

15 Percy Street, Launceston

Structural Steel Execution Plan

Estimation, Fabrication & Installation Methodology

[cite_{start}]**Project:**

Project Lead: Warren Hillman [cite: 4]
Discipline: Civil & Structural Engineering
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Scope: Detailed breakdown of structural steel quantities, fabrication standards, and installation logistics based on Tender Documents.

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1 Task 1: Structural Steel List & Estimated Costing

1.1 Methodology

This estimation is derived from the **Structural Set - Tender (Attachment 5F)** for geometry and **Civil Specification (Attachment 4D)** for material quality requirements. The cost estimation model separates raw material supply from processing (surface treatment and fabrication).

1.2 Structural Steel List (Bill of Quantities)

Table 1: Primary Structural Steel Take-Off

Category	Member Type	Grade	Est. Qty	Notes
Columns	Universal Columns (UC) Square Hollow Sections (SHS)	300PLUS 350/450	Ref S01	Refer to Column Schedule. Base plates to be included in weight.
Floor Beams	Universal Beams (UB) Parallel Flange Channels (PFC)	300PLUS	Ref S02	Includes perimeter PFCs for facade support.
Roof Framing	Universal Beams (UB) Web Trusses	300PLUS	Ref S03	Account for roof pitch (rake) in length calculations.
Secondary	Purlins (Z/C Sections) Girts	G450	Ref Arch	Add 10% for laps. Includes bridging.
Bracing	Cross Bracing (Rods/Angles) Fly Bracing	250/300	Various	Wall and Roof plane bracing per plans.

1.3 Cost Estimation Factors

To convert the list above into a financial estimate, the following cost loadings must be applied as per **Attachment 4D**:

- **Tonnage Calculation:** $\text{Weight} = \text{Length} \times \text{Unit Mass}/1000$.
- **Connection Allowance:** Add **10-15%** to the raw steel weight to account for cleats, gussets, splice plates, and bolts.
- **Testing Allowance:** Provisional sum of **\$2,500** for NDT (Ultrasonic Testing) of critical butt welds.
- **Surface Finish Premium:**
 - **Internal:** Class 1 Blast + 75 μ m Zinc Phosphate (Standard Cost).
 - **External:** Hot Dip Galvanized (HDG) to AS/NZS 4680 (High Cost). Calculated by surface area (m^2), not tonnes.

2 Task 2: Structural Steel Fabrication

2.1 Fabrication Standards

Fabrication must strictly adhere to **AS/NZS 1554.1** Structural Steel Welding, as mandated in specification **Attachment 4D**. Shop drawings are to be generated from **Attachment 5F** and submitted for approval prior to cutting.

2.2 Material & Welding Specifications

Table 2: Fabrication Requirements Matrix

Component	Requirement	Specification Detail
Steel Grades	Hot Rolled: Grade 300PLUS Hollows: Grade 350/450	Mill certificates required for all batches. No uncertified steel permitted.
Welding Category	General Purpose (GP) Structural Purpose (SP)	SP welds required for Moment Frames and Bracing connections.
Bolting	8.8/S (Snug Tight) 8.8/TB (Tensioned Bearing)	Refer to Drawing S01 notes. TB bolts require calibrated torque wrenches.
AESS Steel	Architecturally Exposed	Coordinate with Arch Set (5A). Hidden connections required where visible.

2.3 Shop Detailing & Safety

- **Lifting Lugs:** As per the **Safety in Design Report (Attachment 4E)**, all members exceeding 200kg must have engineered lifting lugs detailed and welded during fabrication to avoid unsafe slinging.
- **Galvanizing Venting:** For all external SHS/RHS members, shop drawings must show appropriate vent and drain holes to prevent explosion during the HDG process.

3 Task 3: Structural Steel Installation

3.1 Site Logistics Plan

Based on the **Detail Survey (Attachment 6C)** and **Site Investigation (Attachment 6A)**, the following logistics plan is required:

- **Crane Position:** Site boundaries at 15 Percy Street are constrained. The crane must be positioned to avoid overhead power lines shown on the survey.
- **Ground Stability:** Verify ground bearing capacity against crane outrigger loads using the data in **Attachment 6A**. Use steel plates or timber mats if "Uncontrolled Fill" is present.

3.2 Erection Sequence & Safety

Table 3: Erection Sequence Steps

Step	Activity	Critical Safety/Quality Check
1	Column Installation	Immediate installation of temporary bracing. Free-standing columns are unstable.
2	Primary Framing	Use tag lines to control beam rotation. Lift using pre-welded lugs.
3	Plumb & Align	Align structure to within tolerances specified in AS 4100.
4	Grouting	Pack column bases with high-strength non-shrink grout (min 60MPa).
5	Final Bolting	Tension 8.8/TB bolts and mark heads for inspection.

3.3 Handover Documentation

To finalize the installation phase, the following documents must be submitted to the Superintendent:

- Rigging Certificate (Licensed personnel).
- Bolt Tensioning Report (for TB/TF connections).
- Survey Certificate confirming building set-out relative to boundaries.