

- TRANSLATION -

The English Translation of the Independent Financial Advisor's Opinion has been prepared solely for the convenience of foreign shareholders of Bangkok Expressway and Metro Public Company Limited and should not be relied upon as the definitive and official document. The Thai language version of the Independent Financial Advisor's Opinion is the definitive and official document and shall prevail in all aspects in the event of any inconsistency with this English Translation.

No. 057/2017

May 17, 2017

Subject Opinion of the Independent Financial Advisor concerning the Connected Transaction of Bangkok Expressway and Metro Public Company Limited

Attention Shareholders
Bangkok Expressway and Metro Public Company Limited

Attachment: 1) Business operation and performance overview of CH. Karnchang Public Company Limited.
2) Summary of draft M&E Equipment Procurement, Construction and Management Contract with CH. Karnchang Public Company Limited.
3) Summary of the Concession Agreement for the MRT Blue Line Extension Project between the Mass Rapid Transit Authority of Thailand ("MRTA") and Bangkok Expressway and Metro Public Company Limited dated March 31, 2017.
4) Information of the MRT Blue Line Extension.
5) Charts of the Bangkok Mass Rapid Transit Network.

Business operation and performance overview of Bangkok Expressway and Metro Public Company Limited is in Part 2 Clause 1 of the Information Memorandum concerning the Connected Transaction, which is enclosed with the notice to this shareholders' meeting.

References: 1) Resolution of the Board of Directors' Meeting No.3/2017 of Bangkok Expressway and Metro Public Company Limited dated April 11, 2017;
2) Information Memorandum on the Connected Transaction of Bangkok Expressway and Metro Public Company Limited dated April 12, 2017;
3) The Annual Registration Statement (Form 56-1) of Bangkok Expressway and Metro Public Company Limited for the year ended December 31, 2016;
4) Audited consolidated financial statements of Bangkok Expressway and Metro Public Company Limited for the year ended December 31, 2016;
5) The Annual Registration Statement (Form 56-1) of CH. Karnchang Public Company Limited for the year ended December 31, 2016;
6) Audited consolidated financial statements of CH. Karnchang Public Company Limited for the year ended December 31, 2014 – 2016;
7) Concession Agreement for the MRT Blue Line Extension Project between the Mass Rapid Transit Authority of Thailand and Bangkok Expressway and Metro Public Company Limited dated March 31, 2017;
8) Draft M&E Equipment Procurement, Construction and Management Contract with CH. Karnchang Public Company Limited;
9) Report of Cost Estimation for the Blue Line Extension Railway System (Hua Lamphong to Lak Song Section and Tao Poon to Tha Phra Section) by Infra Asia (Thailand) Company Limited ("Independent Expert" or "InfraAsia")¹ in March 2017;

¹ Infra Asia (Thailand) Company Limited, who has an extensive experience of Cost Estimation for railways projects, is well accepted by numerous government agencies and corporates of both in Thailand and overseas, such as Cost Estimation for the Supply and Installation of Mechanical and Electrical Equipment ("M&E") of the MRT Purple Line Project for the Company, Supply and Installation of Communication System Upgrading Equipment for the MRT Blue Line for the Company, the Estimation of Operation Expenses: OPEX for BTS Sky Train for supporting its BTS Rail Mass Transit Growth Infrastructure Fund (BTSGIF) Offering, ; the Advisor for MRTA to bidding Concessionaire for the MRT Purple Line Project, and the Technical Advisor and conduct a feasibility study for the relocation of 3 depots from SRT Makkasan to Amphur Khang Khoi, the Double Tracking Phase 4 and 5 Railway Project and the SRT Red Line Project, and Airport Rail Link Extension Project for Thailand State Railway. Besides, overseas works consist of Preparation of Cost Estimation for Gold Coast LRT in Australia as part of

- 10) Company Affidavit, Memorandum of Association, and other documents of Bangkok Expressway and Metro Public Company Limited as well as the interview with the management of Bangkok Expressway and Metro Public Company Limited and relevant staffs of the Company.

Disclaimers: 1) The study results of Capital Advantage Company Limited ("Independent Financial Advisor" or "CapAd") in this report were based on the information and assumptions provided by the management of Bangkok Expressway and Metro Public Company Limited, as well as the information disclosed to the public on the websites of the Securities and Exchange Commission (www.sec.or.th) and the Stock Exchange of Thailand (www.set.or.th);

2) The Independent Financial Advisor shall not be responsible for the profits or the losses, and any impacts resulting from this transaction;

3) The Independent Financial Advisor conducted the study with knowledge, skills, and cautiousness on the basis of the professional ethics;

4) The Independent Financial Advisor considers and provides its opinion based on the situation and information at the present time. If such situation and information change significantly, the study results in this report may be affected.

The Board of Directors' Meeting No. 3/2017 of Bangkok Expressway and Metro Public Company Limited (the "Company" or "BEM") held on April 11, 2017 has resolved to propose to the Extraordinary General Meeting of Shareholders No. 1/2017 on June 12, 2017 for consideration and approval of the engagement of CH. Karnchang Public Company Limited ("CK") for project management regarding (a) supply, installation, and testing of the M&E systems of the MRT Blue Line Project (Design, Supply, Installation, Integration, Testing, and Commissioning of Mechanical and Electrical Equipment ("M&E")) (Phase 1 of the Concession Agreement for the MRT Blue Line Project (the "Concession Agreement")²) and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax).

The aforementioned transaction is considered as a connected transaction (the "Connected Transaction") according to the Notification of the Capital Market Supervisory Board No. TorChor. 21/2551 Re: Rules on Connected Transactions and the Notification of the Board of Governors of the Stock Exchange of Thailand Re: Disclosure of Information and Other Acts of Listed Companies Concerning the Connected Transactions, B.E. 2546 (2003) (the "Notification on the Connected Transaction"), with a transaction size of 66.31 percent of Net Tangible Assets of the Company as at December 31, 2016, which is larger than 3 percent of Net Tangible Assets of the Company. In addition, when combine with other connected transaction with CK during the past 6 months with the transaction size of 0.53 percent (approved by the Board of Directors' Meeting No. 6/2016, dated November 30, 2016), the total transaction size shall be 66.84 percent of Net Tangible Assets of the Company.

Thus, the Company is required to appoint an independent financial advisor to render the opinion on rationality of the Connected Transaction, as well as to disclose information memorandum concerning the Connected Transaction to the Stock Exchange of Thailand ("SET") and to seek for an approval from the Shareholders' Meeting of the Company with the vote of not less than 3/4 of the total number of shares from shareholders attending the meeting and are eligible to vote, excluding shareholders having a conflict of interest.

The Company appointed Capital Advantage Company Limited as an independent financial advisor (the "Independent Financial Advisor" or "IFA" or "CapAd") to render an opinion on rationality and appropriateness of the pricing and conditions of this Connected Transaction to the shareholders.

CapAd has studied Information Memorandum concerning the Connected Transaction of the Company, as well as the interviews of executives and management of the Company and the documents received from the Company and CK such as financial statements, business plan, agreements and other relevant documents and the information disclosed to the public, the information

Due Diligence review of bidding consortiums rails systems on behalf of lending banks, Independent Appraiser for Asian Development Bank (ADB) on the review of project budget for Indian Pune-BGVN-WASI-GR Double Tracking/Electrification Project, and Cost Estimation for Communication System package for Bangalore Line 1 Tender Bid S&T. InfraAsia has extensive experience in Cost Estimation for an aggregate consideration of more than USD 15,000 million and OPEX Cost Estimation for an aggregate value of over USD 4,000 million.

² Please see summary of the Concession Agreement in Attachment 3 of this report.

disclosed on the websites of the Stock Exchange of Thailand and the Securities and Exchange Commission (the “SEC”) as well as financial information retrieved from the internet in order to render an opinion on the Connected Transaction. CapAd cannot assure or warrant any accuracy or completeness of the information provided to the Independent Financial Advisor by the Company and CK and/or the executives and/or the management of the Company and CK.

The opinion of CapAd in this report is based on the assumption that all of the aforesaid information and documents are accurate and complete. Additionally, the rendered opinion is based on operating environment and most up-to-date information at the time of issuance of this report. However, a change or an incident may have a material impact on the business operations of the Company, as well as decision of the shareholders on the Connected Transaction.

In rendering opinion for the shareholders, CapAd takes into account the reasonableness, price, and conditions for the transaction together with all relevant factors. We have considered such information thoroughly and reasonably according to the professional standards.

The attachments to this report are deemed as part of this opinion report and are the information that the shareholders should consider jointly with this report.

After considering and studying all information on the Connected Transaction, we would like to summarize the information and the study results as follows:

Abbreviation	
The “Company” or “BEM”	Bangkok Expressway and Metro Public Company Limited
“CK”	CH. Karnchang Public Company Limited
“MRTA”	Mass Rapid Transit Authority of Thailand
“Independent Expert” or “InfraAsia”	Infra Asia (Thailand) Company Limited
“Concession Agreement ”	Concession Agreement between the Mass Rapid Transit Authority of Thailand and the Company for the MRT Blue Line, dated March 31, 2017
“MRT Blue Line”	MRT Chaloem Ratchamongkhon Line Project and MRT Blue Line Extension Project
“MRT Chaloem Ratchamongkhon” or “MRT Initial Blue Line”	MRT Chaloem Ratchamongkhon Line Project (MRT Initial Blue Line) (Hua Lamphong Station – Bang Sue Station)
“MRT Blue Line Extension”	MRT Blue Line Extension Project which extends from the MRT Chaloem Ratchamongkhon comprising of 2 sections; Section 1 from Bang Sue Station to Tha Phra Station, and Section 2 from Hua Lamphong Station to Lak Song Station
“M&E”	Design, Supply, Installation, Integration, Testing, and Commissioning of Mechanical and Electrical Equipment
“km”	Kilometers
“NTP”	Notice to Proceed
“VAT”	Value-added Tax
“Independent Financial Advisor” or “IFA” or “CapAd”	Capital Advantage Company Limited
“SEC”	The Securities and Exchange Commission
“SET”	The Stock Exchange of Thailand
“Notification on the Connected Transaction”	The Notification of the Capital Market Supervisory Board No. TorChor. 21/2551 Re: Rules on Connected Transactions and the Notification of the Board of Governors of the SET Re: Disclosure of Information and Other Acts of Listed Companies Concerning the Connected Transactions B.E. 2546 (2003) and its amendments.
“NTA”	Net Tangible Assets

Executive Summary

Bangkok Expressway and Metro Public Company Limited (the “Company” or “BEM”) signed the Concession Agreement for the MRT Blue Line Project (the “Concession Agreement”) with the Mass Rapid Transit Authority of Thailand (“MRTA”) on March 31, 2017. The Company has the responsibility to supply, install, and testing the M&E Systems of the MRT Blue Line Extension Project (Phase 1 of the Concession Agreement³) within 36 months from the date the MRTA gives the Company written Notice to Proceed (NTP). However, on March 31, 2017, the MRTA issued the written Notice to Proceed to the Company to start Phase 1 of the Concession Agreement. Therefore, the complete date of the Concession Agreement shall be by March 31, 2020 (unless extended by the MRTA). In order to fulfill the Company’s obligation in Phase 1 of the Concession Agreement, the Company has to engage a professional for project management, supply, installation, and testing of the M&E system of the MRT Blue Line Project (Phase 1 of the Concession Agreement) as soon as possible so that the Contractor shall have sufficient time to complete work within the timeframe of the Concession Agreement.

In addition, the Company would like to purchase 7 new trains for the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) for a certain period of time due to the existing 19 trains are not sufficient for passengers during the rush hours resulting in long waiting time, and to accommodate the increasing number of passengers from the MRT Purple Line Project⁴ and the MRT Blue Line Extension Project in the future. However, most suppliers do not manufacture small lot of rolling stocks. Thus, the Company will combine this order of 7 new trains for the MRT Initial Blue Line Project to the order of 28 new trains for the MRT Blue Line Extension Project, resulting in total purchase of the new rolling stocks of 35 trains.

The Board of Directors’ Meeting No. 3/2017 of the Company, dated April 11, 2017, has resolved to propose to the Extraordinary General Meeting of Shareholders No. 1/2017 on June 12, 2017 for consideration and approval of the engagement of CH. Karnchang Public Company Limited (“CK”) for project management regarding (a) supply, installation, and testing of the M&E systems of the MRT Blue Line Project (Phase 1 of the Concession Agreement and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax), which is based on the negotiation between CK and the Company and verified with the cost estimation report of Infra Asia (Thailand) Company Limited (“InfraAsia”) who act as an independent engineering advisor.

The aforementioned transaction is considered a significant connected transaction with a transaction size of 66.31 percent of Net Tangible Assets of the Company as at December 31, 2016, and when combine with other connected transaction with CK during the past 6 months with the transaction size of 0.53 percent (approved by the Board of Directors’ Meeting No. 6/2016, dated November 30, 2016), the transaction size shall be not exceeding 66.84 percent of Net Tangible Assets of the Company. Thus, the Company is required to appoint an independent financial advisor to render the shareholders of the Company an opinion on rationality of the Connected Transaction, as well as to disclose information memorandum concerning the Connected Transaction to the Stock Exchange of Thailand (“SET”) and to seek for an approval from the Shareholders’ Meeting of the Company with the vote of not less than 3/4 of the total number of shares from shareholders attending the meeting and are eligible to vote, excluding shareholders having a conflict of interest.

Capital Advantage Company Limited (the “Independent Financial Advisor” or “IFA” or “CapAd”) as an independent financial advisor appointed by the Company has considered and deemed that the purpose and necessity of entering into the Connected Transaction is to fulfill the Company’s obligation in Phase 1 of the Concession Agreement with the MRTA. Therefore, the Company has to engage a professional for project management regarding supply, installation, and testing of the M&E systems of the MRT Blue Line Project (Phase 1 of the Concession Agreement). In addition, the Company would like to purchase 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) to accommodate current and future passengers, and large order of rolling stock is required due to most suppliers do not manufacture a small lot of rolling stocks.

³ Including modify, upgrade and/or replace the M&E equipment of the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) to connect and integrate with the MRT Blue Line Extension Project including installation of equipment and building of facilities to support Through Operation of the whole Blue Line Project.

⁴ The MRT Blue Line Extension Project from Tao Poon Station – Bang Sue Station with 1 kilometer length will be connected with the MRT Purple Line Project and the MRT Initial Blue Line Project within August 15, 2017. The Company expects more passengers feeding from the MRT Purple Line Project to the MRT Initial Blue Line Project.

The enter into the Transaction will benefit the Company as follows: (1) reduce risk of cost overrun and delay of the project, (2) reduce foreign exchange risk, (3) CK has experience in civil infrastructure, design, installation and implementation of MRT Projects, and (4) CK is contractor/service provider with strong financial position which can ensure that CK should be able to successfully achieve its responsibility under the scope of work within timeframe, and (5) negotiations and agreements between the Company and CK can be concluded quickly.

In the meantime, an enter into the Transaction shall have disadvantages and risks as follows: (1) the Company does not have opportunity to compare the proposal from CK with other contractors, (2) CK may not achieve the details and conditions set forth in the Concession Agreement, (3) Condition of the Contract limits the maximum aggregate liquidated damages while the Concession Agreement has no limit of the maximum aggregate liquidated damages, (4) potential conflict of interest; and (5) the Company incurs additional expenses for the appointment of the Independent Financial Advisor and the arrangement of shareholders' meeting.

Subsequent to the consideration of the purpose and necessity of entering into the transaction together with advantages, disadvantages, benefits and risks which may arise, the Independent Financial Advisor is of the opinion that the Company will gain benefits for its business with limited disadvantages and risks. The Company shall be the efficient metro operator without having to concern or incur burdens on the Supply of Mechanical and Electrical System. Thus, **the Connected Transaction is Reasonable.**

In the consideration of the price and terms and conditions of the Connected Transaction, CapAd is of an opinion that the comparison between the consideration to be paid to CK and Cost Estimation of the Independent Expert in railways systems is the most appropriate approach due to the MRT Blue Line Extension Project is highly technical and depending on technical know-how which requiring the estimation by specialists. The Cost Estimation referred to by the Independent Financial Advisor is the Cost Estimation conducted by InfraAsia who has experience in cost estimation for railways systems and well accepted from the government agencies and corporate in Thailand such as MRTA, the MRT Purple Line Project, BTS sky train and in overseas such as Cost Estimation for Gold Coast LRT in Australia and Cost Estimation for Communication System package for the Bangalore Line 1 Tender Bid S&T.

Comparison of the Contract Price with CK with the Cost Estimation by InfraAsia is as follows;

(Unit: Baht million)

Group	Description	Contract Price with CK	Cost Estimation by InfraAsia	higher (lower) than the Cost Estimation	
				Baht million	%
1	Rolling Stock for 35 sets ^{1/} and Signaling System	10,074.04 ^{2/} (Baht 288 million per train)	10,964.67 ^{4/} (Baht 313 million per train)	(890.63)	-8.12%
2	Communication Systems and Power Supply System	7,027.46 ^{2/} (Baht 266 million per km ^{6/})	6,891.61 ^{4/} (Baht 261 million per km ^{6/})	135.86	1.97%
3	Automatic Fare Collection System and Platform Screen Doors	1,931.32 ^{2/} (Baht 102 million per station ^{7/})	2,473.44 ^{4/} (Baht 130 million per station ^{7/})	(542.12)	-21.92%
4	Depot Work Equipment and Minor Works	609.51 ^{3/}	775.78 ^{4/}	(166.26)	-21.43%
	Total price (excluding VAT)	19,642.34 (Baht 744 million per km ^{6/})	21,105.49 (Baht 799 million per km ^{6/})	(1,463.16)	-6.93%

Remark:

1/ Consisted of 28 sets of rolling stock for the MRT Blue Line Extension Project, based on the requirement in the Concession Agreement, which was approved by the Meeting of the Board of Director of the Company No. 2/2017 on March 29, 2017, and 7 sets of rolling stock for the MRT Initial Blue Line Project.

2/ Consisted of cost of each work and the allocation of General Requirement* (from the draft contract with CK) based on pro-rata basis.

3/ Consisted of scope of depot work, MRTA Project Facility and Graphic and Signage in the Extension area and Update in the Existing area and the allocation of General Requirement*.

4/ Consisted of cost of each work and Minor Works in relation to such work and the allocation of cost center No. 10 – 17 (from InfraAsia's report) based on pro-rata basis.

5/ Consisted of cost center No. 8 and the remaining Minor Works, and the allocation of cost center No. 10 – 17 (from InfraAsia's report) based on pro-rata basis.

6/ Based on total length of 26.4 kilometers.

7/ Based on total new stations of 19 stations.

* Excluding MRTA Project Facility and Graphic and Signage in the Extension area and Update in the Existing area.

CapAd views that the estimated costs by InfraAsia is reasonable due to in this cost estimation, InfraAsia was not only considering the technical requirements of the Section 2 (Hua Lamphong station – Lak Song station) and Section 3 (Tao Poon station – Tha Phra station), but the affects to an integration with the Section 1 (Bang Sue station – Tao Poon station). In addition, InfraAsia made a reference to the costs of M&E system of other projects such as the MRT Purple Line Project and the its database for other similar projects in the past as well as known price from suppliers.

Therefore, the contract price with CK for project management regarding (a) supply, installation, and testing of the M&E systems of the MRT Blue Line Extension Project (Phase 1 of the Concession Agreement), and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax) is lower than the cost estimation by InfraAsia by Baht 1,463.16 million or lower by 6.93%.

Conclusively, CapAd is of the opinion that the **total consideration to CK** for project management regarding (a) supply, installation, and testing of the M&E systems of the MRT Blue Line Extension Project (Phase 1 of the Concession Agreement), and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) amounting to not exceeding Baht 19,643 million (excluding value-added tax) **is appropriate** due to the contract price with CK is lower than the estimated costs by the Independent Expert by Baht 1,463.16 million or lower by 6.93%. In addition, the term of payment is a general business condition. Therefore, **the term of payment is appropriate.**

Subsequent to the consideration of rationalities and appropriateness of price and conditions of the Connected Transaction, the Independent Financial Advisor is of the opinion that **the shareholders should resolve to APPROVE the Connected Transaction.**

However, the final decision shall be at own discretionary of the shareholders. The shareholders should consider the information in the notice to the shareholders' meeting and its enclosures before making the decision.

CapAd, as the Independent Financial Advisor, hereby certifies that it has provided the above opinion with due care in accordance with professional standard for the benefit of the shareholders.

Details of the IFA's opinion are described as follows

Part 1: Details of the Transaction**1. Details and Characteristics of the Transaction****1.1 Background of the Transaction**

Bangkok Expressway and Metro Public Company Limited ("the Company" or "BEM") (formerly named Bangkok Metro Public Company Limited) was granted the concession agreement for the MRT Chaloem Ratchamongkhon Line (Hua Lamphong Station - Bang Sue Station) ("MRT Initial Blue Line Project") from the Mass Rapid Transit Authority of Thailand ("MRTA") on a PPP Net Cost⁵ basis, whereby the Company has the exclusive right to collect fare box revenue and undertake activities and commercial development, including advertising, leasing space and telecommunications services in the metro stations and in the trains for a period of 25 years from July 2, 2004 to July 1, 2029. Under this agreement, The Company is obliged to pay remuneration calculated from fares and commercial development revenues to the MRTA at the rates prescribed therein.

On September 4, 2013, BEM entered into the agreement for the MRT Purple Line Project from Bang Yai - Rat Burana and Bang Yai - Bang Sue Sections, Contract 4 (the "MRT Purple Line Project") with the MRTA, on a PPP Gross Cost⁶ basis. The MRTA invests in all civil work costs, and the Company invests in the railway systems and rolling stocks, including train operation and maintenance services according to the service standards prescribed in the conditions of the agreement. The MRTA is entitled to collect fare revenues and commercial revenues from the use of all civil infrastructure and the train systems, and reimburse the Company in form of service fees for train operation and maintenance and systems equipment expenses throughout the concession period of 30 years from the signing date of the agreement.

The Board of Directors' Meeting No. 2/2017 of the Company on March 29, 2017 approved the investment in the MRT Blue Line Extension Project by entering into the MRT Blue Line Concession Agreement (the "Concession Agreement") which cover the MRT Chaloem Ratchamongkhon Project (Hua Lamphong - Bang Sue) and the MRT Blue Line Extension Project (Hua Lamphong – Bang Kae and Bang Sue – Tha Phra). The Concession Agreement shall be with the MRTA on the PPP Net Cost Basis⁷ for the concession period of 33 years and investment value of Baht 22,036 million (inclusive of VAT)⁸. Then on March 31, 2017, the Company has entered into the Concession Agreement with the MRTA for the MRT Blue Line Project. **Such Concession Agreement covers the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) from Bang Sue – Hua Lamphong and the MRT Blue Line Extension Project from Bang Sue – Tha Phra and Hua Lamphong – Bang Kae (Lak Song Station)**, whereby the expiration of the MRT Chaloem Ratchamongkhon Project will be extended from July 1, 2029 to be ended simultaneously with the MRT Blue Line Extension Project.

Under the Concession Agreement, the Company has the responsibility to supply, install, and testing the M&E Systems (Works under Phase 1) as well as commences operation of the MRT Blue Line Extension Project and operates Through Operation system of the MRT Chaloem Ratchamongkhon Project and the MRT Blue Line Extension Project. The Company has rights, duty, and obligation to claim for, collect, and retain all fares from passengers in accordance with the Concession Agreement, to generate revenue from commercial development, which the Company is responsible for investment and operating costs, and to make remuneration payment to the MRTA under the Concession Agreement (PPP Net Cost basis).

⁵ PPP Net Cost Basis: The MRTA invests in all civil work costs, and the concessionaire invests in the railway systems and rolling stock, including train operation and maintenance services according to the service standards prescribed in the conditions of the agreement. The concessionaire has the exclusive right to collect fares and undertake activities and commercial development, including advertising, leasing space in the project area, and telecommunications services in the stations and in the trains. Under this agreement, the concessionaire is obliged to pay remuneration calculated from fares and commercial development revenues to the MRTA at the rates prescribed therein.

