

Structural Engineer

FF14 Construction, installation and infrastructure · ISCO-08 2142 · CBS 0712 Engineers (excluding electrical engineering) · seniority senior · Also known as: Structural designer

Calculates and designs the load bearing structure of buildings and tests it against strength requirements, standards and material behaviour.

The structural engineer works closely with the architect and installation advisor and carries personal responsibility for the safety of the structure. The distinction from an architect lies in the focus on strength and stability rather than form and experience. Selection often fails on candidates with strong calculation skill who cannot adequately explain to non-technical parties why a change is or is not possible.

Key figures for this profile

24 skills · 6 competencies to measure · 4 knockout skills · centre of gravity: Professional knowledge domains 29%, Execution, craft, safety and sustainability 24%, Cognitive ability and problem solving 19%

1 Competencies to measure

These are the behavioural and ability constructs in this profile. Each one shows which hrmforce questionnaire measures it.

Competencies to measure	Target level	hrmforce instrument	Assessment method	Behavioural anchor at target level
Numerical reasoning Knockout	■■■■■ N5	Ability Scan	Cognitive ability test	Sees in complex number series which assumptions determine the outcome and sets the calculation logic that others in the organisation follow.

Competencies to measure	Target level	hrmforce instrument	Assessment method	Behavioural anchor at target level
Safety awareness Competency (50-framework): Discipline Knockout	■■■■■ N5	Big Fifty, Competency Check	Situational Judgement Test	Sets the safety standard for the organisation, makes safety discussable at every level and steers behaviour and culture.
Spatial ability	■■■■■ N4	Ability Scan	Cognitive ability test	Derives the build up of the end product from a two dimensional drawing and reports where parts do not fit.
Discipline and keeping commitments Competency (50-framework): Discipline	■■■■■ N4	Big Fifty, 15PF, 360 Feedback	Personality questionnaire	Commits only to what is feasible, tracks own commitments and informs those involved as soon as a deadline comes under pressure.
Client focus Competency (50-framework): Customer Focus	■■■■■ N4	Big Fifty, Competency Check, 360 Feedback	360-degree feedback	Uncovers the real need behind a client question, makes a fitting proposal and checks after delivery whether it works.
Perseverance Competency (50-framework): Perseverance	■■■■■ N4	Big Fifty, 15PF, Mental Resilience (4C)	Personality questionnaire	Keeps seeking alternative routes on a stalled case and involves others in that search on own initiative.

2 Full skill profile

Every skill in this profile, sorted by weight. The behavioural anchor under each skill belongs to the target level.

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
A	Numerical reasoning Sees in complex number series which assumptions determine the outcome and sets the calculation logic that others in the organisation follow.	■■■■■ N5	5	yes	Cognitive ability test	Ability Scan
V	Construction craft work Sets the company's standard construction details and determines, in case of failure costs, which working method needs adjustment.	■■■■■ N5	5	yes	Work sample test	Work sample test, Knowledge test (client-specific)
G	Safety awareness Sets the safety standard for the organisation, makes safety discussable at every level and steers behaviour and culture.	■■■■■ N5	5	yes	Situational Judgement Test	Big Fifty, Competency Check
V	Modelling and abstraction Develops models that several departments use, states their limits of validity and manages their versions and changes.	■■■■■ N5	4	no	Work sample test	Work sample test, Portfolio
K	Applying building regulations and standards Represents the organisation on standards committees and translates new regulation into company wide review protocols.	■■■■■ N5	4	no	Knowledge test	Knowledge test (client-specific)

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
A	Spatial ability Derives the build up of the end product from a two dimensional drawing and reports where parts do not fit.	 N4	4	no	Cognitive ability test	Ability Scan
V	aligning and coordinating Organises consultation between the parties in a shared process, records agreements and actively tracks whether these are met.	 N4	4	no	Assessment centre	Competency Check, 360 Feedback
G	Discipline and keeping commitments Commits only to what is feasible, tracks own commitments and informs those involved as soon as a deadline comes under pressure.	 N4	4	no	Personality questionnaire	Big Fifty, 15PF, 360 Feedback
V	Building services engineering Independently commissions a heating or ventilation system, measures its performance and sets the controls.	 N4	4	no	Work sample test	Work sample test, Knowledge test (client-specific)
V	Reading and applying technical drawings Independently derives the correct dimensions from several drawings, spots contradictions and puts them to the designer.	 N4	4	no	Knowledge test	Knowledge test (client-specific), Work sample test

