







### **Content Outline**

- Introduction
- Current Status
- Special Features
- Prospect for KRTS
- Conclusion







### Geography





Port City-Kaohsiung is situated in the south of Taiwan.





# **Famous Scenery**







# **Project Overview**

2 Lines (Red & Orange Line)	Total 42.7 km (33.3 km underground section)
Government Authority	Kaohsiung Mass Rapid Transit (KMRT)
Concessionaire	Kaohsiung Rapid Transit Corporation (KRTC)
Contract of Concession	6 years construction phase, 30 years operation & maintenance
Primary Date for Starting Construction	October 2001
Scheduled Start of Revenue Service	Mar.2007 (Red Line)/Sep.2008 (Orange Lines)
Construction Cost	NT\$ 181.3 billion ≅ USD 5.46 billion



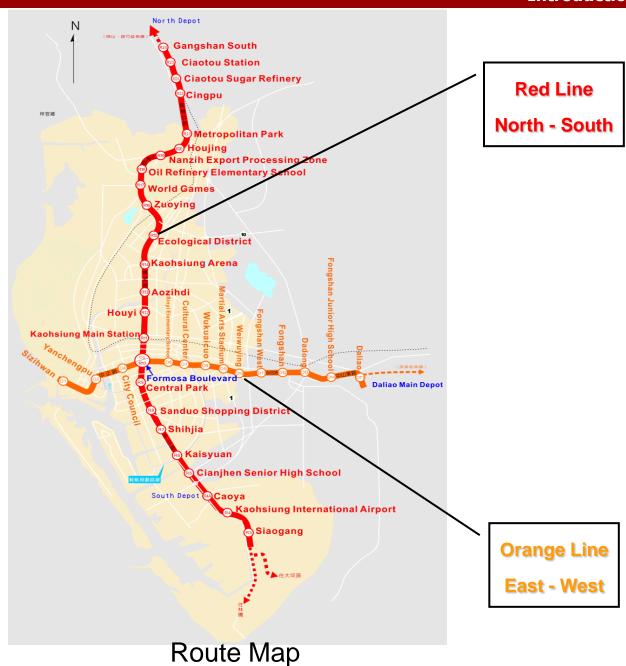


# **Primary Information**

	Red Line	Orange Line	Red + Orange
Length of Line	28.3 km	14.4 km	42.7 km
Elevated	9.4 km		9.4 km
Underground	18.9 km	14.4 km	33.3 km
Direction of Line	North - South	East - West	
Total Stations No.	23	14	37
Underground Stations No.	15	13	28
Depots	2 line depots	1 main depot	
Capacity of Train 3-car Train (5p/m2)			> 750p
Car Body			Stainless steel
Design Headway			6~10 min.
Max op. Speed			80 km/h







The Two
Metro Lines





# **Major Shareholders**

	Shareholders	Investment Proportion
1	China Steel Group	32.50%
2	RSEA Engineering Corp.	10.00%
3	The Far Eastern Group	10.00%
4	National Development Fund, Executuve Yuan	10.00%
5	South East Cement Corp.	7.00%
6	Uni-President Enterprise Group	7.00%
7	Siemens Aktiengesellschaft	5.00%
8	Others	18.50%





# **Key MRT stations**



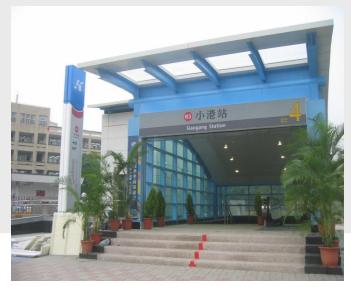
**Entrance 2 of R7 Station** 



**Entrance 2 of R5 Station** 



**Platform of R3 Station** 



**Entrance 4 of R4 Station** 





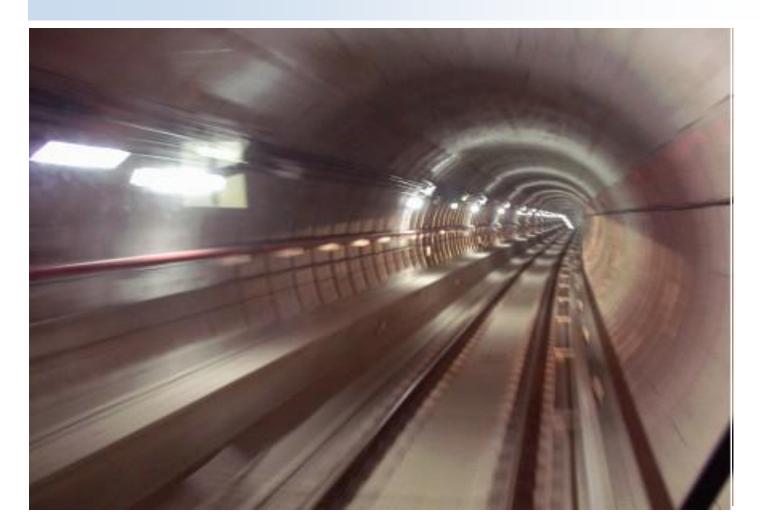
□ 10/2001 Construction work began officially.