⁶ PPP Gross Cost Basis: The MRTA invests in all civil work costs, and the concessionaire invests in the railway systems and rolling stock, including train operation and maintenance services according to the service standards prescribed in the conditions of the agreement. The MRTA is entitled to collect fare revenues and commercial revenues from the use of all civil infrastructure and the train systems, and reimburse the concessionaire in the form of service fees for train operation and maintenance and systems equipment expenses throughout the concession period of 30 years from the signing date of the agreement on September 4, 2013.

⁷ Please see Footnote 5.

⁸ Please see more detail in Figure 1 on Page 9 of this report.

The term of the Concession Agreement is 33 years from the date the MRTA gives Notice to Proceed ("NTP")⁹ which is divided into two phases, as follow:

Phase 1: Design and Construction (M&E System)

Supply, install, and test the M&E System for the MRT Blue Line Extension Project as well as trial running, within an operating period of 36 months from the date the MRTA gives the Company written Notice to Proceed (NTP). The operating schedule is as follows:

Section 1 Bang Sue Station - Tao Poon Station: within August 15, 2017

Section 2 Hua Lamphong Station – Lak Song Station: within 30 months from the NTP date¹⁰

Section 3 Tao Poon Station – Tha Phra Station: within 36 months from the NTP date¹¹

The Company has the duty to supply, install, and test the M&E System. Most equipment is for the MRT Blue Line Extension Project. Some equipment is for the MRT Initial Blue Line Project which require modification, upgrading, and/or replacement in order to connect with the M&E system of the MRT Blue Line Extension Project. In addition, the Company has to install and construct supporting facilities as needed for through operation of the whole MRT Blue Line Project. The Company is also obliged to conduct the trial run and commence operation of the MRT Blue Line Extension Project.

Phase 2: Operation and Maintenance (O&M) Services¹²

Provide operation and maintenance services for the MRT Blue Line Project for 30 years from the commencement date of the operation for service that generate revenue for the whole MRT Blue Line Project.

The Company has the duty to operate Through Operation system of the whole MRT Blue Line Project, to collect all fares from passengers of the MRT Blue Line Project, and to procure and generate revenue from commercial development.

(Please see summary of the Concession Agreement in Attachment 3 of this report, and information of the MRT Blue Line Extension Project and map of the MRT Blue Line Project in Attachment 4 of this report.)

Board of Investment Privileges for the MRT Blue Line Extension Project

On November 16, 2015, the Board of Investment approved the investment promotion in principle for the MRT Blue Line Extension Project from Hua Lamphong – Bang Kae and from Bang Sue - Tha Phra as follows;

- Exemption of import duties on machinery
- Exemption of corporate income tax on the net profit for 8 years (Tax exemption limit will be determined.)
- Exemption of income tax on dividends derived from the promoted activity for 8 years

A letter from the MRTA to the BOI stated that granting of the investment promotion to the Concessionaire is very important for the enforcement of the Concession Agreement as well as the feasibility and the success of the mass rapid transit system under the determined characteristic, guideline and timeline. Therefore, the MRTA shall request for supporting from the BOI to approve and grant the incentive promotion to the Company.

In addition, based on the Concession Agreement Clause 2.2 (c), the MRTA is responsible to request for the approval of the Cabinet to grant the BOI Privileges for the MRT Blue Line Project, and to coordinate with relevant parties as needed to assist the Company to receive the maximum BOI privileges.

After signing of the Concession Agreements on March 31, 2017, the MRTA submitted the letter No. MRTA 007 (NG)/27 dated April 27, 2017 to the Company regarding the submission of documents in relation to the request for the BOI approval under the Investment Promotion Act B.E. 2520 for the MRT Blue Line Project.

⁹ The MRTA issued the Notification to Proceed No. MRTA 007/889 dated March 31, 2017 to notify the Company to commence Phase 1 of the Concession Agreement from March 31, 2017 onwards. Therefore, the completion date of the Concession Agreement shall be by March 31, 2020 (unless the MRTA extends the schedule of the Concession Agreement).

¹⁰ Provided that the NTP date was March 31, 2017, the completion date for Section 2 shall be by September 30, 2019 (unless extended by MRTA).

¹¹ Provided that the NTP date was March 31, 2017, the completion date for Section 3 shall be by March 31, 2020 (unless extended by MRTA).

¹² Before ending of Phase 1 of the Concession Agreement, the Company shall appoint a contractor/service provider to undertake the maintenance for Phase 2 of the Concession Agreement for a 30-year period. The Company may appoint CK to provide the maintenance services for Phase 2 of the Concession Agreement. For the operation of the trains in Phase 2 of the Concession Agreement, the Company shall operate by itself.

At present, the Company is in the process to apply for the BOI privileges from the Board of Investment.

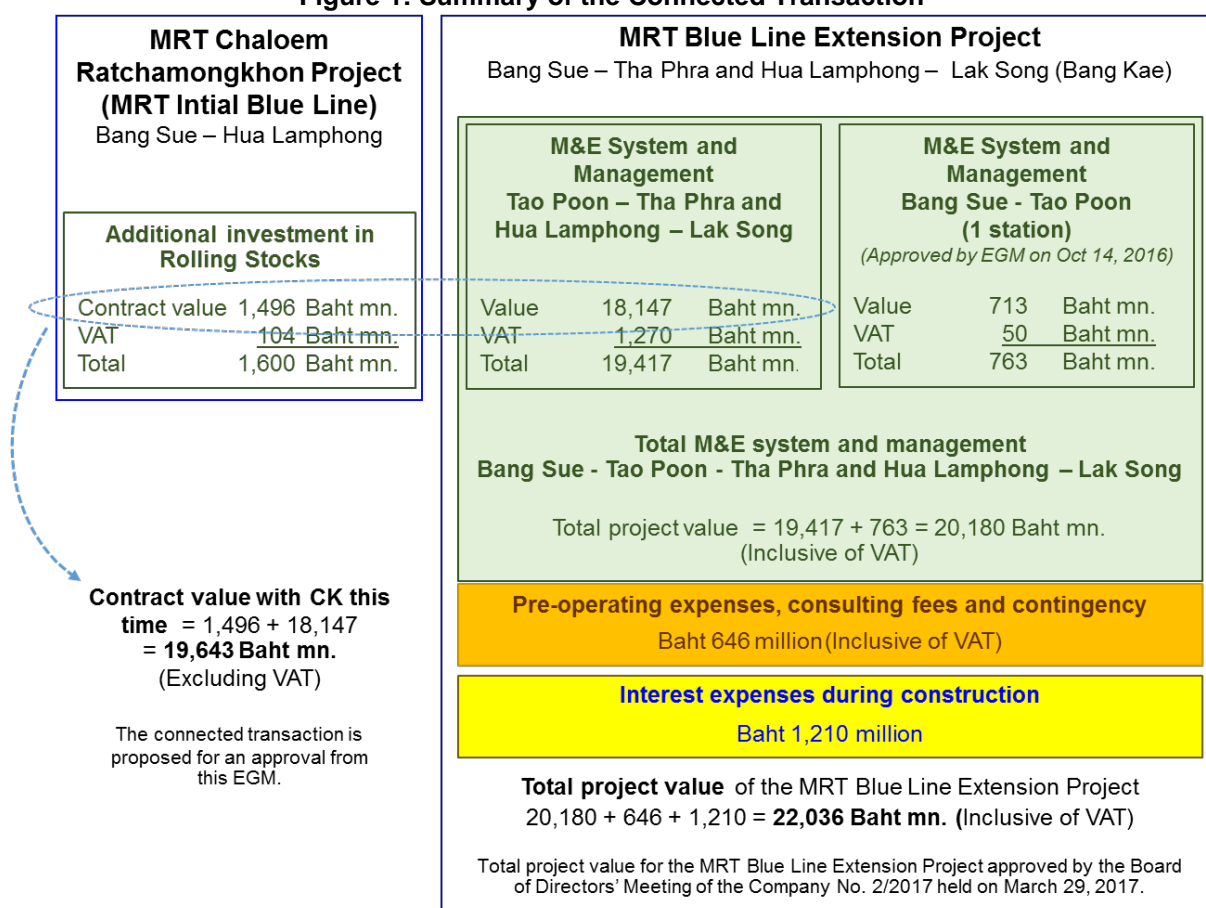
Board of Investment Privileges for the MRT Chaloe Ratchamongkhon Project (the MRT Initial Blue Line Project)

For the purchase of 7 new trains for the MRT Chaloe Ratchamongkhon Project (the MRT Initial Blue Line Project), the Company shall be exempted for import duty based on the existing BOI privileges which was extended to 2020.

The purchase and import of the M&E system for the MRT Blue Line Extension Project and 7 new trains for the MRT Chaloe Ratchamongkhon Project (the MRT Initial Blue Line Project) by CK shall be under the name of the Company who receives BOI privileges. Such process is similar to the import of equipment for the MRT Chaloe Ratchamongkhon Project (the MRT Initial Blue Line Project) which also receives BOI privileges.

The Board of Directors' Meeting of the Company No. 3/2017 held on April 11, 2017 has resolved to propose to the Extraordinary General Meeting of Shareholders for consideration and approval of the engagement of CK for project management regarding (a) supply, installation, and testing of the M&E system of the MRT Blue Line Project (Phase 1 of the Concession Agreement) and (b) supply of 7 new rolling stocks for the MRT Chaloe Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax).

Figure 1: Summary of the Connected Transaction



Remark:

- The Company has appointed CK for project management regarding (a) supply, installation, and testing of the M&E systems for the Bang Sue Station – Tao Poon Station (distance of 1 station) since 2015.
- The consulting fees (under pre-operating expenses, consulting fees and contingency) is reserved for an engineering consultant to oversee CK's works for the project management regarding, supply, installation, and testing of the M&E systems of the MRT Blue Line Project from Tao Poon Station – Tha Phra Station and Hua Lamphong Station – Lak Song Station.

1.2 Date of Transaction

In case that the Extraordinary General Meeting of Shareholders No. 1/2017 which will be held on June 12, 2017 passes a resolution to approve the Connected Transaction, the Company expects to enter into the transaction with CK within June 2017.

1.3 Related Parties and Relationship with the Company

Employer	:	Bangkok Expressway and Metro Public Company Limited (the "Company" or "BEM")
Contractor	:	CH. Karnchang Public Company Limited ("CK")
Relationship	:	<ul style="list-style-type: none"> - CK is the major shareholder of the Company. As at April 27, 2017, CK holds 4,582,121,829 shares of the Company, representing 29.98 percent of the Company's paid-up capital. - CK has its 2 representatives on the Board of Directors of the Company namely, (1) Mr. Plew Trivisvavet and (2) Mr. Vitoon Tejatussanasoontorn. - Please see more details in Part 1 Clause 1.9 of this report.

Source: Thailand Securities Depository Co., Ltd. and the Affidavit of CK and the Company

1.4 General Characteristics of the Transaction

The Company, as the concessionaire under the Concession Agreement for the MRT Blue Line Project granted by the MRTA for 33 years, intends to engage CK for project management regarding (a) supply, installation, and testing of the M&E system of the MRT Blue Line Project (Phase 1 of the Concession Agreement) and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax).

(Please see Summary of the draft M&E Equipment Procurement, Construction and Management Contract with CK in Attachment 2 of this report.)

1.5 Category and Size of the Transaction

The aforementioned transaction is considered the Connected Transaction according to the Notification of the Capital Market Supervisory Board No. TorChor. 21/2551 Re: Rules on Connected Transactions and the Notification of the Board of Governors of the Stock Exchange of Thailand Re: Disclosure of Information and Other Acts of Listed Companies Concerning the Connected Transaction B.E. 2546 (2003) (the "Notification on the Connected Transaction"), with a transaction size of 66.31 percent of Net Tangible Assets of the Company as at December 31, 2016. Details of the calculation are as follows:

Total Assets ^{1/}	Baht million	82,785.56
Deduct Intangible Assets ^{1/}	Baht million	68.23
Deduct Total Liabilities ^{1/}	Baht million	53,002.86
Deduct Minority Interests ^{1/}	Baht million	93.45
Net Tangible Assets (NTA) ^{2/}	Baht million	29,621.02
Total Value of Consideration ^{3/}	Baht million	not exceed 19,643.00
Value of the Connected Transaction (percentage of NTA)	Percent	not exceed 66.31

Remark:

1/ According to the Company's audited financial statement for the year ended on December 31, 2016.

2/ For the calculation of NTA, the Company did not deduct deferred tax asset due to the majority of deferred tax asset was a temporary difference from provision for compensation for site acquisition cost, while the Company has expected to fully utilize this tax privilege.

3/ Please see detail in Part 1 Clause 1.6 of this report.

Such transaction size is higher than 3 percent of NTA of the Company and when combined the above connected transaction with the connected transaction between the Company and CK in the past 6 months with the transaction size of approximately 0.53 percent of NTA (approved by the Meeting of Board of Director of the Company No. 6/2016 dated November 30, 2016), total transaction size becomes 66.84 percent of Net Tangible Assets of the Company, which is considered as significant connected transaction. Thus, entering into the Connected Transaction requires an approval from the shareholders' meeting with the vote of not less than 3/4 of the total number of shares from shareholders who attend the meeting and are eligible to vote, excluding shareholders having the conflict of interest. Also, the Company is required to appoint an independent financial advisor to render the shareholders an opinion on the rationality and appropriateness of the price and conditions of the Connected Transaction for their consideration before making a decision.

1.6 Total Value of Consideration and Criteria for determining the value of consideration

The total value of consideration that the Company agrees to pay to CK as consideration for the transaction at the amount of not exceeding Baht 19,643 million (excluding value-added tax, however, the Company will responsible for the value-added tax) is based on the negotiation between

CK and the Company and verified with the cost estimation report of Infra Asia (Thailand) Company Limited ("InfraAsia") who act as an independent engineering advisor.

The Company has engaged InfraAsia to act as an independent engineering advisor in determining fair value of the project costs for the project management regarding (a) supply, installation, and testing of the M&E system of the MRT Blue Line Project (Phase 1 of the Concession Agreement), and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project). The total consideration estimated by InfraAsia is equivalent to Baht 21,105.49 million (excluding value-added tax).

1.7 Source of funds and Term of Payment

- **Contract Term:** CK shall deliver the work under the contract within the period specified under the MRT Blue Line Concession Agreement, in which the Company has entered the Concession Agreement with MRTA since March 31, 2017.

(Please see Summary of the draft M&E Equipment Procurement, Construction and Management Contract with CK in Attachment 2 of this report.)

Under the Concession Agreement, the supply, installation, and test of the M&E System for the MRT Blue Line Extension Project as well as trial running, must be completed within 36 months from the date the MRTA gives the Company written Notice to Proceed.

(Please see Summary of Concession Agreement for the MRT Blue Line Project in Attachment 3 of this report.)

- **Source of Funds:** The Company will use external sources of financing through issuing of debentures and/or securing credit facilities from financial institutions amounting to Baht 16 billion. The Company will propose to this Extraordinary General Meeting of Shareholders for consideration and approval of the debenture issuance of not exceeding Baht 16,000 million. The remaining amount will derive from internal cash flow of the Company.

The Company shall later decide whether to use source of fund from debenture issuance or financial institutions by considering financial cost and conditions of such funding.

(Please see more detail in Part 2 Clause 5.1 of this report)

- **Term of Payment to CK:** The Company agrees to make payments to CK on a monthly basis according to the conditions prescribed in the agreement within 30 days from the date that the Company receives the invoice.

(Please see Summary of the draft M&E Equipment Procurement, Construction and Management Contract with CK in Attachment 2 of this report.)

1.8 Condition Precedent

The Execution of the Contract to engage CK according to this Transaction shall be completed if the Extraordinary General Meeting of Shareholders resolves to approve the Company to enter into this Connected Transaction.

1.9 Details of Connected Persons and/or the Shareholders Having Conflict of Interest

The Company's Connected Persons, based on the latest book closing of the Company's list of shareholders as of April 27, 2017 and the latest book closing of CK's list of shareholders as of March 16, 2017, details of the connected persons and/or the shareholders having conflict of interest are as follows:

Connected Persons and/or Shareholders Having Conflict of Interest	Relationship with the Company	Shareholding Proportion
1. CH. Karnchang Public Company Limited	Major shareholder of the Company.	holds 4,582,121,829 shares, representing 29.98 percent of the Company's paid-up capital.
2. CH. Karnchang – Tokyo Construction Company Limited	A shareholder of the Company and a subsidiary of CK, who is a major shareholder of the Company, holding 549,996 shares, representing 55.00 percent of CH. Karnchang – Tokyo Construction Company Limited's paid-up capital.	holds 136,659,952 shares, representing 0.89 percent of the Company's paid-up capital.
3. Mr. Plew Trivisvavet	Vice Chairman of the Board of Directors and Chairman of the Executive Board of the Company as well as Chairman of the Executive Board of CK. Besides, he holds 13,631,497 shares, representing 0.80 percent of CK's paid-up capital.	holds 21,706,878 shares, representing 0.14 percent of the Company's paid-up capital.
4. Mrs. Saikasem Trivisvavet	Spouse of Mr. Plew Trivisvavet, holding 5,061,142 shares in CK, representing 0.30 percent of CK's paid-up capital. However, Mrs. Saikasem is not director or management of the Company or CK.	holds 2,402,527 shares, representing 0.02 percent of the Company's paid-up capital.

Sons/Daughter of Mr. Plew Trivisvavet

Name	Relationship with the Company	Shareholding Proportion
1. Dr. Supamas Trivisvavet	Managing Director of CK and an offspring of Mr. Plew Trivisvavet, holding 1,700,000 shares in CK, representing 0.10 percent of CK's paid-up capital.	holds 144,272 shares, representing less than 0.001 percent of the Company's paid-up capital.
2. Mr. Thanawat Trivisvavet	Son of Mr. Plew Trivisvavet.	holds 84,101 shares, representing less than 0.001 percent of the Company's paid-up capital.
3. Mr. Nattavut Trivisvavet	Son of Mr. Plew Trivisvavet, holding 2,405,785 shares in CK, representing 0.14 percent of CK's paid-up capital.	holds 274,391 shares, representing less than 0.002 percent of the Company's paid-up capital.

Corporates might be under control of the Company's director

Name	Relationship with the Company	Shareholding Proportion
1. Mahasiri Siam Company Limited	Major shareholder of CK holding 307,312,365 shares in CK, representing 18.14 percent of CK's paid-up capital. Shares of Mahasiri Siam Company Limited are held by Trivisvavet Family.	holds 4,327,689 shares, representing 0.03 percent of the Company's paid-up capital.
2. CH. Karnchang Holding Company Limited	Major shareholder of CK holding 173,096,530 shares in CK, representing 10.22 percent of CK's paid-up capital. Shares of CH. Karnchang Holding Company Limited are held by Mahasiri Siam Company Limited and Trivisvavet Family.	holds 2,077,291 shares, representing 0.01 percent of the Company's paid-up capital.

Chairman of Audit Committee and Independent Director of both the Company and CK

Name	Relationship with the Company	Shareholding Proportion
1. Mr. Vitoon Tejatussanasoonorn	Chairmen of Audit Committee and Independent Director of both the Company and CK, holding 256,250 shares in CK, representing 0.02 percent of CK's paid-up capital.	holds 803,893 shares, representing 0.005 percent of the Company's paid-up capital.

Source:

- The latest shareholders registration book of the Company dated April 27, 2017 (XM) and that of CK dated March 16, 2017 (XM)
- Affidavit of the Company and CK dated March 2, 2017 and March 6, 2017, respectively
- Form 56-1 for the Year 2016 of the Company and CK

Remark:

- There are a number of shareholders of the Company who hold less than 1 percent of the Company's paid-up capital, namely, Mr. Aswin Kongsiri (a director of CK), a close relative of Mr. Ratn Santaannop (a director of CK), and a close relative of Mr. Phongsarit Tantisuvanitchkul (a management of CK). (This is exclusive of some directors and managements of CK who are holding less than 100,000 shares in the Company, which is considered insignificant amount.)
- The Company informed that the person listed on above tables shall not vote in this EGM.

- 2. The information of Bangkok Expressway and Metro Public Company Limited** is as stated in Part 2 Clause 1 of the Information Memorandum on the Connected Transaction of the Company, which is enclosed to the notice to this shareholders' meeting.
- 3. The information of CH. Karnchang Public Company Limited** is as stated in the Attachment 1 of this report
- 4. Summary of the Agreement** is as stated in the Attachment 2 – 3 of this report.

Part 2: Opinion of the Independent Financial Advisor Concerning the Connected Transaction**1. Purpose and Necessity to Enter into the Transaction**

The Company signed the Concession Agreement for the MRT Blue Line Project (the “Concession Agreement”) with the MRTA on March 31, 2017. The Company has the responsibility to supply, install, and test the M&E System of the MRT Blue Line Project within 36 months from the date the MRTA gives the Company written Notice to Proceed (NTP). On March 31, 2017, the MRTA issued the written Notice to Proceed to the Company to commence Phase 1 of the Concession Agreement. Therefore, the completion date of the Concession Agreement shall be by March 31, 2020 (unless extended by the MRTA). In order to fulfill the Company’s obligation in Phase 1 of the Concession Agreement, the Company has to engage a professional for project management, supply, installation, and testing of the M&E system of the MRT Blue Line Project (Phase 1 of the Concession Agreement) as soon as possible so that the Contractor shall have sufficient time to complete work within the timeframe of the Concession Agreement.

In addition, the Company would like to purchase 7 new trains for the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) for a certain period of time due to the existing 19 trains are not sufficient for passengers during the rush hours resulting to long waiting time, and to accommodate the increasing number of passengers from the MRT Purple Line Project¹³ and the MRT Blue Line Extension Project in the future. However, most suppliers do not manufacture small lot of rolling stocks. Thus, the Company will combine this order of 7 new trains for the MRT Initial Blue Line Project to the order of 28 new trains for the MRT Blue Line Extension Project as specified in the Concession Agreement, and total purchase of the new rolling stocks will be 35 trains.

2. Comparison of Advantages and Disadvantages of the Transaction**2.1. Advantages and Benefit of the Transaction****2.1.1. To reduce risks of cost overrun and delay of construction**

The M&E Equipment Procurement, Construction and Management Contract for the MRT Blue Line Project are on a fixed cost lump sum turnkey basis with definite completion period and schedule of payments in accordance with the work progress. These conditions will help assure the Company that the installation of M&E system of the MRT Blue Line Project will be completed within the determined timeframe and budget, resulting in lower risks of project cost overrun and project completion delay.

2.1.2. To reduce foreign exchange risk

Based on the draft M&E contract with CK on which the payment is on a fixed cost lump sum turnkey basis, the Company will pay to CK in Thai Baht, while CK will import main machinery and equipment from abroad. Therefore, to enter into M&E contract with CK and make payment to CK in Thai Baht can reduce foreign exchange risk of the Company from import machinery and equipment from abroad.

2.1.3. CK has experience in civil infrastructures, design, installation and implementation of MRT Projects

CK has experience in construction, project management, design, supply and installation and testing of the M&E equipment including the Civil Infrastructure, Electrical and Mechanical Systems Maintenance (“CEM”) for the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project). CK has successfully coordinated with various entities and managed the suppliers to supply, install, and testing of the Mechanical and Electrical Equipment to be realigned with the civil infrastructure. In the past, CK could achieve its targets both in term of timing and agreed price. Therefore, the MRT Chaloem Ratchamongkhon Project could start its operation as scheduled.

CK is the contractor and project manager for Phase 1 of the concession agreement for the MRT Purple Line Project under Contract 4¹⁴ and Phase 1 of the concession agreement for the MRT Purple Line Project under Contract 5¹⁵, and provides Civil Infrastructure and Electrical and Mechanical Systems Maintenance (“CEM”) for the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) from Hua Lamphong Station – Bang Sue Station and the MRT Purple Line

¹³ Please see Footnote 4.

¹⁴ Supply, install and testing of M&E Systems for the MRT Purple Line Project from Klong Bang Pai Station – Tao Poon Station.

¹⁵ Supply, install and testing of M&E Systems for the MRT Purple Line Project from Klong Bang Pai Station – Bang Sue Station (1 station). At present, this section from Tao Poon Station – Bang Sue Station has been transferred to the MRT Blue Line Extension Project.

