備標實務及個案分析
-新南向工程顧問標案參與實務

台灣世曦工程顧問(股)公司黃文鑑 協理
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講師介紹

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  - 1988 國立成功大學土木系 學士
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  - 2006 交通工程技師高等考試及格
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  - 1998-2007 中華顧問工程司 正工程師、組長、經理、協理
  - 2007-Present 台灣世曦工程顧問股份有限公司 主任工程師、海外中心協理
  - 2016-Present 世曦(馬來西亞)工程顧問公司 執行董事
  - 2017-Present 淡江大學 兼任助理教授

1969
Established

2000
Professionals

Mission
Worldwide
Infrastructure

台灣世曦參與基礎建設項目

橋梁Bridges

機場Airports

公路
Highways

隧道 Tunnels

港口
Harbors

智慧運輸ITS

環境工程
Environmental
Engineering

軌道 Railways
& MRTs

機電工程 E&M
Engineering

科學園區
Science Parks

建築Architecture

海外工程/據點 OVERSEAS PROJECTS

★分公司 Branches/子公司Subsidiaries ● 完成計畫Projects ● 進行中計畫On-going projects

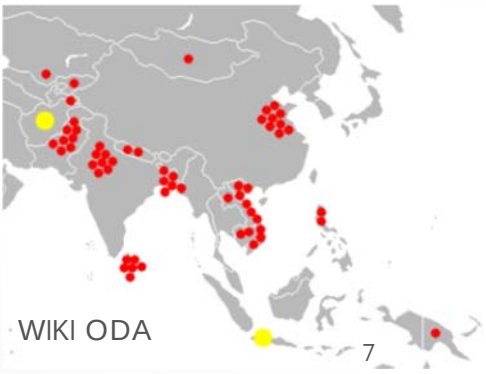
新南向政策

- 潛在工程顧問市場
  - Tier 1 (優勢)
    - 越南、馬來西亞、印尼、菲律賓
  - Tier 2 (持平)
    - 泰國、印度、柬埔寨、緬甸
  - Tier 3 (陌生)
    - 斯里蘭卡、孟加拉、不丹、寮國
  - Tier 4 (困難)
    - 澳洲、紐西蘭、新加坡、汶萊、巴基斯坦
- 選擇我方「有競爭優勢市場」，結合當地「最佳夥伴」為團隊。

Taiwan MOFA

東南亞基礎建設特性

- 東南亞國家缺乏資金，需透過國際金融機構(IFI)投資或融資，或是由先進國家以海外發展基金協助(Official Development Assistance, ODA)，才能進行基礎建設。
  - 馬來西亞雖少接受ODA協助，卻歡迎投資計畫或PPP，如馬星高鐵計畫
  - 印尼長期接受IFI協助，基礎建設發展迅速，累積外債非常驚人
  - 越南複雜法規，多人治管理，增加參與風險
- 東南亞市場發展趨勢
  - 需與當地顧問公司合作，外國公司工作內容比例不得高於50%。
  - 人月(服務)費因國當地技術逐漸成熟，逐年降低。
  - 複雜稅法及外匯管制，需有非工程技術人員協助
  - 大陸海外投資增加，壓縮台灣公司發展空間



WIKI ODA

海外計畫全生命週期

- 計畫全生命週期即從計畫孕釀、啟動、招標、執行、驗收、營運及維修等一系列活動。
- 全生命週期成本，則是各期程所發生成本總和。
- 海外計畫爭取....不是單純從投標開始；計畫成本不是只有執行計畫工作。

