

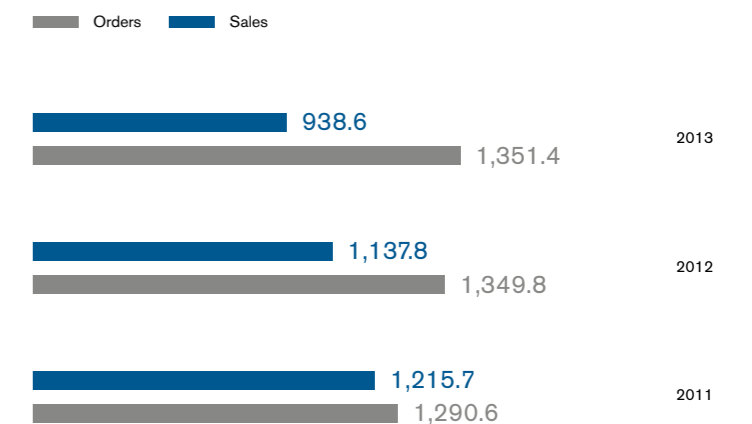


Gwangang Bridge, Busan, Korea (top) / Ansan Sewerage Treatment Plant, Korea (bottom)

CIVIL & ENVIRONMENT

POSCO E&C is taking the initiative in connecting the hearts of communities and linking various worlds together. POSCO E&C has contributed to Korea's balanced territorial development via continuous large-scale civil engineering projects and, is now developing local communities all over the world, including Vietnam, Kazakhstan and Uzbekistan, by building roads, harbors etc... The effort of POSCO E&C to bring new productive changes can also be found in making the world a clearer and cleaner environment. POSCO E&C not only builds facilities for the environment such as, sewage & waste water system, waste energy plants, air-cleaning installations etc, but also provides total environmental solutions by actively participating in the O&M (Operation & Maintenance) field. In addition, POSCO E&C is speeding up seawater desalination technology research for practical implementation, to provide solutions for global water shortages. The facilities under construction on Gwangyang's Dongho shoreline area for seawater desalination, and in Abu Dhabi for the transfer and storage of fresh water are just the beginning in providing such solutions.

ORDERS & SALES



Basic exchange rate: average exchange rate in 2012 / 1\$ = 1,071.10 won (Unit: US dollars in millions)

CIVIL WORKS

BUSINESS AREAS

Roads **Harbors** **Land Development**
Railways **New Transit** **Golf Courses**

LIST OF PROJECTS

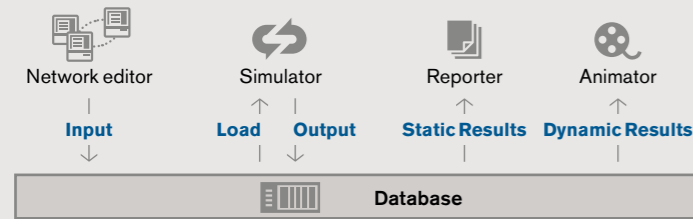
PROJECT NAME: PROJECT PERIOD, PROJECT OUTLINE

- Incheon International Airport Highway, Korea:
Apr 1996–Sept 2000, Length: 6.97km
- Jeonju-Gwangyang Highway, Korea: Mar 2005–Dec 2011, Length: 12.13km
- Yongin-Seoul Highway, Korea: Jan 2006–June 2009, Length: 3.62km
- Noi Bai–Lao Cai Highway, Vietnam
(Package A1, A2, A3): July 2009–Dec 2013, Length: 80.54km
- National Highway No. 1 Extension (Gimcheon-Yeongdong Section), Korea:
Dec 2001–Dec 2006, Length: 7.74km
- Gwangan Bridge, Busan, Korea: Dec 1994–Apr 2002
Double Truss Bridge: 720m/double steel-frame bridge: 80m
- Pyeongtaek Port Pier No. 5, Korea:
Jan 2001–Dec 2003, Berth capacity: 30,000T
- Exclusive Port for Vung Tau Cold Rolling Mill, Vietnam:
Nov 2007–Mar 2009, Berth capacity: 10,000T×2 berths
- Cai Mep International Terminal, Vietnam:
Apr 2008–Apr 2012, Berth capacity: 80,000T×2 berths
- Chungju Company Town Infrastructure Construction, Korea:
June 2008–Mar 2012, Site Development: 70,127,600m²
- Incheon International Airport Railway 2nd-Phase, Korea:
Jan 2004–Dec 2010, Length: 2.185km
- Busan-Gimhae Light Rail Transit, Korea:
Apr 2006–Apr 2011, Length: 23.2km
- Hochiminh-DauGiay Expressway Project Package 3:
May 2010–Apr 2013, Length: 9.8km
- Gyeongui Line (Railroad) Train Office Inspection capacity: Sept 2001–Oct 2010,
minor repair - 320 carriages, Medium - repair 420 carriages, maintenance - 290 carriages

