

## REFERENCES

- Abdul-Rahman, H., Berawi, M.A., Berawi, A.R., Mohamed, O., Othman, M. and Yahya, I.A. (2006). Delay mitigation in the Malaysian construction industry. Journal of Construction Engineering and Management 132(2): 125–33.
- Adolwa, M. (2002). Development of small building contractors in Botswana: a critical evaluation. Thesis submitted in fulfillment of part of the requirements for the degree of Master of Science (Project Management) University of Pretoria.
- Aibinu, A.A. and Jagboro, G.O. (2002). The effects of construction delays on project delivery in Nigerian construction industry. International Journal of Project Management 20(8): 593–9.
- Al-Khalil, M.I. and Al-Ghafly, M.A. (1999). Important causes of delays in public utility projects in Saudi Arabia. Construction Management and Economics, 17: 647–55.
- Amorn, P. and Korb, S. (2008). Factors effecting risk of construction contractors: A case study of Mukdahan province. 13<sup>th</sup> Proceeding of National Convention on Civil Engineering. Pataya. Thailand.
- Aniekwu, A.N. and Okpala, D.C. (1987). Contractual arrangements and the performance of the Nigerian construction industry (the structural component). Construction Management and Economics 5: 3± 11.
- Arditi, R.D., Akan, G.T. and Gurdamar, S. (1985). Reasons for delays in public projects in Turkey. Construction Management and Economics 3: 171–81.
- Assaf, S. and Al-Hejji, S. (2006). Causes of delay in large construction projects. International Journal of Project Management 24: 349–57.
- Assaf, S.A., Al-Khalil, M. and Al-Hazmi, M. (1995). Causes of delay in large building construction projects. ASCE Journal of Management in Engineering 11(2): 45–50.
- Baldwin, J.R. and Manthei, J.M. (1971). Causes of delays in the construction industry. ASCE Journal of the Construction Division 97: 177–87.

- Beach, R., Webster, M. and Campbell, K.M. (2005). An evaluation of partnership development in the construction industry. International Journal of Project Management 23: 611-621.
- Chan, D.W.M. and Kumaraswamy, M.M. (1997). A comparative study of causes of time overruns in Hong Kong construction projects. International Journal of Project Management 15(1): 55-63.
- Cheung, S.O., Tam, C.M., Ndekugri, I. and Harris, F.C. (2000). Factors affecting clients' project dispute resolution satisfaction in Hong Kong. Construction Management and Economics 18: 281-94.
- Drewer, S. (1975). The Supply of Construction Services in the West Midlands. The Study of the Mechanism of Response to Effective Demand. Building Economics Research Unit, University College, London.
- Drewer, S. (1980). Construction and development: a new perspective. Habitat International, 5(3/4): 395-428.
- Drewer, S. (1997). Construction and development: further reflections on the work of Duccio Turin. Proceedings of 1st International Conference on Construction Industry Development: Building the Future Together 9-11 December, Singapore 1: 132-9.
- Economic Committee (1986). The Singapore Economy: New Directions. Ministry of Trade and Industry. Singapore.
- Edmonds, G.A. (1979). The construction industry in developing countries. International Labor Review, 118(3): 355-69.
- Edmonds, G.A. and Miles, D.W.J. (1984). Foundations for Change: Aspects of the Construction Industry in Developing Countries. Intermediate Technology, London.
- Elonen, S. and Arto, A. (2003). Problems in managing international development projects in multi-project environments. International Journal of Project Management 21: 395-402.
- Faridi, A.S. and El-Sayegh, S.M. (2006). Significant factors causing delay in the UAE construction industry. Construction Management and Economics, 24: 1167-76.

