121.61 | 125.42 | 136.13 | 139.18 | 133.88 |        |
| 3       | 102.38 | 101.37 | 111.35 | 111.10 | 107.50 | 109.13 | 112.84 | 117.03 | 125.13 | 126.58 | 137.63 | 135.18 | 131.14 |        |
| 4       | 101.81 | 101.13 | 111.19 | 111.12 | 107.57 | 109.03 | 115.45 | 118.74 | 127.44 | 127.33 | 137.92 | 134.34 | 131.56 |        |

## Construction Cost indices in Chengdu



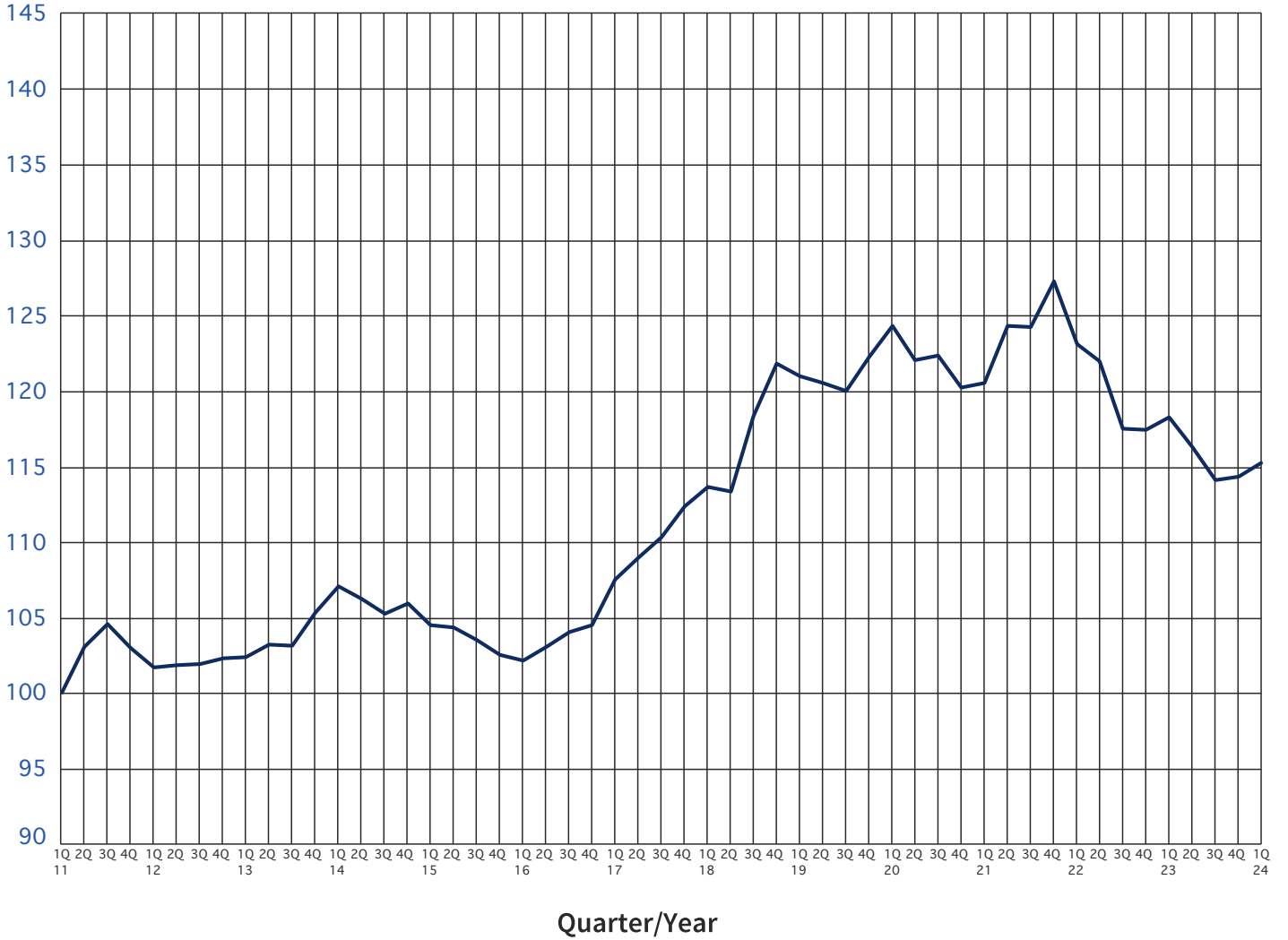
## Construction Cost Indices in Shanghai



| Quarter | 2011   | 2012   | 2013   | 2014   | 2015   | 2016   | 2017   | 2018   | 2019   | 2020   | 2021   | 2022   | 2023   | 2024   |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1       | 100.00 | 98.73  | 99.87  | 104.44 | 107.03 | 105.02 | 113.90 | 120.43 | 121.23 | 123.28 | 130.41 | 134.66 | 137.77 | 136.52 |
| 2       | 100.45 | 97.84  | 100.40 | 104.24 | 107.20 | 107.24 | 115.43 | 119.96 | 121.55 | 123.22 | 134.02 | 132.21 | 136.94 |        |
| 3       | 101.30 | 100.10 | 101.46 | 103.01 | 106.16 | 106.82 | 116.24 | 121.23 | 121.84 | 124.50 | 133.81 | 130.97 | 135.17 |        |
| 4       | 99.52  | 100.31 | 104.44 | 104.64 | 105.42 | 110.29 | 120.63 | 123.87 | 123.59 | 128.32 | 138.30 | 135.04 | 136.04 |        |



## Construction Cost Indices in Shenzhen



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