NZ Procurement

以印尼CISUMDAWU收費公路監造為例

- Cisumdawu Toll Road is a toll road in West Java connecting Cileunyi-Sumedang-Dawuan.
  - Due to the whole toll road is not feasible for investors, the government agrees to construct Section I and Section II. Section II has a 472 meters tunnel. On September 15, 2015, land acquisitions for Section I is 33 percent, while Section II is more than 80 percent.
  - The toll road includes 6 sections where the concession A (Section I) is held by Shanghai Construction Group, Wijaya Karya and Waskita Karya, and the concession B (Sections II-VI) is held by Citra Marga Nursaphala Persada (IDX:CMNP)
- 2016年10月1日，由中国十七冶集团承建的印尼CISUMDAWU高速公路项目开工。
  - 该项目位于印度尼西亚爪哇岛西部，为爪哇岛环网高速的纵向连接线，是印尼国家高速公路重点工程项目，并有印尼第一座公路隧道。项目路线长3900米，包括两个段落，A段长度1100米，其中路基长628米，隧道长472米；B段路基长度2800米，总合同工期1095天。

計畫地理位置

- 萬隆市東方約20公里
  - 本工程係中國「一帶一路」計畫支持，由印尼政府自籌款項，聘請國際顧問監造。

計畫TOR (招標文件原件是印尼文)

- The Directorate General of Highways (Direktorat Jenderal Bina Marga) - Project Implementation Unit (PIU) of Cisumdawu Freeway (Toll Road), in Sumedang Regency West Java Province, intends to carry out Technical Supervision work of Road, Bridge and Tunnel (Tunnel); namely, Implementation for Development of Cisumdawu Toll Road Phase II, Section 2 in West Java province.
- To ensure the implementation of such work in accordance with the plan of quality, cost, volume and time specified in the contract of construction services, it is necessary to have a team that will serve as a supervising and planning role helping Project Implementation Unit (PIU) of Cisumdawu Freeway in conducting technical supervision and a revised design (if necessary) at the location of ongoing construction.

在標案公告前

- 在當地蒐集有關公路發展新聞
- 專人經常拜訪公共工程及住宅部公路廳，了解計畫推展進度
- 提供台灣相關經驗及成果予業主參考
- 安排相關人員來台訓練及參訪
- 現場初步踏勘
- 內部徵求適合參與人員 (橋梁、地工及隧道專長)
  - 外籍人員英語能力足夠參與計畫
  - 當地合作廠商及適合監造人員

計畫概要(1/5)

- Consultant (Engineer) shall perform the duties and authority of the technical supervision of the construction work in field according to standards and criteria for road / bridge / Tunnel undertaken by service providers of construction work (referred as the Contractor), since the assignments of this Task Force are focused both in terms of quantity and quality.
- The consultant commissioned by PPK, and notified in writing to the contractor, to carry out its duties and authorities, whose implementation is acting on behalf of the Directorate General of Highways (referred as the Employer), conducting review, testing and evaluating materials to be used and labor that will be used by the contractors to ensure that the construction work carried out in accordance with plans and specifications.

計畫概要(2/5)

- Creating a contract management system to run the construction contract, and document all correspondence, measurement and control over the quality test and reporting to the construction contract.
- Reviewing and approving contractor's working methods, traffic management plan, implementation of occupational health and safety as well as monitoring the implementation of the environment management plan (EMP) during the construction period.
- Reviewing and approving the Contractor's working drawings, shop drawings, "As Built" drawings, erection drawings, and drawings for temporary works, additional publish of complete working drawings, and giving instructions to the contractor for any job that is not included in the figure of the contract. If additional issued drawings result in a change to the contract drawings and / or changes in construction costs, the "Engineer" must obtain the prior approval from the service user.

計畫概要(3/5)

- To review the work schedule and progress each week to ensure the timely completion of the work and do not experience delays from the schedule that has been agreed upon. When there is a delay, the "Engineer" should instruct the contractor to revise the schedule of work and working methods if necessary for the pursuit of progress. "Engineer" should review and approve these changes and report to the service user.
- Issuing a work order and giving approval to the General Superintendent (GS) as well as key personnel in accordance with the criteria in the tender, conducting inspections and evaluates all equipment contractors, field offices, base camp, yards, warehouses, laboratory and all the work while in the field to ensure compliance with the terms and specifications in the contract.

