Jackson International Terminal Extension

KA PROJET REFERENCE: 12412
INDUSTRY: Civil Infrastructure - Aviation
DISCIPLINES: Structural Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Hydraulics Engineering, Fire Services

PROJECT SUMMARY

CLIENT
National Airports Corporation
Matrix Construction

LOCATION
Port Moresby, Papua New Guinea

PROJECT TYPE
Civil, Structural & Building Services Design & Supervision

YEAR COMPLETED
May 2015

PROJECT DESCRIPTION

Port Moresby International Airport, also known as Jacksons International Airport, is located 8 kilometers outside Port Moresby in Papua New Guinea. It is the largest and busiest airport in Papua New Guinea, with an estimated 1.4 million passengers using the airport in 2015, and is the main hub for Air Niugini, the national airline of Papua New Guinea. The airport serves as the main hub for PNG Air and Travel Air. It replaced the original Port Moresby airport, in what is now the suburb of Waigani.

Kramer Ausenco was engaged by National Airports Corporation (NAC), with civil, structural, mechanical, electrical, hydraulic and fire protection engineering inputs, and was novated to Matrix Construction (PNG) for a Design and Construct Contract. Developed design and performance-based specifications were produced for all disciplines sufficient to facilitate procurement of a Design & Construct Contractor due to a compressed timeframe.

PROJECT ROLE

Kramer Ausenco were novated as the Design Engineer under the D&C contract to provide detailed multidiscipline engineering design documentation and supervision to ensure compliance with the design intent of the contract documents.
Engineering disciplines included:

- Structural Engineers
- Civil Engineers
- Electrical Engineers
- Mechanical Engineers
- Hydraulics Engineers
- Fire Services

Jackson International Terminal Extension

PROJECT DATASHEET

Project Reference: 12412

Industry: Civil Infrastructure - Aviation

ASSIGNMENT NAME:	APPROX. VALUE OF THE CONTRACT:
Jackson International Terminal Extension	PGK 120M
LOCATION & COUNTRY:	**DURATION OF ASSIGNMENT (MONTHS):**
Port Moresby, PNG	31 Months
NAME OF FUNDING AGENCY:	**TOTAL NO. OF STAFF-MONTHS OF THE ASSIGNMENT:**
National Airports Corporation / Matrix Construction	52.7 Person-Months
ADDRESS OF AGENCY:	**APPROX. VALUE OF THE SERVICES PROVIDED BY YOUR FIRM UNDER THE CONTRACT:**
7 Mile, Jacksons Parade, Port Moresby 121, Papua New Guinea	PGK 1,009,515
START DATE (MONTH/YEAR): COMPLETION DATE (MONTH/YEAR):	**NUMBER OF PROFESSIONAL STAFF-MONTHS PROVIDED BY ASSOCIATED CONSULTANTS:**
Start date: October, 2012 Completion date: May, 2015	N/A
NAME OF ASSOCIATED CONSULTANTS, IF ANY:	**NAME OF SENIOR PROFESSIONAL STAFF OF YOUR FIRM INVOLVED AND FUNCTIONS PERFORMED:**
N/A	Adam Kramer – Project Engineer Bruce Nicholson – Project Manager Chris Barnes – Lead Structural Engineer Shane Harris – Lead Services Engineer Jay Jameson – Senior Structural Engineer Dali Chen – Structural Engineer Vagi Gamoga – Structural Engineer Isaiah Kavang – Technician

NARRATIVE DESCRIPTION OF PROJECT:

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- Civil Engineers
- Electrical Engineers
- Mechanical Engineers
- Hydraulics Engineers
- Fire Services

DESCRIPTION OF ACTUAL SERVICES PROVIDED BY YOUR STAFF WITHIN THE ASSIGNMENT:

Kramer Ausenco's scope of services was divided in to two separable portions:

1) **Civil & Structural Engineering:**
   a) General
      i) Documentation is to be autocad in 2D
      ii) The Consultant is to use its best endeavors to retain key specified personnel and project manager for the performance of the Services. Any changes to the Consultant's representative requires approval by the Client's representative.
      iii) This consultancy is for the provision of consultant services for the duration of the project, such service is to include, but is not necessarily limited to the following, all of which are to be completed to the reasonable satisfaction of the Project Manager.
      iv) All services will be undertaken in accordance with PNG Building Codes and BCA
      v) If there is any discrepancy and/or error in the Brief, the Consultant is to notify the Client of the issue immediately becoming aware of the discrepancy or error and, where it is within the Consultant's expertise, provide solutions for rectification.
      vi) All designs, materials and methods of construction specified by the Consultant shall be suitable in all respects for their intended purposes.
      vii) All drawings and documentation to be in a format and scale in accordance with the requirements of authority approvals and submissions.
      viii) All documentation to include the Client logos, contact details etc.
      ix) All documentation to be in a format to the approval of the Client Design Manager
      x) The Consultant has allowed for breaks in continuity and the staging requirements of the project as necessary
      xi) The construction project programme is approximately 60 weeks
      xii) The Consultant has allowed for attendance at all necessary design meetings
   b) Civil & Structural Engineering
      i) Civil and structural engineering detail design and documentation and construction phase service on a consultancy basis
      ii) The purpose for which the Services will be suitable is to upgrade the International Terminal Building at Jacksons International Airport, Port Moresby.
      iii) The Consultant is to provide all design documents in ACAD and PDF format
   c) Approvals & Payment Structure
      i) The consultant shall not commence each stage (including claim) until signed off.
   d) Stage One Services – Developed Design Phase (Building Approval)
      i) Requirements for completion of Stage One Services:
      ii) Design documents to a standard required for lodgment of Building Approval Application with PNG
      iii) Building Board with lodgment within 5 weeks from commencement, including:
         - a) Developed Design
         - b) Update Engineering Specification
         - c) Design certificate (Australia Form 15 equivalent)
      iv) Design documents for tender documentation for the procurement of the Building Structural Trades.
      v) The Consultant must overlay the design documents on the architectural plans for the Building.
      vi) The Consultant is to obtain other consultants' advice, where appropriate and integrate it into the
      vii) design and the Consultant's plan.
   e) Stage Two Services – Detailed Design & Documentation Phase
      i) Requirements for completion of Stage Two Services are as follows:
      ii) All remaining documentation required for construction issues working drawings,
   f) Stage Three Services – Construction Phase
      i) Requirements for completion of Stage Three Services are as follows:
      ii) Construction phase inputs comprising periodic site attendance to ensure that construction is generally in accordance with approved documentation
      iii) Review and comment on shop drawings for structural steel
      iv) The Consultant must provide completed completion certificate (Australia Form 16 equivalent).

2) Building Services (Mechanical, Electrical, and Hydraulic):

a) General

i) Documentation is to be autocad in 2D

ii) The Consultant is to use its best endeavors to retain key specified personnel and project manager for the performance of the Services. Any changes to the Consultant's representative requires approval by the Client's representative.

iii) All Services including the design documents will be designed in accordance with PNG Building Codes and BCA.

iv) The Consultant is to undertake a site investigation phase and site visit to gather all necessary information as part of the Consultant's design obligations

v) The Consultant has allowed for two persons to travel ex Brisbane and a PNG local staff member to gather site information at the start of the Services, including all associated costs including but not limited to flights, accommodation, meals, transfers etc.

vi) If there is any discrepancy and/or error in the Brief, the Consultant is to notify the Client of the issue immediately becoming aware of the discrepancy or error and, where it is within the Consultant's expertise, provide solutions for rectification.

vii) The Building will be classed as a large isolated building under BCA C2.3.

viii) All Services will be undertaken by or supervised by Registered Engineers (PNG) registered in accordance with the Professional Engineers Registration Act of PNG.