- Farooq, S. M. (1996). Contractor – Caused Delays in Construction Projects: A Case Study of Three Construction Sites in Pakistan. A thesis submitted in partial of the requirements for the degree of Master of Engineering AIT Bangkok.
- Groak, S. (1994). Is Construction an Industry? Notes towards a greater analytic emphasis on external linkages. Construction Management and Economics 12: 287-293.
- Hillebrandt, P.M. (2000). Economic Theory and the Construction Industry. 3rd Edition. Macmillan, London.
- Hippoh, Y. (1983). The Construction Industry in Japan: A survey. Asian Productivity Organisation, Tokyo.
- Ittiphong, P. and Vacharapoom, B. (2008). Typical problems on the business process of small and medium-sized construction companies. 13<sup>th</sup> Proceeding of National Convention on Civil Engineering. Pataya. Thailand.
- Kaming, P.F, Olomolaiye, P.O., Corbett, P. and Harris, F.C. (1994). A framework for the strategic development of the construction industry in developing countries. Building Research and Information 22(6): 325-331
- Kaming, P.F., Olomolaiye, P.O., Holt, G.D. and Harris, F. (1997). Factors influencing time and cost overruns on high-rise projects in Indonesia. Construction Management and Economics 15: 83–94.
- Lim, C.S. and Mohamed, M.Z. (2000). An exploratory study into recurring construction problems. International Journal of Project Management 18(3): 267–73.
- Long, N.D., Ogunlana, S., Quang, T. and Lam, K.C. (2004). Large construction projects in developing countries: a case study from Vietnam. International Journal of Project Management 20(7): 553–61.
- Low, S.P. and Leong, C.H.Y. (1992). A revisit to Turin's paradigm: construction and development in the 1970s and 1980s. Habitat International 16(3): 103–17.
- Mansfield, N.R., Ugwu, O.O. and Doran, T. (1994). Causes of delay and cost overruns in Nigerian construction projects. International Journal of Project Management 12(4): 254–60.

- Manuel, G., Benito A. and Alberto F. (1998). Regulation as a Cause of Firm Fragmentation: The Case of the Spanish Construction Industry. International Review of Law and Economics 18: 433-450.
- Mezher, T.M. and Tawil, W. (1998). Causes of delays in the construction industry in Lebanon. Engineering, Construction and Architectural Management 5(3): 252-60.
- Ministry of Land Management, Urban Planning and Construction, (2007). Brief Report of the Growth of Construction Sectors in Cambodia. LMUPC. Phnom Penh. Cambodia.
- Ngowi, A.B., Piennar, E., Talukhaba, A. and Mbachu, J. (2004). The globalization of the construction industry –a review. Building and Environment 40: 135-141.
- NIS. (2006). Statistical Year Book 2006. National Institute of Statistics. Phnom Penh.
- Nuttawat, W. and Wannawit, T. (2008). Works abandonment by contractors leading to contract termination for public construction projects. 13<sup>th</sup> Proceeding of National Convention on Civil Engineering. Pataya. Thailand.
- Odeh, A.M. and Battaineh, H.T. (2002). Causes of construction delay: traditional contracts. International Journal of Project Management 20: 67-73.
- Ofori, G. (1988). Construction industry and economic growth in Singapore. Construction Management and Economics 6: 57-70.
- Ofori, G. (1990). The Construction Industry: Aspects of Its Economics and Management. Singapore University Press. Singapore.
- Ofori, G. (1988). Construction and economic growth in Singapore. Construction Management and Economics 6: 57-70.
- Ofori, G. (1993). Research on construction industry development at the crossroads. Construction Management and Economics 11: 175-185.
- Ofori, G. (1994). Formulating a long-term strategy for developing the construction industry of Singapore. Construction Management and Economics 12: 219-231.
- Ofori, G. (2001). Indicators for measuring construction industry development in developing countries. Building Research and Information 29(1): 40-50.

