

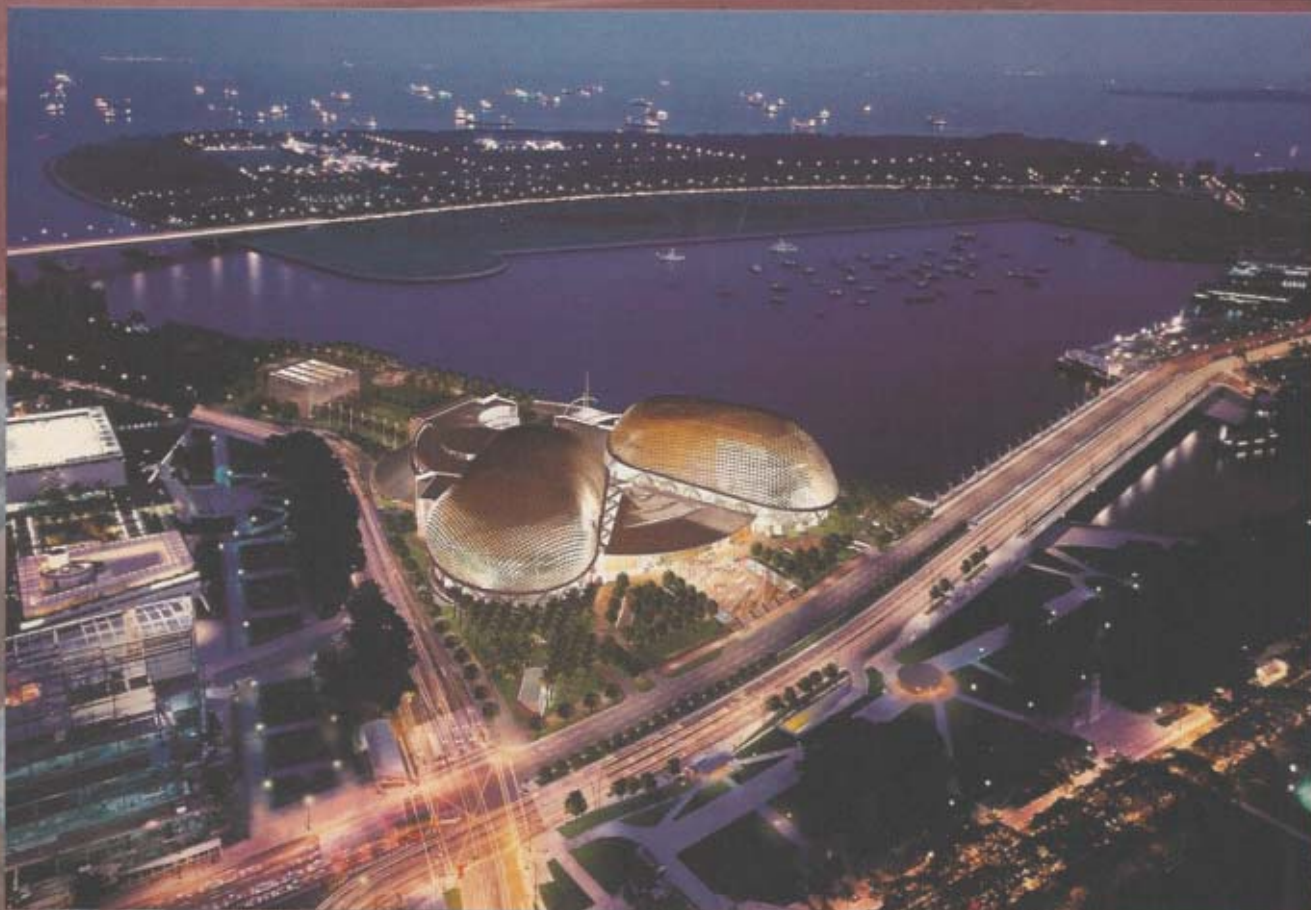
SOUTHEAST ASIA

# building

INCORPORATING ARCHITECTURE, INTERIOR DESIGN AND LANDSCAPING

Published monthly since 1974

JANUARY 2002



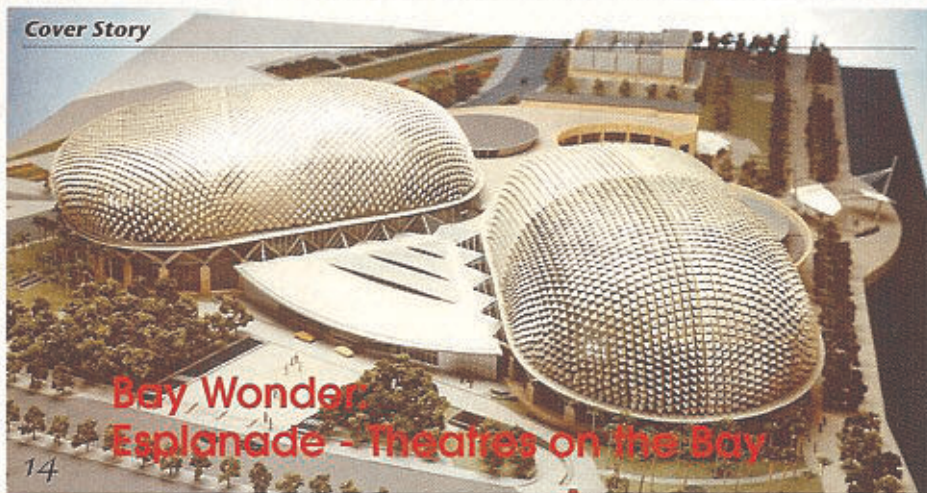
COVER STORY  
*Bay Wonder: Esplanade - Theatres on the Bay*

2001 RAIA National Architecture Awards  
Gunnar Frank Forecast: Individuality is the Way  
BW/AR 2001 AWARDS



## contents

### Cover Story



## Bay Wonder Esplanade - Theatres on the Bay

14

### Feature

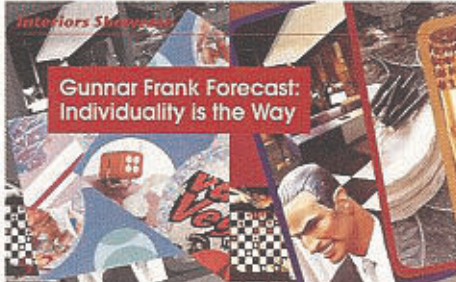
#### 2001 RAI National Architecture Awards



42

### Interiors Showcase

#### Gunnar Frank Forecast: Individuality is the Way



- 02 News
- 08 Events
- 56 Feature: BW/AR 2001 Awards
- 62 New on the Market
- 64 Product Application Showcase
- 66 Product Showcase  
Office Furniture & Furnishing, Doors,  
Windows & Architectural Hardware, Ceiling Systems
- 70 Mixed Category

### What it should have been...

We would like to highlight that Cesma International was in collaboration with Archurban Architects Planners for the implementation of the Liu Xian Cun project (featured in the profile on Cesma International, in the November 2001 issue of Southeast Asia Building). We apologise for the omission.

**SOUTHEAST ASIA BUILDING** is published monthly by:  
Trade Link Media Pte Ltd, 12 Aljunied Road, #04-02 SCN Centre, Singapore 389801.  
Tel: 65-842-2580, Fax: 65-842-2581, Editorial e-mail: [tlm.edit@pacific.net.sg](mailto:tlm.edit@pacific.net.sg).