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
V	Selecting and using tools Selects tools independently for varying materials and jobs, substantiates the choice and replaces worn parts in time.		4	no	Work sample test	Work sample test
V	Using personal protective equipment correctly Determines per task which protective equipment is needed, checks it before use and instructs new colleagues in its use.		4	no	On-the-job observation	Knowledge test (client-specific), Work sample test
V	Working safely at height and in confined spaces Prepares work at height or in a confined space independently, arranges attendant and measurement and issues the work permit.		4	yes	Certificate or diploma	Knowledge test (client-specific), Work sample test
V	Risk assessment Estimates the main risks for the own process, orders them by likelihood and impact and takes measures.		3	no	Work sample test	Competency Check, Work sample test
V	Advisory skill Reframes the question behind the question, offers two supported options with consequences and agrees a decision moment.		3	no	Assessment centre	Competency Check, Structured interview

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
G	Client focus Uncovers the real need behind a client question, makes a fitting proposal and checks after delivery whether it works.	 N4	3	no	360-degree feedback	Big Fifty, Competency Check, 360 Feedback
V	Planning and organising Plans the work of the team for several weeks, distributes tasks and reshuffles on disruptions without missing deadlines.	 N4	3	no	Work sample test	Competency Check, 360 Feedback, Work sample test
G	Perseverance Keeps seeking alternative routes on a stalled case and involves others in that search on own initiative.	 N4	3	no	Personality questionnaire	Big Fifty, 15PF, Mental Resilience (4C)
V	Construction work preparation Independently draws up planning and bills of materials for a project, requests quotations and aligns delivery moments with the site.	 N4	3	no	Work sample test	Work sample test, Knowledge test (client-specific)
V	Site supervision on construction projects Independently inspects completed work for quality and safety, addresses subcontractors and records deviations with photographs.	 N4	3	no	On-the-job observation	Work sample test, Competency Check

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
K	Applying materials knowledge Explains how moisture, heat or load affects a material and selects processing and auxiliary substances accordingly.	 N4	3	no	Knowledge test	Knowledge test (client-specific)
V	Guiding on the job Agrees with the person guided which tasks go solo, observes purposefully and discusses two concrete learning points afterwards.	 N3	2	no	On-the-job observation	360 Feedback, Competency Check
V	Working with digital devices and applications Selects the appropriate device and application for each task and fixes common disruptions without support from others.	 N3	2	no	Work sample test	Knowledge test (client-specific), Work sample test
K	Sustainable and energy efficient construction Independently compares variants of measures on energy performance, cost and material use and advises the client on a choice.	 N3	1	no	Knowledge test	Knowledge test (client-specific)

3 Levels per seniority

The same profile with the job family seniority adjustment applied. Target levels are clamped to 1 to 5.

Skill	medior	senior	lead
Numerical reasoning	N5	N5	N5
Construction craft work	N4	N5	N5
Safety awareness	N4	N5	N5
Modelling and abstraction	N4	N5	N5
Applying building regulations and standards	N4	N5	N5
Spatial ability	N3	N4	N4
aligning and coordinating	N3	N4	N4
Discipline and keeping commitments	N3	N4	N4
Building services engineering	N3	N4	N4
Reading and applying technical drawings	N4	N4	N4
Selecting and using tools	N3	N4	N4
Using personal protective equipment correctly	N3	N4	N4
Working safely at height and in confined spaces	N3	N4	N4
Risk assessment	N3	N4	N4
Advisory skill	N3	N4	N4
Client focus	N3	N4	N4
Planning and organising	N3	N4	N4
Perseverance	N3	N4	N4
Construction work preparation	N3	N4	N4
Site supervision on construction projects	N3	N4	N4
Applying materials knowledge	N3	N4	N4
Guiding on the job	N2	N3	N3
Working with digital devices and applications	N2	N3	N3

