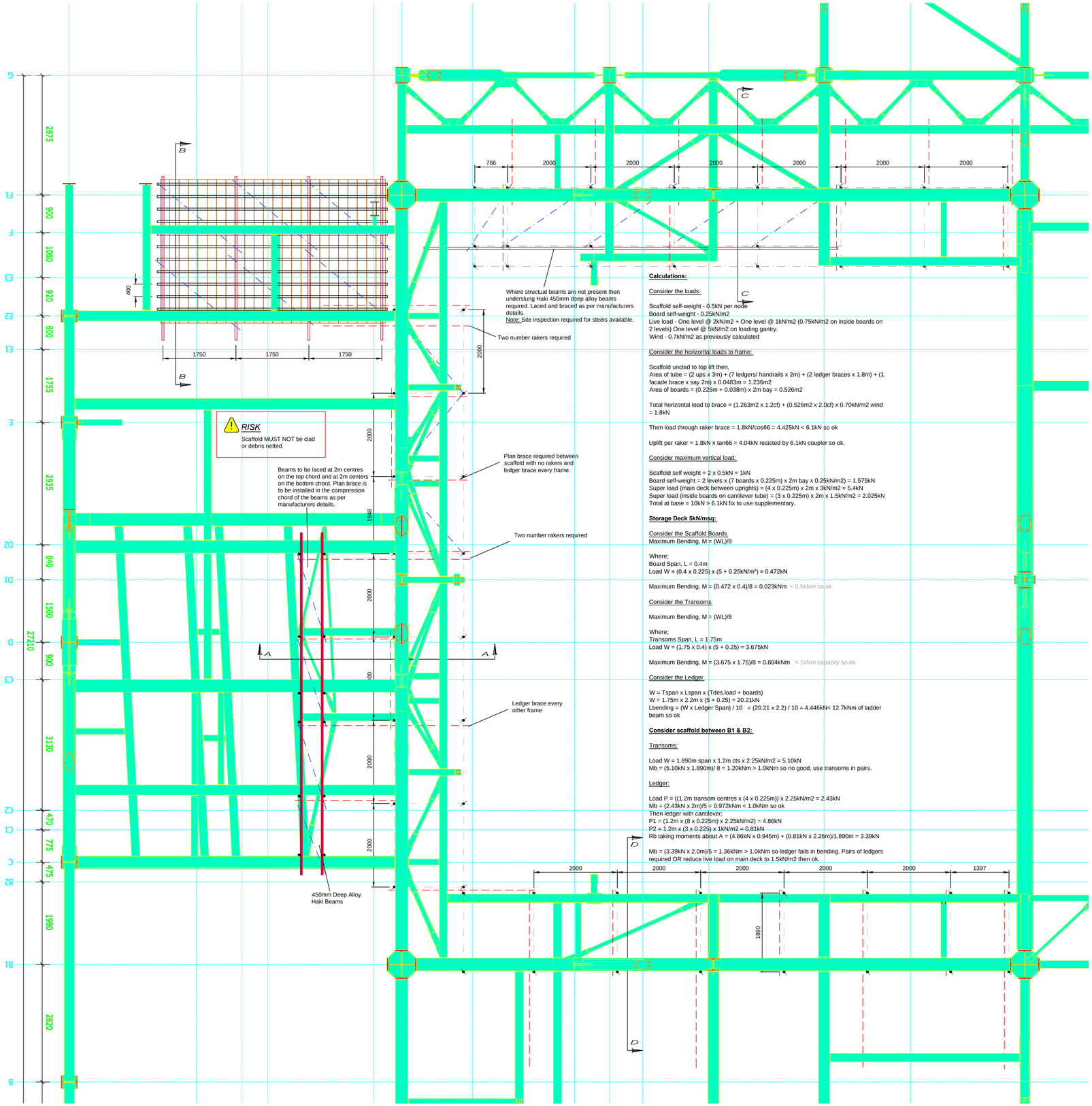


Calculations:

Consider the loads:

Scaffold self-weight - 0.5kN per node
Board self-weight - 0.25kN/m2
Live load - One level @ 2kN/m2 + One level @ 1kN/m2 (0.75kN/m2 on inside boards on 2 levels) One level @ 5kN/m2 on loading gantry.
Wind - 0.7kN/m2 as previously calculated

Consider the horizontal loads to frame:

Scaffold unclad to top lift then,
Area of tube = (2 ups x 3m) + (7 ledgers/ handrails x 2m) + (2 ledger braces x 1.8m) + (1 facade brace x say 2m) x 0.0483m = 1.236m2
Area of boards = (0.225m + 0.038m) x 2m bay = 0.526m2

Total horizontal load to brace = (1.263m2 x 1.2cf) + (0.526m2 x 2.0cf) x 0.70kN/m2 wind = 1.8kN

Then load through raker brace = 1.8kN/cos66 = 4.425kN < 6.1kN so ok

Uplift per raker = 1.8kN x tan66 = 4.04kN resisted by 6.1kN coupler so ok.