The magazine is available free-of-charge to applicants in the building industry, who meet the publication's terms of control. For those applicants who do not qualify for free subscription, copies will be made available, subject to the acceptance by the publisher, of a subscription fee, which varies according to the country of residence in the following manner:

#### Annual Subscriptions

**Airmail:** Europe - US\$198, USA - US\$198, Asia Pacific - US\$176, Brunei - B\$160, Malaysia - S\$160  
**Surface mail:** Singapore - S\$135.95 (Incl 3% GST Reg No.: M20108708-2)  
For further details, fax: 65 842 2581 or tel: 65 842 2580

Printed in Singapore by KHL Printing Co Pte Ltd  
MITA (P) No: 007/10/2001 KDN No: 1560 (1270) - (6)



Cover design by Wendy Wong

On the cover:

The Esplanade - Theatres on the Bay.

Image courtesy of DPA.

**PUBLISHER** Steven Ooi  
**SECRETARY TO THE PUBLISHER** Judy Then  
**HONORARY ADVISOR** Constance Ann, President, SID(S)  
**EDITOR** Jonathan Goh  
**DEPUTY EDITORS** Marissa Mesa, Natalie Foo  
**ASSISTANT EDITOR** Alvin Chumari  
**GROUP ADVERTISEMENT MANAGER** Eunice Foong  
**ADVERTISEMENT MANAGER** Mervin Tan  
**MARKET DEVELOPMENT MANAGER** Eric Ooi  
**ADVERTISEMENT EXECUTIVES** Bernard Tan, Wendell Quek, Keith Lim, Dennis Lim, Henry Lim, Angeline Ng  
**ADVERTISEMENT ADMIN EXECUTIVE** Karen Chan  
**GRAPHIC DESIGNERS** Dolly Ng, Norini bte Zainal  
**CIRCULATION** Yvonne Ooi

### INTERNATIONAL SALES OFFICES

**Malaysia:** Impacta Sdn Bhd (Company No: 227619-D) c/o Lot 28.1, 28th Floor, Menara Maybank, 100, Jalan Tun Perak, 50050 Kuala Lumpur, Malaysia.

**Australia:** Gary Dolder AP Media 183 Henderson Road, Wentworth Falls 2780, NSW Australia. Tel: 61-2-47-57-3314; Fax: 61-2-47-57-3315.

**France:** A. P. Watt International Publisher's Representative 6, Rue Des Acacias, 91810 Vert-Le-Grand, France. Tel: 33-1-6456-0015; Fax: 33-1-6456-0863.

**Italy/Switzerland:** Arch. Aldo Cacchioli/Publstein di Galli Cacchioli & Co. Via Ciseri 5, 6600 Locarno, Switzerland. Tel: 41-91-751-6910; Fax: 41-91-751-7109.

**Japan:** T. Asoshina / Shizuka Kondo ECHO Japan Corporation Grande Maison, Rm 303, 2-2, Kudan-Kita, 1-Chome, Chiyoda-ku, Tokyo 102, Japan. Tel: 81-3-3263-5065 Fax: 81-3-3234-2064.

**Korea:** Chang Hwa Park Far East Marketing Inc. Rm 1806/7, Golden Tower Building, 191, 2-ka, Choongjungro, Seochoemum-ku, Seoul, Korea. Tel: 82-2-364-4182; Fax: 82-2-364-4184.

**Taiwan:** Robert Yu World Wide Services Co. Ltd 3F-3, No. 540, Sec. 1 Wen Hsin Road, Taichung, Taiwan. Tel: 886-4325-1784 Fax: 886-4325-2967 Tlx: 51155 TEKNIB

**China:** Zhu Hui Feng. Tel: 86-21-6205-8761 Fax: 86-21-6205-8761 Email: [zhuhuileng5929@sohu.com](mailto:zhuhuileng5929@sohu.com).

The Editor reserves the right to omit, amend or alter any press release submitted for publication. The publisher and the editor are unable to accept any liability for errors or omissions that may occur, although every effort has been taken to ensure that all information is correct at the time of going to press. No portion of this publication may be reproduced in whole or part without the written permission of the publisher.