□ 05/2006 66 Shield tunnels (45.3 KM) completed.







□ 11/2006 R3-R8 Trial-run started.







□ 01/2007 The last concrete slab of 37 stations laid.







■ The last custom-made train arrived in South Depot on May 22, 2007.







The Opening Ceremony of Orange Line Revenue Service on September 21, 2008.







■ The last custom-made train arrived in South Depot on May 22, 2007.







### **Current Progress**

- E&M systems erection & testing is in progress.
- Final decoration on architecture/interior work is being done.
- The remained 5.4 km track work of the Orange Line is under construction.
- In September, R9-R23 System Integration Test will begin.
- By October, the trial-run of the entire Red Line will get started.





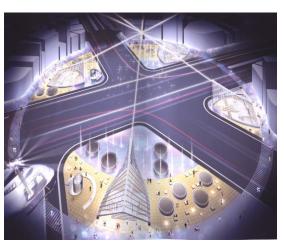


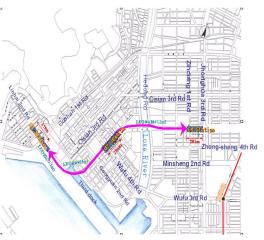




### **Special Features**

- O5/R10 Station, the construction of the largest circular underground station, the architectural design of the four entrances on the plaza.
- The tunnel under the harbor dock crossing a shipping channel.
- The Public art projects designed specifically for individual stations yet all based on one central theme: *Dreaming in Light.*











### O5/R10 Station--1

Location

O5/R10 station is the only crossing-station of the Red and Orange lines.

**Dimension** 

The internal diameter is 140M and 27.05M in depth.

Layout

The first level is the concourse level, the second (Orange) and third (Red) are platforms.

Method

O5/R10 station is constructed using circular diaphragm walls, and each unit of the circular diaphragm walls measures 1.8M in thickness, 3.2M in width, and 60M in depth.





### Circular diaphragm walls method

#### ■Hoop Compression Effect :

Using the axial compression stresses in circumferences direction to suppress tension resulted from circular diaphragm walls.

#### ■Ring Stiffness Effect:

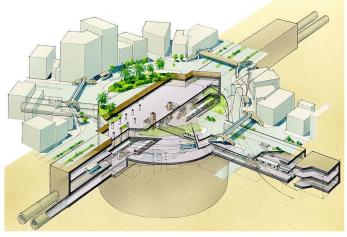
Suppressing circular diaphragm walls and surrounding soil from subsiding by using robust supporting stiffness caused by the circle.

#### Advantages :

- 1. The construction period is shortened.
- 2. The disruption of the traffic on the street level is minimized.









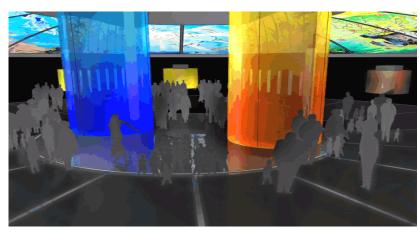


### **O5/R10 Station--2**

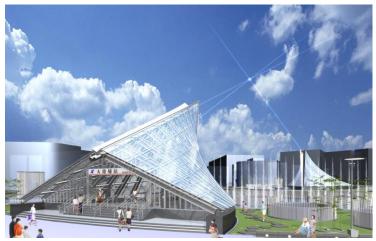
■ The only crossing-station of the two lines serves as the heart of and the symbol for the entire new rapid transit system.

☐ The four entrances on the main plaza, representing the theme of "Praying & Blessing", are designed by the renowned architect -

SHIN TAKAMATSU.



Dome of light



**Entrances of R10 Station** 





### The tunnel under dock--1

Location The tunnel is built under the third dock of Kaohsiung harbor.







