FYFE®

TYFO® FIBER

Anchor Systems

FyfeCo.com | FyfeInfo@cs-nri.com | +1.855.708.3617

TYFO® FIBER ANCHOR SYSTEMS
The Facts

The fiber anchor concept was created by FyfeFRP LLC. Tyfo Fiber Anchors are uni-directional reinforcing carbon fiber rovings saturated with two-part epoxy resin materials (Tyfo S Epoxy). They are designed to improve FRP detailing by developing the tension capacity of the Tyfo Composites, enhancing bond between Tyfo Composites and substrates, and providing shear transfer capacity. When anchors are used to develop tension capacity of the Tyfo Systems, they can be used as a splice anchor or as an embedded anchor to fully develop the tension of the Tyfo Systems.

- Provides a more elegant alternative to conventional anchors
- Develop tension forces through obstacles
- Develop tension and shear forces by embedment
- Improve Structural performance of beam and wall shear designs
- Improve Structural performance of beam and slab flexural designs
- IAPMO UES ER-595 Code Listed Product

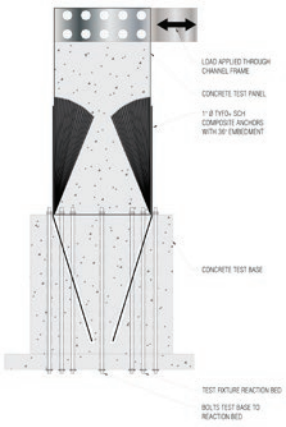
Note: Properties listed below are specific to large diameter anchors.

Fiber Anchor Gross Laminate Properties			
Property[1]	**ASTM Method**	**Typical Test Value**	**ACI 355.4 Design Value[2]**
Ultimate Tensile Strength	E488	140,000 psi	110,000 psi
Ultimate Shear Strength		59,000 psi	40,000 psi
Bond Shear Strength in uncracked concrete		4,100 psi	3,000 psi
Bond shear Strength in cracked concrete, crack width = 0.012”		2,700 psi	2,300 psi
Bond shear Strength in cracked concrete, crack width = 0.020”		2,600 psi	1,600 psi

[1] Properties based on testing ⅝” and ⅞” anchors in low strength concrete.
[2] Design properties calculated per ACI 355.4.

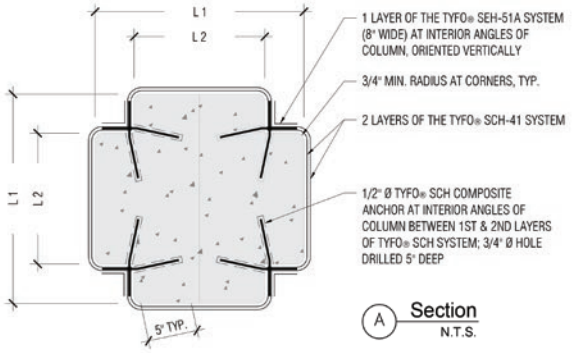
LARGE-SCALE ANCHOR STRUCTURAL TESTING

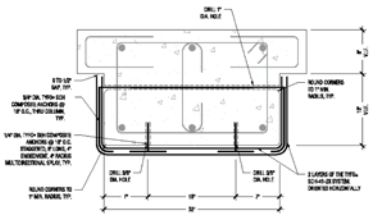
Testing for the Tyfo Fiber anchoring systems has been conducted by the University of Texas at Austin, The University of California at San Diego, the US Army corps of engineers, the University of Washington, Washington State University, the University of Patras, University at Buffalo, the University of Toronto, and North Carolina State University. Our research continues at these and other universities to improve and refine these designs and details.



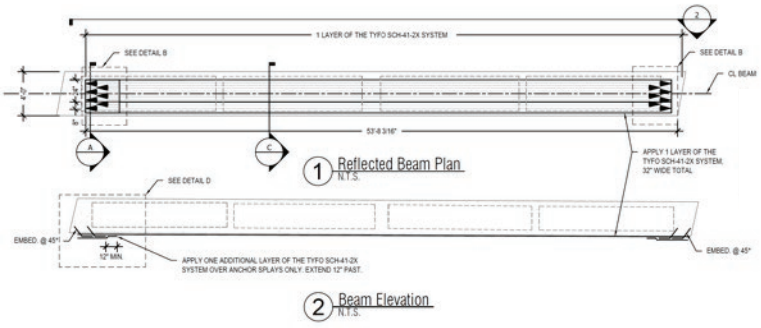
North Carolina State University.