Project from Bang Yai – Rat Burana, Bang Yai – Bang Sue Section (Klong Bang Pai Station – Tao Poon Station).

Moreover, CK is the construction contractor under the Contract 2¹⁶ and Contract 5¹⁷ of the MRT Blue Line Extension Project and was the project manager of the MRT Chaloem Ratchamongkhon Project. As such, it is beneficial for the Company since the Company can connect the M&E system with the civil infrastructure smoothly and integrate the M&E system of the whole MRT Blue Line Project efficiently.

From its experiences, CK has a capability to handle large scale infrastructure projects and has an experience in project management and supply of M&E system to the MRT Chaloem Ratchamongkhon Project including system integration and trial run of the project until the project could be launched within definitive timeframe the MRTA. With familiarity of CK to all MRT projects under the management of the Company, it is convinced that CK should be able to efficiently carry on the MRT Blue Line Extension Project as planned and deliver the MRT Blue Line Extension Project within the timeframe.

2.1.4. CK is the contractor/service provider who has strong financial position

The total value of M&E Equipment Procurement, Construction and Management Contract of not exceeding Baht 19,643 million (excluding value-added tax) is considered a sizable investment. The project manager/contractor of the Project should have a strong financial status and sufficient financial liquidity in order to ensure that such project manager will be able to complete the works of the Contract within the specified time. The contractor may sometimes have to make advance payments. Therefore, if the contractor does not have good credit status and sufficient financial liquidity, the construction of the Project may be interrupted.

According to the term and conditions the Contract, CK has to arrange performance bond issued by a financial institution with the value of 10 percent of total contract value (approximately Baht 1,964.30 million). Such security's term shall remain until CK can be released from the obligation under this Contract.

As of December 31, 2016, CK has total assets of Baht 94,928.37 million, cash and cash equivalent and short-term investments of Baht 12,406.17 million, shareholders' equity of Baht 21,854.32 million, and net profit of Baht 2,042.45 million in 2016. D/E ratio (according to covenants of CK's debenture¹⁸) was at 1.33 times¹⁹, which is still lower than the allowed threshold of 3.00 times²⁰. Hence, CK has sufficient liquidity and borrowing capability to support the M&E equipment procurement, construction and management for the MRT Blue Line Project.

2.2. Disadvantages and Risks of the Transaction

2.2.1. The Company has no opportunity to compare CK's proposal with other contractors

The engagement of CK would be done without an open bidding, as such, the Company has no opportunity to compare CK's proposal with other contractors. However, the proposed price from CK is lower than the price assessed by an Independent Expert (InfraAsia).

The Company did not arrange an open bidding due to (a) limited operating period of the Concession Agreement where the Company has to complete the M&E System within 36 months from the date the MRTA gives the Company written Notice to Proceed (which is on March 31, 2017), while open bidding shall require at least 4 – 5 months to complete the bidding process due to a contractor has to study the design of the project, calculate project price, prepare bidding documents and bid bond. These may cause the Company to delay the completion of Phase 1 of the Concession Agreement.; and (b) At the present, there are only a few companies in Thailand which are capable of the engagement of works in design, supply, installation and system testing, as well as coordinating with subcontractors for the supply of equipment relating to the MRT projects, which are sophisticated and require state-of-the-art technologies, together with experience in design, installation and operation until public service within the specified time.

¹⁶ Design and construction of underground infrastructure of the MRT Blue Line Extension from Sanamchai Station – Tha Phra Station.

¹⁷ Design and construction of underground infrastructure of the MRT Blue Line Extension from Hua Lamphong Station – Bang Kae Station and from Bang Sue Station – Tha Phra Station.

¹⁸ D/E ratio (according to covenants of the Debenture) = Interest bearing debts or debts under discount minus cash and cash equivalent, short-term investment, and interest bearing account receivables of construction contracts from government agencies or state enterprises which issued work acceptance divided by total shareholders' equity. (Source: Form 56-1 for 2016 of CK).

¹⁹ Source: Form 56-1 for 2016 of CK.

²⁰ Source: Form 56-1 for 2016 of CK.

2.2.2. CK may not achieve the details and condition set forth in the Concession Agreement

In the process of M&E equipment procurement, CK has to import or purchase M&E equipment from other suppliers in domestic and oversea. CK is unable to complete all requirements by itself and has to partner with other suppliers who have M&E equipment and systems as required in the Concession Agreement. This may cause CK unable to fulfill all the requirements and determined conditions.

However, in the negotiation period between the Company and MRTA, CK joined the Company in studying of details and requirements for the MRT Blue Line Extension Project. In addition, CK has an experience in communication and negotiation with suppliers for M&E systems as it was a project manager for the MRT Chaloem Ratchamongkhon Project and the MRT Purple Line Project.

2.2.3. Condition of the Contract to limit the maximum aggregate liquidated damages while the Concession Agreement has no limit of the maximum aggregate liquidated damages

Under the Concession Agreement, if the project is delayed from the determined timeframe, the Company is liable to pay a liquidated damage to MRTA amounting to Baht 7 million per day without a maximum limit, while in the case of the Contract with CK, CK is liable to pay liquidated damage to the Company amounting to Baht 7 million per day but the maximum aggregate liquidated damages not exceed 10 percent of the Contract Value. However, from inquiries with 2 leading contractors, 2 medium-sized contractors and information from the SET²¹, CapAd found that the limited amount of aggregate liquidated damages of not exceeding 10 percent of the contract value is a normal business practice between corporate employer and corporate contractor.

In addition, risk from paying the liquidated damage to the MRTA exceeding 10% of the Contract Price is limited because (a) the MRTA focuses on commencing of the MRT Blue Line Extension Project within the specified timeframe, therefore, MRTA will normally send engineering consultant to inspect the work and the progress of the works on a weekly basis in order to ensure that the project can be completed within the timeframe; (b) the Company shall appoint an engineering consultant to inspect the work and the progress of the works in order to ensure that the project can be completed within the timeframe of the Concession Agreement; (c) to reach the maximum aggregate liquidated damage at 10% of the Contract Price with CK (or around Baht 1,964 million) that the delay will be around 281 days (calculated from the liquidated damage at Baht 7 million per day). The delay over 9 months (281 days) from the period of the Contract of around 34 months is less likely to happen due to the MRTA and the Company have plan to closely monitor the progress of CK's works and shall not allow such delay for 9 months until the liquidated damage reaches Baht 1,964 million; and (d) CK has completed the project management, supply, install and testing of the M&E System for the MRT Purple Line Project prior to the scheduled completion date.

3. Comparison Advantages/Benefits and Disadvantages/Risk of Execution of the Transaction between Connected Person and Third Party

3.1. Advantages of Execution of the Transaction with Connected Person

The execution of the Transaction with CK who is the connected person will benefit the Company in the following aspects:

3.1.1 CK is a large construction company in Thailand with experience, expertise and familiarity with equipment, including civil infrastructure of MRT Initial Blue Line Project, and CK was

²¹ Information from the SET are as follows;

- Opinion of the Independent Financial Advisor of Eternal Energy PCL. from page 10
<https://www.set.or.th/dat/news/201101/11002432.pdf>
- Opinion of the Independent Financial Advisor of Green Resources PCL. from page 24
<https://www.set.or.th/set/newsdetails.do?newsId=14510006645261&language=th&country=TH>
- Opinion of the Independent Financial Advisor of TPC Power Holding PCL. from page 26
<https://www.google.com/url?q=https://www.set.or.th/set/pdfnews.do%3FnewsId%3D14285365894490%26sequence%3D2015028380&sa=U&ved=0ahUKEwicwYzfoPXTAhVHqo8KHQWB644ChAWCAUwAA&client=internal-uds-cse&usq=AFQjCNEPzCn8P59DHC8Ms3AH3OS8brb4ZQ>
- Information Memorandum of Ratchaphruek Hospital PCL. from page 10
<https://www.google.com/url?q=https://www.set.or.th/set/pdfnews.do%3FnewsId%3D14878933945431%26sequence%3D2017014300&sa=U&ved=0ahUKEwj7kpbJzPTTAhWnjFQKHVkdA504WhAWCBgwBw&client=internal-uds-cse&usq=AFQjCNHac2-u2NsNSRw8ayn4LvxZNhIEBQ>
- Information Memorandum of Richy Place 2002 PCL. from page 14
<https://www.google.com/url?q=https://www.set.or.th/set/pdfnews.do%3FnewsId%3D14072821857491%26sequence%3D2014047473&sa=U&ved=0ahUKEwiarLuuzfTTAhhUHqVQKHU8fCuMQFggNMAM&client=internal-uds-cse&usq=AFQjCNGR8TFmzpHvmrITZuCBznyWRJQ78Q>

the construction contractor for the tunnels and metro stations in the southern section of the MRT Blue Line Extension Project. Therefore, CK is well-equipped to be the project manager for supply, installation, and testing of the M&E equipment for the MRT Blue Line Extension Project.

CK has experiences in managing contracts with lump sum turnkey characteristics for the Company in the past and CK could complete the work within the determined timeframe and budget with quality. Currently, there are limited number of contractors in Thailand, who have experience in project management, supply and installation of the M&E equipment for MRT projects, which is relatively complicated and required high technology and expertise in design, installation and operation until the MRT projects could efficiently provide services to the public within timeframe.

3.1.2 CK is a large construction company in Thailand with experience, expertise and familiarity with construction of complicated large projects requiring high engineering technology such as the construction of large infrastructure projects i.e. expressway, subway project, and power generation projects.

3.1.3 Negotiations and agreements with CK can be concluded quickly. Given CK as the Company's major shareholder with common directors, the Company will be able to conclude its negotiations, conditions and details quickly and in line with the timeframe specified in the plan.

3.2. Disadvantages/Risks of Execution of the Transaction with Connected Person

3.2.1. Potential conflict of interest transaction

The execution of a transaction with connected person with conflict of interest in the transaction may give rise to doubt about whether such transaction is used as a means to transfer benefits to such connected person or may prevent the parties from negotiating or concluding conditions on an arm's length basis, which would affect the minority shareholders of the Company.

However, the Company's Audit Committee, Board of Directors and management understand and are well aware with the rules and regulations and realize the consequences of executing a connected transaction. They, therefore, has carefully considered such Connected Transaction for the maximum benefits of the Company's minority shareholders.

3.2.2. There are Additional Expenses for the Appointment of the Independent Financial Advisor and the Arrangement of Shareholders' Meeting

This Transaction is considered significant connected transaction which requires the Company to arrange the shareholders' meeting and appoint the Independent Financial Advisor to render an opinion on the Connected Transaction. There are additional expenses for the Company to propose the Connected Transaction for approval, compared to the execution of the transaction with third party.

4. Risk and Consequence if the Shareholders' Meeting Does Not Approve this Connected Transaction

If the Extraordinary General Meeting of Shareholders does not approve this Connected Transaction, the Company will need to source other contractors to replace CK for project management regarding supply, installation, and testing of the M&E systems of the MRT Blue Line Project (Phase 1 of the Concession Agreement) and supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project). Under private negotiation with other contractor, it is expected that the Company will require at least 2 – 3 months for negotiation until reaching an agreement with a contractor since a contractor has to study the design of the project, calculate project price, and negotiate the project price including terms and conditions of the contract with the Company. In case that the Company chooses the open bidding, it may require at least 4 – 5 months completing the bidding process as contractor has to study the design of the project, calculate project price, prepare bidding documents and bid bond. These may cause the Company to delay the completion of Phase 1 of the Concession Agreement and has to pay liquidated damage to the MRTA for Baht 7 million per day.

Apart from the liquidated damage payable to the MRTA, if the project is delayed from the period as specified in the Concession Agreement for more than 180 days, the MRTA may terminate the Concession Agreement. Consequently, the Company may lose the business opportunity for 30-year period. In addition, the expiration of the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) will not be extended to be ended simultaneously with the MRT Blue Line Extension Project.

5. Other Analysis

5.1. The Company's Capability to Settle the Commitment Under the Agreement with CK

The Company has considered two sources of fund for this transaction, which are (1) internal cash flow of the Company and (2) loans from financial institutions and/or debenture issuance of not exceed Baht 16,000 million.

Based on the consolidated financial statement of the Company for the period ended December 31, 2016, cash and cash equivalent was Baht 777.00 million, short-term investments was Baht 5,941.35 million, and net operating cash flow was around Baht 4,000 million per year. In addition, interest bearing debt to equity ratio as at December 31, 2016 was 1.33 times²², which is still lower than the allowed threshold of 2.50 times²³. Hence, the Company has sufficient liquidity and borrowing capability to support this transaction.

6. Conclusion of Opinion of the Independent Financial Advisor on the Rationality of the Transaction

Provided that the Company and MRTA signed the Concession Agreement for the MRT Blue Line Project on March 31, 2017, the Company has the responsibility to supply, install, and test the M&E System of the MRT Blue Line Extension Project (Phase 1 of the Concession Agreement) within 36 months from the date the MRTA gives the Company written Notice to Proceed (NTP). On March 31, 2017, the MRTA issued the written Notice to Proceed to the Company to commence Phase 1 of the Concession Agreement. Therefore, the completion date of the Concession Agreement shall be by March 31, 2020 (unless extended by the MRTA). In order to fulfill the Company's obligation in Phase 1 of the Concession Agreement, the Company has to engage a professional for project management, supply, installation, and testing of the M&E System of the MRT Blue Line Project (Phase 1 of the Concession Agreement) as soon as possible. Thus, the Contractor shall have sufficient time to complete work within the timeframe of the Concession Agreement.

In addition, the Company would like to purchase 7 new trains for the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) for a certain period of time due to the existing 19 trains are not sufficient for passengers during the rush hours resulting in long waiting time, and to accommodate the increasing number of passengers from the MRT Purple Line Project²⁴ and the MRT Blue Line Extension Project in the future. However, most suppliers do not manufacture small lot of rolling stocks. Thus, the Company will combine this order of 7 new trains for the MRT Initial Blue Line Project to the order of 28 new trains for the MRT Blue Line Extension Project, resulting in total purchase of the new rolling stocks of 35 trains.

The enter into the Transaction will benefit the Company as follows: (1) reduce risk of cost overrun and delay of the project, (2) reduce foreign exchange risk, (3) CK has experience in civil infrastructure, design, installation and implementation of MRT Projects, and (4) CK is contractor/service provider with strong financial position which can ensure that CK should be able to successfully achieve its responsibility under the scope of work within timeframe, and (5) negotiations and agreements between the Company and CK can be concluded quickly.

In the meantime, an enter into the Transaction shall have disadvantages and risks as follows: (1) the Company does not have opportunity to compare the proposal from CK with other contractors, (2) CK may not achieve the details and conditions set forth in the Concession Agreement, (3) Condition of the Contract limits the maximum aggregate liquidated damages while the Concession Agreement has no limit of the maximum aggregate liquidated damages, (4) potential conflict of interest; and (5) the Company incurs additional expenses for the appointment of the Independent Financial Advisor and the arrangement of shareholders' meeting.

Subsequent to the consideration of the purpose and necessity of entering into the transaction together with advantages, disadvantages, benefits and risks which may arise, the Independent Financial Advisor is of the opinion that the Company will gain benefits for its business with limited disadvantages and risks. The Company shall be the efficient metro operator without having to concern or incur burdens on the Supply of Mechanical and Electrical System. Thus, **the Connected Transaction is Reasonable.**

²² Source: Form 56-1 for 2016 of the Company.

²³ Latest Terms and Conditions of the Debentures of the Company No. 3/2016, issued date on October 21, 2016.

²⁴ Please see Footnote 4.

Part 3: Opinion of the Independent Financial Advisor on the Appropriateness of the Price and Conditions of the Connected Transaction

The Board of Directors' Meeting No. 3/2017 dated April 11, 2017 has resolved to propose to the Extraordinary General Meeting of Shareholders for consideration and approval of the engagement of CH. Karnchang Public Company Limited ("CK") for project management regarding (a) supply, installation, and testing of the M&E systems of the MRT Blue Line Project (Phase 1 of the Concession Agreement for the MRT Blue Line Project) and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax).

The Independent Financial Advisor has considered the appropriateness of price and conditions of the Connected Transaction based on the information and assumptions provided by the Company and CK, the interviews of executives and related staffs of the Company, Report of Cost Estimation for the Blue Line Extension Railway System (Hua Lamphong to Lak Song Section and Tao Poon to Tha Phra Section) by Infra Asia (Thailand) Company Limited ("Independent Expert" or "InfraAsia")²⁵ in March 2017, the Independent Expert, as well as the information disclosed to the public, the information disclosed on the websites of the SEC (www.sec.or.th) and the SET (www.set.or.th).

However, the opinion of the Independent Financial Advisor is based on the assumption that all of the aforesaid information and documents are complete and accurate, as well as the consideration of current situation and the information, which can be informed in the present time. Changes can significant impact on the business operation and the decision making of the shareholders concerning the appropriateness of the Connected Transaction.

CapAd has considered the appropriateness of the contract price by comparing with the Cost Estimation by the Independent Expert due to the cost estimation for project management, supply, installation, and testing of the M&E systems of the MRT Blue Line Extension Project requires specific know-how and technical expertise.

Subsequent to the study of the related information and document of the Company and CK as well as other related information, the Independent Financial Advisor summarizes the opinion on the appropriateness of the price and condition of the Connected Transaction as follows:

1. Appropriateness of the Price

1.1 Draft M&E Equipment Procurement, Construction and Management Contract with CK

The engagement of CK for project management regarding (a) supply, installation, and testing of the M&E systems²⁶ of the MRT Blue Line Project (Phase 1 of the Concession Agreement for the MRT Blue Line Project²⁷) and (b) supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) will have a total value of not exceeding Baht 19,643 million (excluding value-added tax).

CK fully understands the obligations and liabilities of BEM on the Phase 1 (M&E Equipment Work) of the Concession Agreement, and agrees to comply with the requirement of Phase 1 of the Concession Agreement. In addition, the Concession Agreement and the MRTA's Requirement are deemed as part of this Contract. Satisfactory completion of CK's works is upon the receipt of the Commissioning Certificate from the MRTA.

Scopes of work based on the draft M&E Equipment Procurement, Construction and Management Contract are as follows:

Work No.	Description
1	Rolling Stock <ul style="list-style-type: none"> - Engineering Design and Documentation - Rolling stock for 35 train sets^{1/} (3 cars per train set) - Training Equipment - Factory Testing, Shipping and Delivery - Integrated Testing and Commission of the System - O&M Manuals - Overall System Integration and System Assurance
2	Signaling System <ul style="list-style-type: none"> - Engineering Design and Documentation

²⁵ Please see Footnote 1.

²⁶ M&E Systems based on the Concession Agreement are all mechanical equipment and system for the rail system such as rolling stock, signaling system, communication system, power supply system, automatic fare collection system, platform screen doors and depot and workshop equipment including intellectual property as described in the Concession Agreement.

²⁷ Please see Footnote 3.

Work No.	Description
	<ul style="list-style-type: none"> - Central Traffic Control (CTC) System - Controllers Work Stations and all Furniture - Playback and Training Room (PTR) System - Local Control Workstation - Station Equipment Room (with interlocking and Technicians Mtce Terminal Workstation - Station Equipment Room (SER) (without interlocking) - SER Power Supplies Cubicle - Depot Equipment Room (with Interlocking) and Technicians Mtce Terminal Workstation - Train Detection System - Automatic Train Protection (ATP) and Automatic Train Operation (ATO) System - Signals - Point Machines and Fitting/Manual Handles Complete - Signaling Cabling and Accessories - Training Equipment - Factory Testing, Shipping and Delivery - Installation Acceptance Testing - Integrated Testing and Commission of the System - O&M Manuals - Overall System Integration and System Assurance - Equipment for Test Track Area - Cable Trough for Signaling Cables - Install Raised Floor and Station Modification in Signaling Room - Wayside Cable Containment in Phet Kasem Depot - Main Line Cable Trough Modification - Interface with Track Works
3	Communication Systems <ul style="list-style-type: none"> - Engineering Design and Documentation - Back Bone Transmission Network (BTN) - Master Clock Systems - TETRA Digital Radio System - Train Radio and Accessories - Hand Held Radio - Mobile Car Radio Set Complete and Accessories - Operations Control Center (OCC) Public Address (PA) System and Accessories - Station PA System Complete - Train Passenger Information Display (PID) - Operations Control Center (OCC) Passenger Information Display System (PIDS) Complete and Accessories - Station PIDS System and Accessories - Telephone System for Station, OCC and Depot and Administration - Closed Circuit Television (CCTV) - Communications System Power Supplies - Onboard Train Surveillance System for Train Cars - Controlled Access Security System (CASS) for Stations and OCC Depot Building and Walkthrough Metal Detector Unit for Station Entrances - Board Band Radio Systems (BBS) - Information Technology System - Computerised Maintenance Management System - Operations Control Center (OCC) Modification and Facilities - Training Equipment - Factory Testing, Shipping and Delivery - Installation Acceptance Testing - Integrated Testing and Commission of the System - O&M Manuals - Overall System Integration and System Assurance - Minor works, such as intercom for cash handling room, PA announcement in the ticket office, walk-through metal detector system (WTMD), door locksets and CASS equipment installation, cable trough for communication cable, and change CCTV cable in all lifts.
4	Power Supply System <ul style="list-style-type: none"> - Engineering Design and Documentation - Power Cabling and Accessories for the Main Line and Depot - All Stations and Depot Uninterruptible Power Supply (UPS) System and Standby Generator System - Bulk Substation (BSS) 1 and 2, 69/24 kV - 750 V Traction Substation System (TSS) - Service Substation System - Supervisory Control and Data Acquisition (SCADA) System - All MEA works including and all connection fees - All Earthing and Bonding Works - Training Equipment - Factory Testing, Shipping and Delivery - Installation Acceptance Testing

Work No.	Description
	<ul style="list-style-type: none"> - Integrated Testing and Commission of the System - O&M Manuals - Minor works, such as viaduct lightning protection system, diesel fuel storage tank for power generator, building construction, modification of all Earthing and Bonding Works, station modification in power supply room, wayside cable containment in Phet Kasem Depot, BMS interface with SCADA, Interface with track works
5	Automatic Fare Collection System <ul style="list-style-type: none"> - Engineering Design and Documentation - Token Issuing Machine (TIM) - Automatic Gate - Station Computer System (SCS) - Ticket Office POST - Central Computer System (CCS) - Automatic Remaining Value Terminal (RVT) - Portable Card Reader (PCR) - Cash Counting and Handling Equipment - Park and Ride Facilities - Training Equipment - Factory Testing, Shipping and Delivery - Installation Acceptance Testing - Integrated Testing and Commission of the System - O&M Manuals - Minor works, such as AFC park and ride booth, token issuing machines (TIM) wall opening, modify ballastrate
6	Depot Workshop Equipment <ul style="list-style-type: none"> - Engineering Design and Documentation - Overhead Cranes - Train wash Plant - Brake and Compressor Test Equipment - Upgrade - Traction Motor Test Facility – Upgrade - Electronic Workshop Upgrade - Vehicle Door Test Stand - Upgrade - Train Air Conditioning Module Repair – Upgrade - Bogie Preload Stand - Upgrade - Hi-rail Maintenance Vehicles (Road/Rail Diesel Vehicles) - Flat Wagon - Rail Mounted Rail grinding and Reprofileing Vehicle - Infrastructure Maintenance Vehicle - Underfloor Wheel Lathe - Upgrade - Bogie and Wheelset Workshop Equipment - Upgrade - Track Work Equipment and Hand Tools - Battery Charger – for Rolling Stock - Training Equipment - Factory Testing, Shipping and Delivery - Installation Acceptance Testing - Integrated Testing and Commission of the System - O&M Manuals - Minor works such as diesel fuel storage tank for maintenance vehicle, provision of fixed ladder and guard rails at under floor wheel lathe pit and wheel diagnostic pit, water tank for washing plant, forklift trucks, truck spider lifting vehicle, compressed air system, pallet storage shelf for main storage, pallet storage shelf for dangerous goods and oil storage, two-tier shelf, tool storage, repair equipment, oil & grease disposal, lubricant dispensers, waste disposal, main storage extension and equipment in the existing Rama IX workshop, stabling roof extension in the Rama IX depot and other Rama IX depot modification, additional fence at the transition area and other Phet Kasem Depot modification.
7	Platform Screen Doors <ul style="list-style-type: none"> - Engineering Design and Documentation - Station Platform Screen Doors - Training Equipment - Factory Testing, Shipping and Delivery - Installation Acceptance Testing - Integrated Testing and Commission of the System - O&M Manuals
8	General Requirements <ul style="list-style-type: none"> - MRTA Project Facility - Project Management and Overhead - Utilities Cost - Insurance and Bond - Environment Protection, Mitigation and Monitoring - Training and Technology Transfer of all M&E System - Graphic and Signage in the Extension Area and Update in the Existing Area

Source: The draft M&E Equipment Procurement, Construction and Management Contract

Remark:

- 1/ Consisted of 28 sets of rolling stock for the MRT Blue Line Extension Project, based on the requirement in the Concession Agreement, which was approved by the Meeting of the Board of Director of the Company No. 2/2017 on March 29, 2017, and 7 new sets of rolling stock for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project). (Please see details in Figure 1 on Page 10 of this report for better understanding to this Transaction)
- 2/ This draft contract with CK shall include Supervisory Control and Data Acquisition (SCADA) System in Power Supply System while InfraAsia has presented the SCADA system separately.