- Ogunlana, S.O., Promkuntong, K. and Jearkijran, V. (1996). Construction delays in a fast-growing economy: comparing Thailand with other economies. International Journal of Project Management 14(1): 37–45.
- Olomolaiye, P.O. (1990). Material Management Practice and Waste on Nigerian Building Sites. Building Research and Environment
- Raftery, J., Pasadilla, B., Chiang Y.H., Hui, E.C.M. and Tang B.S. (1998). Globalization and construction industry development: implications of recent development in the construction sector in Asia. Construction Management and Economics 16: 729-737.
- Palalani, K. Challenges Facing the Construction Industry: A Botswana Perspective.
- Ramsaran, R. and Hosein, R. (2006). Growth, employment and the construction industry in Trinidad and Tobago. Construction Management and Economics 24: 465-474
- Samak, T. and Narong, L. (2008). Factors effectings of construction and construction delay improvement in Thai government project. 13<sup>th</sup> Proceeding of National Convention on Civil Engineering. Pataya. Thailand.
- Sambasivan, M. and Soon, Y.W. (2007). Causes and effects of delays in Malaysian construction industry. International Journal of Project Management 25: 517–26.
- Song, Y., Liu, C. and Langston, C. (2006). Linkage measure of the construction sector using the hypothetical extraction method. Construction Management and Economics 24: 579-589.
- Strassman, P. (1970). The construction sector in economic development. The Scottish Journal of Political Economy November: 390–410.
- Strassman, P.A. and Wells J. (1988). The Global Construction Industry. Unwin Hyman, London.
- Su, C.K., Lin, C.Y., and Wang, M.T. (2003). Taiwanese construction sector in a growing 'maturity' economy, 1964-1999. Construction Management and Economics 21: 719-728.

- Sullivan, A. and Harris, F.C. (1986). Delays on large construction projects. International Journal of Operations and Production Management 6(1): 25–33.
- Toor, S.U.R. and Ogunlana, S.O. (2008). Problems causing delays in major construction projects in Thailand. Construction Management and Economics 26: 395-408.
- Turin, D.A. (1969). The Construction Industry, UNIDO, Vienna.
- Turin, D.A. (1973). The Construction Industry: Its Economic Significance and Its Role in Development. 2<sup>nd</sup> Edition. University College Environmental Research Group. London.
- Wang, D., Hadavi, A. and Krizek, R.J. (2006). Chinese Construction Firms in Reform. Construction Management and Economics 24: 509-519.
- Wells, J. (1985). The role of construction in economic growth and development. Habitat International 9: 55± 70.
- Wells, J. (1986). The Construction Industry in Developing Countries: Alternative Strategies for Development. Croom Helm. London.
- Wema, E. (1991). A framework for the strategic development of the construction industry in developing countries. Construction Management and Economics
- Wema, E. (1993). The Concomitant Evolution and Stagnation of the Brazilian Building Industry. Construction Management and Economics 11: 194-202.
- World Bank (1984). The Construction Industry: Issues and strategies in developing countries. Washington. D.C.
- Wutthipong M. and Banham, E. (2008). A comparison of delay factors between private and government projects. 13<sup>th</sup> Proceeding of National Convention on Civil Engineering. Pataya. Thailand.

## **APPENDICES**

**APPENDIX A**

**LIST OF RESPONDING CONTRACTORS IN  
CAMBODIA**



❖ THE CONTRACTORS OF CLASS 1 (BIG CONTRACTORS)

- 1) WEN Holding Co., Ltd
- 2) Muhibbah Engineering (Cambodia) Co., Ltd
- 3) LBL International Company
- 4) Ly Chhuong Co., Ltd
- 5) Khaou Chuly Mkk, Co., Ltd

❖ THE CONTRACTORS OF CLASS 2 (MEDIUM CONTRACTORS)

- 6) South East Corporation Ltd
- 7) Mega Cambo Construction
- 8) L.C.H Group Co., Ltd
- 9) VENTURE (Cambodia) PTE
- 10) Soma Construction Co., Ltd

❖ THE CONTRACTORS OF CLASS 3 (SMALL CONTRACTORS)

- 11) ILI Co., Ltd
- 12) Samnang CRM Company
- 13) Lo Siv Pheng Construction
- 14) Khan Enterprise Co., Ltd
- 15) Cambodia Construction Company (CCC)

**APPENDIX B**

**QUESTIONNAIRE FOR THAI CONTRACTORS**



**QUESTIONNAIRE SURVEY ON THE RESEARCH**

**“AN EXPLORATION OF CAMBODIAN CONSTRUCTION INDUSTRY:  
A CASE STUDY OF CONTRACTORS’ PROBLEMS”**

Dear Respondent:

The data from of this survey will be used strictly for academic purposed. Your data are extremely important for the outcome of this research study.

