

WIRATMAN ARCHITECTURE

# Airport Design

Imelda Akmal  
Architecture  
Writer Studio

IMAJI

First published in Indonesia in 2016

**Publisher**

PT IMAJI Media Pustaka  
Jl. Ciputat Raya No. 8/Blok 8D  
Jakarta 12310, Indonesia  
p. +62 21 2765 6493  
sales.imajibooks@gmail.com  
www.imajibooks.com  
@IMAJIbooks

**Proposed by**

WIRATMAN ARCHITECTURE

**Written by**

Imelda Akmal Architectural Writer Studio

**Editorial Team**

Imelda Akmal (Managing Editor)  
Dinda Mundakir

**English Editor**

Mustapha Kamal Zulkarnain

**Design**

Zinnia Nizar-Sompie (Art Director)

**Graphic Designer**

Rizki Krisnadi for Ampersand Studio

**Photographer**

Sonny Sandjaya Photography

**Image Editing**

M. Aluwi

**3D Image Visualisation**

Blur Indonesia Visualization Studio

**Illustration**

Tateng K. Djajasudarma, IAI, AA, GP.

**Interviewers**

Anindita Rahmadhanisa  
Shandy Cahyo Nugroho

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or any other information storage and retrieval system without the prior written permission of the publisher and/or author.

ISBN 978-602-9260-34-2

Printed and bound in Indonesia  
by Gramedia Printing

# Contents

**006**

Foreword

**012**

Airport Planning and  
Design: A Theory

**030**

Airport Projects by  
WIRATMAN

---

**034**

Depati Amir Airport  
Pangkalpinang,  
Bangka Island

**046**

Raja Haji Fisabilillah  
International  
Airport  
Tanjungpinang,  
Bintan Island

**060**

Sultan Thaha  
Airport  
Jambi, Jambi  
Province

**072**

Lombok  
International  
Airport  
Praya, Nusa  
Tenggara Barat

**084**

Adisutjipto  
International  
Airport  
Special Region  
of Yogyakarta

**100**

I Gusti Ngurah Rai  
International  
Airport  
Denpasar, Bali

**116**

Kualanamu  
International  
Airport  
Medan, North  
Sumatra

**140**

Terminal 3 at  
Soekarno-Hatta  
International  
Airport  
Cengkareng, Banten

---

**158**

WIRATMAN  
Profile

**160**

Imelda Akmal  
Architecture Writer  
Profile

Prof. Dr. Ir. Wiratman Wangsadinata

## WIRATMAN, a Multi-Disciplinary Consultant

When we perceive a consultant's business, it seems that it is artless. The profession of a consultant is simply giving proposals, advice, and consideration to the clients. In fact, it is neither simple nor easy to build a consulting firm, to become successful and sustainable. Besides requiring the necessary expertise in their fields, the people involved must also have passion, values, and the quality of excellence. In other words, the key to a successful consulting business predominantly depends on the professional people in the company. It is what we have experienced for the past 40 years at WIRATMAN.

Established in 1976, WIRATMAN started the consultancy business in the field of Structural and Geotechnical Engineering, in line with the expertise of the company's founders. Along the way, it gradually became developed and currently, WIRATMAN's business group has grown into a multidisciplinary consultant that also offers the services in the fields of Architecture, Civil Engineering, Power Engineering, Environmental Engineering, Project Management and Construction Management, Survey and Mapping, as well as Soil Investigations equipped with a laboratory. We believe that the multidisciplinary services are the company's strengths. During the economic turbulence in the nineties, it helped WIRATMAN to survive and adapt to the contraction of the Indonesian construction market.

During the past 40 years in the industry, WIRATMAN has handled more than 4,300 projects, including those that need multidisciplinary expertise. In

the early years, the assignments were limited to ordinary projects, because at that time big projects generally belonged to the government, designed as well as constructed by state-owned companies. Not until the 1970s did private investors start to have interest in the construction market to build the tall buildings that required the services of engineering consultants, and thus WIRATMAN began to engage in large-scale projects.

Many high-rise buildings in the early formation of Jakarta's skyline had the involvement of WIRATMAN. Opportunities were opened, supported by my previous direct experiences in designing the first tall building in Indonesia, namely Wisma Nusantara, in 1970-1973 and the Block G Building in 1972-1975. Furthermore, the clients' continuous assignments have strengthened the company's existence to become a large-scale national consultant up to the present time. We certainly feel blessed and thankful for the achievement that we have reached.

Being predominantly known as a consultant in the field of Civil Engineering, particularly in Structural Engineering which has received professional acknowledgments and awards, not many people know that since 1979, a mere three years after the company was founded, WIRATMAN has also been involved in architectural design work. At that time, the first assignment came from the Department of Agriculture to design facilities located in various parts of Indonesia. Since then, the Architecture Division of WIRATMAN, recently named "WIRATMAN ARCHITECTURE" has been involved in more than 390 projects of various types and sizes, from privately owned commercial buildings to facilities belonging to state-owned companies and the Indonesian Government.