計畫概要(4/5)

- Evaluating the suitability of all project inputs such as material, labor, equipment (used by the contractor) and working methods in order to achieve progress and ensure that the contractor can meet work schedules, also keeping the type and number of the tools (offered by the Contractor).
- Inspecting and evaluating all the installations built by contractors such as, field offices, warehouses, labs, barracks and all temporary facilities to ensure compliance with the terms and conditions of the contract.

計畫概要(5/5)

- Verifying the survey data to configure the centerline, alignment, location of the structure and vertical control of the Bench Mark.
- Implement effective and routine monitoring to control the quality of the carried-out work in accordance with the standards, criteria, specifications as well as the correct procedures. As of this, keeping that there is at least one representative of the “Engineer” in site to supervise and give necessary instructions when the contractor is working.
- Revising the design, if there is a difference between the existing design (design in construction contracts) with the field condition, then making the analysis as well as drawings of the revised design and calculate the quantity (update quantity) of the revised design and needs based on field conditions and requirement for the scope of work.

承包商責任

- The objectives are the control and supervision of construction work in site to meet the requirements of the implementation of the technical specifications (the right quality), to be carried out in appropriate cost timely and precisely, in order to reach the planned performance accountable, and efficiently and effectively to ensure the availability of reliable road infrastructure.

計畫目標

- As an Targeted procurement in consultancy services of technical supervision of roads, bridges, and Tunnels, it is intended to achieve the results of accountable, efficient and effective work in accordance with the planned performance and to ensure the availability of reliable road infrastructure, so that the expected performance of the road can be handled to provide its services until the end of the planned life.
- In addition, some tasks of Project Implementation Unit (PIU) of Cisumdawu Freeway concerned, especially in matters related to problems of site technical control, administration, technical and physical progress payments etc., can delegate to the consulting service providers.

計畫準備(1/5)

- Developing Contract Quality Plan,
- To comprehend matters related to construction contract documents, including management control, traffic safety, SMK3 of Construction as well as Environmental Document. SMK3 系統管理、職業健康及安全
- Organizing Pre Construction Meeting (PCM) and mutual check.
- Noting the whole deal in PCM and setting forth the Report and Minutes separately.
- Preparing supervision forms
- Explaining the Structure of Technical Director Organization and tasks of each personnel of Technical Director
- Providing a more efficient technical implementation Proposal.

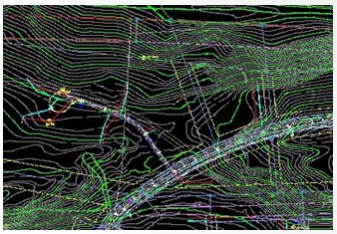
計畫準備(2/5)

- Explaining the work plan
- Deliver and present RMK to the Employer at the time of PCM.
- Contract Quality Plan (RMK, Rencana Mutu Kontrak) submitted by the constructing service provider
- Conducting supervision and testing, checking the quantity and quality and feasibility of equipment, facilities and appliances that are mobilized by the constructing Service Provider.
- Checking the list of equipment, facilities and supplies that are delivered by the constructing Service Provider.
- Checking the validity period of calibration for the equipment used by the constructing Service Provider.

計畫準備(3/5)

- Making recommendations to the Employer, or checking and agreeing on the number, quality and feasibility of the equipment, facilities and equipment when they were mobilized the constructing Service Provider.
- Signing the Minutes of Mobilization Program.
- To submit reports to the Employer on the implementation of mobilization.
- Making analysis to formulate the design parameters based on working drawings and design parameters.
- Identifying field conditions and existing design drawings, and recording the necessary things related to design changes.

計畫準備(4/5)



- To check the topographic survey results conducted by constructing service provider.
- Proposing to the Employer those related changes in design and making design drawings revised plan (if necessary).
- Recalculating the quantity required for the revised design which has been approved as field requirement.
- Examination and discussion on the concept of working drawings.
- To check the working drawings with the related work methods proposed by the constructing Service Provider, and controlling the quantity of related work.

