EPC Steel Structure Procurement Check-list

1. Why a Procurement Checklist Matters

Steel structure is typically the single largest packaged procurement item in an industrial, logistics or airport project - often 15-35% of total EPC cost. Unlike equipment packages, steel is bespoke engineering delivered across months of fabrication with quality that is invisible until erection. A disciplined checklist is the difference between a smooth programme and a site that stalls waiting for missing node drawings, wrong member camber or late mill certificates.

This guide walks the EPC buyer through the eight phases of steel procurement - from pre-qualification through to handover - with the documents, inspection points and commercial terms that must be agreed at each gate. It is written for owner-engineers, EPC contractors and project procurement managers who want a supplier-neutral, verification-based process.

> **Use this checklist as a gate document: do not release the next phase's payment or consent until the previous gate's deliverables are verified in writing.**

2. Phase 0 - Package Definition and Budgeting

Before any supplier is contacted, the steel package must be defined in four dimensions: scope of supply (steel only, or steel + detailing + coating + erection), design responsibility (designer of record vs build-to-suit), standards baseline (EN, GB, AISC or project code), and delivery terms (FOB, CIF, DAP). A scope ambiguity at this stage is the most frequent source of later variation orders.

Package element	Options	Checklist action
Scope of supply	Steel only / +detailing / +blast+primer / +coating / +erection	State boundary in the RFQ scope matrix
Design ownership	Owner designer / supplier detailing only / full engineer-procure	Define who owns the design report and deviation rights
Standard baseline	EN 1090 / GB 50017 / AISC 360 / project-specific	Nominate one code as governing; list permitted deviations
Delivery terms	Ex-works / FOB / CIF / DAP	Fix Incoterms 2020 rule in the contract, not the PO
Quality regime	Supplier QC / third-party (SGS, BV, TUV) / owner hold points	Define hold points with 5-day advance notice

Table 1 - Package definition gates

3. Phase 1 - Supplier Pre-Qualification

Pre-qualification must test capacity, certification and experience - not price. A qualified steel fabricator should furnish the documents below; treat any refusal to share them as a warning signal.

1. Valid EN 1090-1/-2 or ISO 3834 certification and the relevant execution class (EXC2/EXC3) for your project class.
2. ISO 9001 quality certificate and welding procedure specifications (WPS) covering the parent materials and thickness range in your package.
3. Proof of similar completed tonnage in the last 24 months: project names, tonnage, standard applied, delivery performance.
4. Mill source agreements for the plate/section grades required, and confirmed charpy/UT quality levels.
5. Export experience: packing standards, fumigation certificates, Incoterms handling, claims history summary.
6. Production capacity statement: monthly throughput, number of lines, testing lab capability (UT, MT, tension, bending).
7. Reference letters from at least two EPC contractors or owner-engineers of completed international projects.

Where the buyer operates in a country with local content requirements, pre-qualification should also verify compliance with local fabrication rules and any customs or duty exemptions applicable to imported semi-finished steel.

4. Phase 2 - RFQ and Bid Evaluation

The RFQ must convert the package definition into a commercial skeleton that allows comparable bids. Require a breakdown by activity - detailing, materials, cutting, welding, blasting/priming, galvanizing, packing, logistics - and by weight batches, so later scope changes can be priced without renegotiating the whole contract.

Beware of bids quoted purely per tonne with no activity breakdown: they mask the cost structure that drives variation pricing, and they typically carry hidden extras for coating, packing and documentation released only after contract signature.

Bid element	What to verify	Common pitfall
Detailing cost	Separate fixed fee or per-drawing rate	Hidden in per-tonne rate
Material cost	Mill quotation dated within 30 days, grade matched	Generic ‘steel price’ without grade/ charpy premium
Fabrication	Per-tonne rate by weight batch and complexity class	Single rate applied to both simple and node-heavy members
Surface protection	Bare / blast+primer / galvanized thickness per ISO 1461	Primer-only quoted where spec requires galvanizing

Bid element	What to verify	Common pitfall
Packing	Export packing standard, fumigation, mark per shipping mark schedule	Domestic packing quoted for export shipment
Inspection	Third-party inspection terminal charge and hold-point coverage	Inspection assumed free of charge until final invoice

Table 2 - Bid evaluation matrix

5. Phase 3 - Technical Review and Detailing Approval

Before awarding, run a technical review of the bidder's offer against the design report: member sizes, connection philosophy, node types, camber strategy and erection sequence. The successful bidder then submits shop drawings and connection calculations to the designer of record for approval. This approval is a technical gate, not a commercial one - define the number of drawing revision rounds included in the contract, because every round beyond the agreed limit is a change-order battleground.

