



Ishinomaki Regional Wholesale Fish Market Ishinomaki Construction Project

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P r e s e n t a t i o n T e a m

P u r e C M R

漁村総研 **JIFIC**

The Japanese Institute of Fisheries Infrastructure and Communities

山下ピー・エム・コンサルタンツ **Yamashita PM Consultants**

A t R i s k C M R

鹿島建設 **KAJIMA CORPORATION**

Project Background



Ishinomaki fishing port was the fifth largest hub of manufacturing and distribution in the country. Specified as a staple port by the cabinet order (“specific type 3 fishing port”), Ishinomaki port had yearly landing of approximately 12 million tons and yearly sales of over 15 billion yen, bolstering the furtherance of fishing industry in Japan.

However, the wholesale market was annihilated by tsunami in the Great East Japan Earthquake on 11 March 2011. The recovery of the Ishinomaki fish market became a symbol of revival in Ishinomaki city. Moreover, the immediate reconstruction of the market was crucial to the fishing industry around the area.

Traits of Building Production System in Public Works of Japan and Tasks in Reconstruction Project

■ Traits of Traditional Building Production System in Public Works of Japan

- ① Management of quality, cost, and schedule, as well as decision making, approving and inspection were carried out under client responsibility.
- ② Design Bid Build method is conventional.

■ Tasks in Reconstruction Project

① Shortage in human resources

The Ishinomaki City hall with its several urgent reconstruction projects underway and its staffs on hectic schedule, was unable to allocate sufficient human resources to the fish market reconstruction project.

② Speedy recovery

Swift reconstruction of Ishinomaki fishing port was crucial; therefore, project's rapid progression became the most important task to be accomplished.

Task Solution

① Shortage in Human Resources → Adoption of Pure CMR

Advisor (pure CMR) was put in to practical use as a technical assistant in client operation. Conglomerate (the Japanese Institute of Fisheries Infrastructure and Communities / Yamashita PM Consultants) with experiences and knowledge in the wholesale market designing, the advanced hygiene control facility designing, and in the public work CM management was selected as the advisor.

② Speedy Recovery → Adoption of Design-Build At Risk CM Method

Design-Build at risk CM method was adopted not only as a solution to the demands for speedy recovery, but also as a solution to the unpredictable project expenses caused by a jump in construction expenses.

CMR Mission

A Speedy Execution

B Backing Up Client Operation

C Overcoming Technical Difficulties

- Weak ground with its depth of 75m to the subbase
- 300 tie-rods supporting the quay, just beneath the planned building area
- Temporary facilities left inside the site for continuous landing
- Quay recovery projects and road repairing projects operating alongside the site supervised by other agencies

D Becoming an International Wholesale Market

- Introducing advanced hygiene control system to meet international standards

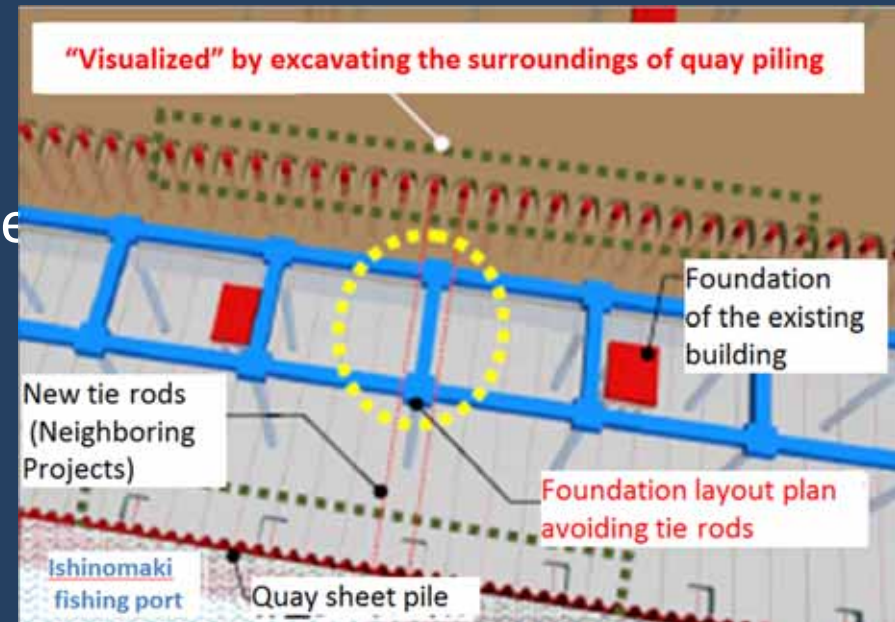
CMR Responsibilities

■ Pure CMR

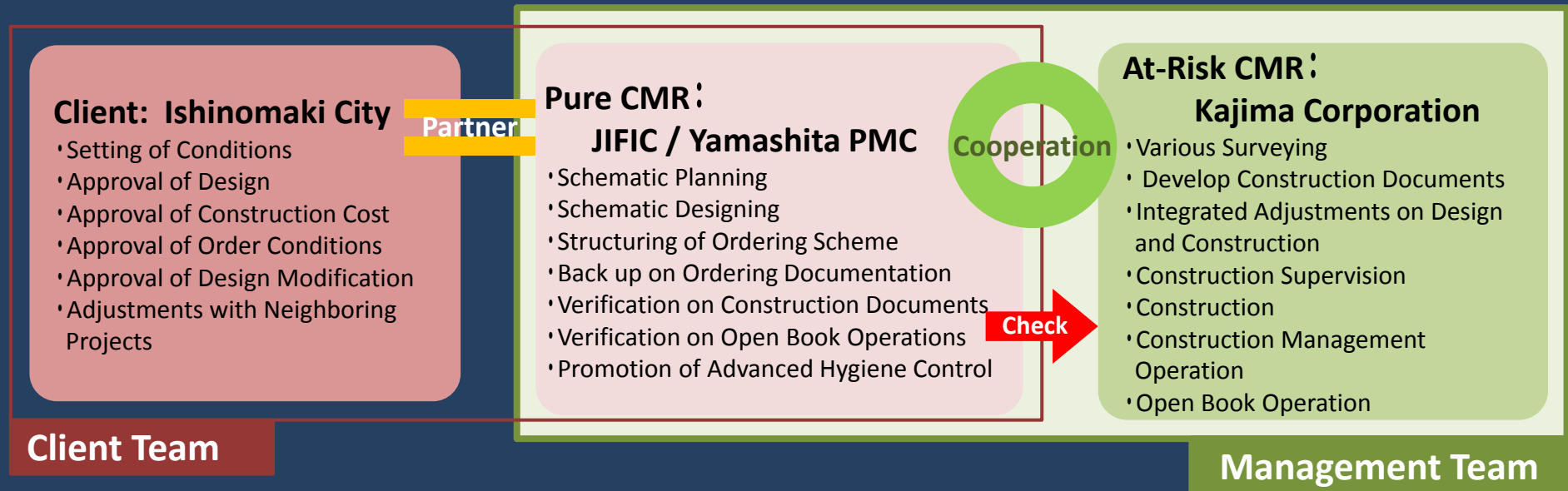
- Facilitation of the earliest opening possible
- Client operation back up (framing the optimum project scheme)
- Introduction of advanced hygiene control system
- Ensured cost transparency