計畫準備(5/5)

- Report the progress of work completed by constructing service provider.
- To create a list of deficiencies in the Defect Liability Period based on the results of field inspection.
- Inspect data for administrative and technical work.

監造(1/2)

- To implement Joint Field Engineering of the Service Providers (the Consultant and Contractor) to be the basis for formulating and evaluating Contract Drawings.
- Examine and approve the working drawings (shop drawing) prepared by the constructing Service Provider.
- Carrying out technical supervision professionally, effectively and efficiently in accordance with the specifications so as to avoid the risk of failure during construction.
- Examine and approve the daily reports, weekly reports and monthly reports of construction work submitted by constructing Service Provider.

監造(2/2)

- To evaluate and approve the Interim Payment Certificate (IPC).
- To control the quality of site work by applying work procedures and quality tests at every stage of the work according to contracted specification documents.
- Make monthly reports related to the progress of site work and put forward recommendations on any problems that arise in field for Service User (the Employer).
- Make technical report (when needed) at each occurrence of change in contract work.

資料與支援設備

- Procurement conducted by the Committing Officer / Service User
  - Data and facilities provided by the Committing Officer of Planning and Supervision (PPK) of Cisumdawu Freeway can be used and must be maintained by the consulting Service Provider:
    - Reports and Data of Services Provider of Construction Contract.
    - Accommodation and Office Space
  - The Committing Officer of Planning and Supervision of Cisumdawu Freeway will act as the representative or a counterpart or project officer (PO) in the framework of implementation in consulting services.
  - The facilities provided by the Committing Officer of Planning and Supervision of Cisumdawu Freeway that can be used by the consulting service provider do not exist.

資料與支援設備

- Procurement conducted by the Service Provider
  - The consulting Service provider shall provide and maintain all the facilities and equipment used for the smooth execution of the work by way of lease.
- To support the site activities and facilitate the in-site identification of personnel / Engineer (Specialists) as well as maintaining security and safety, all personnel / Engineer (Specialists) are mandatory use of uniforms, Project Helmets and Field Shoes provided by the Consulting Service Provider.

技術移轉

- If deemed necessary by the Committing Officer, the service provider shall conduct Training / Short Courses / Discussion / Seminar / Workshop / Dissemination, relating to the substance of execution of work in the framework of transfer of knowledge to staff within the organization of the related Unit.

計畫執行(1/2)

- APPROACH AND METHODOLOGY
  - Work parts covered in this consulting service include:
    - To supervise the implementation of construction work of the constructing Service Provider so that the construction work done can be implemented in accordance with the plans and specifications of contract.
    - Measure and calculate the quantity of work done in order to implement inspection of the final payment.
    - Inspect and test the quality of materials being used and their quality of work.
    - Ensure that the construction has already been completed and qualified.
    - Give advice regarding changes in employment and demands (claims).
    - Provide recommendations on the operation and maintenance (O & M) of the equipment used.
    - Reviewing the design and checking the as-built drawing

計畫執行(2/2)

- Conducting design review for the designs that do not fit the field conditions, do not fulfill the technical rules, and is not yet available in the contract documents, and so on.
- Carrying out periodical checks on built drawings according to the progress mutual check and Interim Payment Certificate (IPC).

- Periodically report on the work progress, problems, quality of work, and financial status of the project, as well as other conditions that can be anticipated.

專家需求(1/12)

- Expatriate Team Leader
  - The Expatriate Team Leader is required a minimum undergraduate degree (S1) in Civil Engineering or equivalent degree who have graduated from a public university or internationally recognized private college. Furthermore, the Team Leader is required to have experience in carrying out supervisory work of road and /or bridge, planning in road and / or bridge and / or Tunnel at least 15 (fifteen) years as evidenced by reference to the experience of work and be able to speak English actively and passively with evidence of minimum TOEFL grade 500 when clarification. Once in case of a similar project Team Leader or Co Team Leader for at least 8 years seniority with a similarly qualified certificate issued by the relevant association, he shall be legalized by the competent institutions.