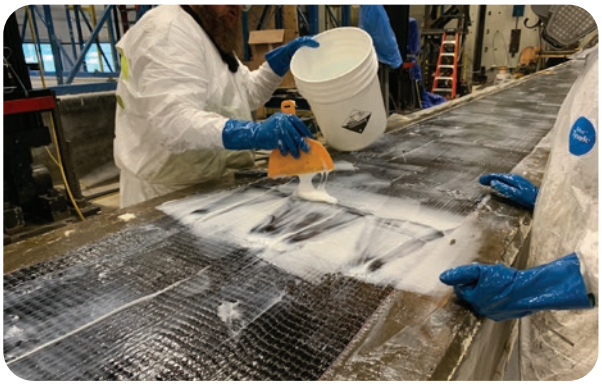
Washington State University; testing of columns with re-entrant corners.





UCSD three sided column anchor test





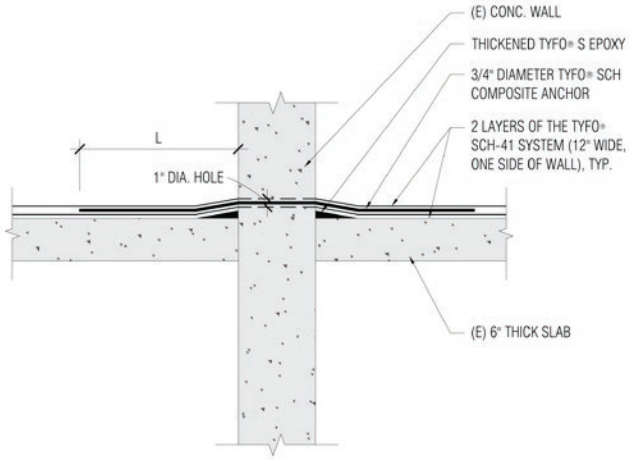
Univ. AT Buffalo testing anchors using in beams.

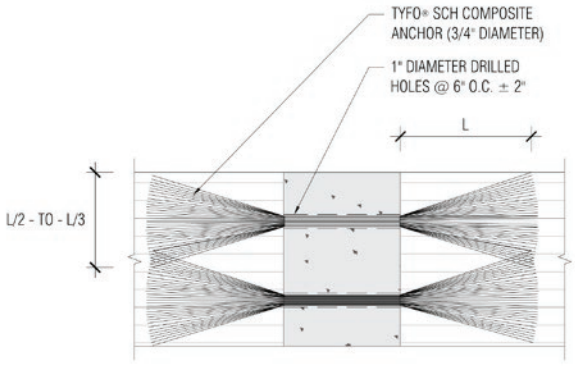
SPLICE ANCHOR APPLICATIONS

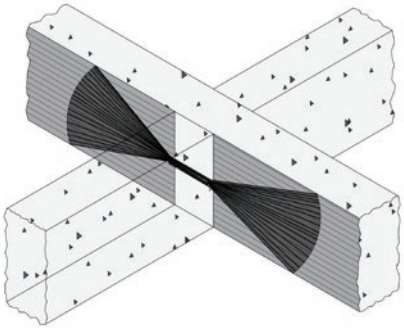
Tyfo Fiber Anchor Systems can be used to develop a tension force through an intersecting element and act as a splice for FRP applications.

