REFERENCES

- ACI Committee 318, 2014. Building Code Requirements for Structural Concrete, American Concrete Institute.
- ACI Committee 440, 2017. ACI 440.2R-17 Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures, Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.
- Adhikary, B.B., Mutsuyoshi, H., 2004. Behavior of Concrete Beams Strengthened in Shear with Carbon-Fiber Sheets. Journal of Composites for Construction 8, 258–264.
- Allen, E., Iano, J., 2009. Fundamentals of Building Construction: Materials and Methods, Fifth. ed. John Wiley & Sons, Inc., Hoboken,.
- Arya, C., 2009. Design of structural elements: Concreate, steelwork, masonry and timber designs to british standards and eurocodes, Taylor & Francis.
- Bond, a J., Brooker, O., Harris, a J., Harrison, T., Moss, R.M., Narayanan, R.S., Webster, R., 2006. How to design concrete structures using Eurocode 2, The Concrete Centre. The Concrete Centre.
- Bousias, S.N., Triantafillou, T.C., Fardis, M.N., Spathis, L., O'Regan, B.A., 2004. Fiber-Reinforced Polymer Retrofitting of Rectangular Reinforced Concrete Columns with or without Corrosion. ACI structural Journal 101, 512–520.
- BS 8110-1:1997, 1997. BS 8110: Structural Use of Concrete Part 1: Code of practice for design and construction. British Standard (BS).
- BS EN 1992-1-1, 2004. Eurocode 2: Design of concrete structures Part 1-1: General rules and rules for buildings. British Standards Institution.
- Cao, S.Y., Chen, J.F., Teng, J.G., Hao, Z., Chen, J., 2005. Debonding in RC Beams Shear Strengthened with Complete FRP Wraps. Journal of Composites for Construction 9, 417–428.

- Chaallal, O., Shahawy, M., 2000. Performance of Fiber-Reinforced Polymer-Wrapped Reinforced Concrete Column under Combined Axial-Flexural Loading. ACI structural Journal 97, 659–668.
- Chajes, M.J., Januszka, T.F., Mertz, D.R., Theodore A. Thomson, Jr., William W. Finch, Jr., 1995. Shear Strengthening of Reinforced Concrete Beams Using Externally Applied Composite Fabrics. ACI Structural Journal 92, 295–303.
- Chen, G.-M., 2010. Behaviour and Strength of RC Beams Shear-Strengthened with Externally Bonded FRP Reinforcement.
- Chen, J.F., Teng, J.G., 2003. Shear capacity of FRP-strengthened RC beams: FRP debonding. Construction and Building Materials 17, 27–41.
- Cosgun, C., Turk, A.M., Mangir, A., Cosgun, T., Kiymaz, G., 2020. Experimental behaviour and failure of beam-column joints with plain bars, low-strength concrete and different anchorage details. Engineering Failure Analysis 109, 104247.
- Cranston, W.B., Kamiński, M., Wróblewski, R., 1996. Aggregate interlock in cracked concrete with excessive crack width. Archives of Civil Engineering 42, 176–193.
- Damian I. Kachlakev, David D. McCurry, Jr., 2000. Testing of Full-Size Reinforced Concrete Beams Strengthened with FRP Composites: Experimental Results and Design Methods Verification.
- Dassault Systèmes, 2014. Abaqus 6.14 Online documentation [WWW Document]. Abaqus Theory Guide. URL https://abaqus-docs.mit.edu/2017/English/SIMACAEMATRefMap/simamat-c-concretedamaged.htm (accessed 5.22.20).
- Diab, H.M.A., Abdelaleem, T., Rashwan, M.M.M., 2020. Moment redistribution and flexural performance of RC continuous T-beams strengthened with NSM FRP or steel bars. Structures 28, 1516–1538.

