GESAMTVERBAND DER ALUMINIUMINDUSTRIE e.V.

Designing the future – building with aluminium
Use of aluminium in Germany’s architecture and construction sector

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18th November 2020

Dortmund Westfalenhalle
Year of Construction 1952, alloy: AlMg1 – mill finished, sheet thickness: 0,7 mm Source: Aluminium Zentrale

Dortmund Westfalenhalle
Condition of the roof in 2007

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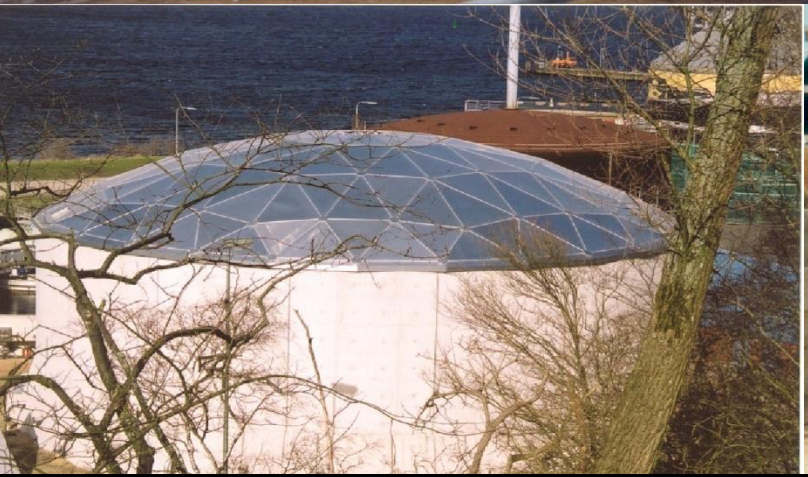
Condition of the roof in 2007

Two Twin Aluminum Domes of the Enel Plant in Civitavecchia (Italy),
Aluminium Roofing and substructure (diameter 144 m and 49 m height)