Since 1994, our company has been helping the Indonesian government through the Ministry of Transportation, PT Angkasa Pura I, and PT Angkasa Pura II in designing air transport facilities to connect the cities and islands of the archipelago. We have been assigned to prepare masterplans as well as to design runways and terminals for airports from small scales up to an ultimate scale. An airport is a complex building type which, during the design process, not only requires the expertise of architects but also input from other disciplines. The strength of WIRATMAN with multidisciplinary services had lessened the complexity towards the completion of the assignments.

As a consultant, it has always been in our spirit that knowledge sharing

is compulsory, including sharing our experience in designing several airports in Indonesia. For that purpose, in relation to the 40<sup>th</sup> anniversary celebration of WIRATMAN, in collaboration with Imelda Akmal Architectural Writer (IAAW) Studio, we decided to write an architectural book, titled *WIRATMAN ARCHITECTURE: Airport Design*.

In fact, this is our fourth book published in the last five years. Even though we are currently living in the digital era of the paperless generation, statistically, a paper book for certain professions is still a desirable media for finding knowledge and information. Although bulkier and more expensive as compared to an e-book, it conveys the material presence particularly in the hands of a good book designer. We hope that this book, designed and published by IAAW Studio, will fulfil those who crave to read and to dig information highlighted with beautiful sketches, drawings, and photography.

Jakarta, November 2016

**Prof. Dr. Ir. Wiratman Wangsadinata**  
President Director  
WIRATMAN

Tateng K. Djajasudarma, IAI, AA, GP

## Airport Design, an Architecture of Infrastructure

In order to fulfil the client's dream of having a new building, an architect's role is very important in the front end, particularly during the design stage. However, it is often misunderstood and underappreciated by the society, while it is reflected in rare mentions of the building's architect by the media. In order to acquire the acknowledgements, it is important for an architect or a consulting firm to publish their projects, among others in the form of a book.

Specifically for "WIRATMAN ARCHITECTURE" that has already been in the business since 1979, its existence always felt overshadowed by the name of WIRATMAN which is known as a structural consultant. Besides knowledge sharing as part of our company's mission, we feel that a publication is a must to expose WIRATMAN ARCHITECTURE's achievements in the construction industry, locally and internationally.

To coincide with the 40<sup>th</sup> anniversary of WIRATMAN, while in line with the spirit of the Indonesian Government's program to accelerate the infrastructure development, we chose to publish a book about airports in Indonesia that have been designed by WIRATMAN through processes of formal design competitions conducted by the Ministry of Transportation and the two government-owned airport management companies, PT Angkasa Pura I and PT Angkasa Pura II. We have been awarded several contracts: some were built while a few are only in the concept stage.

The earliest involvement of WIRATMAN in airport projects was in 1993 when we received an assignment from

the Ministry of Transportation to design an airstrip in the small town of Cilacap, West Java. Later, it was followed by a Detailed Engineering Design (DED) of the runway extension, airside, and landside facilities of Djalaluddin airport in Gorontalo, North Sulawesi, also in 1993. The assignment continued in 1994 where WIRATMAN in cooperation with NACO Consultant, DHV, and Schiphol Airport from the Netherlands designed the Pattimura airport in Ambon and the Sam Ratulangi airport in Manado, both awarded through a World Bank design tender package. The consultants collaborated for the various scopes of masterplanning, design, construction management, testing, and commissioning stages. The project had been handed over to the client in July 2001.

After the Ambon-Manado projects were completed, WIRATMAN then participated in various tenders for airport design projects. Among those conducted by PT Angkasa Pura I were a design competition for Hasanuddin Airport in Makassar (2005), the airport in Lombok (2006), Adi Sucipto Airport in Yogyakarta (2006), and Ngurah Rai Airport in Bali (2007). Of those four designs, only the

Lombok airport was selected to be built. We also participated in PT Angkasa Pura II's design competitions for Kualanamu Airport in Medan (2007) which was subsequently built, Depati Amir Airport in Pangkalpinang (2008) which led to the addition of Raja Haji Fisabilillah Airport in Tanjungpinang (2009) and Sultan Thaha Airport in Jambi (2009), all three of them being built. We also partook in the first design competition for Terminal 3 (T-3) of Soekarno-Hatta Airport in Jakarta (2010). Unfortunately, after we submitted the design proposal and had been judged by the independent jury, the competition design committee has not announced the winner for that T-3 design competition until today; instead we found out later that they have changed it into a design-and-build tender in 2012.

An airport is a dynamic and progressive building type as it will continue to evolve quite rapidly in accordance with the advances of the aviation technology. There are three important issues that must be considered in airport design; those are operation, convenience, and business. The first issue is related to the ease, speed and reliability of airport operation, including in normal and also emergency situations. Secondly, it must be comfortable for the passengers as well as the people who use the facilities, including visitors and workers. Lastly, an airport must be able to facilitate the needs of business growth.