Skill	medior	senior	lead
Sustainable and energy efficient construction	N2	N3	N3

4 The proficiency scale

Level	Label	Autonomy	Complexity	Scope	Depth of knowledge
N1	Guided	works under supervision and follows instruction	routine, one variable at a time	own task	basic understanding of terminology
N2	Applying	works independently within set frameworks	familiar situations with limited variation	own role	working knowledge, applies standard approach
N3	Proficient	sets own approach and seeks input proactively	several variables, some ambiguity	own team or process	thorough knowledge, weighs alternatives
N4	Advanced	directs others and decides on the approach	complex, with conflicting interests	several teams or a department	in-depth knowledge, advises others
N5	Leading	sets the standard and the policy	strategic, under high uncertainty	organisation, value chain or profession	authority, advances the profession

5 Behavioural anchors per skill

Anchors sit at N1, N3 and N5. N2 and N4 are deliberately not anchored: raters interpolate between them, following the O*NET convention.

Skill	N1	N3	N5
Numerical reasoning Works with numbers, ratios and tables and draws conclusions from them about quantities, trends and relationships in numerical material.	Reads a simple table, names the highest and lowest value and calculates a percentage using a calculator.	Combines two data sources, calculates the development over time and explains which calculation step leads to which result.	Sees in complex number series which assumptions determine the outcome and sets the calculation logic that others in the organisation follow.
Construction craft work Carries out structural and finishing construction work, selects materials and joints and works to dimension according to drawing and specification.	Carries out a construction operation under supervision according to the work instruction and checks dimensions with the tools provided.	Independently works out a construction detail on site, selects suitable materials and resolves dimensional deviations on the spot.	Sets the company's standard construction details and determines, in case of failure costs, which working method needs adjustment.

Skill	N1	N3	N5
Safety awareness Continuously watches for unsafe situations and actions at work, addresses others about them and chooses the safe working method even under time pressure.	Follows the safety rules of the workplace and checks back when in doubt about an operation.	Recognises unsafe situations in own process, intervenes and addresses colleagues without bringing the work to a halt.	Sets the safety standard for the organisation, makes safety discussable at every level and steers behaviour and culture.
Modelling and abstraction Turns a real situation into a simplified representation, such as a diagram, formula or flow chart, with explicit assumptions and limits.	Fills in an existing diagram or template and names which part of the work belongs where.	Builds a diagram of a work process independently, names the assumptions and tests the model against real cases.	Develops models that several departments use, states their limits of validity and manages their versions and changes.
Applying building regulations and standards Knows the requirements from building regulations, standards and permits and tests design and execution against structural, fire and energy requirements.	Looks up the applicable requirement in the regulations for a simple building question and submits the outcome.	Independently tests a design against fire, structural and energy requirements and states which adjustment the permit requires.	Represents the organisation on standards committees and translates new regulation into company wide review protocols.
Spatial ability Imagines how objects, spaces or drawings look after rotating, folding or assembling them and uses that mental image in the work.	Points out the right route on a floor plan and names which side lies left or right of the entrance.	Derives the build up of the end product from a two dimensional drawing and reports where parts do not fit.	Thinks complex three dimensional set ups through in advance, predicts clashes between parts and sets the drawing conventions for the field.
aligning and coordinating Aligning the activities of different people and groups in timing, sequence and content so that duplicated work and delays are prevented.	Aligns own activities with one direct colleague and confirms who picks up which task and when.	Organises consultation between the parties in a shared process, records agreements and actively tracks whether these are met.	Sets up the coordination structure between departments or chain partners and decides which meetings, roles and information flows the organisation uses as standard.

Skill	N1	N3	N5
Discipline and keeping commitments Sticks to agreements, procedures and commitments even without supervision, and reports in good time when a commitment turns out to be unachievable.	Arrives at the agreed time with the agreed work and reports any delay to the supervisor.	Commits only to what is feasible, tracks own commitments and informs those involved as soon as a deadline comes under pressure.	Anchors the standard for reliable follow through in working agreements and addresses anyone at any level who lets that standard slip.
Building services engineering Installs and maintains water, heating, air and energy systems in buildings, commissions them and measures their performance afterwards.	Installs pipes and fittings under supervision according to the work instruction and reports deviations in the site situation.	Independently commissions a heating or ventilation system, measures its performance and sets the controls.	Develops building services concepts for complex buildings, sets company standards and advises clients on sustainable system choices.
Reading and applying technical drawings Reads construction and installation drawings with dimensions and symbols and translates them into workable operations or production instructions.	Points out on a drawing the dimensions, symbols and views that belong to the own work.	Independently derives the correct dimensions from several drawings, spots contradictions and puts them to the designer.	Sets drawing conventions and information standards for projects and judges whether delivered drawing sets are workable.
Selecting and using tools Selects the appropriate hand tool or power tool for a job, uses it as prescribed and keeps it in usable and safe condition.	Uses the tool provided for a fixed operation and returns it to its designated place after use.	Selects tools independently for varying materials and jobs, substantiates the choice and replaces worn parts in time.	Sets tool policy, assesses new tools for suitability and safety and determines what becomes the standard equipment.
Using personal protective equipment correctly Selects the protective equipment matching task and hazard, puts it on correctly and checks it for function, fit and shelf life.	Wears the prescribed protective equipment at the workplace and asks for replacement when damage is visible.	Determines per task which protective equipment is needed, checks it before use and instructs new colleagues in its use.	Sets protective equipment policy, selects suppliers on standards and wearing comfort and tracks compliance across the chain.