專家需求(2/12)

- As a team leader, whose main task is to lead and coordinate all activities of the team members working on the implementation of the work until the job is completed. Team Leader duties will include, but not limited to tasks that are mentioned below:
  - To Coordinate regularly with the PPK of Project Implementation Unit and the Contractors for Implementation of Cisumdawu Freeway (Toll Road), examining the working methods and results of construction works (performance of work), and providing the written recommendations of examination for actually requirement in such work, if the contract is only expressed in general
  - To monitor and evaluate the implementation activities undertaken in-site by Constructing Service Providers so as to facilitate the required implementation decision- making of the PPK, including the reinstatement, and/or minor work preceding the main work, and/or other detailed engineering.

專家需求(3/12)

- Ensuring the contractor to understand the contract documents correctly, and carrying out the work in accordance with the technical specifications and contract drawings as well as the implementation drawings.
- Control and inspect closely related to the proposed design changes and changes in employment as a technical proposal to the PPK of physical work implementation.
- To note the implementation activities of the contractor's work achievement on a daily basis to act as a weekly and monthly progress report on the progress worksheet (progress schedule) having been received.
- To make a report to the PPK of physical works implementation about the progress and quality of works that is accepted or rejected with a technical description.
- Closely monitoring the progress of all the works, and report it immediately / timely if the progress of work late as contained in the General Conditions of the construction contract and it really affect the completion of the planned schedule. In such case, the Team Leader shall also recommend in writing the measures to pursue such delay.

專家需求(4/12)

- Scrutinizing any proposed changes in design, scope of work, or contract amendment submitted by the constructing service provider.
- Providing technical recommendations to the PPK of physical works implementation concerning the proposed changes to works/contract (if any) that having been through mutual discussion between the service provider and consultant supervisor for reasons that can be accepted by the parties.
- Examining and approving the Built / Installed drawings (As Built drawings), and monitoring the processing of all drawings so that this kind of issues can be resolved before Provisional Handover of the project.
- To be responsible for maintaining the project archive of correspondence, daily reports, weekly reports, charts of work progress, measurements, drawings and others.
- Preparing monthly reports, quarterly reports, technical reports, and Final report then submit the reports to the PPK of Planning and Supervision and other relevant agencies in a timely manner.

專家需求(5/12)

- Contract Document Engineer
  - Contract Document Engineer is required a degree of Bachelor (S1)/ Master (S2) / PhD (S3) in Law / Civil Engineering or equivalent degree obtained from a public university, private university or international accredited colledge or have passed the state examination. Contract Document Specialist is required familiar with international civil contract documents, including FIDIC Conditions of Contract for Construction (MDB) Harmonized Edition, Indonesian Presidential Regulation No.54 of 2010, Indonesian Presidential Decree 70 of 2012 and its amendments, and Indonesian Presidential Decree No.4 of 2015.
  - Expatriate Contract Document Engineer is required experience in carrying out similar work for ten (10) years, as evidenced by the work experience and references having similarly qualified certificate issued by the relevant association to be legalized by the competent institutions, and be able to speak English active and passive with a minimum TOEFL 500 grade evidenced during clarification.

專家需求(6/12)

- Expatriate Tunnel Engineer
  - Expatriate Tunnel Engineer required a minimum degree of S1 (Bachelor Degree) in Civil Engineering or equivalent degree obtained from a public university or internationally recognized private college and has a certificate of the kind issued by the relevant association to be legalized by the competent institutions,
  - Expatriate Tunnel Engineer is required experience in carrying out similar work for ten (10) years, as evidenced by the work experience and references have similarly qualified certificate issued by the relevant association to be legalized by the competent institutions, and be able to speak English active and passive with minimum TOEFL 500 grade evidenced during clarification.
  - As for Indonesian Tunnel Engineer who is required a Bachelor degree (S1) in Civil Engineering, graduates from public university or private colleges that have been accredited or have passed the state examination.