Thank you for your kind co-operation.

Please answer all following questions.

Name of Contractor:.....  
 Name of Respondent:.....  
 Position:.....  
 Working experience.....  
 Years in current position.....  
 Date:.....

I. Please checklist ( ✓ ) in one of the last three columns about the frequency of problems occurred in your past construction projects.

Categories	Contractors' Problems (at Project Level)	Often	Some-times	Never
<b>Owners</b>	Delay payment by private owners			
	Slow decision making			
	Excessive change orders by owners during construction			
	Unclear responsibility			
	Frequency of design changes			
<b>Consultants</b>	Inadequate experience of consultant			
	Lack of responsibility of consultant			
	Slow response			
	Conflicts between consultant and site engineers			
<b>Subcontractors</b>	Delay in subcontractors' work			
	Low responsibility of subcontractors			
	Low skill and low productivity of subcontractors			
<b>Material Resources</b>	Delay material delivery on site			
	Inappropriate/misuse of material for project			
	Change in material types and specifications during construction			
	Late procurement of materials			
<b>Human Resources</b>	Inadequate of labors' skill on site			
	Less communication in work by labors			
	Supervision too late			
	Personal conflicts among labors			
	High cost of skillful workmanship			
	Low productivity/skill of site engineers			
<b>Communication</b>	Lack of comprehensive dispute resolution			
	Lack of co-ordination between designer and contractors			
	Poor coordination among project participants			

- Please checklist ( ✓ ) in one of the last three columns about the frequency of problems occurred in construction industry.

Categories	Contractors' Problems (at Industry Level)	Often	Some-times	Never
<b>Law and regulation</b>	Not clear construction regulation in country			
	Change of construction regulation			
<b>Government</b>	Delay payment in public project			
	Absent of cost data in construction			
	Lack of government policies and legality for construction industry development			
	Poor contractual procedures			
<b>Human Resources</b>	Most of unskillful domestic labors			
	Low productivity of local workmanship			
	Low quality of local engineers			
	Lack of local engineers and experts			
	Poor design of local engineer in large project			
<b>Material &amp; Machinery Resources</b>	High fluctuation of materials cost			
	High cost of machinery			
	Shortage of materials in the country			
	Inadequate production of raw material in the country			
	Shortage of equipment/machinery			
	High transportation (logistic) and handling cost			
	Low quality of local materials			
	Lack of competent suppliers			
	Low productivity and efficiency of equipment			
	Lack of high-technology mechanical equipment			
<b>Financial</b>	Mode of financing and payment for complete work			
	High interest rate charged by banks and loans			
	Lack of capital and funding			
<b>Coordination &amp; Communication</b>	Poor communication among parties (with Owners, Consultants...)			
	Foreign language problems among parties			
	Bureaucracy of tendering method			
<b>Marketing</b>	Strong competition in construction market			
	Lack of bidding process			
	Domination of construction industry by foreign firms			

II. Please describe in some details about the problems which has occurred in your construction company by each categories as follows:

**Part of Owners:**

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**Part of Consultants**

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**Part of Subcontractors**

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**Part of Material Resources**

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**Part of Human Resources**

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**Part of Communication**

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**Part of Government**

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**Part of Financial and Marketing**