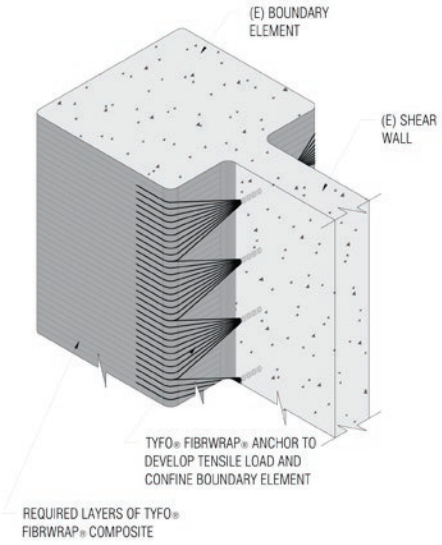
Splice anchors may be installed through wall, slab or beam elements.

TYFO® SCH composite Anchors to develop tension through obstacles to provide negative moment strengthening.





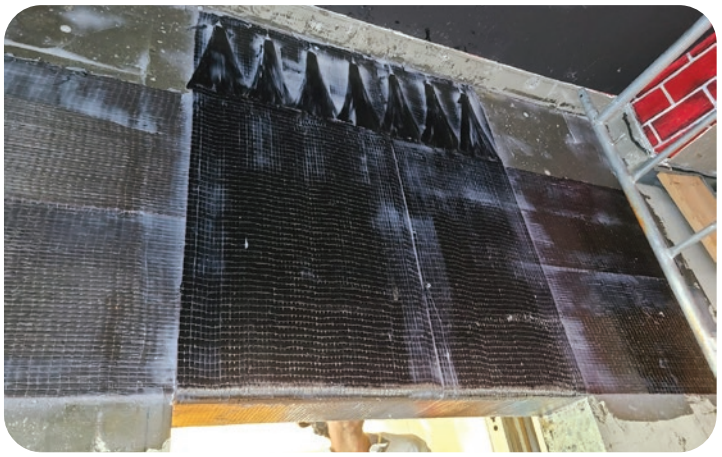


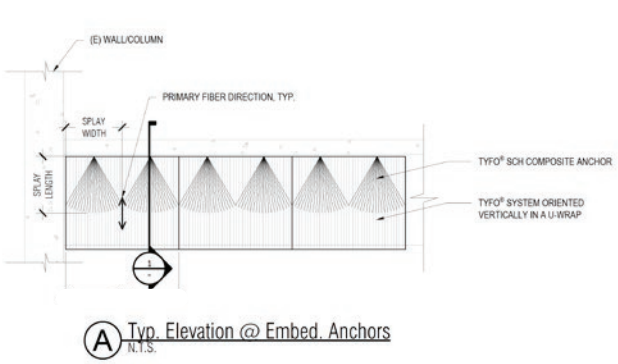


EMBEDDED ANCHOR APPLICATIONS

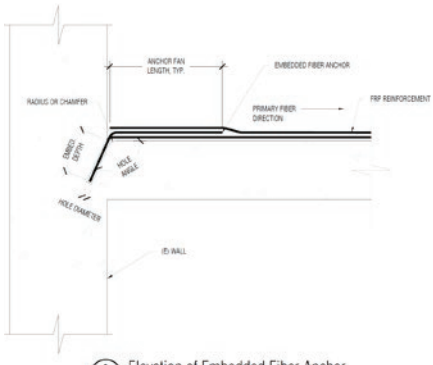
Tyfo Fiber Anchor Systems can be used to fully develop a tension force into a structural element for proper FRP application detailing and load path considerations. Embedded anchors may also be used to provide shear transfer enhancement at wall to diaphragm connections.

Embedded anchors may be installed into walls, slabs, beams, columns or joints.

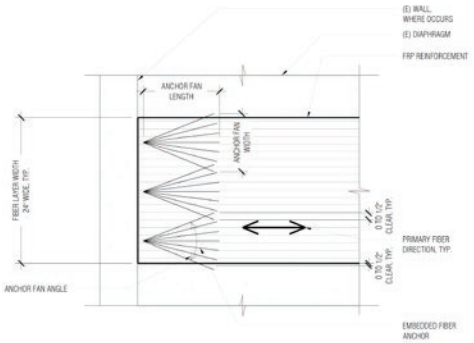




A Typ. Elevation @ Embed. Anchors N.T.S.