專家需求(7/12)

- Expatriate Tunnel Engineer
  - Indonesian Tunnel Engineer shall be experienced in carrying out the required work supervision and planning in the field of tunnel for 8 (eight) years, and have the skills Certificates (SKA) as Associate Tunnel Engineer issued by the relevant association to be legalized by LPJK (Lembaga Pengembangan Jasa Konstruksi, National Construction Service Development Agency).
  - The main task of Tunnel Engineer is to assist the Team Leader in assessing particular tunnel design and techniques evaluation based on the needs of the field at the time of supervision work execution.

專家需求(8/12)

- Expatriate Tunnel Engineer
  - The main task of Tunnel Specialists:
    - To evaluate the existing design drawings with the needs of field conditions at the time of preparation for implementation.
    - To comprehend and evaluate the results of Field Engineering and analyze the existing contract tunnel design.
    - To evaluate the techniques associated with methods of implementation of the tunnel work proposed by the contractor.
    - Checking Work drawings (shop drawings) submitted by the Contractor.
    - Providing guidance to the parties related to the standards and guidelines for planning / implementation of tunnel work.
    - Providing appropriate alternatives for treatment of the existing field condition to the Team Leader and Co Team Leader.

專家需求(9/12)

- To Perform design review, if necessary due to the field conditions, soil investigation results, the design does not meet the technical rules, and the design is not yet available in the contract documents.
- To submit monthly data set to team leader for control of tunnel work no later than the 10th of the following month. The data set should comprise of all work activity.
- All results of technical recommendations are reported to the Team Leader and Co Team Leader.

專家需求(10/12)

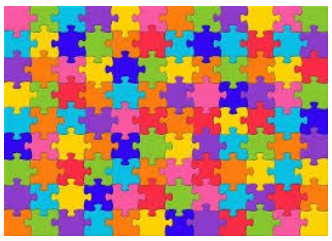
- Expatriate Geotechnical Engineer
  - Expatriate Geotechnical Engineer is required a minimal degree of S1 (Bachelor Degree) in Civil Engineering or equivalent degree obtained from a public university or internationally recognized private college and has a certificate of the kind issued by the relevant association to be legalized by the competent institutions
  - Expatriate Geotechnical Engineer is required experience in carrying out similar work for ten (10) years, as evidenced by the work experience and references have similarly qualified certificate issued by the relevant association to be legalized by the competent institutions, and be able to speak English active and passive with minimum TOEFL 500 grade evidenced during clarification.

專家需求(11/12)

- As for Indonesian Geotechnical Engineer who is required a Bachelor degree (S1) in Civil Engineering, graduates from public university or private colleges that have been accredited or have passed the state examination.
- The main task of Geotechnical Engineer:
  - To evaluate the stability of the existing design drawings with the needs of field conditions at the time of preparation for implementation.
  - Checking the work drawings (shop drawings) submitted by the Contractor.
  - Providing guidance to parties related to the standards and guidelines for planning / execution of excavation and embankment work.
  - Conducting supervision and monitoring the arrangements and procurement of equipment needed in the implementation of excavation and embankment.
  - Evaluating the contractor's working methods both for the suitability of the tools used, the suitability of the material used as sequence of excavation and embankment.

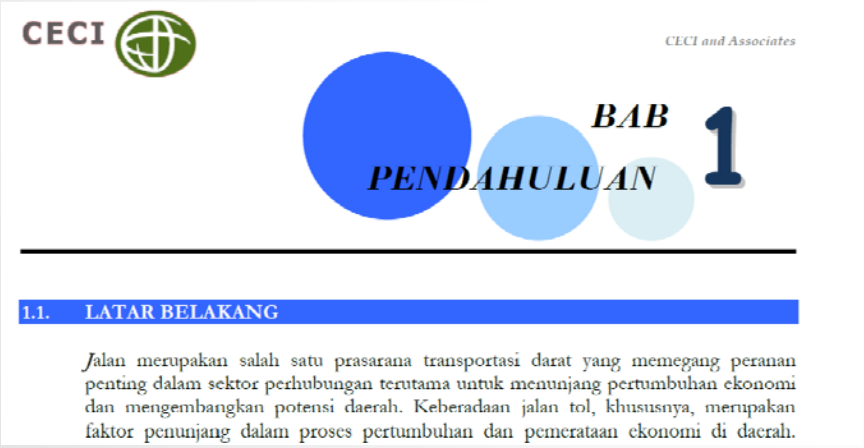
專家需求(12/12)

