

CONTRACT NO:

CONTRACT TITLE: Commercial & Res. Building G+3P+15+R FLOOR
JVC 14TMRH010

CONTRACTOR: M/s. Union Contracting L.L.C

PACKAGE:	
SUBMITTAL NO:	SAR/UC/FA/S13
REVISION NO:	Rev 00
REVISION DATE:	5-Dec-22
TITLE:	Civil
DISCIPLINE:	Supplier of Scaffolding

PROPOSED SUBCONTRACTOR : M/s. Descharge Scaffolding

ATTACHMENT : Company Prequalification

LOCATION :

Supply of Scaffolding

TO: M/s. Bel Yoahah

Description

SUB: -----

Dear Sir ,

Please find enclosed herewith supporting documents pertaining to -----

The following documents are attached with the submittal:

- 1- Sub Contractor Tech. data sheet with high-lighted selection
- 2- Certificates / license from relevant authorities
- 3- Type ,number and current location of plants to be deployed on this project
- 4- Full list of names, Qualifications and Experience of staff
- 5- Details of recent performances.
- 6- Written confirmation that the proposed subcontractor will Act and comply in full conformity with the contract and main contractor's construction programme.

Signature : _____

Date: 5/12/22

(Summary of documentation with proper references are attached and properly signed).

BEL-YOAHAH. 1382
1488
06 DEC 2022
RECEIVED
Sign: _____

Engineer Review / Comments :

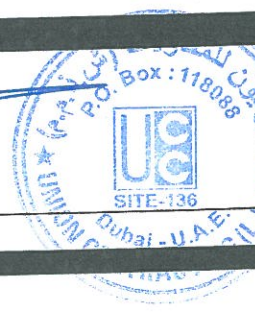
An approval does not relieve the Contractor of his obligations under the contract and he shall be liable for all acts, details, and negligence by the subcontractor.

- Subject to
- 1) Design with design undertaking and shop drawing submission complying to TRAHEES regulation and relevant codes.
 - 2) Site visit and formal confirmation prior to execution of work.
 - 3) Confirmation to deshuttering in conjunction with designer and project specification.

CONTRACTOR'S REVIEW

Contractor has reviewed this submission prior submission to Consultant.

Signature : _____



SUBMITTAL REVIEW STATUS

- (A) Approved - No Comments
- (B) Approved - As Noted
- (C) Revise - Resubmit
- (D) Rejected

DATE RECEIVED BY CONSULTANT:

DATE RETURNED TO CONTRACTOR: _____

Engineer's Signature



For and behalf of

Sulch. m.p.

Date: 9-12-22

13 DEC 2022

_____ 7


CONSULTANT	OWNER	CONTRACTOR
	M10 District One Mr. Xue Jie	

SHOP DRAWING SUBMITTAL (SD)

PROJECT TITLE	B+G+1 MANSION	DATE	27-Jan-23
PLOT NO.	3479795	REF. NO	SD-M10-S-029
LOCATION	MOHAMMED BIN RASHID, AL	REV. NO.	0

DESCRIPTIONS

SI	DRAWING NO.	Rev.	DESCRIPTION	STATUS
1	OPI-M10-P167-S-FW-007	0	<i>FIRST FLOOR SLAB FORMWORK DRAWINGS</i>	
2	OPI-M10-P167-S-FW-008	0	<i>FIRST FLOOR SLAB FORMWORK DRAWINGS</i>	
3		0	<i>Calculation</i>	

CONTRACTOR'S NAME & SIGNATURE	 YAHIA ABDELGHAFOUR	RECEIVED BY CONSULTANT'S NAME & SIGNATURE	
DATE	01/27/2023	DATE	

THE ENGINEER RESPONSE



APPROVED
 APPROVED AS NOTED
 REVISE & RESUBMIT
 REJECTED

FORMWORKS ARE ONLY FOR CONSULTANT INFORMATION AND DOCUMENT PURPOSE ONLY

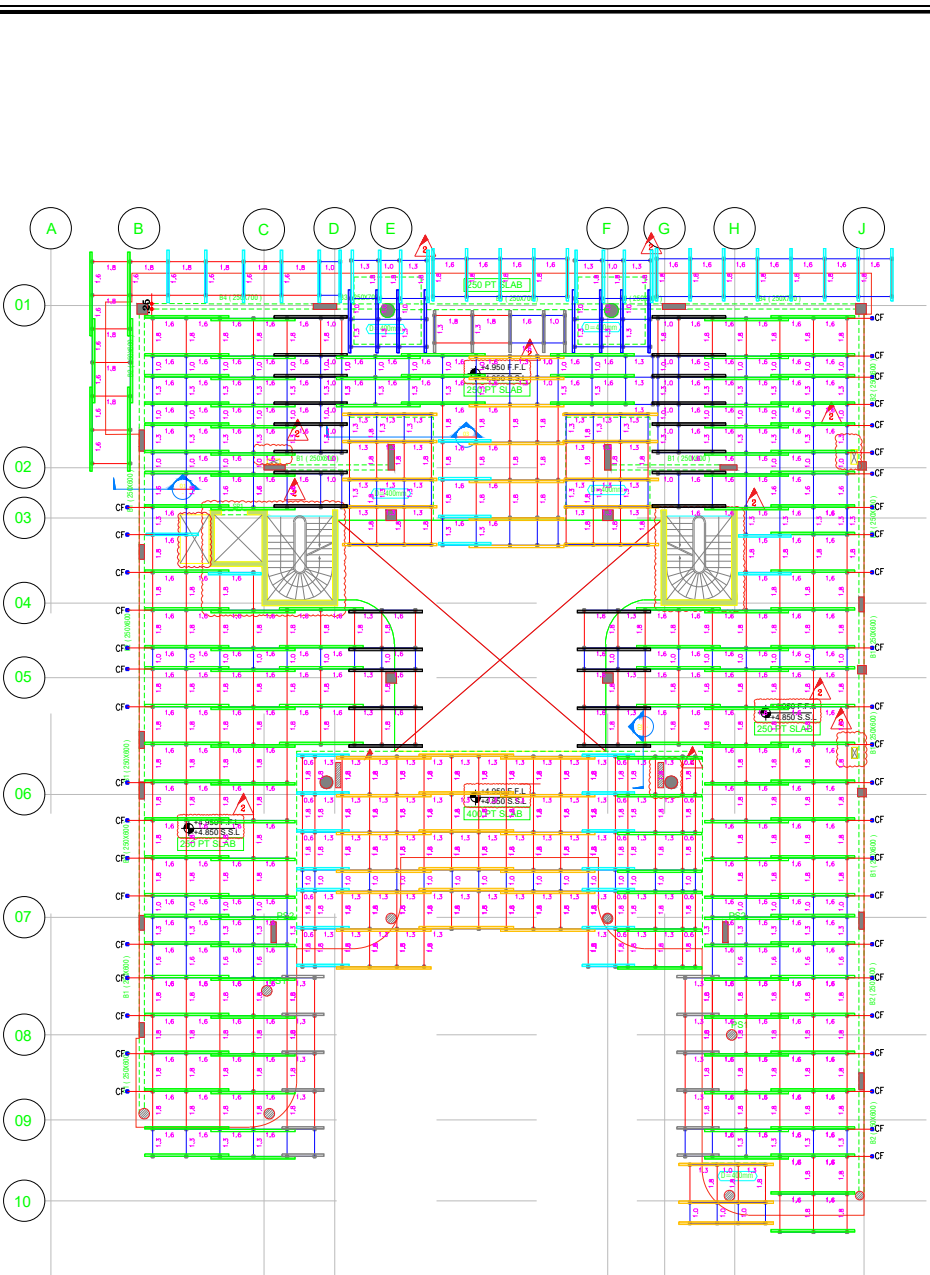
ITS CONTRACTOR RESPONSIBLIY TO PROVIDE DEFECTLESS FW WITH SUITABLE PLANNING WITH CORRECT POSITIONS, ACCURACY WITHIN TOLERANCE, FINISHING HEIGHT MARKOFF, JOINT SEALED AS REQUIRED, BRACINGS, RELEASE AGENT AS REQUIRED TPI INSPECTION AND VERIFICATION "IF ANY"

VERIFICATION ENSURING THE FW MATERIALS AND ARRANGEMENTS ARE ADEQUANCY TO CARRY THE WET CONCRETE AND LIVE LOADS

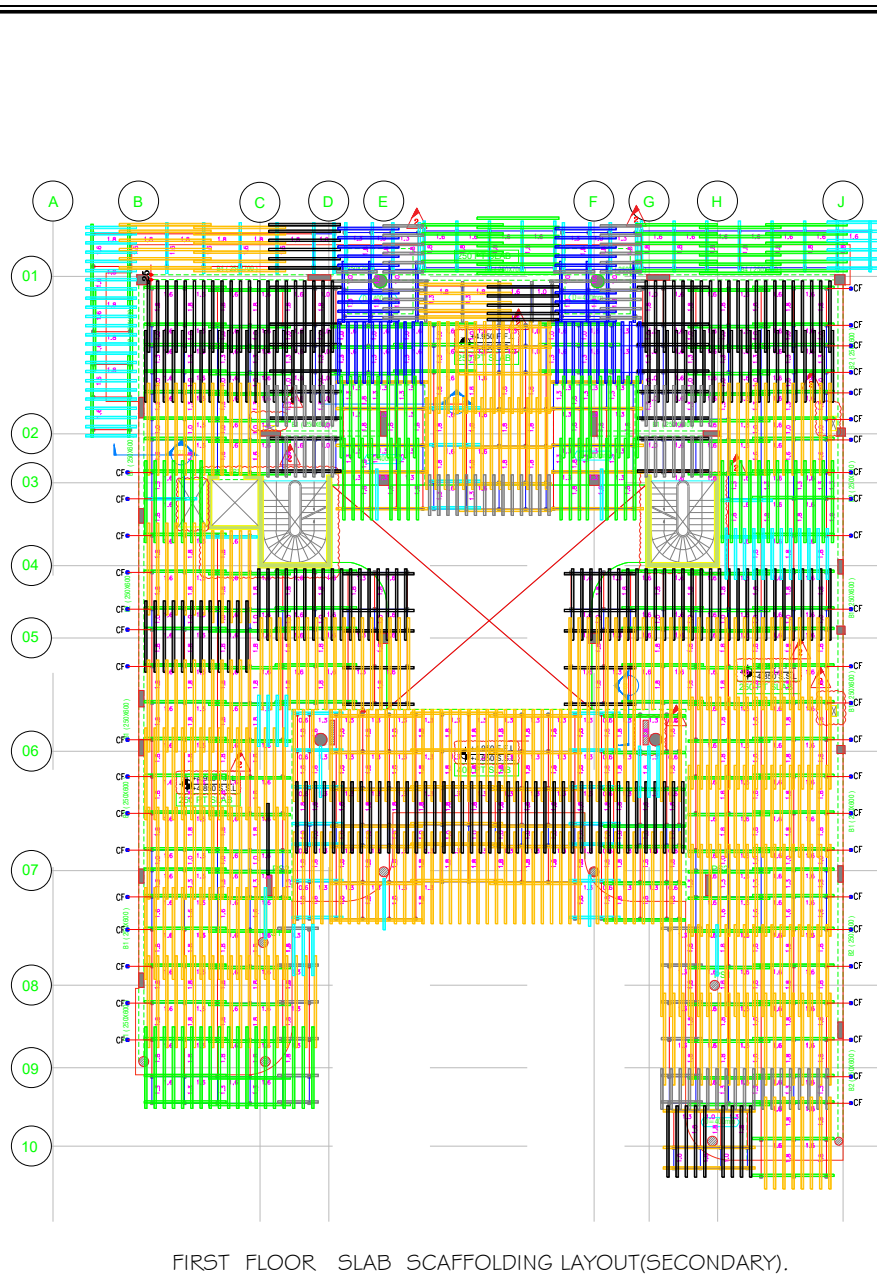
AND SHALL COMPLY ALL THE LOCAL MUNCIPLAITY AUTHORITY REQUIREMENT AND GUIDELINES.

PROJECT ENGINEER NAME & SIGNATURE	  02/07/2023	RECEIVED BY CONTRACTOR'S NAME & SIGNATURE
PROJECT MANAGER'S APPROVAL		
DATE		

RECEIVED
 By Olsen partners at 5:41 pm, Feb 07, 2023



FIRST FLOOR SLAB SCAFFOLDING LAYOUT(PRIMARY).



FIRST FLOOR SLAB SCAFFOLDING LAYOUT(SECONDARY).

GENERAL NOTES

- THIS DRAWING IS NOT TO BE SCALED. THE STATED DIMENSIONS ONLY ARE TO BE CONSIDERED.
- FOR THE GENERAL NOTES & STANDARD DETAILS.
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER UNLESS OTHERWISE NOTED.
- SITE DIMENSION VERIFICATION REQUIRED PRIOR TO PRODUCTION.
- ALL FINISHES AND IRONMONGERIES AS PER APPROVED MATERIAL SAMPLES ONLY.
- ANY OBSERVED DISCREPANCY OF FINISHES AND DETAILS BETWEEN PROJECT DOCUMENTS (DRAWINGS, SPECIFICATION & BOQ), TO BE BROUGHT OUT TO DESIGNER FOR CONFIRMATION.

KEY PLAN

LEGEND & ABBREVIATION

DESIGN DEPT.	WAK	SON	DR
STRUCTURE			
MF			

ISSUES

No.	Date	By	Revision Details
1	28-10-2022	BN	Issued For Approval

CLIENT Mr.Xue Jie

PROJECT PRIVATE VILLA
PROPOSED VILLA (B+G+1+Swimming Pool)

PLOT NO.: M 010 **BLOCK:** **LOCATION:** MEYDAN, DISTRICT ONE

ENGINEERING CONSULTANT
DAT DATA ENGINEERING CONSULTANCY
RASHID | ABU OUBAY | SHAKHAN
MEYDAN, THE PALM, TRUST, BUSINESS BAY, DUBAI
P.O. BOX 778
TEL: +971 4 5516500
FAX: +971 4 5516503
email: info@opimma.com
www.opimma.com

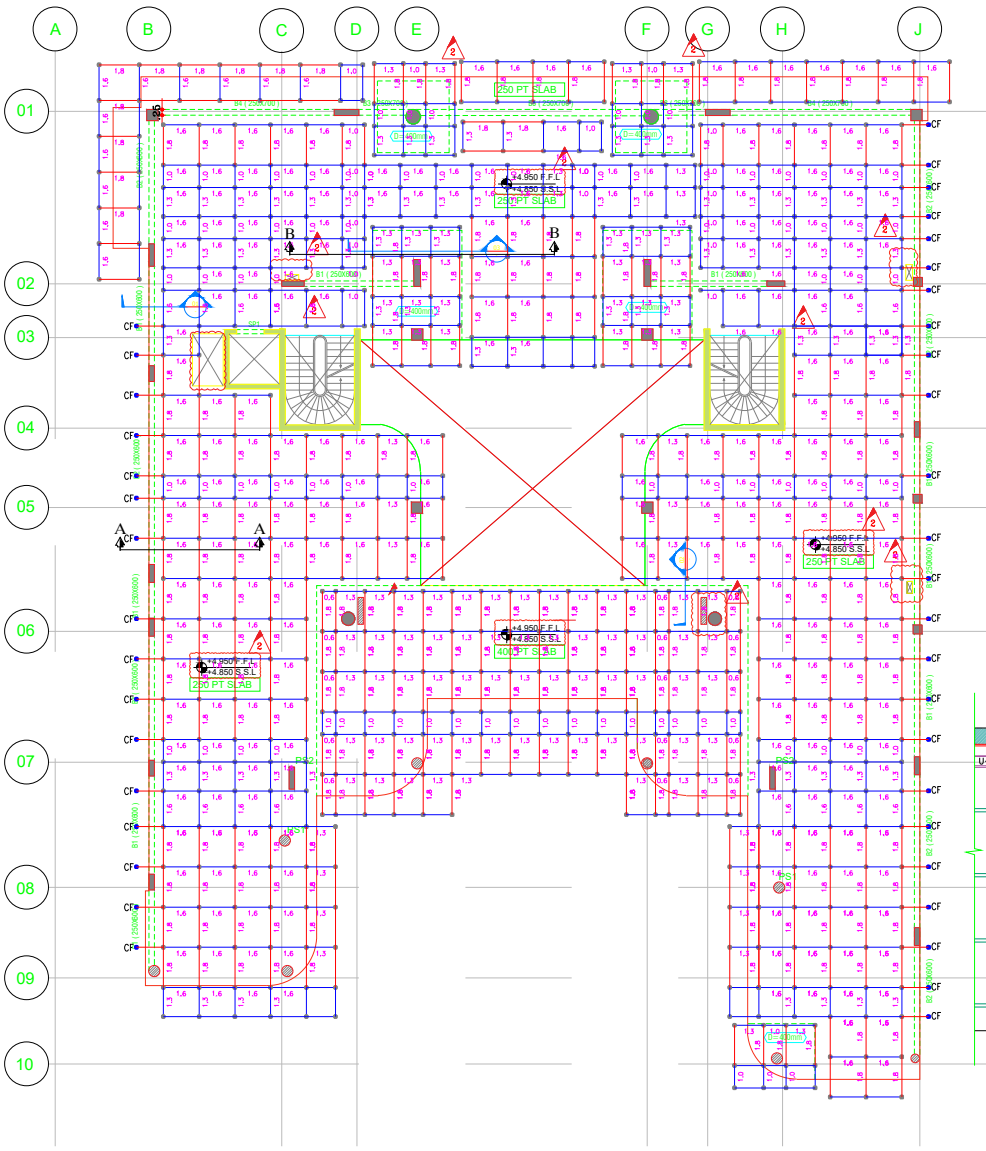
MAIN CONTRACTOR
OLSEN & PARTNERS
P.O. BOX 283025, DUBAI, U.A.E.
TEL: +971 4 5516500
FAX: +971 4 5516503
email: info@opimma.com
www.opimma.com

DRAWING TITLE
FIRST FLOOR SLAB FORMWORK DRAWINGS

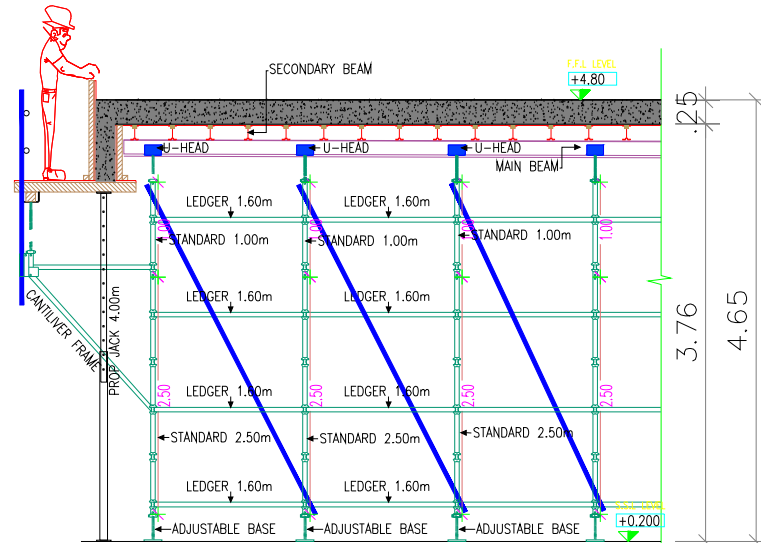
Drawn by	Prepared by	Checked by	Approved by
BN			SS

File Ref: Date: 02-01-2022 Scale: AS SHOWN Revision: 00

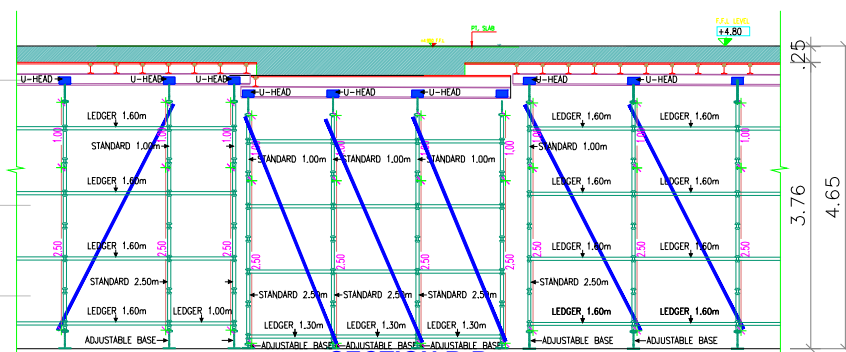
Drawing No: OPI-M10-P167-S-FW-007



FIRST FLOOR SLAB SCAFFOLDING LAYOUT



SECTION A-A.



SECTION B-B.

GENERAL NOTES

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KEY PLAN

LEGEND & ABBREVIATION

DESIGN REPR.	CHK	SN	DPT

ISSUES

No.	Date	By	Revision Details

28-10-2022 BN Issued For Approval

CLIENT Mr.Xue Jie

PROJECT PRIVATE VILLA
(PROPOSED VILLA (B+G+1+Swimming Pool))

PLOT NO. M 010 **BLOCK.** MEYDAN DISTRICT ONE

ENGINEERING CONSULTANT
DAT S.A.F. ENGINEERING CONSULTANCY
DUBAI | ABU DHABI | SHARJAH
RASCAL | THE RASCAL TEAM - RASCAL BLDG. DEPT.
PL. 44-02/708
E: info@dat.ae
W: www.dat.ae

MAIN CONTRACTOR
OLSEN & PARTNERS
P.O. BOX 283025, DUBAI U.A.E.
TEL: +971 4 5516500
FAX: +971 4 5516503
email: info@opimma.com
www.opimma.com

DRAWING TITLE
FIRST FLOOR SLAB
FORMWORK DRAWINGS

Drawn by	Prepared by	Checked by	Approved by
BN			SS

File Ref.	Date	Scale	Revision
	02-01-2022	A3 SHW/N	00

Drawing No. OPI-M10-P167-S-FW-008

**Project: PROPOSED VILLA (B+G+1+SWIMMING POOL)
PLOT NO:- M 010, BLOCK:- MANSION,
MEYDAN, DISTRICT ONE.**

Client: MR. XUE JIE.

Consultant: DAT ENGINNERING CONSULTANTS.

Contractor: OLSEN & PARTNERS INTERIORS

Area: FIRST FLOOR SLAB.

SLAB FORMWORK CALCULATIONS

Slab Loads

Slab Depth	= 250mm (Maximum)
Concrete Load	= 25KN/m ³
Live Load	= 1.5KN/m ²
Formwork Load	= 0.5KN/m ²
Slab Load per m ²	= 0.25m x 25KN/m ³ = 6.25 KN/m ²
Live Load per m ²	= 1.5KN/m ²
Formwork Load per m ²	= 0.50KN/m ²
Total Load per m ²	= 8.25KN/m ²

Loads on Vertical (Standards)

Concrete weight per m ²	= 8.25KN/m ²
Grids considered	= 1.8 x 1.6 (Maximum) as per Drg.
Total weight on standards	= 8.25x1.8 x1.6=23.76KN < 40KN Safe. O.K.
Maximum allowable load on standards	= 4,000KG (40KN)

Ledger lifts 1.50m c/c as per drawing to be maintained at site.

Standards are manufactured from 48.3 mm O.D steel tubes with different housing sets at certain intervals.

Standards are made available in open ended tubes of mild steel confirm to BS 5975.

Bracing Calculations

The design of bracing to horizontal resistance force required to be transmitted is specifies in BS 5975 “False work”

The code specifies a minimum lateral stability criteria equilent to the greater of either 2.5% of the vertical load in the standards acting horizontal forces from wind erection tolerances, non-vertical and concrete pressure of other forces acting as described in the Code.

Total Standard load is 23.76 KN

The safe working slip force of the coupler is = 6.25KN

2.5% of the 23.76KN = 0.594KN

Number of legs one bracing can cover = $6.25/0.594 = 10.52$

One brace is required for 10 legs. Safe O.K.

ALUMINUM BEAM DETAILS

Please see attachment...