TECHNOLOGY

Comprehensive Light Rail Transit System Simulator (PosRail 2.0)

POSCO E&C has developed a system that simulates depots and train operations of the main lines of the LRT. This analyzes the appropriateness of vehicle depot sizes, suitability of track allocations, efficiency of facility arrangements, and the economic feasibility of alternative operations. As a result, our order-taking competitiveness, the credibility of LRT construction, and operational efficiency have been improved.



Comprehensive Light Rail Transit System Simulator: Module Diagram



Incheon International Airport Highway, Korea



Yongin-Seoul Highway, Korea



Noi Bai–Lao Cai Highway Construction, Vietnam



Incheon International Airport Railway, 2nd-Phase, Korea



Gyeongui Line (Railroad) Train Office, Korea

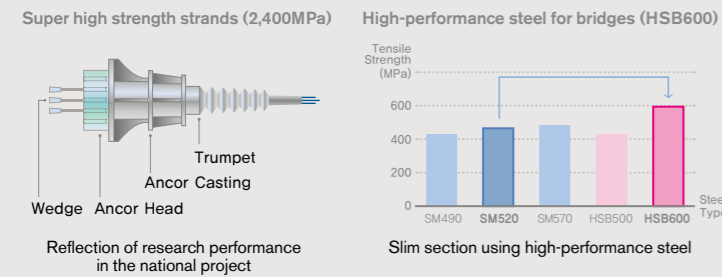


Busan-Gimhae Light Rail Transit, Korea

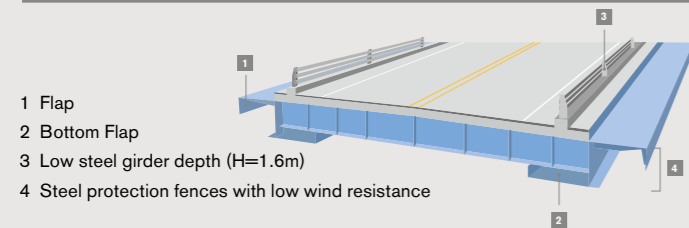
TECHNOLOGY

High-Strength Steel Composite Cable-Stayed Bridge

POSCO E&C is building Imja Bridge, applying the world's first 2,400MPa super high strength strands and high-strength steel HSB600. Imja Bridge is a two-tower steel composite cable-stayed bridge with a main span of 410m; a marine bridge integrating POSCO's state-of-the-art technology. In particular, its economic feasibility was greatly enhanced by applying open-section girders with improved wind resistance through two-dimensional wind tunnel testing, to the upper section. The floor plate utilized the precast method to maximize construction capability, safety, and quality.



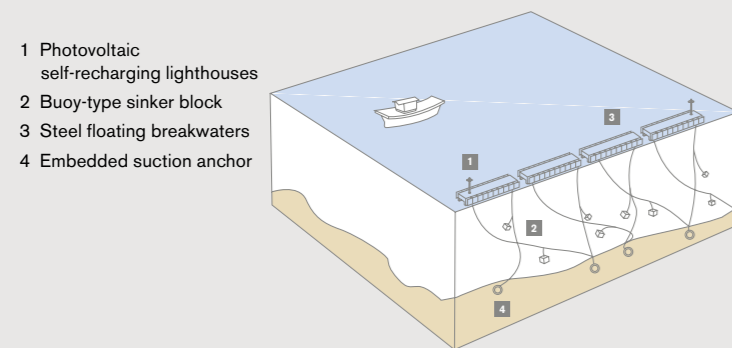
Derivation of optimum sections for wind-resistance stabilization



Floating Seawall

Floating seawalls are seawater drainage-type breakwaters, which boast excellent pollution control and water quality improvement within ports, and outstanding constructability and economic efficiency at weak grounds and deep sea areas. It is an environmentally friendly technology with less impact on the environment, the ecosystem, and the ground of the seabed following the installation of structures. "The floating seawall with space for running water and expanded perforated plates," the independent seawater model installed at Wonjeon Port in Masan and Yeonmyeon Port in Tongyeong, has noticeably augmented the performance of perforated plates to a range of over 6 seconds, whereas the range used to be 3-4 seconds.