- Dinh, H.H., Parra-Montesinos, G.J., Wight, J.K., 2011. Shear Strength Model for Steel Fiber Reinforced Concrete Beams without Stirrup Reinforcement. Journal of Structural Engineering 137, 1039–1051.
- Ebead, U., 2010. Mechanically Fastened Frp Flexural Strengthening of RC Beams. In: 13th Structural Faults & Repair.
- Ehsani, M. R., Saadatmanesh, H. & Tao, S., 1996. Design Recommendations for bond of GFRP reabars to concrete. Journal of Structural Engineering 122, 247–254.
- Ferreira, M., Oliveira, M.H. de, Tapajos, L., Freire, M., 2020. Influence of anchorage on flexural strength of beams strengthened with CFRP sheets. Alconpat 9, 30–47.
- Ghobarah, A., Ghorbel, M.N., Chidiac, S.E., 2002. Upgrading torsional resistance of reinforced concrete beams using fiber-reinforced polymer. Journal of Composites for Construction 6, 257–263.
- Grelle, S. v., Sneed, L.H., 2013. Review of Anchorage Systems for Externally Bonded FRP Laminates. International Journal of Concrete Structures and Materials 7, 17–33.
- Griffiths, A., 2014. Ecological university building by BDG Architects features a circular plan [WWW Document]. dezeen.com. URL https://www.dezeen.com/2014/02/24/stoas-vilentum-university-bdg-architects-circular-plan/ (accessed 5.18.20).
- Grumezescu, V., Grumezescu, A.M., 2019. Materials for Biomedical Engineering, Thermoset and Thermoplastic Polymers. Elsevier, Bucharest.
- Guo, R., Ren, Y., Li, M., Hu, P., Du, M., Zhang, R., 2021. Experimental study on flexural shear strengthening effect on low-strength RC beams by using FRP grid and ECC. Engineering Structures 227, 111434.
- Hafezolghorani, M., Hejazi, F., Vaghei, R., Jaafar, M.S. bin, Karimzade, K., 2017.
 Simplified damage plasticity model for concrete. Structural Engineering
 International 27, 68–78.

- Hassan, W.M., Park, S., Lopez, R.R., Mosalam, K.M., Moehle, J.P., 2010. Seismic response of older-type reinforced concrete corner joints. 9th US National and 10th Canadian Conference on Earthquake Engineering 2010, Including Papers from the 4th International Tsunami Symposium 7, 5288–5297.
- Hollý, I., Bilčík, J., Keseli, O., Gažovičová, N., 2016. Bond of GFRP reinforcement with concrete. Key Engineering Materials 691, 356–365.
- Hota V. S. GangaRao, and P.V.Vijay., 1998. Bending Behavior of Concrete Beams. Journal of Structural Engineering 6, 3–10.
- Hull, D., Clyne, T.W., 1996. An Introduction to Composite Materials (Cambridge Solid State Science Series), 2nd ed. Cambridge University Press, Cambridge.
- Iacobucci, R.D., Sheikh, S.A., Bayrak, O., 2003. Retrofit of Square Concrete Columns with Carbon Fiber-Reinforced Polymer for Seismic Resistance. ACI Structural Journal 100, 785–794.
- International Federation for Structural Concrete (fib), 1999. Structural Concrete Textbook on Behaviour, Design and performance Updated knowledge of the CEB/FIP Model Code 1990, 2nd ed. International Federation for Structural Concrete (fib), Lausanne.
- International Federation for Structural Concrete (fib), 2001. Externally bonded FRP reinforcement for RC structures, International Federation for Structural Concrete (fib).
- Johnoehlers, D., Rudolf, S., 2004. Chapter 4 CDC Debonding of Tension Face Plates. In: Design of FRP and Steel Plated RC Structures Retrofitting Beams and Slabs for Strength, Stiffness and Ductility. Elsevier, pp. 100–136.
- Kahandawaarachchi, K., Gamage, J, C, P, H., Chandrathilaka, E.R.K., 2019. Bond Performance of Carbon Fiber Reinforced Polymer (CFRP) Strengthened Reinforced Concrete Curved Beams. International Conference on Civil Engineering and Applications 6.