For Desarch Associates (Scaffolding division)

For Desarch Building Contracting L.L.C.
(Scaffolding Division)



TEST CERTIFICATE FOR ALUMINIUM EXTRUSION
MILL FINISH + SURFACE TREATMENT
3.1 INSPECTION CERTIFICATE AS PER DIN EN 10204:2004

SERIAL NO: **GE/QC/2017/TC 013**

DATE: **07th Jan 2017**

CUSTOMER	DESARCH BUILDING CONTRACTING L.L.C.										
GULFEX ORDER NO:	1720006	CUSTOMER PO / REF NO:	PO#4151	QUOTATION NO:	1615681						
ALUMINIUM EXTRUSIONS PRODUCED AS PER	BS EN 573-3:2013 – Aluminium Alloys (Extrusions) – Chemical Composition & Form of Wrought Products										
	BS EN 755-1:2008 – Aluminium Alloys (Extrusions) – Technical conditions for inspection and delivery										
	BS EN 755-2:2013 – Aluminium Alloys (Extrusions) – Mechanical Properties										
	BS EN 755-9:2016 – Aluminium Alloys (Extrusions) – Dimensional Tolerances										
	BS EN 12020-2:2008 – Aluminium Alloys (Extrusions) – Dimensional Tolerances										
	ASTM B221-2014 – Specification for Aluminum & Aluminum Alloys Extruded Bars, Rods, Profiles & Tubes										
	SASO Standards : 79/1998 – Aluminium Alloys (Extrusions)										
	QUALANOD SPECIFICATIONS (Anodized Aluminium Extrusions) (Edition 01.01.2017)										
	QUALICOAT SPECIFICATION (Powder Coated Aluminium Extrusions) (14 th Edition)										
PRODUCT	PROFILE NO. / SECTION NO.	ALLOY-TEMPER	FINISH	LENGTH (m)	QUANTITY (PCS)	DELIVERY NOTE NO.					
ALUMINIUM EXTRUSIONS	23526	AA 6082 – T6	MILL	3.000 4.000	300 680	1368251 1368122					
EXTRUSION		POWDER COATING		ANODIZING		CRIMPING					
DIMENSIONS	SURFACE	FILM THICKNESS (≥ 60 µm)	GLOSS (%)	FILM THICKNESS (µm)	SEAL TEST (µS)	SHEAR FORCE (KN)					
OK	OK	N/A	N/A	N/A	N/A	N/A					
CHEMICAL COMPOSITION (%)											
ALLOY: AA 6082	CAST NO:	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Ga	V
minimum	16322H11	0.70	0.00	0.00	0.40	0.60	0.00	0.00	0.00	-	-
maximum		1.30	0.50	0.10	1.00	1.20	0.20	0.10	0.15	-	-
actual		1.00	0.21	0.07	0.48	0.68	0.01	<0.01	0.014	0.01	-
MECHANICAL TESTING											
WALL THICKNESS t (mm)	TEMPER: T6	UTS R_m (MPa)	YS R_{p0.2} (MPa)	ELONGATION A (%)	FORCE @ PEAK (N)	HBW Typical Value					
t ≤ 5	minimum	290	250	8	-	95					
	maximum	-	-	-	-	-					
	actual	318	298	11	13891	98 - 99					

OBSERVATIONS:

- We hereby confirm that the above products are from Aluminium Extrusions.
- We hereby confirm that the above mentioned material fulfills the requirements as per specified international standards and as per customer requirements.
- Billets used in the extrusion are 100 % ultrasonic inspected at billet supplier's end.

Issued by : **OSEL DEPARTMENT**

1/8/2017 5:51:54 PM

For **GULF EXTRUSIONS Co. L.L.C**

Deflection Table for GE-10949

CONCRETE THICKNESS = 15cm, 18cm, 20cm, 25cm

Alum Profile = 3.364 kg/m

Mass = 24.5 kN/m³

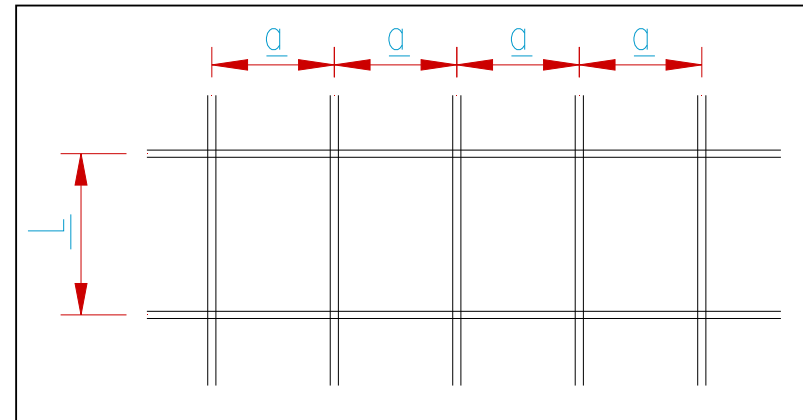
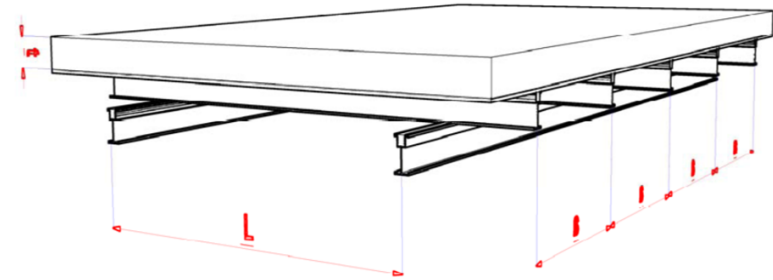
I_x = 390.395 cm⁴

W_x = 51.067 cm³

Moment Capacity = 6.809 kN.m

Table (L) for deflection L/360 (no more than 6mm)

		Slab Thickness (cm)				Limit
		15	18	20	25	
Distance Between Profiles; a(m)	0.8	2.69	2.53	2.45	2.27	2.16
	0.9	2.59	2.44	2.35	2.18	2.16
	1.0	2.50	2.35	2.27	2.11	2.16
	1.1	2.42	2.28	2.20	2.04	2.16
	1.2	2.35	2.21	2.14	1.98	2.16
	1.3	2.29	2.16	2.08	1.93	2.16
	1.4	2.24	2.10	2.03	1.89	2.16
	1.5	2.18	2.06	1.98	1.84	2.16
	1.6	2.14	2.01	1.94	1.80	2.16
	1.7	2.10	1.97	1.90	1.77	2.16
	1.8	2.06	1.93	1.87	1.73	2.16
	1.9	2.02	1.90	1.83	1.70	2.16
2.0	1.98	1.87	1.80	1.67	2.16	



CONCRETE THICKNESS = 15CM, 18cm, 20cm, 25cm

Alum Profile = 3.364 kg/m (GE-10949)

Mass = 24.5 kN/m³

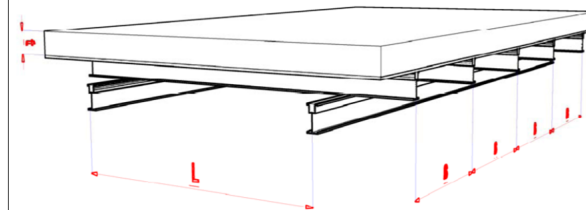
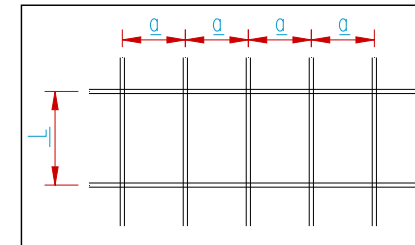
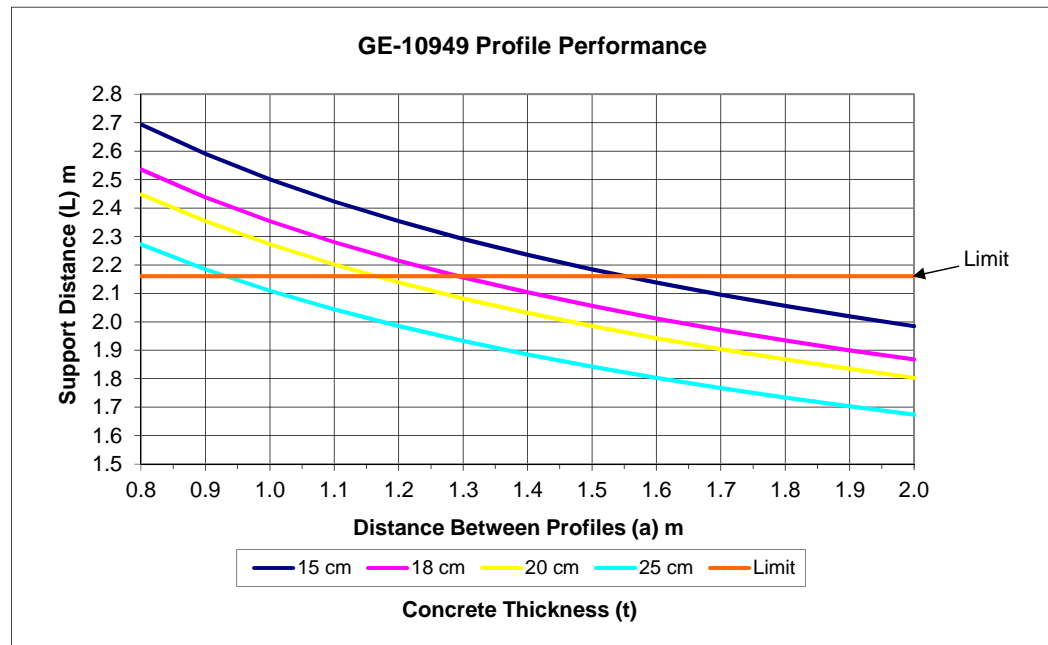
I_x = 390.395 cm⁴

W_x = 51.067 cm³

Moment Capacity = 6.809 kN.m

Table (L) for deflection less than L/360 and no more than 6mm

Slab(t)cm/a	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
15	2.69	2.59	2.50	2.42	2.35	2.29	2.24	2.18	2.14	2.10	2.06	2.02	1.98
18	2.53	2.44	2.35	2.28	2.21	2.16	2.10	2.06	2.01	1.97	1.93	1.90	1.87
20	2.45	2.35	2.27	2.20	2.14	2.08	2.03	1.98	1.94	1.90	1.87	1.83	1.80
25	2.27	2.18	2.11	2.04	1.98	1.93	1.89	1.84	1.80	1.77	1.73	1.70	1.67
Limit	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16



THICKNESS = 25CM

Alum Profile = 2.733 kg/m

Mass = 6.125 kN/m²

Ix = 335.305 cm⁴

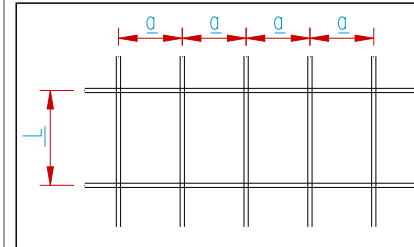
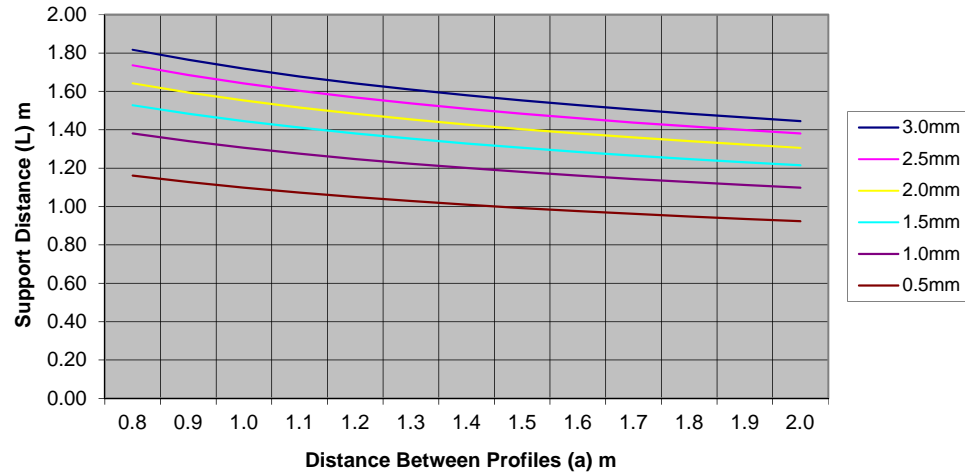
Wx = 41.6851 cm³

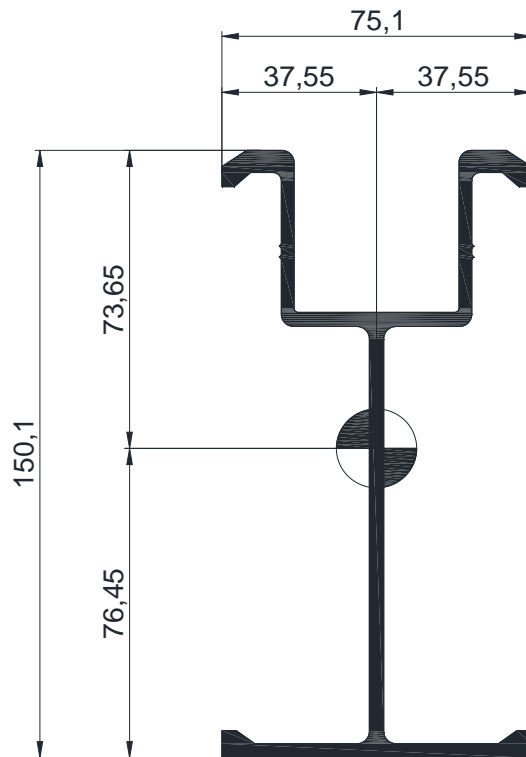
Moment Capacity = 5.5580136 kN.m

Table (L) for different allowable deflection

Def/a	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
3	1.82	1.76	1.72	1.68	1.64	1.61	1.58	1.55	1.53	1.51	1.48	1.46	1.45
2.5	1.74	1.69	1.64	1.60	1.57	1.54	1.51	1.48	1.46	1.44	1.42	1.40	1.38
2	1.64	1.59	1.55	1.52	1.48	1.45	1.43	1.40	1.38	1.36	1.34	1.32	1.31
1.5	1.53	1.48	1.45	1.41	1.38	1.35	1.33	1.31	1.29	1.27	1.25	1.23	1.22
1.0	1.38	1.34	1.31	1.28	1.25	1.22	1.20	1.18	1.16	1.14	1.13	1.11	1.10
0.5	1.16	1.13	1.10	1.07	1.05	1.03	1.01	0.99	0.98	0.96	0.95	0.94	0.92



Scaffolding Profile Performance (t=25cm)





----- **GE-10949** -----

Area:	1245.8535
Perimeter:	675.0949
Bounding box:	X: -37.5500 -- 37.5500 Y: -76.4528 -- 73.6472
Centroid:	X: 0.0000 Y: 0.0000
Moments of inertia:	X: 3898756.2217 Y: 473270.6658
Product of inertia:	XY: 0.0000
Radii of gyration:	X: 55.9409 Y: 19.4904
Principal moments and	X-Y directions about centroid: I: 3898756.2217 along [1.0000 0.0000] J: 473270.6658 along [0.0000 1.0000]

CONSULTANT	OWNER	CONTRACTOR
	M10 District One Mr. Xue Jie	

SHOP DRAWING SUBMITTAL (SD)

PROJECT TITLE	B+G+1 MANSION	DATE	17-Nov-22
PLOT NO.	3479795	REF. NO	SD-M10-S-020
LOCATION	MOHAMMED BIN RASHID, AL	REV. NO.	0

DESCRIPTIONS

SI	DRAWING NO.	Rev.	DESCRIPTION	STATUS
1	OPI-M10-P167-S-FW-003	0	GROUND FLOOR SLAB & BEAMS FORMWORK DRAWINGS (SHEET 1 of 3)	
2	OPI-M10-P167-S-FW-004	0	GROUND FLOOR SLAB & BEAMS FORMWORK DRAWINGS (SHEET 2 of 3)	
3	OPI-M10-P167-S-FW-005	0	GROUND FLOOR SLAB & BEAMS FORMWORK DRAWINGS (SHEET 3 of 3)	
4			CALCULATIONS	

CONTRACTOR'S NAME & SIGNATURE	 YAHIA ABDELGHAFOUR	RECEIVED BY CONSULTANT'S NAME & SIGNATURE	
DATE	11/17/2022	DATE	

THE ENGINEER RESPONSE

APPROVED
 APPROVED AS NOTED
 REVISE & RESUBMIT
 REJECTED

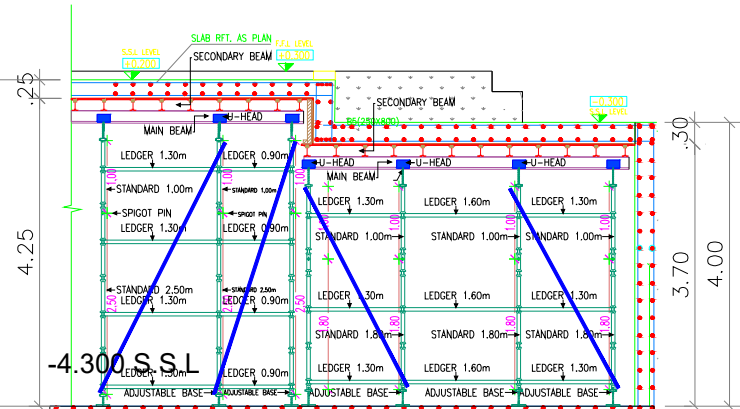
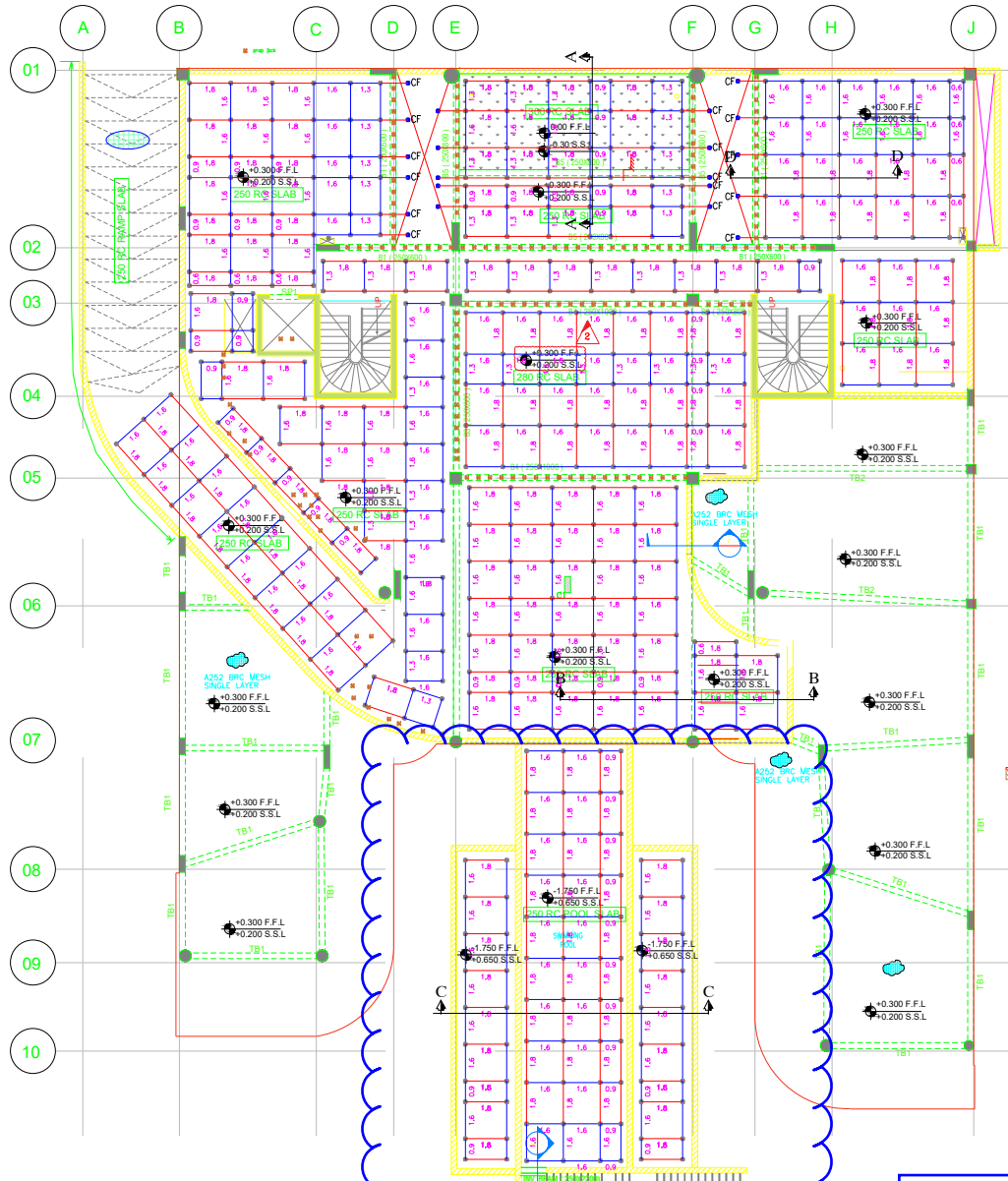
1. After installation submit TPI and certification prior to concreting.
2. Alumiminum Extrusion deflection and section capacity to be verified prior to 30cm concrete thickness

RECEIVED
 By Olsen partners at 4:27 pm, Dec 05, 2022

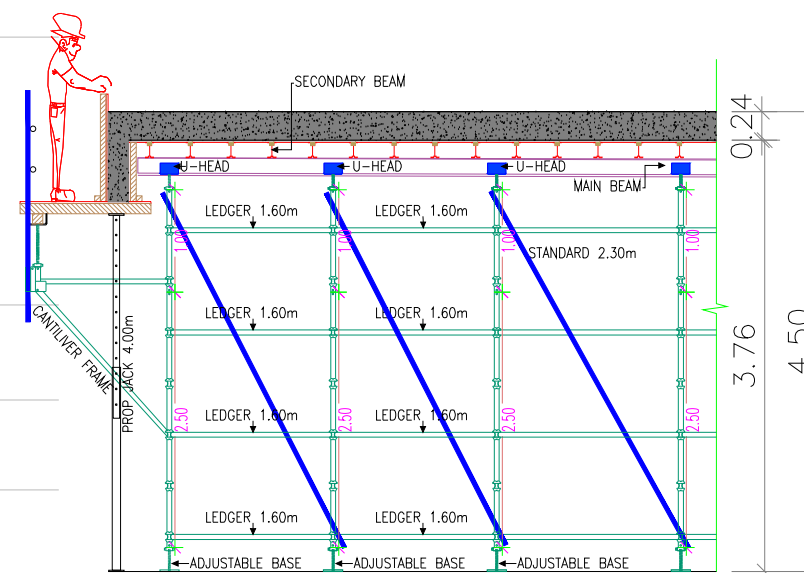
PROJECT ENGINEER NAME & SIGNATURE	 12/05/2022
PROJECT MANAGER'S APPROVAL	
DATE	

RECEIVED BY CONTRACTOR'S NAME & SIGNATURE	
DATE	

GROUND FLOOR SLAB SCAFFOLDING LAYOUT



SECTION A-A



SECTION D-D.

SWIMMING POOL SLAB IS OUT OF OPI SCOPE

- GENERAL NOTES**
1. THIS DRAWING IS NOT TO BE SCALED. THE STATED DIMENSIONS ONLY ARE TO BE CONSIDERED.
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KEY PLAN

LEGEND & ABBREVIATION

DESIGN DEPT.	WAK	SIN	DPR
STRUCTURE			
MP			

ISSUES			

No.	Date	By	Issued For Approval
			Revision Details

CLIENT Mr.Xue Jie

PROJECT PRIVATE VILLA
PROPOSED VILLA (B+G+1+Swimming Pool)

PLOT NO.: M010 **BLOCK:** MEYDAN DISTRICT ONE

ENGINEERING CONSULTANT
DAT S.A.F. ENGINEERING CONSULTANCY
RUBEN | ADU OUBAI | SHAKHAN
RUBEN | The Palm Jumeirah, Dubai, UAE
P.O. BOX 776
www.dattae.com

MAIN CONTRACTOR
OLSEN & PARTNERS
P.O. BOX 283025, DUBAI, U.A.E.
TEL: +971 4 5516500
FAX: +971 4 5516503
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www.opimma.com

DRAWING TITLE
GROUND FLOOR SLAB & BEAMS
FORMWORK DRAWINGS (SHEET 1 OF 3)

Drawn by	Prepared by	Checked by	Approved by
BN			SS
File Ref:	Date	Scale	Revision
	28-10-2022	AS SHOWN	00

Drawing No. OPI-M10-P167-S-FW-003

**Project: PROPOSED VILLA (B+G+1+SWIMMING POOL)
PLOT NO:- M 010, BLOCK:- MANSION,
MEYDAN, DISTRICT ONE.**

Client: MR. XUE JIE.