The Independent Financial Advisor has examined the scope of work on this Draft Contract and the Cost Estimation Report prepared by Infra Asia, and found that most of the equipment and works are similar and within the scope of the Concession Agreement.

Explanation of the scope of works

- 1) To carry out the supply, design and installation of the M&E Systems and other related supporting systems, comprising the following sub-systems:

1.1) Rolling Stock

This consists of procurement of 35 sets of rolling stocks with three bogies each, and allocation of dedicated areas for persons with disabilities in every rolling stock, together with installation of the passenger information systems for convenience and public relations.

1.2) Signaling System

The signaling system for this Project is a Distance to Go (Fixed Block), which is similar to those of the MRT Chaloem Ratchamongkhon Line Project. The signaling system will extend from the existing area. The works will include the modification of control equipment within the Operation Control Center (OCC). This will allow the controlling of the whole system from one operation control center with the function to control and command the rolling stocks for service under the specified conditions, with the tracking system to identify the current position and status of each train in order to enable the staff in the operation control center to promptly and efficiently analyze and solve any problems or defects which may occur in the system.

1.3) Communication System & SCADA consisting of various sub-systems as follows:

- **Backbone Transmission Network: BTN**
This is an intermediate system for communications and transmission of data to other systems through the distribution network to each station, buildings related to the entire operation of the Railway Systems and the main line.
- **Master Clock System**
This is a system for checking time with the GPS satellite system and transmitting signal to other time-based systems for time synchronization with every system to ensure consistency for the purpose of comparison and sequencing of events in case of any faults in the Railway Systems.
- **TETRA Radio Communication System**
This is a digital radio system for two way communications operating in the 380-400 MHz. band, which covers the station area, main line and the depot, comprising Hand Portable Radio and Train Borne Radio, etc., and the communications can be controlled by the control system installed within the operation control center.
- **Passenger Information Systems: PIS**
 - a) **Public Address System (PA)** is a voice announcement system installed within stations and rolling stocks to provide general information and in case of any unusual events to alert passengers to avoid any possible consequences, whereby such announcement can be controlled from the operation control center and within the control room of each station.
 - b) **Passenger Information Display System (PIDS)** is an audio and visual message display system installed within stations and rolling stocks to provide general and service-related information, such as, waiting time for next train, next station, including advertisements, public relations and promotional activities, etc.
- **Telephone System**
This is a VoIP system comprising two sub-systems, namely, PABX system for dialing specified numbers; and Direct Line system for contacting the control room of each station or the operation control center by pressing only one button for convenient and prompt contact in case of urgency or emergency, whereby the communications can be controlled by the control system within the operation control center. The conversations through all

telephone lines with the operation control center will be recorded for inspection and fact-finding in the future.

- **Closed Circuit Television Systems: CCTV**
This is an IP camera CCTV system for 720 pixels video recording at 25 frames per second, installed within stations and rolling stocks, to store and record video to the database system via the IP network, which allows for real-time viewing, receiving files and transmitting data via PoE, using cameras with precise viewing direction as well as rotation and zooming control by the control system installed within the operation control center and the control room of each station, including the control room within trains for surveillance, control and management of events.
- **Controlled Access Security System: CASS**
This is a system to control the opening of doors for access to various controlled areas within the Railway Systems, comprising equipment for checking the authorization using such card similar to the AFC Smart Card and door magnetic locks, for the purpose of zoning and accessibility of staff of various levels.
- **Information Technology System: ITs**
This is a network system for information technology systems required for the operation, whereby such system will be completely separated from the systems for the Operation Service for the purpose of safety, such as, document search system, internal e-mail system, and other support systems, etc.
- **Supervisory Control and Data Acquisition System: SCADA**
This is a system to inspect and control the status of machinery operation, and direct equipment remotely installed from the control rooms to perform the required functions so as to shorten time for carrying out and solving problems within the systems. Such systems, which can be controlled, by the SCADA system include the Power Supply System, escalators and lifts, etc. Moreover, the SCADA system plays a key role to transmit signals of any unusual occurrence to the Computerized Maintenance Management System (CMMS) for further proceeding to the repair or maintenance procedures.

1.4) Power Supply System

This consists of 69kV transformers, installed within the main power station, to receive the high-voltage power from the Metropolitan Electricity Authority and then transform the power to 24kV prior to distribution of power to each station and depot via the transmission line system to retransform the power to be suitable for each usage, such as, transformation of power to 750 VDC for the traction supply system and to 416/230 V 3-phase / 50 Hz for general supply within stations and depot via transformers and equipment installed within stations and depot.

1.5) Automatic Fare Collection System

This is a system to collect fare, keep the statistical information on passenger volume, cash amount in each station and the number of Smart Cards using the service, the Clearing House system and the vehicle access control system at Park & Ride facilities, mainly comprising Smart Card, Token, Token Vending Machine, Ticket Issuing Machine, Automatic Gate, Computer System within each station, and the Central Control System.

1.6) Platform Screen Doors

This is a system to prevent any danger which may arise to passengers, e.g., from falling onto the track while waiting for the train during the peak hours. The Platform Screen Door System for the elevated stations will be half height barriers with a height of approximately 1.5 meters from the platform floor to the upper edge of the door and for the underground stations will be full height barriers from the platform floor to the ceiling, using laminated safety glass for passenger protection whereby glass pieces, when broken, will not be scattered or fallen off the frame.

1.7) Depot Workshop Equipment

This comprises tools and equipment, including vehicles necessary for repair and maintenance of rolling stocks or re-railing and rescue of the systems in case of emergency, and equipment for storage of spare parts, such as:

- Train Washing Plant for cleaning of the rolling stocks according to schedule;
- Infrastructure Maintenance Vehicle for hauling train to the depot;
- Modification and expansion of the rail parking facilities within the Hui Kwang Depot;

- Modification and expansion of the storage areas for spare-parts within the Hui Kwang Depot, and etc.
- 2) Operation & Maintenance Manual: To prepare Manual & Work Instruction for utilization of tools and equipment as supplied, installed and tested under the Concession Agreement, for delivery to the MRTA in accordance with the specified time in the Concession Agreement, as well as reviewing manuals and operation procedures for equipment as supplied by other contracts related to the MRT Blue Line Extension Project.
 - 3) Trial Run: To carry out the Trial Running and measure the performance efficiency of equipment in each system, comparing with the design for correction or improvement to meet the requirements.
 - 4) To inspect and test the systems as supplied under the Concession Agreement so as to ensure that the systems are safe for service.
 - 5) The Contractor shall carry out training of key instructors and support and assist the Concessionaire to organize and manage the training for the operational staff to enable the Concessionaire to satisfactorily perform the operational activities.
 - 6) The Contractor shall coordinate with the MRTA, the consultants and any related agencies/entities to ensure it is completed in order to maintain the Concessionaire's schedule.
 - 7) To participate in the inspection and acceptance of equipment as supplied and installed pursuant to other related contracts of the MRTA.

Details of the Contract Price with CK totaling of Baht 19,643 million (excluding value-added tax) are as follows:

Group	Description	Amount (Baht million)	Average Price Per Unit (Baht million)
1	(1) 35 sets of Rolling Stock ^{1/} and (2) Signaling System ^{2/}	10,074.04	Baht 288 million per train
2	(3) Communication Systems and (4) Power Supply System ^{3/}	7,027.46	Baht 266 million per kilometer ^{6/}
3	(5) Automatic Fare Collection System and (7) Platform Screen Doors ^{4/}	1,931.32	Baht 102 million per station ^{7/}
4	(6) Depot Work Equipment and Other Works ^{5/}	609.51	-
	Total contract price (excluding VAT)	19,642.34	Baht 744 million per kilometer^{6/}

Remark:

- 1/ Consisted of 28 sets of rolling stock for the MRT Blue Line Extension Project, based on the requirement in the Concession Agreement, which was approved by the Meeting of the Board of Director of the Company No. 2/2017 on March 29, 2017, and 7 new sets of rolling stock for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project). (Please see details in Figure 1 on Page 10 of this report for better understanding to this Transaction)
 - 2/ Consisted of scope of work No. 1 – 2 from a table on Page 18 - 20 of this report and the allocation of General Requirement* to work No. 1 - 2 based on pro-rata basis.
 - 3/ Consisted of scope of work No. 3 – 4 from a table on Page 18 - 20 of this report and the allocation of General Requirement* to work No. 3 - 4 based on pro-rata basis.
 - 4/ Consisted of scope of work No. 5 and No. 7 from a table on Page 18 - 20 of this report and the allocation of General Requirement* to work No. 5 and No. 7 based on pro-rata basis.
 - 5/ Consisted of scope of work No. 6 and other works (consisted of MRTA Project Facility and Graphic and Signage in the Extension area and Update in the Existing area) from a table on Page 18 - 20 of this report and the allocation of General Requirement* to work No. 6 and other works based on pro-rata basis.
 - 6/ Based on total length of 26.4 kilometers.
 - 7/ Based on total new stations of 19 stations.
- * Excluding MRTA Project Facility and Graphic and Signage in the Extension area and Update in the Existing area.

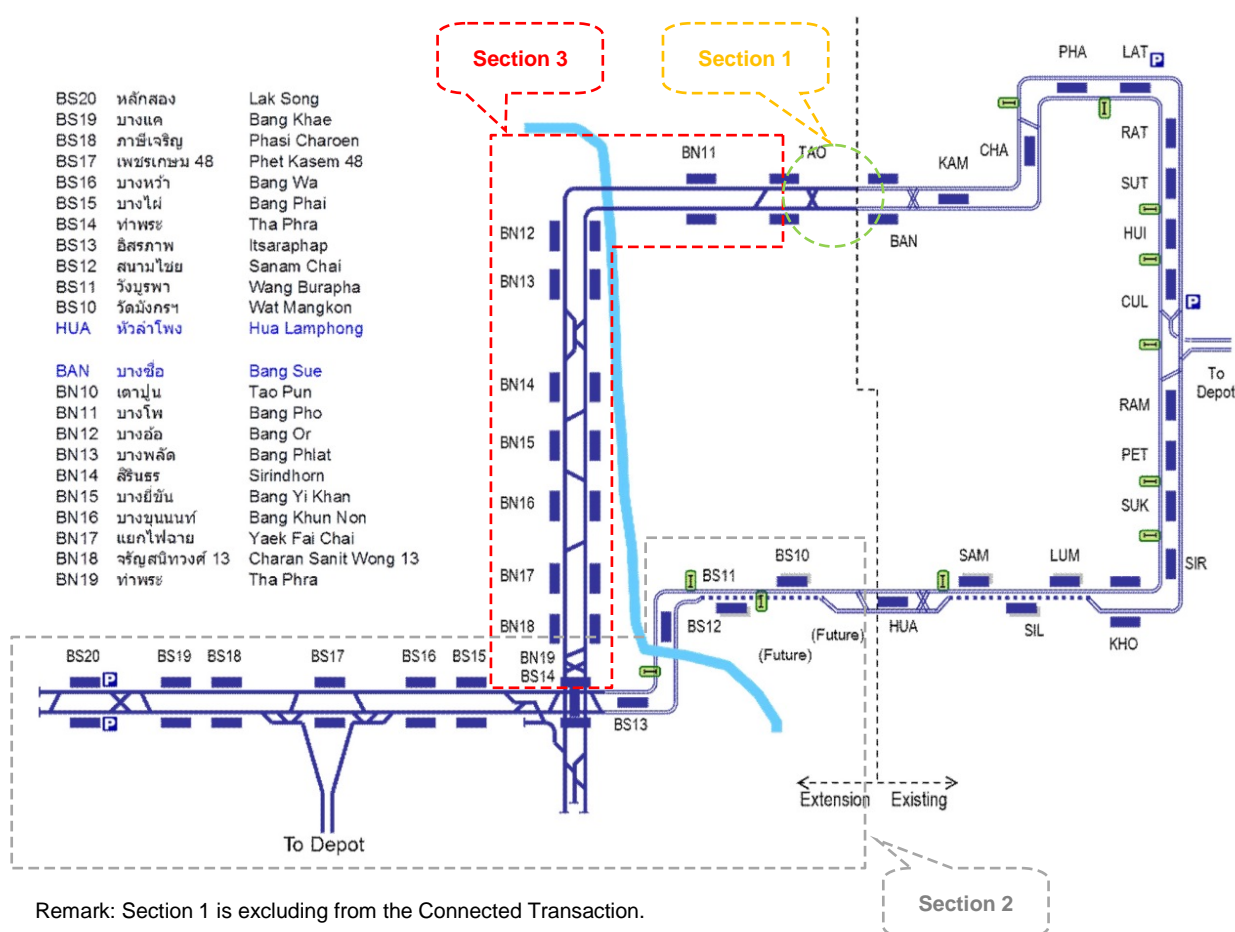
Total contract price with CK consists of (1) a project cost for the MRT Blue Line Extension Project amounting to Baht 18,146.74 million (excluding VAT) and (2) a capital expenditure for the MRT Initial Blue Line Project amounting to Baht 1,495.60 million (excluding VAT).

The Cost Estimation under the scope of works under the Concession Agreement was based on the technical data, which requires specific know-how and expertise. The Independent Financial Advisor has considered comparing the consideration with the Cost Estimation of Infra Asia (Thailand) Company Limited, the Independent Expert who has extensive experience in Cost Estimation for complex rail projects and well accepted by numerous government agencies and corporates of both in Thailand and overseas.

1.2 Cost Estimate for project management regarding (a) supply, installation, and testing of the M&E systems of the MRT Blue Line Project and supply of 7 new rolling stocks for the MRT Initial Blue Line Project

Infra Asia (Thailand) Co., Ltd., the Independent Expert, has been appointed by the Company to evaluate the cost estimate for the implementation of Railway System (M&E) for the MRT Blue Line Extension Project from Hua Lamphong Station to Lak Song Station and Tao Poon Station to Tha Phra Station inclusive (exclusive of the Bang Sue to Tao Poon section), covering approximately 26 km long (The overall Blue Line extension is approximately 27 km long). The MRT Blue Line Extension railway systems will interface with and require modification of the MRT Initial Blue Line Project²⁸ and those of the recently opened the MRT Purple Line Project at Tao Poon station. In addition, InfraAsia has also evaluated the cost estimate for supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project).

Figure 2: A diagram of the extended Blue Line including the Initial Blue Line and Extension sections



The MRT Blue Line Extension Project will link the 2 Initial Blue Line terminus stations at Bang Sue Station and Hua Lamphong Station. The MRT Blue Line Extension consists of 3 sections (Please see Figure 2 above) as follows:

- (1) **Section 1:** Bang Sue Station to Tao Poon Station with a total length of approximately 1.2 km (Investment in this section was approved by the EGM of the Company on October 14, 2015 and was not included in this Transaction.)
- (2) **Section 2:** Hua Lamphong Station to Lak Song Station with a total length of approximately 14.4 km and a total of 11 new stations plus the existing Hua Lamphong Blue Line station. It consists of approximately 5 km (Hua Lamphong - Tha Phra) of underground alignment with 4 underground stations and 9 km (Tha Phra – Bang Khae) of elevated alignment with 7 elevated stations. A Depot facility is located adjacent to Phet Kasem 48 station (for light maintenance). Tha Phra station will act as an interchange between Section 2 and Section 3 of the MRT Blue Line Extension.

²⁸ Please see Footnote 3.

- (3) Section 3: Tao Poon Station to Tha Phra Station with a total a length of approximately 12 km, and a total of 8 new stations (excluding Tha Phra station which is an interchange between Section 2 and Section 3). It a further extension from the existing Tao Poon station. This section is an elevated structure line and double track railway on stanchions.

Cost Estimation Methodology

The Cost Estimate for the Blue Line Extension is based upon technical documentation provided by BEM in respect of the required new equipment, modifications and upgrades together with cost estimation and known Purple Line project costs supplemented by InfraAsia's database of associated system and equipment costs obtained from similar previous projects and known supplier costs. This information is entered into a spreadsheet estimation Rail System Cost Model developed by InfraAsia to produce overall system equipment supply, engineering, project support and logistic costs. The Cost Model has been used & accepted by numerous government bodies, railway operators and main contractors in preparing project Cost Estimate and Budgets.

InfraAsia has divided main cost centers in to 17 groups as follows;

- (1) Rolling Stock for 35 train sets
- (2) Signaling System
- (3) Communication System
- (4) Power Supply System
- (5) Supervisory Control and Data Acquisition (SCADA)
- (6) Automatic Fare Collection System
- (7) Platform Screen Doors
- (8) Depot Workshop Equipment
- (9) Minor Works (including civil works for depot)
- (10) Operations Training
- (11) Test and Trial Run Costs
- (12) System Integration
- (13) Customs and Import Duties
- (14) Project Management
- (15) Project Overhead
- (16) Insurance & Bonds
- (17) Mark up & Contingency

Certain works on this project will involve modification and/or replacement of some equipment of the MRT Exiting Blue Line Project in order to provide a seamless integration and interface with the MRT Exiting Blue Line Project and the MRT Purple Line Project. The link will be at Bang Sue station and Tao Poon station. Besides, the depot at Rama 9 will be modified in order to service both the Initial Blue Line Project and the Blue Line Extension Project.

Cost Estimation by InfraAsia

InfraAsia considered the M&E equipment and system based on the requirement of the Concession Agreement and multiplied amount of each equipment to the estimated price of such equipment based on the database of InfraAsia and known suppliers cost.

Summary of scope of works for the Section 2 (Hua Lamphong station – Lak Song station) and the Section 3 (Tao Poon station – Tha Phra station) of the MRT Blue Line Extension and key assumptions for the cost estimations (Section 1 was excluded from this cost estimation.) are as follows;

No.	Description
	<u>General assumptions</u> - VAT is not applied to the estimation - All costs are based on a cost reference dated March 31, 2017 - Certain items of equipment and engineering service are from offshore sources, the exchange rate for the estimation was assumed at USD/Baht 35 and EUR/Baht 37, which was the exchange rate at the time of estimation (Report date was on March 31, 2017) - Assumed the MRT Blue Line Extension Project will be granted special BOI privileges that will result in zero tariffs for customs and import duties (Please see details in Part 1 Clause 1.1 of this report)
	No. of new station : 19 station Comprising of 11 stations for Section 2 and 8 stations for Section 3 (Tha Phra joint-station is not included in Section 3.)
	Length of route : 26.4 km.
1	<u>Rolling Stock</u> ^{1/} No. of train set : 35 sets (3 cars per set) InfraAsia considered reference prices of rolling from major brands such as J-TREC and Hitachi (from Japan), Siemen (from Germany), Bombardier (from Canada), Hyundai Rotem (from South Korea) and CRRS (from China)

No.	Description
2	<p><u>Signaling System</u>¹⁷</p> <p>Extension and expansion of the existing signaling system encompassing the following;</p> <ul style="list-style-type: none"> - Upgrade and modification of the OCC Central Signaling Equipment and software to cover the new sections including new CCR Signaling work-stations - Wayside equipment for Section 2 & 3 - Track occupation detection equipment for Section 2 & 3 - 3 new interlocking with interfacing to OCC - Upgrade and modification of the existing on-board train signaling equipment and software - Implementation of on-board train signaling equipment on the new rolling stock - Rearrange train stopping location at the Rama IX stabling area <p>InfraAsia considered reference prices of equipment from Germany, USA, France and Japan.</p>
3	<p><u>Communication System</u>¹⁷</p> <p>Extension and upgrade of the Communications System including replacement of Blue Line system / equipment known to be nearing end of life / obsolescence</p> <ul style="list-style-type: none"> - Extension and upgrade of the Back Bone Transmission Network (BTN, where main equipment are such as Synchronous Data Hierarchy (SDH) Synchronous Transport Module (STM) 16 Node for 56 items, Ethernet Switch Core for 56 items, and 24 Port Switch with Optic Fiber Uplink for 51 items, and etc. - Extension of the new BL TETRA radio implemented, where main equipment are such as Radio Base Stations (2 Transmit/Receive, 8 Slots) for 22 items, Train Radio 80 sets, Hand Held Radio 398 items, Leaky Feeder for 38,900 m., and etc. - Implementation of new CCTV system for the BLE including the existing CCR and interfacing with the existing BL CCTV system and central control facilities at CCR to create a single integrated system. Main equipment are such as Fixed Camera (included Housing) for 1,246 items, Pan Tilt Zoom Camera for 152 items, Network Video Recorder and Network Video Management System for 39 sets, Ethernet 6 Port Switch (Power over Ethernet) for 304 sets, and etc. - Implementation of on-board CCTV for new trains only including interfacing to the BBRS system that will provide coverage for the entire BL. - Implementation of new Public Address (PA) system for the BLE including the existing CCR and interfacing with the existing BL PA system and central control facilities at CCR to create a single integrated system. Main equipment is such as Station PA Node Equipment for 20 items, Indoor Speaker Cable for 106,000 m., outdoor Speaker Cable for 28,000 m., PA Control Panel (Platform) for 40 sets, and etc. - Expansion of the BL Passenger Information Display (PID) system to cover the BLE as an integrated extended BL PID system. Main equipment is such as Station Liquid Crystal Display (LCD) for 160 items, Liquid Crystal Display (LCD) at Entrance for 76 items, Software Control System for Station PID for 28 sets, Fiber Optic Switch 8 Port for 38 items, and etc. - Expansion of the BL Master Clock System (MCS) system to cover the BLE as an integrated extended BL MCS system. Main equipment is such as Station/Depot Master Clock for 25 items, Central Master Clock for 2 items, Digital Clock – Equipment Room for 106 items, and etc. - Implementation of new Telephone system for the BLE including the existing CCR and interfacing with the existing BL Telephone system and central control facilities at CCR to create a single integrated system. Main equipment is such as OCC Central PABX for 2 sets, OCC Operation Software for 2 sets, Operation Workstation for 10 sets, Station Voice Switch for 20 items, Telephone IP for 36 items per elevated station and 40 items per underground station, and etc. - Expansion of the BL IT network to cover the BLE as an integrated extended BL IT system - Implementation of new Broadband Radio System (BBRS) system to cover both the existing BL and BLE, there is currently no BBRS on the existing BL, to provide wireless communication for the train on-board systems, including CCTV for remote monitoring from CCR. (At the present, the MRT Initial Blue Line Project has no BBRS system.). Main equipment is such as Access Point (Rail & Depot) for 380 items, Track Side Fiber Optic for 106,000 m., wayside cable for 106,000 m, Optical to Electrical Converter (Transmit/Receive Pair) for 380 items, and etc. - A Trainborne Communication System (TCS) will be provided for the new trains providing on-board voice communications, PID and CCTV functions. Main equipment is such as Dynamic Display (Train Destination Display Unit) for 840 sets, Car Communication Unit for 105 sets, Vehicle Communication Controller 70 sets, CCTV DVR for 105 items, and etc. - A Controlled Access Security System will be provided for the BLE section. Main equipment is such as Card Reader for 512 items, Door Local Equipment Type A (with Alarm Sensor) for 350 sets, Fiber Optic (Transmit/Receive Pair) for 135 sets, Local Controller for 135 sets, and etc. - Walk Through Metal Detectors will be provided for the BLE stations to provide passenger security similar to the existing BL. <p>InfraAsia considered reference prices of equipment from Singapore, France, Italy, China, South Korea and USA.</p>
4	<p><u>Power Supply System</u>¹⁷</p> <p>Extension and expansion of the Power Supply and Traction Power system and station auxiliary power equipment</p> <ul style="list-style-type: none"> - 2 new BSS (67 / 24 kV) and connection to MEA at the new Depot and Tha Phra station - Implementation of mainline Station Service Supply (SSS) 24kV distribution system Station Service Supply (SSS) consisting of 24/0.4kV transformers (2 SSS per location and Intermediate Ventilation Shaft), track side cable ring, SSS switch gear. Main equipment is such as 24/0.4kV transformers for 44 sets, Remote Terminal Unit (RTU) 24kV for 22 set and Switch Gear 1,250A 25kA for 44 sets, and etc. - Implementation of Traction Power Supply consisting of dual 24kV trackside cable distribution, to 1 Depot TSS, 10 Station TSS of which 2 will be for future expansion requiring only 24kV switch gear and 8 will be fully fitted with 2 rectifier transformers, 2 rectifiers, 750V DC switchgear, ancillary equipment and trackside feed cables. Main equipment is such as Track Feeder Circuit Breaker 750V 4A for 66 sets, Transformer 2,550 kVA Dry Type for 22 sets, Rectifier Unit 2,250 kVA 750 V DC 12 Pulse for 22 sets, and etc. - UPS and 110V DC Battery and Charger for the 19 BLE stations and the Depot Area - Diesel generator at BSS area