- Kalfat, R., Al-Mahaidi, R., Smith, S.T., 2013. Anchorage Devices Used to Improve the Performance of Reinforced Concrete Beams Retrofitted with FRP Composites: State-of-the-Art Review. Journal of Composites for Construction 17, 14–33.
- Karaca, E., Buyukozturk, O., 2002. FRP strengthening of RC beams in flexure and shear: FRP strengthening of RC beam in flexure and shear: failure modes and design.
- Karbhari, V.M., Seible, F., 2000. Fiber reinforced composites advanced materials for the renewal of civil infrastructure. Applied Composite Materials 7, 95–124.
- Khalifa, A., Gold, W.J., Nanni, A., Abdel Aziz, M.I., 1998. Contribution of externally bonded FRP to shear capacity of RC flexural members. Journal of Composites for Construction 2, 195–202.
- Koutas, L., Triantafillou, T.C., 2012. Use of anchors in shear strengthening of reinforced concrete T-beams with FRP. Proceedings of the 6th International Conference on FRP Composites in Civil Engineering, CICE 2012.
- Lee, J.H., Chacko, R.M., Lopez, M.M., 2010. Use of Mixed-Mode Fracture Interfaces for the Modeling of Large-Scale FRP-Strengthened Beams. Journal of Composites for Construction 14, 845–855.
- Lee, S.Y., 1956. Design of curved beams in reinforced concrete.
- Li, W., Tang, S., Huang, Z., Yang, X., Shi, T., Xing, F., 2020. Shear behavior of concrete beam reinforced in shear with carbon fiber-reinforced polymer mesh fabric (CFRP-MF) configuration. Engineering Structures 218, 110828.
- Lorenzis, L. de, Nanni, A., 2002. Use of carbon fiber laminates for strengthening reinforced concrete beams in bending. ACI structural Journal 2, 67–84.
- Meier, U., 1995. Strengthening of structures using carbon fibre/epoxy composites. Construction and Building Materials 9, 341–351.
- Meisami, M.H., Mostofinejad, D., Nakamura, H., 2014. Strengthening of flat slabs with FRP fan for punching shear, Composite Structures. Elsevier Ltd.

- Memon, M.S., Sheikh, S.A., 2005. Seismic Resistance of Square Concrete Columns Retrofitted with Glass Fiber-Reinforced Polymer. ACI structural Journal 102, 774–783.
- Mofidi, A., Chaallal, O., 2011. Shear Strengthening of RC Beams with Externally Bonded FRP Composites: Effect of Strip-Width-to-Strip-Spacing Ratio. Journal of Composites for Construction 15, 732–742.
- Nanni, A., de Luca, A., Zadeh, H., 2014. Reinforced Concrete with FRP Bars: Mechanics and Design. CRC Press: Taylor & Francis Group, Boca Raton.
- Norris, T., Saadatmanesh, H., Ehsani, M.R., 1997. Shear and Flexural Strengthening of R/C Beams with Carbon Fiber Sheets. Journal of Structural Engineering 123.
- Orton, S.L., Jirsa, J.O., Bayrak, O., 2008. Design Considerations of Carbon Fiber Anchors. Journal of Composites for Construction 12, 608–616.
- Ozbakkaloglu, T., Fanggi, B.L., 2014. Axial Compressive Behavior of FRP-Concrete-Steel Double-Skin Tubular Columns Made of Normal- and High-Strength Concrete. Journal of Composites for Construction 18.
- Paul, D., Datta, A.K., 2018. A Study on Flexural Strengthening of RC beam using FRP. In: International Conference on ADVANCES IN CONSTRUCTION MATERIALS AND STRUCTURES. Uttarakhand.
- Pellegrino, C., Modena, C., 2002. Fiber Reinforced Polymer Shear Strengthening of Reinforced Concrete Beams with Transverse Steel Reinforcement. Journal of Composites for Construction 6, 104–111.
- Pilkey, W.D., 2005. Formulae for stress, strain and structural matrices, John Wiley & Sons, Inc.
- Polak, M.A., Lawler, N., 2011. Application of FRP for punching shear retrofit of concrete slab-column connections. Advances in FRP Composites in Civil Engineering - Proceedings of the 5th International Conference on FRP Composites in Civil Engineering, CICE 2010 854–857.

- Priestley, M.J.N., Seible, F., 1995. Design of seismic retrofit measures for concrete and masonry structures. Construction and Building Materials 9, 365–377.
- Richardson, A., Drew, P., 2011. Fibre reinforced polymer and steel rebar comparative performance. Structural Survey 29, 63–74.
- Ritchie, P., Thomas, D., Lu, L., Conneley, G., 1991. External Reinforcement of Concrete Beams Using Fiber Reinforced Plastics. ACI Structural Journal 88, 490–500.
- Ross, C.A., Muszynski, L.C., Jerome, D.M., Tedesco, J.W., Sierakowski, R.L., 1997.

