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BET365 GROUP LIMITED

THE ZENITH BUILDING –HVAC REPLACEMENT
SPRING GARDENS, MANCHESTER

STRUCTURAL FEASIBILITY STUDY REPORT

REPORT NO: 776-016 R01

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DOCUMENT CONTROL SHEET

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1 INTRODUCTION AND CLIENT'S BRIEF

Wilde Consultants Limited were commissioned by Bet365 Group Ltd to carry out a structural feasibility study and report on an existing commercial building structure – The Zenith Building, located at 26 Spring Gardens, Manchester M2 1AB. It is proposed to install new condensers to the roofs at either first or second floors. The roof at first floor is located on the northeast side of the building and the roof at second floor is to the southwest side. The purpose of the study was to identify the form of construction and structural condition of the existing floor, and to advise on the likelihood of the structure to withstand increased loadings from the proposed condensers.

This feasibility study aims to provide a broad level of consideration to the structural impact of the proposed load increases. Detailed examination and design calculations to prove the adequacy of this structure is still required to be undertaken prior to installation of the proposed new kit.

In undertaking this study, we have been supplied with record information directly from Bet365 and Ombler Architects. We have undertaken a review of the information most likely to help us in our understanding of the structure. We have not reviewed all information supplied.

A site walkover inspection to get an appreciation of the condition and validate the structural arrangement was undertaken by Chris Jarvis BEng(Hons) CEng MIStructE and Matthew Ng MSc BEng CEng MIStructE MHKIE, of Wilde Consultants Ltd., on the 13th July 2022.

No intrusive or invasive inspection or testing was undertaken. Only exposed accessible elements were inspected and our findings and recommendations must be considered in this light.

Comments on the inspection are made throughout this report with handing being expressed as viewed facing the front (southeast) elevation, from Spring Gardens.

This report is for the private use of Bet365 Group Ltd as our client and the content must not be relied upon by third parties without the express written authority of a Director of Wilde Consultants Ltd.

Irrespective of the purpose for which this inspection is carried out and notwithstanding any comment made therein, expert comment on specialised issues is excluded from the responsibilities of this report. Such matters should be the subject of a specialist's inspection and report. If required, we will advise upon where, and how, these may be obtained.

The order and this resulting report are subject to our Terms and Conditions supplied and Wilde Consultants Ltd's limit of liability and Professional Indemnity shall be as set out therein.

Any work subsequent to this report will be the subject of a separate order. This covers any remedial work recommended in the report, including monitoring or further intrusive investigation work or any extension to the inspection or any other recommended works.

2 GENERAL DESCRIPTION OF EXISTING PROPERTY

The Zenith Building is a commercial building, and is located on Spring Gardens in Manchester.

The building is generally rectangular shaped on plan, comprises a three-storey podium with an eleven-storey tower above and a one level of basement. The podium is approximately 27m wide x 40m long, and three storeys high. The front, left and rear elevations are clad in stone panels set between perimeter concrete columns and horizontal concrete banding at floor levels. Large windows to these elevations are observed, they are typically subdivided and proportioned. The right elevation abuts the nearby premise with a party wall. Mezzanine and first floor at podium can be accessed by a two-storey high entrance foyer to the front elevation at ground floor level.

The tower set above the podium is approximately 16m wide x 40m long, set back from the both left and right elevations. The front and rear elevation are generally clad in metal panels, and the left and right elevations have moderately sized windows and aluminium solar shading arranged at regular spacings, except for the top two storeys where much larger glazed units, likely curtain walls are observed. The building has a flat roof.

The building appears to be of concrete frame construction, however structural steelwork on some floors is noted. This steelwork appears to relate to a later significant modification and extension undertaken around 2006. The original building is believed to have been built around 1969.

3 DESCRIPTION OF STRUCTURE SUPPORTING NEW KIT

The focus on this report is on the first floor roof terrace as that is anticipated to be the better location for the plant.

The first floor roof terrace, appears to be a later extension (Photo 3.1). The primary structure is a structural steel frame with concrete and metal deck composite floor. Two sizes of substantial primary steel beams within the area were noted, 254x254x32UC and 356x171x51UB, which are alternately arranged at 3.78m centres, and span approximately 6.25m from left to right between internal and external columns. Secondary steel beams, 203x133x30UB, are arranged 3.15m back from the edge beams to the right side, and span 3.78m from front to rear between primary steel beams. Edge steel beams, 203x133x25UB, span front to rear between external columns spaced at 3.78m centres. Internal columns appear to be of reinforced concrete, approximately 685mm x 685mm. These have also been strengthened with steel angles bonded to the corners. External steel columns are 150x150x10SHS.

Photo 3.1 Existing first floor roof terrace

The second floor roof is a green roof with wild seeding and approximately 80mm of stone ballast (Photo 3.2). The roof has a long span in the transverse direction, approximately 12.2m with a span of around 7.5m in the longitudinal direction. The form of the construction is unknown, although it is expected to be of reinforced concrete. The roof has been modified with the addition of 7 large glazed roof lights approximately 2.3m x 1m formed through the slab. The columns supporting this roof were noted to have been strengthened, probably due to the addition of storeys at the top of the building.

Photo 3.2 Existing second floor green roof

Arrangement of existing structure:

The following figures show a first floor part plan and a typical section with the paved terrace and potential area for new proposed plant shaded in gold.

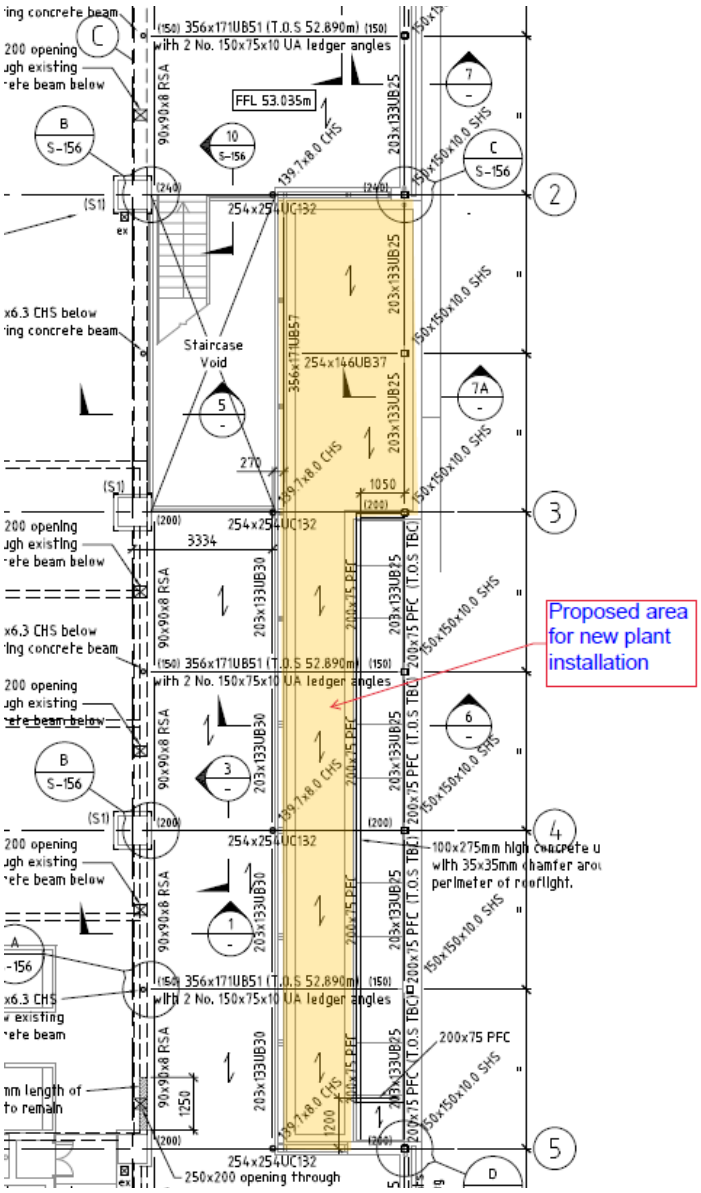

Figure 3.1 First floor part plan (Extracted from drawing EM10409-S-155-C5)