Source: F. M. Mazzolani, 11th INALCO Conference 2010, Eindhoven, June 2010

Basin cover in a sewage treatment plant

Source: KBU, Ennepetal

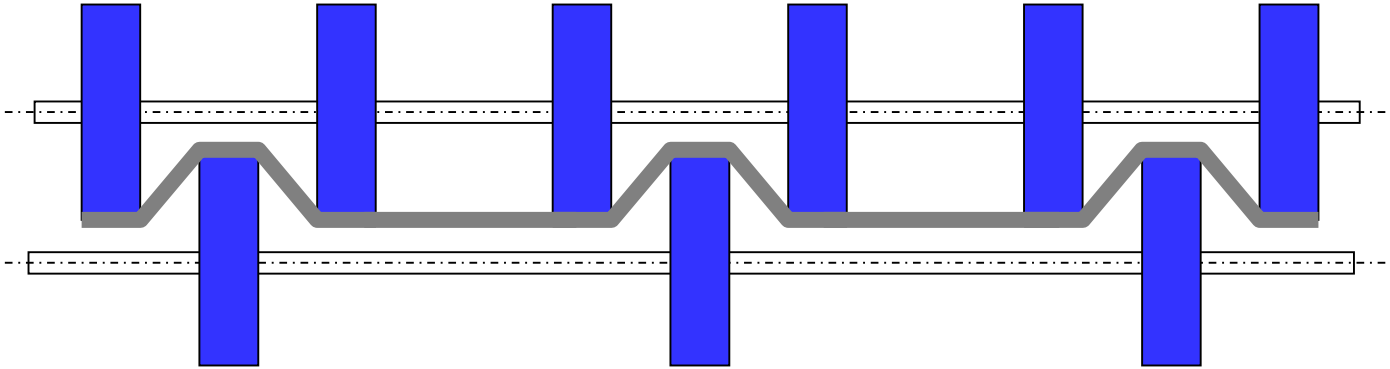


sewage treatment plant: tank cover, dam beams, scraper bridge

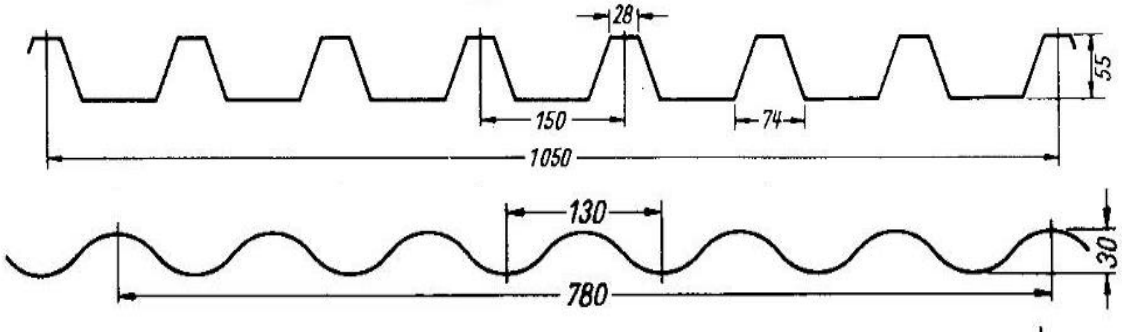
Source: KBU, Ennepetal, Alcan,Singen

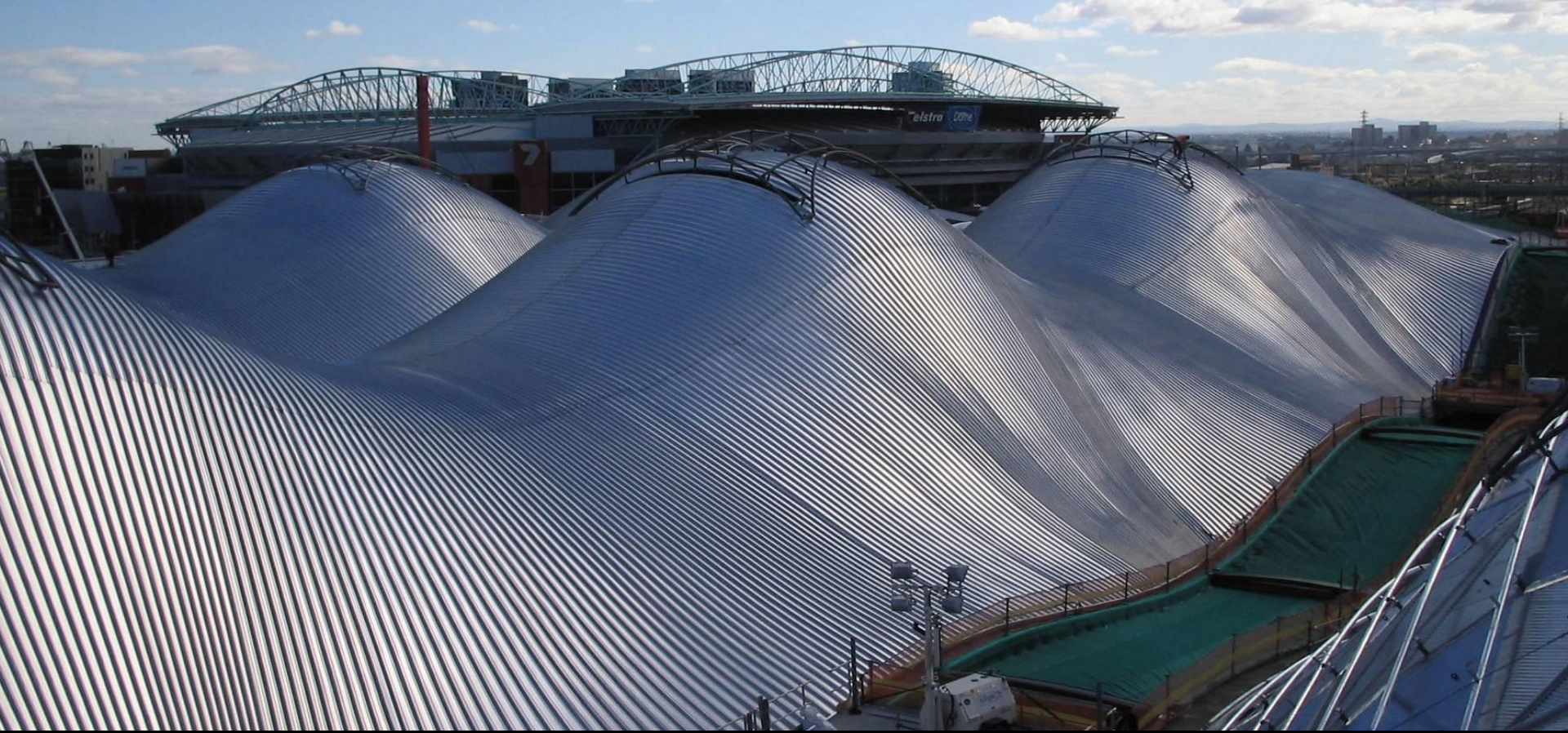
Roll forming of aluminium sheets

Rolling former



Typical profile shapes





Spencer Street Station, Melbourne (Australia)
Year of construction: 2006, 37 000 m², path forms: convex, concave rounded, hyperbolic, elliptical