Consultant: DAT ENGINNERING CONSULTANTS.

Contractor: OLSEN & PARTNERS INTERIORS

Area: GROUND FLOOR SLAB.

SLAB FORMWORK CALCULATIONS

Slab Loads

Slab Depth	= 30mm (Maximum)
Concrete Load	= 25KN/m ³
Live Load	= 1.5KN/m ²
Formwork Load	= 0.5KN/m ²
Slab Load per m ²	= 0.30m x 25KN/m ³ = 7.5 KN/m ²
Live Load per m ²	= 1.5KN/m ²
Formwork Load per m ²	= 0.50KN/m ²
Total Load per m ²	= 9.5KN/m ²

Loads on Vertical (Standards)

Concrete weight per m ²	= 9.5KN/m ²
Grids considered	= 1.8 x 1.6 (Maximum) as per Drg.
Total weight on standards	= 9.5x1.8 x1.6=27.36KN < 40KN Safe. O.K.
Maximum allowable load on standards	= 4,000KG (40KN)

Ledger lifts 1.50m c/c as per drawing to be maintained at site.

Standards are manufactured from 48.3 mm O.D steel tubes with different housing sets at certain intervals.

Standards are made available in open ended tubes of mild steel confirm to BS 5975.

Bracing Calculations

The design of bracing to horizontal resistance force required to be transmitted is specifies in BS 5975 “False work”

The code specifies a minimum lateral stability criteria equilent to the greater of either 2.5% of the vertical load in the standards acting horizontal forces from wind erection tolerances, non-vertical and concrete pressure of other forces acting as described in the Code.

Total Standard load is 27.36 KN

The safe working slip force of the coupler is = 6.25KN

2.5% of the 27.36KN = 0.68KN

Number of legs one bracing can cover = $6.25/0.684 = 9.13$

One brace is required for 9 legs. Safe O.K.

ALUMINUM BEAM DETAILS

Please see attachment...

For Desarch Associates (Scaffolding division)

For Desarch Building Contracting L.L.C.
(Scaffolding Division)



TEST CERTIFICATE FOR ALUMINIUM EXTRUSION
MILL FINISH + SURFACE TREATMENT
3.1 INSPECTION CERTIFICATE AS PER DIN EN 10204:2004

SERIAL NO: **GE/QC/2017/TC 013**

DATE: **07th Jan 2017**

CUSTOMER	DESARCH BUILDING CONTRACTING L.L.C.										
GULFEX ORDER NO:	1720006	CUSTOMER PO / REF NO:	PO#4151	QUOTATION NO:	1615681						
ALUMINIUM EXTRUSIONS PRODUCED AS PER	BS EN 573-3:2013 – Aluminium Alloys (Extrusions) – Chemical Composition & Form of Wrought Products										
	BS EN 755-1:2008 – Aluminium Alloys (Extrusions) – Technical conditions for inspection and delivery										
	BS EN 755-2:2013 – Aluminium Alloys (Extrusions) – Mechanical Properties										
	BS EN 755-9:2016 – Aluminium Alloys (Extrusions) – Dimensional Tolerances										
	BS EN 12020-2:2008 – Aluminium Alloys (Extrusions) – Dimensional Tolerances										
	ASTM B221-2014 – Specification for Aluminum & Aluminum Alloys Extruded Bars, Rods, Profiles & Tubes										
	SASO Standards : 79/1998 – Aluminium Alloys (Extrusions)										
	QUALANOD SPECIFICATIONS (Anodized Aluminium Extrusions) (Edition 01.01.2017)										
	QUALICOAT SPECIFICATION (Powder Coated Aluminium Extrusions) (14 th Edition)										
PRODUCT	PROFILE NO. / SECTION NO.	ALLOY-TEMPER	FINISH	LENGTH (m)	QUANTITY (PCS)	DELIVERY NOTE NO.					
ALUMINIUM EXTRUSIONS	23526	AA 6082 – T6	MILL	3.000 4.000	300 680	1368251 1368122					
EXTRUSION		POWDER COATING		ANODIZING		CRIMPING					
DIMENSIONS	SURFACE	FILM THICKNESS (≥ 60 µm)	GLOSS (%)	FILM THICKNESS (µm)	SEAL TEST (µS)	SHEAR FORCE (KN)					
OK	OK	N/A	N/A	N/A	N/A	N/A					
CHEMICAL COMPOSITION (%)											
ALLOY: AA 6082	CAST NO:	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Ga	V
minimum	16322H11	0.70	0.00	0.00	0.40	0.60	0.00	0.00	0.00	-	-
maximum		1.30	0.50	0.10	1.00	1.20	0.20	0.10	0.15	-	-
actual		1.00	0.21	0.07	0.48	0.68	0.01	<0.01	0.014	0.01	-
MECHANICAL TESTING											
WALL THICKNESS t (mm)	TEMPER: T6	UTS R_m (MPa)	YS R_{p0.2} (MPa)	ELONGATION A (%)	FORCE @ PEAK (N)	HBW Typical Value					
t ≤ 5	minimum	290	250	8	-	95					
	maximum	-	-	-	-	-					
	actual	318	298	11	13891	98 - 99					

OBSERVATIONS:

- We hereby confirm that the above products are from Aluminium Extrusions.
- We hereby confirm that the above mentioned material fulfills the requirements as per specified international standards and as per customer requirements.
- Billets used in the extrusion are 100 % ultrasonic inspected at billet supplier's end.

Issued by : **OSEL DEPARTMENT**

1/8/2017 5:51:54 PM

For **GULF EXTRUSIONS Co. L.L.C**

Deflection Table for GE-10949

CONCRETE THICKNESS = 15cm, 18cm, 20cm, 25cm

Alum Profile = 3.364 kg/m

Mass = 24.5 kN/m³

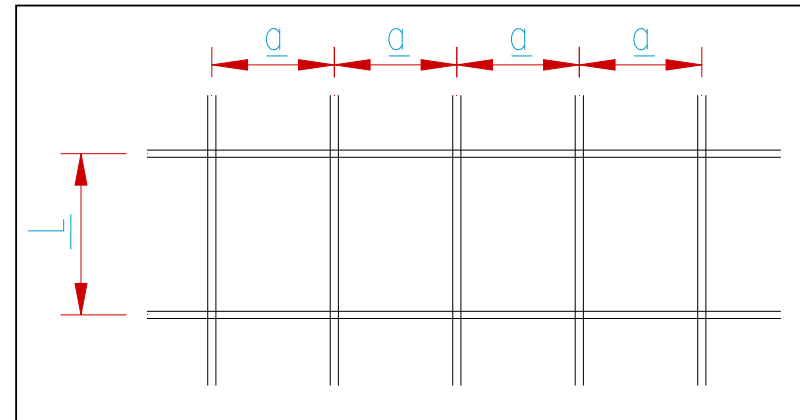
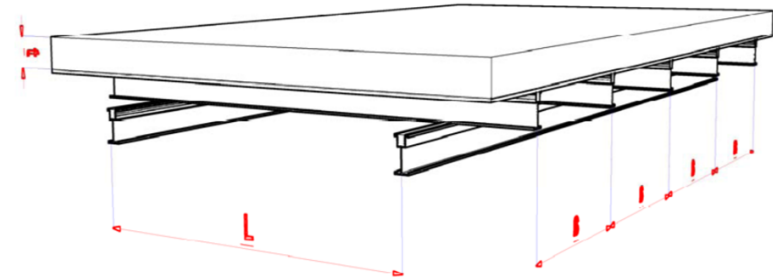
I_x = 390.395 cm⁴

W_x = 51.067 cm³

Moment Capacity = 6.809 kN.m

Table (L) for deflection L/360 (no more than 6mm)

		Slab Thickness (cm)				Limit
		15	18	20	25	
Distance Between Profiles; a(m)	0.8	2.69	2.53	2.45	2.27	2.16
	0.9	2.59	2.44	2.35	2.18	2.16
	1.0	2.50	2.35	2.27	2.11	2.16
	1.1	2.42	2.28	2.20	2.04	2.16
	1.2	2.35	2.21	2.14	1.98	2.16
	1.3	2.29	2.16	2.08	1.93	2.16
	1.4	2.24	2.10	2.03	1.89	2.16
	1.5	2.18	2.06	1.98	1.84	2.16
	1.6	2.14	2.01	1.94	1.80	2.16
	1.7	2.10	1.97	1.90	1.77	2.16
	1.8	2.06	1.93	1.87	1.73	2.16
	1.9	2.02	1.90	1.83	1.70	2.16
	2.0	1.98	1.87	1.80	1.67	2.16



CONCRETE THICKNESS = 15CM, 18cm, 20cm, 25cm

Alum Profile = 3.364 kg/m (GE-10949)

Mass = 24.5 kN/m³

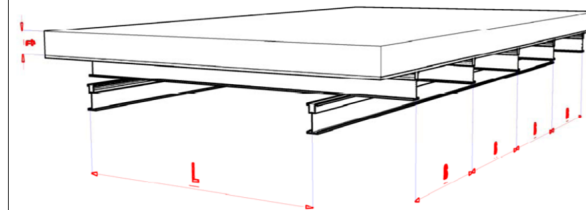
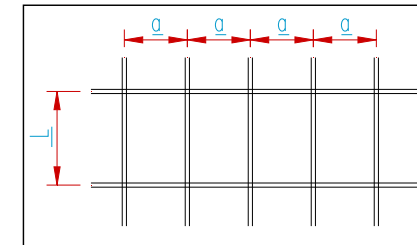
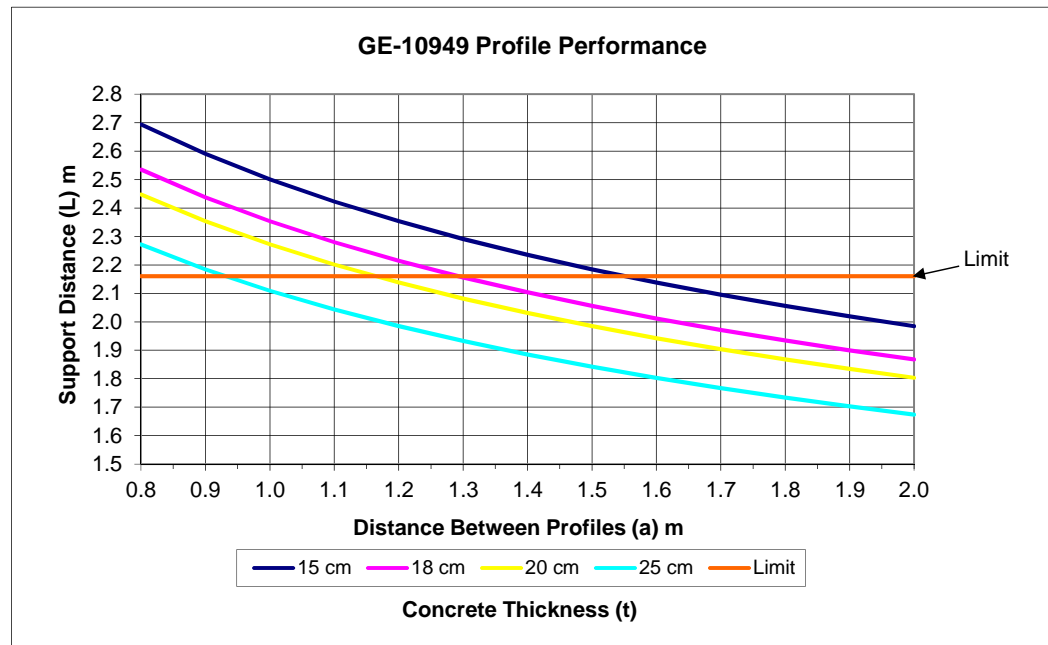
I_x = 390.395 cm⁴

W_x = 51.067 cm³

Moment Capacity = 6.809 kN.m

Table (L) for deflection less than L/360 and no more than 6mm

Slab(t)cm/a	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
15	2.69	2.59	2.50	2.42	2.35	2.29	2.24	2.18	2.14	2.10	2.06	2.02	1.98
18	2.53	2.44	2.35	2.28	2.21	2.16	2.10	2.06	2.01	1.97	1.93	1.90	1.87
20	2.45	2.35	2.27	2.20	2.14	2.08	2.03	1.98	1.94	1.90	1.87	1.83	1.80
25	2.27	2.18	2.11	2.04	1.98	1.93	1.89	1.84	1.80	1.77	1.73	1.70	1.67
Limit	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16



THICKNESS = 25CM

Alum Profile = 2.733 kg/m

Mass = 6.125 kN/m²

Ix = 335.305 cm⁴

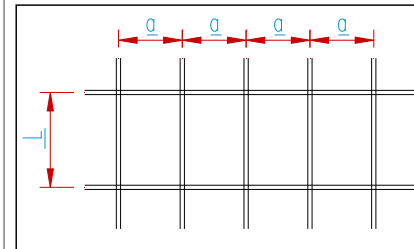
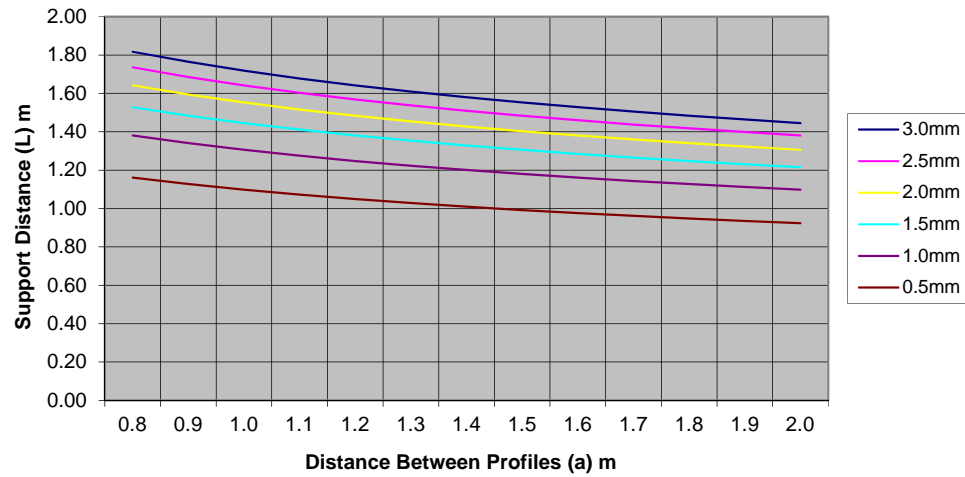
Wx = 41.6851 cm³

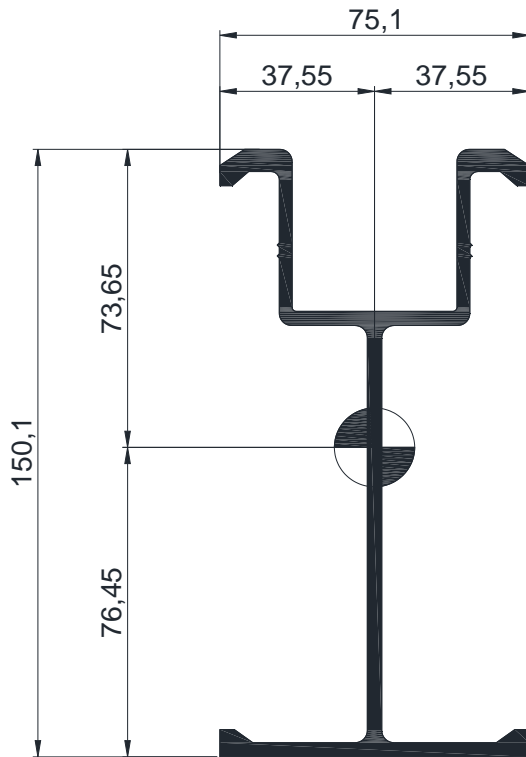
Moment Capacity = 5.5580136 kN.m

Table (L) for different allowable deflection

Def/a	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
3	1.82	1.76	1.72	1.68	1.64	1.61	1.58	1.55	1.53	1.51	1.48	1.46	1.45
2.5	1.74	1.69	1.64	1.60	1.57	1.54	1.51	1.48	1.46	1.44	1.42	1.40	1.38
2	1.64	1.59	1.55	1.52	1.48	1.45	1.43	1.40	1.38	1.36	1.34	1.32	1.31
1.5	1.53	1.48	1.45	1.41	1.38	1.35	1.33	1.31	1.29	1.27	1.25	1.23	1.22
1.0	1.38	1.34	1.31	1.28	1.25	1.22	1.20	1.18	1.16	1.14	1.13	1.11	1.10
0.5	1.16	1.13	1.10	1.07	1.05	1.03	1.01	0.99	0.98	0.96	0.95	0.94	0.92

Scaffolding Profile Performance (t=25cm)





----- **GE-10949** -----

Area:	1245.8535
Perimeter:	675.0949
Bounding box:	X: -37.5500 -- 37.5500 Y: -76.4528 -- 73.6472
Centroid:	X: 0.0000 Y: 0.0000
Moments of inertia:	X: 3898756.2217 Y: 473270.6658
Product of inertia:	XY: 0.0000
Radii of gyration:	X: 55.9409 Y: 19.4904
Principal moments and	X-Y directions about centroid: I: 3898756.2217 along [1.0000 0.0000] J: 473270.6658 along [0.0000 1.0000]

Project:	Mr. Mohamed Saif AL Suwaidi	Date:	02/01/2023
Project No:	Private villa – Nareel island – W32- Plot 160	Contract No.:	

Submittal Ref. No:	NA-W32-160-S-CIV-ShD-16-Rev-02	Revision No:	02
Submittal Title:	Shuttering Shop Drawing for Ground Floor Slab	Discipline:	

We are sending herewith under separate cover the drawings / documents / samples listed below:

Item No.	Drgs. / Specs. / BOQ Ref.	Description	Type *	Copies	Remarks
1	Contract	Shuttering Shop Drawing for Ground Floor Slab including: Layouts & Sections Calculations Test Certificates Catalogues Pre-Qualifications.		01	Sent By mail

Type: SD - Shop Drawings SM- Sample MS- Material Submittal CAL - Calculations CT – Certificates PQ- Prequalification TR- Test Results OT - Other

Subcontractor / Supplier / Manufacturer: **Discharge**

We certify that the documents / materials submitted herewith have been reviewed in detail and are in strict conformance with the contract drawings and specifications except as otherwise stated.

Issued By: Company Name: Integrated palaces general contracting co. Contact Person: Omar Jarbough Signature: Date: 02/01/2023	 Received By: Name: Al Ain Consulting Engineers L.L.C. Signature: Date:
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Consultant Review Comments:

No objection for the attached temporary works drawing & design calculation by the Specialist, subject to comply with the below comments:

- Proposed arrangement to be checked by temporary work Supervisor & sign prior to load and Contractor to maintain same till the end of deshuttering as per the Project's Specification.
- Temporary work execution / installation to be done by an approved / certified scaffolder.
- Slab edges & thickness shown to be followed as per the approved Structural / Arch. shop drawing



Approval Status:	Approved <input type="checkbox"/>	Approved as Noted <input checked="" type="checkbox"/>
	Revise & Resubmit <input type="checkbox"/>	Not Approved <input type="checkbox"/>

Corrections or comments made relative to submittals during this review do not relieve the contractor from compliance with the requirements of The Contract. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of other trades and performing his work in a safe and satisfactory manner.

Reviewed By: Name: Department: Signature:	Received By: Name: Signature: Date:
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DESARCH
SCAFFOLDING

DESIGN CALCULATION SHEET

SYSTEM: CUP LOCK (D-TYPE) W/ ALUMINUM BEAM



PROJECT:

RESIDENTIAL VILLA -NAREEL ISLAND DEVELOPMENT.
PLOT NO.ALDAR R-043 ADM 160,W32, ABU DHABI ISLAND

CLIENT:

MOHAMMED SAIF AL SUWAIDI

MAIN CONSULTANT:

AL AIN CONSULTING ENGINEERS L.L.C.

MAIN CONTRACTOR:

INTEGRATED PALACE CONTRACTING L.L.C.

