

**‘International Physical Education  
and Sport University’,  
part of a  
Floating - Transportable Array of Sport  
Facilities to Rent, for Mega-Sport Events**

**By Michael Burt, Architect, D.Sc. Prof. Emeritus  
Technion, I.I.T, Israel**

**Sport industry and 'mass entertainment and recreation through sport' enter the globalization era.**

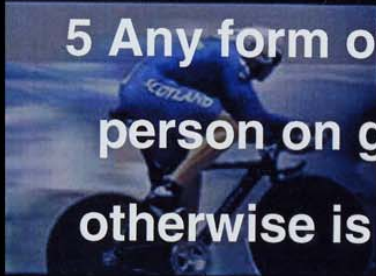
**The revival of the Olympic legacy and spirit by Coubertin's vision**, in the end of the 19-th century, started a chain of **Olympic and other mega-sport world events**, generating in its wake a proliferating cultural activity **on a national and international level**, with an ever-increasing impact on human-cultural-educational and economic-political sphere, the scale and magnitude of which cannot be exaggerated.

**The Uniqueness of the Olympic legacy is in its message of unity and shared destiny of the human race; with moral – ethical commitment to friendship, peace and **total rejection of prejudice and discrimination.****

FROM THE OLYMPIC CHARTER:



5 Any form of discrimination with regard to a country or a person on grounds of race, religion, politics, gender or otherwise is incompatible with belonging to the Olympic Movement.



## **On a national and international level**

**The harsh reality is that most of world's nations (about 80%+!) are incapable of hosting a major sport event, mostly on economical grounds, because of the inhibitive costs of sport facilities, required infrastructures and event operation expenditures.**

# ECONOMIC FACTS

## GAMES

The estimated gross cost  
(before taking account  
of any income)  
at the time of the bid

Additional  
constructions costs

Overall  
up-to-date



Barcelona 1992

US\$ 1.1 milliard

US\$ 1.4 milliard



Atlanta 1996

US\$ 1.5 milliard



Sydney 2000

US\$ 3.27 milliard

US\$ 2.2 milliard

US\$ 6 milliard



Athens 2004

US\$ 8.7 milliard

US\$ 14.6 milliard

## AFTER THE PARTY, SYDNEY'S OLYMPIC BLUES

(CNN) -- If you build it they will come. In Sydney, they don't.

Future Olympic city hosts be warned. Despite the stunning sellout success of the 2000 Games, Sydney's \$200 million Olympic Stadium is shaping up as a white elephant of mammoth proportions.



## GHOST TOWN

The problems are not confined to the main stadium. Most days, this sprawling complex resembles little more than a state-of-the-art ghost town.

**Sydney, like so many host cities before it,  
is struggling to convert the short-term publicity bonanza of the games  
into long-term economic benefits.**

The suggested central idea-concept is

**to realize and construct a modular array of floating, transportable, state of the art Olympic facilities, capable of traversing the oceans, which could be borrowed-rented by the interested hosting nations of mega-sport events, Olympic Games included, for the duration of the event, to be moored in proximity of major port cities and reasonably protected coastal marine environments.**



## **On a personal – individual- social level**

**The competitive mega-sport events** with activities elevated to a form of art and an expression of the **ultimate human achievement and excellence**, are open to all races, nationalities and social tracts and provide the **shortest track for young men and women to rise to prominence and draw world attention and recognition, once reserved only to god-like epic heroes.**

**The talented sportsmen are lavishly rewarded and manage to reach the status of national and international social-cultural idols.**

**That makes competitive sport activities and physical education at large, an attractive career option, appreciated and desired by ever growing numbers of young people around the globe.**

**Desiring and yearning to join the ranks of the privileged is unattainable for most of humanity, mostly on economical grounds, lack of supportive social environment and of appropriate educational infrastructures.**

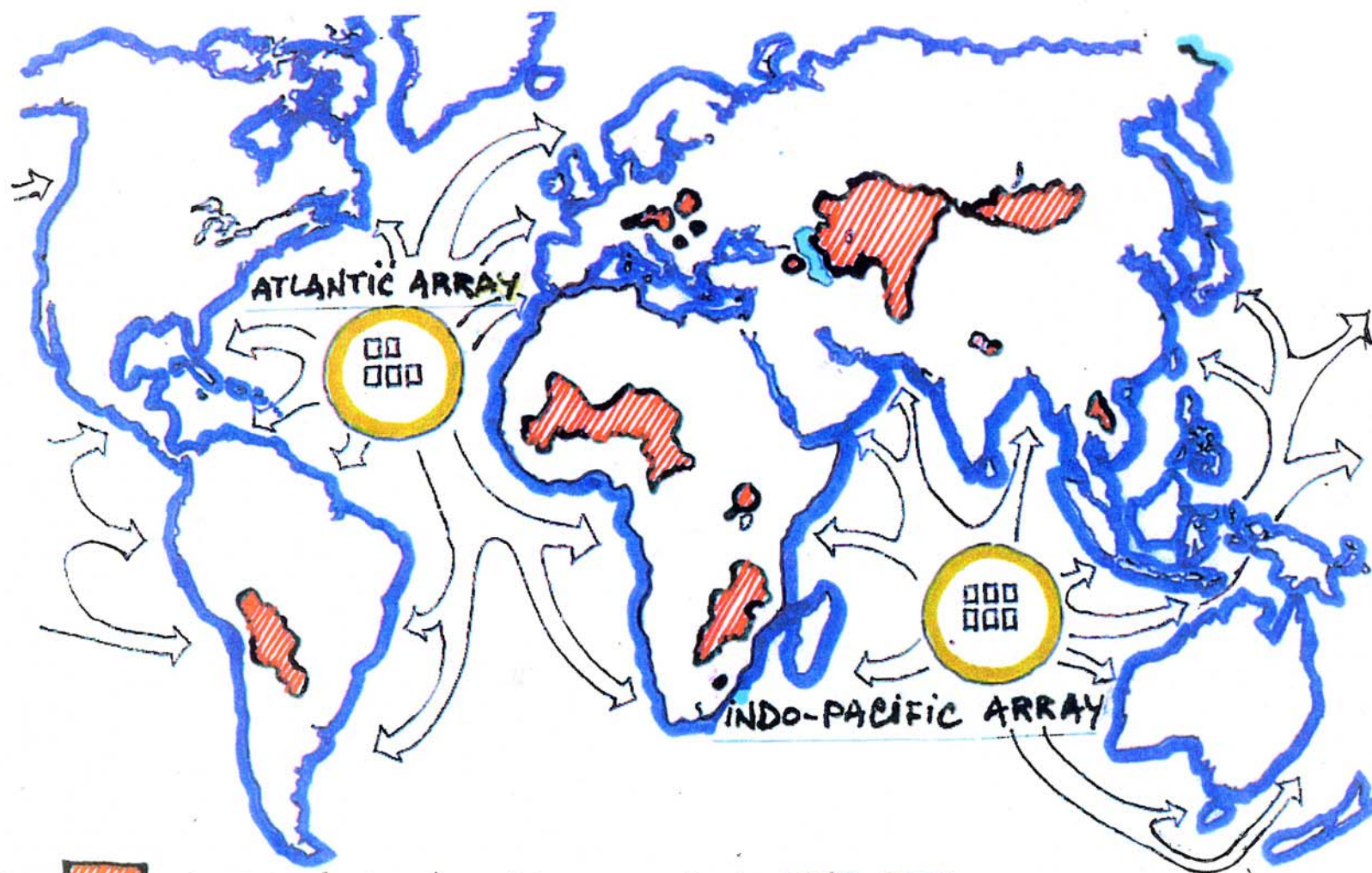
**It is a form of discrimination, a breach of the Olympic charter and a stain on the Olympic ethos.**