Surface: stucco patterned

Source: Corus Bausysteme GmbH, Koblenz

Facade made of roll-formed profiled panels
Corrugated profiled sheet, coil-coated

Source: Alcan, Göttingen

Schwansbell Bridge, Lünen - built in 1956 (Photo: 2005)
Profiles, sheets, rivets: AlMgSi1 - mill finished

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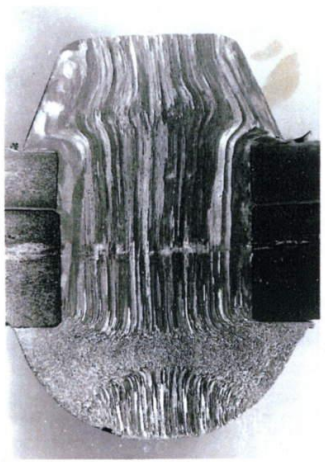
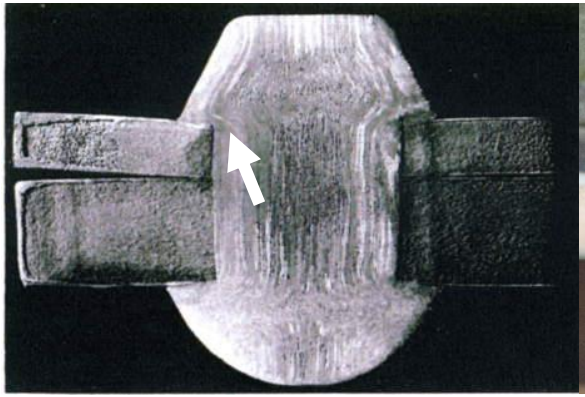
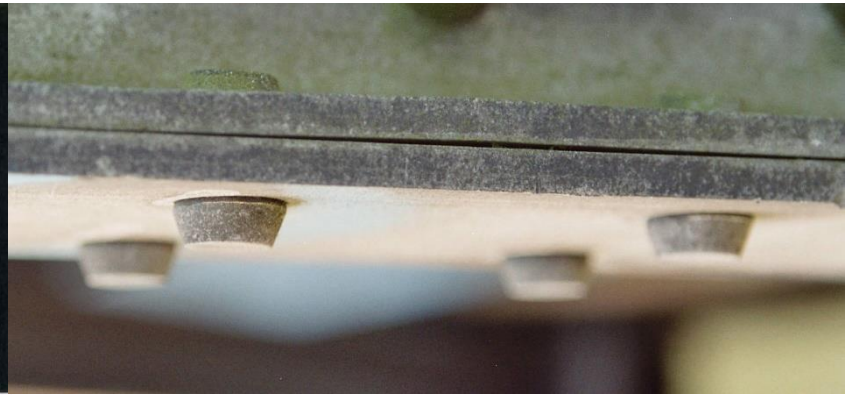
Schwansbell Bridge, Lünen - built in 1956

