Contents

RECENT PROJECTS

1 Stadia
2 Buildings
3 Bridges
4 Maritime
5 Offshore
6 Special Applications
7 Production
Stadia
Scottish Premiership Club, Hearts, has used SPS terraces to redevelop the Tynecastle main stand as their Gorgie home is expanded. 2,049msq of SPS terraces were specified in the design by James Clydesdale Architects for the upper stand section – Rows 11-37. The SPS terraces accommodate 4,200 seats and were delivered to site with pre-drilled hardware fixing holes for rapid seat and handrail installation.
The 2016 US Open marked the opening of USTA’s new grandstand at Flushing Meadow, New York. In partnership with Walters Group, IE won the contract from HUNT Construction Group to supply and install SPS terraces for the 5,800 seat grandstand. This was the second SPS stadia project for USTA.

“The SPS stadia system is one of the most accurate stadia systems we have worked with.

- The design build process helped coordinate the accuracy of structural steel and eliminated unforeseen conditions.
- The engineers at SPS helped to coordinate and resolve complex expansion joint issues which were a huge concern for our unstable site.
- The SPS system helped to complete a complex, 16 sided stadium in an extremely limited amount of time.
- As designers of sport venues, we especially appreciate the look of the finished system from below and above. The finish on the system is beautiful.”

Douglas Woodward RA, LEED AP
Associate, Senior Designer, Rossetti
San José Earthquakes Stadium  
February 2015

Owner  
Earthquakes Soccer LLC

Architect  
360 Architecture

Structural Engineer  
Magnusson Klemencic Associates

Contractor  
Devcon Construction

“We congratulate you and your team on the successful installation of your SPS Terracing - [and] - thank the SPS team for all the efforts to make the Avaya stadium one of the best in North America. We hope that there will be future opportunities to work together in new stadium or arena.”

Dave Kaval, President  
San Jose Earthquakes Avaya Stadium

SPS and Steel Systems Engineering, Inc. win 2014 Tekla award in BIM category.

“For coordination of fabricator and general contractor requirements, providing accurate, latest drawings and minimising workload.”

spstechnology.com
The Philippine Arena is the world's largest mixed-use indoor theatre. SPS terraces account for approximately 40,000 of the 55,000 seats. The use of SPS enabled the terraces to be installed after the roof had been completed. This key benefit offered programme flexibility and cost effectiveness which could not be achieved by any other method or material.
Aquatics Centre
London 2012 Olympics

Conversion - May 2013

The two temporary wing-like seating stands containing SPS terraces were removed during the building’s conversion to a public swimming pool, in-line with the Olympic organisers’ goal of creating a sporting legacy for London. The SPS terraces have been sold on for re-use in a new venue.

Construction - January 2011
Completed - June 2012

spstechnology.com
Recent Projects

Buildings
Clean Rooms and Data Centres

Microchip Factory – Clean Room Environment 2019 - 2020

• SPS strong track record in this area
• November 2013 53,000 SPS panels delivered to new facility of a global chip manufacturer
• SPS panels intrinsic to building design
• 210,500 panels in production for four new facilities
• Used to cover access ports on raised floor
• SPS 28lb panels vs previous solution 95lbs
• Light enough to be lifted by one person
• Act as immediate load carrying platform for forklifts

Data Centres 2018

• November 2018 flooring panels for third power plant of US data centre
• 1778m² for each centre for same client
• SPS panels inserted into modules then transported to site for building assembly
• Only viable product
• Benefits - weight savings and ease of assembly
Modular Police Detention Cells

Owner
Confidential

Main Contact
Wates Construction

Steel Fabricators
Westbury Park Engineering, Wiltshire

- Sixth project for client – five previous projects in 2011 and 2012
- 1,753 m²/294 SPS panels delivered to steel fabricators December 2018
- Plates manufactured with openings for service runs
- Assembly, window installation, painting carried out by Westbury Park Engineering
- Delivered to site April/May 2019
- Cells lifted directly from lorry into place using a standard crane
Summer 2018 saw the Space Needle, Seattle undergo a major multi-year renovation, bringing floor-to-ceiling glass to both the observation deck and restaurant.

48 SPS panels (86.4msq) were used at the inner radius of the revolving floor.

**Advantages**
- Construction at height issues minimised with lightweight SPS panels.
- Weight of SPS ideal solution for tall buildings where minimal weight is ideal.

"The project has been a huge success. Thanks for your involvement.... We are ecstatic. And, your products all fit together perfectly. It's been great doing business with you."

Wade Morris, Fives Group
Carnegie Hall - New York
February 2011

Architect  
Structural Engineers  
Construction Manager  
Steel Erector Fabricator
iu + bibliowicz  
Robert Silman Associates  
Tishman Construction  
Metropolitan Walters

Shrink wrapped pallet of 14 SPS floor panels (630 sq.ft.)

Restricted access by exterior hoist

Lightweight, easily handled panels facilitate installation in constrained site

spstechnology.com
Weston-super-Mare Pier, UK

October 2010

Architect  Angus Meak
Contractor  John Sisk & Sons

SPS Floors were key to meeting the challenges of rebuilding on an old and damaged structure with limitations on weight, restricted access and a demanding schedule. Intelligent Engineering has gone the extra mile in supporting us from design to installation to ensure the success of the project.”