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**APPENDIX C**

**TOP PROBLEMS AFFECTING CONTRACTORS IN  
DEVELOPING COUNTRIES**

**Top Problems affecting the contractor in previous studies**

<b>Frimpong et al. (2003)</b>	<b>Long et al. (2004)</b>	<b>Faridi and El-Sayegh (2006)</b>
<b>Nigeria</b>	<b>Thailand</b>	<b>Indonesia</b>
<b>Public sector projects</b>	<b>High-rise projects</b>	<b>High-rise projects</b>
<ul style="list-style-type: none"> <li>- Contractors' difficulties in receiving interim payments from public agencies</li> <li>- Contractors' financial difficulties</li> <li>- Inadequate public agencies' budgets</li> <li>- Deficiencies in contractors' organizations</li> <li>- Deficiencies in planning and scheduling</li> <li>- Frequent variation/changed orders</li> <li>- Difficulties in obtaining construction materials</li> <li>- Deficiencies in public agencies' organizations</li> <li>- Contractors' unrealistic tenders</li> <li>- Unrealistic contract durations imposed by public agencies</li> </ul>	<ul style="list-style-type: none"> <li>- Materials procurement</li> <li>- Waiting for information</li> <li>- Poor contractor management</li> <li>- Laborers/tradesmen shortages</li> <li>- Waiting for information</li> <li>- Design delays</li> <li>- Planning and scheduling deficiencies</li> <li>- Construction plant shortages</li> <li>- Changed orders</li> <li>- Contractors' financial difficulties</li> </ul>	<ul style="list-style-type: none"> <li>- Design changes</li> <li>- Poor labor productivity</li> <li>- Inadequate planning</li> <li>- Locational restriction of the project</li> <li>- Skilled labor shortage</li> <li>- Equipment shortage</li> <li>- Materials shortage</li> <li>- Inaccurate prediction of equipment production rate</li> <li>- Inaccurate prediction of craftsmen production rate</li> <li>- Inaccuracy of materials estimate</li> </ul>
<b>Sambasivan and Soon (2007)</b>	<b>Frimpong et al. (2003)</b>	<b>Long et al. (2004)</b>
<b>Saudi Arabia</b>	<b>Ghana</b>	<b>Vietnam</b>
<b>Public utility project</b>	<b>Groundwater projects</b>	<b>Large construction projects</b>
<ul style="list-style-type: none"> <li>- Cash flow problems faced by contractor</li> <li>- Delay in the preparation of contractor submission</li> <li>- Difficulties in obtaining work permits</li> <li>- Government tendering system requirement of selecting the lowest bidder</li> <li>- Delay in progress payment by the owner</li> <li>- Effects of subsurface conditions of soil</li> <li>- Delay in mobilization</li> <li>- Changes in the scope of project</li> <li>- Ineffective planning and scheduling of the project by the contractor</li> <li>- shortage of manpower (skilled, semi-skilled, and unskilled labor)</li> </ul>	<ul style="list-style-type: none"> <li>- Monthly payment difficulties</li> <li>- Poor contract management</li> <li>- Material procurement</li> <li>- Inflation</li> <li>- contractors' financial difficulties</li> <li>- Escalation of material prices</li> <li>- Cash flow during construction</li> <li>- Planning and scheduling deficiencies</li> <li>- Bad weather</li> <li>- Deficiencies in cost estimates prepared</li> </ul>	<ul style="list-style-type: none"> <li>- Slow site clearance</li> <li>- Slow government permits</li> <li>- Inaccurate time estimating</li> <li>- Lack of capable representatives</li> <li>- contractors' financial difficulties</li> <li>- Improper planning and scheduling</li> <li>- Unsatisfactory site compensation</li> <li>- Inadequate experience</li> <li>- Obsolete technology</li> <li>- Lack of responsibility</li> </ul>