Riveting tests (Ø 16 mm) to determine the head shape

Alloy of the profiles: AlMgSi1 F32 (EN AW-6082 T6)
Alloy of the rivet: AlMgSi1 F20 (EN AW-6082 T4)







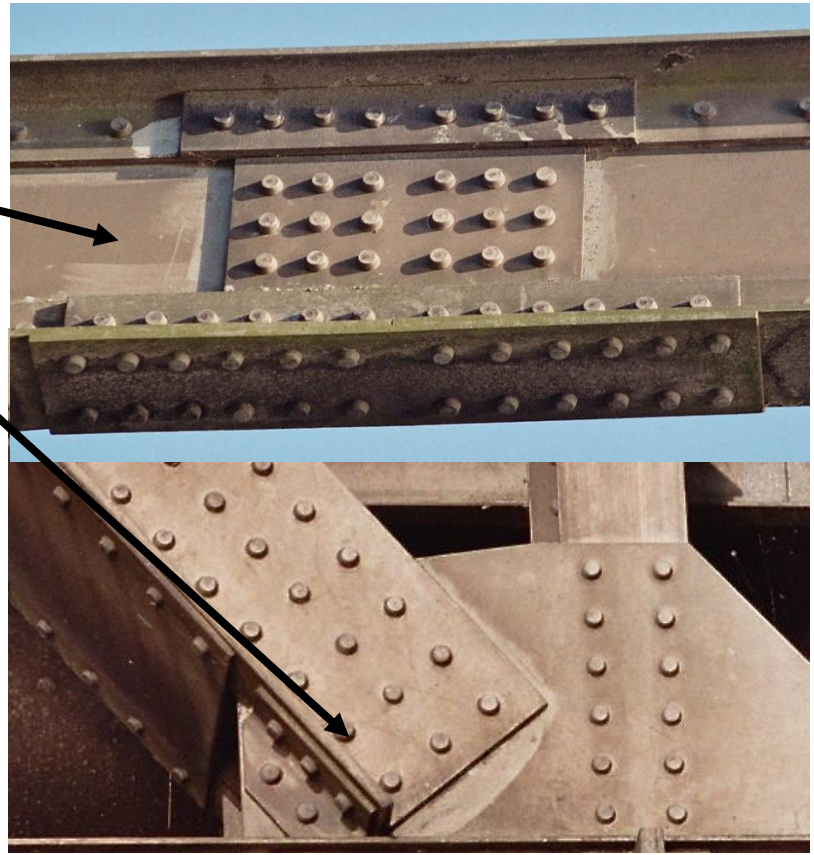
Gaping of the sheets cannot be avoided

Risk of crevice corrosion

Schwansbellbrücke, Lünen - built 1956 (Photos: 2005)

Avoiding crevice corrosion by intermediate coat

Service life of the Riveted joints: 50 years



Congress bridge Saarbrücken

Built: 2015, Span: 84 m

Source: Metal construction luck

Pedestrian and bicycle bridge in Schorndorf
span width: 32 m, width: 3 m

Source: Metal construction luck

Aluminium Centrum Houten (NL)

European Standardisation

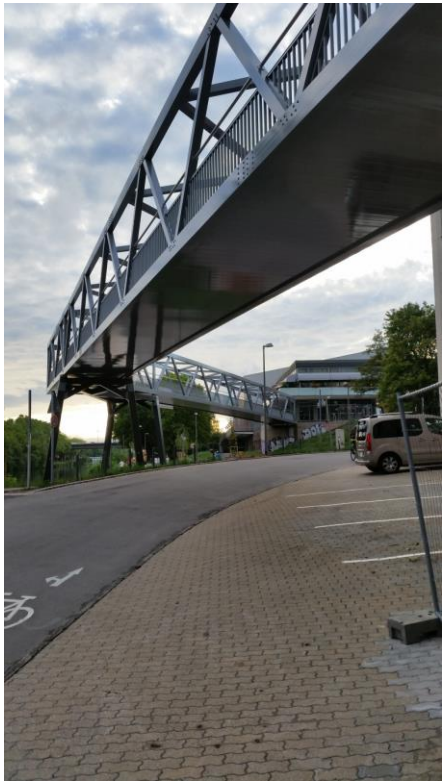
Eurocode 9: Design of aluminium structures (EN 1999)