Consider maximum vertical load:

Scaffold self weight = 2 x 0.5kN = 1kN
Board self-weight = 2 levels x (7 boards x 0.225m) x 2m bay x 0.25kN/m2) = 1.575kN
Super load (main deck between uprights) = (4 x 0.225m) x 2m x 3kN/m2 = 5.4kN
Super load (inside boards on cantilever tube) = (3 x 0.225m) x 2m x 1.5kN/m2 = 2.025kN
Total at base = 10kN > 6.1kN fix to use supplementary.

Storage Deck 5kN/msq:

Consider the Scaffold Boards
Maximum Bending, M = (WL)/8

Where;
Board Span, L = 0.4m
Load W = (0.4 x 0.225) x (5 + 0.25kN/m²) = 0.472kN

Maximum Bending, M = (0.472 x 0.4)/8 = 0.023kNm < 0.5kNm so ok

Consider the Transoms

Maximum Bending, M = (WL)/8

Where;
Transoms Span, L = 1.75m
Load W = (1.75 x 0.4) x (5 + 0.25) = 3.675kN

Maximum Bending, M = (3.675 x 1.75)/8 = 0.804kNm < 1kNm capacity so ok.

Consider the Ledger

W = Tspan x Lspan x (Tdes.load + boards)
W = 1.75m x 2.2m x (5 + 0.25) = 20.21kN
Lbending = (W x Ledger Span) / 10 = (20.21 x 2.2) / 10 = 4.446kN< 12.7kNm of ladder beam so ok

Consider scaffold between B1 & B2:

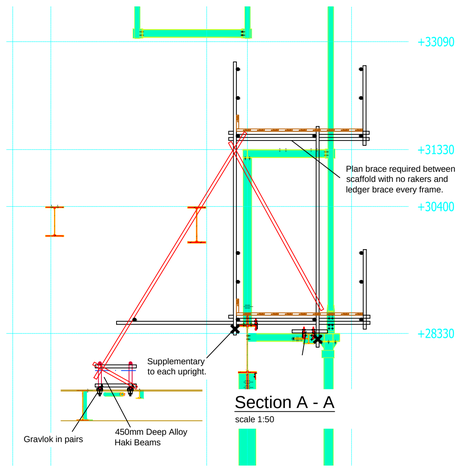
Transoms:

Load W = 1.890m span x 1.2m cts x 2.25kN/m2 = 5.10kN
Mb = (5.10kN x 1.890m)/ 8 = 1.20kNm > 1.0kNm so no good, use transoms in pairs.

Ledger:

Load P = ((1.2m transom centres x (4 x 0.225m)) x 2.25kN/m2 = 2.43kN
Mb = (2.43kN x 2m)/5 = 0.972kNm < 1.0kNm so ok
Then ledger with cantilever;
P1 = (1.2m x (8 x 0.225m) x 2.25kN/m2) = 4.86kN
P2 = 1.2m x (3 x 0.225) x 1kN/m2 = 0.81kN
Rb taking moments about A = (4.86kN x 0.945m) + (0.81kN x 2.26m)/1.890m = 3.39kN

Mb = (3.39kN x 2.0m)/5 = 1.36kNm > 1.0kNm so ledger fails in bending. Pairs of ledgers required OR reduce live load on main deck to 1.5kN/m2 then ok.



Section A - A
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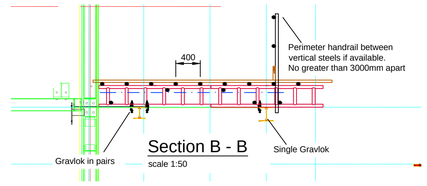

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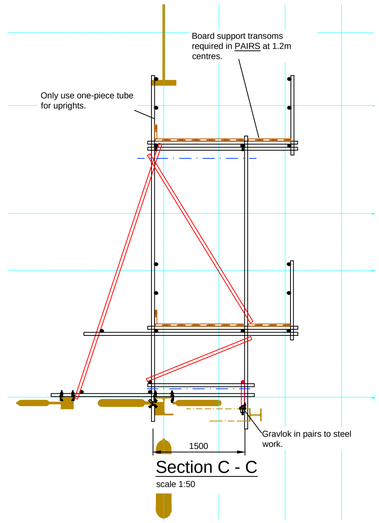