<b>Faridi and El-Sayegh (2006)</b>	<b>Assaf and Al-Hejji (2006)</b>	<b>Sambasivan and Soon (2007)</b>
<b>UAE</b>	<b>Saudi Arabia (Consultants)</b>	<b>Malaysia</b>
<b>General (construction industry)</b>	<b>Different projects</b>	<b>General (construction industry)</b>
<ul style="list-style-type: none"> <li>- Preparation and approval of drawings</li> <li>- Inadequate early planning of the project</li> <li>- Slowness of the owner's decision-making process</li> <li>- Shortage of manpower</li> <li>- Poor supervision and poor site management</li> <li>- Productivity of manpower</li> <li>- Skill of manpower</li> <li>- Non-availability of materials on time</li> <li>- Obtaining permit/approval from the municipality/different government authorities</li> <li>- Financing by contractor during construction</li> </ul>	<ul style="list-style-type: none"> <li>- Difficulties in financing project by contractor</li> <li>- Inadequate contractor's experience</li> <li>- Shortage of labor</li> <li>- Delay in progress payments by owner</li> <li>- Delay in material delivery</li> <li>- Poor site management and supervision by contractor</li> <li>- Ineffective planning and scheduling of project by contractor</li> <li>- Type of project budding and award</li> <li>- Poor qualification of the contractor's technical staff</li> <li>- Low productivity level of labor</li> </ul>	<ul style="list-style-type: none"> <li>- Improper planning</li> <li>- Site management</li> <li>- Inadequate contractor experience</li> <li>- Finance and payments of completed work</li> <li>- Subcontractors</li> <li>- Shortage in material</li> <li>- Labor supply</li> <li>- Equipment availability and failure</li> <li>- Lack of communication between the parties</li> <li>- Mistakes during construction stage</li> </ul>

(Source: Toor and Ogunlana, 2008)

**APPENDIX D**

**RESULT FROM THAI CONTRACTORS**

Categories	Contractors' Problems (at Industry Level)	No. of respondent											Often	Some-times	Never
		1	2	3	4	5	6	7	8	9	10	11			
Construction regulation	Not clear construction regulation in country	N	O	O	S	N	S	N	N	N	N	S			✓
	Change of construction regulation	N	S	O	S	N	S	N	N	N	N	O			✓
Government	Delay payment in public project	S	S	N	O	S	S	S	O	N	N	S		✓	
	Absent of cost data in construction	S	S	S	S	S	N	S	S	N	N	O			✓
	Lack of government policies and legality for construction industry de	S	S	S	S	S	S	S	S	N	N	O		✓	
	Poor contractual procedures	S	S	O	O	S	S	S	S	S	N	S		✓	
Human Resources	Most of unskillful domestic labors	S	S	S	O	S	S	S	O	S	S	O		✓	
	Low productivity of local workmanship	S	S	S	O	S	S	S	S	O	S	O		✓	
	Low quality of local engineers	S	O	O	S	O	S	S	S	O	S	S		✓	
	Lack of local engineers and experts	S	N	N	S	S	N	S	N	N	N	S			✓
	Poor design of local engineer in large project	O	S	S	O	O	S	S	N	N	N	S		✓	
Material & Machinery Resources	High fluctuation of materials cost	S	O	S	S	S	S	O	S	S	S	O		✓	
	High cost of machinery	S	S	S	S	S	S	O	S	N	S	O		✓	
	Shortage of materials in the country	S	N	S	N	S	S	N	S	S	N	O			✓
	Inadequate production of raw material in the country	N	N	N	S	S	S	N	N	S	N	S			✓
	Shortage of equipment/machinery	N	S	N	S	S	S	S	S	S	N	S		✓	
	High transportation (logistic) and handling cost	N	S	N	N	S	S	O	S	S	N	O			✓
	Low quality of local materials	N	N	N	S	S	S	S	N	S	N	N			✓
	Lack of competent material suppliers	S	S	S	S	O	S	N	O	N	N	S		✓	
	Low productivity and efficiency of equipment	S	S	S	S	S	S	S	N	S	N	S		✓	
Lack of high-technology mechanical equipment	N	N	S	N	S	S	S	S	S	N	O		✓		
Financial	Mode of financing and payment for complete work	N	S	N	N	S	S	S	O	N	N	O			✓
	High interest rate charged by banks and loans	S	S	N	S	S	S	S	N	S	N	O		✓	
	Lack of capital and funding	N	N	S	S	S	S	O	S	N	N	S		✓	
Coordination & Communication	Poor communication among parties (with Owners, Consultants...)	S	S	N	S	O	S	S	O	S	S	O		✓	
	Foreign language problems among parties	S	S	S	S	O	S	O	O	O	N	O	✓		
	Bureaucracy of tendering method	S	N	N	S	O	S	O	S	N	S	S		✓	
Construction Marketing	Strong competition in construction market	O	S	S	S	S	S	S	S	O	O	O		✓	
	Lack of bidding process	S	N	N	N	S	S	S	N	N	O	S			✓
	Domination of construction industry by foreign firms	S	N	S	S	S	S	S	O	S	S	S		✓	