Trade Link Media Pte Ltd also publishes:  
• Southeast Asia Construction • Southeast Asia Fire & Security • Southeast Asia Facility Management • Stone Link Today • Bathroom Today • Concrete Technology Today • Mass Transit Today • Cleaning Today • Lighting Today •

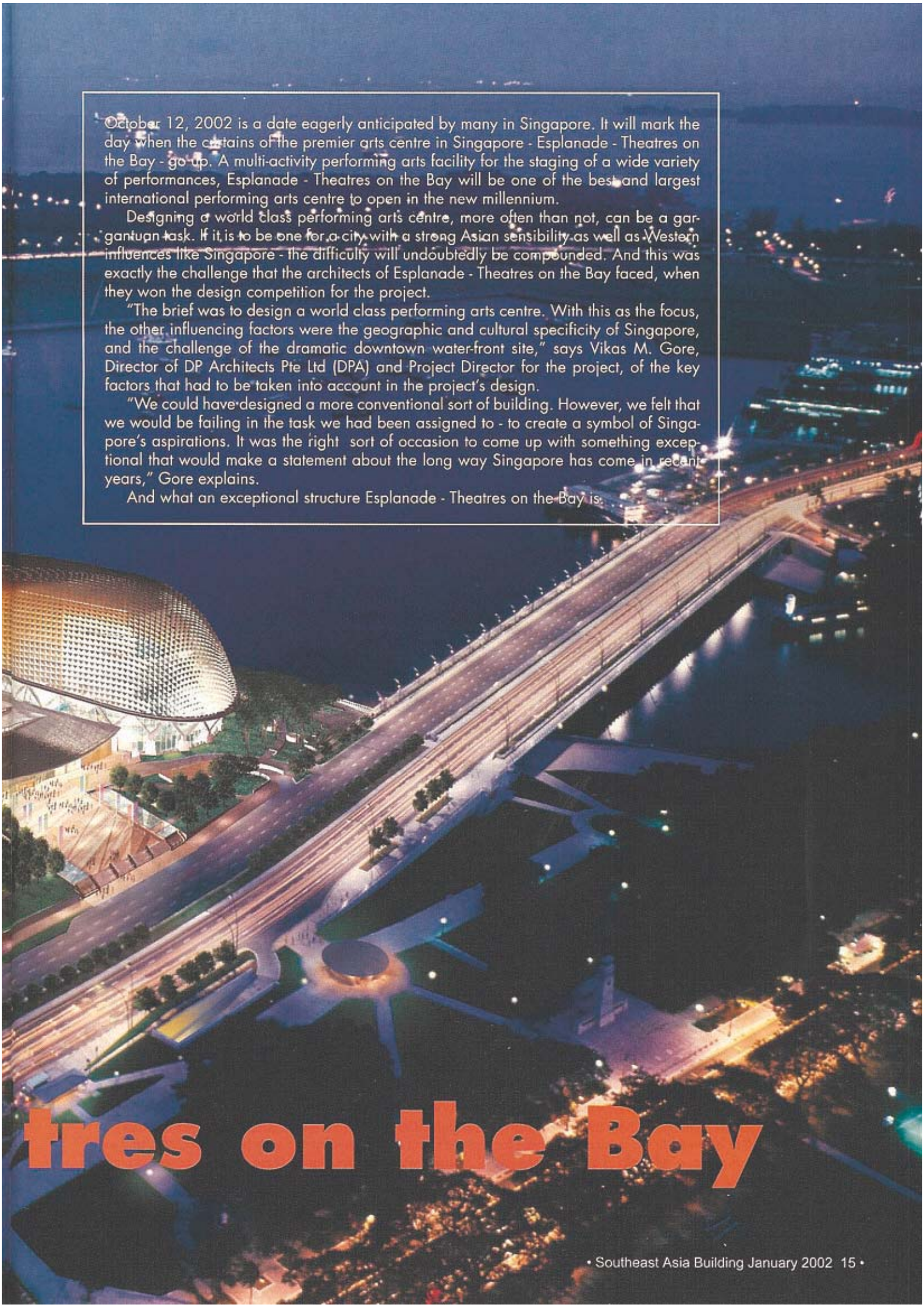


*In photo:* Overview from the Swissôtel The Stamford, Singapore. At night, the two shells glow from within.