- To perform a design review if necessary due to the field conditions, the design does not meet the technical rules, and the design is not yet available in the contract documents.
- To submit monthly data set to team leader for control of geotechnical work no later than the 10th of the following month. The data set should comprise of all work activity.



服務建議書

- 需以印尼文呈現，人員資料CV也需適當轉換
- 可由當地人員或合作廠商協助，製作合於規定之服務建議書


CECI

CECI and Associates

BAB 1

PENDAHULUAN

1.1. LATAR BELAKANG

Jalan merupakan salah satu prasarana transportasi darat yang memegang peranan penting dalam sektor perhubungan terutama untuk menunjang pertumbuhan ekonomi dan mengembangkan potensi daerah. Keberadaan jalan tol, khususnya, merupakan faktor penunjang dalam proses pertumbuhan dan pemerataan ekonomi di daerah.

評分結果

投標商	報價	1經驗	2方法	3人員	1+2+3	A技術	B價格	AB總分	議價序
		10%	20%	70%	100%	80%	20%		
CECI	68.7	10	18.70	69.93	98.96	78.90	18.51	97.41	1
D	63.63	9.5	15.57	69.69	94.74	75.81	20.00	95.81	2
E	71.86	8.5	17.03	51.54	77.07	61.65	17.71	79.36	3
S	74.83	8.0	16.21	53.43	77.64	62.11	17.01	79.12	X
CM	67.03	9.5	15.33	49.99	78.42	59.86	18.99	78.85	X

- 非單純以價格取勝，技術仍需有優勢。
- 技術仍以人員及方法為重要評分指標。

結論(1/2)

- 以計畫全生命週期態度參與海外工程，亦即在政府構想時開始接觸，並能了解其需求，提供最佳建議，以及適時透過來台參訪或主管赴當地拜訪宣傳，以獲取更多機會。
- 詳讀招標文件(TOR)，特別對於重複出現之文句，如品質、時程、標準、協調等，業主希望投標廠商能夠提出有效方法，達到上述目標。
- 參與人員經歷、學歷及英文程度等是當地業主非常重視之項目，台灣工程人員，具有現場建造經驗者，往往難符合上述條件，加上國內公司常有老舊觀念，能力強的工程師應該留在國內，或是擔任設計工作，以至無法競爭國外監造計畫。
- 國外統包計畫日漸增多，顧問公司若無法結合工程公司，恐僅有監造工作可以選擇，國家隊組成確有其必要性。

結論(2/2)

- 參與國際專案與當地顧問公司合作是必然現象，如何選擇信賴合作對象，成為長期夥伴仍是一大難題，特別在招標文件上常註明「當地廠商工作量不得少於50%」，或是「技術轉移」條件，若無雙方信任，將成為未來競爭對手。
- 本次參與報價雖佔20%，但仍能決定勝負，台灣廠商報價時不應一味低價競爭，而是能評斷能獲利價格，以免得標卻是賠錢的開始。
- 印尼政府財政吃緊，計畫雖議價完畢，卻遲不簽約，以致外派人員待命數月，此狀況在近期已有改善，目前計畫進展順利，請款亦正常。
- 我國政府推動南向政策缺乏資金協助，廠商只能在夾縫中生存，東南亞國家基礎建設殷切，卻苦缺資金，大陸雖極力滿足，惟仍有照顧不及之處，或許可為新南向發展之切入點。

感謝聆聽，敬請指教

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