Skill	N1	N3	N5
Working safely at height and in confined spaces Works at height and in confined spaces according to the applicable procedure, takes the required measures beforehand and observes the work permit system.	Works at height under supervision with the prescribed fall protection and leaves the location when in doubt.	Prepares work at height or in a confined space independently, arranges attendant and measurement and issues the work permit.	Designs procedures for work at height and in confined spaces, audits contractors against them and decides on release of work.
Risk assessment Names what can go wrong, estimates likelihood and impact and links control measures or a deliberate acceptance to them.	Spots unsafe or deviating situations in the own work and reports them according to the applicable procedure.	Estimates the main risks for the own process, orders them by likelihood and impact and takes measures.	Sets the risk appetite and the assessment method for the organisation and accounts for accepted residual risks.
Advisory skill Sharpening the question of a client and delivering a well founded recommendation in a way that the receiver adopts and implements it.	Supplies requested information and explains a standard recommendation following the fixed structure used by the team.	Reframes the question behind the question, offers two supported options with consequences and agrees a decision moment.	Advises the board on issues with conflicting interests, challenges established assumptions and safeguards the quality of advice across the organisation.
Client focus Acting from the question and interest of the client, keeping agreements and visibly directing own work towards usefulness for that client.	Responds to client questions within the agreed term and refers on when the answer falls outside own task.	Uncovers the real need behind a client question, makes a fitting proposal and checks after delivery whether it works.	Translates client signals into changes in services and policy and holds the organisation accountable for the promised client experience.
Planning and organising Placing activities, people and resources in time, setting priorities and arranging dependencies so that agreed results are delivered on schedule.	Makes a daily or weekly schedule for own tasks and sticks to the agreed order and times.	Plans the work of the team for several weeks, distributes tasks and reshuffles on disruptions without missing deadlines.	Sets the planning system for the organisation, links annual plan, capacity and budget and decides on conflicting claims.

Skill	N1	N3	N5
Perseverance Keeps working towards a goal when the work brings resistance, repetition or disappointing interim results, and looks for another route to the same goal.	Picks up a task again after a failed attempt once the supervisor shows how it can be done differently.	Keeps seeking alternative routes on a stalled case and involves others in that search on own initiative.	Keeps multi year programmes on course despite sustained opposition and holds the organisation to the chosen direction after setbacks.
Construction work preparation Translates a construction assignment into planning, bills of materials, costing and work instructions, and aligns delivery and deployment with site and suppliers.	Collects data from drawing and specification under guidance and completes the bill of materials in the standard format.	Independently draws up planning and bills of materials for a project, requests quotations and aligns delivery moments with the site.	Develops the company's work preparation method, standardises costing benchmarks and guides preparers through complex projects.
Site supervision on construction projects Supervises progress, quality and safety on the construction site, addresses executing parties and records findings demonstrably.	Walks a check round under guidance, completes the checklist and reports unsafe situations immediately to the site manager.	Independently inspects completed work for quality and safety, addresses subcontractors and records deviations with photographs.	Sets the supervision and safety regime for projects, analyses incidents and improves the working method of all supervisors.
Applying materials knowledge Knows the properties and behaviour of the materials used and on that basis selects processing, auxiliary substances and storage method for an assignment.	Names the most used materials and their prescribed processing and picks the correct material for the job.	Explains how moisture, heat or load affects a material and selects processing and auxiliary substances accordingly.	Assesses new materials for applicability and sustainability, advises on material choice in the organisation and maintains the knowledge base.
Guiding on the job Guides a colleague or trainee during real work, gives targeted feedback on what was observed and builds up independence step by step.	Works alongside a new colleague, points out deviations in the operation and reports progress to the practice trainer.	Agrees with the person guided which tasks go solo, observes purposefully and discusses two concrete learning points afterwards.	Sets up workplace guidance for the organisation, trains the guides and keeps the quality of their coaching in view.