 RC Beams and Slabs Externally Reinforced with Fiber Reinforced Plastic (FRP)

 Panels. In: Proceedings of the Twenty-Seventh DoD Explosives Safety Seminar.
- Saribiyik, A., Abodan, B., Balci, M.T., 2020. Experimental study on shear strengthening of RC beams with basalt FRP strips using different wrapping methods. Engineering Science and Technology, an International Journal.
- Sayed-Ahmed, E.Y., Bakay, R., Shrive, N.G., 2009. Bond strength of FRP laminates to concrete: State-of-the-art review. Electronic Journal of Structural Engineering 45–61.
- Shahawy, M.A., Beitelman, T., Arockiasamy, M., Sowrirajan, R., 1996. Experimental investigation on structural repair and strengthening of damaged prestressed concrete slabs utilizing externally bonded carbon laminates. Composites Part B: Engineering 27, 217–224.
- Sharif, A., Al-Sulaimani, G., Basunbul, I., Baluch, M., Ghaleb, B., 1994. Strengthening of Initially Loaded Reinforced Concrete Beams Using FRP Plates. ACI Structural Journal 91, 160–168.
- Sheikh, S.A., Yau, G., 2002. Seismic behavior of concrete columns confined with steel and fiber-reinforced polymers. ACI Structural Journal 99, 72–80.

- Silva, M.A.L., Dedigamuwa, K. v., Gamage, J.C.P.H., 2021. Performance of severely damaged reinforced concrete flat slab-column connections strengthened with Carbon Fiber Reinforced Polymer. Composite Structures 255, 112963.
- Sundarraja, M.C., Rajamohan, S., 2009. Strengthening of RC beams in shear using GFRP inclined strips An experimental study. Construction and Building Materials 23, 856–864.
- Tamura, T., Murata, H., 2010. Experimental study on the ultimate strength of R / C curved beam. Fracture Mechanics of Concrete and Concrete Structures High Performance, Fiber Reinforced Concrete, Special Loadings and Structural Applications 1783–1788.
- Teng, J.G., 2001. Failure modes of FRP-strengthened restructures. In: 26th Conference on Our World in Concrete & Structures. Singapore, pp. 627–634.
- Teng, J.G., Chen, J.F., Smith, S.T., 2001. Debonding Failures in FRP-StrengthenedRC Beams: Failure Modes, Existing Research and Future Challenges. In:Composites in Construction: A Reality. Italy, pp. 139–148.
- Teng, J.G., Chen, J.F., Smith, S.T., Lam, L., 2002. FRP-Strengthened RC Structures. John Wiley and Sons, Inc., Chichester.
- Teng, J.G., Chen, J.F., Smith, S.T., Lam, L., 2003. Behaviour and strength of FRP-strengthened RC structures: A state-of-the-art review. Proceedings of the Institution of Civil Engineers: Structures and Buildings 156, 51–62.
- Teng, J.G., Lam, L., Chen, J.F., 2004. Shear strengthening of RC beams with FRP composites. Progress in Structural Engineering and Materials 6, 173–184.
- Triantafillou, T.C., 1998. Shear strengthening of reinforced concrete beams using epoxy-bonded FRP composites. ACI Structural Journal 95, 107–115.
- Triantafillou, T.C., Antonopoulos, C.P., 2000. Design of Concrete Flexural Members Strengthened in Shear with FRP. Journal of Composites for Construction 4, 198–205.

- Triantafillou, T.C., Choutopoulou, E., Fotaki, E., Skorda, M., Stathopoulou, M., Karlos, K., 2016. FRP confinement of wall-like reinforced concrete columns. Materials and Structures 49, 651–664.
- Wong, Y.-C., 1970. Horizontally curved beam analysis and design.
- Yao, J., Teng, J.G., Chen, J.F., 2005. Experimental study on FRP-to-concrete bonded joints. Composites Part B: Engineering 99–113.
- Yindeesuk, S., 2009. Overpass Bridge Crossing Intersection between Highway No. 345 and Highway No. 3100 in THAILAND [WWW Document]. tonsukit.com. URL http://www.tonsukit.com/blog-and-article/personsnamesnewwebsitewinswobbyaward (accessed 5.18.20).
- Zeng, J.J., Lin, G., Teng, J.G., Li, L.J., 2018. Behavior of large-scale FRP-confined rectangular RC columns under axial compression. Engineering Structures 174, 629–645.
- Zhang, J., Chen, Z., Guo, X., 2016. Experimental Study on Fracture Behaviors of Concrete Beams Strengthened with FRP Sheet of Different Width. International Journal of Materials Science and Applications 5, 31.
- Zhang, Z., Hsu, C.-T.T., 2005. Shear Strengthening of Reinforced Concrete Beams Using Carbon-Fiber-Reinforced Polymer Laminates. Journal of Composites for Construction 9, 158–169.