No.	Description
	<ul style="list-style-type: none"> - Track Isolation Switch and Track Section Switch <p>InfraAsia considered reference prices of equipment from Germany, England and Japan.</p>
5	<p><u>Supervisory Control and Data Acquisition (SCADA)</u>^{17/31}</p> <p>The existing BL SCADA system will be extended and expanded to incorporate the SCADA equipment provided to monitor and control the BLE sections 2 and 3. This will require the following works.</p> <ul style="list-style-type: none"> - Provision of RTU at all new BLE stations, intervention shafts, Depot and Bulk Substation (BSS). Main equipment is such as Station RTU Base Unit with Input/Output Modules (Above Ground Telecommunication Equipment Room Distributed RTU) for 19 sets, Station RTU Base Unit with Input/Output Modules (for Traction Power System) for 16 sets, Station Server for 19 sets, and etc. - Interfacing to the various items of equipment and systems including BLE M&E under the same contract and those provided under the Civil Contracts for the stations and Depot. - New SCADA servers and workstations to replace the existing ones at OCC/CCR - Interfacing to existing BL RTU to provide a single integrated extended BL SCADA system.
6	<p><u>Automatic Fare Collection System (AFC)</u>¹⁷</p> <p>Implementation of AFC system for the new BLE stations and upgrade and modification of the existing Blue line AFC system to include the BLE sections 2 and 3 as an extension of the initial Blue Line to provide a single integrated extended Blue Line AFC system. The works in summary shall include the following</p> <ul style="list-style-type: none"> - Enhancement, replace and capacity upgrade of the existing BL Central Computer System (CCS) to include the BLE - New AFC equipment at the new BLE stations, including: Automatic Gates, Ticket Issuing Machines, Point of Sale equipment, Station Computer, Central Computer (if required) and Cash Handling Equipment. Main equipment is such as Ticket Vending Machine for 156 sets, Automatic Gate Normal Size for 240 sets, Automatic Gate Wide for Disable for 38 sets, Ticket Office Machine for 76 sets, and etc. - Interface and integration of the BL P&R buildings - Modification of interface to the MRTA Level 4 and Common Clearing House (CCH) interface to include new BLE stations as part of the BL system and provide interoperability with the Purple Line - Provision of additional Fare Media for the additional BLE ridership <p>InfraAsia considered reference prices of equipment from Singapore, France, Spain and India.</p>
7	<p><u>Platform Screen Doors</u>¹⁷</p> <p>Installation of Platform Screen Doors (PSD) for all BLE stations consisting of:</p> <ul style="list-style-type: none"> - Half height PSD at fifteen BLE elevated stations - Full height PSD at four BLE underground stations <p>InfraAsia considered reference prices of equipment from Singapore, Germany and France.</p>
8	<p><u>Depot Workshop Equipment</u>¹⁷</p> <p>The new BLE Depot will be used as a light maintenance, cleaning and train stabling facility. BEM have analyzed the requirements, existing facilities and capacity and concluded that the due to the similarity of the existing and new rolling stock the existing Rama 9 Depot can provide the maintenance functions for both fleets. Therefore the new Depot facility will only require certain items of depot workshop equipment (DWE) to achieve the intended maintenance strategy and not a complete fit out.</p> <p>The DWE items to be provided under the BLE contract will consist of the main items summarized as follows.</p> <ul style="list-style-type: none"> - Overhead Crane - Train Wash Plant - Flat Wagon - Unimog - Infrastructure Maintenance Vehicle - Track work Equipment and Hand Tools - Repairing Machine - Storage Area - Pallet Storage System - Shelving System - Workshop Vehicle
9	<p><u>Minor Works</u>¹⁷</p> <ul style="list-style-type: none"> - Modification of the Initial Blue Line Graphics and Signage at stations and on the trains for the BLE introduction - Construction of extension to existing stabling sidings structure at Rama 9 Depot facility for additional BLE train fleet - Construction and fit out of new Depot stores at existing Rama 9 Depot for BLE spares - Construction of basic administration building at new BLE Depot - Construction GIS Building - Provide cable trough along the line and in the depot for Signaling and Communication cable - Modification building structure and building services systems to accommodate installation of the M&E equipment
10	Operations Training : 0.1% of the equipment systems
11	Test and Trial Run Costs : 0.5% of the equipment systems
12	System Integration : 5% of the equipment systems ²⁷
13	<p>Customs and Import Duties : 0 % the equipment systems</p> <p>Assumed the MRT Blue Line Extension Project will be granted special BOI privileges that will result in zero tariffs for customs and import duties</p>
14	Project Management : 12% of the equipment systems ²⁷
15	Project Overhead : 8% of the equipment systems ²⁷
16	Insurance & Bonds : 2% of the equipment systems ²⁷
17	Mark up & Contingency : 8% of the equipment systems ²⁷

Remark: InfraAsia considered number of M&E equipment and systems for each major works based on design of the project and the requirement of the project based on the Concession Agreement, and multiplied with the reference price of the

equipment based on its database and current market price from suppliers. All information was entered into its cost estimation model. There were 28 main worksheets (excluding sub-worksheets)

- 1/ In addition to equipment for 9 major works, InfraAsia has estimated other associated project engineering costs which are considered as relevant costs such as Engineering Documentation, Manufacture / Fabrication of System, Shipping & Delivery, Installation and Acceptance Testing, Integrated Testing and Commissioning, Training, Spare Parts, Special Tools, and Test Equipment. Then, these associated project engineering costs were included in each 9 major works.
- 2/ Percentage of the equipment systems is average value of other similar major railway projects from InfraAsia database.
- 3/ This draft contract with CK shall include Supervisory Control and Data Acquisition (SCADA) System in Power Supply System while InfraAsia has presented the SCADA system in separated item.

Cost estimation for project management, supply, installation, and testing of the M&E systems of the MRT Blue Line Project by InfraAsia is summarized as follows;

Group	Description	Amount (Baht million)	Price per Unit (Baht million)
1	(1) 35 sets of Rolling Stock ^{1/} and (2) Signaling System ^{2/}	10,964.67	Baht 313 million per train
2	(3) Communication Systems and (4) – (5) Communication Systems and Power Supply System ^{3/}	6,891.61	Baht 261 million per kilometer ^{6/}
3	(6) Automatic Fare Collection System and (7) Platform Screen Doors ^{4/}	2,473.44	Baht 130 million per station ^{7/}
4	(8) Depot Work Equipment and (9) Minor Works ^{5/}	775.78	-
	Other Costs and Expenses (10) Operation Training (11) Test & Trial Run Costs (12) System Integration (13) Customs and Import Duties (14) Project Management (15) Project Overhead (16) Insurance & Bonds (17) Mark up & Contingency	These cost centers was pro-rated to Group 1-4	These cost centers was pro-rated to Group 1-4
	Total cost estimation by InfraAsia (excluding VAT)	21,105.49	Baht 799 million per kilometer^{6/}

Remark:

- 1/ Consisted of 28 sets of rolling stock for the MRT Blue Line Extension Project, based on the requirement in the Concession Agreement, which was approved by the Meeting of the Board of Director of the Company No. 2/2017 on March 29, 2017, and 7 new sets of rolling stock for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project). (Please see details in Figure 1 on Page 10 of this report for better understanding to this Transaction)
- 2/ Consisted of cost center No. 1 – 2 and Minor Works in relation to cost center No. 1 – 2, and the allocation of cost center No. 10 – 17 based on pro-rata basis.
- 3/ Consisted of cost center No. 3 – 5 and Minor Works in relation to cost center No. 3 – 5, and the allocation of cost center No. 10 – 17 based on pro-rata basis.
- 4/ Consisted of cost center No. 6 – 7 and Minor Works in relation to cost center No. 6 – 7, and the allocation of cost center No. 10 – 17 based on pro-rata basis.
- 5/ Consisted of cost center No. 8 and the remaining Minor Works, and the allocation of cost center No. 10 – 17 based on pro-rata basis.
- 6/ Based on total length of 26.4 kilometers.
- 7/ Based on total new stations of 19 stations.

Analysis of foreign exchange assumption on the cost estimation by InfraAsia

InfraAsia assumed that System Integration, Project Management, Project Overhead, Insurance & Bonds and Mark-up & Contingency would be in Thai Baht currency. The M&E equipment would be from local contents of around 30% of total cost of M&E equipment, which would not be affected by foreign currency fluctuation. The remaining is from imported contents of around 70% of total cost of M&E equipment, which would be in USD or Euro. Conclusively, over 50% of the project cost would be in Thai Baht.

Sensitivity Analysis

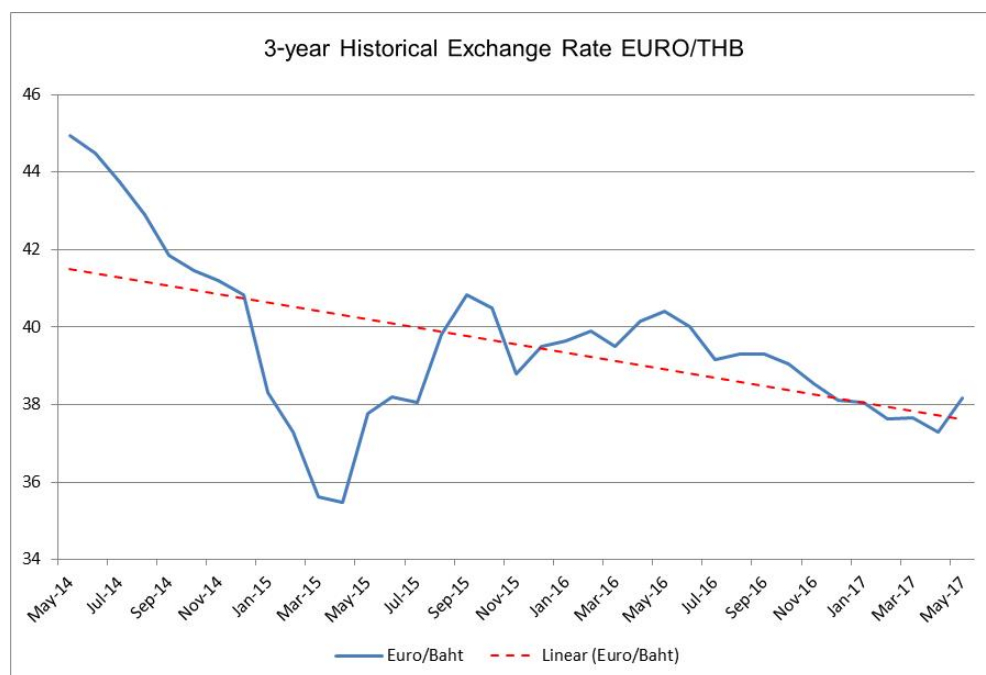
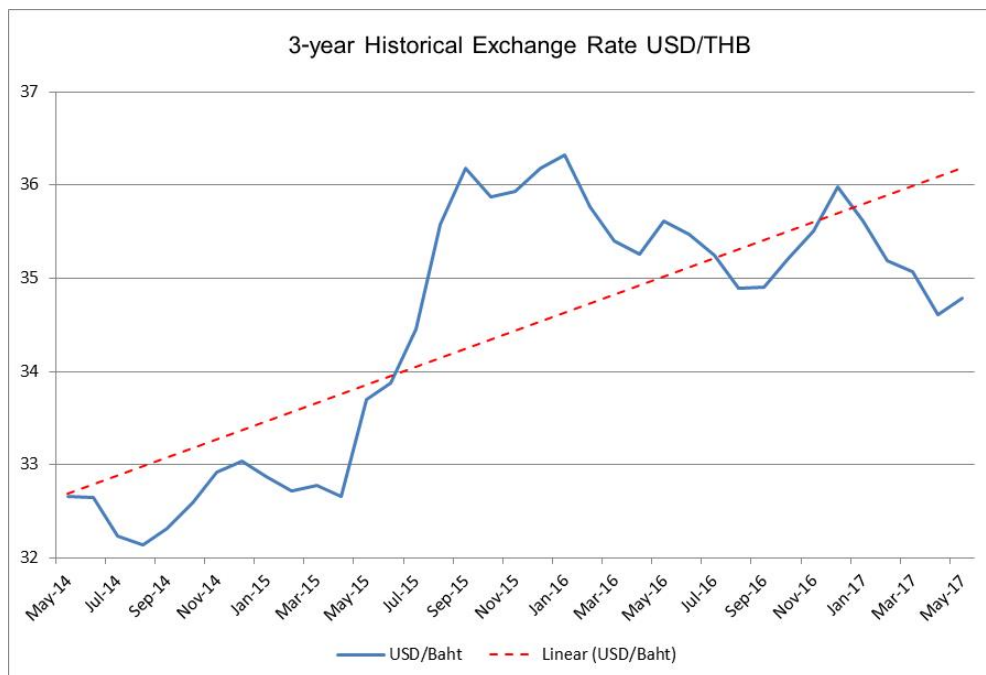
From sensitivity analysis by InfraAsia, the cost estimation evaluated by InfraAsia will be lower than the Contract Price with CK when Thai Baht is strengthen against USD together with the strengthen of Thai Baht against Euro comparing to the current exchange rate. For example;

- In the case that the exchange rate is lower (strengthen of Thai Baht against Euro) from EUR/Baht 37 to EUR/Baht 35 and lower (strengthen of Thai Baht against USD) from USD/Baht 35 to USD/Baht 26.72, the cost estimation by InfraAsia will be equivalent to the Contract Price with CK.

Exchange rates caused the Cost Estimation by InfraAsia to be equivalent to the Contract Price with CK	
Changed in EUR/Baht	Changed in USD/Baht
EUR/Baht 37 ^{1/}	USD/Baht 21.03
EUR/Baht 36	USD/Baht 23.88
EUR/Baht 35	USD/Baht 26.72
EUR/Baht 34	USD/Baht 29.56
EUR/Baht 33	USD/Baht 32.40

Remark: 1/ The exchange rates for the cost estimation were assumed at USD/Baht 35 and EUR/Baht 37 at the time of estimation.

Analysis of historical foreign currency



Source: Bank of Thailand (3-year historical exchange rate until May 15, 2017)

Due to the following reasons (1) cost of M&E equipment is only a part of total costs, (2) the imported M&E equipment is only a part of all M&E equipment, (3) the payment currency with some suppliers can be chosen, (4) the payment currency can be changed by selecting country of the suppliers, and (5) historically, trend of USD/Baht exchange rate is in the opposite direction of trend of EUR/Baht exchange rate, CapAd, therefore, views that the cost estimation by InfraAsia as of the date of this report is not significantly different from the cost estimation as of the report date by InfraAsia. However, the future foreign exchange rate is difficult to be accurately predicted.

1.3 Comparison of the Contract Price with CK with the Cost Estimation by InfraAsia is as follows;

(Unit: Baht million)

Group	Description	Contract Price with CK	Cost Estimation by InfraAsia	higher (lower) than the Cost Estimation	
				Baht million	%
1	Rolling Stock for 35 sets ^{1/} and Signaling System	10,074.04 ^{2/} (Baht 288 million per train)	10,964.67 ^{4/} (Baht 313 million per train)	(890.63)	-8.12%
2	Communication Systems and Power Supply System	7,027.46 ^{2/} (Baht 266 million per km ^{6/})	6,891.61 ^{4/} (Baht 261 million per km ^{6/})	135.86	1.97%
3	Automatic Fare Collection System and Platform Screen Doors	1,931.32 ^{2/} (Baht 102 million per station ^{7/})	2,473.44 ^{4/} (Baht 130 million per station ^{7/})	(542.12)	-21.92%
4	Depot Work Equipment and Minor Works	609.51 ^{3/}	775.78 ^{3/}	(166.26)	-21.43%
	Total price (excluding VAT)	19,642.34 (Baht 744 million per km. ^{6/})	21,105.49 (Baht 799 million per km. ^{6/})	(1,463.16)	-6.93%

Remark:

- 1/ Consisted of 28 sets of rolling stock for the MRT Blue Line Extension Project, based on the requirement in the Concession Agreement, which was approved by the Meeting of the Board of Director of the Company No. 2/2017 on March 29, 2017, and 7 sets of rolling stock for the MRT Initial Blue Line Project.
 - 2/ Consisted of cost of each work and the allocation of General Requirement* (from the draft contract with CK) based on pro-rata basis.
 - 3/ Consisted of scope of depot work, MRTA Project Facility and Graphic and Signage in the Extension area and Update in the Existing area and the allocation of General Requirement*.
 - 4/ Consisted of cost of each work and Minor Works in relation to such work and the allocation of cost center No. 10 – 17 (from InfraAsia's report) based on pro-rata basis.
 - 5/ Consisted of cost center No. 8 and the remaining Minor Works, and the allocation of cost center No. 10 – 17 (from InfraAsia's report) based on pro-rata basis.
 - 6/ Based on total length of 26.4 kilometers.
 - 7/ Based on total new stations of 19 stations.
- * Excluding MRTA Project Facility and Graphic and Signage in the Extension area and Update in the Existing area.

From the table above, the contract price with CK for project management regarding supply, installation, and testing of the M&E systems of the MRT Blue Line Extension Project, and supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax) is lower than the cost estimation by InfraAsia, who is the Independent Expert, which is Baht 21,105.49 million by Baht 1,463.16 million or lower by 6.93%.

CapAd views that the estimated costs by InfraAsia is reasonable due to in this cost estimation, InfraAsia was not only considering the technical requirements of the Section 2 (Hua Lamphong station – Lak Song station) and Section 3 (Tao Poon station – Tha Phra station), but the affects to an integration with the Section 1 (Bang Sue station – Tao Poon station). In addition, InfraAsia made a reference to the costs of M&E system of other projects such as the MRT Purple Line Project and the its database for other similar projects in the past as well as known price from suppliers. Therefore, the contract price with CK for project management regarding supply, installation, and testing of the M&E systems of the MRT Blue Line Extension Project, and supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) for a total value of not exceeding Baht 19,643 million (excluding value-added tax) is lower than the cost estimation by InfraAsia by Baht 1,463.16 million or lower by 6.93%. Conclusively, CapAd is of the opinion that **the contract price for project management, supply, installation, and testing of the M&E systems of the MRT Blue Line Project by CK is appropriate.**

2. Appropriateness of the term of payment

Total contract value for project management regarding supply, installation, and testing of the M&E systems of the MRT Blue Line Extension Project, and supply of 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Line Project (the MRT Initial Blue Line Project) is not exceeding Baht 19,643 million (excluding value-added tax), where term of payment will be monthly basis on progress and subjected to the details and conditions as specified in the Contract. The Company shall make a payment on monthly basis within 30 days after receiving invoice and the first payment will be Baht 2,946.35 million (around 15% of the Contract Price).

CapAd views that the term of payments is a general business condition, and the payment is based on the progress of works. Therefore, **the term of payment is appropriate.**

3. Conclusion of the opinion of the Independent Financial Advisor concerning appropriateness of price and condition of the Connected Transaction

Conclusively, CapAd is of the opinion that **the total consideration to CK amounting to not exceeding Baht 19,643 million (excluding value-added tax) is appropriate** due to the contract price with CK is lower than the estimated costs by the Independent Expert by Baht 1,463.16 million or lower by 6.93%. In addition, the term of payment is a general business condition. Therefore, **the term of payment is appropriate**.

Part 4: Conclusion of Opinion of the Independent Financial Advisor on the Connected Transaction

Please see the conclusion of the IFA opinion in the **Executive Summary** on Page 4 of this report.

However, the shareholders should consider the information in the notice to the shareholders' meeting and its enclosures before making the decision. The final decision shall be at own discretionary of the shareholders.

CapAd as the Independent Financial Advisor hereby certifies that the opinions have prudently been provided in compliance with the professional standards and principles, with due regard to the shareholders' benefits.

Yours sincerely,

Capital Advantage Company Limited

- Patchara Netsuwan -

(Mr. Patchara Netsuwan)
Managing Director

- Patchara Netsuwan -

(Mr. Patchara Netsuwan)
Supervisor in Charge

Attachment 1

Business Overview and Operating Results of CH. Karnchang Public Company Limited

1. General Information

Company Name	: CH. Karnchang Public Company Limited ("CK")
Main Business	: General contract construction for government agencies, state enterprises, private sector, including direct contractor, sub-contractor, joint venture, or consortium
Head Office	: 587 Viriyathavorn Building, Sutthisarn Road, Dindaeng sub-district, Dindaeng district, Bangkok 10400
Telephone	: 0 2277 0460, 0 2275 0026
Fax	: 0 2275 7029
Website	: http://www.ch-karnchang.co.th/
Registered Capital	: Baht 1,693,899,970 Divided into 1,693,899,970 of ordinary shares at par value of Baht 1.00
Paid-up Capital	: Baht 1,693,896,872 Divided into 1,693,896,872 of ordinary shares at par value of Baht 1.00

2. Nature of Business

2.1 Background

CH. Karnchang Public Company Limited ("CK") was established on November 27, 1972 with the initial registered capital of Baht 1,400,000 to engage in general construction business. Initially, the scope of work covered construction of building and general civil works. Its major clients are government agencies. Later in 1981, CK entered into a joint venture with Tokyu Construction Co., Ltd., one of Japan's top ten contractors, to expand construction business and long term prosperity.

CK became a public company on October 10, 1994, increased its registered capital to Baht 700 million, and listed in the Stock Exchange of Thailand on August 3, 1995. Later on April 19, 1996, CK increased its registered capital to Baht 1,050 million. From that point of time, CK was growing rapidly and improving the construction technology development through its joint venture with foreign companies, e.g., Bilfinger AG from Germany and Thames Water International Limited from England. This enabled CK to become one of a few construction contractors which is able to carry out sophisticated construction requiring advanced construction technology such as large scale infrastructure projects. Moreover, CK was able to operate the projects on a design and construction basis or turnkey, concessions on Build-Transfer-Operate (BTO), Build-Operate-Transfer (BOT), Build-Own-Operate (BOO), and Acquire-Operate-Transfer (AOT) basis. Samples of the past performance are the concession project for tap water production and distribution for the Provincial Waterworks Authority in Nakhon Pathom, Samutsakorn, and Patumthani Province; the MRT Initial System Project – Chaloem Ratchamongkhon Line, etc.