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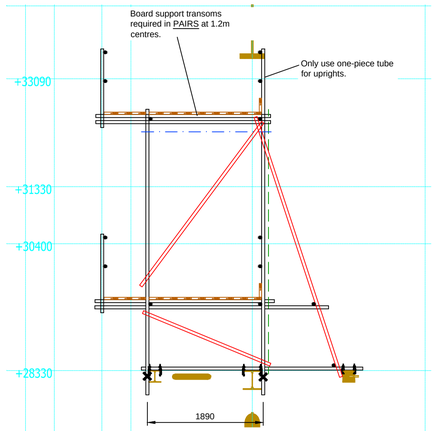

Section D - D
scale 1:50

GENERAL NOTES

BASIS OF DESIGN

1. This drawing has been prepared from information supplied to us by, or on behalf of the contractor, who should check that his requirements have been correctly interpreted and that all loading, dimensions, lift heights, bay sizes, erection / striking etc.....are as required and practicable.

IMPOSED LOADS

2. The contractor is to ensure that the existing structure, it's fabric and/or the ground will safely support imposed loads, or to supply new.

   Maximum calculated tie load:
   Maximum calculated leg load:

LOADINGS ALLOWED

3. The contractor must ensure that all loading(s) allowed for are/is sufficient.

   Live load:

   Wind load:
   Maximum number of boarded levels:

TIES

4. Suitable anchor system in accordance with the design & tested in accordance with TG20 subject to proof tests carried out in accordance with TG4 / TG20.

SHORING WORKS

5. We cannot and will not pass comment on the building being shored as this involves matters beyond our knowledge. It is the contractors responsibility to ensure that the existing structure will safely span between our supports and can be safely shored in the way indicated.

FOUNDATIONS

6. The contractor must prepare all foundations prior to erection.

TEMPORARY ROOFS

7. No temporary roof can be made watertight
   Loading - snow load assesses using BS6399 Part 3, unless a snow management system is adopted by the contractor.

MATERIALS

8. This design has been engineered using TG20 and is based on good quality galvanised tube to BS1139 1982 or as in TG20 safe load tables.

MODIFICATION

9. No alteration is to be made to this structure detailed on this drawing without written permission from the 'SCAFFOLD DESIGNS LTD' design office.

PROPERTY

10. This drawing is confidential and the exclusive property of 'SCAFFOLD DESIGNS LTD'. No unauthorised use, copy or disclosure is to be made and is to be returned upon request.

DIMENSIONS

11. Written dimensions shall take precedence over scaled dimensions. The contractor must verify and notify 'SCAFFOLD DESIGNS LTD' of any discrepancies.

PERMITS AND PERMISSIONS

12. The contractor must obtain all permits and permissions prior to erection. he must also be responsible for supply & fixing of any earth bonding/ lightning conductors.

CONSTRUCTION NOTES

13. All construction must comply with the design & general principles of SG4 & TG20.
14. Design based hazards have been eliminated where possible within the design process. This symbol indicates a DESIGN BASED RESIDUAL HAZARD exists.
    The identified hazards must be managed by the person in charge of construction and dismantling. Should clarification be required on the idenified hazard, contact must be made with 'SCAFFOLD DESIGNS LTD' design office.
15. When working over water or near water, life jackets must be worn. Life saving plan and equipment to be in place together with a boatman or boat available as necessary.
16. Crawling boards or other suitable access equipment fitted with edge protection must be used when working over or near fragile roofs.
17. Where wind exceeds 0.3kN/m2 on unclad scaffolds all boards should be effectively secured using board clips

SG4 Notes

Although not shown for reasons of clarity this scaffold must be constructed as TG20 and SG4 (current editions)

AMENDMENTS

REV	DATE	DESCRIPTION	BY	CHECK	APP'D
A	15.3.16	Sections added	ATM	RA	–
B	18.3.16	Section A – A amended	ATM	RA	
C	24.3.16	lift heights amended	RA	ATM	

PREPARED FOR:–

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DRAWING STATUS:- FOR CONSTRUCTION

DESIGNED BY/ DATE	CHECKED BY/ DATE	PROJECT NO:-	REVISION
RA 24.2.16	ATM 15.3.16	S/2637/6	C
APPROVED BY:- -	DATE:- -		
SCALES:- 1:100 @ A1			

PROJECT:- TEMPLEBOROUGH BIO-MASS

TITLE:-
BOILER ACCESS
Level + 31330
Sections and Plan

CONTRACTOR:- SEE QUOTE