■ At risk CMR

- Construction schedule observance
- Resolution of various technical difficulties
- Ensured quality of design and construction
- Appropriate cost management



Role Allotment of Client, Pure CMR, and At Risk CMR



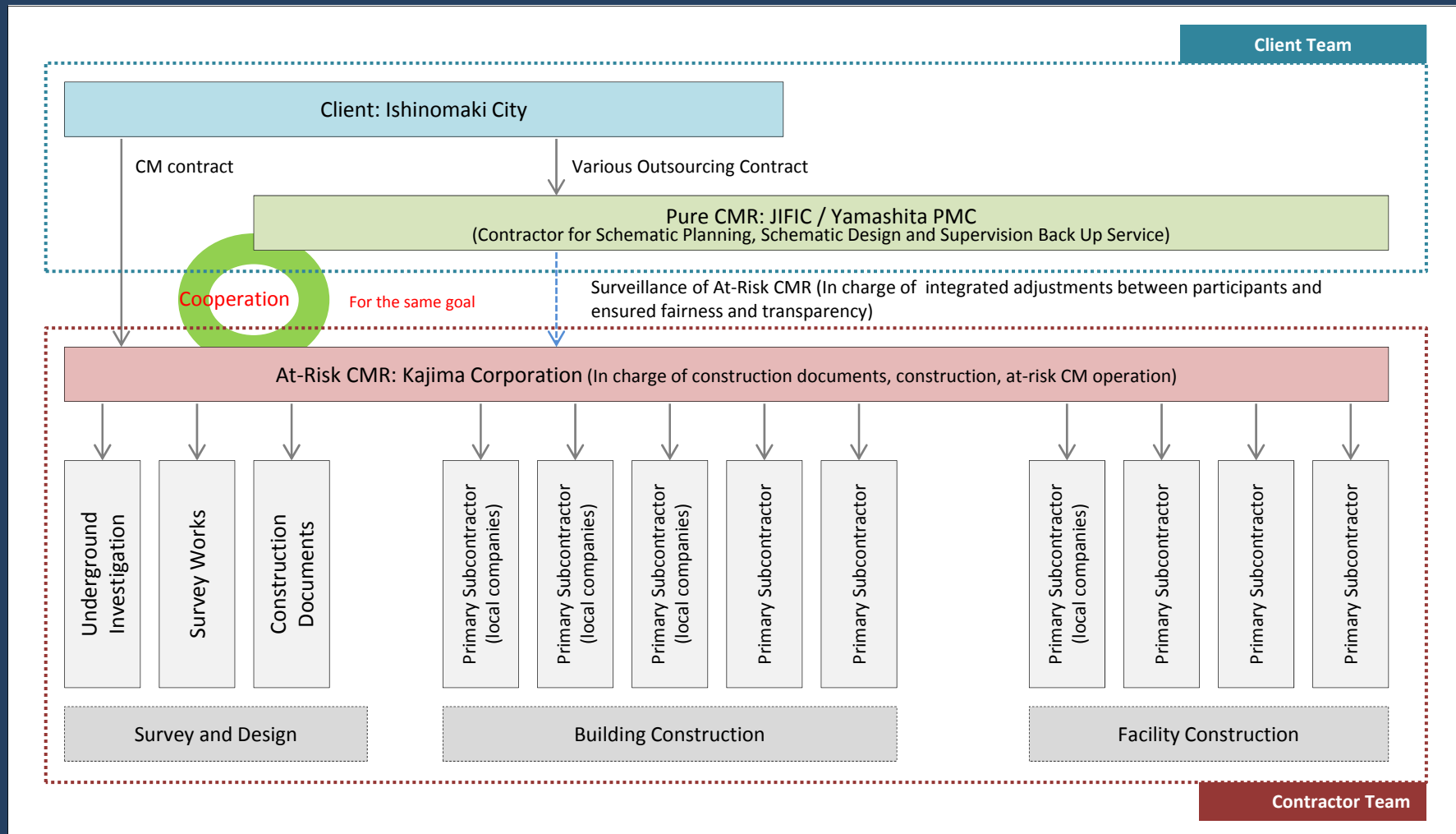
Main Traits in Role Allotment

- Surveillance and supervision of at risk CMR done by pure CMR as a client team
- Strong cooperation system structured between pure CMR and at risk CMR as a management team
- Strict surveillance system structured through Open Book method (※).

※Open Book method

A method which coerces the At-risk CMR to disclose and report every price of designing, surveying and constructing ordered to each primary subcontractor for approval by the client.

Overall Scheme of the Project





Quality

Building Outline

Building Outline (All Facilities Included)