In 2004, CK set up SouthEast Asia Energy Limited to serve as a developer of Nam Ngum 2 Hydroelectric Power Project in Lao People's Democratic Republic ("Lao PDR"). In 2006, CK commenced the construction of Nam Ngum 2 Hydroelectric Power Project, a 615 MW hydropower plant with a project value of Baht 22,000 million for the production and distribution of electricity to the Electricity Generating Authority of Thailand (EGAT). Apart from the investment in hydroelectric power plant, CK further invested in varieties of energy business such as natural gas power project, cogeneration power project, and solar power projects. CK established Bangpa-in Cogeneration Limited in 2009, Xayaburi Power Co., Ltd. in 2010, Nakhon Ratchasima Solar Co., Ltd., Chiangrai Solar Co., Ltd. and Bangkhenchai Co., Ltd. in 2011. In the same year, CK set up CK Power Limited ("CKP") as a holding company with its core business in SouthEast Asia Energy Limited, the major shareholder of the Nam Ngum 2 Hydroelectric Power Project. CKP's objective is to invest in good energy business which is under the development of CK Group. CKP transformed to be a public company on February 6, 2013 and was listed in the Stock Exchange of Thailand on July 18, 2013. In June 2013, CK increased registered capital in the amount of Baht 41,311,536 to support stock dividend paid to shareholders, resulting registered capital to increase to Baht 1,693,896,872.

In 2015 CK supported the amalgamation between Bangkok Expressway Public Company Limited ("BECL") and Bangkok Metro Public Company Limited ("BMCL") since the amalgamation was considered a strategy to integrate the strengths of both companies in order to diversify services; strengthen business competitiveness and create investment opportunities in the future; and promote image of securities of the new company from the amalgamation. The joint shareholders' meeting between shareholders of BMCL and shareholders of BECL resolved to approve various matters of the

new company from the amalgamation as stipulated by the Public Limited Companies Act B.E. 2535 (1992) and its amendments. In this regard, the public limited company registrar, Department of Business Development, Ministry of Commerce, accepted the registration of the amalgamation on December 30, 2015, and therefore BMCL and BECL became defunct and amalgamated into Bangkok Expressway and Metro Public Company Limited ("BEM"), with its registered and paid-up capital equal to Baht 15,285,000, divided into a total of 15,285,000 ordinary shares at the par value of Baht 1 per share. Therefore, all assets, debts, rights, duties and responsibilities of BMCL and BECL were transferred to BEM in effective of law from the date of the public limited company registrar accepted the registration of the amalgamation.

Significant changes in 2016

1) On March 31, 2016, the Company signed the Construction Agreement of Highway No. 7, Bangkok – Ban Chang, Pattaya – Map Ta Phut Section, Phase 5 between km. 13+900.000 – km. 16+150.000, for a distance of approximately 2.250 kilometers, including highway lighting installation in Amphoe Bang Lamung, Chonburi Province, with the Department of Highways, for a construction period of approximately 900 days and with the contract value worth approximately Baht 778,371,000 inclusive of value added tax.

2) On April 20, 2016, CK (Lao) Co., Ltd., as the Company's subsidiary signed the Engagement Agreement for Improvement of Voltage and Construction of the 230/500 kV Nabong Substation with Nam Ngum 2 Power Co., Ltd., for a completion period of approximately 26 months and with the contract value worth approximately Baht 799,850,000 and USD 39,113,320 (exclusive of value added tax).

3) On July 6, 2016, CK (Lao) Co., Ltd., as the Company's subsidiary, signed the Amendment to Engineering, Procurement and Construction Contract (EPC Contract) for First Stage Works and Second Stage Works for the Xayaburi Hydroelectric Power Project with Xayaburi Power Co., Ltd., divided into two additional construction work phases, which can be materially summarized as follows:

Phase 1: The construction value amounted to Baht 14,650 million for improvement of the Project construction for the right-hand side of the Mekong River carried out during 2011-2015 for addition and improvement of necessary characteristics to meet the requirements relating to the environmental and engineering standards, at the government of the Lao PDR's request, namely adding the sediment flushing outlets and lowering the height of the Spillway's threshold, adding the fish passage system, as well as additionally reinforcing the steel structure etc.; and

Phase 2: The construction value amounted to Baht 4,750 million for revisions and modifications of the construction design, components of the Project for the left-hand side of the Mekong river to be carried out during 2016-2019, namely modifying the fish passage system, reducing the sludge drain channels underneath the powerhouse and reducing the length of the powerhouse and installation site, including works relating to the mechanical and electrical system etc.

It is expected to be completed around October 2019 with the contract value worth approximately Baht 19,400,000.

4) On August 8, 2016, the Company signed the Construction Agreement of Motorway, Bang Pa-In-Saraburi-Nakhon Ratchasima Section, km. 27+500.000 - km.37+700.000 (including Hinkong Interchange), for a distance of approximately 10,200 kilometers, with the Department of Highways for a construction period of approximately 1,080 days with the contract value worth approximately Baht 1,945,500,000 inclusive of value added tax.

5) On September 26, 2016, the Company signed the contract of the repair of the Si Rat Expressway; Periodic 3 Phase 5, Sector D (Asoke – Srinagarindra) with BEM, for a completion period of approximately 10 months with the contract value worth approximately Baht 32,341,810 exclusive of value added tax.

6) On December 14, 2016, the Company signed as the Contractor for additional maintenance services on Civil Infrastructure and E&M Systems for the MRT Purple Line Project (the repair and maintenance of the Civil Infrastructure and E&M Systems, including supply of equipment and tools for operation and maintenance for the MRT Purple Line Project in addition to the scope of work from the existing Agreement in which the Company is a project manager for maintenance services on Civil Infrastructure and E&M Systems for the MRT Purple Line Project) with BEM for a completion period around October 2023 and with the contract value worth approximately Baht 155,000,000 exclusive of value added tax.

7) The Company has executed a Joint Venture Agreement with Sino-Thai Engineering & Construction PCL. under the name CKST Joint Venture, with the purpose for bidding under the announcement and terms for bidding of the MRT Orange Line Project (East Section), Thailand Cultural Center – Min Buri Section, and with the investment ratio as follows:

- CH. Karnchang PCL. 60%
- Sino-Thai Engineering & Construction PCL. 40%

On February 9, 2017, CKST Joint Venture has signed as the Contractor for three contracts of the MRT Orange Line Project (East Section) with Mass Rapid Transit Authority of Thailand as follows:

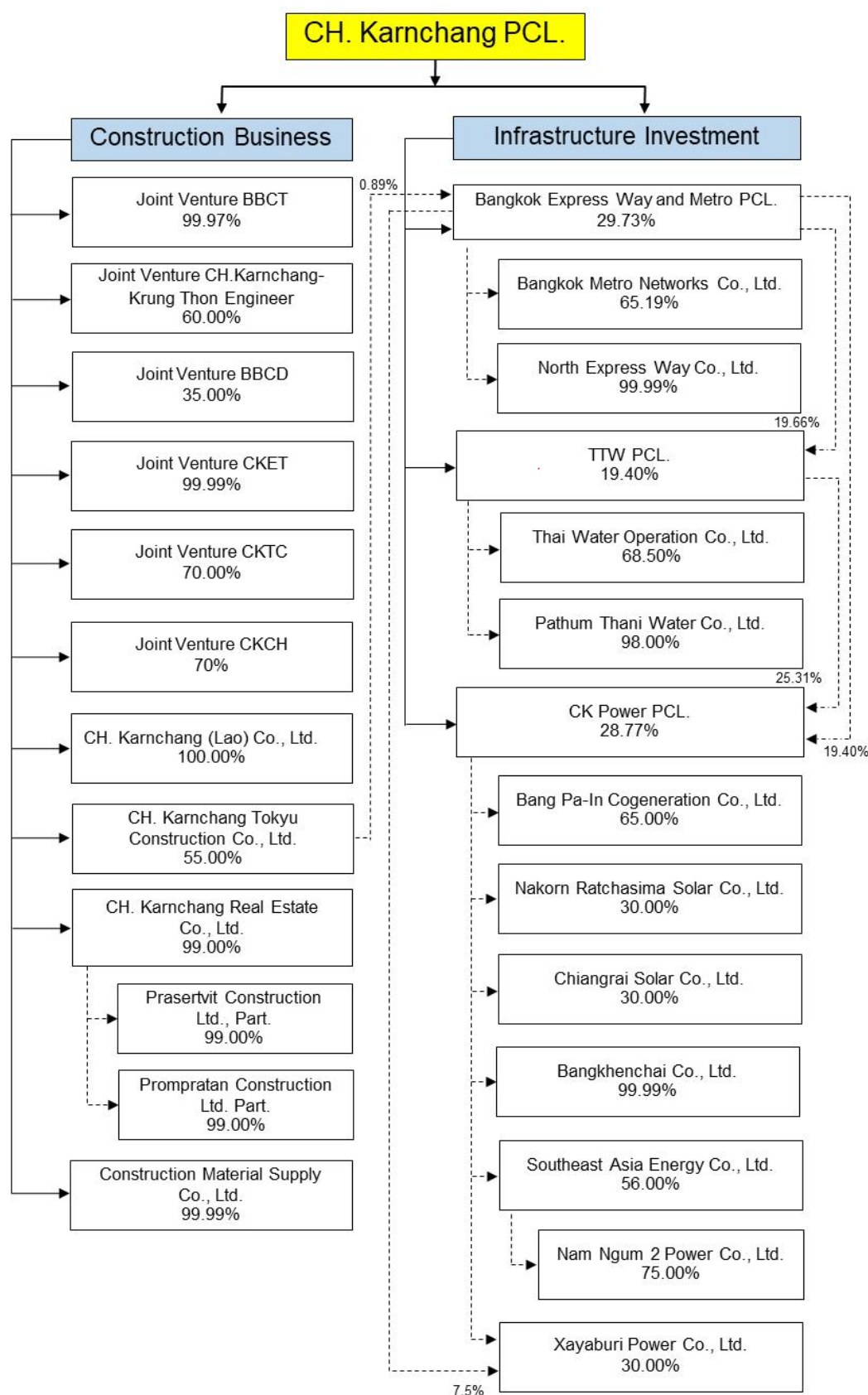
- Contract E1: Underground Civil Works, Thailand Cultural Center – Ram Khamhaeng 12 Section, for a completion period of approximately 1,980 days and with the contract value worth around Baht 20,633 million inclusive of value added tax;
- Contract E2: Underground Civil Works, Ram Khamhaeng 12 – Hua Mak Section for a completion period of approximately 1,980 days and with the contract value worth about Baht 21,507 million inclusive of value added tax;
- Contract E5: Depot and Park & Ride Construction Works for a completion period of approximately 1,980 days with a contract value worth around Baht 4,831.24 million inclusive of value added tax.

- **CK's Group Structure**

CK's business operations can be divided into 2 categories:

- (1) Contractor business
- (2) Infrastructure investment business

A chart of group structure is in the following page.

CK's Group Structure

Source: Form 56-1 for the year 2016 of the Company.

Remark: *On February 24, 2017, CK sold all 999,992 shares in Construction Material Supply Co., Ltd. to a legal entity having no connection with the Company as a result, Construction Material Supply Co., Ltd ceased to be the Company's subsidiary.

2.2 Business and Operation

CK's primary business is a construction contractor on works from government agencies, state enterprises, and private entities in the form of main contractor or sub-contractor through bidding, tender, and joint venture or consortium with foreign contractor companies. In addition, CK expands the scope of business to develop basic infrastructure project in the regional level. Currently CK invests in transportation system, mass transportation system, water supply system and power supply system e.g. Highway and MRT management project which operated by Bangkok Metro Public Company Limited ("BEM"), tap water production project which operated by TTW Public Company Limited ("TTW"), electricity production project which operated by Patum Thani Water Co., Ltd., etc.

3. Board of Directors

List of Board of directors of CK as of March 6, 2017 is as follows:

	Names	Position
1.	Mr. Aswin Kongsiri	Chairman of the Board of Directors and Independent Director
2.	Mr. Plew Trivisvavet	Chairman of the Executive Board
3.	Ms. Supamas Trivisvavet	President
4.	Mr. Vitoon Tejatussanasoontorn	Chairman of the Audit Committee and Independent Director
5.	Mr. Thawansak Sukhawun	Audit Committee and Independent Director
6.	Mr. Pavich Tongroach	Audit Committee and Independent Director
7.	Mr. Narong Sangsuriya	Director
8.	Mr. Ratn Santaannop	Director
9.	Mr. Prasert Marittanaporn	Director
10.	Mr. Anukool Tuntimas	Director

Remark: The authorized directors are Ms. Supamas Trivisvavet, Mr. Plew Trivisvavet, Mr. Narong Sangsuriya, and Mr. Prasert Marittanaporn, by 2 of 4 directors to co-sign with an affix the company's seal on behalf of the company or by 1 of 4 directors to co-sign with any of the following directors; Mr. Ratn Santaannop, or Mr. Anukool Tuntimas, totaled 2 directors with an affix the company's seal.

4. Shareholder Structure

As of March 16, 2017, CK had registered capital of Baht 1,693,899,970, of which Baht 1,693,896,872 were paid up (divided into 1,693,896,872 ordinary shares at Baht 1.00 each). Top 10 major shareholders are as follows:

Name	Number of shares	% Shareholding
1. Trivisvavet group ^{1/}	608,907,945	35.95
1.1 Mr. Plew Trivisvavet	13,631,497	0.80
1.2 Mrs. Pranee Tongkittikul	7,567,642	0.45
1.3 Mrs. Saikasem Trivisvavet	5,061,142	0.30
1.4 Mr. Nattavut Trivisvavet	2,405,785	0.14
1.5 Ms. Supamas Trivisvavet	1,700,000	0.10
1.6 Mr. Sittidej Trivisvavet	1,550,000	0.09
1.7 Mr. Puvanet Trivisvavet	1,013,225	0.06
1.8 Ms. Sunan Trivisvavet	869,100	0.05
1.9 Mrs. Korakot Trivisvavet	700,250	0.04
1.10 Mr. Prasert Trivisvavet	154,285	0.01
1.11 Mahasiri Siam Co., Ltd. ^{2/}	307,312,365	18.14
1.12 CK Holding Co., Ltd. ^{3/}	173,096,530	10.22
1.13 CK Office Tower Co., Ltd. ^{4/}	91,048,212	5.38
1.14 Bang Pa-in Land Development Co., Ltd. ^{5/}	2,797,912	0.17
2. Thai NVDR Co., Ltd. ^{6/}	65,258,385	3.85
3. Bangkok Bank PCL.	38,950,000	2.30
4. The Bank of New York Mellon	21,685,000	1.28
5. K Equity 70:30 LTF	19,666,665	1.16
6. K 20 Select LTF	17,168,800	1.01
7. K Equity Dividend LTF	16,149,625	0.95
8. The Viriyah Insurance PCL.	15,545,200	0.92
9. Mrs. Sopida Trivisvavet ^{7/}	15,383,225	0.91
10. HSBC (Singapore) Nominees Pte.	14,304,571	0.84
Total top 10 major shareholders	833,019,416	49.18
Other shareholders	860,877,456	50.82
Total	1,693,896,872	100.00

Source: Lists of shareholders as at the share register book closing (XM) on March 16, 2017 prepared by Thailand Securities Depository Co., Ltd.

Remark:

1/ The list of shareholders in Trivisvavet Group is based on the information in the Annual report and Form 56-1 for the year 2016

2/ Directors and shareholders of Mahasiri Siam Co., Ltd. are as follows:

Directors: Mr. Prasert Trivisvavet, Mr. Thep Trivisvavet, Mr. Yim Trivisvavet, Mr. Plew Trivisvavet, Mrs. Ornanong Trivisvavet and Ms. Supamas Trivisvavet

Shareholders:

Name	Number of shares	% Shareholding
1. Mr. Thavorn Trivisvavet	2,411,473	26.80
2. Mr. Prasert Trivisvavet	2,281,895	25.35
3. Mr. Plew Trivisvavet	1,993,633	22.15
4. Mr. Thep Trivisvavet	937,837	10.42
5. Mr. Kamthorn Trivisvavet	753,948	8.38
6. Ms. Ruangkhao Promphat	621,213	6.90
7. Mrs. Saikasem Trivisvavet	1	0.00
Total	9,000,000	100.00

3/ Directors and shareholders of CH. Karnchang Holding Co., Ltd.

Director: Mr. Plew Trivisvavet, Mr. Prasert Trivisvavet, Mr. Thep Trivisvavet, Mr. Yim Trivisvavet, Mrs. Ornanong Trivisvavet, and Ms. Supamas Trivisvavet

Shareholders:

Name	Number of shares	% Shareholding
1. Mahasiri Siam Co., Ltd.	2,100,000	25.00
2. Mr. Nattapong Kummee	1,050,000	12.50
3. Namphol Construction Co., Ltd.	1,050,000	12.50
4. Cholatet Civil Co., Ltd.	1,050,000	12.50
5. Tawornwong Co., Ltd.	1,050,000	12.50
6. Vetprasert Co., Ltd.	1,050,000	12.50
7. Ekkamthorn Co., Ltd.	1,050,000	12.50
Total	8,400,000	100.00

4/ Directors and shareholders of CK. Office Tower Co., Ltd.

Directors: Mr. Plew Trivisvavet, Mr. Prasert Trivisvavet, Mr. Thep Trivisvavet, Mr. Yim Trivisvavet, Mr. Prasert Thongkittikul, Mrs. Ornanong Trivisvavet, and Ms. Supamas Trivisvavet

Shareholders:

Name	Number of shares	% Shareholding
1. Mahasiri Siam Co., Ltd.	750,000	25.00
2. Mr. Kamthorn Trivisvavet	375,000	12.50
3. Mr. Thavorn Trivisvavet	375,000	12.50
4. Mr. Thep Trivisvavet	375,000	12.50
5. Mr. Prasert Trivisvavet	375,000	12.50
6. Mr. Plew Trivisvavet	375,000	12.50
7. Mr. Yim Trivisvavet	375,000	12.50
Total	3,000,000	100.00

5/ Directors and shareholders of Bangpa-in Land Co., Ltd.

Director: Mr. Plew Trivisvavet, Mr. Prasert Trivisvavet, Mr. Yim Trivisvavet, Mr. Thep Trivisvavet, Mr. Vorawut Anurakwongsri, and Ms. Supamas Trivisvavet

Shareholders:

Name	Number of shares	% Shareholding
1. Mahasiri Siam Co., Ltd.	600,000	25.00
2. CK Office Tower Co., Ltd.	600,000	25.00
3. Mr. Thavorn Trivisvavet	200,000	8.33
4. Mr. Prasert Trivisvavet	200,000	8.33
5. Ms. Jiraporn Yordsaeng	200,000	8.33
6. Mr. Plew Trivisvavet	200,000	8.33
7. Mr. Thep Trivisvavet	200,000	8.33
8. Mr. Kamthorn Trivisvavet	200,000	8.33
Total	2,400,000	100.00

(Source of remark 1 – 4: www.corpus.bol.co.th)

6/ This is a subsidiary established by the Stock Exchange of Thailand. NVDR represents the automatic listed securities. NVDR investors enjoy the same financial privilege as investment in ordinary shares of companies, except that they have no right to vote in shareholders' meeting.

7/ This person is not concert parties so it is not classified as Trivisvavet Group

5. Summary of Financial Positions and Operation Results

- Statement of Financial Positions as of December 31, 2014, 2015 and 2016

Consolidated Statement of Financial Positions (Unit: Baht thousand)	Dec. 31, 2014	Dec. 31, 2015	Dec. 31, 2016
Current Assets			
Cash and cash equivalents	5,265,068	4,666,962	11,406,173
Current Investments	683,659	70,947	1,130,475
Trade and other receivables	5,336,592	6,173,560	7,920,131
Short-term loans to related parties and interest receivable	31,209	283,913	283,913
Unbilled receivables	13,275,865	13,146,933	2,715,073
Construction in progress and construction supplies	8,562,297	12,786,884	2,775,199
Advance payment to subcontractors	10,315,917	7,233,238	6,209,782
Financial derivatives	-	-	28,831
Other current assets	508,528	677,940	860,234
Total Current Assets	43,979,135	45,040,379	33,329,812
Non-current assets			
Restricted bank deposits	24,182	16,893	33,120
Long-term loans to associated companies and interest receivable, net of current portion	-	-	10,359,710
Long-term loans to related company and interest receivable	22,411	12,384	9,253
Investment in subsidiary companies	-	-	-
Investments in associated companies	7,375,512	17,259,131	19,436,337
Other long-term investments	13,829,918	8,007,596	8,312,220
Long-term trade and other receivables	7,624,344	14,406,046	14,095,406
Investment properties	398,994	383,974	417,259
Property, plant and equipment	6,961,836	7,329,633	8,609,984
Intangible assets	85,921	75,978	58,656
Advances for future projects	277,685	282,307	71,801
Withholding tax deducted at source	76,478	108,149	72,547
Deferred tax assets	185,517	116,250	103,593
Other non-current assets	30,306	27,176	18,674
Total non-current assets	36,893,104	48,025,518	61,598,563
Total Assets	80,872,239	93,065,896	94,928,375
Current liabilities			
Bank overdrafts and short-term loans from financial institutions	4,516,035	8,191,277	9,531,534
Trade and other payables	5,904,480	6,602,049	6,440,968
Current portion of hire purchase creditors	226,313	193,918	90,884
Current portion of long-term loans	5,327,627	5,099,472	4,547,791
Current portion of debentures	3,000,000	2,000,000	2,000,000
Advances received from employers and construction revenue received in advance	8,308,850	5,883,109	5,513,544
Retention for construction	891,332	1,145,622	907,481
Income tax payable	77,861	1,301	3,276
Unbilled output tax	702,944	1,231,232	186,395
Derivative financial liabilities	511,227	57,647	-
Other current liabilities	137,636	149,723	123,607
Total current liabilities	29,604,305	30,555,349	29,345,481
Non-current liabilities			
Long-term payable	-	769,741	-
Hire purchase creditors – net of current portion	295,282	109,119	21,610
Long-term loans, net of current portion	14,047,380	16,769,086	14,631,230
Debentures, net of current portion	14,979,666	21,478,214	26,479,666
Provision for long-term employee benefits	447,096	568,443	612,159
Deferred tax liabilities	2,027,826	1,960,275	1,983,905
Total non-current liabilities	31,797,250	41,654,880	43,728,571
Total Liabilities	61,401,555	72,210,229	73,074,052
Share capital			
Par value (Baht 1 per share)			
Registered capital			
1,693,899,970 ordinary shares	1,693,900	1,693,900	1,693,900
Issued and paid up capital			
1,693,896,872 ordinary shares	1,693,897	1,693,897	1,693,897
Share premium	4,869,410	4,869,410	4,869,410
Retained earnings			
Appropriated			
Statutory reserve	174,890	174,890	174,890
Unappropriated	8,587,174	9,781,926	10,637,165
Other components of shareholders' equity	3,799,348	3,937,167	4,105,277

Consolidated Statement of Financial Positions (Unit: Baht thousand)	Dec. 31, 2014	Dec. 31, 2015	Dec. 31, 2016
Equity attributable to owners of the company	19,124,719	20,457,290	21,480,640
Non-controlling interests of the subsidiaries	345,965	398,377	373,683
Total Shareholders' Equity	19,470,684	20,855,667	21,854,322
Total Liabilities and Shareholders' Equity	80,872,239	93,065,896	94,928,374

- Comprehensive income statement for the year ended December 31, 2014, 2015 and 2016

Consolidated Comprehensive Income Statement (Unit: Baht thousand)	2014	2015	2016
Revenue from construction services	32,857,869	34,814,594	45,705,063
Sales of construction materials	7,194	32,348	63,224
Project management income	5,153	4,082	40,439
Rental income	63,687	48,597	48,868
Transportation income	17,141	12,361	6,447
Other income			
Interest income	74,948	56,593	355,423
Dividend income	711,710	900,900	464,631
Gain on sales of investment in associated companies and other long-term investment	1,268,571	2,010,994	270,964
Gain on exchange	35,559	-	-
Others	401,527	147,285	64,484
Total revenues	35,443,360	38,027,755	47,019,543
Cost of construction services, sales of construction material and services	29,827,416	31,985,795	42,530,058
Administrative expense	1,475,251	1,758,512	1,781,231
Total expenses	31,302,666	33,744,306	44,311,290
Profit before share of profit (loss) from investments in associated companies, finance cost and income tax expenses	4,140,693	4,283,448	2,708,254
Share of profit (loss) from investments in associated companies	26,768	(19,360)	(577,611)
Profit before finance cost and income tax expenses	4,167,462	4,264,089	3,285,864
Finance cost	(1,467,957)	(1,544,689)	(1,165,802)
Profit before income tax expenses	2,699,504	2,719,420	2,120,062
Income tax expenses	(342,433)	(459,012)	(77,615)
Profit for the year	2,357,071	2,260,407	2,042,447
Profit attributable to			
Equity holders of the company	2,296,257	2,192,644	2,002,402
Non-controlling interests of the subsidiaries	60,814	67,762	40,045
Earnings per share (Baht)	1.36	1.29	1.18

- Cash flow statement for the year ended December 2014, 2015, and 2016

Consolidate Cash Flow Statement (Unit: Baht Thousand)	2014	2015	2016
Net cash flow from (used in) Operating activities	(4,930,741)	(9,982,974)	18,362,197
Net cash flow from (used in) Investing activities	1,315,838	(1,246,675)	(14,133,168)
Net cash flow from (used in) Financing activities	4,954,885	10,614,370	2,505,585
Effect of exchange rate on cash and cash equivalents	11,871	17,173	4,596
Net (decrease) in cash and cash equivalents	1,351,852	(598,105)	6,739,210
Cash and cash equivalents at the beginning of the year	3,913,216	5,265,068	4,666,962
Cash and cash equivalents at the end of the year	5,265,068	4,666,962	11,406,173

Source: The financial statements of CK and its subsidiaries for the year ended December 31, 2014, 2015, and 2016 were audited by EY Company Limited, the certified auditor approved by the SEC.