What is urgently required is

**an internationally endorsed  
and supported 'University of  
Sport',**

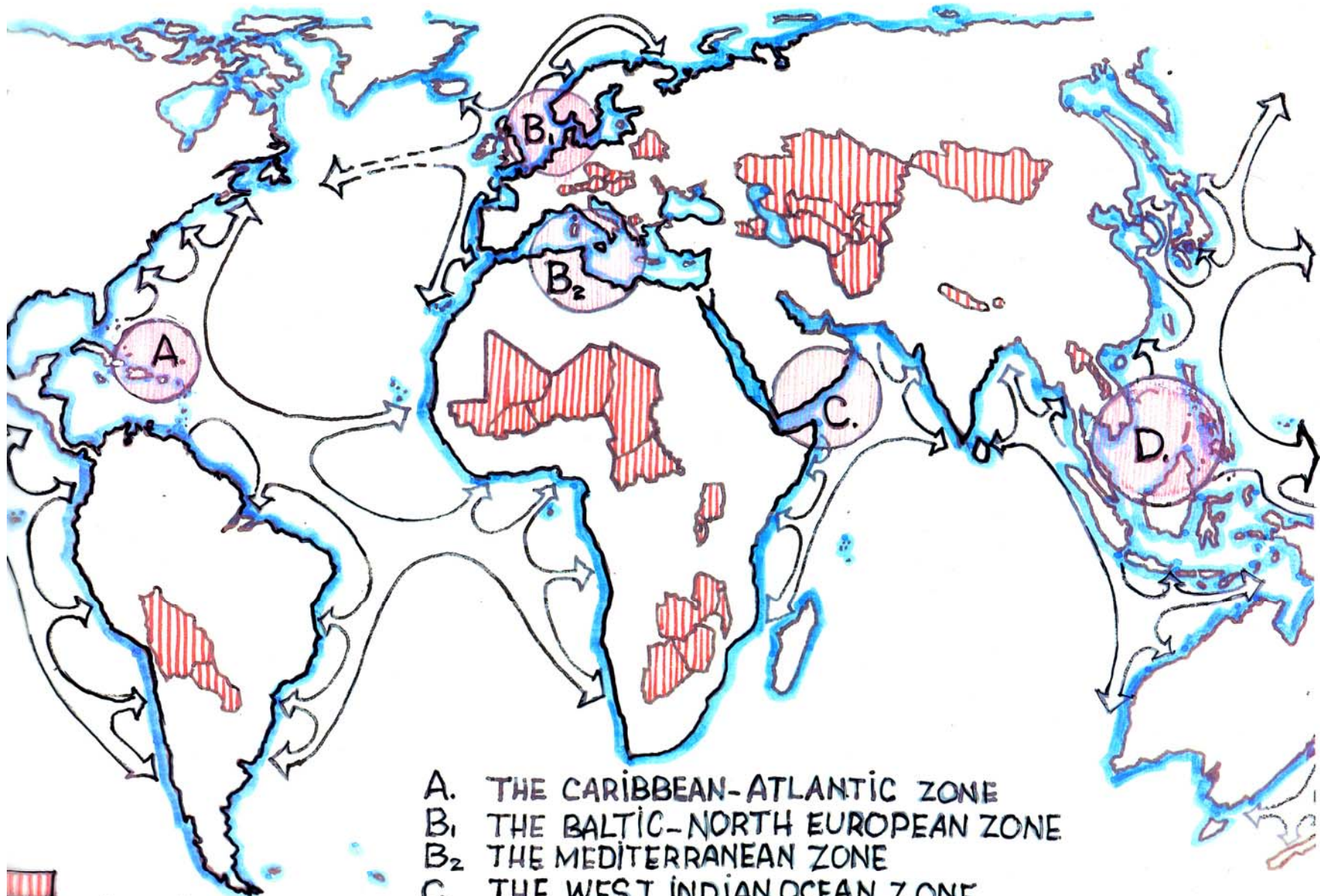
**As part of the modular Olympic  
facilities fleet**

**to provide physical education and  
training, study and research  
environment, for the most  
promising and aspiring sport talents  
and probable candidates to take  
charge of sport and physical  
education in their own countries.**