Wonjeon Port in Masan (Double curtain type)



Gwangan Bridge, Busan, Korea



Pyeongtaek Port Pier No. 5, Korea



Exclusive Port for Vung Tau Cold Rolling Mill, Vietnam



Cai Mep International Terminal, Vietnam



Chungju Company Town Infrastructure, Korea



Jeonju-Gwangyang Highway, Korea

ENVIRONMENT

BUSINESS AREAS

Wastewater Treatment & Reuse **Waste Recycle (Reuse)**
Desalination

LIST OF PROJECTS

PROJECT NAME: PROJECT PERIOD, CAPACITY

- Ansan Sewage Treatment Plant, Korea: July 2004–Mar 2009, 385,000m³/day
- Jungnang Water Reclamation Center, Korea: Feb 2004–Oct 2007, 460,000m³/day
- Yangsan Resources Recycling Facility, Korea: Oct 2004–Jan 2008
 – Pyrolysis and Melting Facility: 100 tons/day×2 units / Recycling Facility: 80 tons/day×1 unit
- Suwon Sewage Sludge Treatment Plant, Korea: June 2007–Dec 2009, 450m³/day
- Cheongna Auto Clean Net Facility, Korea: Apr 2008–Dec 2013
 – Pipeline: 45.7km / Collection Sites: 5 units / Inlets: 2,013 units
- Electric Precipitator for Blast Furnace No. 5, Gwangyang Works, Korea:
 June 1996–Mar 1999, 15,000m³/minute
- Kimpo Recopark (Sewage Treatment Plant): Mar 2009–Mar 2012, 90,000m³/day
- Gongchon Sewage Treatment Plant: July 2009–July 2012
 – Revamping: 26,000m³/day / Establishment of high class treatment: 39,000m³/day
- Construction of a Thermal Waste Incineration Plant, Krakow, Poland:
 Oct 2012–Nov 2015, Treatment capacity: 220,000 ton/yr (340 ton/day×2 series)
- Bakdal Sewage Treatment Plant, Korea: Apr 2013–Dec 2016
 – Treatment capacity: 250,000tons daily (Digester / drying / generation 1 method)
- Gwangyang Dongho Shoreline Desalination Water Supply Project (RO Method), Korea: Dec 2012–July 2014, Freshwater output: 30,000 tons daily

TECHNOLOGY

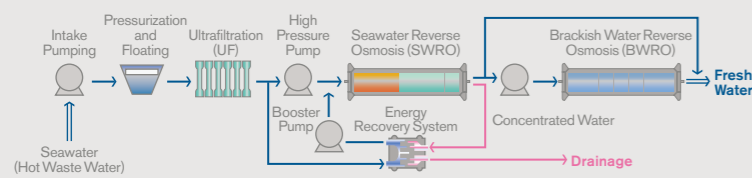
Desalination

Two types of desalination exist: evaporation (MSF/MED) and reverse osmosis (RO). The latter is most common globally, due to its excellent economic efficiency and technology. POSCO E&C has entered the RO-type desalination business, based on its impressive experience in water supply and drainage facility construction and membraneusing sewage reuse technologies. Key process technologies in development include high-recovery head end process technology using ceramic MF membranes, UF-RO direct-coupled process technology, and osmotic backwashing and maintenance chemical cleaning technologies. POSCO E&C is also constructing a desalination facility with a 30,000 tons daily capacity along Gwangyang's Dongho shoreline area.

Gwangyang Dongho Shoreline Desalination Water Supply Project

Location: 908 Geumho-dong, Gwangyang-si, Jeollanam-do, Korea / Production scale: 30,000m³/day
 Period: EPC (Dec 2012-July 2014 / 20 months), O&M (Aug 2014-July 2044 / 30 years)

Applied Process



Facility Features

- Recovery rate (50–55%) SWRO facility
- Energy-saving desalination process
- Economical UF-RO direct-coupled system
- Excellent process to correspond to seawater temp changes



Jungnang Water Reclamation Center, Korea



Cheongna Auto Clean Net Facility, Korea



Electric Precipitator for Blast Furnace No. 5, Gwangyang Works, Korea



Construction of a Thermal Waste Incineration Plant, Krakow, Poland



Bakdal Sewage Treatment Plant, Korea



Yangsan Resources Recycling Facility, Korea