- Financial ratios for the year ended December 31, 2014, 2015 and 2016

Financial Ratio	2013	2014	2015
Gross Profit Margin (%)	9.24	8.21	7.08
Net Profit Margin (%)	6.48	5.77	4.26
Current Ratio (times)	1.49	1.47	1.11
Return on Equity (ROE) (%)	11.79	10.51	9.16
Return on Assets (ROA) (%)	2.84	2.36	2.11
Debt to Equity Ratio (times)	3.15	3.46	3.34
Debt to Equity Ratio (according to terms and conditions of debenture*) (times)	1.48	1.66	1.33

Remark: * Net debt to equity ratio (according terms and conditions of debenture) = Interest bearing debt deducted by cash and cash equivalent, short-term investment, and accounts receivable which are government agencies or state enterprises of which such organization has issued performance certificate/ total shareholders' equity.

Financial positions and operating results analysis of CK and its subsidiaries**Operating results**

In 2015, CK and its subsidiaries had main revenues from construction services, and sales of construction materials, totaling of Baht 34,847 million or 91.6% of total revenues, increasing by Baht 1,982 million or 6.0% from 2014 as a result of the progress in construction of various projects and newly awarded projects particularly the Si Rat Expressway Project, the MRT Purple Line Project, Contract 4, the Cogeneration Power Project No. 2, and the 2nd Tap Water Production Plant Construction Project for production capacity expansion in Samut Sakhon – Nakhon Pathom Area. In 2016, CK and its subsidiaries had main revenues from construction services and sales of construction materials of Baht 45,768 million, representing 97.3% of total revenues, an increase by Baht 10,921 million, representing 31.3% from the previous year as a result of progress in construction of various projects particularly the Xayaburi Hydroelectric Power Project, including additional construction works as approved by the employer in 2016.

In 2015, CK and its subsidiaries had other income of Baht 3,181 million, increasing by Baht 603 million or 23.4% from 2014 mostly due to sales of investment in Xayaburi Power Co., Ltd. In 2016, CK and its subsidiaries posted other income of Baht 1,251 million, decreasing by Baht 1,930 million or 60.7% decrease from 2015 due to the decline in gain from sale of investment and dividend income after the completion of BEM's amalgamation in December 2015 by CK recognized the share of profits instead of dividend.

In 2015, CK and its subsidiaries had Baht 2,861 million gross profits, declining by Baht 176 million or 5.8% decrease from 2014 because the projects with high gross profit margin were completed. In 2016, gross profit of CK and its subsidiaries were Baht 3,238 million, equal to gross profit margin of 7.08% decreasing from 8.21% in 2015 because the subsidiary recognized additional revenue from the progress of Xayaburi Hydropower Project which had lower gross margin than main construction work.

In 2015, CK and its subsidiaries had administrative expenses of Baht 1,759 million, increasing by Baht 283 million or 19% growth from 2014, mainly due to foreign exchange loss and the increase in employee related expenses as well the donation. In 2016, there were administrative expenses of Baht 1,781 million, a growth of Baht 23 million or 1.3% increase from last year. In 2015-2016 CK and its subsidiaries had no incurred expense for research and development.

In 2015, CK and its subsidiaries had financial cost amounting to Baht 1,545 million, increasing by Baht 77 million or 5.2% from 2014, because of the increase in long-term loan from bank and debenture. In 2016, financial cost was Baht 1,166 million, a reduction of Baht 379 million in 2015 or 24.5% from 2015 due to the reduction of average financial costs. Moreover, CK's subsidiaries expected to be compensated for interest expenses by the employers in the future.

For the corporate income tax, in 2015, CK had income tax expense amounting to Baht 459 million, increasing by Baht 116 million or 34% from the previous year mostly resulting from tax from gain on sale of investment. In 2016, income tax expense was Baht 78 million, decreasing by Baht 381 million or 83% reduction due to lower tax from gain from sale of investment.

Nevertheless, at the end of the year 2015, CK posted net profit attributable to equity holders of Baht 2,193 million, a decrease of Baht 103.6 million or 4.5% from 2014 due to the fact that the Company's and its subsidiaries' gross margin ratio marginally decreased together with higher administrative expenses and financial cost than the previous year. However, in 2016 CK and its subsidiaries had net profit attributable to equity holder of Baht 2,002 million, decreasing of Baht 190 million or 8.7% from year 2015 due to lower investment from sale by Baht 190 million as a result of the reduction in gain from sale of investment by Baht 1,740 million from the previous year. However, the Company had higher gross profit of Baht 377 million and a decrease in financial costs and income tax expenses comparing with that of the previous year.

Financial status

At the end of 2015, CK and its subsidiaries had total assets amounting to Baht 93,066 million, an increase by Baht 12,194 million or 15% from the previous year, mostly resulting from an increase in construction progress, investments in associated companies and metro project construction contract receivable, all of which would be due for billing on the date of the Commission Certificate. In 2016, CK and its subsidiaries had total assets amounting of Baht 94,928 million, an increase by Baht 1,862 million or 2% growth from the previous year mainly due to the increase in cash, investment in associated company which was BEM and loan to associated companies.

In term of liabilities, in 2015, CK and its subsidiaries had total liabilities amounting of Baht 72,210 million, an increase by Baht 10,809 million or 17.6% from the previous year, mostly due to

loans from banks and debentures for use in accelerating construction and accommodating future projects. In 2016, CK and its subsidiaries had total liabilities amounting of Baht 73,074 million, an increase by Baht 864 million or 1% from the previous year, mainly due to drawdown of short-term loans and issuance of additional debentures.

For shareholders' equity, at the end of 2015, CK and its subsidiaries had total shareholders' equity of Baht 20,856 million, an increase by Baht 1,385 million or 7% growth from the previous year, mainly due to the increase in retained earnings from operational results that had net profit of Baht 2,193 million. At the end of 2016, CK and its subsidiaries had total shareholders' equity in the total amount of Baht 21,854 million, an increase by Baht 999 million or 5% growth from the previous year, resulting from the operational results of the Company and gain on fair value of investments in TTW PCL.

Liquidity

In 2015, CK and its subsidiary had net cash used in operating activities of Baht 9,983 million as a result of the acceleration of construction progress resulting in an increase of long-term receivable and construction in progress. There was net cash used in investing activities amounted to Baht 1,247 million mostly came from the increase in investment in associated companies and other long-term investment. CK had net cash flow from financing activities of Baht 10,614 million from the increase in long-term loan from banks and debenture issuance, resulting in the decline in net cash of Baht 598 million from the beginning of the year.

In 2016, the Company and its subsidiaries had net cash from operating activities amounting to Baht 18,362 million, due to the Company's receipt of payment for service charges from various projects, particularly the Xayaburi Hydroelectric Power Project. There were net cash used in investing activities amounting to Baht 14,133 million, mostly resulting from loans to associated companies, investments in associated companies and other current investments. For the financing activities, there was net cash from financing activities amounting to Baht 2,505 million resulting from an increase in loans from banks and debentures, therefore, net cash increased by Baht 6,739 million.

Financial Ratio Analysis

The profitability ratio was deteriorated as the net profit margin decreased from 6.48% in 2014 to 5.77% in 2015 and 4.26% in 2016 respectively. Net project margin in 2015 decreased from 2014 because of the reduction in gross profit margin, higher administrative expense, and higher income tax expenses while net profit margin in 2016 decreased from 2015 because of the reduction in gross profit margin and the lower gain from sale of investment.

Return on equity also decreased from 10.51% in 2015 to 9.16% in 2016 as a result of the decrease in net profit from the lower gain from sale of investment.

6. Industry Overview

According to the GSB Research Center, Grassroots Economic and Business, Sector-Based Economy, the situation and trend of the business and construction industry in 2016 were reported well expanding, due to the significant supporting factor from acceleration of investment in the government sector's 20 basic infrastructure projects, with the investment value of Baht 1.79 trillion, which commenced bid from early 2016, and as a result, Thailand's construction industry in 2016 expanded more than that in 2015. Furthermore, the Ministry of Transport formulated the Transport Action Plan Year 2017 covering the transportation infrastructure investment projects as an urgent priority, for example, double track railway and new railway development projects, construction projects for roads, airports and ports, etc. However, the approach to the ASEAN Economic Community (AEC) caused Thai government policies to involve construction of transportation systems to link with the neighboring countries, such as, hi-speed train and road network, East-West Economic Corridor (EWEC) or Route No. 9 (R9), in accordance with the government's strategy for Thailand's utmost benefits from the ASEAN Economic Community (AEC), thereby resulting in continued growth of the construction industry, particularly investment in the government's basic infrastructure.

Source: Form 56-1 (2016) of the CK

Attachment 2
Summary of Draft M&E Equipment Procurement, Construction
and Management Contract for MRT Blue Line Project with
CH. Karnchang Public Company Limited

1. Transaction Date

If the Extraordinary General Meeting of Shareholders No. 1/2017, which will be held on June 12, 2017, passes a resolution to approve the Transaction, the Company expects to enter into the transaction within June 2017.

2. Related Parties for the Transaction

Employer : Bangkok Expressway and Metro Public Company Limited (the "Company" or "BEM")
Contractor : CH. Karnchang Public Company Limited ("CK")

3. General Characteristics of the Contract

The Company intends to engage CK for project management, supply, installation, and testing of the Mechanical and Electrical Equipment Work of the MRT Blue Line Extension Project in accordance with the Concession Agreement for the MRT Blue Line Project (the "Concession Agreement") dated March 31, 2017.

4. Scope of the Contract

Main scope of CK is (a) to perform Phase 1 of the Concession Agreement (Phase 1 is to design, manufacture, supply, install, test and commission the M&E Equipment of the MRT Blue Line Extension Project including the integration with the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) and installation and construction of supporting facilities in order to operate Through Operation System of the MRT Blue Line Project.), and (b) to supply 7 new rolling stocks for the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line project).

The main duties of CK under this contract are as follows:

- Design, supply, and install, the M&E systems of the MRT Blue Line Project, which comprises of but not limited to rolling stocks, signaling systems, power supply systems, SCADA system, communication systems, automatic fare collection system, platform screen doors, and depot workshop equipment.
- Connect the M&E Systems of the MRT Blue Line Extension Project with those of MRT Chaloem Ratchamongkhon and of the MRT Blue Line Project Bang Sue Station - Tao Poon Station Section, and conduct trial running to be in accordance with the provisions in the concession for the MRT Blue Line Project.
- Coordinate with the respective MRTA Designated Contractors for the Civil Infrastructure to check and ensure it is completed in order to maintain the Concessionaire's schedule.
- Jointly perform inspection, testing, and commissioning of the M&E systems of the MRT Blue Line Extension Project with the Company.

5. Term of the Contract

CK shall deliver the work under the contract within the period specified under the Blue Line Concession Agreement, in which the Company and The Mass Rapid Transit Authority of Thailand ("MRTA") signed on March 31, 2017¹. The completion date based on the Concession Agreement is divided to 2 phases as follows;

- Phase 1: Hua Lamphong Station – Lak Song Station will be completed by September 30, 2019, and
- Phase 2: Tao Poon Station – Tha Phra Station will be completed by March 31, 2020.

(Unless the MRTA later changes the completion schedule).

6. Performance Guarantee

¹ Under the Concession Agreement, timeframe for supply, install, and testing the M&E Systems for the MRT Blue Line Extension Project as well as trial running, within an operating period of (a) 30 months from the date the MRTA issues the Notice to Proceed (NTP) to the Company for the section from Hua Lamphong Station – Lak Song Station and (b) 36 months from the date the MRTA issues the Notice to Proceed (NTP) to the Company for the section from Tao Poon Station – Tha Phra Station.

MRTA issued the Notification to Proceed (NTP) to the Company since March 31, 2017. Therefore, the completion date of the Concession Agreement shall be (a) September 30, 2019 for the section from Hua Lamphong Station – Lak Song Station and (b) March 31, 2020 for the section from Tao Poon Station – Tha Phra Station (unless the MRTA later changes the completion schedule).

CK shall provide a performance bond with a value of 10 percent of the contract value. Such bond shall be valid until CK can be released from the obligation under this contract.

7. Completion

CK shall deliver the work under the contract within the period specified under the Blue Line Concession Agreement, in which the Company and MRTA signed on March 31, 2017.

Phase 1 Contract Work will be completed once the Company receives the Commissioning Certificate from the MRTA.

8. Total Value of Consideration

Baht 19,642.34 million (excluding value-added tax).

9. Term of Payments

The Company shall make a payment within 30 days after receiving invoice. The first payment will be Baht 2,946.35 million (around 15% of total contract value). Summary of the payment schedule is as follows;

Month	% of Contract Price	Payment Amount (Baht million)
1 - 12	53.85%	10,576.88
13 - 24	35.26%	6,924.95
25 - 34	10.90%	2,140.50
Total	100.00%	19,642.34

Remark: Provided that the Company enters into the Contract with CK within June 2017, 1st – 12th month will be June 2017 – May 2018, 13th – 24th month will be June 2018 – May 2019, and 25th – 34th month will be June 2019 – March 2020 (unless the MRTA later changes the completion schedule).

10. Variation Order

The Company may request variation of the design and requirements of the M&E Systems, and CK shall proceed in accordance with such variation, provided that both parties shall agree on the responsibility, costs, conditions and related details prior to CK carrying out such variation.

11. Insurance

CK shall provide for all risks insurance and third party liability with an insurance company duly engaging in business in Thailand, at its own expense, whereby the Company and CK shall be the insured and the MRTA shall be the co-insured and co-beneficiary, provided that such insurance coverage shall be effective throughout the period of Phase 1 of the Concession Agreement.

12. Liquidated Damages

If the Contractor fails to comply with the Key Dates, the Contractor shall, pay liquidated damages to the Concessionaire in accordance with the following schedule;

- In the event the delay to the Key Date for completion of Section 2 (from Hua Lamphong Station – Lak Song Station), based on the Concession Agreement, exceeds fifteen (15) Days, after the sixteenth day, the relevant daily rate of liquidated damages shall be applicable at the rate of Baht 7 million per day.
- In the event the delay to the Key Date for completion of Section 3 (from Tao Poon Station – Tha Phra Station), based on the Concession Agreement, exceeds fifteen (15) Days, after the sixteenth day, the relevant daily rate of liquidated damages shall be applicable at the rate of Baht 7 million per day

Notwithstanding, the maximum aggregate liquidated damages payable by the Contractor in respect to the timely completion of the Contract Work shall not exceed ten percent (10%) of the Contract Price.

13. Milestones and Key Dates

	Description	Completion Date
1	Obtain Notice to Proceed ^{1/} from MRTA	Start of Project Day #1 On March 31, 2017
2	Design all M&E Systems and External Interfaces, including detailed interface specifications and receives "Notice of No Objection".	End of Project Day #270 from NTP date ^{2/} (around 9 months or by December 26, 2017 ^{3/})
3	The Contractor has completed the assembly of the first complete 3 rolling stocks including communication systems, signaling systems & all other interfacing systems, factory tested, inspected by the BEM, and has been delivered to a designated location site in Bangkok Thailand.	End of Project Day #650 from NTP date ^{2/} (around 22 months or by January 10, 2019 ^{3/})
4	The Contractor has achieved successful Systems Integration Tests, submitted the related test results and test reports to the BEM that have received "Notice of No Objection". The Provisional Acceptance Certificate has been issued. The system is ready to commence Trial Running for Section 2 (Hua Lamphong Station – Lak Song Station).	End of Project Day #810 from NTP date ^{2/} (around 27 months or by June 19, 2019 ^{3/})
5	The Contractor has completed the obligations set out in General Specification for the completion of Trial Running, and the Contract Work is substantially completed. Taking Over Certificate has been issued and MRTA issues Commissioning Certificate for Section 2 (Hua Lamphong Station – Lak Song Station).	End of Project Day #900 from NTP date ^{2/} (around 30 months or by September 17, 2019 ^{3/})
6	The Contractor has achieved successful Systems Integration Tests, submitted the related test results and test reports to the BEM that have received "Notice of No Objection". The Provisional Acceptance Certificate has been issued. The system is ready to commence Trial Running for Section 3 (Tao Poon Station – Tha Phra Station).	End of Project Day #990 from NTP date ^{2/} (around 33 months or by December 16, 2019 ^{3/})
7	The Contractor has completed the obligations set out in General Specification for the completion of Trial Running, and the Contract Work is substantially completed. Taking Over Certificate has been issued and MRTA issues Commissioning Certificate for Section 3 (Tao Poon Station – Tha Phra Station).	End of Project Day #1,080 from NTP date ^{2/} (around 36 months or by March 15, 2020 ^{3/})

Remark:

1/ MRTA issued the Notification to Proceed (NTP) to the Company on March 31, 2017.

2/ Based on the NTP dated on March 31, 2017

3/ Unless the MRTA later changes the completion schedule.

14. Contract Document which are deemed to be construed as part of the Contract with CK

Appendix 1	Definition
Appendix 2	Milestones and Key Dates
Appendix 3	Contract Price, Pricing Schedule, and Interim Payment Schedule
Exhibit 1:	BEM's Requirement (Operation and Maintenance General Performance Requirement ("OMGPR"), General Specification ("GS"), and Technical Specifications ("TS"), all to the extent applicable to the M&E Equipment Specification and Requirements
Exhibit 2:	The Concession Agreement for the MRT Blue Line Project and MRTA's Requirements

Attachment 3

Summary of the Concession Agreement for the MRT Blue Line Project

1. Transaction Date

The Company signed the Concession Agreement with MRTA on March 31, 2017.

2. Related Parties for the Transaction

Concession Grantor : The Mass Rapid Transit Authority of Thailand ("MRTA")

Concessionaire : Bangkok Expressway and Metro Public Company Limited (the "Company")

3. General Characteristics of the Agreement

The Concession Agreement for the MRT Blue Line Project (the "Concession Agreement") is on a PPP Net Cost basis, where the MRTA invests in all civil work costs, and BEM invests in the railway systems and rolling stock, including train operation and maintenance services according to the service standards prescribed in the conditions of the agreement. BEM has the exclusive right to collect fares and undertake activities and commercial development, including advertising, leasing space in the project area, and telecommunications services within the stations and within the trains over the concession period. Under this agreement, BEM is obliged to pay remuneration from fares and commercial development to the MRTA at the rates prescribed therein.

The Concession Agreement for the MRT Blue Line Project consists of the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) from Bang Sue Station – Hua Lamphong Station and the MRT Blue Line Extension Project from Bang Sue Station – Tha Phra Station and from Hua Lamphong Station – Lak Song Station (Bang Kae).

The concession agreement of the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) is considered a part of this Concession Agreement in order to operate through operation system. The expiration of the concession agreement of the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) will be extended to be ended simultaneously with the MRT Blue Line Extension Project.

4. Term of the Agreement

The term of 33 years from the date the MRTA gives Notice to Proceed ("NTP")² which is divided into two phases, as following:

– Phase 1: Design and Construction (M&E System)

Supply, install, and testing the M&E Systems³ for the MRT Blue Line Extension Project as well as trial running, within an operating period of 36 months from the date the MRTA issues the Notice to Proceed (NTP) to the Company. The Operating schedule is as follows:

Section 1: Bang Sue Station – Tao Poon Station within August 15, 2017

Section 2: Hua Lamphong Station – Lak Song Station within in 30 month from the NTP date⁴

Section 3: Tao Poon Station – Tha Phra Station within 36 months from the NTP date⁵

– Phase 2: Operation and Maintenance Services (O&M Services)

The Company has the duty to effectively and safely operate Through Operation system of the whole MRT Blue Line Project over 30 years, starting from the commercial date that can generate revenue for the whole MRT Blue Line.

In the case that, the MRTA is unable to provide BEM with access to the civil infrastructure of the site within a specific time exceeding 60 days, whereby the Company has been granted an extension of time for Phase 1 and other phases accordingly.

² MRTA issued the Notification to Proceed (NTP) to the Company since March 31, 2017. Therefore, the completion date of the Concession Agreement shall be by March 31, 2020 (unless the MRTA later changes the completion schedule).

³ M&E System is all mechanical and equipment system of rail system such as rolling stocks, signal system, operation control system, power supply system, communication system, auto fare collection system, platform screen door system and repair and maintenance equipment within depot and outside depot including patent, where the details are described in the Concession Agreement.

⁴ MRTA issued the Notification to Proceed (NTP) to the Company since March 31, 2017, the completion date for Section 2 shall be on September 30, 2019 (unless the MRTA later changes the completion schedule).

⁵ MRTA issued the Notification to Proceed (NTP) to the Company since March 31, 2017, the completion date for Section 3 shall be on March 31, 2020 (unless the MRTA later changes the completion schedule).

5. Scope of Work

Right and Obligation of the Company

- Phase 1: Design and Construction (M&E System)

The Company has the duty to supply, install, and testing the M&E Systems of the MRT Blue Line Extension Project as well as commences the operation of the MRT Initial Blue Line Project and the MRT Blue Line Extension Project for the completed sections with efficiency and complying with safety standard set out in the Concession Agreement. In addition, the Company has the exclusive right to undertake activities and commercial development.

- Phase 2: Operation and Maintenance Services (O&M Services)

The Company has the duty to operate of the MRT Initial Blue Line Project and the MRT Blue Line Extension Project on Through Operation Basis with total distance of 47 kilometers and total 38 stations. The Company has the exclusive right to collect fares and undertake activities and commercial development.

For maintenance in Phase 2, the Company shall undertake the repair and maintenance works of the M&E systems including civil infrastructure but not including the park-and-ride building and its equipment and system. In addition, the Company shall arrange accredit personal and staffs sufficiently to provide O&M services throughout the period of the Concession Agreement.

6. Performance Guarantee

On the Agreement date, the Company shall submit to MRTA a performance bond in the amount of Baht 210 million. Such bond's term shall remain throughout the term of the Concession Agreement.

7. Source of Revenues

The Company's source of revenue is from fares collection and revenues from commercial development. The structure of fare rates and fare adjustments will be in accordance with the concession agreement of the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project).

8. Remuneration Payment to MRTA

Phase 1: In accordance with the concession agreement of the MRT Chaloem Ratchamongkhon Project

Phase 2: The MRT Blue Line Extension Project and the MRT Chaloem Ratchamongkhon Project (from July 2, 2029 to the end of the concession agreement).

- (1) In any year that the Company earns Equity Internal Rate of Return ("EIRR") of more than 9.75 percent but less than 11.00 percent, the Company shall pay consideration to the MRTA at the rate of 50.00 of Free Cash Flow to Equity ("FCFE"), which is generated EIRR more than 9.75 percent but less than 11.00 percent;
- (2) In any year that the Company earns EIRR of more than 11.00 percent but less than 15.00 percent, the Company shall pay consideration to the MRTA at the rate of 60.00 of FCFE, which is generated EIRR more than 11.00 percent but less than 15.00 percent; and
- (3) In any year that the Company earns EIRR of more than 15.00 percent, the Company shall pay consideration to the MRTA at the rate of 75.00 of FCFE which is generated EIRR more than 15.00 percent.