Andy McGoldrick
Project Director, John Sisk & Sons Ltd

spstechnology.com
Bridges
Seattle Waterfront Bridge
November 2018

- Over 157’ long bridge, part of Seattle waterfront re-development (Coleman Dock)
- Harbour key for Seattle to islands from where many commute on a daily basis to Downtown and hub for visitors to Victoria BC and San Juan Islands
- SPS deck panels delivered to bridge fabricators on one truck
- Light wearing surface factory applied
- Complete bridge shipped via barge to Coleman Dock
- Lifted into position by 250,000 lb crane and bolted down in just 35 minutes

Online at spstechnology.com
The widening and strengthening of this bridge was undertaken by German SPS bridge licensee, SEH Engineering.

Pont Rouge was upgraded from six vehicle lanes to a mixed use bridge fulfilling modern day requirements. 1.82m was added to its width using a total of 2,240 m² of SPS panels.

The bridge now accommodates four SPS strengthened vehicle lanes and two newly installed tram lines; plus a two-way cycle lane and pedestrian walkways on either side which are accommodated on the newly installed SPS panels.
A new 52’ 6” bridge, with a 100 year service life, was successfully installed in just 29 days. With an integrated SPS bridge deck, this two vehicle lane modular prefabricated bridge, arrived on site on two trucks. Each section was located onto the abutments in just 10 minutes. The bridge was funded by the FHWA AID programme, the aim of which, was to identify a competitive alternative superstructure to address their aging bridge inventory.

The bridge, designed and delivered by SPS licensee US Bridge, won the NSBA Special Award - Technological Advancement.
Mettlach Bridge
January 2015

- Renovation of Mettlach Bridge in Germany carried out by Eiffel Deutschland Stahltechnologie (EDS) using prefabricated SPS panels to replace existing concrete deck
- Use of SPS reduced deck weight by 300 tonnes allowing load restrictions to be lifted. Works completed within four months
- Project received prestigious Ulrich Finsterwalder Engineering Award in January 2015

spstechnology.com
Wark Tyne Bridge
September 2011

Owner
Northumberland County Council

Structural Engineers
Northumberland County Council, SPS Technology

Construction Manager
Carillion

Fabricator/Steel Erector
DMJ Engineering
RECENT PROJECTS

Maritime
Pride of Bruges and Pride of York
January and February 2019

**Pride of Bruges**
- 55m² deck reinstated whilst still in service between Hull and Rotterdam
- Sixth programme of SPS works to be executed on this vessel

**Pride of York**
- Work carried out at Damen Shipyard
- 58m² reinstated across Decks E&F, plus 17m² on bulkhead of water ballast tank
- Fourth SPS project to be undertaken on this vessel
- Took just 8 days to complete

**Owner**
- P&O North Sea

**Class**
- Lloyd's Register

**SPS Licensee**
- SRC Group
Project Summary

- 62sqm on deck 14 (ventilation room), reinstated using SPS
- Pipework etc made access challenging
- Project completed on time according to schedule
Project Summary

With SPS licensee, SRC Group, an SPS project for Carnival Cruises on board the Queen Mary 2 was completed in September 2018. It follows on from a similar project October 2017. Both projects were undertaken during a scheduled cruise between New York and Southampton. Two areas, 48m² and 88m² were reinstated tween deck 8 and deck A. The repairs were inspected and approved by Lloyd’s Register on both sides of the Atlantic!

“The team was able to complete the repair under challenging circumstances whilst the vessel was in-service. In order not to impact on our guests’ cruise experience, restrictions were placed on when works could be undertaken which the team worked around, delivering the project on time with minimal disruption.”

Andrew Menzies
Deck & Safety SME, Carnival UK
The 127,500dwt Solitaire, one of the world’s largest pipe-layers, has completed some of the most challenging projects in which heavy pipe has been laid in very deep waters.

Fatigue and corrosion meant that 550m² of tank top in hold number 6 needed to be reinstated. After a detailed assessment was carried out, Allseas opted for SPS technology instead of steel renewal. The project was undertaken with LR Class approval at United Stevedores in Amsterdam.

“I am very pleased with the performance and will consider using SPS again should a similar project have to be undertaken.”

Quirien Grul
Allseas’ Manager Technical Department
The existing steelwork on board the vessel was badly corroded, access tight and a crop-and-replace repair was an unattractive option.

40m² of deck required steel reinstatement. Solid perimeter bars that form the boundary of the cavity and top plates were welded into place and the resulting cavity injected with the elastomer core to form the new composite deck.

The SPS deck reinstatement was substantially quicker than an equivalent conventional steel repair.

“I like the fact that the new deck is much stronger because the old deck is still there with a new deck on top bonded by the elastomer core. I recommend this process to anyone who has to replace steel on board ships where the SPS system can be used.”