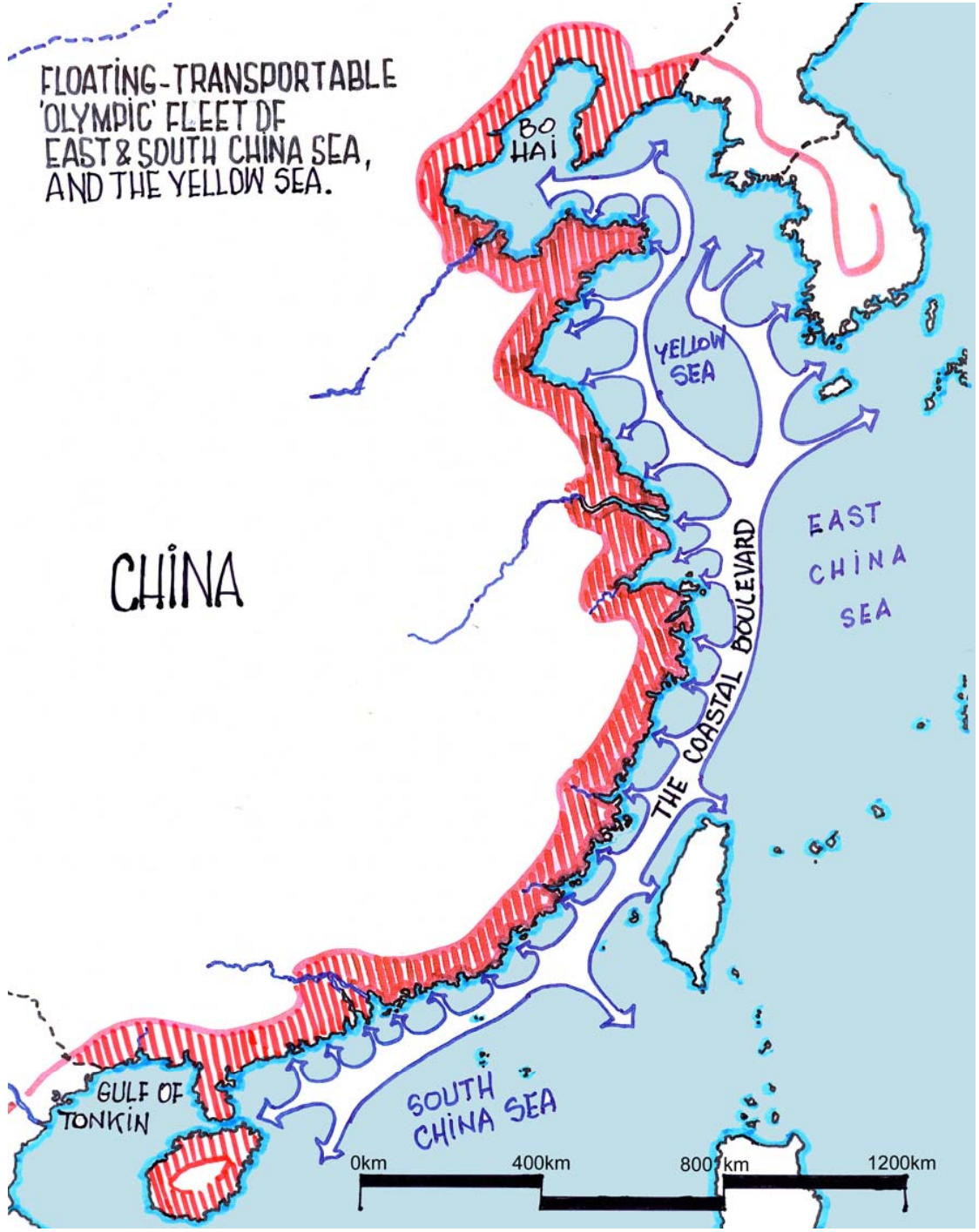
 COUNTRIES WITH NO ACCESS TO THE SEA

### THE ATLANTIC AND THE INDO-PACIFIC OLYMPIC FLEETS

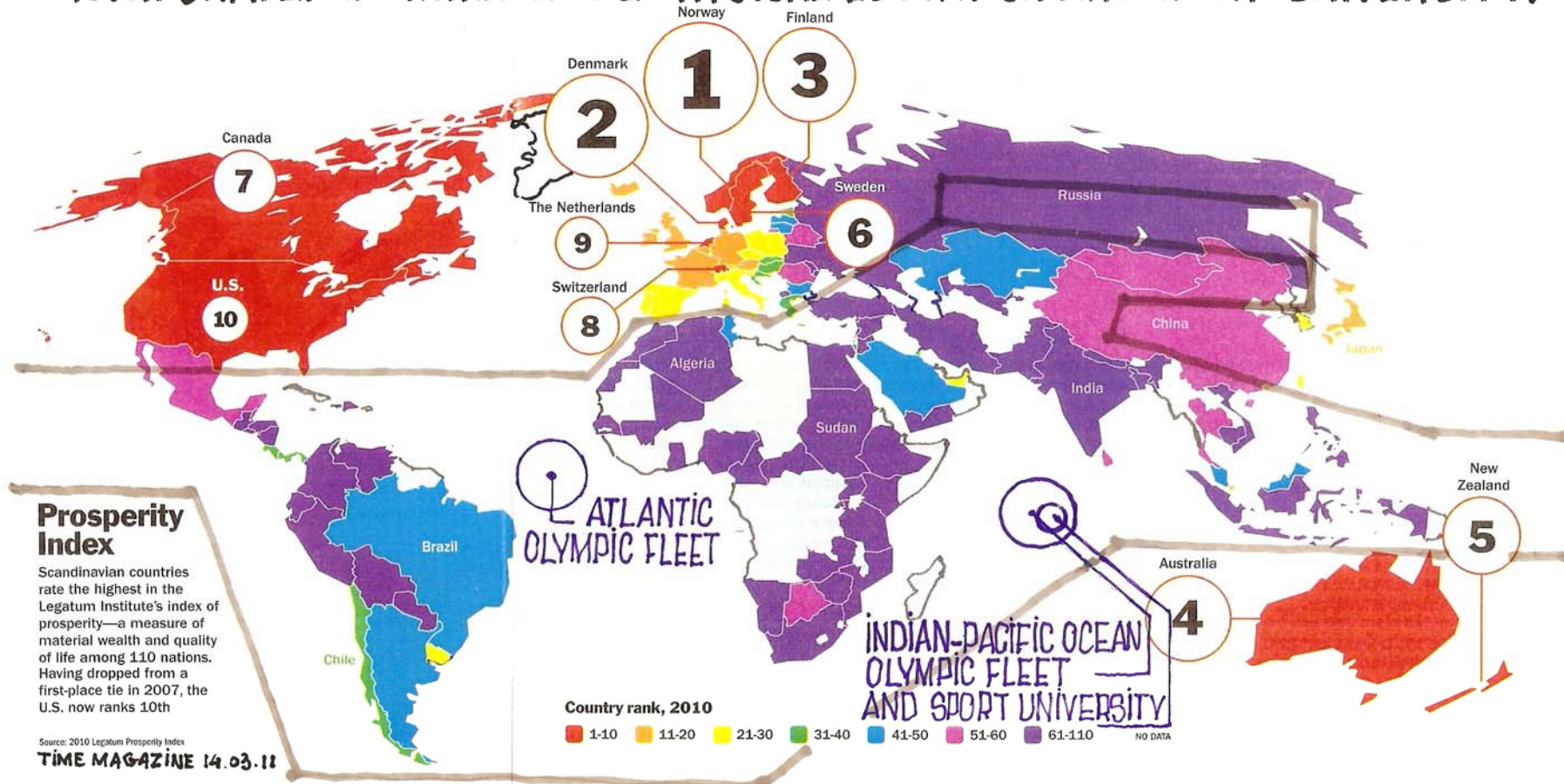


 COUNTRIES WITH NO ACCESS TO THE SEA

- A. THE CARIBBEAN-ATLANTIC ZONE
- B<sub>1</sub> THE BALTIC-NORTH EUROPEAN ZONE
- B<sub>2</sub> THE MEDITERRANEAN ZONE
- C. THE WEST INDIAN OCEAN ZONE
- D. THE EAST INDIAN-PACIFIC ZONE



THE DARK-GREY AREA COUNTRIES, MOSTLY UNDER-PRIVILEGED, TO BENEFIT FROM THE SUGGESTED VISION OF THE "FLOATING TRANSPORTABLE OLYMPIC FLEET AND THE INCORPORATED INTERNATIONAL PHYSICAL EDUCATION AND SPORT UNIVERSITY".



**The suggested fleet should be realized as an economically viable enterprise, which should generate reasonably sufficient income from its mega-sport (and auxiliary) activities to cover and maintain its operation.**

**Key contribution is the dramatically increased operational frequency, which is denied in the case of land-based facilities.**



| Sport             | Number of international/big events*<br>for the year 2005 |
|-------------------|--|
| Archery           | 6  |
| Athletics         | 21   |
| Basketball        | 26   |
| Boxing            | 2  |
| Cycling - indoor  | 1  |
| Fencing           | 3  |
| Gymnastics        | 2  |
| Judo              | 2  |
| Karate            | 3  |
| Modern pentathlon | 8  |
| Powerlifting      | 6  |
| Shooting          | 12   |
| Swimming          | 10   |
| Table tennis      | 6  |
| Taekwondo         | 3  |
| Tennis            | 36   |
| Volleyball        | 17   |
| Waterpolo         | 2  |

SPORTING CALENDAR FOR 2005



The envisaged floating modules might include the following:

- **The Central Stadium, equipped to serve up to 150.000 spectators.**
- **Auxiliary Sport Facilities Module, for various branches of sports, water sports included.**
- **One or two ‘Olympic Village’ modules and visitors accommodation; urban modules with all the servicing and infrastructures.**
- **‘Media studios and laboratories, Communication and Research Center’ and Administration module.**

**International ‘Sport University Campus’, with all the required facilities and infrastructures**

**TECHNOLOGY HAS MATURED TREMENDOUSLY SINCE THE CONCEPT OF MEGA-FLOATS WAS FIRST INTRODUCED BY ARMSTRONG IN THE 1920-th.**

**IT IS HIGH TIME TO RECOGNIZE THAT THE MARINE EXPANSES CAN ACCOMMODATE FOR THE TRANSPORTATION OF MAJOR URBAN-SCALE FACILITIES, HITHERTO CONSIDERED TO BE EARTH BOUND, STATIC.**

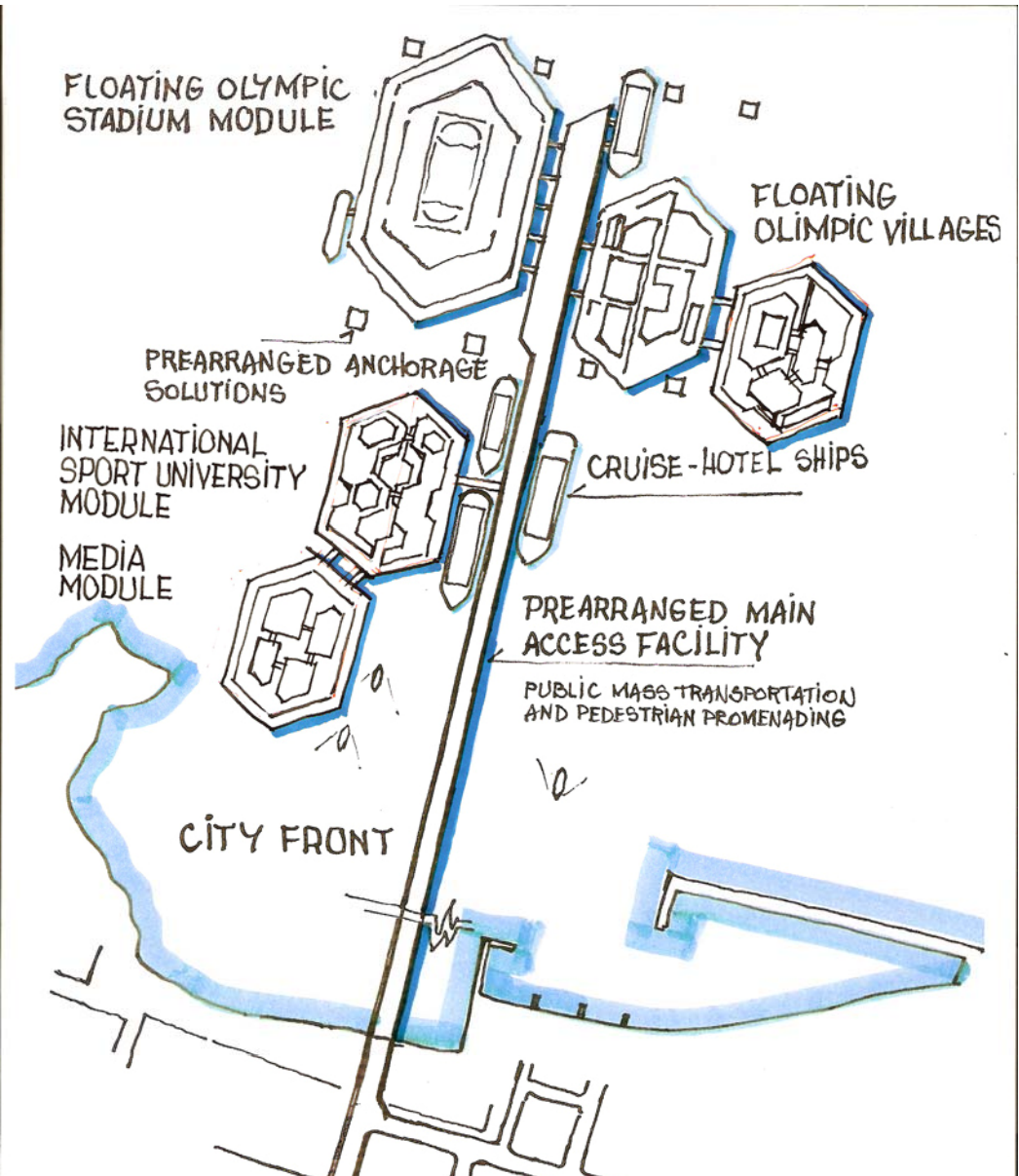
**CONCEPTUAL BREAKTHROUGHS ARE PERFORMED EVERY YEAR, WITH MAJOR OCEAN GOING RECREATIONAL FACILITIES AND INFRASTRUCTURE MEGA-VESSELS LEADING THE WAY.**

**GIVEN TODAY'S TECHNOLOGY IN MARINE ENGINEERING AND SPACE STRUCTURES WE ARE LIMITED ONLY BY OUR IMAGINATION.**

## ARRAY OF FLOATING MODULES:

The Central Stadium, equipped to serve up to 150.000 spectators;  
Auxiliary sport facilities module, for various branches of sport, water sports included;  
The “Olympic Village” and visitors accommodations; an urban module(s) with all the servicing and infrastructures;  
Sport University campus”, with all the required facilities and infrastructures.





