Candidate supervisor's information summary form
maximum 2 pages – it should be a summary of most important achievements

Name and surname, degree, title: Professor Gabriela Rutkowska	
Academic discipline/disciplines	Civil Engineering, Geodesy and Transport (ILGT): 100% full-time
Professional development (degrees and titles) in chronological order	**1995** – Master of Science in Engineering (Environmental Engineering) **2000** – Doctoral degree (PhD) – Field of Agricultural Sciences / Environmental Management **2024** – PhD, Ing – Field of Engineering and Technical Sciences / Civil Engineering and Transport
Most important publications/ patents in the last 3 years (maximum 10)	1. Francke, B., Michalak, H., Kula, D., Rutkowska, G., Zięba, W., & Salata, B. (2026). Assessment of the durability of polyurea resin coatings against selected aggressive solutions in the sewage infrastructure environment. *Scientific Reports*, 1–28. https://doi.org/10.1038/s41598-026-37921-0. 2. Rutkowska, G., Francke, B., Filip, C., Żółtowski, M., Michalak, H., Starzyk, A., Musiał, M., & Sierakowski, O. (2026). Assessment of the Mechanical Properties and Durability of Cement Mortars Modified with Polyurethane Foam Waste. *Materials*, *19*, Article 3. https://doi.org/10.3390/ma19030491. 3. Rutkowska, G., Francke, B., Filip, C., Żółtowski, M., Baryłka, A., & Matyjasek, P. (2026). Influence of Addition of Recycled Concrete Aggregate on Physico-Mechanical Properties and Microstructure of Mortar. *Buildings*, *16*, Article 3. https://doi.org/10.3390/buildings16030466. 4. Rutkowska Gabriela, Ogrodnik Paweł, Powęzka Aleksandra, Żółtowski Mariusz, Filip Chyliński, Karolina Kaszewska: Effect of cenospheres on the proprieties of plain concrete exposed to elevated temperature, Clean Technologies and Environmental Policy, 2024, s. 1-15, DOI:10.1007/s10098-024-03034-3. 5. Wiśniewski Krzysztof, Rutkowska Gabriela, Jeleniewicz Katarzyna, Dąbkowski Norbert, Wójt Jarosław, Chalecki Marek, Wierzbicki Tomasz: Ecologically Friendly Building Materials: A Case Study of Clay–Ash Composites for the Efficient Management of Fly Ash from the Thermal Conversion of Sewage Sludge, Sustainability, MDPI, vol. 16, nr 9, 2024, Numer artykułu: 3735, s. 1-18, DOI:10.3390/su16093735. 6. Rutkowska Gabriela: Wpływ dodatku popiołu lotnego ze spalania osadów ściekowych na wybrane właściwości betonu zwykłego, 2023, Wydawnictwo SGGW, ISBN 978-83-8237-182-6, [978-83-8237-183-3], 179. 7. Ogrodnik Paweł, Rutkowska Gabriela, Powęzka Aleksandra, Żółtowski Mariusz, Szulej Jacek, Wiśniewski Krzysztof, Howorus Patryk: Research on the Effect of Fire Thermal

	Energy on the Microstructure and Properties Mechanical of Fiber-Reinforced Cement Mortars, Energies, MDPI, vol. 16, nr 18, 2023, Numer artykułu: 6450, s. 1-21, DOI:10.3390/en16186450. 8. Rutkowska Gabriela: Assessment of fly ash from thermal treatment of sewage sludge according to the applicable standards, Journal of Ecological Engineering, Polish Society of Ecological Engineering (PTIE), vol. 24, nr 3, 2023, s. 20-34, DOI:10.12911/22998993/157319. 9. Rutkowska Gabriela, Żółtowski Mariusz, Filip Chyliński, Trach Yuliia, Gortych Elżbieta: The Effect of Glass Flour on The Microstructure and Properties of Fiber-Reinforced Concrete: Experimental Studies, Applied Sciences-Basel, MDPI, vol. 13, nr 21, 2023, Numer artykułu: 11937, s. 1-17, DOI:10.3390/app132111937. 10. Wichowski Piotr, Kalenik Marek, Rutkowska Gabriela, Malarski Maciej, Czajkowska Justyna, Franus Wojciech: Properties of products obtained in the process of solidification and stabilization of fly ash resulting from thermal treatment of sewage sludge, Cement Wapno Beton, Fundacja Cement Wapno Beton, vol. 28, nr 6, 2023, s. 389-408, DOI:10.32047/cwb.2023.28.6.3.
Experience in work with doctoral students (defended doctoral dissertations, initiated doctoral procedures) in chronological order	From 2025 – auxiliary supervisor
Achievements in the area of projects/grants (in the last 5 years)	1) 2019 – Principal Investigator of the research project entitled: *"Fly ash from the thermal treatment of sewage sludge as a modifier of concrete"* (Grant Agreement No. MNISW/2019/174/DIR of 13 June 2019, concerning the award of funding under the call **"**Innovation Incubator 2.0", implemented within the measure *"Support for research management and commercialization of R&D results in scientific institutions and enterprises"*, as part of the Smart Growth Operational Programme 2014–2020 – Measure 4.4). 2) 2022 – Participation in scientific research works related to the development of energy- and process-efficient technologies for senior housing construction under the project **"**BIOPAN components**"** – Project Manager at SGGW: Łukasz Mazur. As part of the project, preparation of the report entitled: *"Recycling of construction materials. Analysis of the carbon footprint and recycling of construction materials for a senior housing facility."*
Subject area of the research project for which the candidate student is being recruited	The thematic scope covers interdisciplinary research on modern, sustainable technologies in construction, focused on improving the mechanical, thermal, and environmental performance of cementitious and concrete materials. 1. **Effect of high temperature on cementitious materials** – identification of mechanisms responsible for the degradation of

	microstructure and mechanical properties of concrete and cement mortars at elevated temperatures, taking into account the role of mineral phases, porosity, and modifying additives enhancing thermal resistance. 2. **Design of sustainable cement-based composites using waste materials** – modeling the influence of industrial by-products (fly ash, cenospheres, glass powder, zeolites) on hydration kinetics, microstructure development, and the mechanical properties and durability of materials at the micro-, meso-, and macro-structural scales of concrete and mortars. 3. **Microstructural engineering of concrete and cement mortars** – application of fibers, microfillers, and mineral additives to achieve controlled microstructure development, enhanced resistance to cracking, creep, shrinkage, and exposure to extreme environmental conditions. 4. **Potential application of fly ash from sewage sludge incineration in concrete technology** – comprehensive physicochemical and environmental characterization of ashes, assessment of their pozzolanic reactivity, and evaluation of safe and effective utilization in cementitious materials. 5. **High-performance and ultra-high-performance concretes (HPC and UHPC)** – analysis of the effects of specimen scale, fiber content and type, and mix design on the development of mechanical properties, durability, and damage resistance under mechanical and environmental loading conditions.
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