Site area: 71,966m²

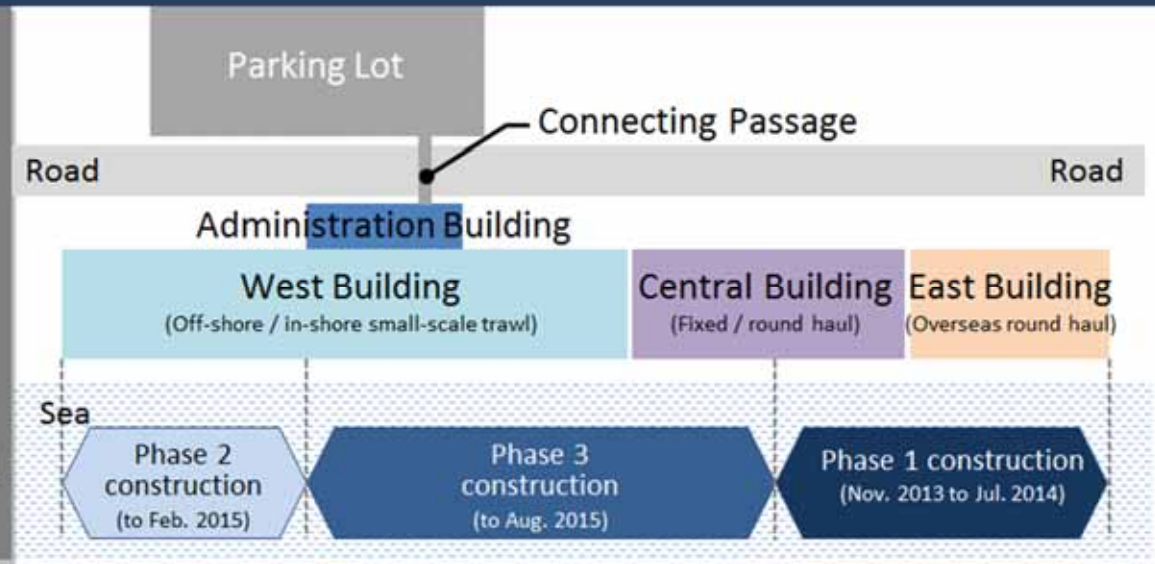
Building area: 42,127m²

Gross floor area: 50,236 m²

Building use: Wholesale market

Structure: Steel structure

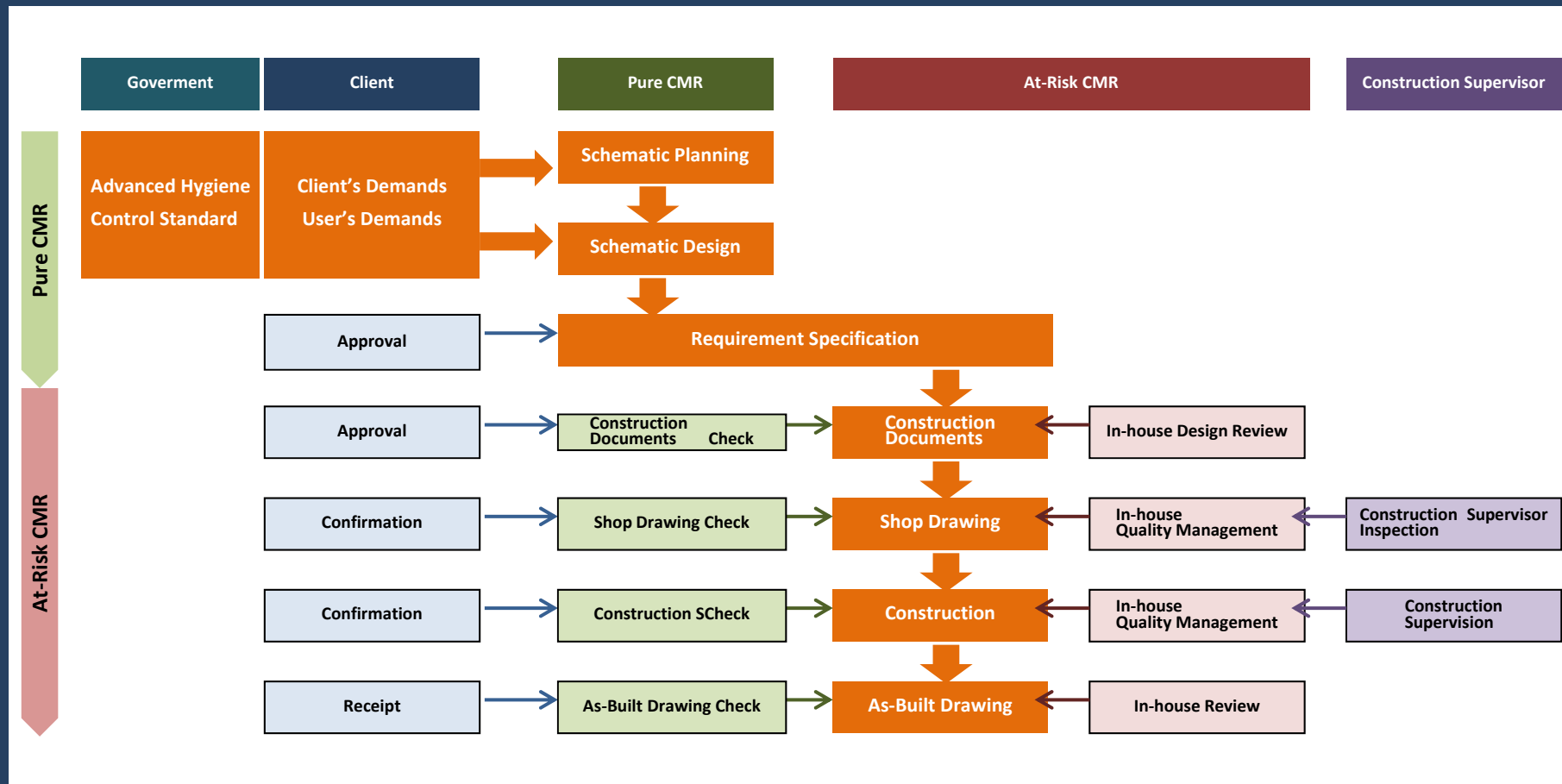
No. of floors: Four floors aboveground



- One of the world's largest wholesale market of fisheries products with its gross floor area of 50,000m², 4 stories above ground, and a length of 880m.
- Efficient and hygienic landing, cargo sorting system
 - Distinctive traffic lines of vehicles, pedestrians, and marine products
 - Traceability function to confirm hygienic operation
 - Landing to shipping controlled in the administration tower to conform to the advanced hygiene control system