FLOATING OLYMPIC STADIUM MODULE

FLOATING OLYMPIC VILLAGES

PREARRANGED ANCHORAGE SOLUTIONS

INTERNATIONAL SPORT UNIVERSITY MODULE

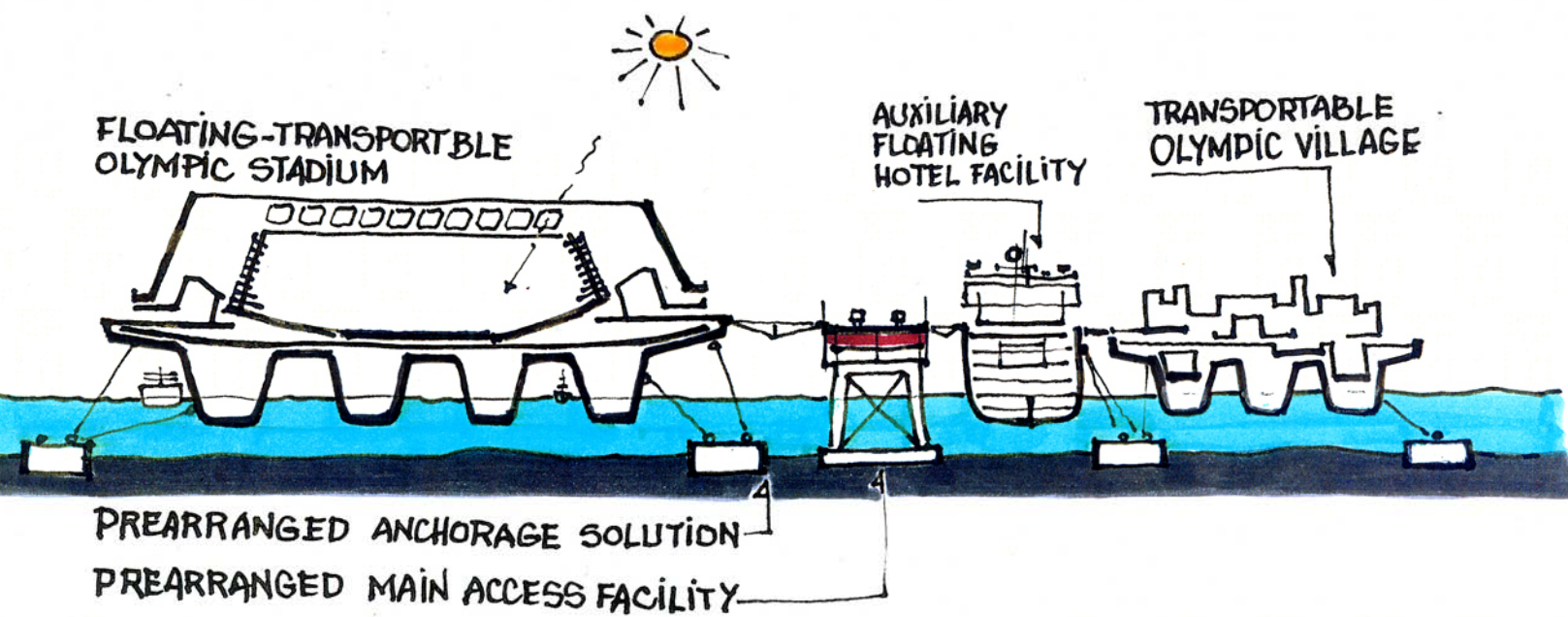
MEDIA MODULE

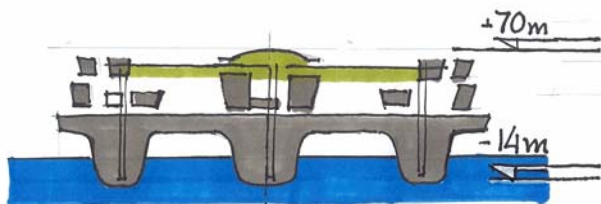
CRUISE-HOTEL SHIPS

PREARRANGED MAIN ACCESS FACILITY

PUBLIC MASS TRANSPORTATION AND PEDESTRIAN PROMENADING

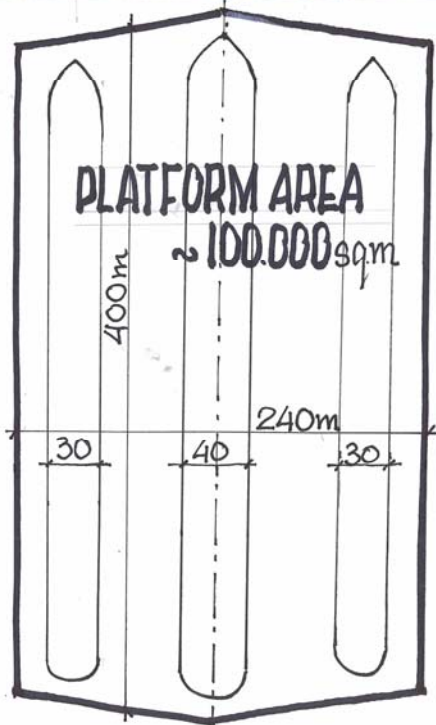
CITY FRONT





FLOATING, OCEAN TRAVERSING INTERNATIONAL SPORT UNIVERSITY  
AS PART OF A MODULAR ARRAY OF FLOATING-TRANSPORTABLE  
OLYMPIC FACILITIES FLEET.

A PROBABLE PROGRAMME:

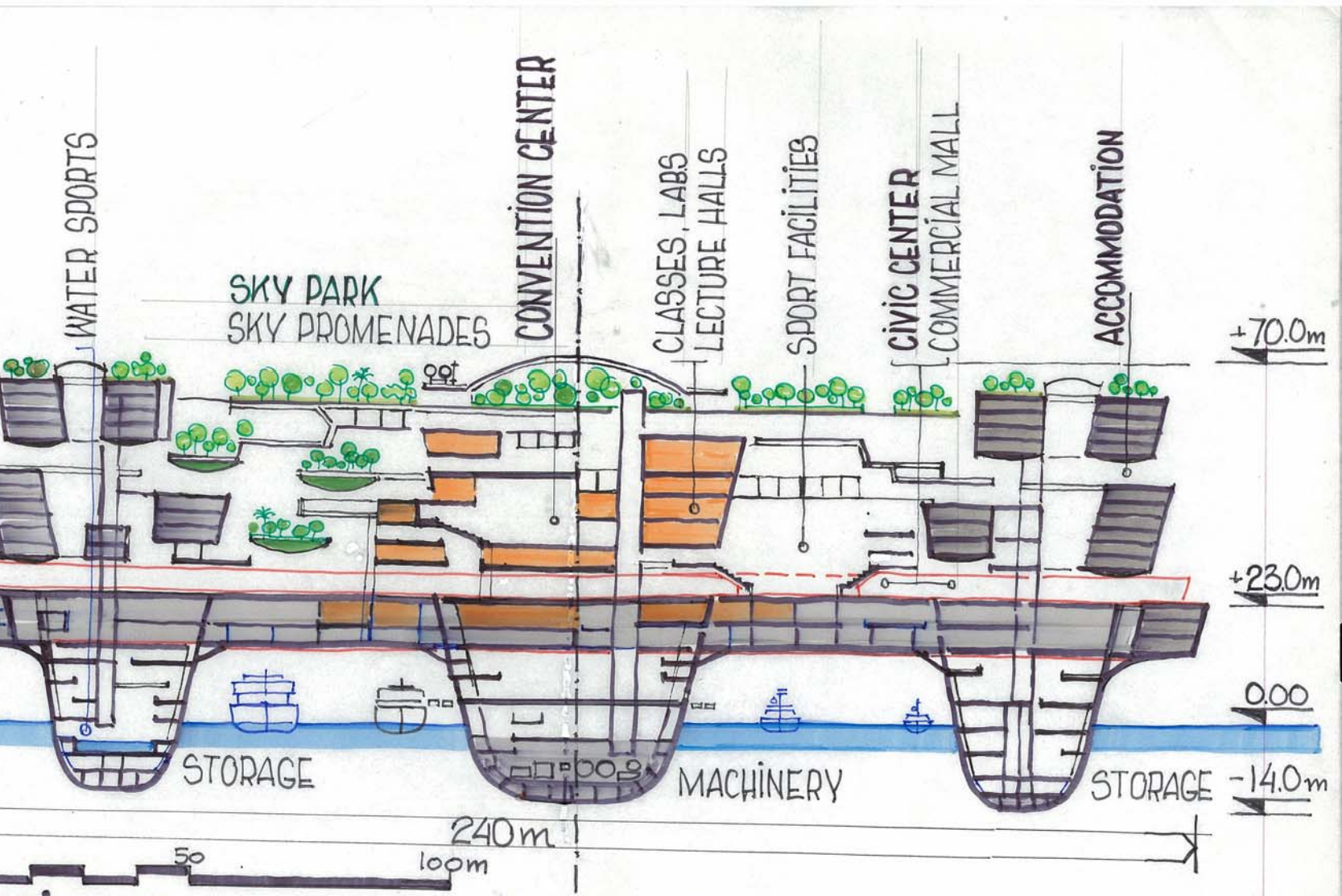


- ACCOMMODATION-  
6000 STUDENTS  
2500 ACADEMIC STAFF, TECHNICIANS  
SERVICE AND ENGINEERING TEAM
- LEARNING FACILITIES-  
CLASSES, LECTURE HALLS, LABS, OFFICES
- SPORT FACILITIES  
TRAINING AND PHYSICAL EDUCATION GYM,6  
TRACK SPORTS, WATER SPORTS
- CIVIC CENTER, RECREATION MALL, CONVENTION  
CENTER, LIBRARY
- GREEN PARK, SKY PROMENADES
- SERVICES, MACHINERY, STORAGE
- OPEN SPACES, TRAFFIC, MISCELLANEOUS

**BUILDING AIR RIGHTS- 516%**

ASSUMING LOADS OF 1.0 TON/SQ.M  
THE DRAUGHT IS EXPECTED TO BE  $\approx 14.0m$ .

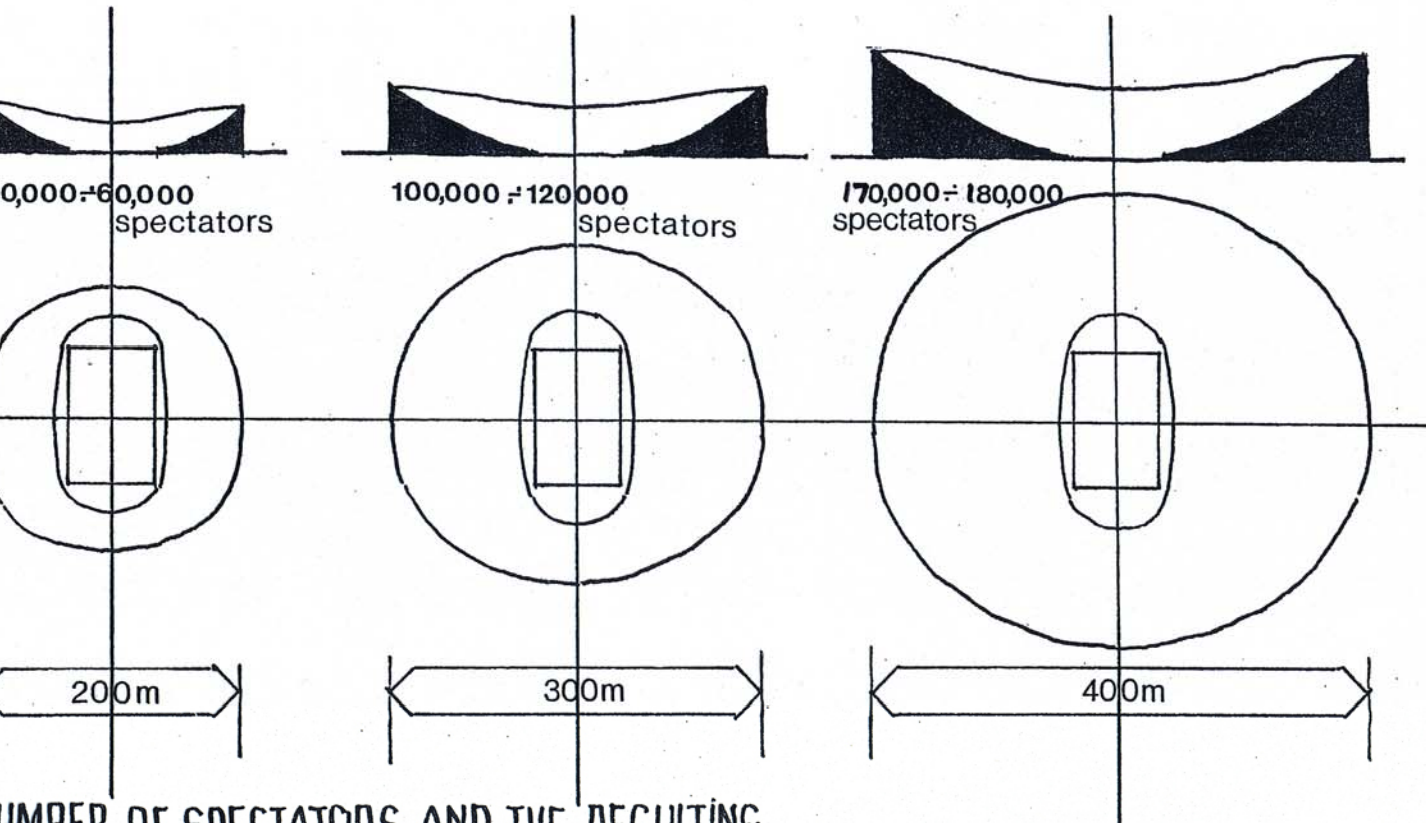
|            |            |
|------------|------------|
| 90.000sq.m |            |
| 45000 "    | 135000sq.m |
|            | 90000 "    |
|            | 40.000 "   |
|            | 21.000 "   |
|            | 20.000 "   |
|            | 60.000 "   |
|            | 150.000 "  |
|            | <hr/>      |
|            | 516000     |
|            | sq.m       |



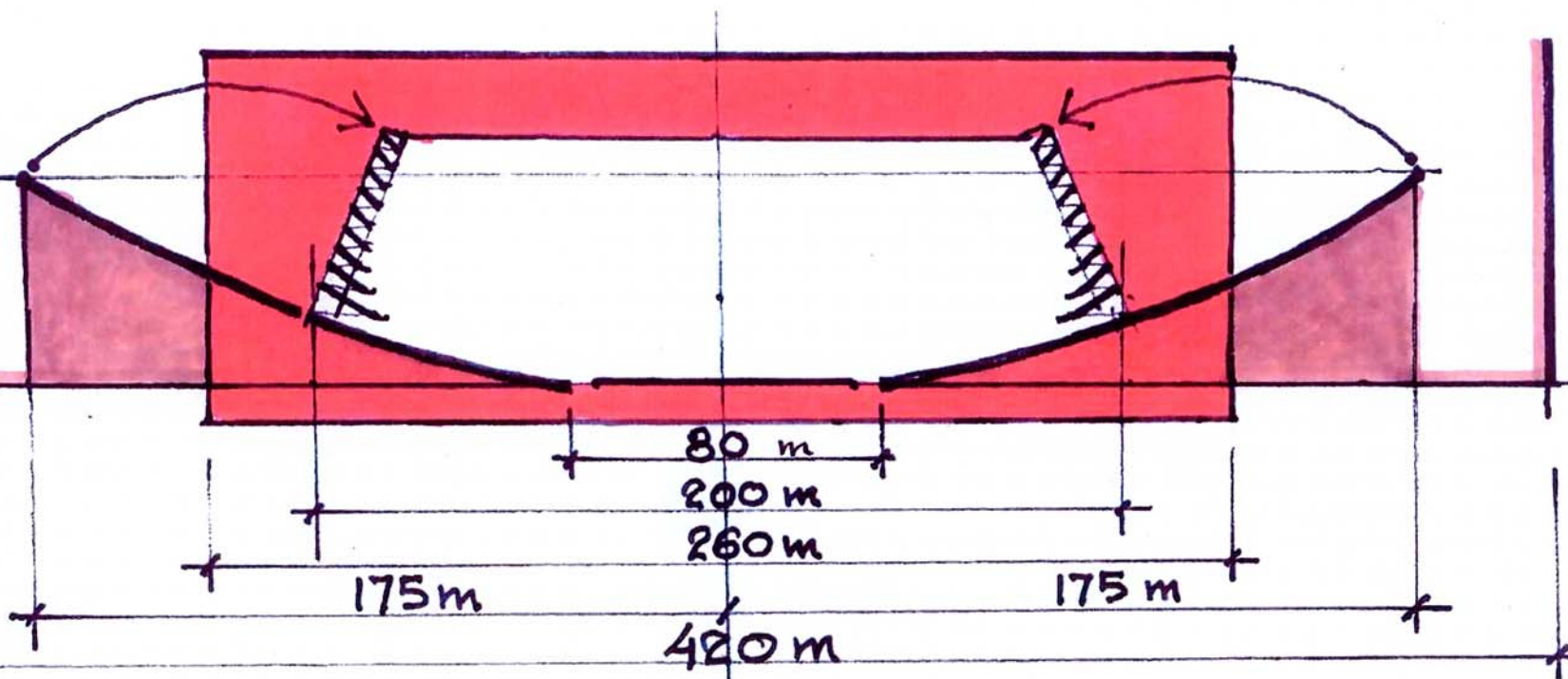


The suggested ocean – going platforms are not just transportation vessels but mostly living and working environments which should be endowed with as much of the characteristics of land based normalcy as possible.