Scale model and computer generated images courtesy of DPA.  
Photographs courtesy of Penta-Ocean.  
Images reproduced with kind permission from TECL.

# BAY WONDER: Esplanade - Thea





October 12, 2002 is a date eagerly anticipated by many in Singapore. It will mark the day when the curtains of the premier arts centre in Singapore - Esplanade - Theatres on the Bay - go up. A multi-activity performing arts facility for the staging of a wide variety of performances, Esplanade - Theatres on the Bay will be one of the best and largest international performing arts centre to open in the new millennium.

Designing a world class performing arts centre, more often than not, can be a gargantuan task. If it is to be one for a city with a strong Asian sensibility as well as Western influences like Singapore - the difficulty will undoubtedly be compounded. And this was exactly the challenge that the architects of Esplanade - Theatres on the Bay faced, when they won the design competition for the project.

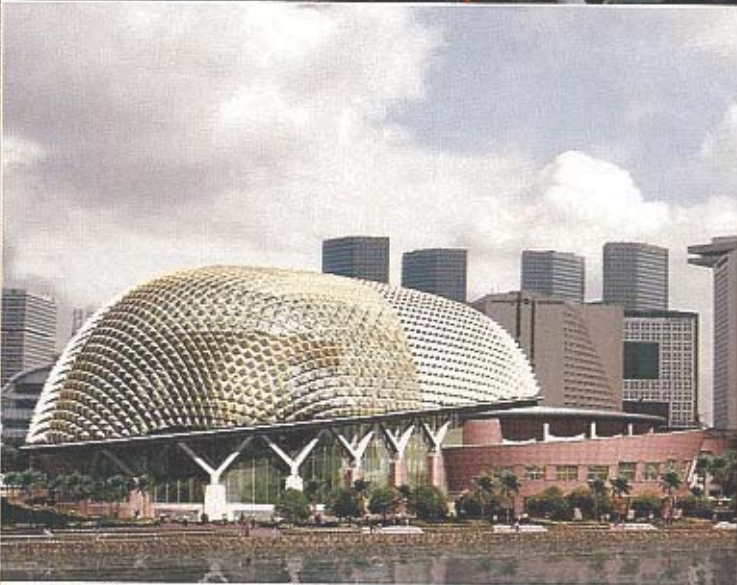
"The brief was to design a world class performing arts centre. With this as the focus, the other influencing factors were the geographic and cultural specificity of Singapore, and the challenge of the dramatic downtown water-front site," says Vikas M. Gore, Director of DP Architects Pte Ltd (DPA) and Project Director for the project, of the key factors that had to be taken into account in the project's design.

"We could have designed a more conventional sort of building. However, we felt that we would be failing in the task we had been assigned to - to create a symbol of Singapore's aspirations. It was the right sort of occasion to come up with something exceptional that would make a statement about the long way Singapore has come in recent years," Gore explains.

And what an exceptional structure Esplanade - Theatres on the Bay is.

# tres on the Bay





**Clockwise from left:** The glass sunshades afford a beautiful view from the foyer of the Concert Hall; overview from the Swissôtel The Stamford, Singapore; view of the Concert Hall from Marina Bay.

Sitting on a 6-ha linear site between Marina Centre and Marina Bay, two large shells encompass the two main auditoria: the Theatre and the Concert Hall. The Theatre, with 2,000 seats and an orchestra pit for up to 100 musicians, an adjustable proscenium and main stage with side and rear stages, is versatile enough for traditional dramas and large musical performances. The Concert Hall, with 1,600 seats and adjustable acoustics (adjustable acoustic canopy and reverberation chamber) and a Klais pipe organ, is ideal for musical performances of all genres, from jazz to pop and orchestral. "Each is also a unique architectural space both inside and in the foyers," adds Gore.