Quality Management Flowchart

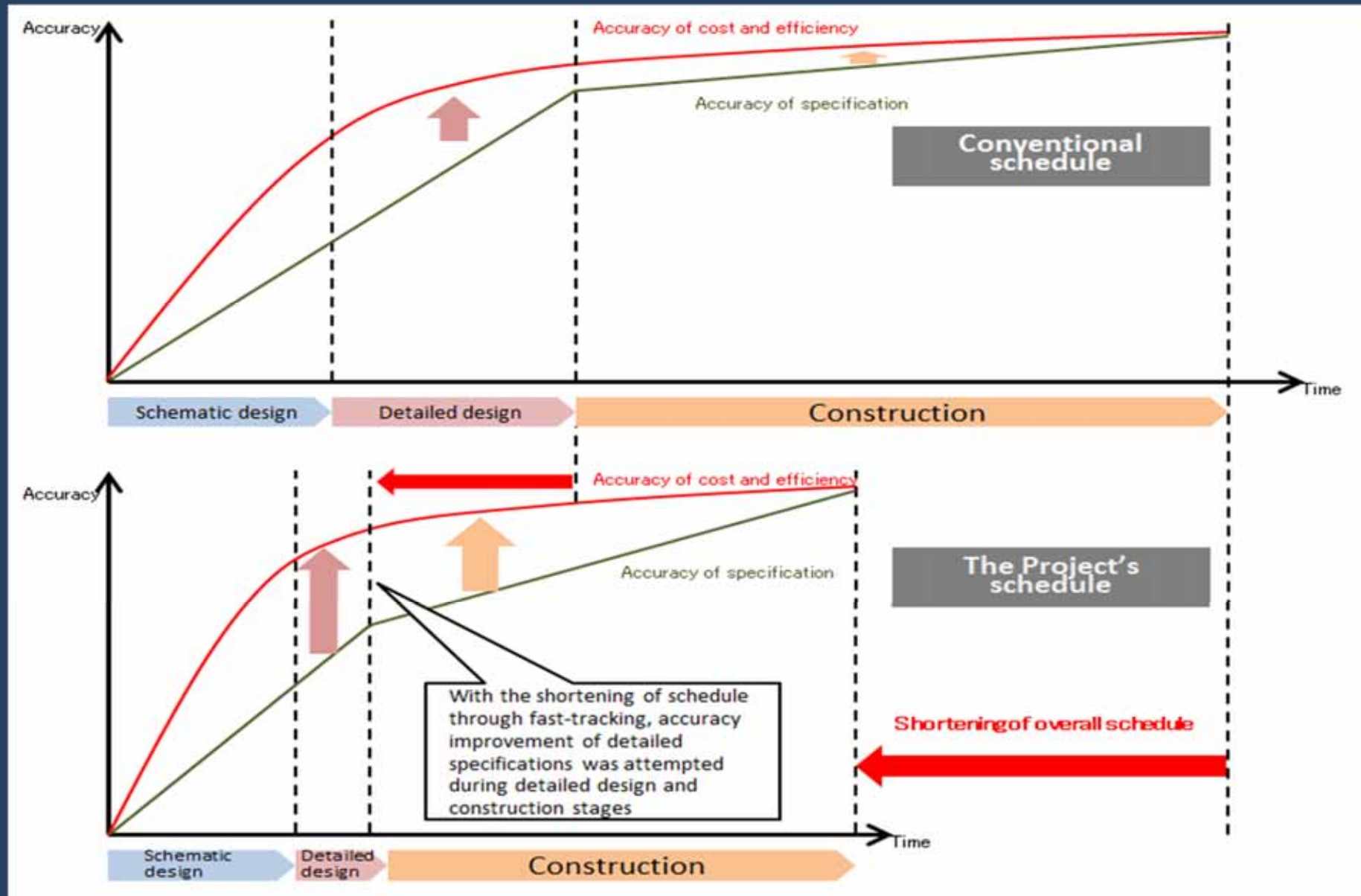


Advanced Hygiene Control System Preparation Policy

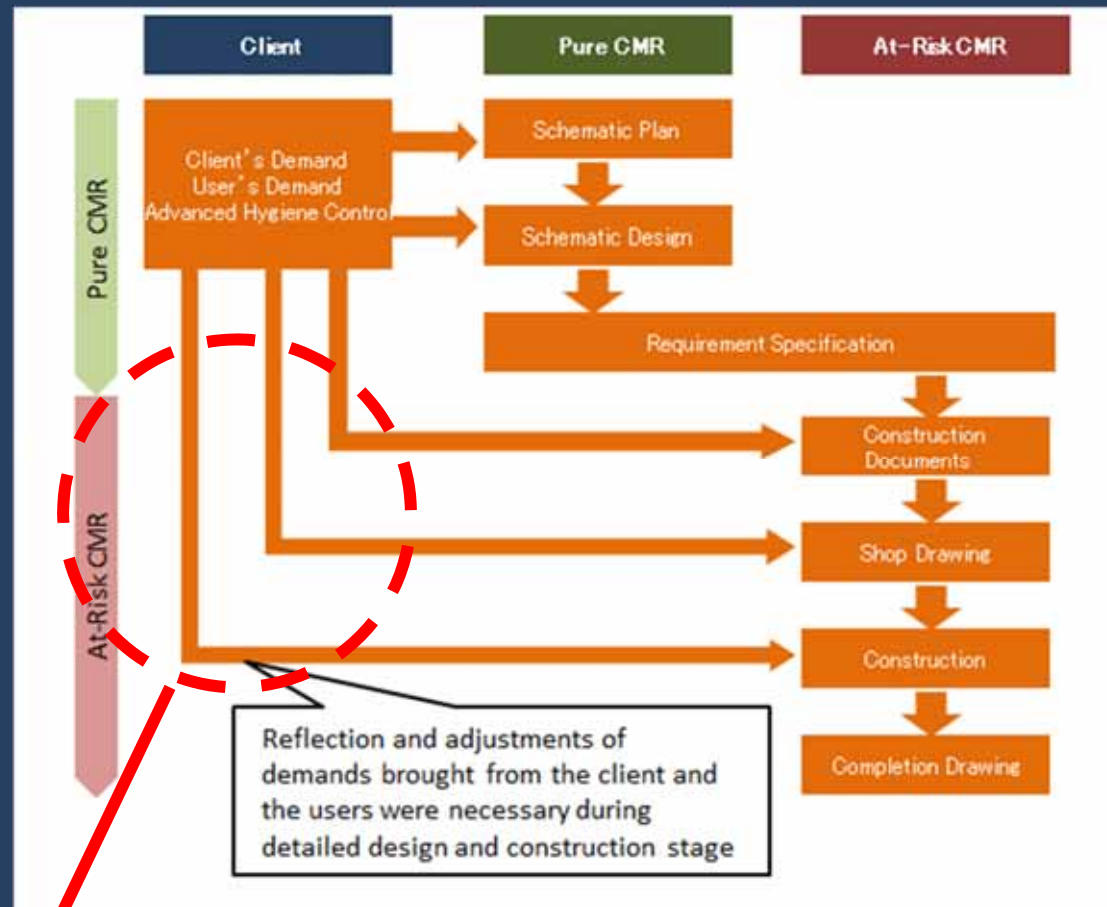
Advanced Hygienic Control System Preparation Policy of The Ishinomaki Fish Market

- Construct efficient and hygienic landing / cargo sorting framework
- Implement integral maintenance and hygienic control of quay / cargo sorting facility
- Distinct traffic lines of vehicles / pedestrian / marine products
- Introduce temperature control for marine products / low temperature room, etc.
- Introduce pure seawater intake facility
- Dispose sewage of quay / cargo sorting facility properly
- Maintain cleanliness of the quay and the cargo sorting facility thoroughly
- Record and archive information

Difference in Specification Confirmation Schedule Between Conventional Projects and The Fish Market Reconstruction Project



