

Minimum Drafting Requirements



1. PURPOSE

This procedure defines the minimum requirements of documentation essential to the Boweng project and production staff as part of the Quality System in place at BOWHILL ENGINEERING.

2. SCOPE

This relates to documentation relevant to the detailed workshop drawings and additional information for the ordering, production and erection of individual projects.

Scope of detailing shall be comprehensively aligned to scope tendered by Bowhill Engineering. To ensure that this is the case, a copy of Bowhill Engineering's tender (word document) shall be requested (where not supplied) and scope shall be strictly and accurately reflected within the approved detailing quotation and deliverables.

3. REFERENCES - Quality Manual

4. PREREQUISITES

Drafting contractor to be furnished with relevant information from Bowhill Engineering at the planning stage of the detailing for the project:-

- **Purchase order**, which will briefly describe the scope with reference to the approved quotation.
- The specific Boweng **project number** and project title is to be noted on all drawings and also referenced when submitting invoices.
- **Scope** document (as noted above) – usually extracted from tender and available at the quotation stage. Including any advice on other services being contracted to complete the works (eg. erection services, external painters, electrical req'ts etc).
- Preliminary project plan including identification of deadlines for completion and submission of workshop drawings (if available "required by" date may suffice).
- Clarification and advice of the potential to stage the detailing.
- AFC engineering and architectural drawings.
- Where possible .dwg format files are to be arranged to assist the detailing process
- Project Specifications and conditions of the contract from the client including any unique requirements, relevant comments, addendums or emails which may need to be considered in the context of the detailing subcontract.
- Advice of any material (eg welded profiles, extruded aluminium etc) required to be procured prior to completion of the detailing (long lead-times).
- Holes for Hot Dip Galv
- Advise if early availability of the H/D PLAN is required to allow footings to be poured accurately.
- Potential transport difficulties including wide load implications and or height limitations.
- Consider pre-cambering – rolled or 'built in'.
- Identification of preferred supplier of product (eg purlins, grating, profiling of plates or flatbar etc.)
- Clarification and establishment of communication responsibilities (regular reporting, RFI submission, project protocols etc.)

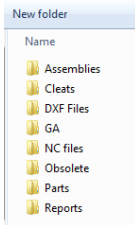
5. DETAILER OBLIGATIONS

- The agreed deadlines are maintained, with early warning or intervention should slippage occur due to unavailability of relevant information or other actions outside of the detailers control.
- RFI's to be initiated, and electronically sent to BE Project management as warranted.
- RFI register to be established and maintained of which summarises current status (consider use of dropbox & google drive).
Note – this is separate from RFI register maintained by BE.
- The BHE appointed representative(s) to be copied in on all correspondence as it develops.
- Priority identification and availability of drawings for rolled or folded parts.

Minimum Drafting Requirements



- Drawings to be submitted electronically with drawing register.
- Approved drawings to be submitted electronically (A3 preferred otherwise A2)
- Structural detailing to include a suite of documents including:-



- Remove Cleats – Replace with Shaft
 - Drawing issue register (.pdf)
 - General Arrangement plans (incl HD Plan) - pdf
 - Assembly drawings in PDF format (DWG available upon request)
 - A4 drawings of all plates & shafts (multi style drawings for cleats or parts may be acceptable upon agreement)
Single/Odd Parts & 1 off special items to not be also created as assemblies, to be shown as parts only
 - Reports – all other reports in excel (csv)
 - DXF & PDF files of all plates (to be issued at the same time to facilitate processing)
 - NC1 files for all member steel (to allow for processing on a beam line). This is to include fittings and cleats (if they consist of member steel eg beam, angle, SHS, pipe etc) that are to be assembled onto main members. Note: A4 drawings of all single part structural profiles in PDF format files for all structural profiles (to be issued at the same time in a package to facilitate processing)
Pot Marks & contour marking can be included as required
 - Separate drawings for rolled structural profiles (show note to add green on members as necessary).
 - Separate drawings for folded or pressed plates with “lay flat” dimensions.
 - Purlin sheets (order sheets or individual A4 drawings) – lowercase p for part, uppercase P for assembly.
 - Grating, handrail & stair tread drawings etc. (notify if outsourcing)
 - Precast concrete ferrule location plans (if applicable).
 - Bolt summary list for ordering bolts (exact numbers – no allowance for wastage)
 - Schalk to advise of extra bolt lengths from SteveW email & no intermediate bolt lengths, SteveW has created Boweng Bolt list with modified max/min lengths
 - Coranet washers to be used on all significant bolted connections
 - Bolt assembly list for steel erection purposes.
 - Steel assembly list (.xls) for BE production spreadsheet.
 - Full material list (plates & shafts profiles)
 - ~~Material list that identifies structural profiles only.~~
 - Material marks list that identifies structural profiles only.
 - Lists, charts or drawings for all non-standard BE supplied parts (ie bridge bearings)
 - Edge of cleat measurement (rather than centreline)
 - Running dimensions in preference to intermediate dimensions (if drawing is cluttered)
- Normal structural assemblies should be labelled according to their function:

➤ B = Beam	➤ T = Truss
➤ C = Column	➤ BR = Bracing
➤ SC = Stub Column	➤ S = Strut
➤ R = Rafter	➤ ST=Stair

Minimum Drafting Requirements



- FB = Fly Brace
- P = Purlin
- G=Girt
- FP=Facia Purlin
- GR = Grating
- HR = Handrail
-
- X = existing items
- Assembly parts to be labelled:
 - f = fitting
 - m = structural part

6. REPORTS

- a. Assembly Parts List – assembly as a title, with all parts for each assembly listed - PDF
 - i. Assembly name, Number of Assemblies, Part number, qty of parts, finish type
- b. Part List – quantity of parts only – used for Material Trace Record
- c. Material List – list of profiles used for Supplier quotations
- d. Bolts List
- e. Erection Bolts List

7. DRAWING LAYOUT

- Drawings shall generally be neat, free from clutter and laid out in an easy to read manner and shall include as a minimum:
 - Title block showing project name & number
 - Bowhill Engineering logo (to be supplied), tag line (*ATTITUDE OF EXCELLENCE*) and contact details.
 - Project description including stage where necessary (where there is more than one building or area within the same project)
 - Drawing number in bottom right hand corner. The drawing number should be the assembly number.
 - Show total number of assemblies required (bold).
 - Draftsman and contact details (as many as possible)
 - Surface treatment (refer to V-1 Thickness Range)
 - Revisions to drawings:
 - “Alfa” identifier for pre-approved drawings (A, B, C etc)
 - “Numerical” identifier for review approved drawings (0, 1, 2 etc.)
 - Revisions must be clouded & noted with a description & authority source.
 - Include reference to revised construction drawing number **Note:** Revision clouds from previous revisions shall be removed prior to the new ones being included.
 - Item list, showing quantity, section, weight, material grade, and total weight of each assembly.
 - Grid location of assembly
- Drawings to have a 3D view for each assembly.
- HD Plans to show locations of both bolts and cast in components (include assembly details, length, grade and coating)
- Marking plan for each area or building with sufficient information to accurately erect the steel work. A system of ensuring consistent cleat placement on a certain side of attaching members is preferable to allow erection crews to easily place steelwork.
- General hole sizes (if threaded, size & pitch)
- Running dimensions on members where possible (from a datum end of each member)
- Scale to be 1:10 where possible, but clarity should take priority.
- “Opposite hand” notation is not acceptable at an assembly level.

Minimum Drafting Requirements



- Orientation: Marks usually placed on North or West ends.
- GA plans to show Project North.

NOTE: Shared access to electronic files (drawings, registers etc) via public domain or internet server access is an invaluable tool and is encouraged where at all possible

7. DOCUMENT CONTROL

- It shall be the responsibility of the draftsman to ensure that copies of all approved documents are maintained in their office along with the approved, modified (if necessary) copies updated in their computer files.
- RFI and drawing registers are to be created and maintained for the duration of the project in a compatible format to that of Boweng's RFI template. Regular submission of these documents will be required to facilitate the appropriate clarification and approval of the RFIs and drawings.
- All obsolete documents shall be noted on the drawing register.
- One copy only of the previous revision shall be kept in a file marked OBSOLETE until the end of the defects liability period of the project.
- Revisions to be issued as a full pack, rather than individual drawings

8. VARIATIONS

- In the event that there is a change of scope post tender and acceptance of approved quotation, this may constitute a variation. A standard Bowhill Engineering Variation form (to be supplied) is to be completed (including a detailed breakdown of associated costs) and emailed to the nominated Bowhill Engineering Project Manager as soon as practical. This request will be evaluated and dealt with on a case by case basis.