### The tunnel under dock--2

# rings, each ring measures 1.2M in length. 2. Section under dock : Up-Track is 124M, E

#### Scale

2. Section under dock : Up-Track is 124M, Down-Track is 127.2M.

1. Total length of the tunnel is 977M, with 826 shielding

3. The depth of the two underwater tunnels is 19M below sea level, with 14M of earth and 5M of seawater on top of them.

### **Precautions**

- 1.Engineers needed to conduct on-site inspections with radar prospecting and electromagnetic wave prospecting to ensure that no obstacles were ahead of shield tunneling machine.
- 2.An Alignment-adjusted measure was taken to control the exact alignment due to the tunnel's delicacy and the curve section with a radius of 305M.



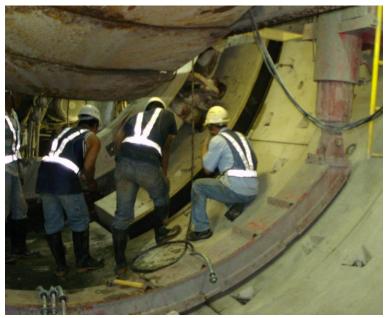


### The tunnel under dock--3

**Progress** 

**Up-Track**: Totaling 106 rings, completed within 15 days.

**Down-Track**: Totaling 103 rings, Completed within 10days.



Rings set up



The third dock





### Public art projects

Architectural Art Glass, the natural conduit of Light, is the choice material **Dreaming in Light** is the THEME connecting all public artworks in SPIRIT.

R4: Emerald Laminata



O5/R10: Dome of Light



R17: Floating Forest



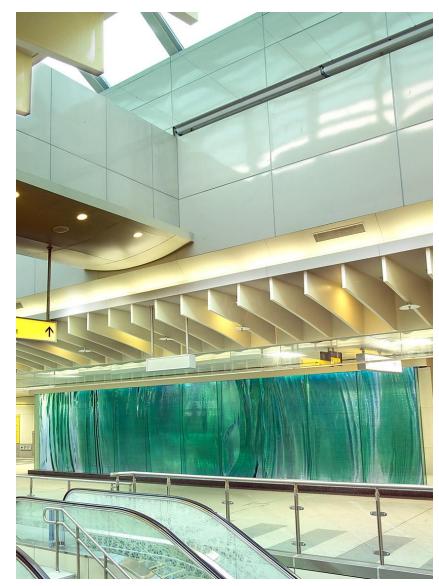




### **R4- Emerald Laminata--1**

The largest glass sculpture in the world: consisting of two 15M x 3.5M glass wall.

Master Lutz Haufschild first modeled it with clay and then using the digital technologies to transfer his design into virtual fabrication, followed by an arduous process combining the 3-D digital technology with traditional methods to create this stunning masterpiece.







### **R4- Emerald Laminata--2**





TREE OF LIFE

**INFINITY** 





### 05/R10-Dome of Light--1

The Dome of light, designed by Maestro Narcissus Quagliata, to be supported by a curved steel frame of 30M in diameter covering an area of 667 M<sup>2</sup>, is the largest one-piece glass artwork in the world.

The logistics of fabrication of the *Dome of Light* is an art itself: parts are made in four countries - the USA, Mexico, Italy, and Germany; then sent to and integrated by Derix, a 150-year Glass Studio in Germany.

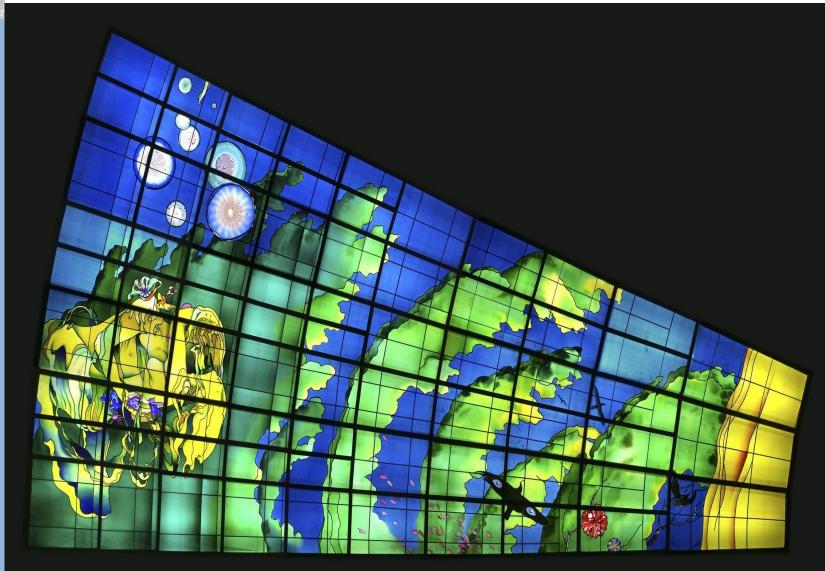








# 05/R10-Dome of Light--2







☐ The largest AAG public art — "Dome of Light" at Formosa Blvd. Station (O5R10)