REFERENCE DWG.NO.:

GROUND FLOOR SLAB- DBC/S/2022/606A-B

PREPARED BY: ENGR. SACHIN

CHECKED BY: ENGR. BENJAMIN

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A . CODE REFERENCE

B . LOAD CONSIDERATIONS

C . TECHNICAL DETAILS

D . SLAB FALSEWORK

E . PLYWOOD SHEATING

F . CHECK SECONDARY ALUMINUM BEAM

G . CHECK PRIMARY ALUMINUM BEAM

H . SUPPORT SYSTEM (STANDARDS)

I . DIAGONAL BRACING

A. CODE REFERENCE

BS 5975:1996 - Code of practice for falsework

BS 8118-1- 1991 - Structural use of Aluminum beam

B. LOAD CONSIDERATIONS

Self weight of Concrete = 25 kN/m³

Self weight of Formwork = 0.50 kN/m³

Live load = 2.00 kN/m³

C. TECHNICAL DETAILS

System Used = Cuplock (D-Type) with Aluminum Beam

Depth of Hourdi Slab = 300 mm

Maximum Grid Size Used = 1.6 m x 1.8 m

Plywood:

Plywood to be provided by the client and it should have the below specifications:

Thickness

Allowable bending stress F_b = 17.54 N/mm²

Allowable shear stress F_v = 4.83 N/mm²

Modulus of Elasticity E = 4608 N/mm²

Aluminum Beam:

Allowable Bending Moment = 6.8 KN-m

Allowable Shear Force = 13.891 KN-m

Vertical Standard:

Safe working Load = 66.55 KN

D. SLAB FALSEWORK

Cuplock Support System- (Grid 1.80x1.60)

Slab FalseworkSelf weight of Concrete = 25 kN/m³Self weight of Formwork = 0.50 kN/m³Live load = 2.00 kN/m³

Concrete slab depth = 0.3 m

Grid consider (*primary x secondary*) = 1.6 m x 1.8 m**E. PLYWOOD SHEATING****Design of plywood sheating:**

Considering Plywood Strip = 10 cm

Width of plywood strip = 0.1 m

Span of plywood (B/w Secondary beam) = 0.4 m

Technical Data of Plywood:Allowable Bending stress F_b = 17.54 N/mm²Allowable shear stress F_v = 4.83 N/mm²Modulus of Elasticity E = 4608 N/mm²**Loading Intensity 0.10 KN/M run:**

Self-weight of Slab = 0.3 x 25 x 0.1 = 0.75

Live Load = 2 x 0.1 = 0.2 KN/m

Wt of plywood = 0.105 x 0.1 = 0.0105 KN/m

Total Weight w = 0.9605 KN/m

Page-5/9	CALCULATION SHEET	27/12/2022
PROJECT: RESIDENTIAL VILLA		CLIENT: MOHAMMED SAIF ALSUWAIDI

Check through Bending Stress-Shear & Allowable Deflection

$$\text{Max. Bending Moment } M = \frac{wl^2}{10} = \frac{0.96 \times 0.4^2}{10} = 0.0154 \text{ KN-m}$$

$$\text{Max. Shear Force } V = 0.6wl = 0.6 * 0.96 * 0.4 = 0.231 \text{ KN}$$

$$\text{Allowable Deflection } \delta = \frac{l}{270} = \frac{400}{270} = 1.4815 \text{ mm}$$

For 0.10m strip * 18mm thick of Plywood:

$$\text{Section modulus } Z = \frac{bd^2}{6} = \frac{100(18^2)}{6} = 5400 \text{ mm}^3$$

$$\text{Moment of Inertia } I_{xx} = \frac{bd^3}{12} = \frac{100(18^3)}{12} = 48600 \text{ mm}^3$$

$$\text{Moment Area about N/A axis } Q = \frac{100 * 9 * 9}{2} = 4050 \text{ mm}^3$$

$$\text{Width of plywood strip } B = 100 \text{ mm}$$

$$\text{Bending Stress } F = \frac{M}{Z} = \frac{0.0154}{0.1} = 0.154 \text{ N/mm}^2$$

2.8459 < 17.54 N/mm2 ----- (SAFE)

$$\text{Shear stress } F_{vr} = \frac{VQ}{I_{xx}B} = \frac{0.231 * 4050}{48600 * 100} = 0.001921 \text{ N/mm}^2$$

0.1921 < 4.83 N/mm2 ----- (SAFE)

$$\text{Max. Deflection } \delta_{ma} = \frac{wl^4}{145EI} = \frac{0.96 * 0.4^4}{145 * 48600} = 0.757 \text{ mm}$$

0.757 < 1.48 mm ----- (SAFE)

F. CHECK SECONDARY ALUMINUM BEAM

Calculation of loading intensity (per M²)

$$\text{Self-weight of Slab} = 0.3 \times 25 = 7.5 \text{ KN/m}^2$$

$$\text{Weight of formwork} = 0.5 \text{ KN/m}^2$$

$$\text{Live load} = 2 \text{ KN/m}^2$$

$$\text{Total Weight} = w = 10 \text{ KN/m}^2$$

$$\begin{aligned} \text{UDL on secondary beam} &= \text{spacing} \times w && \text{(Secondary beam spacing} \\ &= 0.4 \times 10 && \text{at every 0.4 c/c to be} \\ \mathbf{W} &= 4.00 \text{ KN/m} && \text{maintained at site.)} \\ \text{Length } l &= 1.8 \text{ m} \end{aligned}$$

$$\text{Max. Bending Moment} = \frac{wl^2}{8} = 1.62 \text{ KNm}$$

$$1.620 < 6.80 \text{ KNm} \text{ ----- (SAFE)}$$

$$\text{Maximum Shear Force} = \frac{wl}{2} = 3.6 \text{ KN}$$

$$3.600 < 13.891 \text{ KN} \text{ ----- (SAFE)}$$

$$\text{Maximum Deflection } \delta_{\max} = \frac{5wl^4}{384EI} = 1.705 \text{ mm}$$

$$\text{Allowable deflection} = \frac{l}{360} = \frac{1800}{360} = 5.000 \text{ mm}$$

$$1.705 < 5.000 \text{ KNm} \text{ ----- (SAFE)}$$

G. CHECK PRIMARY ALUMINUM BEAM

Calculation of loading intensity (per M²)

$$\text{Self-weight of Slab} = 0.3 \times 25 = 7.5 \text{ KN/m}^2$$

$$\text{Weight of formwork} = 0.5 \text{ KN/m}^2$$

$$\text{Live load} = 2 \text{ KN/m}^2$$

Total Weight

$$w = 10 \text{ KN/m}^2$$

$$\text{UDL on Primary beam } W = \text{spacing} \times w$$

$$= 1.6 \times 10$$

$$W = 16 \text{ KN/m}$$

$$\text{Length } l = 1.6 \text{ m}$$

$$\text{Max. Bending Moment} = \frac{wl^2}{8} = 5.12 \text{ KNm}$$

$$5.120 < 6.80 \text{ KNm} \text{ ----- (SAFE)}$$

$$\text{Maximum Shear Force} = \frac{wl}{2} = 12.8 \text{ KN}$$

$$12.8 < 13.891 \text{ KN} \text{ ----- (SAFE)}$$

$$\text{Maximum Deflection } \delta_{\max} = \frac{5wl^4}{384EI} = 4.257 \text{ mm}$$

$$\text{Allowable deflection} = \frac{l}{360} = 1600 = 4.444 \text{ mm}$$

$$4.257190692 < 4.444 \text{ KNm} \text{ ----- (SAFE)}$$

H. SUPPORT SYSTEM (Standards)

(Combination of Standard, ledgers, Base Jack, Adjustable U-Head & Bracings)

Technical information

According to Cuplock Technical Data Information
allowable load per Standard with lift of ledger 1.5m
and providing bracing every after 2 bays at both directions is 35 kN

Area of Slab per standard	=	1.6 m	x	1.8 m	=	2.88	m ²
Self-weight of Slab	=	0.3	x	25	=	7.5	KN/m ²
Weight of formwork	=				=	0.5	KN/m ²
Live load	=				=	2	KN/m ²

Total Weight

$$w = 10 \text{ KN/m}^2$$

$$\text{Load on per Standard} = (\text{area} \times w) = 28.8 \text{ KN}$$

$$28.800 < 66.550 \text{ KN} \text{ ----- (SAFE)}$$

$$\text{Safety Factor} = 66.55 / 28.80 = 2.31$$

$$\text{Allowable Safety Factor} = 1.65$$

$$1.65 < 2.31 \text{ (SAFE)}$$

Ledger Spacing

According to BS 1139-1:1990, Maximum permissible axial load for unbraced used tubes with effective length of 1500mm is 35.0 kN is greater than allowable.



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I. DIAGONAL BRACING

(Diagonal bracing with scaffold tube 48.30 mm Dia. & swivel coupler)

The design of bracing to horizontal resistance force required to be transmitted is specifies in BS5975:1996

Code of practice for falsework

The BS code specifies minimum lateral stability criteria aqualine to the greater of either 2.50% of the vertical load in the standards acting horizontal forces from wind erection tolerances, non vertical and concrete pressure of other forces acting as described in the code.

1. Horizontal force equivalent to 2.50% of vertical load (Hv)

$$28.800 \text{ kN} \times 2.50\% = 0.72 \text{ kN/m}$$

1. Horizontal force resulting from erection tolerances 1.0% of applied vertical load H, is 1 & of 28.800 KN.

$$28.800 \text{ kN} \times 1.0\% = 0.288 \text{ kN/m}$$

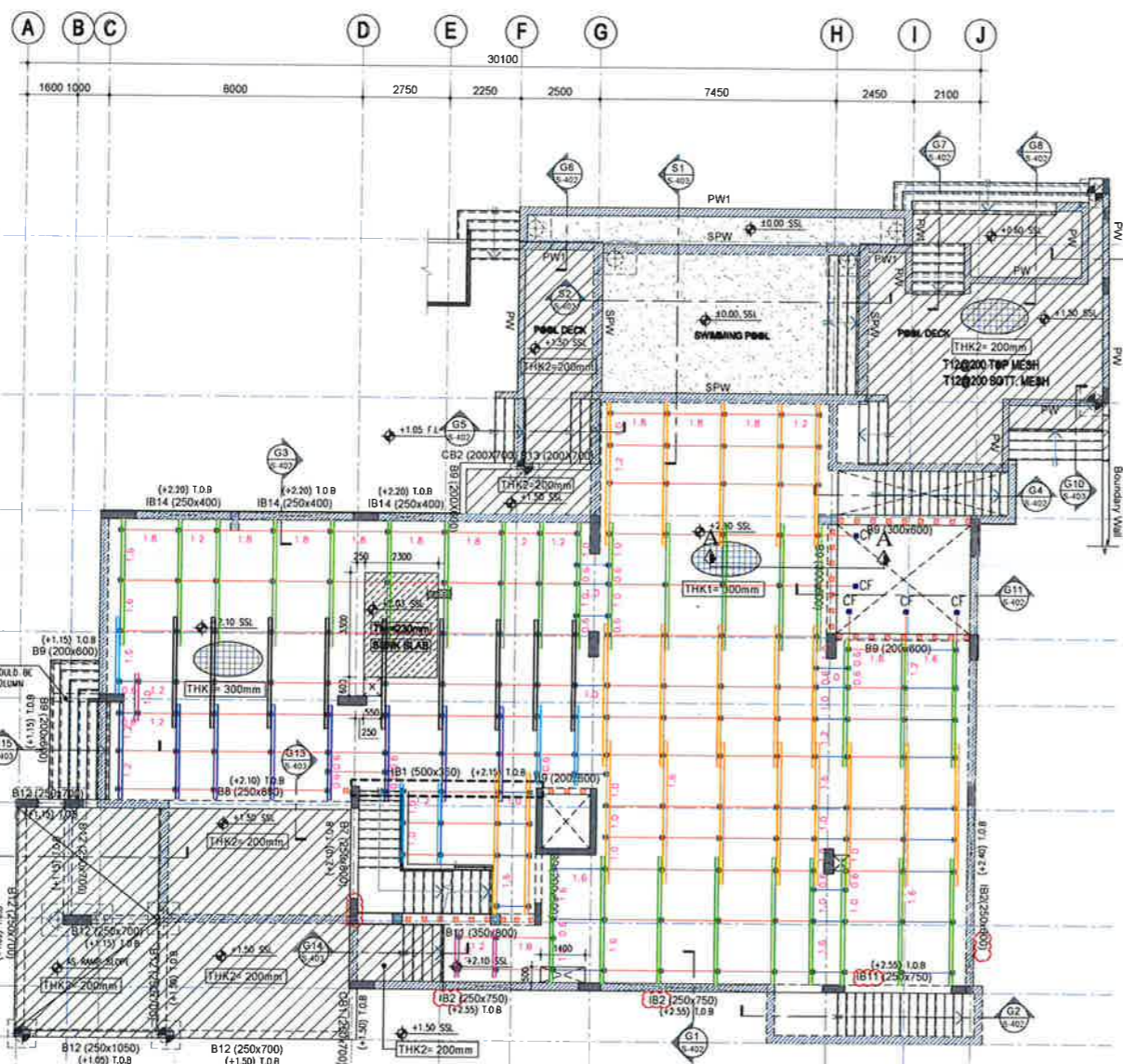
$$\text{Total horizontal force} = 0.72 + 0.288 = 1.008 \text{ KN}$$

$$\text{Safe load of diagonal as strut} = 1.008 / \cos 35 \text{ deg.} = 0.935 \text{ kN}$$

Use least of A) coupler capacity of 6.30kN

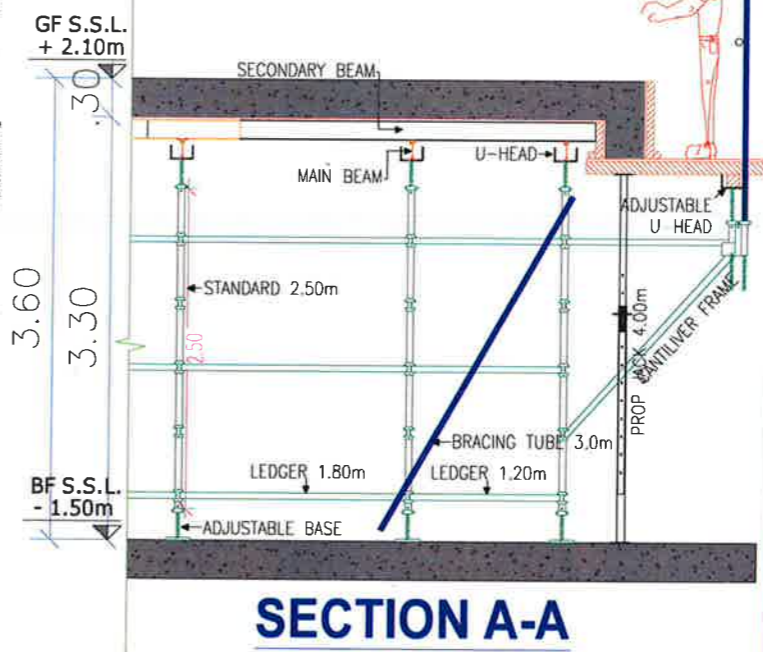
B) Safe load of diagonal as strut.

6.30/0.935=6.7 say 6 standards, so bracing shall be provided every sixth standard at both direction.



GROUND FLOOR SLAB SCAFFOLDING LAYOUT

NOTE: 18mm PLYWOOD SHOULD BE USED IN ALL SLAB SHUTTERING.
 NOTE: DIAGONAL BRACING PLACEMENT SHOULD BE ALTERNATE IN BOTH X,Y DIRECTION.
 NOTE: SECONDARY ALUMINUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 40cm FOR SLAB.
 NOTE: SECONDARY ALUMINUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR BEAMS.
 NOTE: L.D PROPS TO SUPPORT BEAMS SPACED AT 0.5m CENTER TO CENTER.

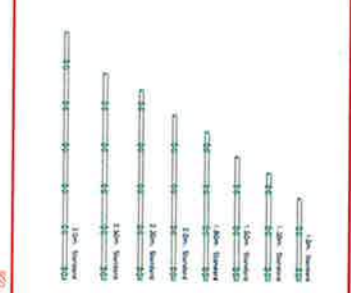


SECTION A-A

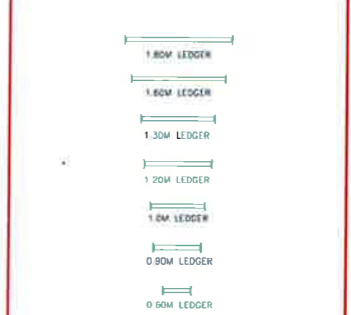
LEGEND:

Aluminum beam 100m	[Red line]
Aluminum beam 150m	[Orange line]
Aluminum beam 200m	[Yellow line]
Aluminum beam 250m	[Light Green line]
Aluminum beam 300m	[Green line]
Aluminum beam 400m	[Dark Green line]
Aluminum beam 450m	[Blue line]

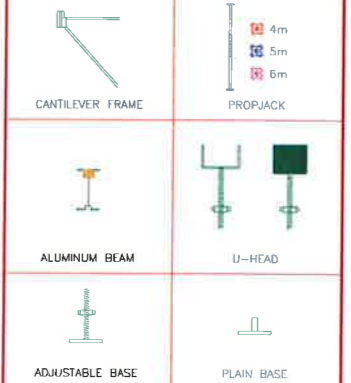
ALUMINUM BEAM



STANDARD TUBES



LEDGERS



ACE | Al Ain Consulting Engineers LLC
 APPROVED
 APPROVED AS NOTED
 REVISE & RESUBMIT
 REJECTED
 SIGNATURE
 DATE: 10/01/23

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 3. SCAFFOLDING FOR MAKE-UP AREAS BY PROPS BY CONTRACTOR.
 4. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE NOTED.

CONTRACTOR:
INTEGRATED PALACE CONTRACTING L.L.C.

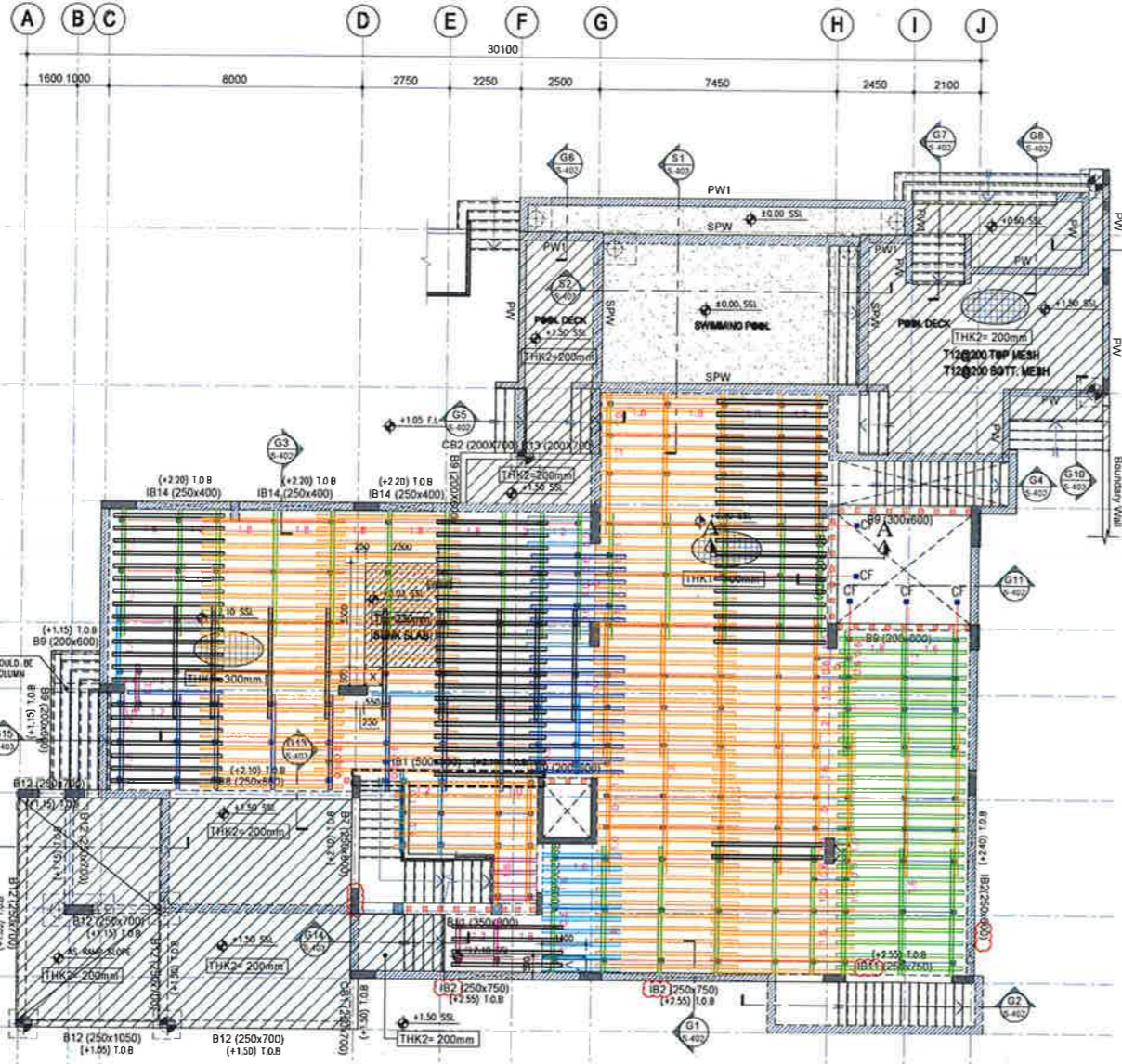
CONSULTANT:
AL AIN CONSULTING ENGINEERS L.L.C

CLIENT:
MOHAMMED SAIF ALSUWAIDI

SCAFFOLDING SUPPLIER:
DESARCH SCAFFOLDING
 (HEAD OFFICE)
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 Tel: 00971 4 3337012 | Fax: 00971 4 3337154
 Email: desarchscalfolding@gmail.com
 (BRANCH OFFICE)
 P.O. BOX 92269, ABU DHABI, UAE
 Tel: 00971 2 5538330 | Fax: 00971 2 5538331
 Email: desarchscalfolding@gmail.com
 (BRANCH OFFICE)
 P.O. BOX 2611, AJMAN, UAE
 Tel: 00971 6 5396655 | Fax: 00971 6 5396672
 Email: desarchscalfolding@gmail.com

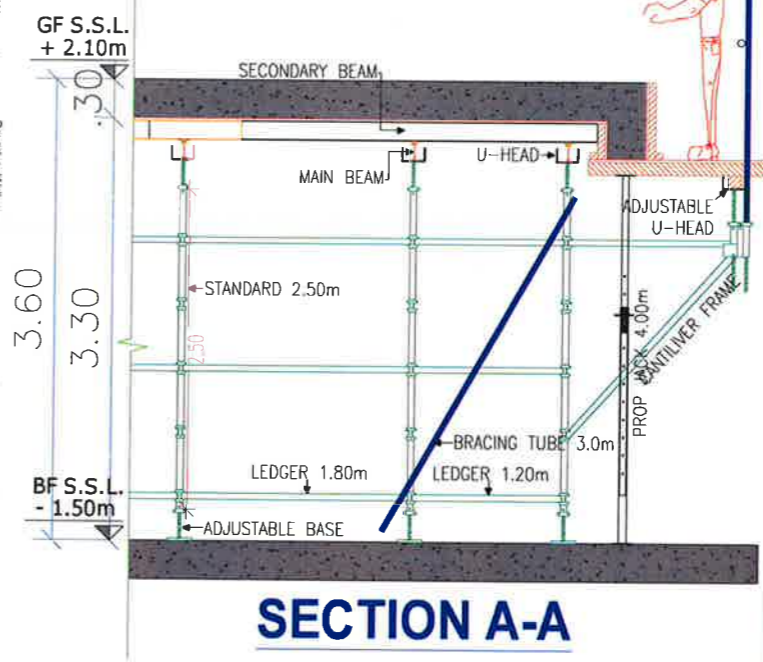
PROJECT:
RESIDENTIAL VILLA- NAREEL ISLAND DEVELOPMENT
 PLOT NO. ALDAR R-043 ADM 160, W32, ABU DHABI ISLAND, ABU DHABI, UAE
DRAWING TITLE:
GROUND FLOOR SLAB SCAFFOLDING LAYOUT & SECTION
 DRAWING NUMBER: **DBC/S/2022/606A** | REV: **00** | SCALE: **NTS** | DATE: **27-09-2022** | SHEET: **A1**

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GROUND FLOOR SLAB ALUMINIUM BEAM LAYOUT

NOTE: 18mm PLYWOOD SHOULD BE USED IN ALL SLAB SHUTTERING.
 NOTE: DIAGONAL BRACING PLACEMENT SHOULD BE ALTERNATE IN BOTH X,Y DIRECTION.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 40cm FOR SLAB,
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR BEAMS,
 NOTE: L.D PROPS TO SUPPORT BEAMS SPACED AT 0.5m CENTER TO CENTER.



SECTION A-A

LEGEND:

Aluminum beam 100m	[Symbol]
Aluminum beam 150m	[Symbol]
Aluminum beam 200m	[Symbol]
Aluminum beam 250m	[Symbol]
Aluminum beam 300m	[Symbol]
Aluminum beam 350m	[Symbol]
Aluminum beam 400m	[Symbol]
Aluminum beam 450m	[Symbol]

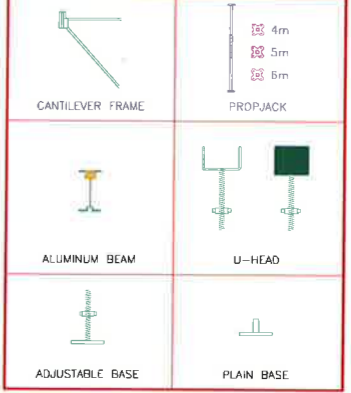
ALUMINIUM BEAM



STANDARD TUBES

- 1.8M LEDGER
- 1.6M LEDGER
- 1.3M LEDGER
- 1.2M LEDGER
- 1.0M LEDGER
- 0.9M LEDGER
- 0.8M LEDGER

LEDGERS



ACE | العنبر للاستشارات الهندسية
 Al Ain Consulting Engineers L.L.C

APPROVED
 APPROVED AS NOTED
 F. REVISE & RESUBMIT
 REJECTED

SIGNATURE
 DATE: 10/10/23

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CONTRACTOR:
INTEGRATED PALACE CONTRACTING L.L.C.