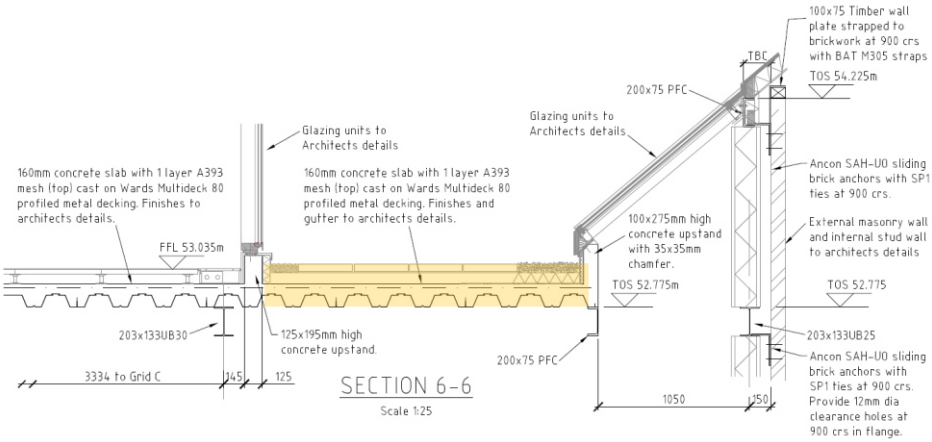

Figure 3.2 Typical section (Extracted from section 6-6 of drawing EM10409-S-155-C5)

Floor and finishes:

The first floor is formed from 160mm concrete composite slab with 1 layer A393 mesh (top) cast on Wards Multideck 80 profiled metal decking. Finishes appear to be comprised of tiled finish and waterproofing system above the floor to the external area, and a raised access floor to the internal area. Details are illustrated in Figure 3.3 and 3.4.

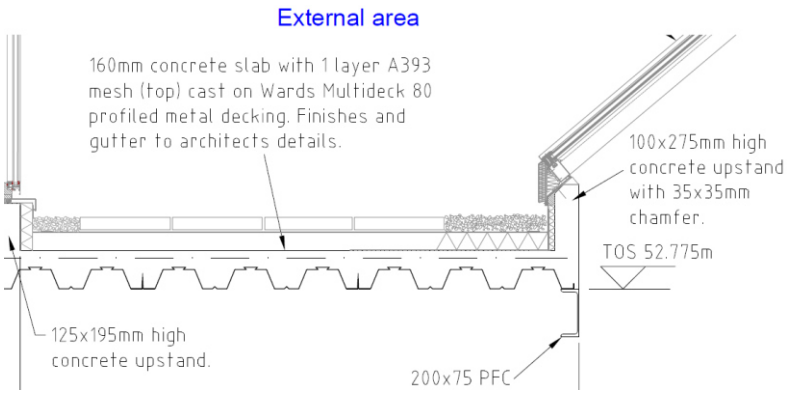

Figure 3.3 Floor and finishes to external area (Extracted from drawing EM10409-S-155-C5)

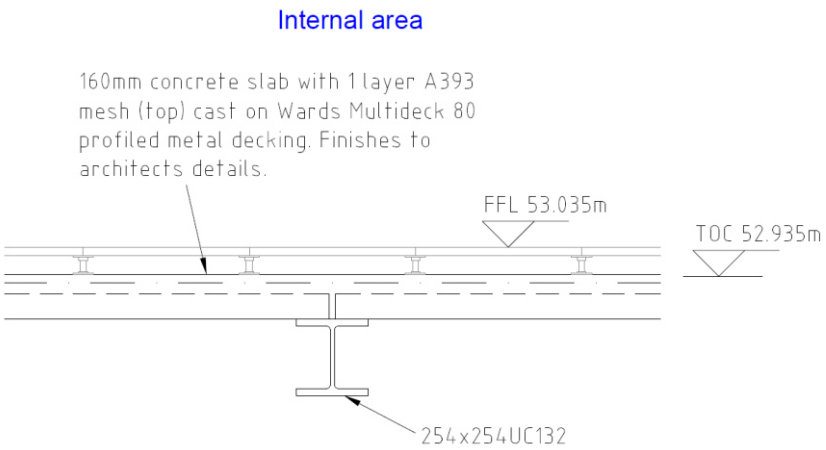

Figure 3.3 Floor and finishes to internal area (Extracted from drawing EM10409-S-155-C5)

4 LOAD IMPLICATIONS FROM PROPOSAL

4.1 Summary of Proposed Applied Load

The proposed condensers installation with raised steel platform will add approximately 3.34kN/m^2 of dead load to part of the first floor roof terrace to the building. As snow load will still be possible following the condensers installation, the effect of the dead load from the condensers will need to be assessed in addition to the snow load. Other existing loads such as allowance for services and other suspended loads will also need to be considered.

4.2 Snow Drift

The effects of snow drifting are considered to be minimal and can be considered inconsequential.

4.3 Wind Loads

The proposed plant installation is considered unlikely to significantly affect the wind loading on the existing building structure. There is likely to be an increased frictional drag effect but this is not expected to have a significant impact.

This feasibility report is predominantly focused on the additional downward self-weight loads that the condensers and raised steel platform apply. It is assumed that wind uplift forces are not significantly greater than those that should have been allowed for in the original design. The uplift forces are somewhat dependent on the degree of permeability below the condensers and the solidity ratio of the raised steel platform which is fixed to the roof terrace. The manufacturer of the condenser should advise on the fixity required to the raised steel platform required to stop it from moving. The uplift forces are deemed unlikely to be significant on the secondary or primary structure but should be considered in the detailed checks once the condensers layout and fixing arrangements are confirmed. In the feasibility appraisal of the structure, no account has been made for any additional ballast loads applied to counteract any wind uplift and it is assumed that there will be a positive fixity to the roof terrace.

4.4 Load Patterns

With the condensers being applied on one side of the first floor, there is some amount of asymmetric load applied. It is unlikely however that this load pattern will have significant impact on the performance of the structure.

5 REVIEW OF RECORD INFORMATION

5.1 Summary of Information Found

The following summarise the useful information found in relation to the existing structure supporting the new kit:

- Structural drawings for the modification works to the structure in 2006 received from Bet365 and Ombler Architects.

5.2 Age of Property

The building is believed to have been built in 1969 and significant alterations and additions were carried out around 2006.

5.3 Significant Modifications

Alterations and additions to the building were carried out around 2006.

5.4 Information on Allowable Imposed Loads

The existing structural drawings state that at first floor, the composite floor is to be designed for an imposed load of 3.5kN/m^2. It is assumed that this is the design imposed load allowed for in the design of the primary structure that supports the decking too. This imposed load allowance would seem appropriate given its location and that doors lead onto the terrace potentially being used as a place where people may gather.

No loading allowances are noted for the second floor roof. It is assumed that this may have been designed for 1.5kN/m^2 as would have been appropriate for design at the time given roof access from a doorway is possible. This is probably the load allowance that would have been used when checking the structure for the modifications.

5.5 Structural Review on Likely Adequacy

5.5.1 *First Floor and Finishes*

The existing first floor is a later extension and is formed from 160mm concrete composite slab with 1 layer A393 mesh (top) cast on Wards Multideck 80 profiled metal decking. Finishes appear to be comprised of tiled finish and waterproofing system above the floor to the roof terrace. It is recommended that the new condensers and the supporting raised steel platform are fixed directly above the supporting primary steel beams thereby, not applying additional load to the span of the decking.

5.5.2 *First Floor Secondary Steel Beams*

Secondary steel beams, 203x133x30UB, are arranged 3.15m back from the edge beams to the right side, and span 3.78m from front to rear between primary steel beams. Edge steel beams, 203x133x25UB, spanning front to rear between external columns spaced at 3.78m centres. The new condenser installation and the supporting raised steel platform are proposed to be fixed above the supporting primary steel beam directly, therefore, we consider that there is no need for additional load to be applied on the secondary steel beams and edge steel beams.

5.5.3 *First Floor Primary Steel Beams*

There are two sizes of substantial primary steel beams within the first floor roof terrace, 254x254x32UC and 356x171x51UB. These are alternately arranged at 3.78m centres, and span approximately 6.25m from left to right between internal and external columns.

Comparing design loads against applied loads, we can get a feel for increase in loads and the likelihood of it being suitable.