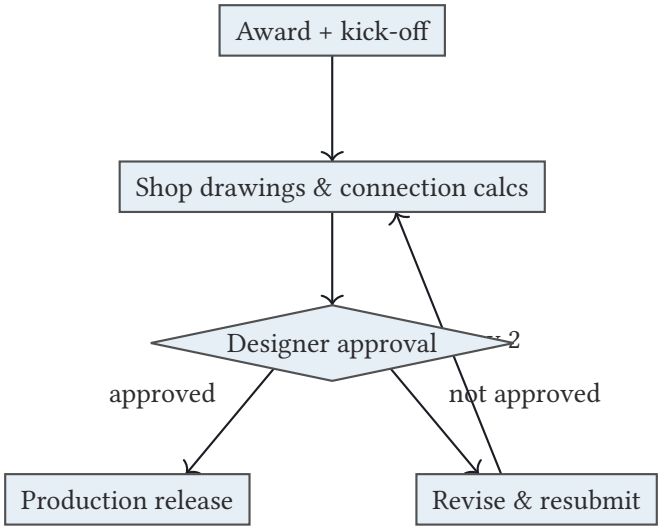


Figure 1: Figure 1 - Detailing approval loop with defined revision cap

6. Phase 4 - Contract and Commercial Terms

The contract should lock commercial mechanics the day it is signed. Key terms that protect the EPC buyer: milestone payment schedule tied to verified production gates (not calendar dates alone), liquidated damages for late delivery with a cap of 5-10% of contract value, warranty of 12-24 months from handover covering fabrication defects, and a defined escalation formula for material price movements beyond an agreed band (typically +/-5-10% of the material index).

- Payment: 10-20% advance (against bank guarantee), 30-40% against material certification, 30-40% against pre-shipment inspection, 10% against documents.
- Incoterms: FOB for buyer-controlled shipping; CIF/DAP for supplier-managed logistics; always state the port pair and demurrage responsibility.
- Suspension rights: buyer may suspend production on 14 days notice with defined storage and re-inspection rates.
- Force majeure definition should exclude ordinary weather that a competent fabricator budgets for.

7. Phase 5 - Production Monitoring and Witness Points

Production monitoring is staged around weld and NDT hold points. The buyer's inspector (or third-party agency) should witness: material receipt and identification against mill certificates; fit-up and welding of first-of-series critical nodes; NDT execution per the approved schedule (typically 100% UT on full-penetration butt welds, MT at critical details); and dimensional check of trial-assembled modules against the approved camber table.

Insist on a weekly production report with photographic evidence and a live schedule against the approved milestone plan. Reserve the right to audit any subcontracted process - galvanizing, blasting, special welding - since subcontractor performance is the most variable quality link in the chain.

8. Phase 6 - Quality Control and Inspection

The inspection regime should be defined in the contract, not improvised at the factory. A robust regime covers the four inspection families below; the buyer should agree the acceptance criteria (usually EN 1090 / ISO 5817 level B/C or per project spec) before production starts, not when defects are found.

Family	Typical scope	Acceptance basis
Material	Mill certificates, chemistry, charpy, UT on plate edges	EN 10025 / GB/T 1591, project additional s
Weld	Visual 100%, UT/MT per WPS and NDT plan	ISO 5817, EN 1090-2 execution class
Dimension	Member length, camber, twist, hole patterns	Approved shop drawings + camber table
Surface	Profile, primer DFT, galvanizing thickness & adhesion	ISO 8501/8502, ISO 1461, ISO 12944

Table 3 - Inspection families and acceptance basis

9. Phase 7 - Packing, Logistics and Documentation

Export packing failures are disproportionately costly. Require: sea-worthy packing (steel crates or open frames with dunnage), rust-preventive wrapping for bolted nodes and machined surfaces, moisture-absorbing sachets with a stated life for containerised small parts, and legible waterproof marking per the shipping mark schedule. Documentation must include the packing list with net/gross weight per crate, fumigation certificate (ISPM 15) where required, and the full dossier - mill certificates, NDT reports, inspection certificates, coating records - in one handover package in English plus the project language.

10. Phase 8 - Erection Support and Handover

Contractual support does not end at the dock. Define the supplier's erection assistance: shop-drawing and erection manual, on-site technical supervision (engineer-days included or rate), bolt and hardware rationalisation to minimise site inventory, and a defect-response service level agreement (typically 72-hour response, remedial parts dispatched within 2 weeks). Handover includes as-built drawings, weld maps, torque records and the O&M coating schedule.

11. Thirty-Point Master Checklist

#	Gate	Checkpoint
1	P0	Scope matrix signed off by engineering and procurement
2	P0	Governing standard and deviation list frozen
3	P0	Incoterms rule and port pair fixed
4	P1	EN 1090/ISO 3834 certificates verified with execution class
5	P1	Similar-tonnage project references documented
6	P1	Mill sources confirmed for required grades and charpy levels
7	P2	Bid priced by activity and weight batch
8	P2	Coating and packing priced explicitly, not assumed
9	P2	Third-party inspection terminal charge confirmed
10	P3	Connection philosophy and node types approved by designer
11	P3	Drawing revision cap defined in contract
12	P4	Payment milestones linked to verified production gates
13	P4	LD cap and warranty period in writing
14	P4	Material price escalation formula agreed
15	P5	Hold points and 5-day notice rule in inspection contract
16	P5	Weekly production report with photo evidence contracted

#	Gate	Checkpoint
17	P6	NDT plan with acceptance level approved before production
18	P6	Trial assembly (mock-up) mandated for representative module
19	P7	Export packing standard and ISPM 15 fumigation confirmed
20	P7	Dossier language and content defined (English + project language)
21	P8	Erection manual and site supervision scope in contract
22	P8	As-built drawings, weld maps and coating O&M schedule delivered

Table 4 - Master procurement checklist (condensed)

> **Every gate above should be evidenced with a signed checklist or inspection report. A supplier that performs well through all eight gates is a partner for the next project, not just a vendor for this one.**