CONSULTANT:
AL AIN CONSULTING ENGINEERS L.L.C

CLIENT:
MOHAMMED SAIF ALSUWAIDI

SCAFFOLDING SUPPLIER:

(HEAD OFFICE)
 P.O. BOX 71957, DUBAI, UAE
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(BRANCH OFFICE)
 P.O. BOX 2611, AJMAN, UAE
 Tel: 00971 6 5396655 | Fax: 00971 6 5396672
 Email: desarchscalfolding@gmail.com

PROJECT:
RESIDENTIAL VILLA- NAREEL ISLAND DEVELOPMENT

PLOT NO. ALDAR R-043 ADM 160, W32, ABU DHABI ISLAND, ABU DHABI, UAE

DRAWING TITLE:
GROUND FLOOR SLAB ALUMINIUM BEAM LAYOUT & SECTION

DRAWING NUMBER: **DBC/S/2022/606B** | REV: **00** | SCALE: **NTS** | DATE: **27-09-2022** | SHEET: **A1**

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APPROVAL OF SHOP DRAWINGS

Project Name: **Seaside Hill Residential Building** Ref. No.: ELM-P155-SD-CIV-0010 Rev.02

Plot No: 1431 Location: Al Zohra City: Ajman, U.A.E. Date: 11 Sep 2023

Main Contractor: Emirates Link Maltauro Company LLC (Branch-1)

Sub-Contractor: M/s. Desarch Scaffolding

Review Check List

Architectural
 Structural / Civil
 Mechanical
 Electrical
 I.D/ FF&E

State compliance as per approved program schedule Yes No



Submittal Title:- **Shop Drawings for Block 3 Zone E, F & G First Floor Slab Scaffolding, Primary Aluminium Beam, Secondary Aluminium Beam Layout, Scaffolding & Aluminium Beam Sections**

Sr. No.	Drawings No.	Drawing Title	Revision No.	Copies
1	DBC/S/2023/1110A	Block 3 Zone E, F & G First Floor Slab Scaffolding Layout	02	01
2	DBC/S/2023/1110B	Block 3 Zone E, F & G First Floor Slab Primary Aluminium Beam Layout	02	01
3	DBC/S/2023/1110C	Block 3 Zone E, F & G First Floor Slab Secondary Aluminium Beam Layout	02	01
4	DBC/S/2023/1110D	Block 3 Zone E, F & G First Floor Slab Scaffolding & Aluminium Beam Sections	02	01

Project Manager: Mr. Muneer Altiti Signature: _____ Date: 11 Sep 2023



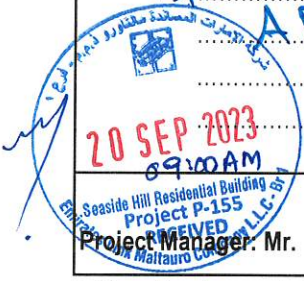
This portion is for the use of proarc office only

Status: A. Approved B. Approved as commented C. Revise and Resubmit D. Rejected

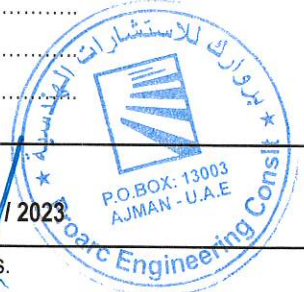
Arch. Eng'r. Struc. Eng'r. MEP Eng'r.

Comments:

* Contractor to ensure the work @ site is as per design.
 * 3rd Party Certificate for safe erection to be submitted
 * Contractor to provide cross bracing to Engineer's satisfaction.
 * final approval subject to comply the Structural Calculation.
 * Material used @ site to be in good condition.
 * final approval subject to AUTHORITY APPROVAL!



Project Manager: Mr. Dhanyaraj Sadan Signature: _____ Date: 19/09/2023



• Shop Drawings submittal to be submitted to proarc office and allow enough time to review from all concern parties.

APPROVAL OF SHOP DRAWINGS

Project Name: **Seaside Hill Residential Building** Ref. No.: ELM-P155-SD-CIV-0010 Rev.01

Plot No: 1431 Location: Al Zohra City: Ajman, U.A.E. Date: 23 Aug 2023

Main Contractor: Emirates Link Maltauro Company LLC (Branch-1)

Sub-Contractor: M/s. Desarch Scaffolding

Review Check List

Architectural
 Structural / Civil
 Mechanical
 Electrical
 I.D/ FF&E

State compliance as per approved program schedule Yes No

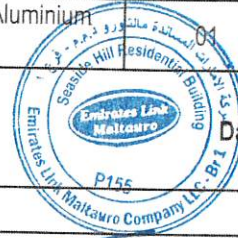
Submittal Title:- **Shop Drawings for Block C First Floor Slab Scaffolding Layout, Primary Aluminium Beam Layout & Secondary Aluminium Beam Layout**

Sr. No.	Drawings No.	Drawing Title	Revision No.	Copies
1	DBC/S/2023/1110A B	Block C - First Floor Slab Scaffolding Layout	01	01
2	DBC/S/2023/1110B B	Block C - First Floor Slab Primary Aluminium Beam Layout	01	01
3	DBC/S/2023/1110C B	Block C - First Floor Slab Secondary Aluminium Beam Layout	01	01
4	DBC/S/2023/1110D C	Block C - First Floor Slab Secondary Aluminium Beam Layout	01	01

Project Manager: Mr. Muneer Altiti

Signature: 

Date: 23 Aug 2023



This portion is for the use of proarc office only

Status: A. Approved B. Approved as commented C. Revise and Resubmit D. Rejected

Arch. Eng'r.
 Struc. Eng'r.
 MEP Eng'r.

Comments:

** Refer the comments in the drawing.*



Project Manager: Mr. Dhanyaraj Sadan

Signature: 

Date: 24/08/2023

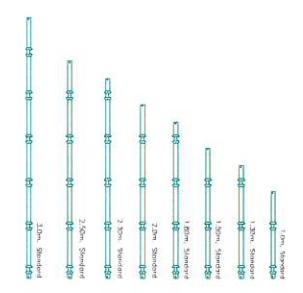
• Shop Drawings submittal to be submitted to proarc office and allow enough time to review from all concern parties.



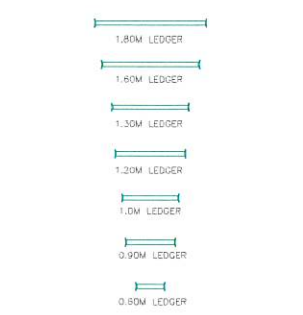
LEGEND:

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Aluminum beam 1.50m	
Aluminum beam 2.00m	
Aluminum beam 2.50m	
Aluminum beam 3.00m	
Aluminum beam 4.00m	
Aluminum beam 4.50m	

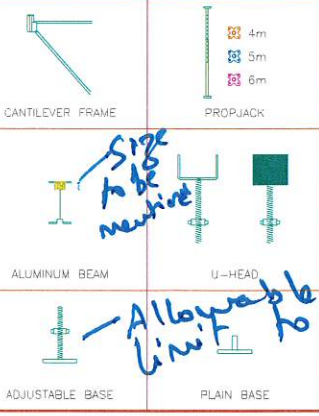
ALUMINUM BEAM



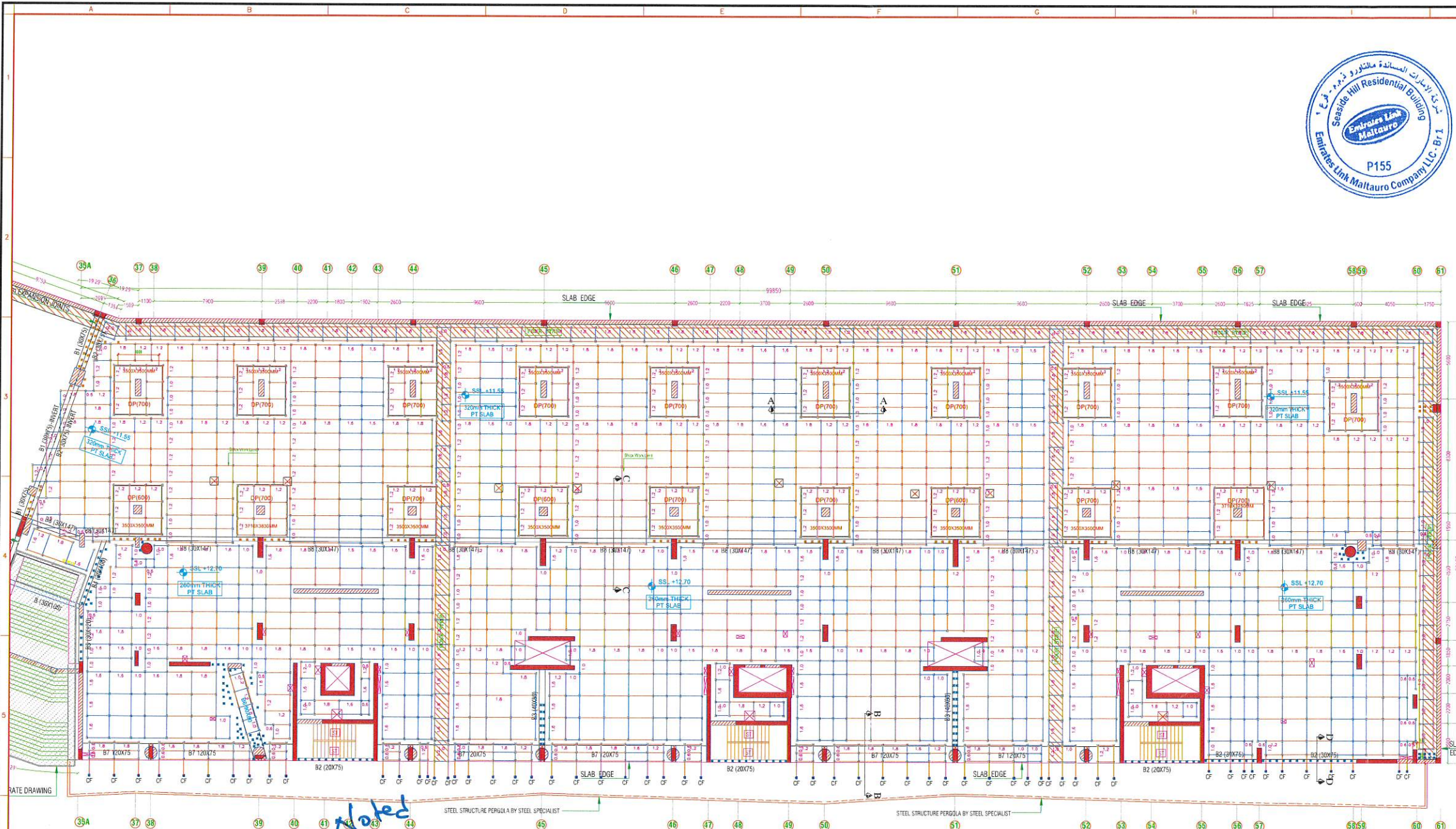
STANDARD TUBES



LEDGERS



Allowable to be specified



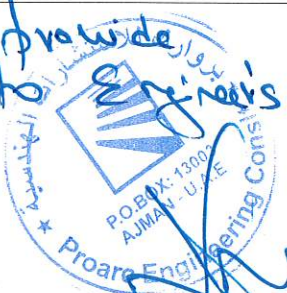
Approved as noted

FIRST FLOOR SLAB SCAFFOLDING LAYOUT

** Contractor to provide cross bracing to Engineer's satisfaction*

** DA to ensure the work @ site is as per design. 3rd Party Certificate for safe erection / work for completion required.*

19/09/2023



NOTE: 18mm PLYWOOD SHOULD BE USED IN ALL SLAB SHUTTERING.
 NOTE: DIAGONAL BRACING PLACEMENT SHOULD BE ALTERNATE IN BOTH X,Y DIRECTION.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 40cm FOR 26CM SLAB.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR 32CM SLAB.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 30cm FOR DROP PANEL.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR BEAMS.
 NOTE: L.D PROPS TO SUPPORT BEAMS SPACED AT 0.5m CENTER TO CENTER.

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CONTRACTOR:
EMIRATES LINK CONTRACTING L.L.C

CONSULTANT:
proarc
ARCHITECTS & ENGINEERING CONSULTANTS
P.O.Box 1300, Ajman, UAE | T: +971 6 744 8833 | F: +971 6 744511 | E: info@proarc.ae | www.proarc.ae

CLIENT:
AL ZORAH DEVELOPMENT (PRIVATE) COMPANY LIMITED F.Z.C

SCAFFOLDING SUPPLIER:
DESARCH
SCAFFOLDING
HEAD OFFICE: P.O. BOX 71957, DUBAI, UAE
Tel: 00971 4 3337012 | Fax: 00971 4 3337154
Email: desarchscalfolding@gmail.com
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BRANCH OFFICE: P.O. BOX 2611, AJMAN, UAE
Tel: 00971 6 5396655 | Fax: 00971 6 5396672
Email: desarchscalfolding@gmail.com
BRANCH OFFICE: P.O. BOX 22099, SHARJAH, UAE
Tel: 00971 6 5357788 | Fax: 00971 6 5357788
Email: desarchscalfolding@gmail.com

PROJECT:
PROPOSED G+6 BUILDING
PLOT NO. 1431, ZORAH SECTOR, ZORAH, UAE
DRAWING TITLE:
BLOCK 3 - ZONE E,F,G -FIRST FLOOR SLAB SCAFFOLDING LAYOUT

DRAWING NUMBER:	REV:	SCALE:	DATE:	SIZE:
DBC/S/2023/1110A	02	NTS	08-09-2023	A1

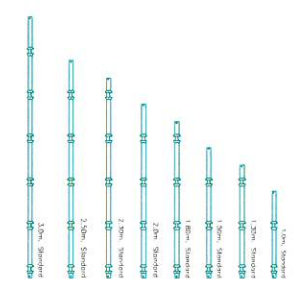
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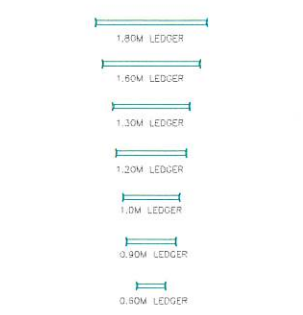
LEGEND:

Aluminum beam 1.00m	[Color swatch]
Aluminum beam 1.50m	[Color swatch]
Aluminum beam 2.0m	[Color swatch]
Aluminum beam 2.50m	[Color swatch]
Aluminum beam 3.0m	[Color swatch]
Aluminum beam 3.50m	[Color swatch]
Aluminum beam 4.0m	[Color swatch]
Aluminum beam 4.50m	[Color swatch]

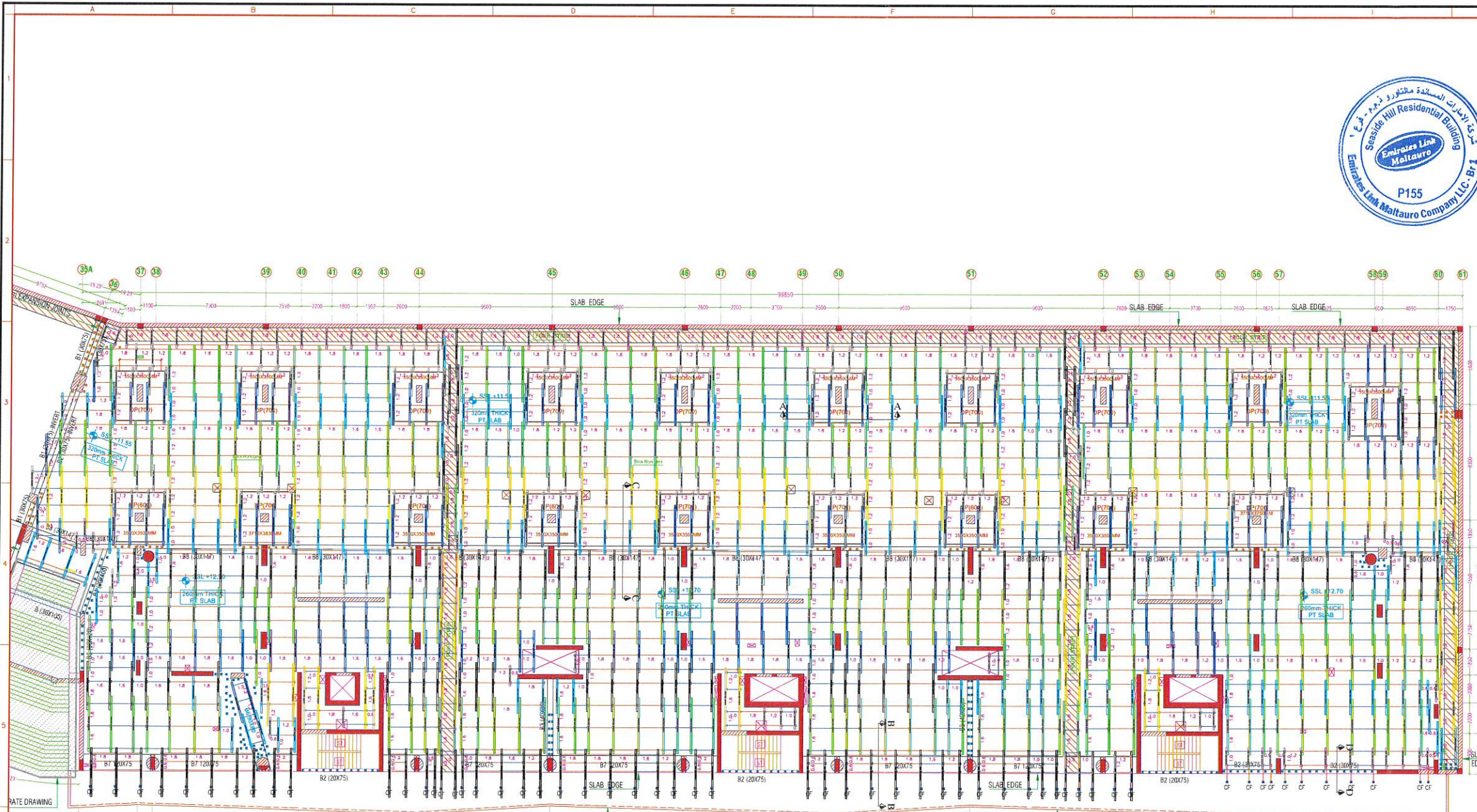
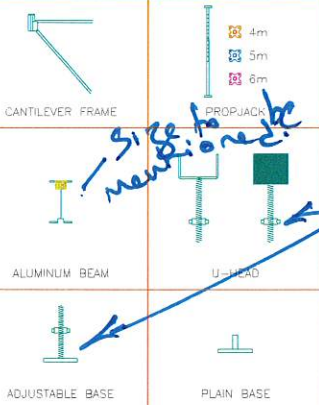
ALUMINUM BEAM



STANDARD TUBES



LEDGERS



FIRST FLOOR SLAB PRIMARY ALUMINIUM LAYOUT

Approved As Noted

** DA to ensure the work @ site is as per design.
* 3rd Party Certificate for safe erection/work completion required.*

** Contractor to provide cross bracing to provide Engineer's satisfaction*

19/09/2023



NOTE: 18mm PLYWOOD SHOULD BE USED IN ALL SLAB SHUTTERING.
NOTE: DIAGONAL BRACING PLACEMENT SHOULD BE ALTERNATE IN BOTH X,Y DIRECTION.
NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 40cm FOR 26CM SLAB.
NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR 32CM SLAB.
NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 30cm FOR DROP PANEL.
NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR BEAMS.
NOTE: L.D PROPS TO SUPPORT BEAMS SPACED AT 0.5m CENTER TO CENTER.

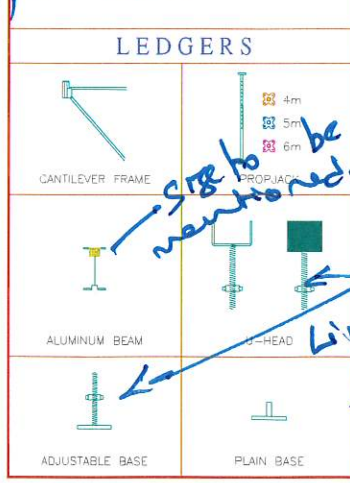
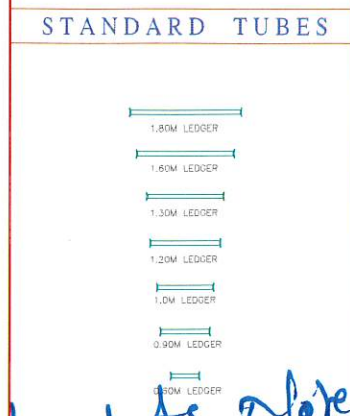
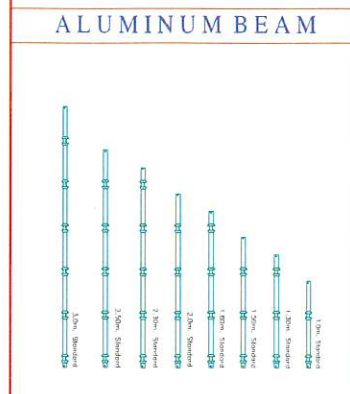
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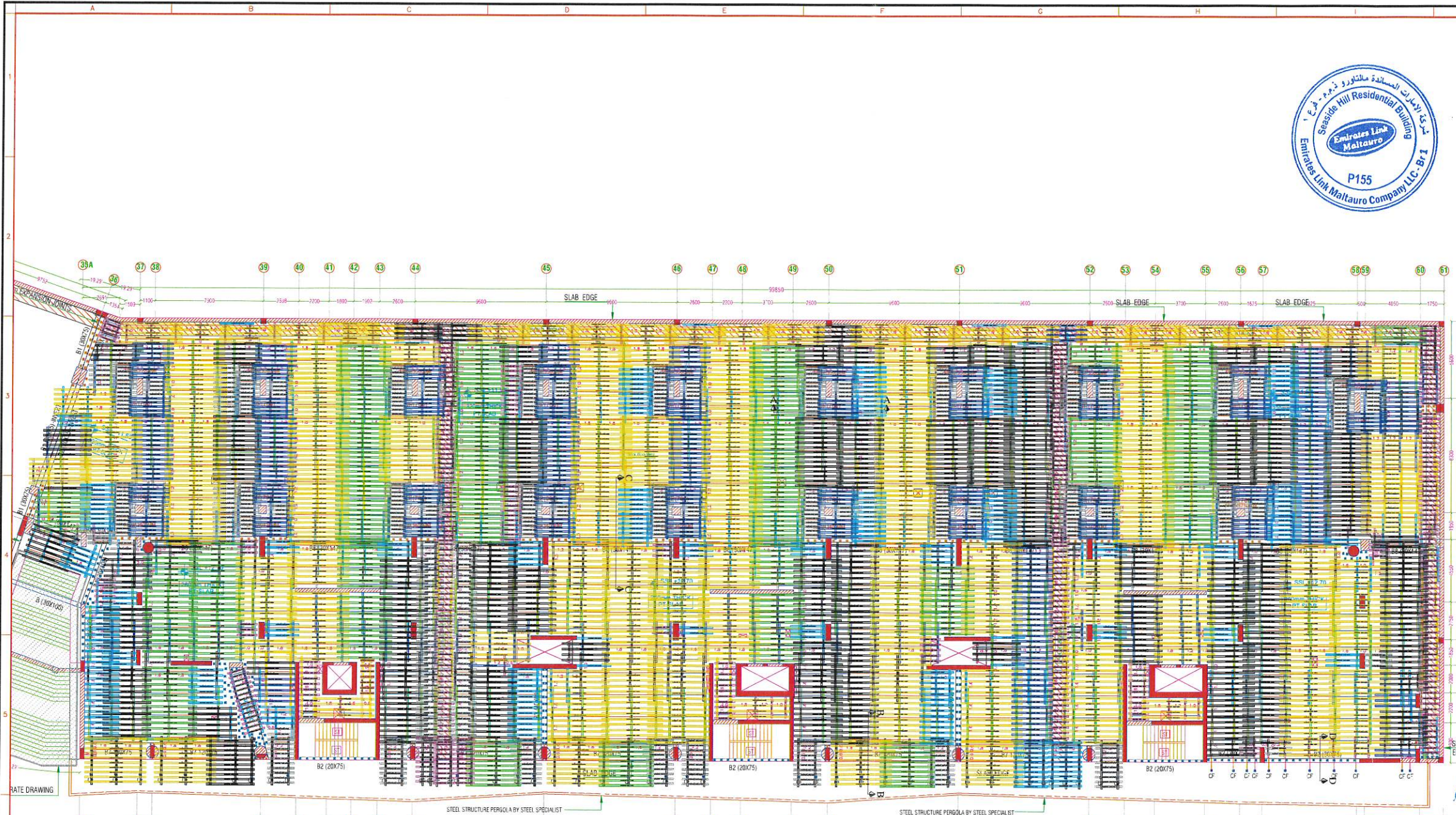
LEGEND:

Aluminum beam 1.00m	[Color swatch]
Aluminum beam 1.50m	[Color swatch]
Aluminum beam 2.00m	[Color swatch]
Aluminum beam 2.50m	[Color swatch]
Aluminum beam 3.00m	[Color swatch]
Aluminum beam 3.50m	[Color swatch]
Aluminum beam 4.00m	[Color swatch]
Aluminum beam 4.50m	[Color swatch]



Approved As noted.