Assume original loads on primary structure at first floor:

Dead load:

1. 160mm concrete slab cast on profiled metal decking = 2.69kN/m^2
   (Assume 70% of full thickness of slab)
2. Dead loads on floor (refer to the existing drawings) = 1.0 kN/m^2
   (Assume finishes, raised flooring system, ceiling and services)
3. Window wall system (Floor Height = 3.15m) = 1.0 kN/m^2
4. Raking roof glazing (Neglect from this initial assessment) = 0.9 kN/m^2
   (Assume 8+8 IG unit (0.4kN/m^2), supporting members and accessories (0.5kN/m^2))
5. Secondary steel beams, 203x133x30UB = 0.3 kN/m
   (Neglect in this preliminary assessment)

Imposed load:

6. Roof terrace and office (refer to the existing drawings) = 3.5 kN/m^2
7. Snow load (included for terrace imposed load) = 0.6 kN/m^2

Total factored loads to British Standards which likely to have been used in the original design

= (1.4 x (2.69+1+1)) + (1.6 x 3.5) = 12.17 kN/m^2.

Determine new loads come from condensers and raised steel platform:

Provisional area of raised steel platform = 2.75 x 11.3 = 31 m^2

Superimposed dead load:

1. Condensers (10No. units, weighing 410kg each, over plan area of 0.765m x 1.86m):
   4.1kN x 10No. = 41 kN
   over total plan area = 0.765 x 1.86 x 10No. = 14.2 m^2
   Average load on the raised steel platform = 41 / 31 = 1.32 kN/m^2
2. Raised steel platform = 0.5 kN/m^2

Imposed load:

3. Maintenance load on steel platform = 0.6 kN/m^2
   over rest of plan area = 31 - 14.2 = 16.8 m^2
   Average load on the platform = 0.6 x 16.8 / 31 = 0.33 kN/m^2
4. Roof terrace = 1.5 kN/m^2

The existing imposed load for roof terrace would need to be reduced from 3.5kN/m^2 to 1.5kN/m^2, This is deemed acceptable, provided access to roof is restricted to maintenance only.

Total new factored loads to British Standards

= (1.4 x (2.69+1+1+1.32+0.5)) + (1.6 x (1.5 + 0.33)) = 12 kN/m^2

Our preliminary calculation found that, based on the assumptions above, the new loads that come from condensers and raised steel platform on the existing primary steel beams are likely to be close to the original design loads. As such, we consider that the existing primary steel beams are likely to have sufficient structural capacity to carry the weight of the proposed condensers installation and raised steel platform.

Detailed analysis with detailed design checks are going to be required on the existing structure. This is beyond the scope of the current feasibility study, however preliminary calculation checks have been undertaken on both types of primary beams indicating a utilisation of around 90% based on the new loads.

Deflection of the beams is another consideration. Preliminary calculations indicate that the new the plant will result in a further movement of 3mm. This is not considered excessive although the beams do support a line of glazing which could be sensitive to movement.

Overall, we think there is a fair chance that the design could be justified by undertaking detailed checks. It is however likely to be pushing the structure towards its acceptable design limit and the position of condensers may have to be carefully considered.

5.5.4 *Second Floor Roof Structure*

The second floor roof has a long span. It has been modified with the insertion of several roof windows. It also supports a significant dead load.

The form of the structure is unknown and if as suspected it is formed from reinforced concrete, there are no details on the reinforcement. The degree of fixity to the support structure is also unknown.

Based on the above, the maximum permissible imposed load would need to be limited to 1.5 kN/m^2.

5.5.5 *Vertical Support Structure*

The existing columns are likely to be close to their design limit, especially the columns that have been strengthened. That said, the percentage load increase will likely be small and the overall loading will be within the imposed load allowance.

5.5.6 *Foundations*

It is expected that the foundations will be adequate and able to carry the proposed loading.

6 WALKOVER SURVEY

6.1 Introduction

A walkover survey was undertaken by Chris Jarvis and Matthew Ng of Wilde Consulting Engineers on 13th July 2021.

The floor in the area of the proposed installation was inspected from both above and below. Ceiling finishes were present to the underside of the first floor, which restricted clear visual inspection of the structure.

6.2 Modifications from Record Information

No alterations and additional works appear to have been carried out since 2006.

6.3 Condition Summary

From the limited inspection of the structure, there were no excessive deflection or other signs of structural distress observed in the structure at these levels, and it appeared to be in a good condition. A hairline crack was noted to the slab soffit of the 2nd floor coming from one of the roof windows.

6.4 Any Areas of Concern

No areas of concern were observed.

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7 OVERALL FINDINGS

7.1 Likelihood of Structure Being Sufficient

We believe there is a fair chance that the 1st floor roof terrace will be suitable to take the proposed loads from the condensers and raised steel platform, however further detailed analysis and checking is required. It may be that the condensers have to be carefully positioned to accommodate the capacity of the frame.

A proposed arrangement for a plant support frame is provided in Appendix D. The viability of this proposal needs further consideration, particularly from a services engineering and architectural perspective.

The second floor roof offers less opportunity to support new kit. It may be able to support a limited amount if the kit if suitably spread out and maintenance access is strictly controlled.

7.2 Recommendations for Further Inspections or Studies

The following is recommended:

- More detailed structural adequacy checks on the affected structural members that will carry the proposed new condensers and raised steel platform.
- Check suitability of extending the proposed frame over a larger area to fill the first floor void.
- Detailed design of new plant platform
- Undertake review on implications on increased floor deflection such glazing movement.

7.3 Likely Form of Strengthening Required

It is unlikely to be appropriate to strengthen the existing structural members due to the proposed new loadings. It is likely to be more appropriate to re-position the condensers if the existing structural members were found to be struggling.

7.4 Potential for Alternative Locations for Kit

The first floor roof terrace appears to be a suitable location to locate all of the kit. The platform could potentially be extended to fully cover the terrace. Some kit could potentially be placed on terrace directly at the north eastern end without a raised steel platform.

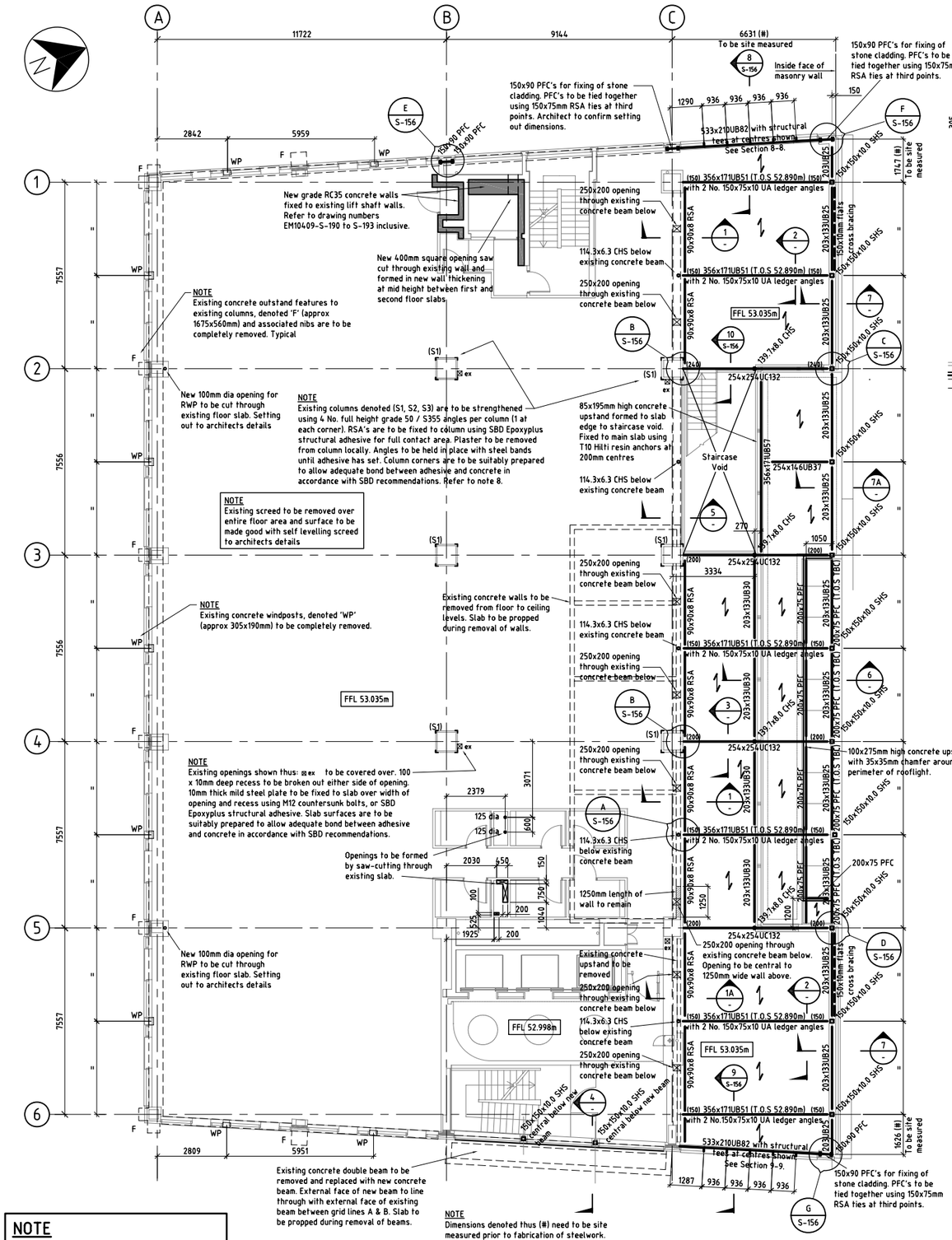
We would not recommend placing heavy kit on the 2nd floor roof on the south western side but if no other options exist, then a limited amount of kit may be able to be justified.