ix) During the term of the Contract, the Consultant must co-operate with the Client to ensure all services trade designs are coordinated to ensure compliance, spatial sizing, no clashing between disciplines, and coordinated with the architectural and engineering drawings

x) All designs, materials and methods of construction specified by the Consultant shall be suitable in all respects for their intended purposes.

xi) The Consultant must liaise closely with Client's representative and Consultants.

xii) All design documents are to include the Client logos, contact details etc.

xiii) All drawings and documentation to be in a format and scale in accordance with the requirements of authority approvals and submissions.

xiv) The Project construction programme is approximately 60 weeks

xv) The Consultant has allowed for attendance at all necessary design meetings in Brisbane during the term of this Agreement as necessary.

xvi) Architectural Drawings - The Client must ensure that frozen architectural drawings provided by others are available for the Consultant's use as the base in ACAD or DXF format by the time provided in the Program.

xvii) The Client will use best endeavors to ensure that other Project stakeholders are available to liaise with the Consultant, in particular the Consultant requires access to the architect and the Client when reasonably required.

b) Electrical

i) Developed & Detailed Design for the electrical services which will include but not limited to the following: -

(1) Establishment of the brief and design criteria
(2) Sizing of plant and equipment
(3) Emergency lighting and general light and power
(4) Checking of spatial limitations
(5) Technical performance specifications on drawing sheets.

ii) Preparation of developed and detailed designs for the Building comprising:-

(1) Standard lighting and power reticulation layouts
(2) Switchboard schematics
(3) Fans to outdoor areas as necessary
(4) MSB and Gen-sets
(5) Emergency lighting and exit signage
(6) External lighting to roads and car parks if required
(7) Data cabling layouts
(8) Data and communications
(9) Power supplies to baggage handling installation and screening systems
(10) Co-ordination on access security and CCTV, including control room
(11) Technical specifications
(12) Security – coordination with appropriate Client specialist
(13) Coordination with relevant Building Services Trades

c) Mechanical

i) Developed and Detailed Design for the following mechanical services:

(1) Establishment of the brief and design criteria
(2) Plant options if required
(3) Sizing of plant and equipment
(4) Dimensions of ductwork

(5) Advice to the architect on sizes, areas required and locations of external plant
(6) Checking of spatial limitations
(7) Specifications

ii) Preparation of developed and detailed mechanical designs, comprising: -
(1) Air conditioning to all floors
(2) Layouts of external plant areas
(3) Air conditioning of lift motors rooms (if required)
(4) Air conditioning to shops/cafeterias and other spaces
(5) Plan to ensure exhaust systems from kitchens can be effective, we will allow for ducting if required however hoods and fans will be by the tenant
(6) Technical specifications
(7) Design of makeup air and exhaust system and
(8) Toilet ventilation systems
(9) Sub-circuits from an isolator to the plant
(10) Coordination with other trades packages to ensure compliance
(11) supply a fresh air supply duct and an exhaust duct including any main duct fans. The tenant will feed from and into those and provide their own hoods / fans/ filters etc.
(12) smoke hazard management system complying with BCA E2.2 to the entire Building including the existing areas.

d) Hydraulic
i) Developed & Detailed Design of the hydraulic services including but not limited to cold and hot water reticulation, soil and wastewater, gas reticulation if required including drawings and associated specifications.
ii) Drainage, plumbing, water, hydrants and supply systems to wet fire

e) Fire
i) Developed & Detailed Design of the Sprinkler protection, hydrants and hose reels, smoke detection, FIP, EWIS and Fire control room including drawings and specifications. Liaison with airport fire service division.
ii) Dry Fire services (AS1670)
iii) Wet fire (sprinklers) services as necessary
iv) Wet Fire and Dry fire will need to tie into the FIP
v) The staging of the fire protection and detection systems is understood to be available for activation at the first new floor area handover – approximately in September 2013. This includes the entire existing Building. The Consultant must design system to include this ongoing strategy and utilize flexible supply systems and zone shutoffs.