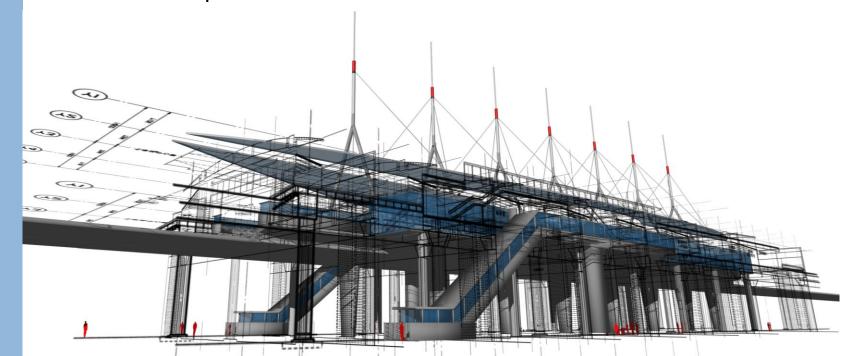






# R17-World Games Station (The Half Cliff Mountain) --1

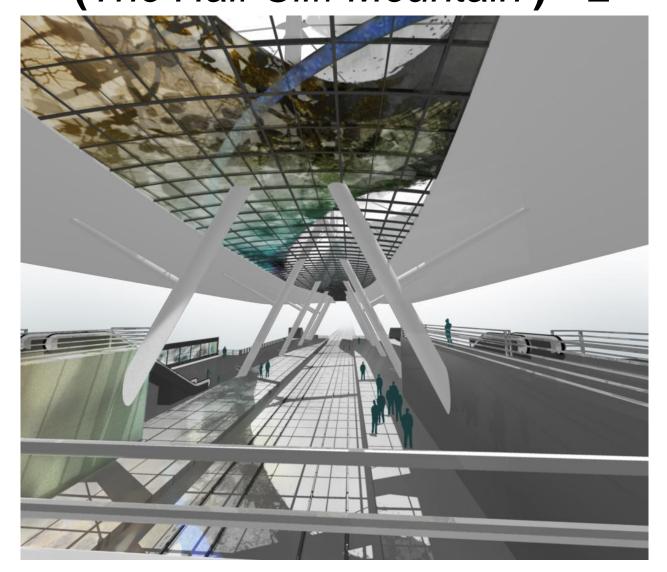
With digital technologies, Ronwood made R17 Station resemble a floating forest, graced by hundreds of plants and insects unique to the Southern Taiwan environment, displayed on more than 1,000 Sq Meters of glass canopy, balustrade, and stairways, weaved in the rich tapestry-like Artwork representing the "Soul of the Land and the People in Southern Taiwan".







# R17-World Games Station (The Half Cliff Mountain) -- 2

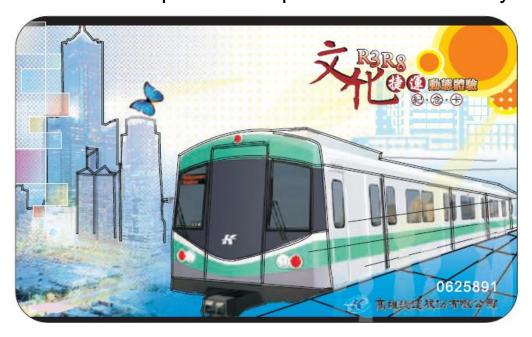






### **Prospect for KRTC/KRTS**

- ☐ The new rapid transit system will present the Citizen of Kaohsiung with more than just an alternative mode on public transportation.
- ☐ The KRTC has committed itself in forging a new image/identity for the City through the creation of world class public art projects.
- The KRTC has exceeded its required mandate and dedicated extra efforts in business development and promotion for the City.







### Conclusion

In 2009, the 8th World games will be hosted by the City of Kaohsiung.

In the next 30 years, the KRTC, in addition to provide a safe, comfortable, and convenient rapid transit system to our citizens and visitors, will share a slice of our dream and a spark of our hope through the spectacular public artworks with every one visiting our beloved City – **Kaohsiung**.



### THANK YOU.



- Kaohsiung Rapid Transit Corporation (KRTC) web site : http://www.krtco.com.tw
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