Traits in Quality Management



Key Traits in Quality Management

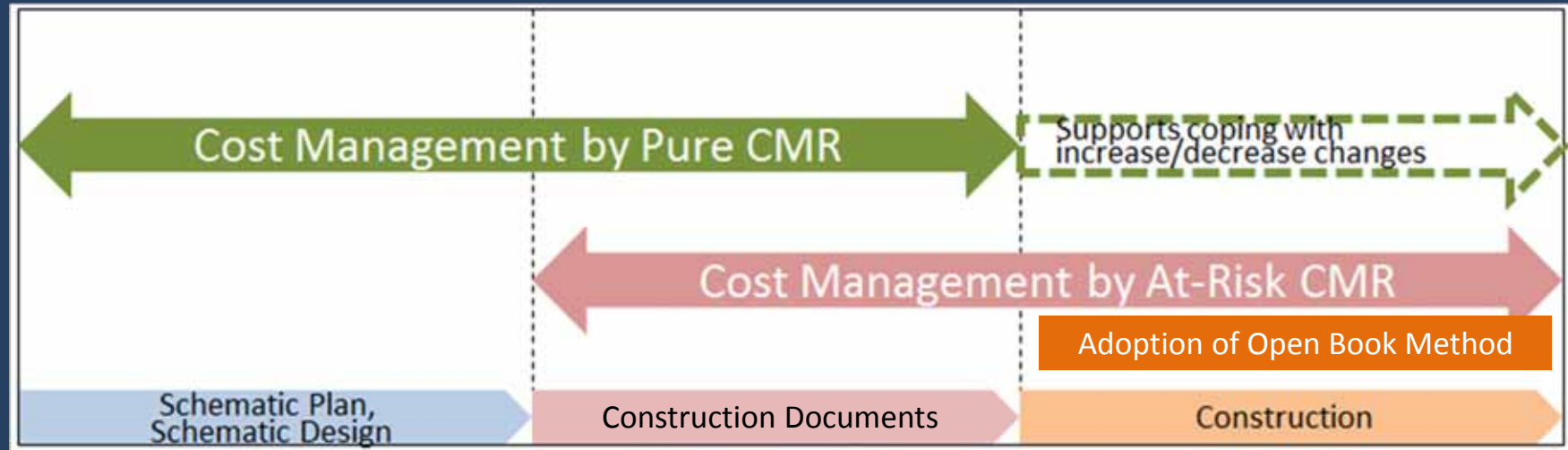
⇒ In a process where specifications were confirmed rather slowly during the construction documents and construction stages, the following factors were vital to execute a short schedule project without causing confusion in the site; a close cooperation between Pure CMR and At-risk CMR, meticulous arrangements with the client and fish market staffs, and an appropriate approach to design changes.

⇒ Due dates were properly tracked, prompting clients to decide and confirm at the most suitable time. This helped avoid unreasonable overwork on site, all the while achieving construction in high quality.

Cost



Ensured Cost Transparency



Changes of main party responsible of cost management

■ Conventional Price Setting Method of Public Works in Japan

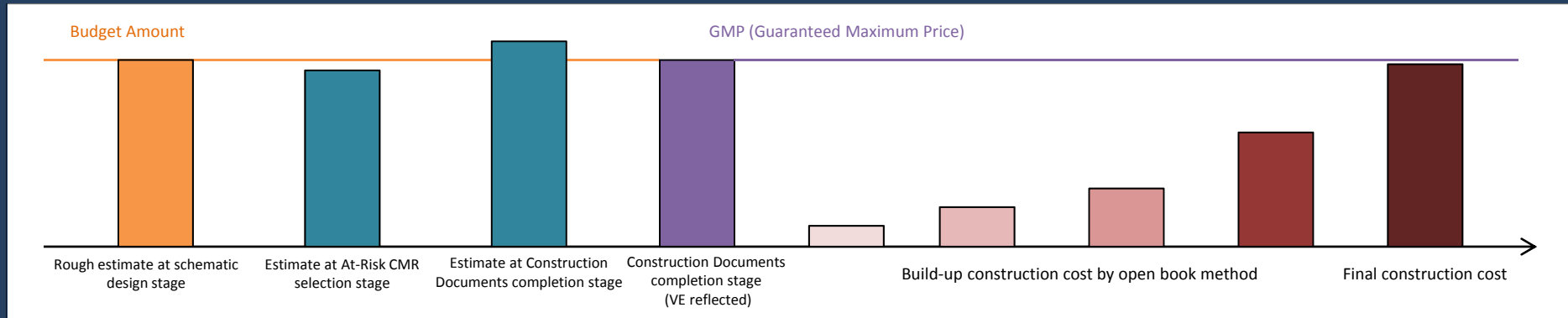
- Bidding takes place after the completion of detail design, followed by the conclusion of lump-sum contract with the contractor which presented the lowest price.

■ Price Setting Method of The Project

- At risk CMR is selected through technical proposal including VE and CD right after the completion of schematic design.
- Business contract is made after mutual agreement with the at risk CMR on the maximum price. (Construction documents starts here)
- GMP (Guaranteed Maximum Price) is set after the completion of Construction documents.
- Cost reimbursement method is adopted during construction phase. (expenses exceeding the GMP is charged to at risk CMR)

→ Open Book method is adopted to ensure transparency of cost reimbursement

Cost Management and Changes of Total Cost



Schematic Planning, Schematic Designing Stage

- ① Pure CMR calculated a rough estimate during the schematic designing stage
⇒ the estimated price was set as an upper limit of the budget
- ② Maximum price (budget amount) was presented as a condition of participation in the At-risk CMR selection
- ③ Economic efficiency of the At-Risk CMR's proposal was evaluated not on the price, but on the proposal of technical methodology including Value Engineering proposal

Construction Documents Stage

- ④ The selected At-Risk CMR submitted a quotation breakdown to the Ishinomaki City (the client)
⇒ the city confirmed the quotation to be within the budget
- ⑤ Design-Build At-Risk CM contract was concluded
- ⑥ The estimate cost based on the construction documents exceeded the budget
- ⑦ Value Engineering was considered thoroughly by the At-Risk CMR (main participant), Pure CMR and the client
- ⑧ Construction cost reduced by the VE was then set as the GMP (Guaranteed Maximum Price)

Construction Stage

- ⑨ Open Book method with the limit of GMP was adopted for the cost reimbursement
- ⑩ Open Book implementation was surveilled by the Pure CMR
- ⑪ Various additional demands of design changes during the construction stage were solved by the VE, enabling the implementation of cost management
- ⑫ Expense settlement was made within the GMP after the completion of construction

Rules of Open Book Method



Cost Disclosure Range

⇒ Design cost and construction cost

- Construction cost consists mainly of direct work cost, temporary work cost and site management cost

