



REFURBISHMENT STRUCTURAL STRENGTHENING

BUILDING TRUST



STRUCTURAL APPLICATIONS

Range of civil engineering applications now possible with FRP systems

USED WITH INCREASING effectiveness since their introduction to the aerospace industry in the early 1960s, composite materials are now used in numerous applications to solve challenging construction problems. From the early days of acceptance of composites in the construction industry to today, this technology now offers

CONFINEMENT

Confinement is generally applied to members in compression, with the aim of enhancing their load-carrying capacity or in cases of seismic upgrading, to increase their ductility. SikaWrap® FRP composite materials are reliable confinement devices for reinforced concrete elements.



SHEAR STRENGTHENING

The flexibility of the SikaWrap® fabric allows application to irregular cross sections which can be present in RC beams and columns. The combination of a shear strengthening with high-modulus carbon fiber fabrics together with a flexural strengthening with CFRP plates Sika® CarboDur® is optimal.



SEISMIC STRENGTHENING

This is often a combination of seismic, shear and dynamic loads. An important field historically is the wrapping of bridge columns to prevent premature failure in a seismic event.



IMPACT STRENGTHENING

SikaWrap® fabrics can absorb the high energy rates caused by an impact of a car or a major vessel in order to protect the column from collapsing.



practical solutions to an array of applications such as seismic upgrade, confinement, blast mitigation, masonry strengthening, etc. This product group continues to evolve, mature and transform into one of the most exciting and key product segments for the repair industry.

FLEXURAL STRENGTHENING

Structural elements may be strengthened in flexure not only with steel or Sika® CarboDur® CFRP plates but also with SikaWrap® fabrics, especially if substrate properties are low. Special attention has to be given to the correct alignment of the load-carrying fibers in the case of long fabrics for flexural strengthening.



BLAST MITIGATION

Embassies, airports, government buildings, bridges and other sensitive structures are often a target for terrorists to create mass destruction and mayhem. FRP Composite materials are a proven means to blast harden existing structures without changing the usefulness of the facility.



MASONRY STRENGTHENING

FRP Composite Materials are an excellent means to upgrade and rehabilitate masonry structures. FRP combines the positive attributes of high tensile capacity with the load bearing capabilities of masonry walls to form a composite action. They also work extremely well for rehabilitating unreinforced masonry (URM) walls, especially in seismic zones where ductility can be increased.



PIPE STRENGTHENING

Due to the aging infrastructure in the United States, it is not uncommon for pipes to burst causing flooding and catastrophic damage to major cities. SikaWrap® fabrics have been used to re-line the inside or outside of concrete and steel pipes which have been degraded due to corrosion damage, distress, overload or seismic events.



PRODUCT PORTFOLIO

Product Mix that covers all your strengthening needs with FRP systems

CARBON WRAPS

- Complete portfolio
- ICC Evaluation Report
- Uni and Bidirectional
- Hi Mod, heavy weight and \pm 45

PRODUCT NAME

- SikaWrap® 103C
- SikaWrap® 117C
- SikaWrap® 230C
- SikaWrap® 103C HM
- SikaWrap® 1200C



GLASS WRAPS

- Bidirectional
- Unidirectional & lightweight
- ICC Evaluation Report
- Economical

PRODUCT NAME

- SikaWrap® 100G
- SikaWrap® 430G



CARBODUR STRIPS

- Pultruded CFRP laminate
- External reinforcement
- Easy overhead applications
- Custom lengths

PRODUCT NAME

- Sika® CarboDur® S512
- Sika® CarboDur® S812
- Sika® CarboDur® S1012



SIKA CARBODUR RODS

- Pultruded CFRP laminates
- Negative moment reinforcing in slabs

PRODUCT NAME

- Sika® CarboDur® 1/4"
- Sika® CarboDur® 3/8"



***SIKAWRAP PRESATURATED SYSTEM PRODUCT NAME**

- No need to saturate fabrics on site
 - Fast & easy applications reduce labor
 - Drop in replacements for current FRP systems
 - Factory controlled quality
- SikaWrap® Presaturated 100G
 - SikaWrap® Presaturated 103C
 - SikaWrap® Presaturated 117C
 - SikaWrap® Presaturated 430G



SIKA CARBODUR L BRACKETS

- Unique L-shape CFRP plates
 - Effective anchorage of stirrup forces
 - Externally applied
 - Multiple width options
- PRODUCT NAME**
- Sika® CarboDur® L 4/20/50
 - Sika® CarboDur® L 4/30/70
 - Sika® CarboDur® L 4/50/100



POST TENSIONING

- Active reinforcement
 - High strength CFRP laminate
 - Reduces tensile strain in steel reinforcement
 - Anchored System
- PRODUCT NAME**
- Sika® CarboStress®
 - Sikadur® 30