**The over-riding design criterion (besides safety and security) of the entire modules array is a far-reaching compactness** which implies special attention to morphologically and functionally efficient space utilization.

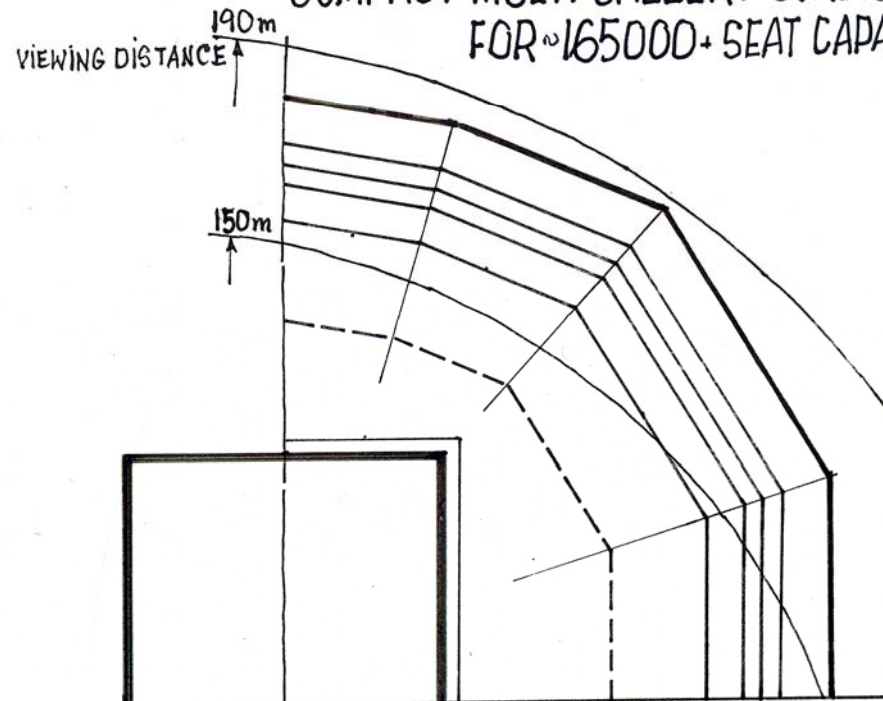


NUMBER OF SPECTATORS AND THE RESULTING



CAPACITY EQUIVALENCE OF THE 'MULTI-GALLERY' (200m)

# COMPACT MULTI-GALLERY STADIUM FOR ~165000+ SEAT CAPACITY



110m

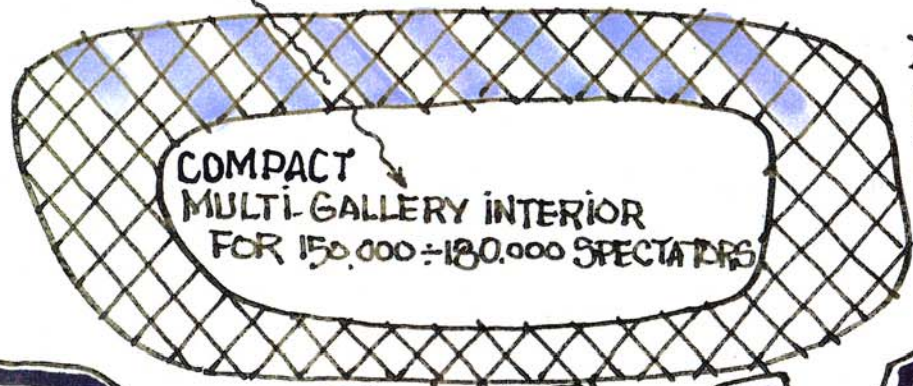
- A - 63,000
- B - 30,000
- C - 20,000
- D - 16,000
- E - 35,000
- F - 4,000

LEVEL



CONTROLLED PERMEABILITY  
TO CLIMATIC PARAMETERS

OPEN PUBLIC SKY-PARK SPACES



COMPACT  
MULTI-GALLERY INTERIOR  
FOR 150,000 ÷ 180,000 SPECTATORS

EXOSKELETAL STRUCTURE  
BOX-LIKE CLOSED IRL TRUSS,  
TO PROVIDE FOR LATERAL  
STABILITY

MULTI-HULL FLOATATION  
TRANSPORTATION STRUCTURE

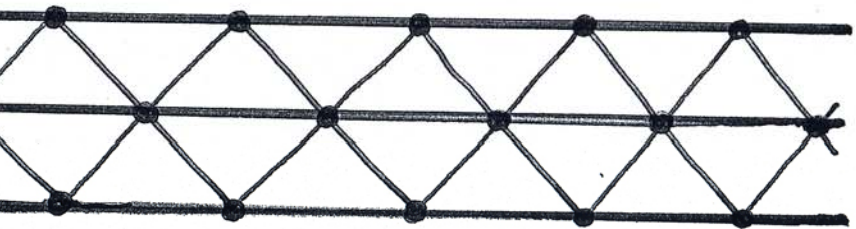
CONCEPTUAL FORMULATION OF PRINCIPLES OF THE  
FLOATING-TRANSPORTABLE OLYMPIC STADIUM MODULE

STRUCTURES DERIVED FROM THE OCTET SPACE LATTICE.



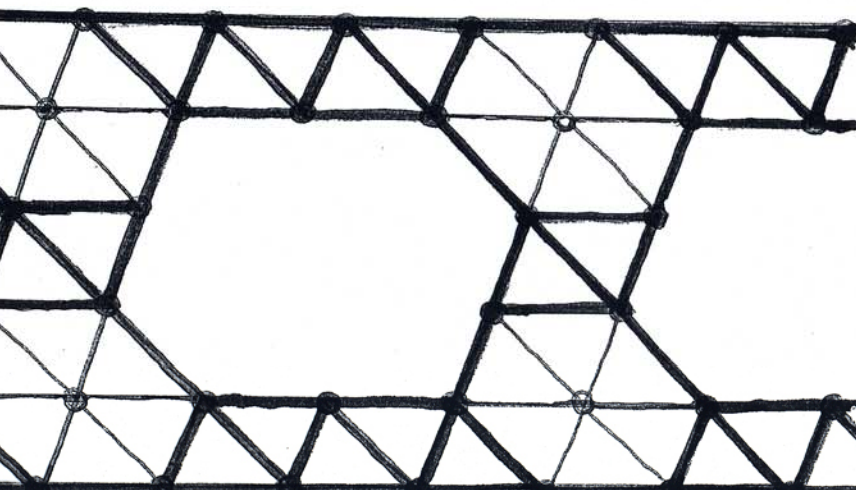
$h$  DOUBLE LAYER-OCTATRUISS  
SPACE FRAME