Skill	N1	N3	N5
Working with digital devices and applications Uses computers, mobile devices and standard applications to carry out work tasks, adjusts settings and resolves simple usage problems without help.	Opens and uses the prescribed applications for own tasks and asks for help whenever an unfamiliar message appears.	Selects the appropriate device and application for each task and fixes common disruptions without support from others.	Defines organisation wide which digital workplace facilities are used and guides their introduction across all teams.
Sustainable and energy efficient construction Knows measures and materials that lower the energy use and environmental impact of buildings and weighs them on performance, cost and lifespan.	Carries out prescribed insulation and airtightness measures under guidance and reports details that do not close properly.	Independently compares variants of measures on energy performance, cost and material use and advises the client on a choice.	Develops the sustainability policy for projects, sets performance standards above the legal minimum and justifies them to clients.

6 Assessment methods and validity

The validities are the corrected meta-analytic estimates from Sackett, Zhang, Berry and Lievens (2022) in the Journal of Applied Psychology, which replace the older Schmidt and Hunter (1998) figures. The spread matters as much as the mean: with a high SD, validity varies strongly by context.

Assessment method	rho	SD	What it is
Cognitive ability test	0.41	0.14	Standardised test of verbal, numerical or abstract reasoning.
Work sample test	0.33	0.09	The candidate performs a representative work sample under standardised conditions.
Situational Judgement Test	0.12	0.11	Scenario with response options, scored on knowledge or behavioural tendency.
Knowledge test	0.40	0.13	Test of declarative job knowledge, usually assembled per client.
Assessment centre	0.29	0.09	Multiple exercises, multiple assessors, dimension-wise scoring.
Personality questionnaire	0.40	0.15	Self-report of behavioural preferences. At hrmforce the Big Fifty and the 15PF.
On-the-job observation	-	-	Structured workplace observation with a form based on behavioural anchors.
Certificate or diploma	-	-	Formal proof of completed education or examination.
360-degree feedback	-	-	Multiple raters around the person rate behaviour against behavioural anchors.

7 Assessment instruments for this job

hrmforce instrument	Skills	What it measures
Work sample test	12	Representative work sample under standardized conditions
Knowledge test (client-specific)	10	Professional knowledge test, customized for each client
Competency Check	8	Behavioral-Level Competency Assessment
360 Feedback	5	Multiple assessments based on behavioral anchors
Big Fifty	4	Personality questionnaire, 150 items, 25 factors
Ability Scan	2	Aptitude Test: Verbal, Numerical, and Abstract Reasoning Skills

hrmforce instrument	Skills	What it measures
15PF	2	Personality Profile, a shorter alternative to the Big Fifty
Portfolio	1	Evaluation of prior work against fixed criteria
Structured interview	1	Behavioral interview with a fixed structure
Mental Resilience (4C)	1	Mental Resilience According to the 4C Model

8 How to use this profile

1. Agree the profile with the hiring manager before the first candidate is measured. Weights shifted afterwards make the outcome indefensible.
2. Choose the assessment method per skill from the Assessment method column. Combine at most three methods per candidate.
3. Calibrate the assessors in a two-hour session using the anchors in chapter 5. Anchors without rater training deliver little.
4. Fill in the match calculator and discuss the gaps in the development conversation. Type A and type G are selection criteria, not one-quarter development goals.

Source: hrmforce Skills Framework 2.0, version 2.0.0, built 2026-09-08. Crosswalks to ESCO v1.2.1, O*NET 31.0, Lightcast Open Skills, SFIA 9, DigComp 3.0, EntreComp, LifeComp, GreenComp, Allit, WEF Future of Jobs 2025, ISCO-08 and the Dutch CBS occupational classification BRC 2014 edition 2025. This profile is a starting point, not a standard: align it with your own organisation before selecting on it.