Definition of Management Fee

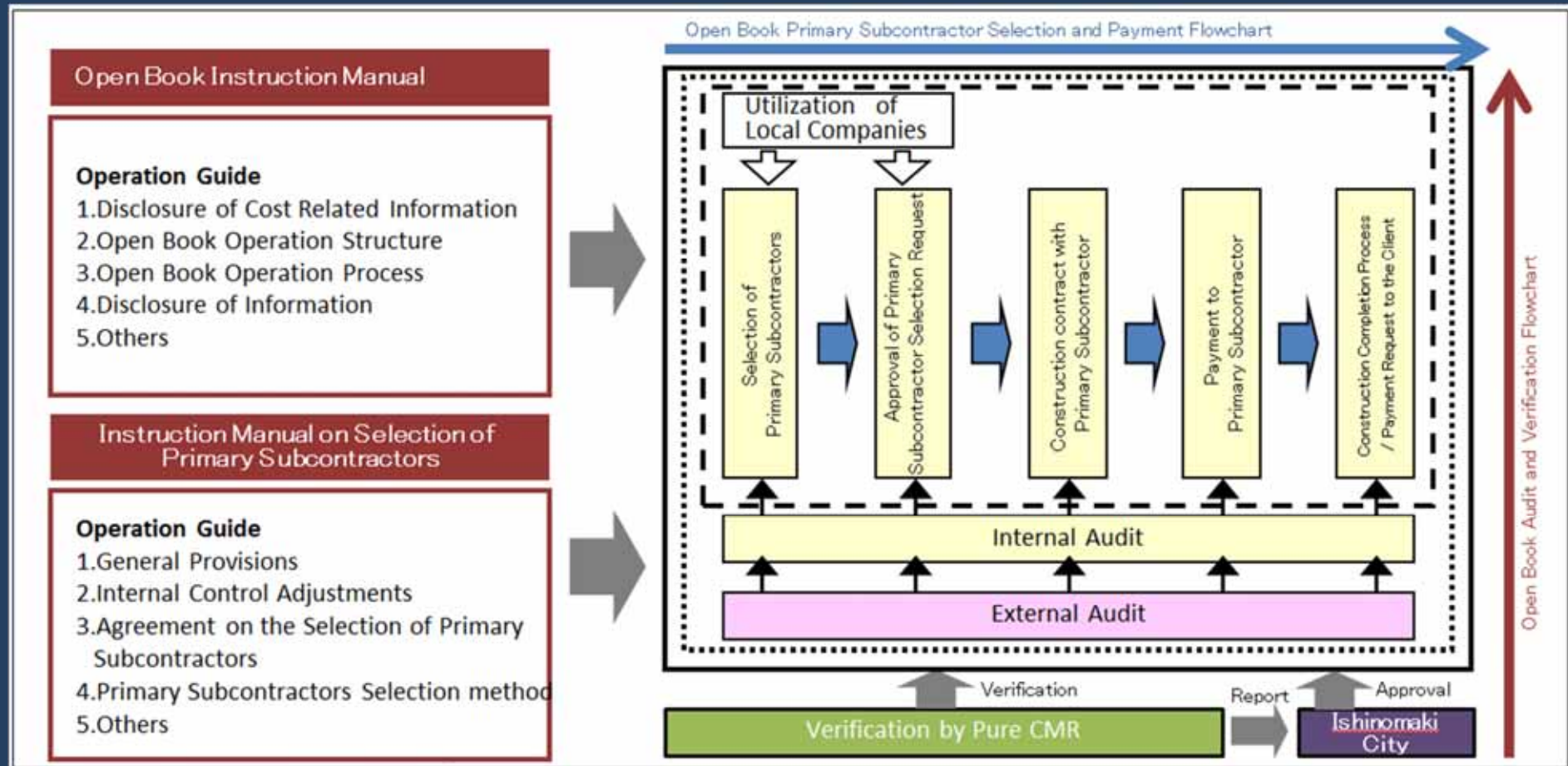
⇒ Cost + Fee method

- 10% (fixed rate) of the cost (initial cost)
- Includes At-Risk CMR management cost and administrative cost
- ※ administrative cost = head office expenses etc.

Definition of GMP Limited Cost Reimbursement

⇒ As costs are treated in reimbursement, the basic rule is to pay the expenses incurred. However, exceeded GMP will be charged to the At-Risk CMR.

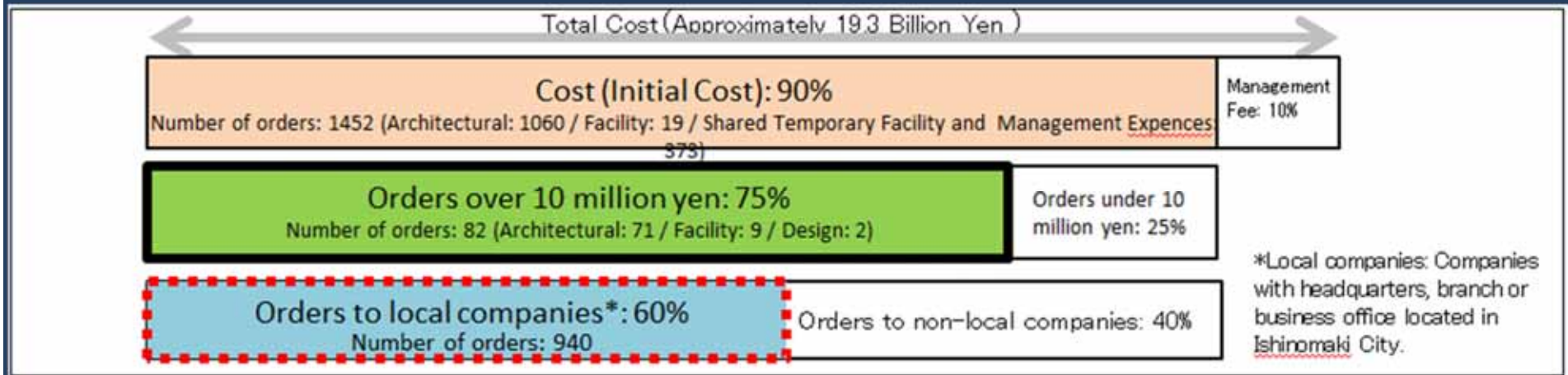
Auditing System of Open Book Operation



“Cost Management Meeting” attended by the client, the Pure CMR, and the At-risk CMR was held every month to confirm construction costs through monthly aggregation results, ensuring cost transparency.

In addition to third party auditing in the At-risk CMR mandated by the client, **Pure CMR verified monthly payment tabulations and every evidence of the payment bill**, to ensure higher reliability and transparency.

Auditing System of Open Book Operation



■ Operation omission ~ limiting the target ~

Rule was established that every primary subcontractors are in the range of Open Book disclosure, but **only primary subcontractors with over 10 million yen per order requires approval from the client**.

As a result, numbers of approval required orders were reduced from 1,452 to 82, covering 75% of the total cost at the same time.

■ Usage of local companies

The rules stipulated that At-risk CMR would obtain quotations from at least three primary subcontractors, and submit them to the client with a selection request form. The subcontractor would then be selected after the confirmation by the Pure CMR and the client.