EUROCODE 9

EN 1999-1-1	Part 1-1: General structural rules
EN 1999-1-2	Part 1-2: Structural fire design
EN 1999-1-3	Part 1-3: Structures susceptible to fatigue
EN 1999-1-4	Part 1-4: Cold-formed structural sheeting
EN 1999-1-5	Part 1-5: Shell structures

Execution of steel structures and aluminium structures (EN 1090)

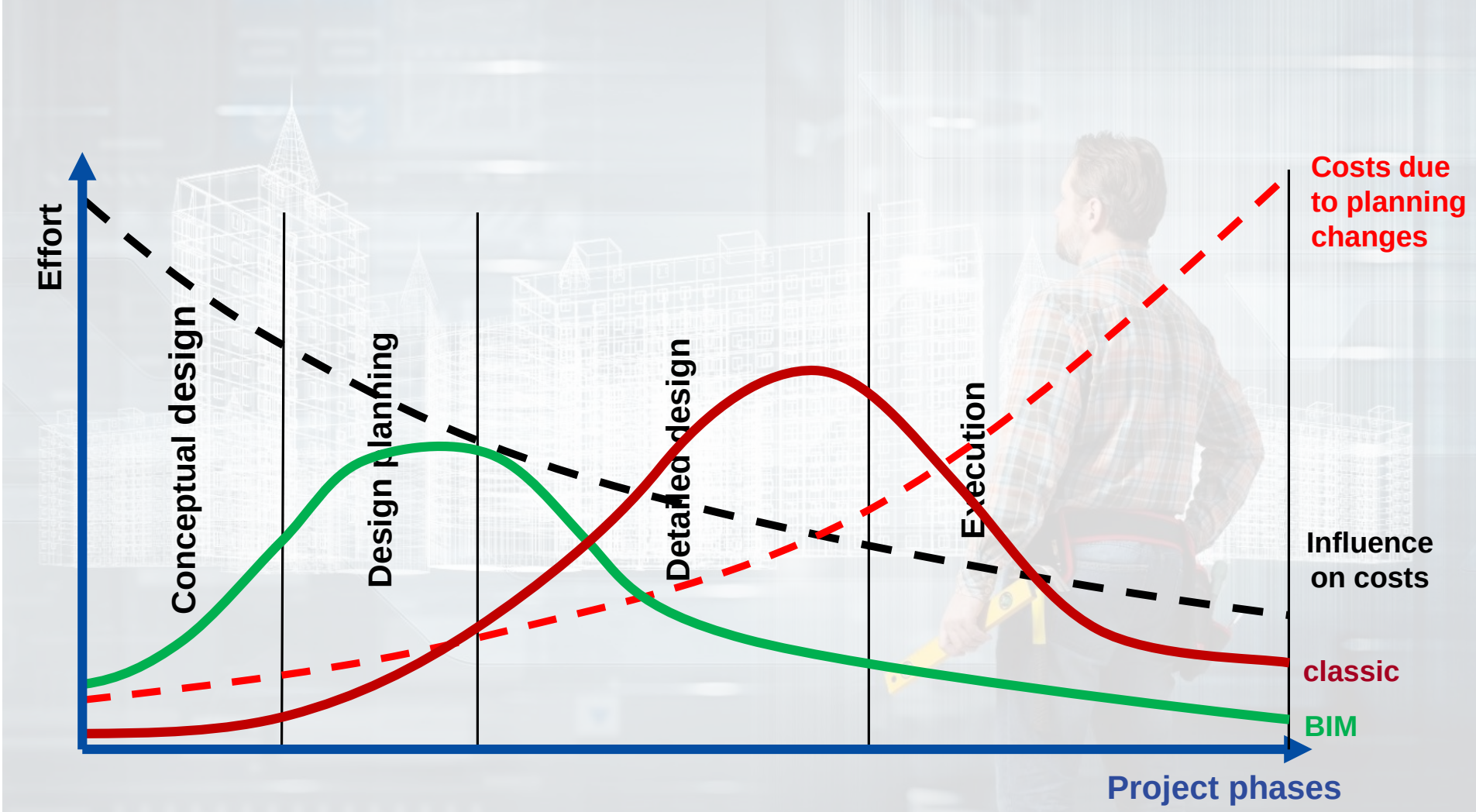
EN 1090-1	Part 1: Assessment and verification of constancy of performance of steel components and aluminium components for structural use
EN 1090-3	Part 3: Technical requirements for aluminium structures