Den. =  $8a/a^2$



$2h$  TRIPLE LAYER-OCTET  
SPACE FRAME

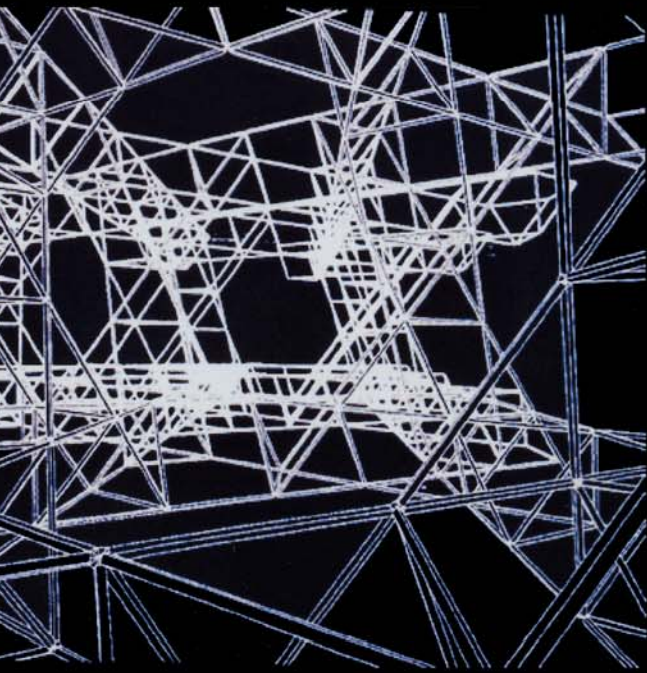
Den. =  $13a/a^2$



$3^3.4.3.4_3 -$   
INFINITE POLYHEDRA LATTICE  
(-I.P.L) SPACE STRUCTURE  
 $H = 5h$

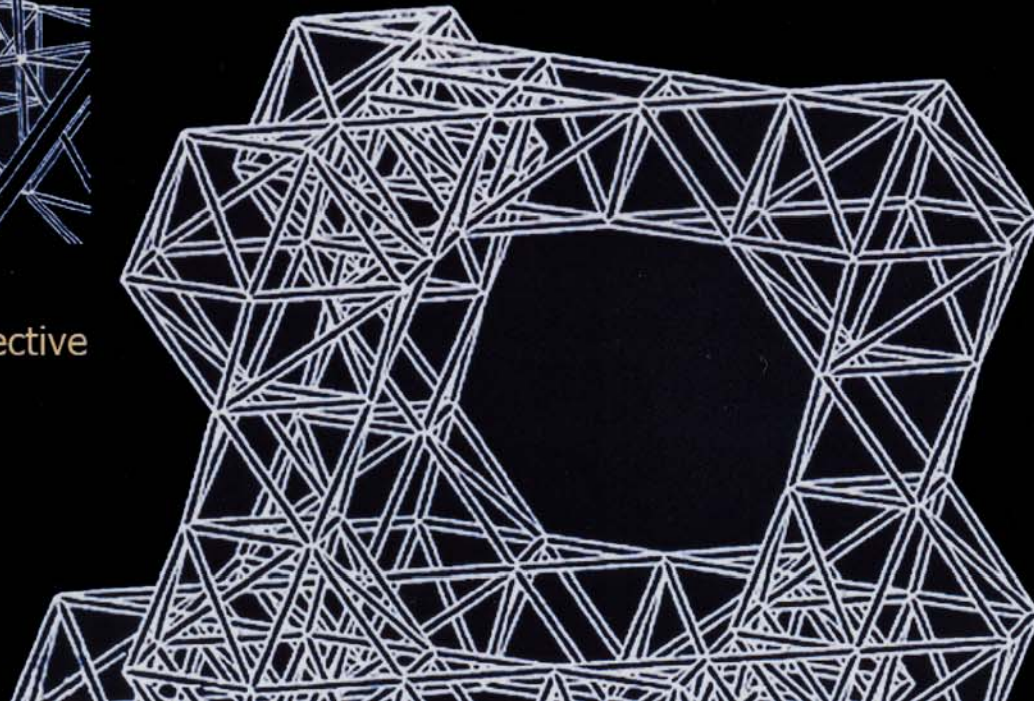
Den. =  $8a/a^2$

- SPATIAL DENSITY OF  $3^3.4.3.4_3$   
I.P.L LATTICE -  $D = 1.6a/a^3$



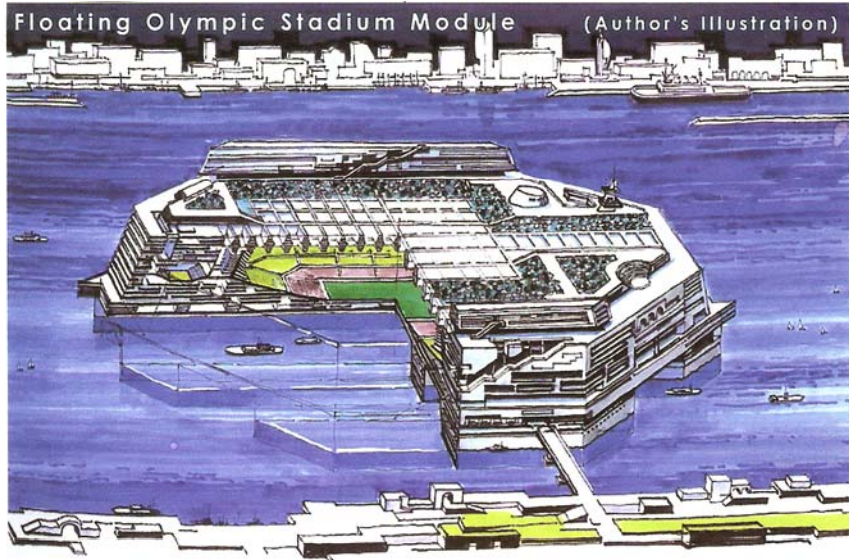
Six layer  $3^3.4.3.4_3$  -I.P.L space truss,  
demonstrating its low density  
and edge-bar alignment

$4.3.4_3$  - I.P.L space truss perspective  
view through its interior.

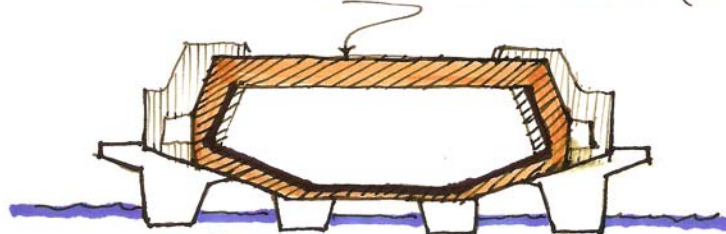


**I.P.L Space Structures** are multi-layered, low density, bar and joint trusses, the geometry of which is derived from '**Infinite Hyperbolic Sponge Polyhedra**'. Some of the I.P.L geometries, as physical structures, **are statically stable while maintaining a very low bar and joint density over their volume.** These structures are highly ordered and if used as large span mega-plates. I.P.L space trusses can span as much as 200÷300m, with bar-elements of 4÷5m in length.





EXOSKELETAL STRUCTURE (BOX-LIKE)