Both auditoria are being designed with the co-operation of Artec Consultants Inc, an acoustic consultant in New York; and Theatre Projects Consultants, a theatre planning consultant based in London, to ensure sensitivity to the performances that will be held there. The Concert Hall's acoustic canopy, reverberation chamber doors and acoustic banners allow the hall to be tuned like a musical instrument for performances ranging from a flute solo to a large orchestra performance. Internal wall linings of the Concert Hall and Theatre are constructed with Glass Reinforced Gypsum

(GRG) panels and Novawall track stretched wall system using 100 percent silk fabric.

"Each auditorium is in effect a building within a building, in the sense that a continuous acoustic joint - a physical gap - separates it from the enclosing structure on all sides. Even at the bottom it is separated from the main foundations by virtue of each hall sitting on a series of rubber pads to separate them from the foundations. This is to eliminate all possibility of ground and structure borne noise being transmitted to the interior," explains Gore. "Even the air-conditioning and other services are designed to achieve a noise rating that is in fact just below audible levels."

On the design of the building, Gore says that it grew out of a careful consideration of the site, and out of the need to make the building contextually significant to Singapore. (Read Gore's design statement on pages 26 and 28).

The architects have chosen conventional materials for the construction of the building, with the building mostly in concrete or concrete framed with block work infill, and external walls clad in stone. There are two concrete block walls around the auditoria and two concrete slabs on steel trusses cover these halls overhead for acoustic reasons.



According to Gore, the cladding over the two main halls, made of triangulated glass panels sitting on a steel structure with aluminium sunshades on the outside, constitute a structure that has never been attempted before. "Recent developments in computer technology for the building industry have been instrumental in realising it, and it would not have been possible to either design or build it a few years ago." DPA and Atelier One, the London-based cladding specialist engineer, had both used Bentley Systems' MicroStation product in generating the design of the cladding. DPA had also used the MicroStation product to generate the bulk of the project's CAD images, which have won the firm Bentley Systems' 1998 Excellence in Engineering Award in the Building/Architecture category.

In creating the cladding, Gore says that "the glass, steel and aluminium system used for the two shells was selected to arrive at an optimum compromise between three conflicting needs: to have air-conditioning; to exploit the dramatic views on all sides; and to shelter the interior from the equatorial sun."

Other facilities available at Esplanade - Theatres on the Bay include a Theatre Studio, a Recital Studio, a Rehearsal Studio, outdoor performance areas, the Esplanade Mall, an 800-lot basement carpark, and convenient access to the city's subway, bus and taxi stands.

The Theatre Studio and Recital Studio, seating up to 250 and 200 respectively, are suitable for intimate performances. The outdoor performance spaces include the concourse, a waterfront feature cum performance space, an experimental space known as The Edge, a 300m-long waterfront and landscaped gardens for visitors to enjoy outdoor entertainment.

The Esplanade Mall, a 8,600sq m retail mall offering thematic dining and retail experiences over three storeys, will also have outdoor facilities by the waterfront. It has recently signed up its first key tenant, library@esplanade, which will be Singapore's first performing arts library.

Over the next few pages, you will find interesting snippets of information on the design and construction of what will likely be one of Singapore's most recognisable and highly-acclaimed landmarks to date.



**Clockwise from left:** The entrance forecourt; the Esplanade Mall will offer dining and retail experiences; the entrance concourse; the F&B courtyard.



## ENSURING SOUND PERFORMANCES

To make Esplanade - Theatres on the Bay a top class performing arts centre, the renowned Russell Johnson of US-based Artec Consultants Inc was roped in to design the Concert Hall and Theatre. Artec has been responsible for many a great concert hall. The Morton H Meyerson Symphony Centre in Dallas, USA; Avery Fisher Hall at Lincoln Centre, USA; Birmingham Symphony Hall, UK; and the recently opened Lucerne Culture and Congress Centre in Switzerland, are some examples of the impressive work Artec has done.