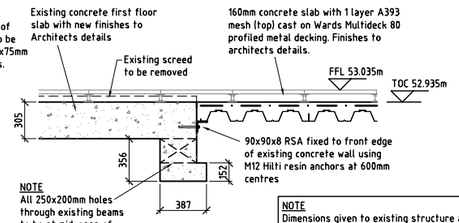
APPENDIX A – PHOTOGRAPHS FROM WALKOVER SURVEY

Photographic records are available to download from the following link. It is recommended that these are downloaded within one month of issue of the report.

Photographs from Site Visit 13.07.22

APPENDIX B – RECORD INFORMATION (BY OTHERS)

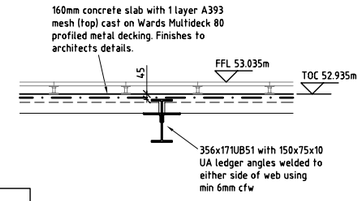




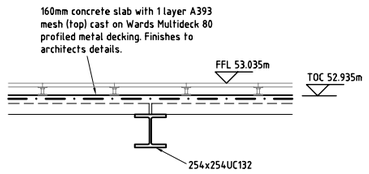
SECTION 1-1
Scale 1:25

SECTION 1A-1A
Similar

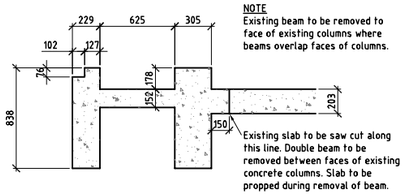
NOTE
Dimensions given to existing structure are based on existing information and as such are given for guidance only. Steelwork Contractor to undertake site measuring prior to commencement of fabrication.



SECTION 2-2
Scale 1:25

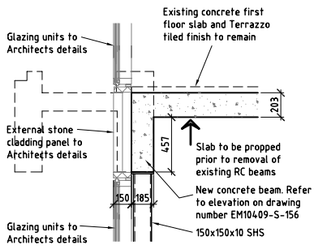


SECTION 3-3
Scale 1:25

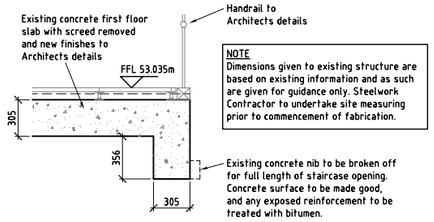


NOTE
Existing beam to be removed to face of existing columns where beams overlap faces of columns.

SECTION 4-4 (EXISTING)
Scale 1:25

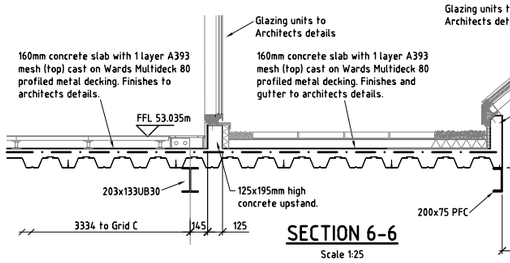


SECTION 4-4 (PROPOSED)
Scale 1:25

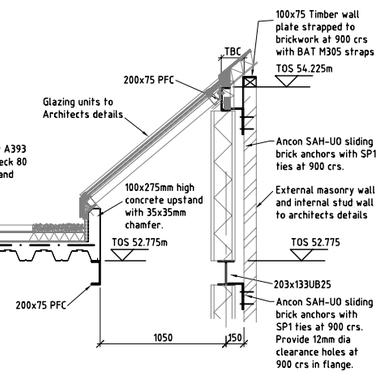


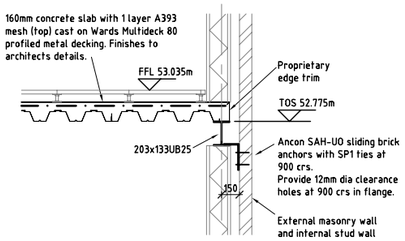
NOTE
Dimensions given to existing structure are based on existing information and as such are given for guidance only. Steelwork Contractor to undertake site measuring prior to commencement of fabrication.

SECTION 5-5
Scale 1:25

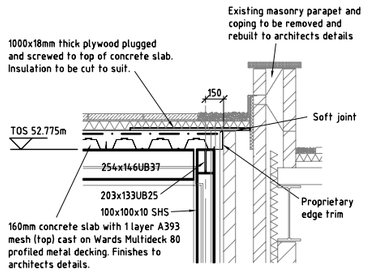


SECTION 6-6
Scale 1:25





SECTION 7-7
Scale 1:25



SECTION 7A-7A
Scale 1:25

Notes.

1. This drawing to be read in conjunction with standard notes drawing EM10409-S-120 and all relevant Architects and Engineers drawings and specifications.

2. All dimensions are in millimeters unless otherwise stated. All levels are in metres unless otherwise stated.

3. This drawing must not be scaled. The Contractor is to report all dimensional discrepancies and any errors or omissions to the Engineer prior to construction commencing.

4. The Contractor shall be responsible for checking all setting-out dimensions and levels prior to commencement of works on site. For setting out of all walls refer to the Architects drawings.

5. Additional permanent or temporary supports to Multideck are to be provided around voids and columns where decking edges are unsupported or as specifically required by the decking manufacturer.

6. All steelwork to be grade S275 unless noted otherwise. All steel to steel connections to be designed by steelwork fabricator.

7. All steelwork connections are to be designed for a minimum shear load of 100kN unless noted otherwise thus : (140).
All connections are to have a minimum of 4 No. M16 grade 8.8 bolts.
Where any beam cantilevers denoted thus :-[M], the connection is also to be designed for a moment of 140kNm unless noted otherwise. All loads are factored ultimate loads unless noted otherwise.

8. Strengthening angle sizes :
(S1) - 90x90x8 RSA Grade 50/S355
(S2) - 120x120x12 RSA Grade 50/S355
(S3) - 100x100x10 RSA Grade 50/S355

LEGEND

Denotes span of 160mm grade RC35 concrete slab with 1 layer A393 mesh (top) cast on Wards Multideck 80, 1.2mm gauge, profiled metal decking. Floor finishes to Architects details.
Min Bearing for Multideck to be 50mm.
Wards Multideck is to be designed by Wards for the following loads :
Dead = 1.0kN/m²
Imposed = 3.5kN/m²
and is to be suitable for 2 hour fire conditions.
Reinforcement
1 No. T12 bar per trough to be provided for single spans.
1 No. T8 bar per trough to be provided for the end span only of multi spans.
No reinforcement required for remaining spans of multi spans.