Allowable Limit to be specified



FIRST FLOOR SLAB SECONDARY ALUMINIUM LAYOUT

** DA to ensure the work @ site is as per design*

** 3rd Party Certificate for safe erection*

** Contractor to provide cross bracing to Engineer's satisfaction.*

19/09/2023



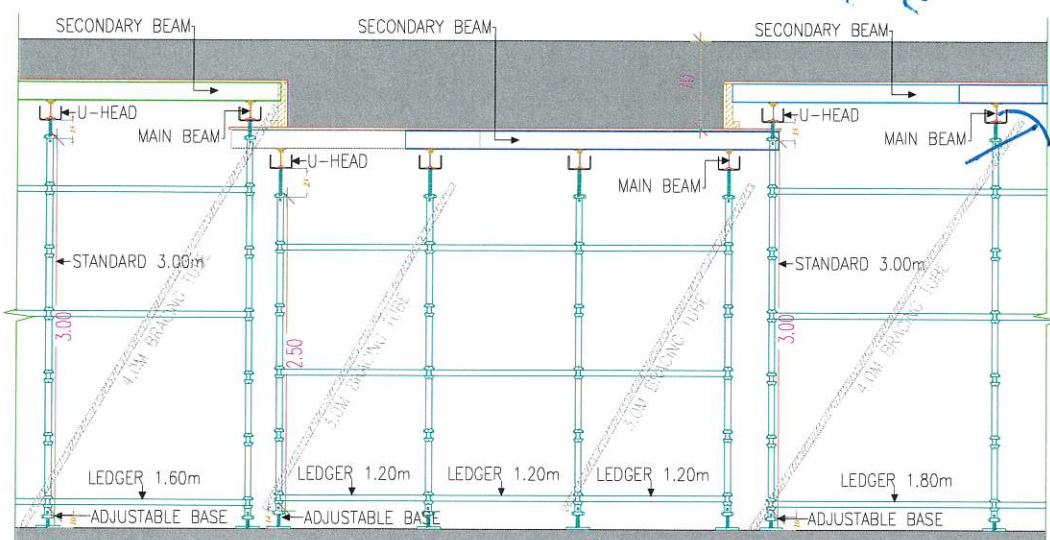
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 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR 32CM SLAB.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 30cm FOR DROP PANEL.
 NOTE: SECONDARY ALUMINIUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR BEAMS.
 NOTE: L.D PROPS TO SUPPORT BEAMS SPACED AT 0.5m CENTER TO CENTER.

<p>GENERAL:</p> <ol style="list-style-type: none"> THIS DRAWING IS NOT TO BE SCALED. ONLY THE WRITTEN DIMENSIONS TO BE FOLLOWED. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF 'DA' BEFORE COMMENCEMENT OF CONCRETING. SCAFFOLDING FOR MAKE-UP AREAS BY PROPS BY CONTRACTOR. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE NOTED. 	<p>CONTRACTOR:</p> <p>EMIRATES LINK CONTRACTING L.L.C</p>	<p>CONSULTANT:</p> <p>P.O.Box:13003, Ajman, UAE T: +971 6 744 8833 F: +971 6 7446511 E: info@proarc.ae www.proarc.ae</p>	<p>CLIENT:</p> <p>AL ZORAH DEVELOPMENT (PRIVATE) COMPANY LIMITED F.Z.C</p>	<p>SCAFFOLDING SUPPLIER:</p> <p>HEAD OFFICE: P.O. BOX 71957, DUBAI, UAE Tel: 00971 4 3337012 Fax: 00971 4 3337154 Email: desarchscalfolding@gmail.com</p> <p>BRANCH OFFICE: P.O. BOX 92269, ABU DHABI, UAE Tel: 00971 2 5538330 Fax: 00971 2 5538331 Email: desarchscalfolding@gmail.com</p> <p>BRANCH OFFICE: P.O. BOX 2611, AJMAN, UAE Tel: 00971 6 5396655 Fax: 00971 6 5396672 Email: desarchscalfolding@gmail.com</p> <p>BRANCH OFFICE: P.O. BOX 22099, SHARJAH, UAE Tel: 00971 6 5357788 Fax: 00971 6 5357788 Email: desarchscalfolding@gmail.com</p>	<p>PROJECT:</p> <p>PROPOSED G+6 BUILDING PLOT NO. 1431, ZORAH SECTOR ,ZORAH, UAE</p> <p>DRAWING TITLE:</p> <p>BLOCK 3 - ZONE E,F,G -FIRST FLOOR SLAB SECONDARY ALUMINIUM BEAM LAYOUT</p> <table border="1"> <tr> <th>DRAWING NUMBER</th> <th>REV</th> <th>SCALE</th> <th>DATE</th> <th>SIZE</th> </tr> <tr> <td>DBC/S/2023/1110C</td> <td>02</td> <td>NTS</td> <td>08-09-2023</td> <td>A1</td> </tr> </table>	DRAWING NUMBER	REV	SCALE	DATE	SIZE	DBC/S/2023/1110C	02	NTS	08-09-2023	A1
DRAWING NUMBER	REV	SCALE	DATE	SIZE											
DBC/S/2023/1110C	02	NTS	08-09-2023	A1											

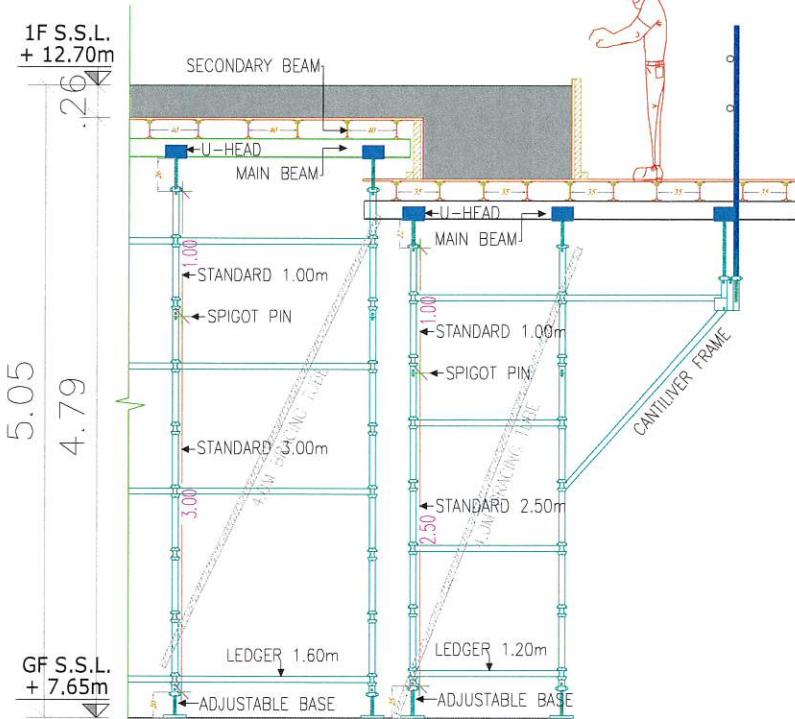
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size to be mentioned.

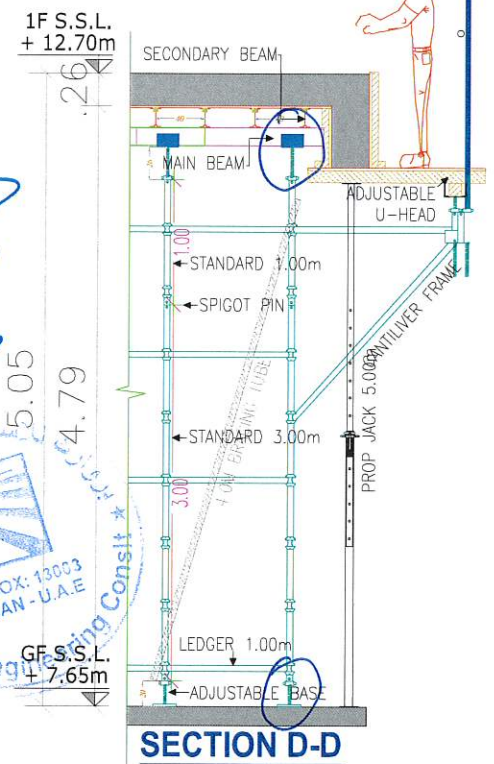
size to be mentioned



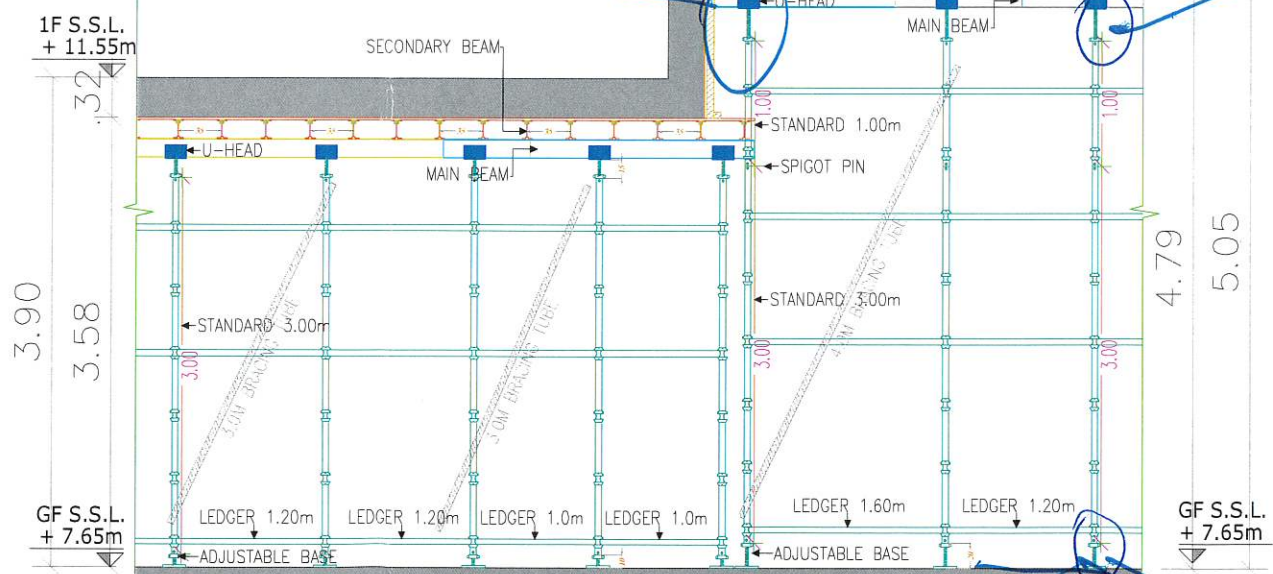
SECTION A-A



SECTION B-B



SECTION D-D



SECTION C-C

LEGEND:

Aluminum beam 1.00m	Aluminum beam 1.00m
Aluminum beam 1.50m	Aluminum beam 1.50m
Aluminum beam 2.00m	Aluminum beam 2.00m
Aluminum beam 2.50m	Aluminum beam 2.50m
Aluminum beam 3.00m	Aluminum beam 3.00m
Aluminum beam 3.50m	Aluminum beam 3.50m
Aluminum beam 4.00m	Aluminum beam 4.00m
Aluminum beam 4.50m	Aluminum beam 4.50m

ALUMINUM BEAM

STANDARD TUBES

1.80M LEDGER
1.60M LEDGER
1.30M LEDGER
1.20M LEDGER
1.00M LEDGER
0.90M LEDGER
0.80M LEDGER

LEDGERS

CANTILEVER FRAME

PROP JACK

size to be mentioned

ALUMINUM BEAM

U-HEAD

to be specified

ADJUSTABLE BASE

PLAIN BASE

Approved As Noted

19/09/2023



NOTE: 18mm PLYWOOD SHOULD BE USED IN ALL SLAB SHUTTERING.
 NOTE: DIAGONAL BRACING PLACEMENT SHOULD BE ALTERNATE IN BOTH X,Y DIRECTION.
 NOTE: SECONDARY ALUMINUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 40cm FOR 26CM SLAB.
 NOTE: SECONDARY ALUMINUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR 32CM SLAB.
 NOTE: SECONDARY ALUMINUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 30cm FOR DROP PANEL.
 NOTE: SECONDARY ALUMINUM BEAM MAXIMUM SPACING CENTER TO CENTER SHOULD BE 35cm FOR BEAMS.
 NOTE: L.D PROPS TO SUPPORT BEAMS SPACED AT 0.5m CENTER TO CENTER.

<p>GENERAL:</p> <ol style="list-style-type: none"> THIS DRAWING IS NOT TO BE SCALED. ONLY THE WRITTEN DIMENSIONS TO BE FOLLOWED. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF 'DA' BEFORE COMMENCEMENT OF CONCRETING. SCAFFOLDING FOR MAKE-UP AREAS BY PROPS BY CONTRACTOR. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE NOTED. 	<p>CONTRACTOR:</p> <p>EMIRATES LINK CONTRACTING L.L.C</p>	<p>CONSULTANT:</p> <p>proarc ARCHITECTS & ENGINEERING CONSULTANTS</p>	<p>CLIENT:</p> <p>AL ZORAH DEVELOPMENT (PRIVATE) COMPANY LIMITED F.Z.C</p>	<p>SCAFFOLDING SUPPLIER:</p> <p>DESARCH SCAFFOLDING</p>	<p>PROJECT:</p> <p>PROPOSED G+6 BUILDING</p> <p>PLOT NO. 1431, ZORAH SECTOR ,ZORAH, UAE</p> <p>DRAWING TITLE:</p> <p>BLOCK 3 - ZONE E,F,G -FIRST FLOOR SLAB SCAFFOLDING & ALUMINUM BEAM SECTIONS</p> <table border="1"> <tr> <td>DRAWING NUMBER</td> <td>REV</td> <td>SCALE</td> <td>DATE</td> <td>SIZE</td> </tr> <tr> <td>DBC/S/2023/1110D</td> <td>02</td> <td>NTS</td> <td>08-09-2023</td> <td>A1</td> </tr> </table>	DRAWING NUMBER	REV	SCALE	DATE	SIZE	DBC/S/2023/1110D	02	NTS	08-09-2023	A1
DRAWING NUMBER	REV	SCALE	DATE	SIZE											
DBC/S/2023/1110D	02	NTS	08-09-2023	A1											

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TRANSMITTAL LETTER			
Ref. No.: DT-P155-PROARC-0036	Job No.: 0036	Date:	23 Aug 2023
To	M/s. PROARC ARCHITECTS & ENG CONSULTANTS		
Attn.	Project Manager: Engr.Dhanyaraj Sadan	Ref.No.	Job No.
Subject	Calculation Sheet for Double Side Support of Wall 400 mm Thickness - Basement Floor Steel Waller System		
Project	SEASIDE HILL RESIDENTIAL BUILDING		
Further to your:	<input type="checkbox"/> Letter <input type="checkbox"/> Fax <input type="checkbox"/> Meeting <input type="checkbox"/> Telecon <input type="checkbox"/> E-Mail		

We are hereby enclosing the following:

- Drawings
 Diskettes
 Pre-qualifications
 Material submittal
 Other: Design Calculation

Document/ Drawing Ref No.	Description	No. of Sets	Status
ELM-P155-SD-CIV-0013 Rev.00	Calculation Sheet for Double Side Support of Wall 400 mm Thickness - Basement Floor Steel Waller System	01	



For your:

- Approval
 Coordination
 Action
 Comments
 Review & onward submission
 Reference
 Information

Further Details:

Approved As Commented
** Contractor to ensure the fixing at site is as per the approved design & shopdrawings*
** Design found generally Acceptable.*



Received the above document from proarc Engineering Consultant	
Sender	Receiver
Name : Project Manager: Engr. Muneer Attifi	Name :
Signature:	Signature: <i>[Signature]</i>
Date: 23/08/2023	Date: 24 AUG 2023



Calculation Sheet

for

Double Side Support of Wall 400 mm Thickness

Basement Floor

Steel Waller System

PROPOSED G+6 BUILDING

PLOT NO. 1431SEC: ZOHRAH, ZORAH, AJMAN

CONTRACTOR: **EMIRATES LINK MALTAURO L.L.C.**

CONSULTANT: **PROARC Architects & Engineering Consultants**

CLIENT: **AL ZORAH DEV. COMPANY LIMITED FZC**

DRAWING REFERENCE: **DBC/B/2023/3272-73**

Date: 14-AUGUST-2023

Regulations and Standards

- 1 – BS 5975: 1996, Formwork for Concrete
- 2 – BS: Formwork Guide to Good Practice 1995
- 3 – Plywood 18mm – Reference for Formwork Guide to Good Practice 1995 Page (38)
- 4 – BS 5975:2008 Code of Practice for Temporary Works Procedures & the permissible Stress Design
- 5 – SAP 2000: Structural Analysis Program.
- 6 – BS 5950-2000: Code of Design Steel in SAP 2000
- 7 – CIRIA REPORT CIRIA R108



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d. TIES: (TIE ROD DVD ϕ 16mm)	Page 05
e. TURNBUCKLE	Page 06
3. Design of Formwork Elements	
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b. Secondary H20 Beam	Page 9
c. Main Decking is Steel Waller.	Page 10 – 11
d. TIES: (TIE ROD DVD ϕ 16mm)	Page 12
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2 – Formwork Elements Design Data

1. Sheeting Plywood 18mm:

*Where values assumed are based on the **18mm. Thickness COFI – Form SP Plus or Equivalent** stated in the (formwork – A Guide to Good Practice)

Appendix A table D-S

For 1.00m Wide

$$A = 100 \times (1.8) = 180 \text{ Cm}^2$$

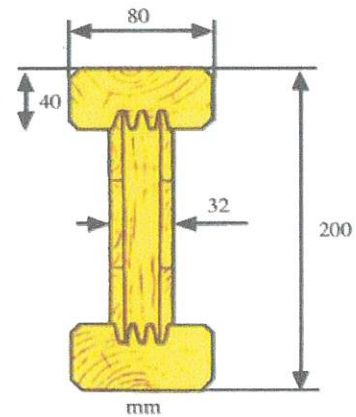
$$E I = 0.321 \text{ T.m}^2 / \text{m} \quad (\text{Attached Table page no.16})$$

$$M \text{ Resistance} = 0.060 \text{ T.M} \quad (\text{Attached Table page no.16})$$

$$Q \text{ Capacity} = 0.862 \text{ T} \quad (\text{Attached Table page no.16})$$

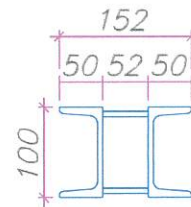
2. Secondary is H20 Beam:

- Allowable Bending Moment = 0.5 T.M
- Allowable Shear Force = 1.10 T
- Moment Of Inertia I = 4642 Cm⁴
- Modulus of Elasticity E = 100 T/Cm²

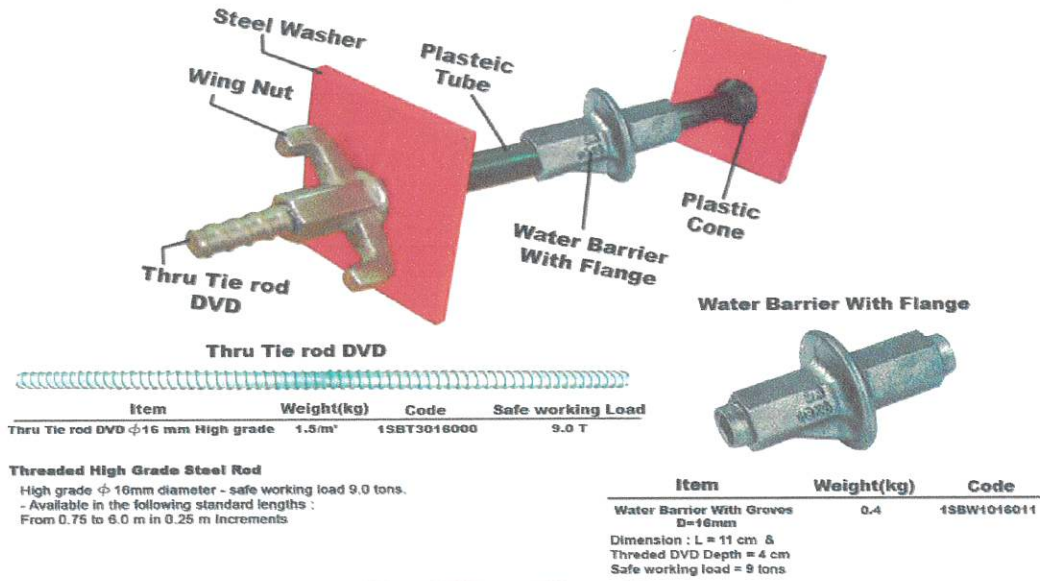


3. Main Decking is Steel Waller:

- Allowable Bending Moment = 1.14 T.M
- Allowable Shear Force = 10 T
- I (Moment of Inertia) = 412 Cm⁴
- E (Modules of Elasticity) = 2100 T/Cm²



4. TIES: (TIE ROD DVD ϕ 16mm):



❖ Tie Rods is subjected to only Axial force from concrete pressure

Allowable tensile force = 9.0 t

5. TURN BUCKLE (TUBE = 2.0" x 2.50mm):

- A = 4.716 cm²
- I = 19.668 cm⁴
- Z = 6.528 cm³
- i = 2.040cm

3- Design of Formwork Elements

*Design Loads

From CIRIA REPORT 108:

$$P_{\max} = D \times (C_1 \times \sqrt{R} + C_2 \times K \times \sqrt{H - C_1 \times \sqrt{R}}) \text{ or } DH \text{ t/m}^2 \text{ whichever is smaller.}$$

Where	C1	coefficient dependent on the size and shape of formwork
	C2	coefficient dependent on the constituent materials of the concrete
	D	weight density of concrete, t/m ³
	H	vertical form height, m
	h	vertical pour height, m
	K	temperature coefficient taken as $[36 / (T+16)]^2$
	R	the rate at which the concrete rises vertically up the form. m/h
	T	concrete temperature at placing, °C

$$\text{Max. Conc. Height} = H_{\text{SIDE}} = 3.925 \text{ m}$$

$$\text{Assumed Max. Rate of pour (R)} = 1.00 \text{ m/hr}$$

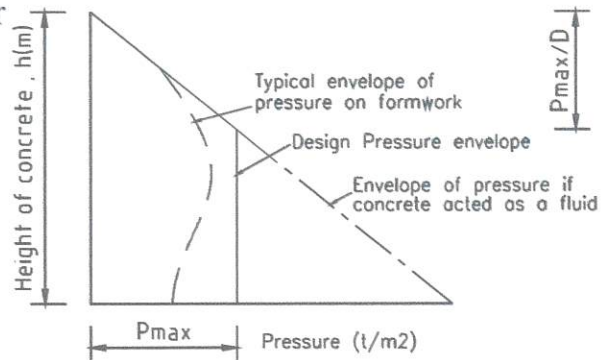
$$\text{Concrete temperature (T)} = 32.0 \text{ }^\circ\text{C}$$

$$K = [36 / (T+16)]^2 = 0.563$$

$$C1 \text{ (walls)} = 1.00$$

$$C2 = 0.45$$

$$D = 2.50 \text{ t/m}^3$$



$$P_{\max} = 2.5 \times (1.0 \times \sqrt{1.00} + 0.45 \times 0.563 \times 3.925 \sqrt{3.925 - 1.0 \times \sqrt{1.00}}) \text{ t/m}^2$$

$$\underline{P_{\max} = 3.60 \text{ t/m}^2}$$

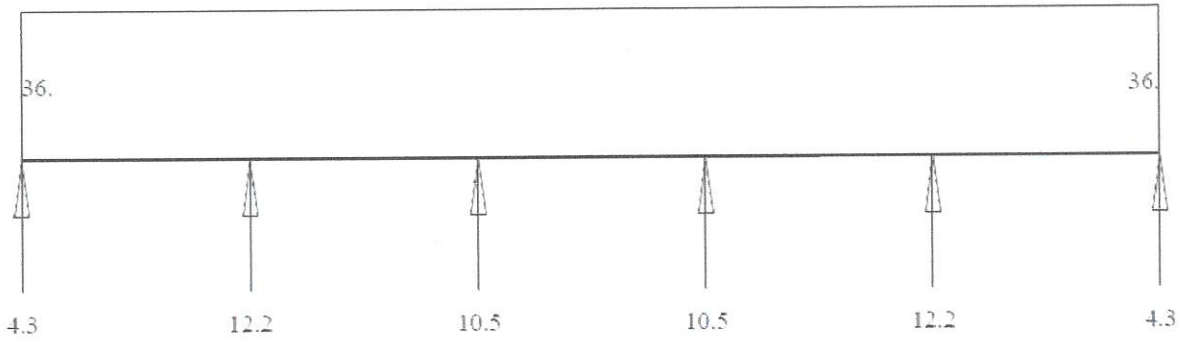
Sheeting Plywood 18mm:

The assumed plywood is 18mm thickness COFI – FORM plus or equivalent with the width of the bearers acting as secondary supporting the plywood is 80mm B width of H20 beam.