In order to achieve acoustical excellence for the project, Artec set out very stringent design goals for noise and vibration. The outcome? The Concert Hall and Theatre (which, together, probably are the latest and most technologically advanced piece of work done by Artec to date) hold within their halls the latest technological equipment and the finest acoustics. Notable acoustic features include the acoustic rubber pads used in the construction of the Concert Hall and Theatre, and the adjustable acoustic canopy and reverboration chamber in the Concert Hall.

## ACOUSTIC RUBBER PADS

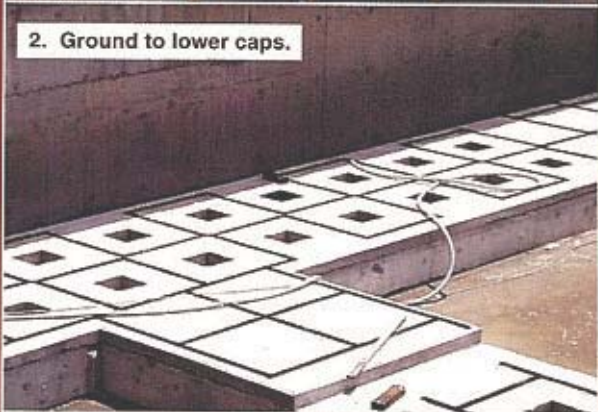
To isolate the hall from the ground and structure borne vibration through the structure slab, the audience chambers were rested on customised rubber pads. Each rubber pad, measuring 20cm in thickness, comprise embedded rubber layers intermeshed with steel plates. About 600 pieces of these rubber pads were installed at the basement floor of the Concert Hall, with another 800 pieces at the basement floor of the Theatre. Even the roof trusses are sitting on smaller rubber pads. A total of about 2,000 pieces of the rubber pads were used in the two halls.

## RUBBER PADS INSTALLATION »

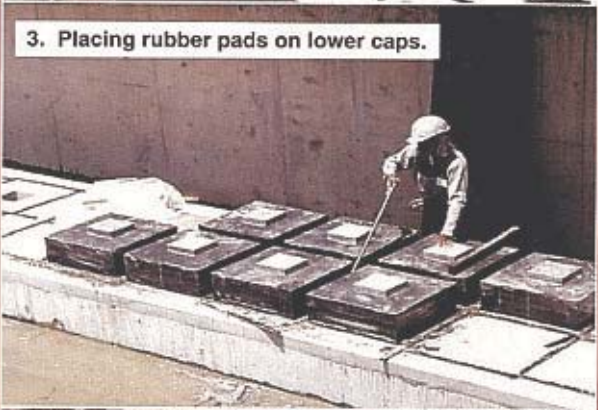
1. Preparation to cast lower caps.



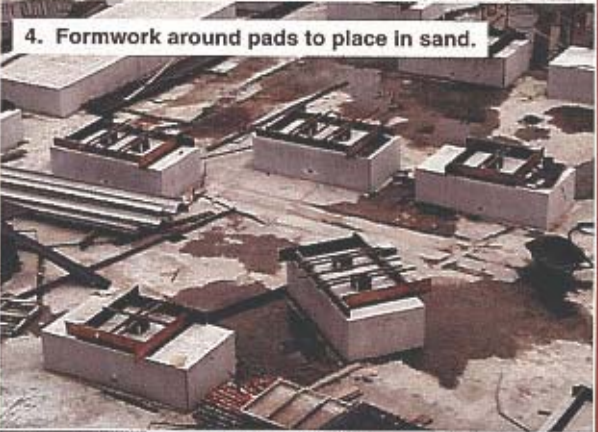
2. Ground to lower caps.



3. Placing rubber pads on lower caps.



4. Formwork around pads to place in sand.



5. Preparation to cast lower caps.