As an architect, our design must also consider the past, present and future of building techniques and cultures to deliver a message that relates past and

present thoughts with a future awareness and cultural identity. In other words, we need to review the previous concept of the existing airports to find out the reason behind their early design formation. We must be aware of new developments in aviation technology and comply to the latest related regulations, both domestically and internationally to meet the current and future needs. Since an airport is also a gateway to a region, the local wisdom and cultures should also be expressed in the building.

In the meantime, the local government has the role to prepare a feasibility study in order to know the estimated number of passengers per year and to predict the future figure. This is very important particularly in Indonesia, as in the last couple of years we have seen a rapid increase in air travel passengers due to the fast growth of low cost carrier industries.

In designing an airport, all of the abovementioned aspects should be considered and accommodated. This book is intended to provide the information about the design process and could become a reference for other architects and stakeholders.

Jakarta, November 2016

**Tateng K. Djajasudarma, IAI, AA, GP**  
Director, Senior Principal Architect  
WIRATMAN ARCHITECTURE

Imelda Akmal

## Celebrating WIRATMAN's Achievement and Providing a Learning Tool Through Writing

This book is the second book that we have compiled for WIRATMAN, one of the largest multi-disciplinary engineering consultants in Indonesia. The first book, titled "Momentum & Innovation 1960-2010: Wiratman" had been published in 2010. The book traces the works and career records of Prof. Dr. Ir. Wiratman Wangsadinata, the founder of the consulting firm and one of the most respected technopreneurs of the civil engineering field in Indonesia. Their work gave birth to the formula in the calculation of steel, concrete and earthquake-resistant buildings. Those works of high value made an outstanding contribution to the field of construction in the country. Therefore, it is with utmost joy and pride that we are here again, having been given the opportunity to arrange and publish the second book from the prestigious multi-disciplinary firm of WIRATMAN.

This second book focuses on documenting the architectural design works of airports. Ever since the architectural division of WIRATMAN was established in 1979, three years after WIRATMAN's consultant group was established, they have designed no less than 35 airports in Indonesia. Under the leadership of Tateng K. Djajasudarma, IAI, AA, GP, the division has planned and designed various types of airports ranging from the small airstrip up to the international hub, an example being Kualanamu International Airport which is considered to be one of the most complex airport designs in Indonesia. There are not many architectural firms able to handle the design of the airport. WIRATMAN's

architectural division has indeed planned and designed the majority number of airports in Indonesia.

The airport design process is extremely complex. This is a transportation typology set to serve hundreds to tens of thousands users per day. Complexity is present in the vital circulation between the human routes of passengers, visitors, staff, and the goods routes of baggage and packages, as well as the vehicular routes for land and air modes of transportation. Air safety is also a crucial factor considering that air transportation demands near-perfect safety, in prevention of fatal accidents. Not to mention the issue of terrorism that places the strain of paranoia for

airport officials and passengers. All of these things affect the architectural design of the airport. In addition, airports also function as the gateway of an area, requiring it to become welcoming buildings that express the identity of the place. The common requirement that arose from local authority is to be able to show a sense of locality, and this is not easy to be realized. The reason is that the airport building typologies are entirely different to local architectures that are generally traditional houses.

The anticipation of an airport's future development in accordance with the growth of airline routes and the growth of passengers is also of vital importance. An example is Depati Amir Airport in Pangkalpinang which had been designed with three phases of development, each of which increased two to threefold the number of passengers able to be processed while also changing the airport development from a small domestic airport into an international airport with more complex needs. When all of the criteria must be addressed and resolved through the design by architects, an expertise in providing design solutions is needed. In this case, the system of a flexible modular architecture is one of the solutions offered by WIRATMAN.

Another impressive feat is that the majority of airports in WIRATMAN's repertoire are the result of winning design competitions. Through a competition, the design must be carefully assessed by the jury in order to defeat other candidates.

A victory amidst a competition is usually the fruit of an innovative solution, and this is indeed what is offered in the many airport designs by WIRATMAN.

Not everything can run perfectly. Some aspects of the design by WIRATMAN's team did not materialize in the construction of airports, both for the main design and the architectural details. In general, these are caused by factors of execution in the field and limited development funds. Hence, in this book, we present pictures of the designs by WIRATMAN, alongside photographs of airports that are already in operation as a reference towards the journey of a design from the design stage to the application.

Above all, in accordance with the request of Tateng K. Djajasudarma, IAI, AA, GP as the principal of WIRATMAN's architectural division, this book comes with a theoretical discussion about airport design, in accordance with the practical experiences of WIRATMAN's architecture division. This book is expected to be a learning tool for young Indonesian architects and students in designing airports and to provide insight for the public about the design of the airport.

We are hopeful for this book to add to the wealth of literature in the architectural world. Happy reading.

**Imelda Akmal**

Principal - Studio IAAW

Imajibooks Publishing Director