**Note:**

O : Often

S : Sometimes

N : Never

Categories	Contractors' Problems (at Project Level)	No. of respondent											Often	Some-times	Never
		1	2	3	4	5	6	7	8	9	10	11			
Owners	Delay payment by private owners	S	O	S	S	S	S	S	S	S	S	O		✓	
	Slow decision making	S	O	O	S	O	S	S	N	O	S	S	✓		
	Excessive change orders by owners during construction	S	S	S	S	O	S	O	S	O	S	O		✓	
	Unclear responsibility	S	S	S	S	O	S	S	S	S	S	S		✓	
	Frequency of design changes	S	S	S	O	O	S	O	O	O	S	S	✓		
Consultants	Inadequate experience of consultant	O	S	S	S	S	S	S	S	S	O	S		✓	
	Lack of responsibility of consultant	O	S	S	S	O	S	N	S	S	O	O		✓	
	Slow response	S	S	S	S	O	S	O	N	S	O	O		✓	
	Conflicts between consultant and site engineer	S	S	S	S	O	S	S	S	N	O	O		✓	
Subcontractors	Delay in subcontractors' work	S	O	O	S	O	S	O	O	S	S	S	✓		
	Low responsibility of subcontractors	S	S	S	S	S	S	N	S	S	S	O		✓	
	Low skill and low productivity of subcontractors	S	S	S	S	O	S	S	S	S	S	O		✓	
Material Resources	Delay material delivery on site	S	S	S	S	O	S	O	N	S	S	S		✓	
	Inappropriate/misuse of material	S	S	S	S	O	S	S	N	N	S	S		✓	
	Change in material types and specifications during construction	S	S	S	S	S	S	S	S	S	S	O		✓	
	Late procurement of materials	S	S	S	S	O	S	S	S	S	S	S		✓	
Human Resources	Inadequate of labors' skill on site	S	O	O	O	S	S	S	O	O	S	O	✓		
	Less communication in work by labors	O	S	S	O	S	S	O	O	O	S	O	✓		
	Supervision too late	S	S	S	S	O	S	S	S	N	S	O		✓	
	Personal conflicts among labors	S	S	S	S	O	S	S	O	S	N	S		✓	
	High cost of skillful workmanship	S	S	O	S	O	S	O	S	O	S	S	✓		
	Low productivity/skill of local engineers	S	S	O	S	O	S	S	S	S	S	S		✓	
Communication	Lack of comprehensive dispute resolution	S	S	O	S	O	S	O	N	S	N	O		✓	
	Lack of co-ordination between designer and contractors	N	S	S	S	O	S	O	O	S	S	O		✓	
	Poor coordination among project participants	S	S	O	O	O	S	S	S	S	S	S		✓	

**List of Interviewed Contractors:**

1. SYNTEC Engineering Co.,Ltd.
2. Sunshine Engineering and Construction Co.,Ltd.
3. Summit Grade Co.,Ltd
4. C.E.S Co., Ltd.
5. Italian-Thai Engineering

## BIOGRAPHY

Menghour Phann was born on March 08, 1985 in Phnom Penh, the capital city of Cambodia. He spent most of his time in Phnom Penh from the primary school until he finished his undergraduate study. He studied in the Department of Rural Engineering, majoring in Geotechnical Engineering, Institute of Technology of Cambodia (ITC), Phnom Penh, Cambodia. He earned his Bachelor of Engineering degree in 2005. He was awarded AUN/SEED-Net scholarship to continue his study in the Department of Civil Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand in November 2005.