Captain Rex Simmonds
Ueushuk Fisheries Ltd
Recent Projects

Offshore
The high impact resistance that SPS provides made it the perfect solution for the reinstatement of the pipe deck on this semi-submersible, which had suffered damage from dropped objects. Two areas of the deck were repaired with SPS. Its use guaranteed the integrity of below deck service runs which were unaffected by the extensive work above.

A second project to reinstate 134m² of pipe deck scheduled for June 2019.
FPSO Repair
July 2018

Class
ABS

Location
On-station offshore Australia

SPS Licencee
ASOM

Project Summary

• 72sqm of its side shell reinstated
• 6 weeks of June and July 2018
• Reinstatement of the side shell and longitudinal bulkhead plating for the starboard slop tank
• Vessel remained fully operational throughout the repair
• Second SPS project reinstatement of accommodation deck plating in May 2014
• No cofferdam and divers
• Reduced safety risk, repair schedule and cost significantly
• SPS low heat input solution avoids direct welding to the affected side shell

spstechnology.com
Project Summary

- Low heat SPS installation method – safe, rapid repair
- Use of SPS eliminated need to empty fuel oil settling and water tanks
- Vessel fully operational throughout
- 494m² steel reinstated across decks B, C, D, wheel house top and upper deck
- Insulation, piped and electrical service runs unaffected
- Work started November 2017 concluding February 2018
Project Summary

- 746m² steel reinstated across various decks
- Selected as SPS preserves insulation and cable runs
- Low heat solution used to ensure safety
- Completed in just two months despite monsoon rain
FPSO Espoir Ivoirien
February 2017

Class: DNV GL
Client: BW Offshore/Marine Service International (MSI)
Location: On-station 25km off Ivory Coast
SPS Licencee: ASOM
Area: 203m²

Project Summary

• Two phase undertaken between November 2016 – February 2017
• Side shell reinstatement in the Forepeak Tank Most of the side shell plates to be repaired were located below the FPSO’s waterline
• Using allowed a safe and unhindered repair to be undertaken: no cropping of existing side shell, cofferdam or diving team
• FPSO remained on-station fully operational

spstechnology.com
Recent Projects

Special Applications
**SPS Modular Construction - Volumetric**
London Metropolitan Police Custody Centres (Brixton, Kingston, Wood Green, Walworth)
January 2016

- SPS delivered as a ‘Modular System’
- Lightweight SPS Cells lifted directly into position
- Clean architectural finishes

**SPS Modular Construction - Flat Panel**
London Metropolitan Police Custody Centres (Croydon)
August 2011

- Owner: Metropolitan Police
- Architect: Raymond Smith Partners
- Main Contractor: Wates Construction

- SPS delivered as a ‘Flat Panel System’
- Lightweight SPS Cells lifted directly into position
- SPS Cell roof forms load bearing floor above
Vehicle Barriers

January 2016

The rising anti-ram SPS vehicle barrier, tested successfully in the UK to industry standards in May 2015, has now gone into production. The vehicle barriers which successfully brought a 40 tonne truck to a complete standstill are for national and international clients.
Column Protection

July 2015

DESIGN CRITERIA
• Absorb energy from radial impacts or glancing blows without contact or damage to column
• Impact protection system is replaceable

DESIGN
• Consists of SPS 20-25-20 circular plate, 15 mm thick Y-shaped steel stiffeners, steel-concrete composite reaction wall secured to a base structure and embedded in the tarmac adjacent to columns supporting the airport piers
• Designed to resist a direct impact from a tow hitch on a 70 tonne tug master moving at 30 km/hr (kinetic energy = 2.4 MJ)

PROVEN IMPACT RESISTANCE
• The design was verified by advanced finite element analyses for all possible impact scenarios (critical load case is radial impact along centreline)
• Full-scale test demonstrates impact resistance

PRODUCTION
• 22 units under production in Singapore by client.
  IE to undertake injection
• To be installed by client

spstechnology.com
Special Applications

Transformer Casing
November 2013

- SPS Transformer Casings increase stiffness, reduce weight and dampen vibration and sound
- Six projects completed to date, using the Overlay method in-situ, to verify design and benefits
- High volume production will use prefabricated SPS panels

spstechnology.com
Production
The new SPS production facility at Hae Gang Co Ltd was opened in early 2019. First on its order book were terraces for Delaware Stadium and 6,000 semi-conductor chip plant floor panels per week during a 12 month production run.
Production Process
SPS Production Plant

March 2014

Steel plate surface preparation
Fast low heat robotic welding
Injecting PU
CNC drilling of bolt holes
Panels stacked
Panels loaded for shipment
Shipment
SPS Production
September 2013

Loads 77 to 79 to Philippine Arena, Manila, Philippines. Total 64,471 kgs of longest SPS Terraces fabricated to date (up to 12,183mm)

Big R Demo Bridge to Greeley, Colorado, USA. 3 concept bridge deck panels with innovative connection details - Total 4,370 kgs

Load 73 to Philippine Arena, Manila 22,112 kgs wide back of bowl terraces

Loads 3 & 4 to Q204 Escape tunnel Mokpo, Korea. Total 22,670 kgs of flat, large radius outer tunnel & small radius inner tunnel panels up to 4,925mm long