SIKADUR EPOXY

- Different viscosities that fit your application
 - Dry and wet lay up resins
 - Paste material for strips, rods
 - Produced in ISO Approved facility
- PRODUCT NAME**
- Sikadur® 30
 - Sikadur® 330
 - Sikadur® 300



SIKACRETE FIRE PROOFING

- Dry mix fire protection mortar
 - Protects FRP/epoxy from high heat
 - 4 hour fire resistance over FRP
 - Spray applied
- PRODUCT NAME**
- Sikacrete® 213F



PROJECT GALLERY

Structures that have trusted Sika's product solutions and services



OHIO HORSESHOE STADIUM



Owner: Ohio State University

Location: Columbus, Ohio

Year: 2001

Product: SikaWrap® 103C

Application:
Strengthening of columns

Significance:
Meet the building code / time sensitive repair

Awards:
ICRI Project of the Year - 2001

Image courtesy of www.flickr.com



I-80 BRIDGE (25 BRIDGES)



Owner: UTAH DOT

Location: Salt Lake City, Utah

Year: 2002

Product: SikaWrap® 103C

Application:
Strengthening of columns

Significance:
Seismic upgrade prior to Salt Lake City Olympics

Awards:
ICRI Award of Excellence - 2002



LAGUARDIA AIRPORT



Owner: Port Authority of NY/NJ

Location: Flushing, NY

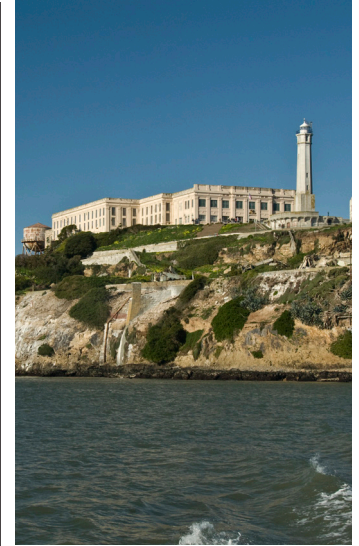
Year: 2003

Product: Sika® CarboDur®

Application:
Strengthening of deck

Significance:
Time sensitive project using CFRP with success for one of the busiest airports in the nation

Image courtesy of www.flickr.com



ALCATRAZ



Owner: National Park Services

Location: San Francisco, CA

Year: 2005

Product: SikaWrap® 100G / 103C

Application:
Strengthening of columns / roof support / seismic strengthening

Significance:
1.4 million visitors annually / historic landmark

Award:
ICRI Award of Excellence - 2005



OFFICE BUILDING



Owner: Private Owner
Location: Washington DC Metro
Year: 2006
Product: SikaWrap® 103C, Sika® CarboDur®
Application: Blast Mitigation

Significance: Blast hardened office building



MIAMI CITY HALL BUILDING



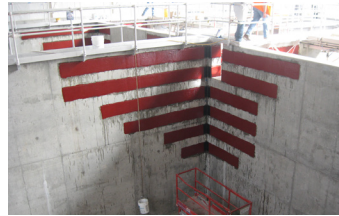
Owner: City of Miami
Location: Miami, FL
Year: 2008
Product: SikaWrap® 230C
Application: Strengthening of columns

Significance: Renovation of the 1927 Old Miami City Hall Building - A Historic Landmark

Award: ICRI Award of Merit - 2008



CAMP VERDE WASTEWATER TREATMENT PLANT



Owner: Camp Verde Sanitary District
Location: Camp Verde, AZ
Year: 2010
Product: SikaWrap®
Application: Strengthening of walls

Significance: A new construction structural defect, successfully addressed using CFRP

Awards: ICRI Award of Excellence - 2010



CULVER LINE VIADUCT

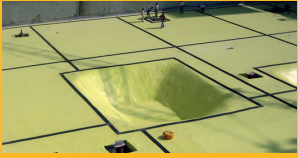


Owner: NYCT
Location: Brooklyn, NY
Year: 2012
Product: SikaWrap® 100G
Application: Confinement

Significance: Continued operation of a significant transit system by the viaducts confining

Image courtesy of www.flickr.com

SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:



WATERPROOFING



CONCRETE



REFURBISHMENT



SEALING AND BONDING



FLOORING



ROOFING

All sales of Sika products are subject to Sika's current Terms and Conditions of Sale available at www.sikausa.com or by calling 201-933-8800. Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Product Data Sheet, product label and Material Safety Data Sheet, which are available at www.sikausa.com or by calling Technical Services at 1-800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instructions for each Sika product as set forth in the current Product Data Sheet, product label and Material Safety Data Sheet prior to product use.

The sale of all Sika products are subject to the following Limited Warranty:

LIMITED MATERIAL WARRANTY

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor.

NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Our most current General Sales Conditions shall apply. Please consult the Product Data Sheets prior to any use and processing.



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