FINAL REVISION OF DRAWING ISSUED TO THE CONTRACTOR AND AS SUCH IS BELIEVED TO BE THE DRAWING USED FOR CONSTRUCTION
DATE 20-09-07: SIGNED: S.TAN

No	DATE	DRAWN	REV'D ENG.	AMENDMENT
C5	20.09.07	IG	ST	FINAL CONSTRUCTION ISSUE
C4	09.01.06	IG	YA	Tee centres added. Details F & G added.
C3	01.12.05	IG	YA	Tee centres added. Detail E added.
C2	05.08.05	IG	YA	Section 7A-7A amended. Setting out to openings added. Service ducts amended. Beam omitted.
C1	13.05.05	IG	GWK	Issued for construction
T5	24.02.05	IG	YA	Setting out amended. Posts amended. Stone supports added. Details C & D added.
T4	05.11.04	IG	YA	Existing openings added. SHS post added. Openings through beams added. Section 4-4 amended. Dimensions & notes added.
T3	28.01.04	IG	YA	Openings added to suit M&E requirements. Lift shaft thickening note amended. Multideck reinforcement note added.
T2	05.12.03	IG	YA	Dimensions added. Notes amended. Beam size added. Levels amended to suit architects details.
T1	11.11.03	IG	YA	Issued for Tender

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CLIENT: ELTASCO LTD.
PROJECT: 26, SPRING GARDENS MANCHESTER
DRAFTER: IG
ENGINEER: YA

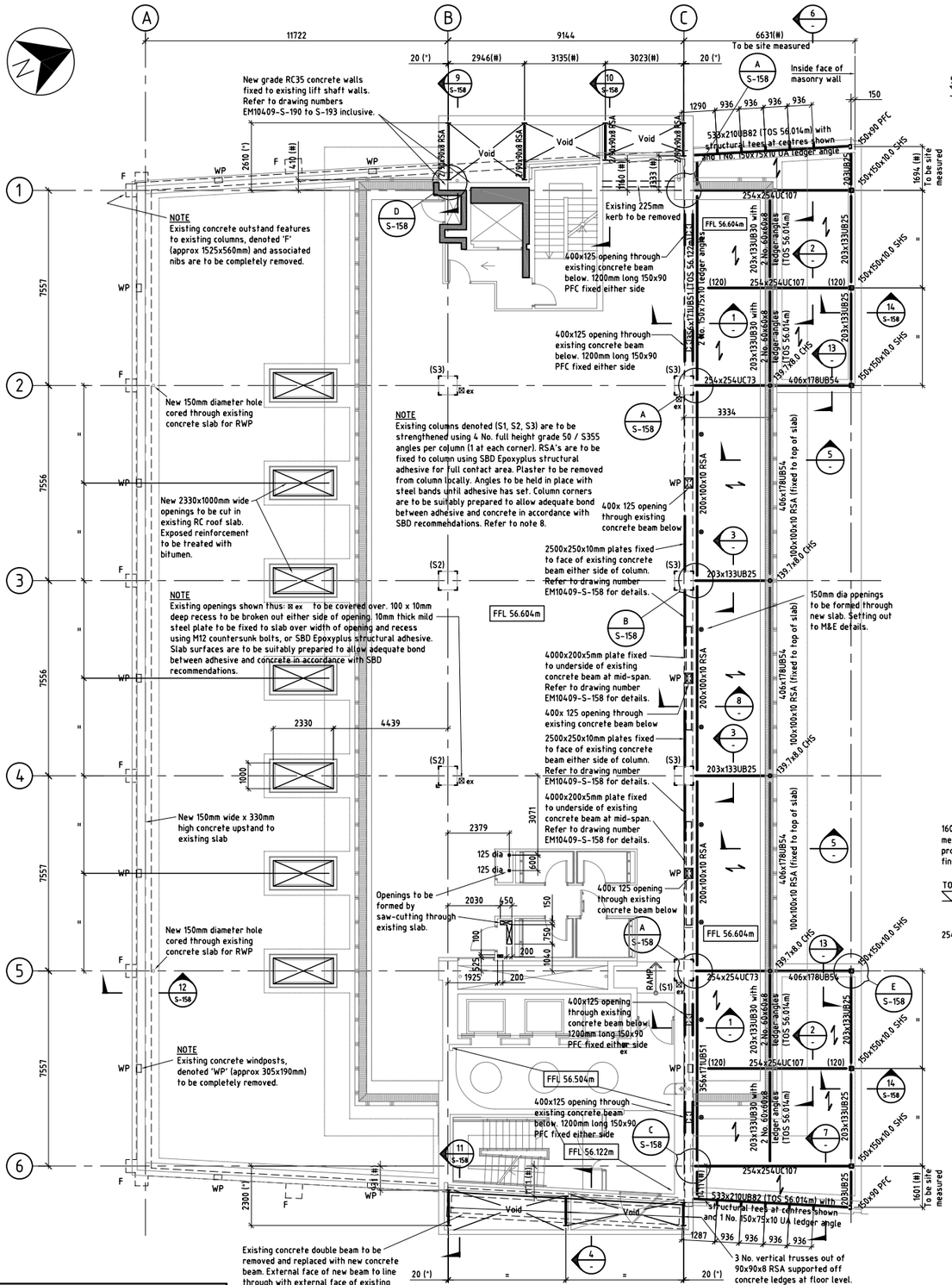
TITLE
STEELWORK LAYOUT FIRST FLOOR LEVEL GENERAL ARRANGEMENT

SCALE	DRAWING No	DATE	AMDT
AS SHOWN	EM10409-S-155	OCT 03	C5

NOTE
All Hilti resin anchors to be HIS-N grade 8.8 bolts with HIT HY150 injection mortar unless noted otherwise.

Steelwork Plan at 53.035m First Floor Finished Floor Level.
(All Columns To be Grade S275 U.N.O. All Beams to be Grade S275 U.N.O.).
(All Top of Steelwork Levels to be 52.775m U.N.O.)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 cm
FULL SIZE ON ORIGINAL
A1



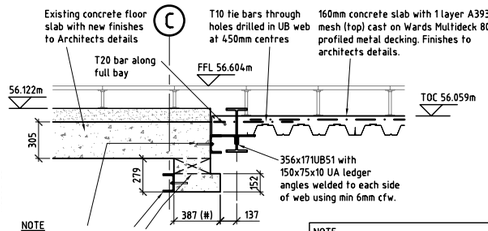
NOTE
All Hilti resin anchors to be HIS-N grade 8.8 bolts with HIT HY150 injection mortar unless noted otherwise.

NOTE
Dimensions denoted thus (#) need to be site measured prior to fabrication of steelwork.
Dimensions denoted thus (*) are subject to confirmation of Metsec cladding rail depth.

NOTE
See drawing number EM10409-S-175 for connection forces to end pods.

Steelwork Plan at 56.604m Second Floor Finished Floor Level.

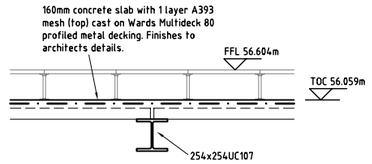
(All Columns To be Grade S275 U.N.O. All Beams to be Grade S275 U.N.O.).
(All Top of Steelwork Levels to be 55.899m U.N.O.)



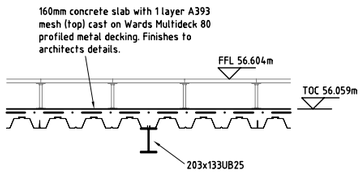
NOTE
All 400x125mm holes through existing beams to be at mid-span of beam between shear links as shown. Holes to be core drilled. 1200mm long 150x90 PFC's fixed centrally to opening using M16 resin anchors at 200mm centres.

SECTION 1-1
Scale 1:25

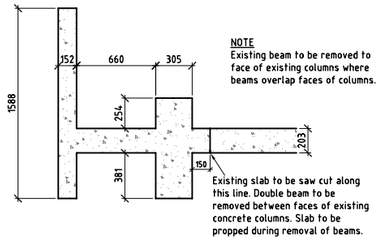
NOTE
Dimensions given to existing structure are based on existing information and as such are given for guidance only. Steelwork Contractor to undertake site measuring prior to commencement of fabrication.