f) Approvals & Payment Structure
i) The consultant shall not commence each stage (including claim) until signed off.

g) Stage One Services –Developed Design Phase (Building Approval)
i) Requirements for completion of Stage One Services:
ii) Design documents to a standard required for lodgment of Building Approval Application with PNG Building Board with lodgment within 5 weeks from commencement, including:
(1) Update Building Services Trade briefs
(2) Design development
(3) Design certificate (Form 15 equivalent)
iii) Design documents for tender documentation for the procurement of the Building Services Trades.
iv) The Consultant is to provide the Client with some plant options which may be explored.
v) The Engineering Analysis is to be to Building Approval stage only.
vi) The Consultant is not required to provide fully coordinated drawings at this stage, but is required to provide co-ordination sufficient and adequate for the purposes of obtaining Building Approval.
vii) The Consultant is not required to provide detailed and accurate sizing of plant and equipment - sizing for plant and equipment is to be an estimate only.
viii) The Consultant must identify plant and equipment and the location of switchboards, panels, cables, ducts conduits on the design documents but is not required to provide detailed design information. The Consultant is not required to provide details of the type and manufacture details of relevant equipment.
ix) The Consultant must provide preliminary sizing of plant and equipment, ducts, conduits, trays and cables.
x) Design drawings for Stage One Services will contain:
(1) No notes
(2) No specifications on drawings
(3) No dimensions Incomplete schedules
(4) Scaled drawings.
xi) The Consultant must provide copies of the design documents in PDF format to the Client only. The Consultant is not required to provide CAD drawings as a part of Stage One Services.
xii) The Consultant must overlay the design documents on the architectural plans for the Building.
xiii) The Consultant is not responsible for documentation of the structural or architectural elements of the Building or responsible for producing the design document for major services infrastructure outside the building

development site with reference to the drawings listed under Part D.

xiv) The Consultant is to consult regularly with the Client's representative and, within the reasonable policy guidelines set down by the Client's representative, consult with the Client and local authorities, on concept design issues, where applicable.

xv) The Consultant is to obtain other consultants' advice, where appropriate and integrate it into the design and the Consultant's plan.

h) Stage Two Services – Detailed Design Phase

i) Requirements for completion of Stage Two Services are as follows:

ii) Completed detailed design documents based on frozen architectural drawings and frozen Brief:

(1) 100% complete design documents

(2) 100% complete notes on design drawings

(3) Completed specifications, scaled drawings and schedules on design drawings

(4) Completed sizing of all plant, equipment, ductwork, cables, switchboards and cable trays

(5) Non brand specific equipment nominated except for small items where viable options are not a consideration

(6) Type and manufacture details provided where required.

iii) Completed engineering design drawings of the HVAC, Fire, Hydraulics and Electrical Systems and completed computer simulations.

iv) Documentation required for construction design documents must include interface of the other consultant disciplines

v) All remaining documentation required for construction issues working drawings, review and acceptance of shop drawings

vi) The Consultant is to consult regularly with the Client's representative and, within reasonable policy guidelines set down by the Client's representative, consult with the Client and local authorities on concept design issues, where applicable.

vii) The Consultant is to liaise with the Client in the preparation of Contract Materials, and minimize omissions, ambiguities, and gaps with abutting Building Services Trades.

viii) The consultant is to assist the Client with the review of the services trade quotes and recommendations prior to engagement of the services trades.

ix) The Consultant must provide completed completion certificate (Form 16 equivalent).

x) The Consultant must provide the detailed design documents overlayed on the architectural plans.

xi) The Consultant is not required to document structural or architectural elements of the building or to provide design document for major services infrastructure outside the building development site with reference to the drawings listed under Part D.

xii) The Consultant is to provide all design documents in ACAD and PDF format with specifications being provided in PDF format only