For a Strip 1m

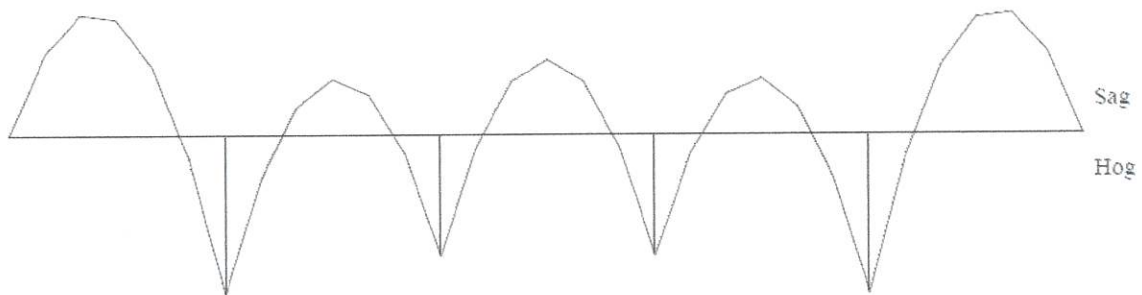
Assumed Spacing Between Sec. Beams = 30 Cm.

Noted that the width of the secondary beam is 8 cm



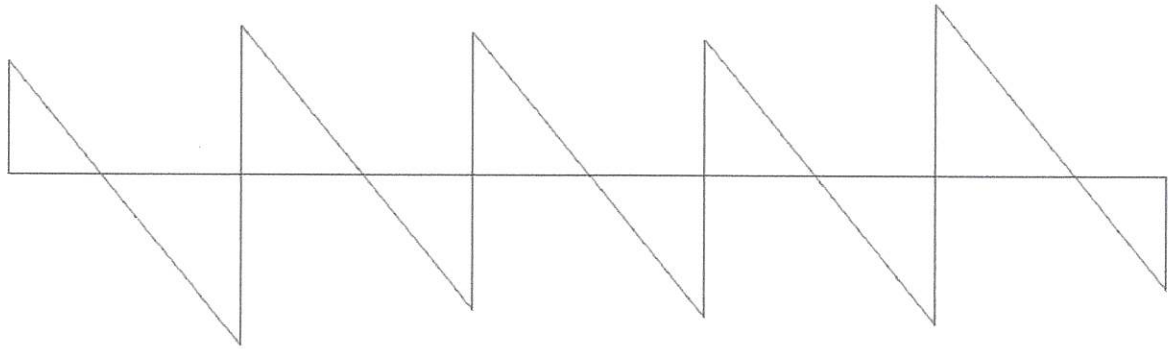
• Check for Moment:

BENDING MOMENT DISTRIBUTION - Max. Sag 0.3 kN.m - Max. Hog 0.3 kN.m



$$M = Wl^2/10$$

$$= 3.60 \times (0.30)^2/10 = 0.0324 \text{ T.M.} < 0.06 \text{ T.M.} \quad \text{Safe}$$

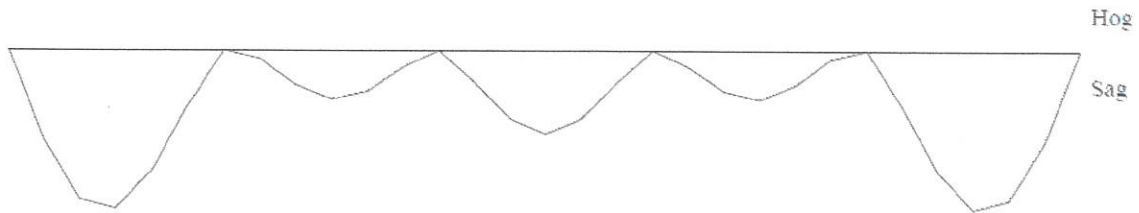


$$Q = 0.525 W (L-B)$$

$$= 0.525 \times 3.60 \times (0.30-0.08) = 0.416 T < 0.862 T \quad \text{Safe}$$

• Check for Deflection:

DEFLECTION DISTRIBUTION - Max. Sag 0.4 mm



$$D = 0.0068 Wl^4/EI$$

$$= 0.0068 \times 3.60 \times (0.30)^4 / 0.321$$

$$= 0.61 \text{ mm} < L/270$$

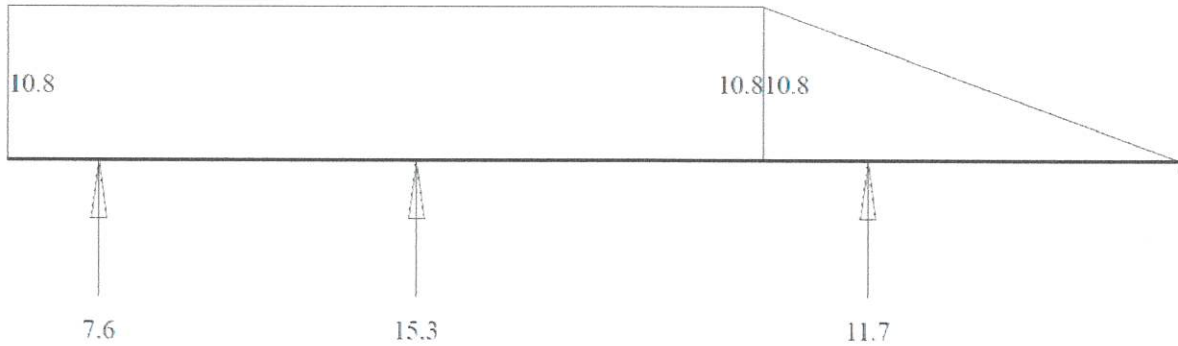
$$= 300/270$$

$$= 1.11 \text{ mm.} \quad \text{Safe}$$

*****Plywood will not work as cantilever**

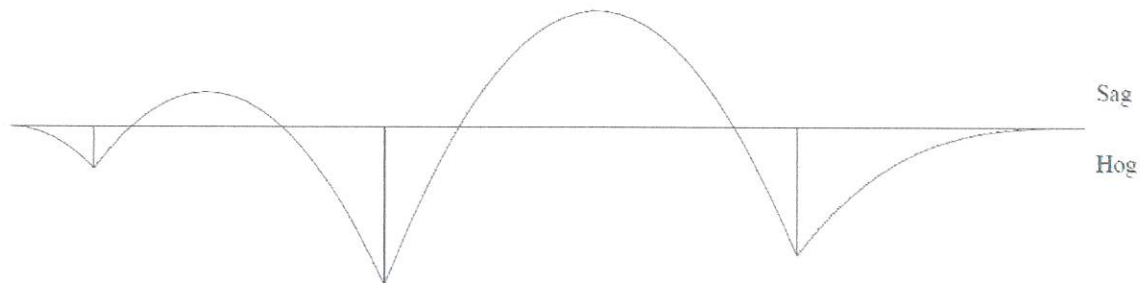
Secondary is H20 Beam:

Spacing Between Secondary Beams = 30 Cm
Span = as per steel waller spacing
 $W = 3.60 \times 0.30 = 1.08 \text{ T/M}$



• **Check for Moment:**

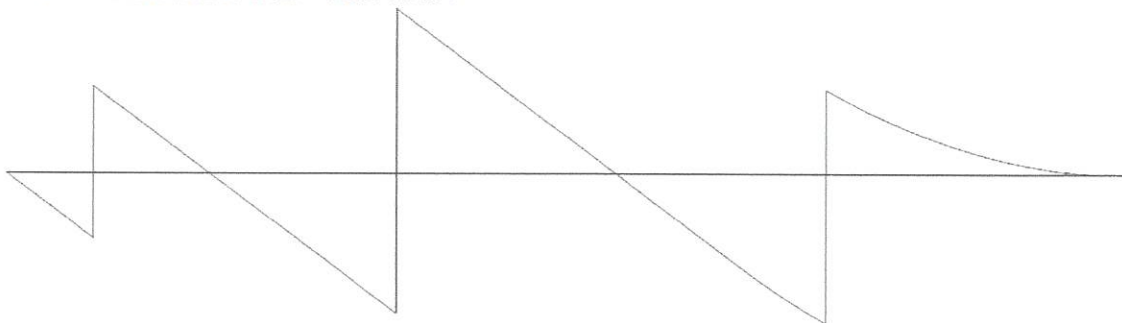
BENDING MOMENT DISTRIBUTION - Max. Sag 1.3 kN.m - Max. Hog 1.8 kN.m



$M = 0.18 \text{ T.M.} < 0.5 \text{ T.M.}$ **Safe**

• **Check for Shear:**

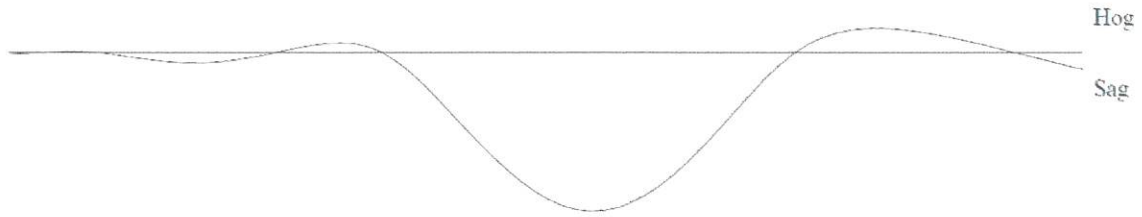
SHEAR FORCE DISTRIBUTION - Max. 8.3 kN



$Q = 0.83 \text{ T} < 1.10 \text{ T}$ **Safe**

• Check for Deflection:

DEFLECTION DISTRIBUTION - Max. Sag 0.5 mm - Max. Hog 0.1 mm



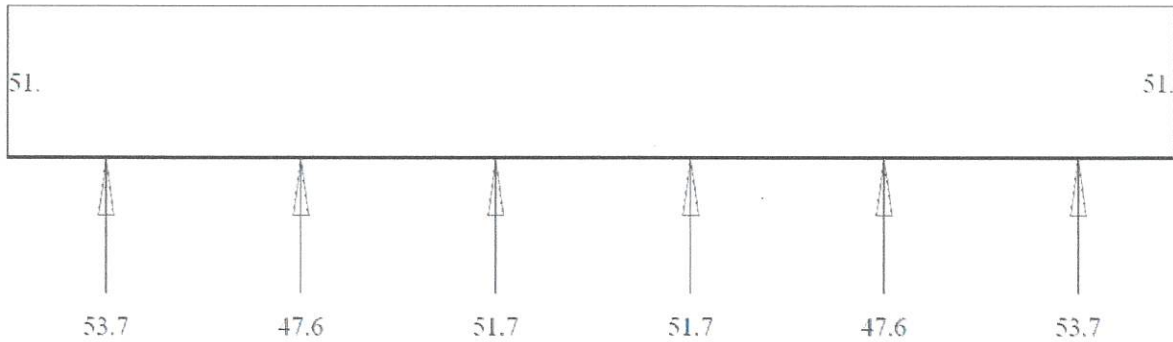
$D = 0.50 \text{ mm} < L/270 = 1500/270 = 5.55 \text{ mm.}$ **Safe**

Main Decking is Steel Waller:

Critical steel waller = the second steel waller

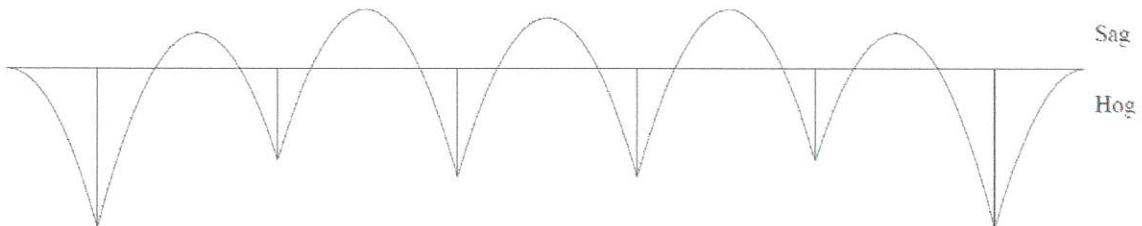
$W = \text{Max. Reaction on secondary / secondary spacing}$
 $= 1.53 / 0.30 = 5.10 \text{ T/M}$

$L_{\text{Main}} = \text{spacing between tie rod} = 1.00 \text{ M}$



• Check for Moment:

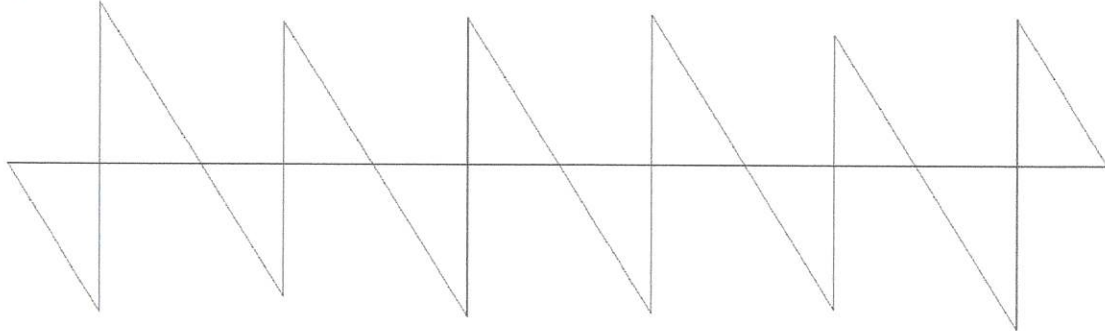
BENDING MOMENT DISTRIBUTION - Max. Sag 2.4 kN.m - Max. Hog 6.4 kN.m



$M = 0.64 \text{ T.M.} < 1.14 \text{ T.M.}$ **Safe**

• Check for Shear:

SHEAR FORCE DISTRIBUTION - Max. 28.2 kN

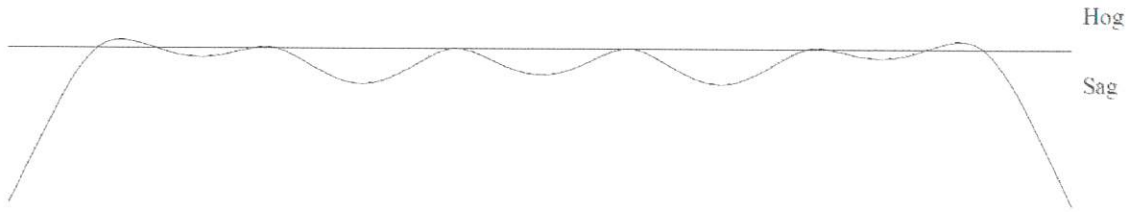


$Q = 2.82 T < 10 T$

Safe

• Check for Deflection:

DEFLECTION DISTRIBUTION - Max. Sag 0.8 mm - Max. Hog 0.0 mm



$D = 0.80 \text{ mm} < L/270 = 1000/270 = 3.70 \text{ mm.}$

Safe

TIES: (TIE ROD DVD ϕ 16mm):

• Load on Tie Rod:

$P = \text{Max. Reaction on Main}$
 $= 5.37 T < 9.0 T$ **Safe**

TURN BUCKLE (TUBE = 2.0" x 2.50mm):

For using turn buckle every 60 cm linear

HZ Load = 2.5% Dead Load BS5975 (attached page no. 22)

$$H = 2.5 \times (3.925 \times 1.40 \times 0.60) / 100 = 0.082 \text{ t}$$

For using 2 turn buckle one on angle 6 and the other on angle 59

The critical one on angle 59

$$F = 0.082 / 2 / \cos 59 = 0.08 \text{ t}$$

$$L = 3.118 \text{ m}$$

$$\lambda = \frac{L}{i} = (311.8 / 2.04) = 152.8 > 100$$

$$F_{\text{all}} = 7500 / \lambda^2 = 0.32 \text{ t/cm}^2$$

$$F_{\text{act}} = \frac{P}{A}$$

$$= 0.08 / 4.71$$

$$= 0.017 \text{ t/cm}^2 < 0.32 \text{ t/cm}^2 \quad \text{Safe}$$

4 – Used Tables and Formulas

Table D – 5. Working structural properties of sheet materials from trade associations and suppliers, general and SOFFIT formwork.

PERMISSIBLE STRESSES	Source	Plywoods (Note 2)									Expanded Metal		
		Finnish 18 mm			Canadian US 17.5 mm			US 17.5mm			English		
		UKM Symmetric Data tables (Note 2)			- MATT			APA – The Engineered Wood Association			Exoform Building Products		
General and SOFFITS	Take from other manufacturers' data tables (Note 2)	WISA Form Deck through	Minor Construction Deck and aprone	Spanco through	OSB-4/OSB-3/Plus 17.5mm	Mixed softwood Species 17.5mm	Exogrip F+ G+ 19mm	American Group 1 Exterior	American Hardwood or Group 1 Exterior	American Group 1 Exterior	Hy-Red Designers Guide December 2004		
		Hy-Red form deck	Hy-Red form deck	7-ply overleaf	7-ply overleaf	7-ply overleaf	7-ply overleaf	7-ply overleaf	7-ply overleaf	7-ply overleaf	Grade 2411	Grade 2611	Grade 2811
Bending stresses (0.33 mm/m)	Parallel Perpendicular	3/16 2/34	2/30 2/30	2/36 1/21	3/21 1/70	3/30 1/59	2/25 1/55	2/74 1/15	2/63 1/61	3/15 1/41	1/94 1/62	2/51 1/62	2/60 1/62
Alignment of resistance (1% deflection)	Parallel Perpendicular	0/902 0/766	0/708 0/568	0/488 0/292	0/603 0/439	0/577 0/427	0/515 0/277	0/526 0/277	0/644 0/323	0/484 0/297	0/491 0/287	0/387 0/244	0/344 0/244
Shear load (Base C (0.33 mm/m))	Parallel Perpendicular	1489 1405	9/55 14/03	3/41 4/57	8/62 1/66	6/62 1/44	6/58 1/44	9/28 8/14	8/46 8/46	8/46 8/46	9/97 7/86	7/86 5/44	5/44 5/44
Thickness (mm)		17.6	17.6	17.6	17.2	17.0	18.5	17.2	17.0	16.1	17.5	17.0	16.1
Estimated weight (kg/m ²)		12.0	10.2	8.1	11.90	8.7	10.0	11.5	10.0	10.7	6.84	4.23	3.89
Trade names		WISA Form Deck	WISA Form Deck	Spanco M20 WSA-Form 18	OSB-4/OSB-3/Plus 17.5mm	Hy-Red/Exogrip	Exogrip G15	Exoform 431	Exoform Class	Exogrip B-Mat	Hy-Red 311	Hy-Red 301	Hy-Red 291

- Notes to Table D – 5:
- Direction of force perpendicular to span indicates the disposition of the plywood formwork relative to the supporting structure and not relative to its orientation on the panel. See Figure 3A.
 - The working properties for plywoods were submitted by the trade associations for general use only. Formwork for wet end use where none stated marked as such.
 - The working properties for Expanded Metal were submitted by the supplier.
 - The span span for plywoods includes the 75 allowance for the parabolic distribution of the steel sheets. See Section 4.1.2.2.2.2.2.
 - The span span for expanded metal includes the 75 allowance for the parabolic distribution of the steel sheets.

Appendix D. Structural properties of sheet materials.

Case condition	Moment (kNm)	Reaction (kN)	Shear force (kN)	Deflections	
				Distance from A	Value (m)
S7 	$M_1 = M_2 = -3.281 PL$ $M_3 = M_4 = -0.211 PL$ $M_5 = M_6 = 0.240 PL$ $M_7 = M_8 = 0.107 PL$ $M_9 = 0.132 PL$	$R_1 = R_2 = 1.719 P$ $R_3 = R_4 = 3.331 P$ $R_5 = R_6 = 2.869 P$	$V_1 = V_2 = -0.72 P$ $V_3 = V_4 = -1.28 P$ $V_5 = V_6 = +1.02 P$ $V_7 = V_8 = -0.95 P$ $V_9 = V_{10} = 1.00 P$	0.4421 1.973 1.533 2.504 -	$\delta_{1a} = 0.0183 \frac{PL^4}{EI}$ $\delta_{1b} = -0.00610 \frac{PL^4}{EI}$ $\delta_{1c} = 0.03484 \frac{PL^4}{EI}$ $\delta_{1d} = 0.00916 \frac{PL^4}{EI}$ $\delta_{1e} = 0.0186 \frac{PL^4}{EI}$
S8 Formwork use only; face contact material continuous over four or more supports with $L < 610$ mm and width of support B wider than $2t$ 	$M_1 = -0.395 wL$ $M_2 = 0.385 wL$	$R_1 = 0.3 wL$ $R_2 = 1.0 wL$	$V_1 = V_2 = V_3$ $= -0.525 wL$	-	Approximate $\delta_{1a} = 0.0066 \frac{wL^4}{EI}$ Approx $\delta_{1b} = 0.00491 \frac{wL^4}{EI}$

Appendix B.3 Typical loading cases

horizontal forces on the opposing formwork surfaces may be resisted within the formwork system by tying opposite faces together. Where the opposite faces are not adequately tied together, the lateral forces will be transferred either to the falsework or through the soffit formwork acting as a plate, see 19.3.2.4. It is important that individual formwork panels forming the soffit are also adequately restrained against separation by horizontal forces.

Where the soffit is not level, the concept is more complex and is discussed in Annex H.

19.2.7 Water and wave forces

Where falsework is subjected to water and wave forces, these should be evaluated as outlined in 17.5.2.

19.2.8 Dynamic and impact forces

The effects of dynamic and impact forces on falsework should be evaluated and allowed for in the design. The magnitude of such forces is given in Clause 4. Where possible, such impact forces should be minimized or avoided (see 17.4). It is always preferable to prevent accidental impacts from occurring rather than to strengthen the falsework to resist them.

The dynamic effects from concrete pumping should also be considered [see 17.4.3.4e)].

19.2.9 Notional lateral forces to be considered

19.2.9.1 Minimum stability

To ensure the lateral stability of general falsework structures, including beam grillages, they should be designed to be able to resist, at each phase of construction, the applied vertical loads (W) and a horizontal disturbing force F_d , which is the greater of:

- 2.5% of the applied vertical loads (i.e. 2.5% W) considered as acting at the points of contact between the vertical loads and the supporting falsework; or
- the forces that can result from erection tolerances (normally taken as 1% of the applied vertical load (i.e. 1% W), refer to 19.2.4) plus the sum of other imposed loads, including wind, out of vertical by design, concrete pressures, water and waves as described in 19.2.7, dynamic and impact forces as described in 19.2.8, and the forces generated by the permanent works as described in 19.2.10.

NOTE The term F_d is used in the text and figures which follow. The term R_d is used to denote the reaction that resists F_d .

19.2.9.2 Node point stability

Within falsework structures the effective lengths of members, as struts, may be reduced by introducing points of restraint within the length of the strut. A point of restraint will normally be achieved where there is lacing or bracing in two directions to that point, usually called a node point. Each level of lacing and associated diagonal bracing should be capable of resisting a notional force, denoted by M_d ,

5 – Material Manufacturer Data and Tests

MR BLAKE

JIANGSU LANDISI WOOD CO., -LTD

GUANHU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA

TEL: +86-516-86919099, FAX: +86-51682869999.

PACKING LIST

DATE: MAY 1, 2018

INVOICE NO.: LDSC180401/2

THE CREDIT NUMBER: 40011ML201800739

TO: CICON BUILDING MATERIALS.

P.O. BOX 660, ABU DHABI, U.A.E.

FROM LIANYUNGANG PORT, CHINA

TO JEBEL ALI PORT, U.A.E.