9. Insurance

The Company shall provide for all risks insurance and third party liability insurance with an insurance company duly engaging in business in Thailand, at its own expense, whereby the Company shall be the insured and the MRTA and a creditor to this project (if any) shall be the co-insured and co-beneficiary, provided that such insurance coverage shall be effective throughout the period of the Concession Agreement.

10. Delay of the Project Caused by BEM

In the case that the delay caused by BEM and not a force majeure or under the exceptional clauses for a period exceeding 60 days, the Company is liable to pay a liquidated damage to MRTA amounting to Baht 7 per day from the first day of such delay.

11. Source of Fund

The Company shall secure the source of financing for the investment and operation under its right and obligation under this Concession Agreement.

12. Ownership on the M&E System

The Company shall transfer the ownership of the M&E System, which were the assets constructed and procured under the concession agreement for the MRT Chaloem Ratchamongkhon Project that is in service at the present, to the MRTA right after the signing of this Concession Agreement and the MRTA shall transfer a right to use and process of the assets to the Company on the same day.

The Company shall transfer the ownership of the M&E System, which are the assets constructed and procured under the concession agreement for the MRT Blue Line Extension Project, to the MRTA when the Company has passed all necessary tests under the Concession Agreement and commence the operation of the MRT Blue Line Project in whole or in part. Then, the MRTA shall transfer the right to use and process of the assets including the civil work (excluding the park-and-ride building but including the basement of the park-and-ride building at Lad Prao Station) to the Company on the same day.

13. Termination of the Agreement caused by BEM's Faults

In the case that the Company is unable to complete the works and commence the services in whole or in part within 180 days from the specified date in the Concession Agreement or the extended date.

As a result, the MRTA has a right to terminate the Concession Agreement and the MRTA shall make a payment to the Company as follows;

- Phase 1: The MRTA shall make a payment to the Company in equivalent to the book value of the completed works and M&E systems that can be used by the MRTA and deducted by the damage claim of the MRTA.
- Phase 2: The MRTA shall make a payment to the Company in equivalent to the book value of the M&E systems that can be used by the MRTA and deducted by the damage claim of the MRTA.

14. Board of Investment (BOI) Privileges

The MRTA shall request to the cabinet to consider the approval the Board of Investment (BOI) Privileges under the Investment Promotion Act B.E. 2520 (and the amendment) for the MRT Blue Line Project, and assist the Company to be granted the Board of Investment (BOI) Privileges under the Investment Promotion Act B.E. 2520 (and the amendment) as necessary.

15. Attachment to the Agreement

Attachment 1	M&E Specification and O&M Requirements of the MRTA
Attachment 2	Implementation Schedules and Key Dates
Attachment 3	MRTA's Ridership
Attachment 4	Procedures and Criteria for Transfer and Handover
Attachment 5	Example of the calculation of remuneration payment to the MRTA
Attachment 6	Form of the Performance Bond
Attachment 7	Other documents
	7.1 Confirmation Letter from BEM
	7.2 Work area
	7.3 Commercial area
	7.4 Affidavit of BEM

Attachment 4

Information of the MRT Blue Line Extension Project

1. Background

Developing of the MRT Blue Line Project, meaning the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) from Hua Lamphong – Bang Sue and the MRT Blue Line Extension Project from Hua Lamphong – Bang Kae and Bang Sue – Tha Phra, was facing with many problems, which are the connection and operation of the whole Blue Line Project, the selection of private sector and the revision of the existing public private partnership agreement, as to the operation of the project must be Through Operation system. Therefore, for the highest advantages to public and the government, on July 17, 2016, the Head of National Council for Peace and Order (NCPO) issued Order No.42/2559 (2016) (as published in the Government Gazette dated July 21, 2016) concerning the implementation of the MRT Blue Line Extension Project, stating that the PPP Policy Committee under Section 35 considering the MRT Blue Line Extension Project and the Supervisory Committee under Section 43 for the Public Private Partnership Act considering the MRT Chaloem Ratchamongkhon Project must jointly consider the problems of the MRT Blue Line Project. After reaching the conclusion, negotiation with the concessionaire of the MRT Chaloem Ratchamongkhon Project was follow to conclude the operation of the MRT Blue Line Project and the revision of the Concession Agreement for the MRT Chaloem Ratchamongkhon Project. This will allow Through Operation system of the MRT Chaloem Ratchamongkhon Project and the MRT Blue Line Extension Project, and allow the expiration of the Blue Line Project to be ended simultaneously or consistently.

On March 28, 2017, the Cabinet has approved the MRTA to enter into the Concession Agreement for the MRT Blue Line Project (the “Concession Agreement”) with the Company.

Then on March 30, 2017, the Company and the MRTA have signed the Concession Agreement on a public-private partnership (PPP) Net Cost basis⁶ for the concession period of 33 years. Under the Concession Agreement, the MRT Chaloem Ratchamongkhon Project (the MRT Initial Blue Line Project) is considered a part of the MRT Blue Line Project. The expiration of the MRT Initial Blue Line Project will be extended from July 1, 2029 to end simultaneously with the MRT Blue Line Extension Project.

2. MRT Blue Line Extension Routes

Total length of the MRT Blue Line Extension Project is 26.9 kilometers, 21.5 kilometers elevated structure with 15 stations and the remaining 5.4 kilometers underground structure with 4 stations.

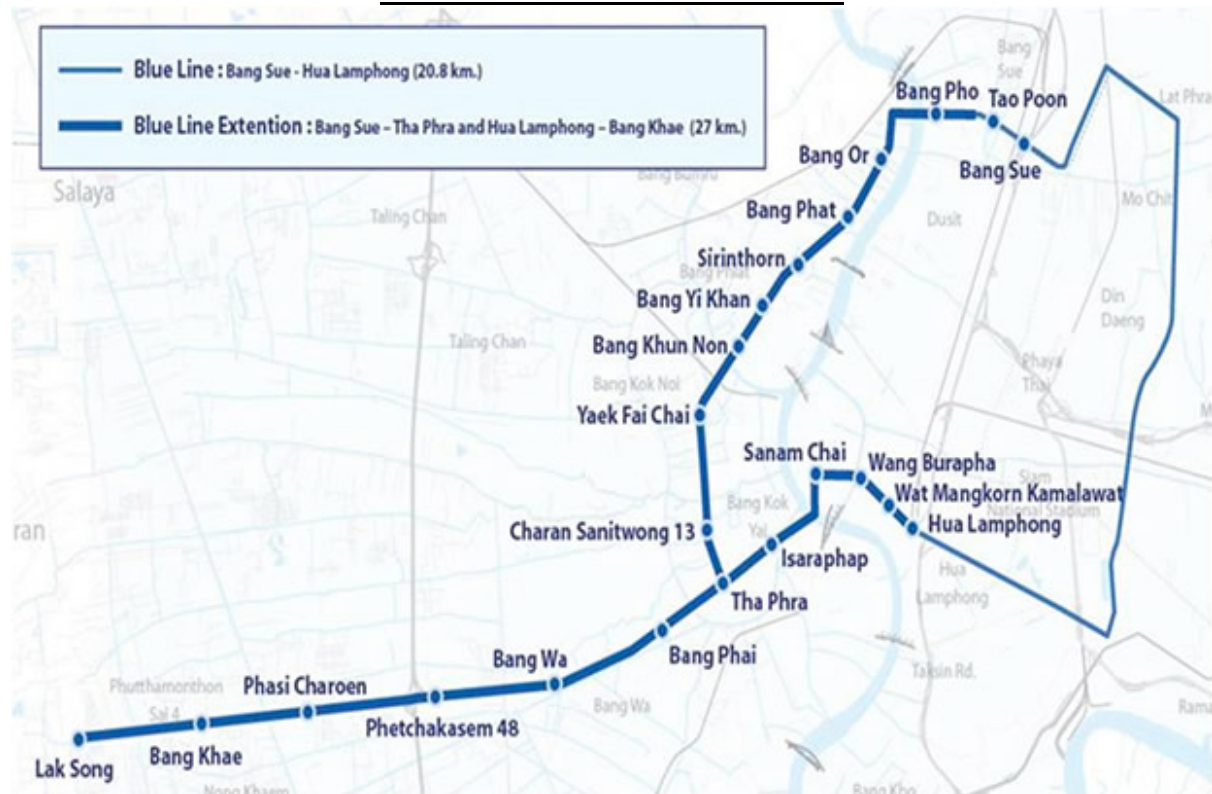
Hua Lamphong – Bang Khae (Lak Song Station)

The Hua Lamphong to Lak Song section is a total length of approximately 14 km with a total of 11 new stations plus the existing Hua Lamphong station. It consists of approximately 5 kilometers of underground structure with 4 underground stations and 9 kilometers of elevated structure with 7 elevated stations. The underground route starts from Hua Lamphong Station along Rama IV Road to Charoen Krung Road, passing Wat Mangkorn Kamalawat and Wang Burapa. The route then enters Sanam Chai Road, goes crossing under the Chao Phraya River at Pak Khlong Talad, and goes along Issaraphap Road. Then, the line changes to elevated structure and heads to Tha Phra intersection, which intersects with the MRT Blue Line Project Bang Sue Station – Tha Phra Station Section, runs along Phetkasem Road, passing Bang Pai, Bang Wa, Phasi Charoen, and Bang Kae, and ends at Kanchanapisek Road.

A Depot facility is located adjacent to Phet Kasem 28 (for light maintenance). Tha Phra station will act as an interchange between Hua Lamphong – Bang Khae (Lak Song Station) and Tao Poon - Tha Phra.

⁶ PPP Net Cost Basis: The MRTA invests in all civil work costs, and BEM invests in the railway systems and rolling stocks, including train operation and maintenance services according to the service standards prescribed in the conditions of the agreement. BEM has the exclusive right to collect fares and undertake activities and commercial development, including advertising, leasing space in the project area, and telecommunications services in the stations and in the trains. Under this agreement, BEM is obliged to pay remuneration calculated from fares and commercial development revenues to the MRTA at the rates prescribed therein.

Route of the MRT Blue Line Extension



<http://www.skyscrapercity.com/showthread.php?t=949098&page=85>

Remark: Lak Song – Phuttha Monthon Sai 4 Section of the MRT Blue Line Extension has not yet constructed.

Location of the stations

- Wat Mangkorn Kamalavas Station located on Charoen Krung Road intersects with Phlapphla Chai Road and Plang Nam Intersection.
- Wang Bura Pha Station located on Charoen Krung Road intersects with Mahachai Road at Sam Yod Intersection until Charoen Krung Road intersects with Aunakan and Bura Pha Road. This station is interchange station with the MRT Purple Line (Bang Yai – Rat Burana).
- Sanam Chai Station located on Sanam Chai Road intersects with Prapipit Road until Sanam Chai Road intersects with Rajini Road around Khlong Khu Mueang Doem.
- Itsaraphap Station located on Soi Itsaraphap 23 until Soi Itsaraphap 34.
- Tha Phra Station located on Tha Phra Intersection, which is the co-station with the MRT Blue Line Section 3 (Bang Sue – Tha Phra).
- Bang Phai Station located along Phet Kasem Road between Soi Phet Kasem 19 and Soi Phet Kasem 19/2.
- Bang Wa Station located along Phet Kasem Road between Bang Wa Intersection and Soi Phet Kasem 34.
- Phet Kasem 48 Station located along Phet Kasem Road between Soi Phet Kasem 31/1 and Soi Phet Kasem 46/2.
- Phasi Charoen Station located along Phet Kasem Road in front of Seacon Bang Kae Shopping Center.
- Bang Khae Station located along Phet Kasem Road between Soi Phet Kasem 62/3 and Soi Phet Kasem 62/4.
- Lak Song Station located along Phet Kasem Road between Soi Phet Kasem 80 and Tang Ra Dab Phet Kasem Junction and Kanchanaphisek Road.

Bang Sue – Tha Phra

The Tao Poon to Tha Phra section is a total a length of approximately 13 kilometers with a total of 10 new elevated stations (including Tha Phra Station). The route starts from Bang Sue Station, enters Tao Poon intersection, which intersects with the MRT Purple Line Project, and then enters into Pracharat Sai 2 Road, passing Bang Pho intersection, crosses the Chao Phraya River, goes along Charansanitwong Road around Technology Pharam 6 school, passing Bang Phlat

intersection, Borommaratchonnani intersection, and Fai Chai intersection, and ends at Tha Phra intersection, which intersects with the MRT Blue Line Project Hua Lamphong Station – Bang Khae Station Section.

Location of the stations

- Tao Poon Station is the interchange station with the MRT Purple Line (Bang Yai – Bang Sue) and located on Pracharat Sai 2 Road intersect with Krung Thep – Nonthaburi Road at Tao Poon Intersection.
- Bang Pho Station located on Pracharat Sai 2 Road intersects with Pracharat Sai 1 Road at Bang Pho Intersection.
- Bang Or Station located on Charansanitwong Road between Soi Charansanitwong 86/2 and Soi Charansanitwong 90.
- Bang Phlat Station located on Charansanitwong Road between Soi Charansanitwong 76 and Soi Charansanitwong 81.
- Sirindhorn Station located on Charansanitwong Road intersects with Ratchawithi Road and Sirindhorn Road at Sirindhorn Intersection.
- Bang Yi Khan Station located on Charansanitwong Road around Soi Charansanitwong 42.
- Bang Khunnon Station located on Charansanitwong Road around Bang Khunnon Intersection.
- Yaek Fai Chai Station located on Charansanitwong Road around Fai Chai Junction.
- Charansanitwong 13 Station located on Charansanitwong Road between Soi Charansanitwong 13 and Klong Watdeedoew.
- Tha Phra Station located on Tha Phra Intersection and is the co-station with the MRT Blue Line Extension Section Hua Lamphong – Bang Khae.

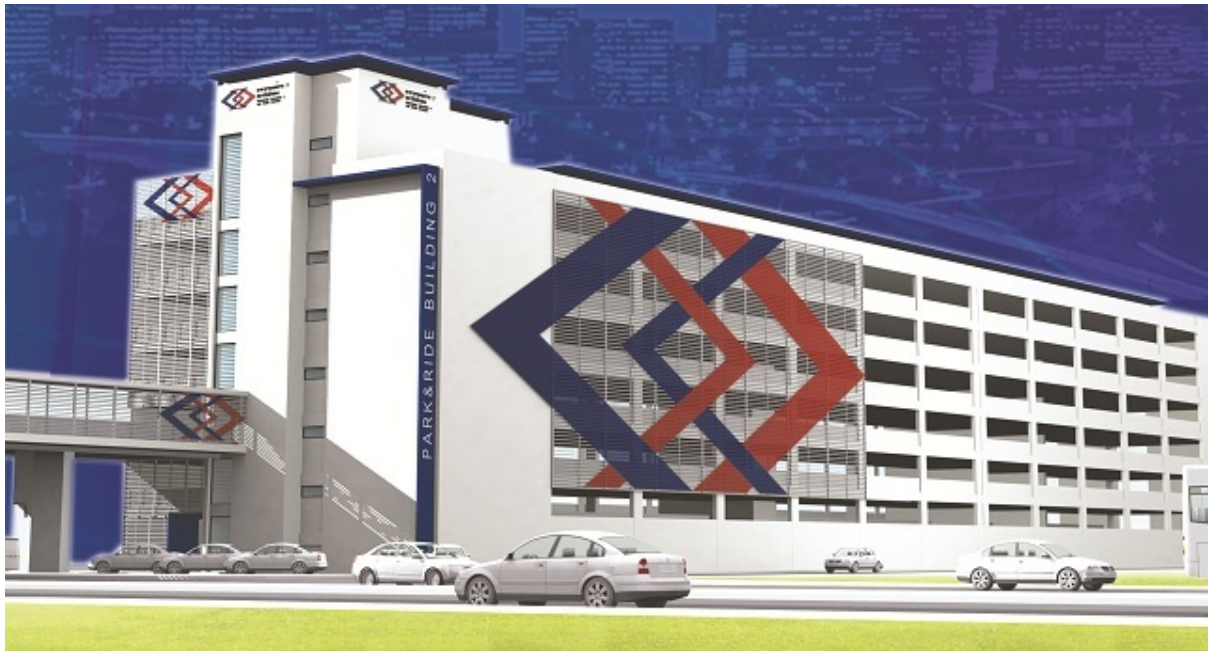
3. Park-and-Ride Buildings

The MRT Blue Line Project will have 2 park-and-ride buildings located on both side of Phet Kasem Road at Lak Song Station. Elevated walkways and road across the road will be constructed to connect 2 buildings, which are 10-storey building (between Soi Phet Kasem 47 and Soi 47/1) and 8-storey building (next to Soi Phet Kasem 80).

(1) 10-storey park-and-ride building for 650 cars



(2) 8-storey park-and-ride building for 350 cars



4. Depot

Total area is 90 rais next to Phet Kasem 48 Station. The depot will comprise of the Operations Control Center (OCC), maintenance buildings, management office, parking facility for trains and testing track.



5. Construction and Consulting Agreements

Contract No.	Description	Details	Contract Value (Baht mn)	Winner (Contractor)	Progress ^{1/}
1	Design and construction of the 2.8 km underground structure from Hua Lamphong to Sanam Chai	<ul style="list-style-type: none"> - 2.8 kilometers length of underground twin running tunnel - Construction of 2 underground stations, Wat Mungkorn Station and Wang Burapa Station - Ventilation system for 2 stations - Construction work to connect with the existing underground station at Hua Lamphong Station 	11,441	Italian-Thai Development PCL. (ITD)	95.70% (0.16% faster than its schedule)
2	Design and construction of the 2.6 km underground structure from Sanam Chai - Tha Phra	<ul style="list-style-type: none"> - 2.57 kilometers length of underground twin running tunnel - Construction of 2 underground stations, Sanam Chai Station and Itsaraphap Station - Construction of underground tunnel through Chao Praya river - Construction work to connect with the Contract 4 at Tha Phra 	10,687	CH. Karnchang PCL. (CK)	100% (Delivering the work)
3	Construction of 11 km elevated structure from Tao Poon to Tha Phra and construction of crossing way along Chao Praya river	<ul style="list-style-type: none"> - Construction of elevated structure with 17 meter high - Length 11.04 kilometers - 8 elevated stations from Tao Poon – Tha Phra 	11,284	SH-UN Joint venture (Sino Hydro Corporation Co., Ltd. and Unique Engineering and Construction PCL. (UNIQ))	76.02% (0.01% faster than its schedule)
4	Construction of 10.5 km elevated structure from Tha Phra to Lak Song, and construction of Depot and 2 parking buildings	<ul style="list-style-type: none"> - Civil works (elevated structure) from Tha Phra – Lak Song - Length of 10.47 kilometers 	13,334	Sino-Thai Engineering and Construction PCL. (STEC)	97.15% (0.0% faster than its schedule)
5	Design and project management for the civil works of rail system	<ul style="list-style-type: none"> - Track system (Length 70.00 kilometers) - Design, supply, test and fabrication of track system with total length of 27 kilometers - Hua Lamphong – Bang Khae Section and Bang Sue – Tha Phra Section 	5,153 (Standard price)	CH. Karnchang PCL. (CK)	83.47% (0.92% faster than its schedule)
6-1	Manufacturing, installation and testing of the M&E system (Hua Lamphong – Lak Song and Tao Poon – Tha Phra)	<i>Execution of the power under Section 44 of the interim constitution, the Cabinet's resolution approved BEM to undertake the MRT Blue Line extension project on a public-private partnership (PPP) net cost basis for 33 years and extension of the Initial Blue Line Project to be ended simultaneously.</i>			
6-2	Installation of testing of the M&E system (Bang Sue – Tao Poon)				
7	Project Management Consultant (PMC)	Project management for civil works and system works	726	Group of consultant: Index ^{2/}	
8	Construction Supervision Consultant (CSC)	Responsible for supervision of 5 civil work contracts	1,209	Group of consultant: MAA ^{3/}	

Remark:

1/ Overall progress of 91.45% (0.12% faster than schedule), as of March 2017 (Please see more information in http://www.mrta-blueline.com/progresses/report_latest)

2/ Comprised of Index International Co., Ltd., Dorsch Consult Co., Ltd., Lanna Engineering Consultant Co., Ltd., Arun Chaiseri Consulting Engineers Co., Ltd., Project Planning Services Co., Ltd., PPSN Co., Ltd. and Merlin's Solutions International Ltd.

3/ Comprised of MAA Consultants Co., Ltd., Tesco Co., Ltd., Epsilon Co., Ltd., Norciv Engineering Co., Ltd., Utility Design Consultants Co., Ltd., D2 Consult Asia Co., Ltd., Moh and Associates Co., Ltd. and Nippon Koei Co., Ltd.

Reference for the Attachment 3:

- <http://www.mrta-blueline.com/>
- <http://www.mrta.co.th/th/projectelectrictrain/blueline/>
- https://th.wikipedia.org/wiki/MRT_Chaloem_Ratchamongkhon
- The MRT Blue Line Project Concession Agreement

Attachment 5

Mass Rapid Transit Network

1. 13 Projects of Mass Rapid Transit Network

- (1) **Dark Red Line** (Suburban railway system)
Thammasart Rangsit Campus – Bang Sue – Hua Lamphong – Bang Born – Mahachai
- (2) **Light Red Line** (Suburban railway system)
Saraya – Taling Chan – Bang Sorn – Bang Sue – Phyathai – Makkasan – Huamark
- (3) **Airport Rail Link**
Suvarnabhumi – Phyathai – Bang Sue – Don Mueang
- (4) **Dark Green Line** (Elevated structure)
Lam Luk Ka – Khu Khot – Sapan Mai – Mo Chit – Siam Square – On Nut – Bearing – Samut Prakan – Bangpu and Udom Suk – Suvarnabhumi
- (5) **Light Green Line** (Elevated structure)
Taling Chan – Bang Wha – Wongwian Yai – Saphan Taksin – Siam Square – National Stadium – Yod Sae
- (6) **Blue Line** (Underground and elevated structure)
Tha Phra – Bang Sue – Hua Lamphong
Hua Lamphong – Tha Phra – Bang Khae – Phutthamonthon Sai 4
- (7) **Purple Line** (Underground and elevated structure)
Klong Bang Phai – Tao Poon – Rat Burana
- (8) **Orange Line** (Underground and elevated structure)
Taling Chan – Thailand Cultural Center – Bangkokpi – Min Buri – Suwinthawong
- (9) **Pink Line** (Elevated straddle monorail system)
Khae Rai – Pak Kret – Lak Si – Outer Ring – Min Buri
- (10) **Yellow Line** (Elevated straddle monorail system)
Lad Prao – Phatthanakan – Srinakarin – Samrong
- (11) **Grey Line**
Wat Cha Ra Pon – Lad Prao – Thonglor – Rama 4 – Rama 9 Bridge
- (12) **Light Blue Line**
Din Dang – Makkasan – Wittayu – Sathorn
- (13) **Brown Line** (Under study)
Kae Rai – Kasetsart – Nuanchan – Bung Kum – Sammakorn

2. Mass Rapid Transit Projects in Services at the Present

- (1) **Light Red Line** (Suburban railway system)
Taling Chan – Bang Son
- (2) **Airport Rail Link**
Suvarnabhumi – Phyathai
- (3) **Dark Green Line** (Elevated structure)
Mo Chit – Siam Square – On Nut – Bearing – Samrong
- (4) **Light Green Line** (Elevated structure)
Bang Wha – Wongwian Yai – Saphan Taksin – Siam Square – National Stadium
- (5) **Blue Line** (Underground structure)
Bang Sue – Hua Lamphong
- (6) **Purple Line** (Elevated structure)
Klong Bang Phai – Tao Poon

Map of Mass Rapid Transit Network (13 Projects)



Source: <http://news.mthai.com/pic-news/infographics/391147.html>

Map of Mass Rapid Transit Projects in Services



Source: <http://yusabuy.com/2016/02/26/progress/>

Remark: Additional routes in service (addition to ones shown in the above chart) are the Dark Green Line from Bearing – Samrong and the Purple Line (North Section) from Klong Bang Phai – Tao Poon