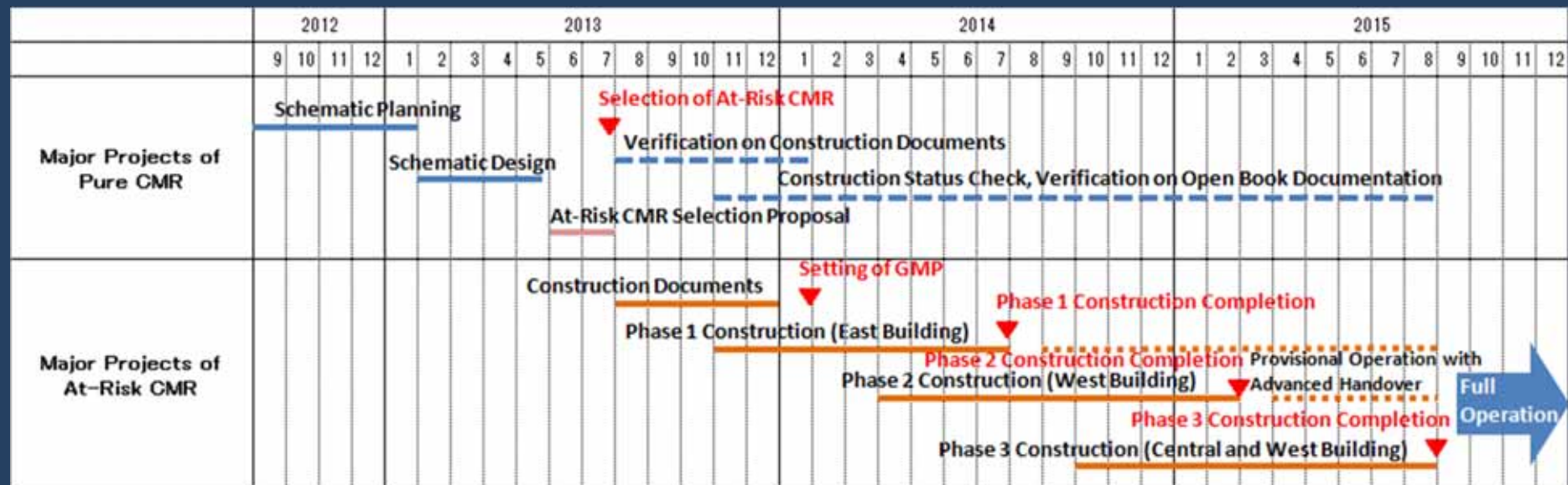
The rules also stipulated that **“local companies were to be used as much as possible”**.

With the help of At-Risk CMR’s great effort, 60% of the total construction cost were ordered to the local companies as a result.

Schedule



Schedule Outline and Contrivance on Shortening



Master Schedule

Top priority mission of the project **“Speedy Execution”**

The given project period was impossibly short to be managed by conventional process

⇒ Each CMR attempted schedule shortening as indicated below

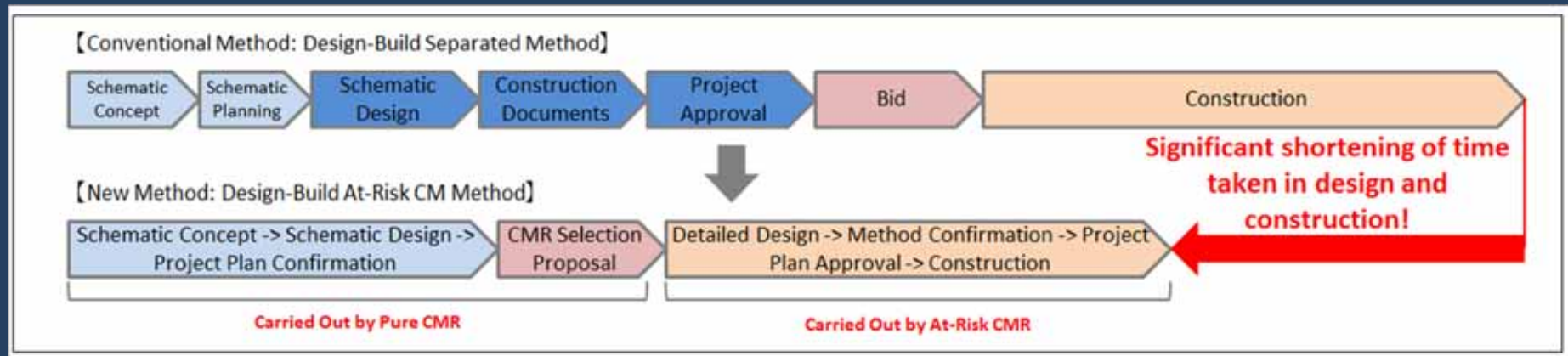
Pure CMR

⇒ ① Adoption of Design-Build At Risk CM method

At Risk CMR

⇒ ② Usage of Fast Track in 3 different areas

① Adoption of Design-Build At Risk CM Method



■ Conventional Method of Public Works in Japan

Approval from the client is required for the plan and the cost on each stage, with selections of designers and contractors made every time.

■ Method Adopted in The Project

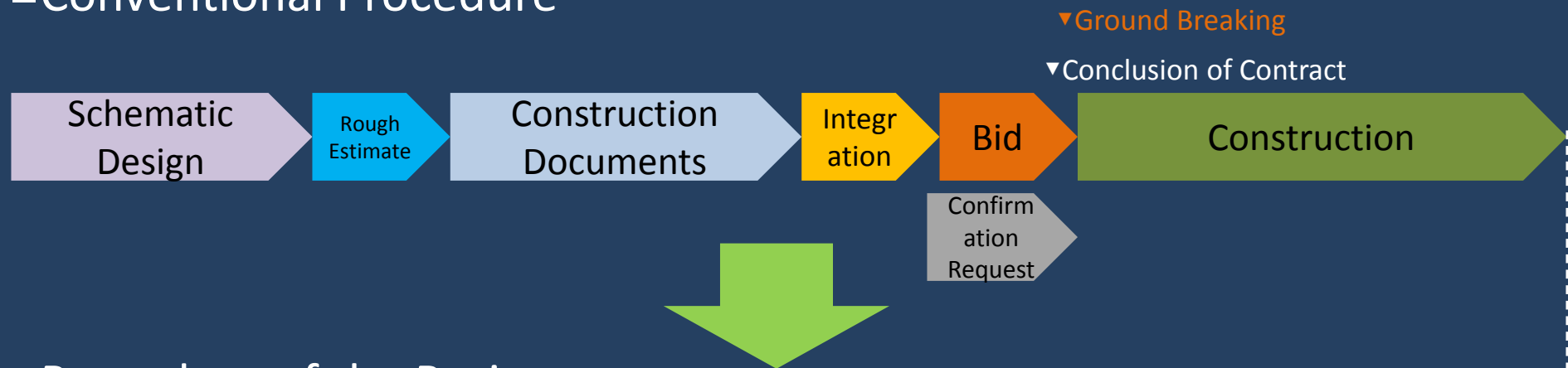
By selecting the At-Risk CMR with Design-Build method, approval procedures and selection procedures were simplified.

