

Case	Type of structure or element	Exposure class	Mechanical performances	Protective function/constructive details	Workability	Special requirements	Characterization tests
3	Ribbed slab, city fire station 40 mm reinforcing layer in reinforced UHPFRC (with rebar) cast in place on existing slab, hydrojetting of 10 mm thickness. Total volume of UHPFRC to be produced in a concrete plant 15 km away: 40 m³	XC3 Depending on location, XD2 or even XD3 because trucks come and go in winter, with water loaded with de-icing salt depending on the day.	Application on existing substrates = eigenstresses due to restrained shrinkage. Shocks, abrasion → UHPFRC uniaxial tensile strain-hardening = UA in combination with rebar (can be combined with shrinkage limiter too)	→ plan casting steps according to the volume to be produced → ensure continuity of mechanical load transfer in the UHPFRC between stages.	Self-placing, (Slump flow approx. 700 mm) - SF2 Cast-in-place, workability to be maintained over 2 to 3 hours (due to transport of UHPFRC from concrete plant)	Building interiors = fire resistance needed <u>Cure:</u> In all cases, protect with plastic sheeting as soon as possible. and wet cure for 7 days from setting, under plastic sheeting	Slump-flow 4 PT bending without notching / inverse analysis, 28-day tests 28-day water capillarity test
4	Protective plates for overpass piers on a highway Swiss Alps Prefabricated UHPFRC Thickness 40 mm, height 3 m, width 2 m	XC4, XD3, XF4 very severe	Prefabrication: eigenstresses negligible (if molds have no hindrance) Shocks → Flexural strain-hardening material sufficient - U0 (transport load case)	Plate edge geometry with overlap joints → continuity of protection on structures	Central casting, no transport delays self-compacting, fiber length max=10 to 13 mm (formwork) (slump flow: 700 mm - class SF2 SCC)	Passage through narrow formwork	Slump flow Full-scale prototype elements and cut-outs (fiber orientation - K-factor) 4 PT notchless bending at 28 days (same as case 3.) Water capillarity at 28 days