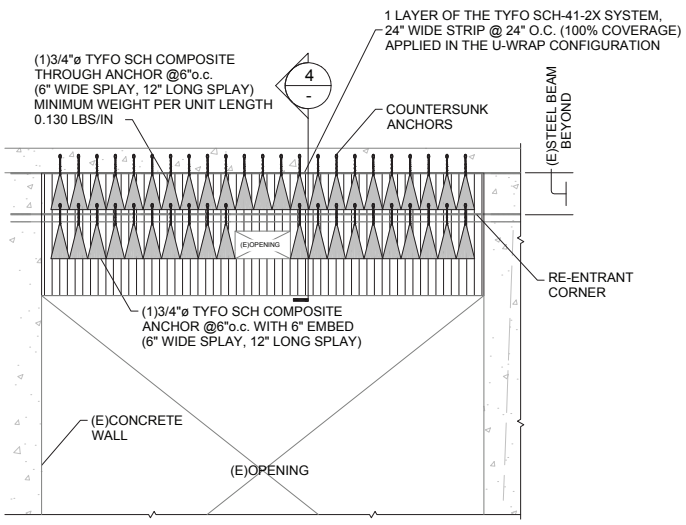


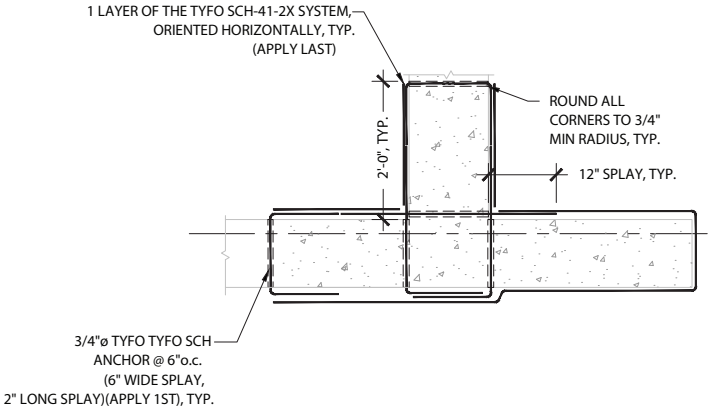
A Elevation of Embedded Fiber Anchor N.T.S.



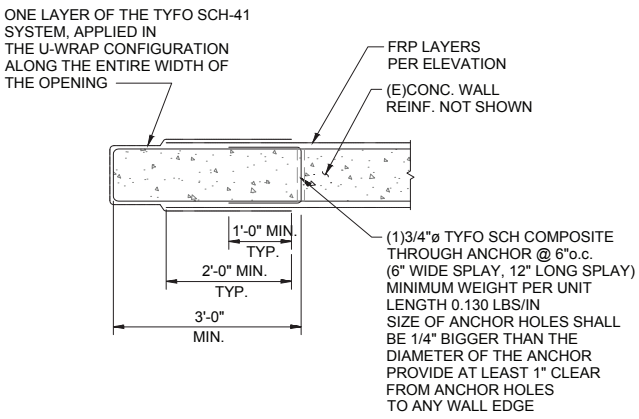
1 Plan View of Embedded Fiber Anchor N.T.S.

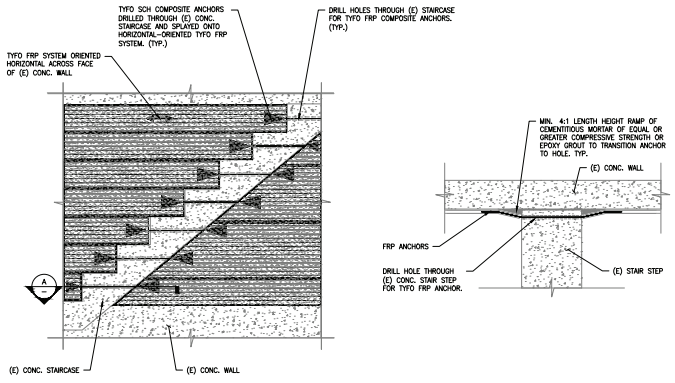
ENGINEERING DRAWINGS AND COMPLETED INSTALLATION





ENGINEERING DRAWINGS AND COMPLETED INSTALLATION





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