⇒ Master Schedule was shortened significantly by approximately 1 year

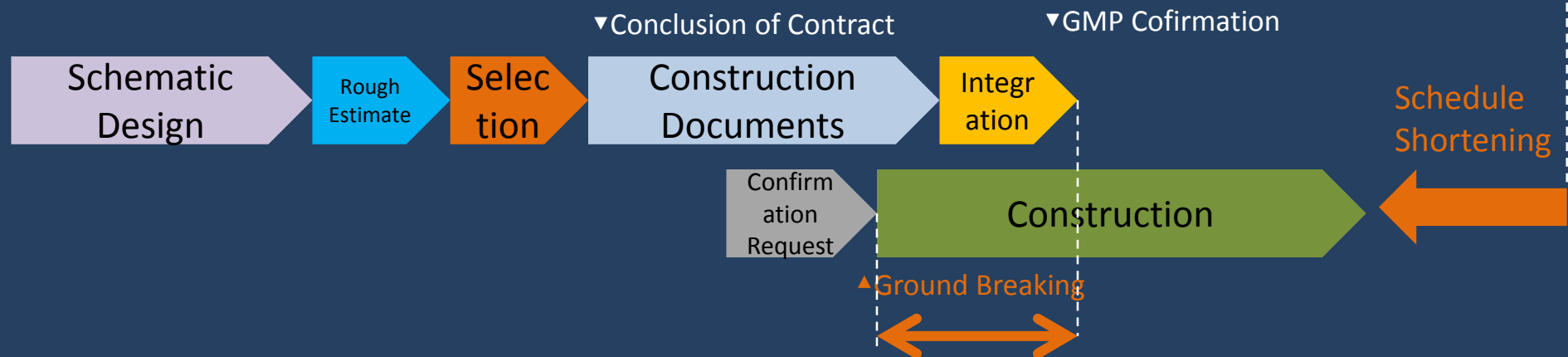
② Usage of Fast Tracking in 3 areas

A. Fast Tracking in Design and Construction

■ Conventional Procedure



■ Procedure of the Project



Lapping Period of Design, Integration and Construction

② Usage of Fast Tracking in 3 areas

- B. Fast Tracking in Neighboring Construction and the Project's Construction
Quay construction, tide embankment construction and fish market construction was in progress concurrently in the same area.

⇒ The project embarked stake driving from the restored part of the quay through Fast Track method



② Usage of Fast Tracking in 3 areas

C. Fast Tracking in construction and market openings

First handover · · · after the completion of East Building

⇒ opening of the East Building

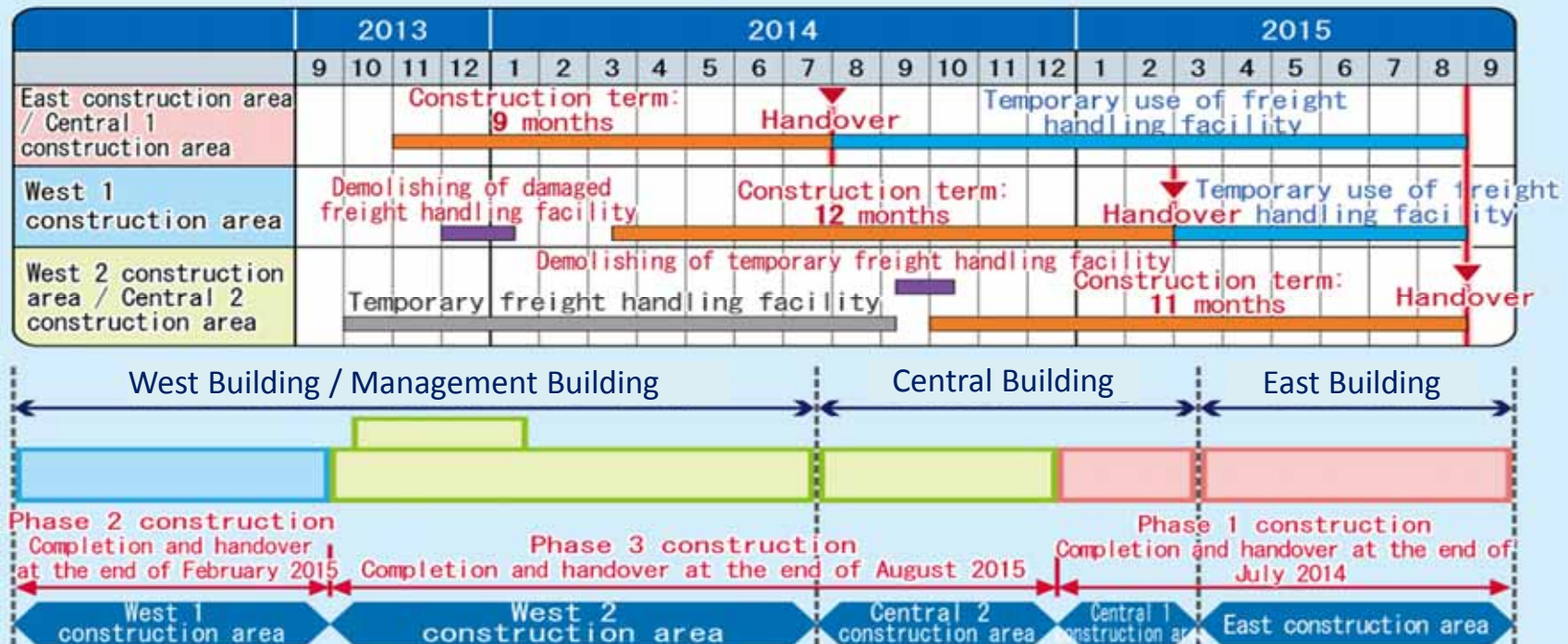
Second handover · · · after the partial completion of the West Building

⇒ partial opening of the West Building

Third handover · · · after the completion of the entire construction

⇒ opening of the entire market

Construction Flow until the Completion of New Ishinomaki Fish Market





Achievements and Future Issues

Achievements

■Speed

The project proceeded in a speed unimaginable if done by conventional method. As the project was regarded as the symbol of reconstruction in Ishinomaki, rapid completion was the most valuable achievement.

■Framework

The Project structured a framework of the “Pure CM Method”, the “Design-Build At-Risk CM Method” and the “GMP Limited Open Book Method” which are all regarded as new methods to be addressed in public works of Japan.

■BCP

In a country suffering from countless earthquakes, building a reconstruction scheme which can correspond quickly to the state of emergencies with the actual planning and implementation, was a major gain to the country in terms of BCP measurements.

Future Issues

■Daily Usage

The project took place in the state of emergencies which allowed partial exceptions; there are few institutional difficulties to be liquidated if used in the ordinary state. (Ex. Prevailing Conventional “Predetermined Price Method”, Introduction of “Cost Reduction Incentive Rule” etc.)

■Partnering System

The system is designed on the premise of cooperative relationship between the participants. The project lead to success via the cooperativeness, thus the risk identification and consideration on framework is yet to be done on the premise of hostile relationship.



Thank you for your kind attention.