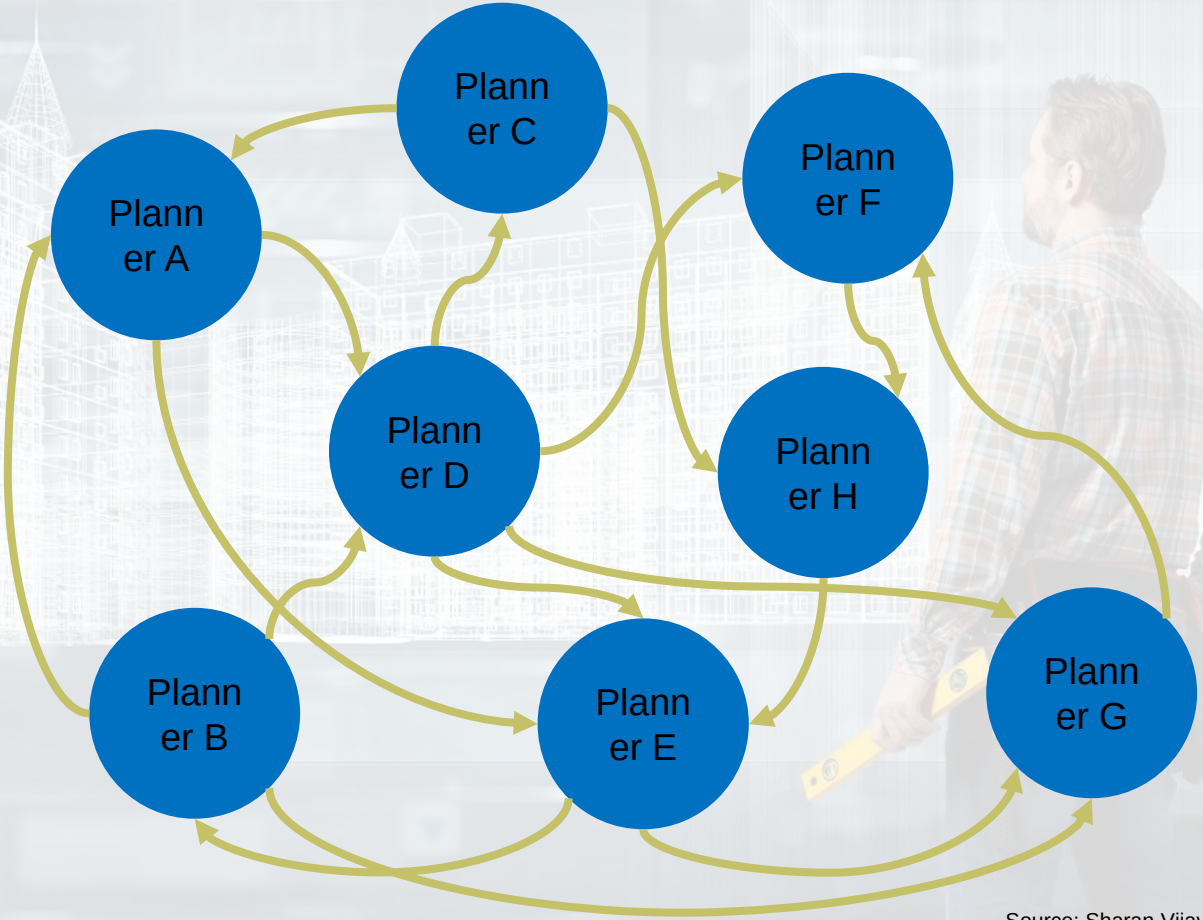


www.metall-glueck.de

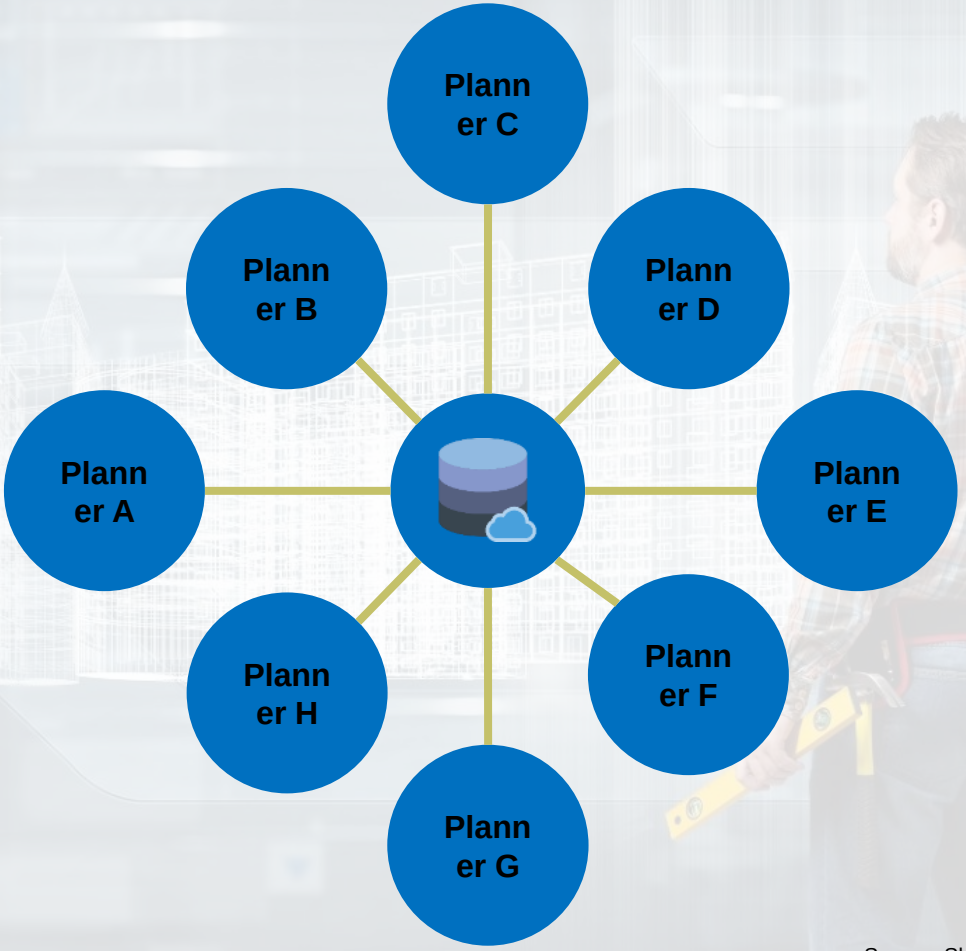
International Standardisation

Source: Adobe Stock


Effort
Conceptual design
Design planning
Detailed design
Execution
Costs due to planning changes
Influence on costs
classic
BIM
Project phases



Source: Sharan Vijayagopal, M.Sc, bauforumstahl e.V.



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Cooperation
Pilot Project

GSB INTERNATIONAL

bauforumstahl

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