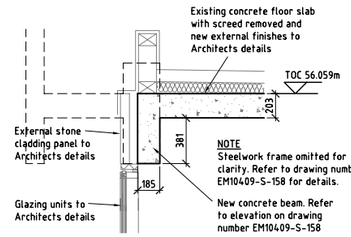
SECTION 2-2
Scale 1:25



SECTION 3-3
Scale 1:25

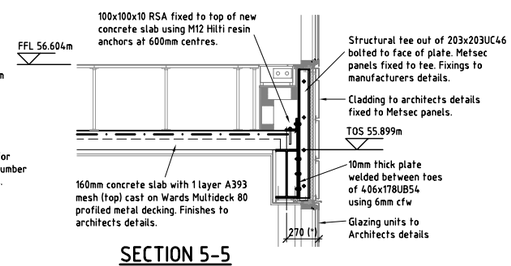


SECTION 4-4 (EXISTING)
Scale 1:25

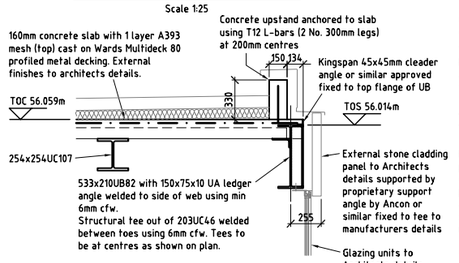


NOTE
Steelwork frame omitted for clarity. Refer to drawing number EM10409-S-158 for details.

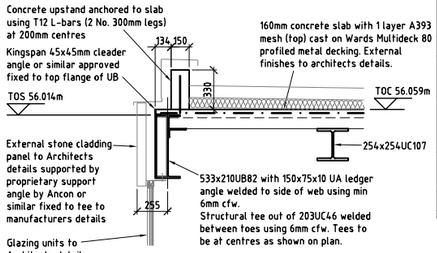
SECTION 4-4 (PROPOSED)
Scale 1:25



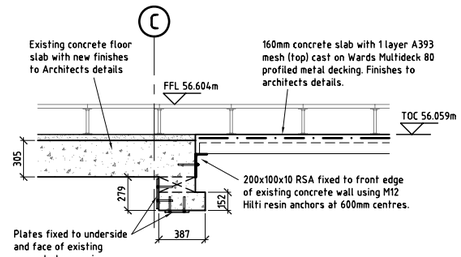
SECTION 5-5
Scale 1:25



SECTION 6-6
Scale 1:25

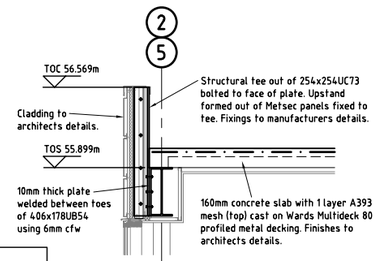


SECTION 7-7
Scale 1:25



SECTION 8-8
Scale 1:25

NOTE
Dimensions given to existing structure are based on existing information and as such are given for guidance only. Steelwork Contractor to undertake site measuring prior to commencement of fabrication.



SECTION 13-13
Scale 1:25

Notes.

1. This drawing to be read in conjunction with standard notes drawing EM10409-S-120 and all relevant Architects and Engineers drawings and specifications.

2. All dimensions are in millimeters unless otherwise stated. All levels are in metres unless otherwise stated.

3. This drawing must not be scaled. The Contractor is to report all dimensional discrepancies and any errors or omissions to the Engineer prior to construction commencing.

4. The Contractor shall be responsible for checking all setting-out dimensions and levels prior to commencement of works on site. For setting out of all walls refer to the Architects drawings.

5. Additional permanent or temporary supports to Multideck are to be provided around voids and columns where decking edges are unsupported or as specifically required by the decking manufacturer.

6. All steelwork to be grade S275 unless noted otherwise. All steel to steel connections to be designed by steelwork fabricator.

7. All steelwork connections are to be designed for a minimum shear load of 100kN unless noted otherwise thus : (140).
All connections are to have a minimum of 4 No. M16 grade 8.8 bolts.
Where any beam cantilevers denoted thus : [M], the connection is also to be designed for a moment of 140kNm unless noted otherwise. All loads are factored ultimate loads unless noted otherwise.

8. Strengthening angle sizes :
(S1) - 90x90x8 RSA Grade 50/S355
(S2) - 120x120x12 RSA Grade 50/S355
(S3) - 100x100x10 RSA Grade 50/S355

LEGEND

Denotes span of 160mm grade RC35 concrete slab with 1 layer A393 mesh (top) cast on Wards Multideck 80, 12mm gauge, profiled metal decking. Floor finishes to Architects details.
Min Bearing for Multideck to be 50mm.
Wards Multideck is to be designed by Wards for the following loads :
Dead = 1.0kN/m²
Imposed = 3.5kN/m²
and is to be suitable for 2 hour fire conditions.
Reinforcement
1 No. T12 bar per trough to be provided for single spans.
1 No. T8 bar per trough to be provided for the end span only of multi spans.
No reinforcement required for remaining spans of multi spans.

FINAL REVISION OF DRAWING ISSUED TO THE CONTRACTOR AND AS SUCH IS BELIEVED TO BE THE DRAWING USED FOR CONSTRUCTION
DATE 20-09-07: SIGNED: S.TAN

No	DATE	DRAWN	REV'D ENG.	AMENDMENT
C5	20.09.07	IG	ST	FINAL CONSTRUCTION ISSUE
C4	09.01.06	IG	YA	Tee centres added.
C3	01.12.05	IG	YA	Tee centres added. Openings amended.
C2	05.08.05	IG	YA	Setting out to openings added. Ledger angles added. Section 8-8 amended. Levels to beams on grids C/1-2 amended. Openings to existing beams added.
C1	13.05.05	IG	GWK	Issued for construction
T4	05.11.04	IG	YA	Existing openings added. Vent openings added. Existing windposts added. Note added. RWP's and upstand added.
T3	28.01.04	IG	YA	Openings added to suit M&E requirements. Lift shaft thickening note amended. Multideck reinforcement note added. Beam strengthening plates added.
T2	05.12.03	IG	YA	Notes amended. Dimensions added. Section marks amended. SHS Posts added. Levels amended to suit architects details.
T1	11.11.03	IG	YA	Issued for Tender

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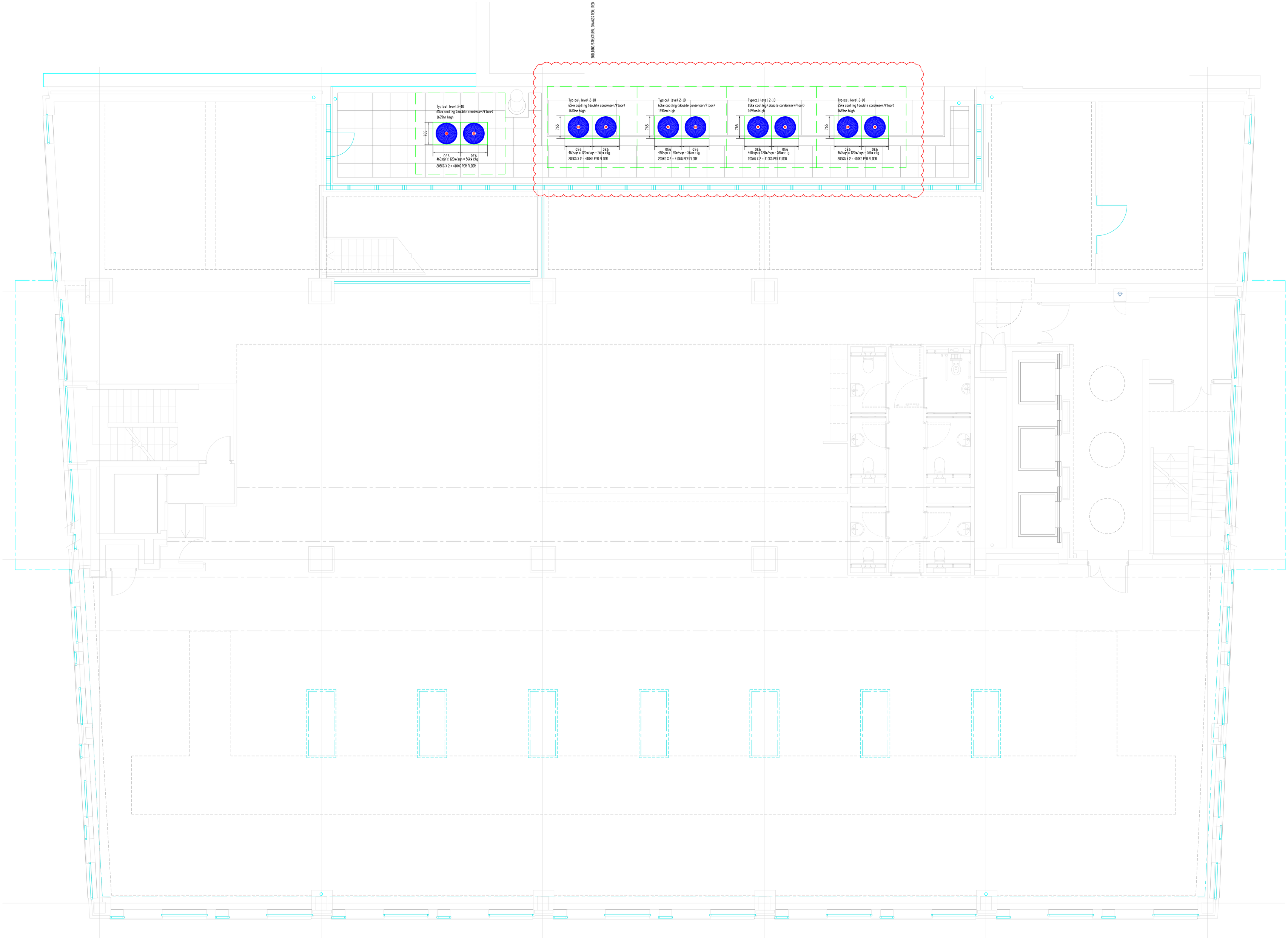
CLIENT: ELTASCO LTD.
PROJECT: 26, SPRING GARDENS MANCHESTER
DRAFTER: IG | ENGINEER: YA