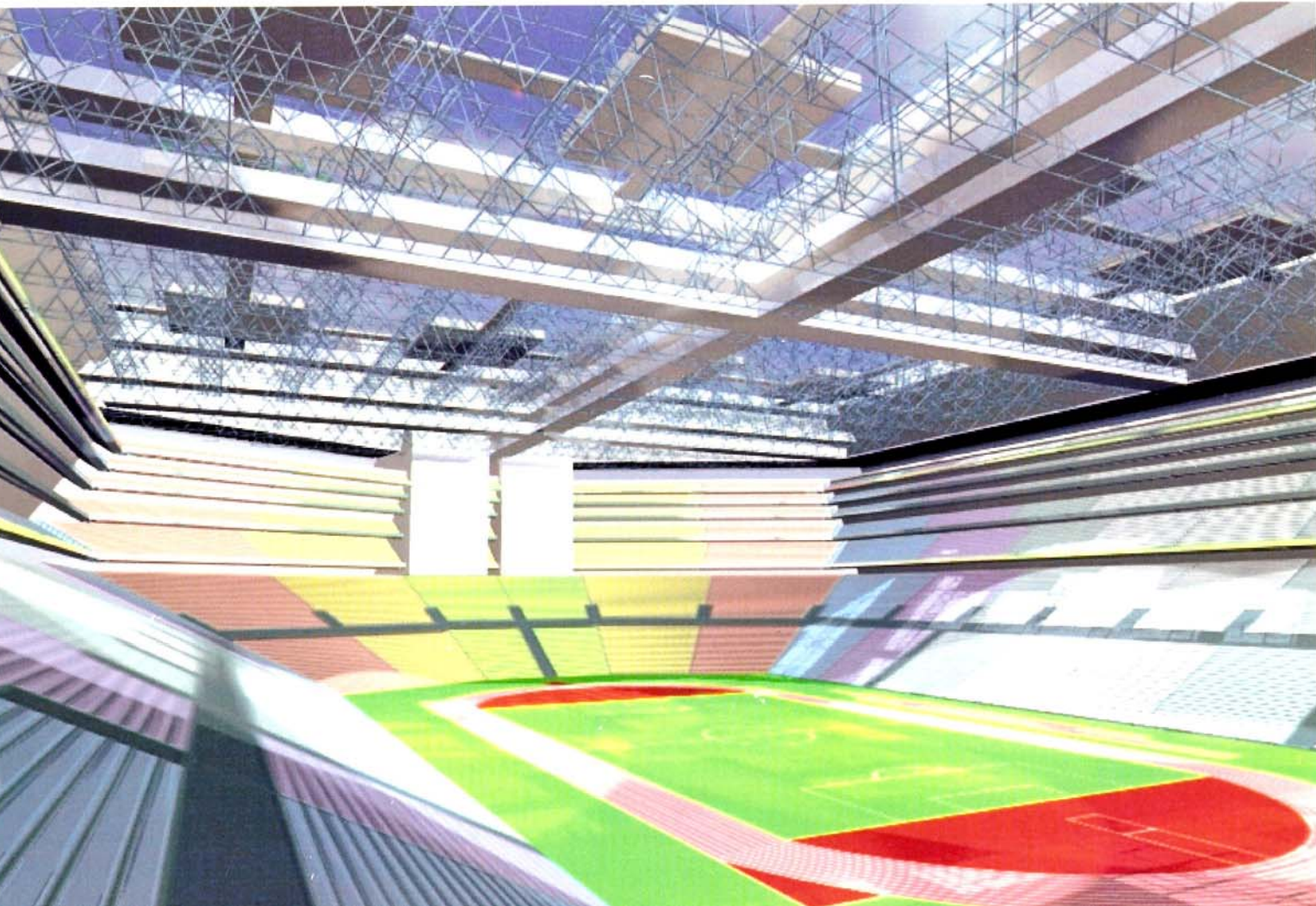
MULTI-HULL FLOATATION SYSTEM

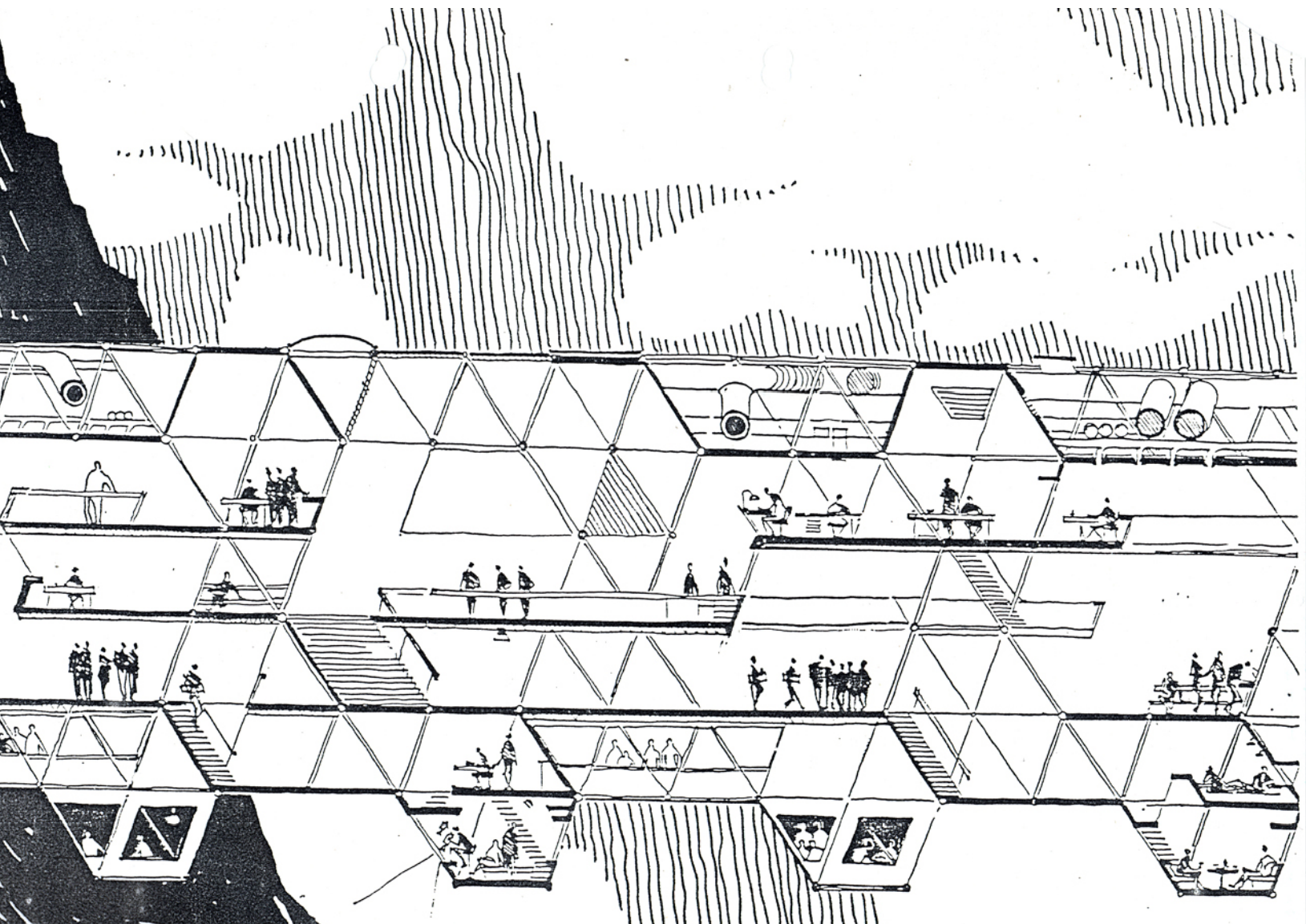
A CROSS SECTION

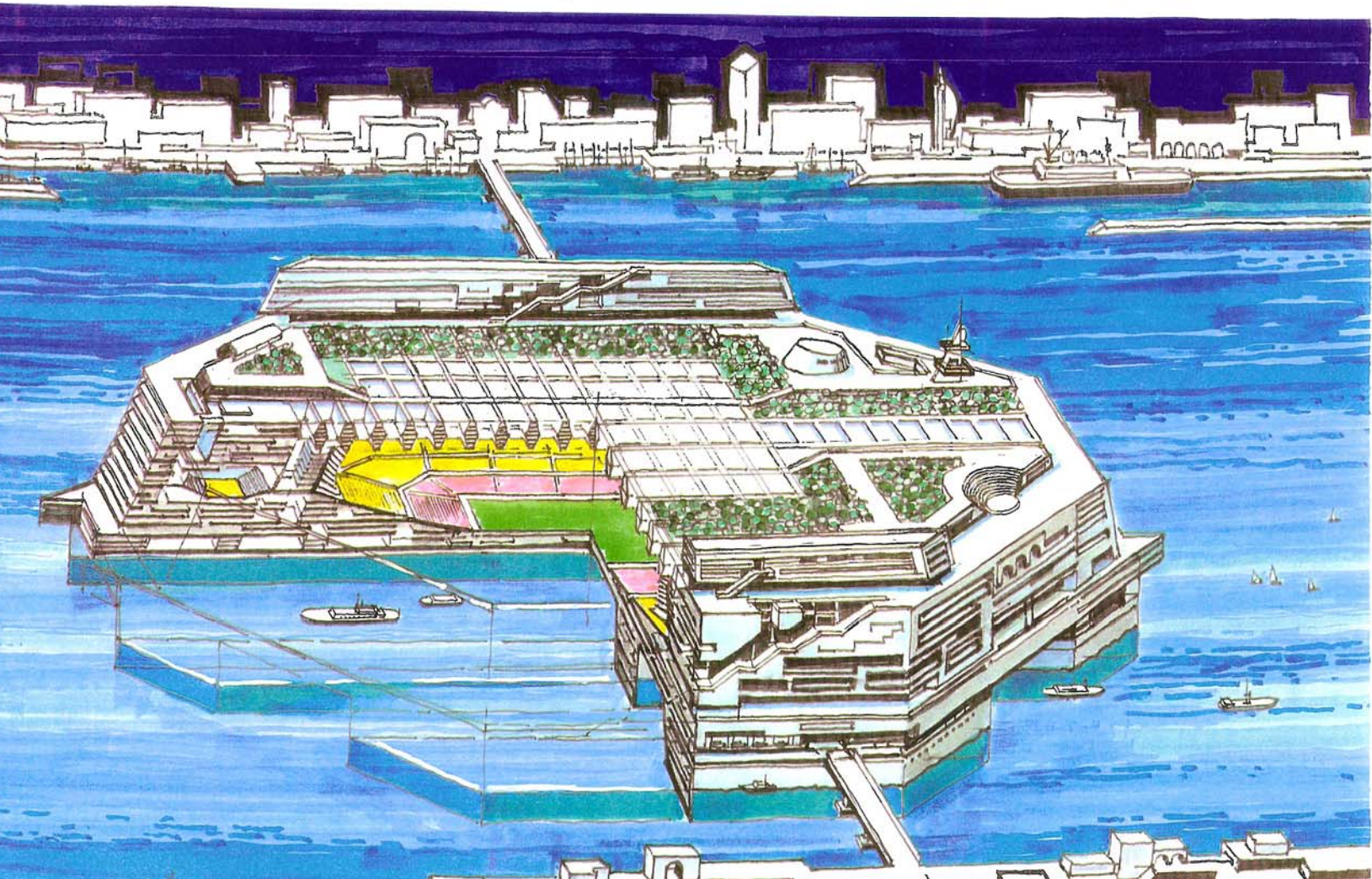


A COMPACT OLYMPIC STADIUM









## IN CONCLUSION

The idea of a floating array of 'Olympic facilities' (including the Olympic Stadium), capable of traversing the oceans, **is not just a visionary dream but a stark necessity**, which could be realized and made practical.

**It can be sustained by contemporary technology**, various critical aspects of which were already successfully tested.

**The establishment of an International Sport University campus** (with the UNESCO sponsorship or otherwise) **is an opportunity to redress the ethical-moral equity issue between the developed and the under-developed countries and humanity** by helping the under-privileged to join and take their rightful place in the evolving global sport culture and to foster cultural and racial inter-relations.