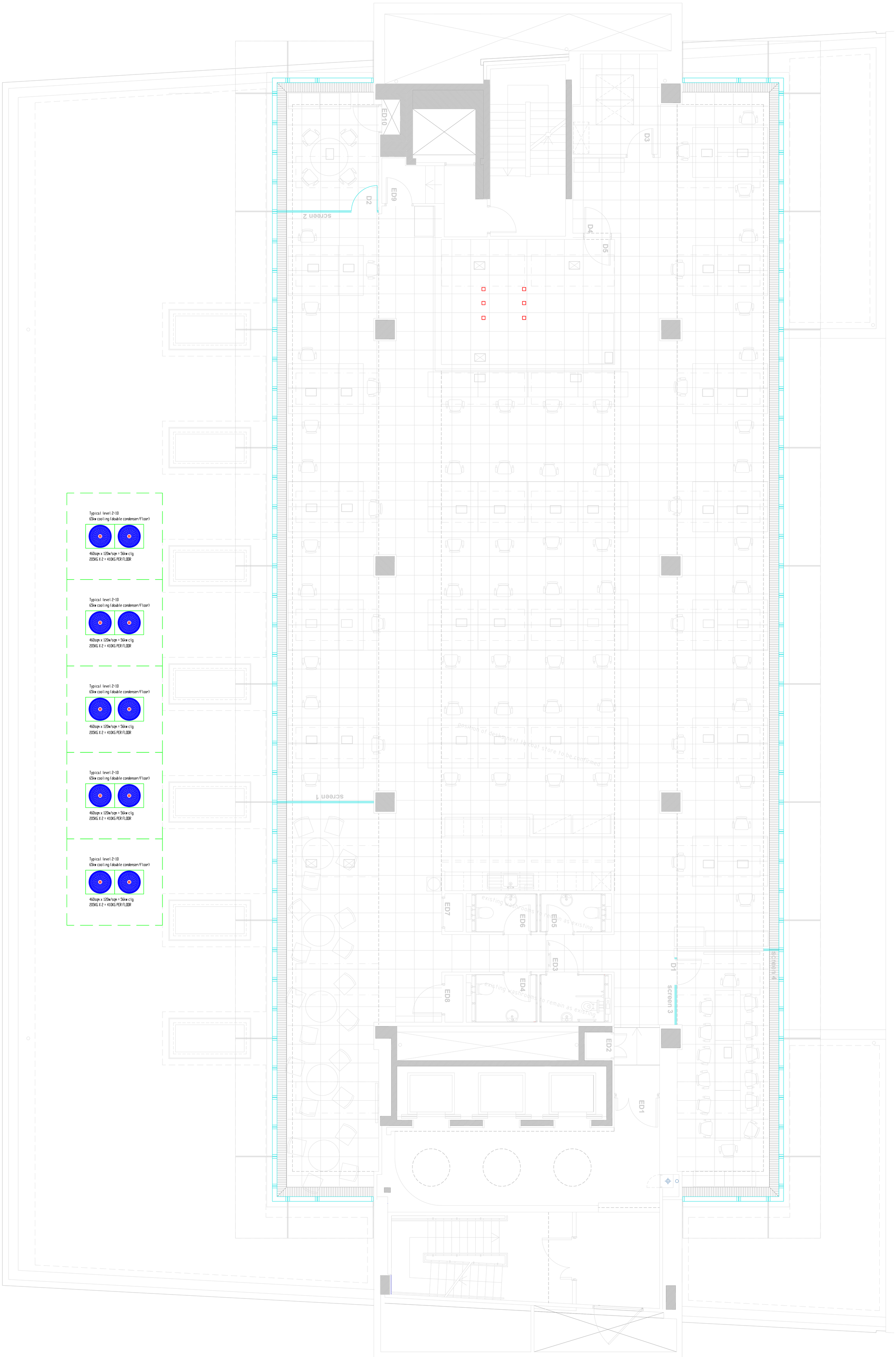
TITLE: STEELWORK LAYOUT SECOND FLOOR LEVEL GENERAL ARRANGEMENT

SCALE	DRAWING No	DATE	AMDT
AS SHOWN	EM10409-S-157	OCT 03	C5

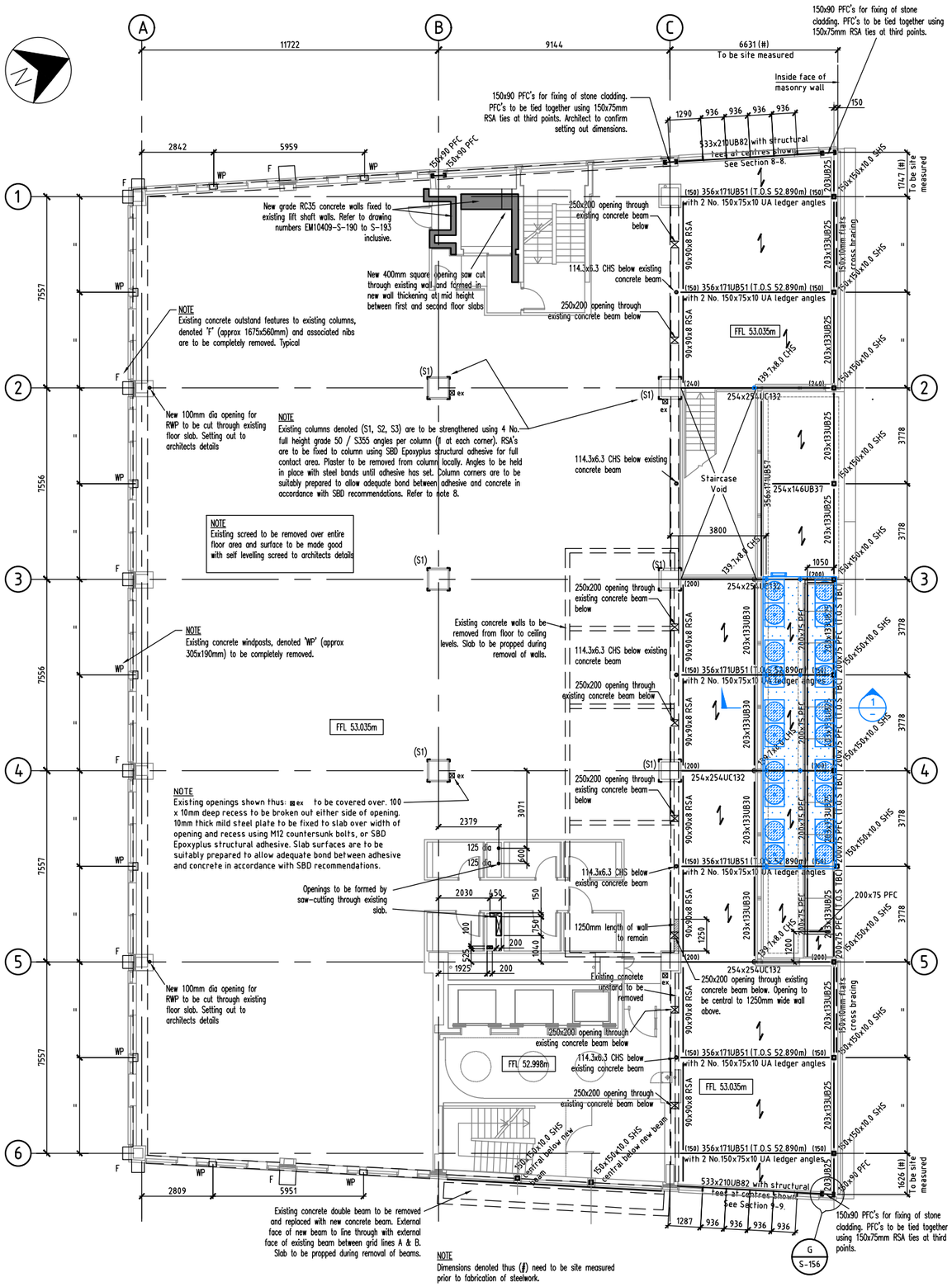
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 cm
FULL SIZE ON ORIGINAL
A1

APPENDIX C – DETAILS OF PROPOSED KIT TO BE INSTALLED (BY OTHERS)


BUILDING/STRUCTURAL CHANGES REQUIRED
Typical level 2-10
63kw cooling (double condenser/Floor)
1695mm high
765
OE6
460sqm x 120W/sqm = 56kw Clg
205KG X 2 = 410KG PER FLOOR


Typical level 2-10
65kw cooling (double condenser/floor)
460sqm x 120w/sqm = 56kw clg
205KG X 2 = 410KG PER FLOOR
Typical level 2-10
65kw cooling (double condenser/floor)
460sqm x 120w/sqm = 56kw clg
205KG X 2 = 410KG PER FLOOR
Typical level 2-10
65kw cooling (double condenser/floor)
460sqm x 120w/sqm = 56kw clg
205KG X 2 = 410KG PER FLOOR
Typical level 2-10
65kw cooling (double condenser/floor)
460sqm x 120w/sqm = 56kw clg
205KG X 2 = 410KG PER FLOOR
Typical level 2-10
65kw cooling (double condenser/floor)
460sqm x 120w/sqm = 56kw clg
205KG X 2 = 410KG PER FLOOR
ED10
ED9
D2
screen 2
D3
D4
D5
position of desks next to bat store to be confirmed
screen 1
existing washrooms to remain as existing
ED7
ED6
ED5
ED3
ED4
ED8
D1
screen 3
screen 4
ED2
ED1

APPENDIX D – PROPOSED PLANT SUPPORT FRAME



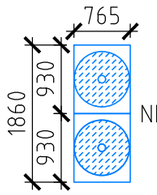
FIRST FLOOR PART PLAN

PROPOSED EXTENT OF RAISED STEEL PLATFORM FOR CONDENSERS INSTALLATION

1:200

LEGEND

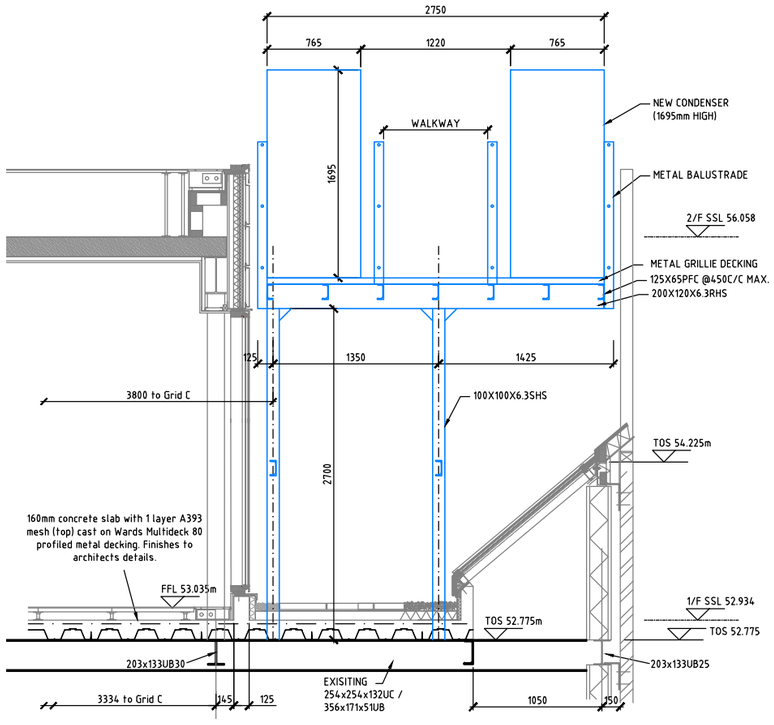
PROPOSED EXTENT OF RAISED STEEL PLATFORM



NEW CONDENSER

GENERAL

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S, ENGINEER'S & SPECIALISTS DRAWINGS & SPECIFICATIONS.
2. ANY CONFLICT/CONTRADICTION IN INFORMATION BETWEEN DRAWING AND THE STRUCTURAL SPECIFICATION TO BE BROUGHT UP TO THE ATTENTION OF THE ENGINEER.
3. ALL DIMENSIONS ARE APPROXIMATE AND ARE IN MILLIMETRES. TO BE APPROVED BY CLIENT PRIOR TO CONSTRUCTION. DO NOT SCALE.
4. ALL LEVELS ARE IN METRES AND ARE TO BE APPROVED BY CLIENT PRIOR TO CONSTRUCTION.
5. WORK TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT GOOD PRACTICE, BUILDING REGULATIONS AND SUBSEQUENT AMENDMENTS, THE PROJECT SPECIFICATION, RELEVANT BRITISH STANDARDS, CODES OF PRACTICE AND NHBC STANDARDS. MATERIALS AND COMPONENTS TO BE SUITABLE FOR THEIR INTENDED USE.
6. FOR SETTING OUT REFER TO ARCHITECTS DRAWINGS.
7. STRUCTURAL STEELWORK TO BE GRADE S275 (U.N.O). ALL CONNECTIONS (UNLESS DETAILED) ARE TO BE DESIGNED BY STEELWORK CONTRACTOR.
8. MATERIALS SHALL BE STEEL IN ROLLED SECTIONS, STRUCTURAL HOLLOW SECTIONS, PLATES AND BARS AND SHALL COMPLY WITH THE APPROPRIATE STANDARD SHOWN IN TABLE 2.1 OF THE NSSS. ALL FABRICATED STRUCTURAL STEELWORK TO BE 'CE' MARKED.
9. DESIGN OF ALL TEMPORARY WORKS, PROPPING AND BRACING SHALL BE THE RESPONSIBILITY OF THE STEELWORK CONTRACTOR.
10. UNLESS OTHERWISE NOTED IN THE PROJECT SPECIFIC SPECIFICATION, PROTECTION TREATMENT OF STEELWORK SHALL BE IN ACCORDANCE WITH BRITISH STEELS 'PREVENTION OF CORROSION OF STRUCTURAL STEELWORK' APPROPRIATE SYSTEM. A MINIMUM STRUCTURAL LIFE OF 50 YEARS AND A FIRST MAJOR MAINTENANCE OF 15 YEARS IS TO BE ASSUMED.



SECTION 1-1

1:50

REV	DRN	CHK	APP	DATE	DESCRIPTION
P1	MN	CJ	CJ	29.07.22	PRELIMINARY ISSUE

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Fax : 0161-474-7492

Client
BET365 GROUP LIMITED

Project
THE ZENITH BUILDING - HVAC REPLACEMENT

Title
PROPOSED EXTENT OF RAISED STEEL PLATFORM FOR CONDENSERS INSTALLATION

Scale	Drawn	Date	Chkd	Approved
AS SHOWN	MN	JUL 2022	CJ	CJ

Drawing No.
776-016_SD01

Revision
P1

Status
PRELIMINARY

Sheet Size
A3