DESCRIPTION OF GOODS	QUANTITY	CRATES	SHEETS	G.W	N.W
----------------------	----------	--------	--------	-----	-----

BOTH SIDES PRINTED IN GOLD "INDONESIA" BRAND, FILM FACED PLYWOOD, COMBI CORE, WBP PHENOLIC GLUE, IMPORTED BROWN DYNEA FILM, GLOSSY SURFACE, ALL EDGES SEALS AND PAINTED WITH DARK BROWN COLOUR WATER PROOF PAINT.

SIZE: 4' X 8' X 18 MM (13-PLY)

525.19CBM 280CRATES 9800SHEETS 285000KGS 280000KGS

PRICE AS PER SALE CONTRACT NO. DUB/0121/18 DATED 21ST MARCH 2018 OF TRANSCONTINENTAL INDENTING CO. (L.L.C), DUBAI.

SHIPPING MARKS: ON FOUR SIDES OF THE CRATE HAVE BEEN MARKED AS FOLLOWS:

"INDONESIA" FILM FACED PLYWOOD, WBP PHENOLIC GLUE SIZE: 18MM X 1220MM X 2440MM (13) PLY CICON/ABU DHABI INDONESIA

TOTAL: 525.19CBM 280CRATES 9800SHEETS 285000KGS 280000KGS

PACKING: EXPORT STANDARD IN STRONG SEAWORTHY WOODEN CRATES, CRATES COVERED WITH THICK PLYWOOD AND POLYTHENE HAVING 5 PLY TIGHTLY TIED WITH 7 IRON BOUND STRIPS, 35 SHEETS PER WOODEN CRATE.

NUMBER OF SHEETS IN EACH CRATE: 35 SHEETS

TOTAL NUMBER OF SHEETS: 9800SHEETS

TOTAL NUMBER OF CRATES: 280CRATES

WE CERTIFY THAT FOREST STEWARD CHIP CERTIFICATE NUMBER HAS BEEN CLEARLY MENTIONED ON EACH AND EVERY CRATE.

WE CERTIFY THAT THE WORD "INDONESIA" TO APPEAR ON TWO SIDES OF THE EACH AND EVERY SHEET.

江苏兰蒂斯木业有限公司
JIANGSU LANDISI WOOD CO., LTD.

兰蒂斯



CERTIFICATE
Number: BV-COC-097420

Issued April 20th, 2018
Valid until April 20th, 2023

Bureau Veritas Certification certifies that **JIANGSU LANDISI WOOD CO., LTD**
has implemented a FSC product control system according to the Forest Stewardship
Control certification system, in the following location:

JIANGSU LANDISI WOOD CO., LTD
GUANHU TOWN, NIZHOU CITY, JIANGSU PROVINCE, CHINA
221405 - 3921050 - CHINA

for its activities concerning:
Manufacturing and sales of plywood certified FSC 100%
Certified to FSC® C0C-COC-1373 (FSC® C0C-1373)

This company has been assessed and found to conform to the requirements of the
FSC Chain of Custody standard, Ref.: FSC-COC-1373, v. 2.1

This certificate is valid for a 5 years period.

THE CREDIT NUMBER: 40011M201800739

April 20th, 2018
FSC GLOBAL HEADQUARTERS
3000 Central Expressway
Foster, CA 94504, USA



The validity of this certificate shall be subject to the following conditions:
The certificate holder does not constitute a system that is part of a system certified
by an authorized body as FSC-COC or FSC-COC-1373. The certificate holder is not
allowed to use the FSC logo or other FSC marks on its products, services or
processes of sale, distribution, sales and marketing, unless it is certified to do so
with the appropriate FSC Chain of Custody certification.

Management of the Bureau Veritas Certification system
A list of the products or services and the locations of the sites of the
certificate holder shall be available to Bureau Veritas Certification at
all times. The certificate holder shall be subject to periodic audits by
Bureau Veritas Certification and the Bureau Veritas Certification system
shall be subject to periodic audits by Bureau Veritas Certification.

The validity of this certificate shall be subject to the following conditions:
The certificate holder does not constitute a system that is part of a system certified
by an authorized body as FSC-COC or FSC-COC-1373. The certificate holder is not
allowed to use the FSC logo or other FSC marks on its products, services or
processes of sale, distribution, sales and marketing, unless it is certified to do so
with the appropriate FSC Chain of Custody certification.



JIANGSU LANDISI WOOD CO., LTD

GUANHU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA

TEL: +86-516-86919099, FAX: +86-51682869999.

TECHNICAL DATA SHEET

DATE: MAY 1, 2018

INVOICE NO.: LDSC180401/2

THE CREDIT NUMBER: 4001IML201800739

PRODUCT NAME: BOTH SIDES PRINTED IN GOLD "INDONESIA" BRAND, FILM FACED PLYWOOD, COMBI CORE, WBP PHENOLIC GLUE, IMPORTED BROWN DYNEA FILM, GLOSSY SURFACE, ALL EDGES SEALS AND PAINTED WITH DARK BROWN COLOUR WATER PROOF PAINT.

Technical Specifications					
Characteristics	Unit of Measure	Test Method	Value	Result	
Moisture Content	%	En 322	10	Approved	
Density	Kg/m ³	En 323	600	Approved	
Longitudinal Module of Elasticity	Mpa	En 310	6100	Approved	
Lateral Module of Elasticity	Mpa		4800	Approved	
Longitudinal Bending Strength(N/mm)	Mpa	En 310	55.01	Approved	
Lateral Bending Strength(N/mm)	Mpa		43.01	Approved	
Bonding	Bonding quality	Mpa	En 314	Max:1.72 Min:0.85	Approved
Data sheet of WBP (Phenolic) GLUE					
Test item	Test result	standard			
Appearance	Red Tansparent liquid	Red Tansparent liquid			
Solid content %	35.9%	30.8%-40.6%			
Viscosity cp	72	60~100			
Solid time sec	1050 s	900~1200s			
PH	11.2	10~12			
Hydromete	1.076	1.018~1.198			

JIANGSU LANDISI WOOD CO., LTD.

GUANHU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA

TEL: +86-516-86919099, FAX: +86-51682869999.

MILL TEST CERTIFICATE

PRODUCT NAME: BOTH SIDES PRINTED IN GOLD "INDONESIA" BRAND, FILM FACED PLYWOOD			CONTRACT: CICON BUILDING MATERIALS.	
TESTED DATE	MAY 1, 2018	ITEM	THICKNESS	COLOR
ORDER	CICON BUILDING MATERIALS.	FACE	1.10	W
STANDARD TEST	GB/T 17656-2008	CORE	1.71	B
DIMENSION	18.0mmX4'X8'	CORE	1.66	W
GLUE TYPE	WBP GLUE	CORE	1.70	B
WOOD KIND	COMBI	CORE	1.75	W
MOIST CONTENT	10.0%	CORE	1.70	B
NUMBER OF SAMPLE	1	CORE	1.75	W
SAMPLE TEST	1	CORE	1.66	W
		CORE	1.75	B
		BACK	1.17	W
ITEM	UNIT	VALUE OF TEST		JUDGEMENT
DENSITY	KG/M3	600		PASSED
BONDING QUALITY	Mpa	0.85-1.72		PASSED
	%	90%samples>=0.70Mpa		PASSED
MODULES OF ELASTICITY	Longitudinal	Mpa	6100	PASSED
	Lateral		4800	PASSED
BEND STRESS	Longitudinal	Mpa	55.01	PASSED
	Lateral		43.01	PASSED
REMARK: HOT PRESS: 930 TEMPERATURE : 135℃ PRESS GAUCE: 10 kg/cm3 DATE: MAY 1, 2018 INVOICE NO.: LDSC180401/2 THE CREDIT NUMBER: 40011ML201800739 SHIPPING MARKS: ON FOUR SIDES OF THE CRATE HAVE BEEN MARKED AS FOLLOWS: "INDONESIA" FILM FACED PLYWOOD, WBP PHENOLIC GLUE SIZE: 18MM X 1220MMX 2440MM (13) PLY CICON/ABU DHABI INDONESIA THE VESSEL NAME: CAPE KORTIA 007W JIANGSU LANDISI WOOD CO., LTD VERY TRULY YOURS JIANGSU LANDISI WOOD CO., LTD				



中华人民共和国出入境检验检疫
ENTRY-EXIT INSPECTION AND QUARANTINE
OF THE PEOPLE'S REPUBLIC OF CHINA

正本
ORIGINAL

第1页, 第1页 Page 1 of 1

植物检疫证书
PHYTOSANITARY CERTIFICATE

编号 No.: 318000001623546001

发货人名称及地址 Name and Address of Consignor	JIANGSU LANDISI WOOD CO., LTD GUANHEU TOWN, PIZHOU CITY, JIANGSU PROVINCE, CHINA TEL: +86-516-86212039, FAX: +86-516-8699299		
收货人名称及地址 Name and Address of Consignee	CICON BUILDING MATERIALS, P.O. BOX 589, ABU DHABI, U.A.E		
品名 Name of Produce	植物学名 Botanical Name of Plants	***	
报检数量 Quantity Declared	**578.19CBM	标记及号码 Mark & No.	
包装种类及数量 Number and Type of Packages	**280CRATES	SEE REMARKS 1	
产地 Place of Origin	XUZHOU, CHINA		
到达口岸 Port of Destination	JEBEL ALI, U.A.E		
运输工具 Means of Conveyance	BY VESSEL	检验日期 Date of Inspection	08 May 2018

兹证明上述植物、植物产品或其他检疫物已经按照规定程序进行检查和/或检验，被认为不带有输入国或地区规定的检疫性有害生物，并且基本不带有其他的有害生物，因而符合输入国或地区现行的植物检疫要求。
This is to certify that the plants, plant products or other regulated articles described above have been inspected and/or tested according to appropriate procedures and are considered to be free from quarantine pests specified by the importing country/region, and practically free from other injurious pests; and that they are considered to conform with the current phytosanitary requirements of the importing country/region.

杀虫和/或灭菌处理 DISINFESTATION AND/OR DISINFECTIION TREATMENT

日期 Date	***	药剂及浓度 Chemical and Concentration	***
处理方法 Treatment	***	持续时间及温度 Duration and Temperature	***

附加声明 ADDITIONAL DECLARATION
REMARKS: 1. ON FOUR SIDES OF THE CRATE HAVE BEEN MARKED AS FOLLOWS:
"INDONESIA"
"FILM FACED PLYWOOD."
CREDIT NUMBER: 4001116.201800739
WBP PHENOLIC GLUE
SIZE: 18MM X 1230MM
Y 2440MM (13) PLY
CICON/ABU DHABI
INDONESIA



签证地点 Place of Issue XUZHOU, CHINA 签证日期 Date of Issue 08 May 2018

授权签字人 Authorized Officer WU SHEN 签名 Signature 

中华人民共和国出入境检验检疫机关及其官员或代表不在此证书上签字的任何声明任其自行承担法律责任。本证书不附带任何检疫性有害生物。
Inspection and Quarantine Authorities of the P. R. of China or its officials or representatives shall not be held responsible for any statement made on this certificate which is not signed by them. This certificate shall not be accompanied by any quarantine pests.

[e-S-C(2000) 1 (1)]



RIVET PIN & SPRING CLIP



إحدى شركات استثمار رأس المال العربي والأجنبي



Technical Report

RIVET PIN 17MM

* Allwable Double Shear force for RIVET PIN 17MM is **8.0 ton**

Approved:

Head Of Technical Sector

Eng. Mostafa Sabry



Housing and Building National Research Center
Building Materials Research & Quality Control Institute



مركز البحوث والدراسات الإسكانية

المعهد القومي للبحوث والدراسات الإسكانية

Shear Test Results on Rivet Pin & Spring Clip

Client: Acrow Misk

Delivery No. : 1140

Project : ———

Delivery Date: 12/5/2009

Specimen Code: MFL/S1/2009/264

Additional information : ———

Specimen No.	Ultimate load (kN)	Factor of safety	Working load (kN)
1	108.5	1.5	72.33
2	111.0	1.5	74.00
3	113.0	1.5	75.33

Specimen Shape:



Before testing

Page 1 of 2

83 El-Lahem St. Dokki, Giza, P.O. Box 1770
Tel: 90213356/222-3156/853 Fax: 3311564
www.hbrc.edu.eg

مركز البحوث والدراسات الإسكانية
المعهد القومي للبحوث والدراسات الإسكانية

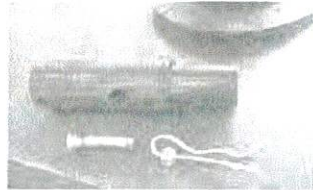
Housing and Building National Research Center
Building Materials Research & Quality Control Institute



Failure of specimen no. 1



Failure of specimen no. 2



Failure of specimen no. 3

Notes :

- The above information is according to the client's letter .
- The factor of safety is given by the client.
- The above results are valid only for the Samples delivered by the client .



Prepared by
Eng. Ghada Diaa
Eng. Ranyeha El-Samer

Supervisor
Dr. H. Karamy

Head of Institute
Prof. Dr. Sayed Abd-El Baky

Page 2 of 2

87 El-Talzeel St. Dokki Giza P.O. Box 1770
Tel: 40213316722-3356853 Fax: 3351564
www.abrc.eg

شارع التحرير، حي الدقي، الجيزة ١١٧٠١
تليفون: ٤٠٢١٣٣١٦٧٢٢-٣٣٥٦٨٥٣ فاكس: ٣٣٥١٥٦٤



TIE ROD



إحدى شركات استثمار رأس المال العربي والأجنبي



Metallic Scaffolding - Formwork
Steel Structure, Storage & Shelving Systems



للشركات والمقاولات المعدنية
مشاتل معدنية - أنظمة تجهيزات المخازن

Design Department Technical Report


According to the attached test report of:

Tie Rod DVD Imported

D=15mm

It is recommended that:

Allowable tensile force (T) = 9.0ton

Approved:
Eng. 
M. Sabry

Head Office & Factories : Wady Houf - Helwan - Cairo Tel: 02/239 90 816 - 236 90 739
Tel: 36 95 700 (10 Lines) Fax: 236 95 260
Alexandria: 27 - Dr. Mahmoud Dawod St. - Customs Building - Smouha Telex: 03/ 42 00 489
Port Said: El Freeport Building Tel: 066/ 32 32 542

الإدارة والمصانع: وادي حوف حلوان
تليفون: ٣٣٦٩٥٠٠ (١٠ خطوط) فاكس: ٢٣٦٩٥٦٠
الإسكندرية: ٢٧ شارع د. محمود داود - عمارة الجمارك - سموحة ت. وفاكس: ٠٣/٤٢٠٠٤٨٩
بورسعيد: عمارة الفريبور تليفون: ٠٦٦/٣٢٣٢٥٤٢

Internet: www.acrowmiser.com E-mail: info@acrowmiser.com E-mail: sales@acrowmiser.com E-mail: Design@acrowmiser.com



Housing & Building National Research Center
Building Materials Research & Quality Control Institute.



Tensile Test Results of "Tie Rod" Samples

Client: ACROWMISK
Project: -----
Code No. : MTLAST\2008\103

Delivery Date: 13/5/2008
Delivery No. : 789
Additional Info: Tie Rod Samples
صليب ترمسيون لؤ سن بوليداج هندی

PROPERTY		Sample NO.		
		1	2	3
Nominal Size	(mm)	16	16	16
Nominal Area	(mm ²)	201.06	201.06	201.06
Sample Length	(mm)	350.22	349.16	350.63
Sample Mass	(gm)	524	524	525
Mass per meter run	(Kg/m)	1.496	1.501	1.497
Initial Gauge Length	(mm)	160	160	160
Final Gauge Length	(mm)	161.48	166.64	163.87
Ultimate Load	(KN)	149.20	147.60	147.50
Tensile Strength	(N/mm ²)	742.06	734.11	733.61
Elongation	%	---	4.15	---

NOTES:

- Tests were carried out as per ESS76/2001 Specification.
- Tested samples didn't show any yield
- Fracture occurred in the gauge length for specimen 2 only.
- The above results are valid only on the samples delivered.
- The above information is according to the client's letter.

Prepared by
Eng. Fatma Al Zahra

Supervisor
Dr. Hamed

Head of Institute
Dr. Heba Bahrawy
14/5/2008

Prof. Dr. Heba Hamed Bahrawy

87 El-Tahreer St. Dokki Giza P.O. Box 1770
Tel. (02)3356722-3356853 Fax: 3351564
www.hbrc@hbrc.uot.eg

٨٧ شارع التحرير - العلي ص.ب.: ١٧٧٠٠
تلپون: ٢٣٥٦٧٢٢ (٠٢) - ٢٣٥٦٨٥٣ (٠٢) فاكس: ٣٣٥١٥٦٤

Steel Wailer (Solider) [10 UPN]

PROPERTIES OF SECTION

Painted Blue

Area of Section = 27.00 cm²

Space between flange = 52mm

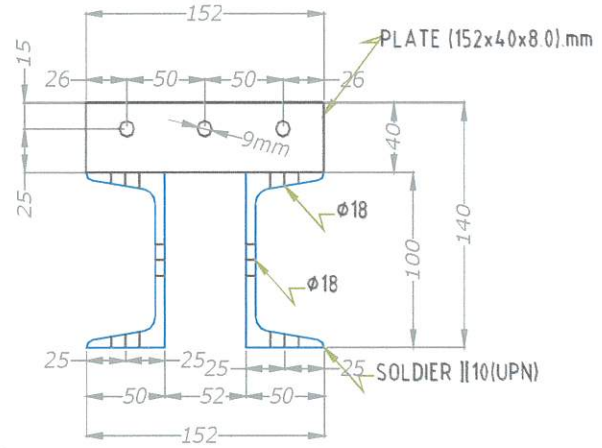
Moment of inertia (I_y) = 412.0cm⁴

Section Modulus (Z_y) = 82.4 cm³

Allowable Stress = 1.4t/ cm²

Permissible Bending Moment = Allowable Stress x (Z_y) = 11.50 KN.m

Weight/m = 10.60 kg/m (for one Channel)



Designation	Depth	Width	Thickness Web	Thickness Flange	Sectional Area	Weight	Moment of Inertia - I _x	Moment of Inertia - I _y	Section of Modulus - W _x	Section of Modulus - W _y
	mm	mm	mm	mm	cm ²	kg/m	cm ⁴	cm ⁴	cm ³	cm ³
UPN 50 x 25	50	25	5	6	4.92	3.85	16.8	2.5	6.7	1.48
UPN 50 x 38	50	38	5	7	7.12	5.59	26.4	9.1	10.6	3.75
UPN 60 x 30	60	30	6	6	6.46	5.07	31.6	4.5	10.5	2.16
UPN 65 x 42	65	42	5.5	7.5	9.03	7.09	57.5	14.1	17.7	5.07
UPN 80 x 45	80	45	6	8	11	8.64	106	19.4	26.5	6.36
UPN 100 x 50	100	50	6	9	13.7	10.6	206	26.2	41.2	9.40
UPN 120 x 55	120	55	7	9	17	13.4	364	49.2	60.7	11.1
UPN 140 x 60	140	60	7	10	20.4	16	605	62.7	86.4	14.8
UPN 160 x 65	160	65	7.5	10.5	24	18.8	925	85.3	116	19.3
UPN 180 x 70	180	70	8	11	28	22	1350	114	150	22.4
UPN 200 x 75	200	75	8.5	11.5	32.2	25.3	1910	148	191	27
UPN 220 x 80	220	80	9	12.5	37.4	29.4	2690	197	245	33.6
UPN 240 x 85	240	85	9.5	13	42.3	33.2	3600	248	300	39.6
UPN 260 x 90	260	90	10	14	48.3	37.9	4820	317	371	47.7
UPN 280 x 95	280	95	10	15	53.3	41.8	6280	399	448	57.2
UPN 300 x 100	300	100	10	16	58.8	43.2	8030	495	535	67.8
UPN 350 x 100	350	100	14	16	77.3	60.6	12840	570	734	75.0

RAWL[®] Throughbolt

CONCRETE

BOLT FIXINGS

The Rawl R-HPT Throughbolt is a high performance Throughbolt designed to function reliably in both non-cracked and cracked concrete and is ideal for safety critical applications.

- Economical, quick to install.
- Tested in accordance with level 1 of the pending European Technical Guidelines (ETAG). Enhanced load performance.
- Suitable for all applications in concrete.

Features

Cold forming for increased tensile strength, good surface finish and reduced friction

Increased external grip for improved load capacity in cracked concrete



• Rolled thread form to ensure good thread fit and reliable setting

• Special design of stainless steel expander provides an enhanced performance in cracked and non-cracked concrete

R-HPT

Product Data (R-SPT & R-HPT)

THROUGHBOLTS	BOX 100	BOX 50	BOX 25	BOX 10
Standard Throughbolt	56-102	56-120	56-152	56-164
Performance Throughbolt (zinc-plated)	56-104	56-129	56-153	56-166
	56-108	56-132	56-154	56-168
	56-112	56-136	56-156	56-172
	56-114	56-138	56-158	-
	56-116	56-139	56-159	-
	56-120	56-140	56-160	-
	56-124	56-144	-	-
	56-126	56-148	-	-
	-	56-150	-	-
Standard Performance Throughbolt (stainless steel 316)	56-604	56-628	56-651	56-664
	56-610	56-630	56-652	56-666
	56-616	56-638	56-656	56-672
	56-620	56-640	56-658	-
	56-624	56-648	56-659	-
	-	56-650	56-660	-
Standard Performance Throughbolt (Hot Dip Galvanised)	56-814	56-828	56-853	56-864
	56-816	56-832	56-852	56-872
	56-820	56-836	56-856	-
	56-824	56-840	56-859	-
	56-826	56-844	56-860	-
	56-829	56-848	-	-
	-	56-850	-	-
High Performance Throughbolt	56-314	56-328	56-350	56-364
	56-316	56-330	56-352	56-366
	56-320	56-332	56-354	-
	56-324	56-336	56-356	-
	56-326	56-338	56-360	-
	-	56-340	56-362	-
	-	56-342	-	-
	-	56-344	-	-
	-	56-346	-	-

Standard Performance Throughbolts (R-SPT) Design Data

SIZE	STANDARD EMBEDMENT DEPTH SAFE WORKING LOAD IN CONCRETE 30N/mm ² (kN)		REDUCED EMBEDMENT DEPTH SAFE WORKING LOAD IN CONCRETE 30N/mm ² (kN)	
	Tension	Shear	Tension	Shear
M6	2.3	2.0	1.8	1.5
M8	3.8	4.4	2.3	2.0
M10	5.8	6.6	3.1	4.6
M12	9.0	10.5	5.2	6.5
M16	14.2	16.3	7.1	12.8
M20	17.5	24.0	13.4	20.5
M24	19.1	28.8	17.8	28.8

For Performance Data Characteristics for M16 (R-SPT) please contact Technical Advisory Service

High Performance Throughbolts (R-HPT) Design Data

SIZE	STANDARD EMBEDMENT DEPTH SAFE WORKING LOAD IN CONCRETE 30N/mm ² (kN)	
	Tension	Shear
M8	4.0	4.4
M10	6.5	6.6
M12	10.6	10.5
M16	16.1	16.3
M20	23.2	24.0

Installation

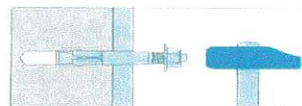
Technical Advisory Service Tel 0141 638 7961



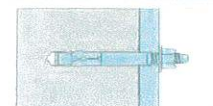
Drill hole of required depth and diameter through concrete.



Remove debris.



With nut and washer assembled, tap Throughbolt through fixture into hole until fixing depth is reached.



Tighten nut to recommended torque.





SHOP DRAWINGS SUBMITTAL FORM

PROJECT : Commercial Building & Warehouses on Plot No 2150119 at Umm Ramool
CONSULTANT : R.Qitects Design Studio LLC
CONTRACTOR : Arifco Building Contracting

Date: 19 / Nov / 2022 **Ref:** ABC-S114-SD-16

S/R	Drawing Title	Copy	Drawings Ref.
1	Service Block Roof SLAB Scaffolding Aluminum Beam Layout & Section.	1	DBC/A/2022/1345
2	Under Ground Water Tank SLAB Scaffolding and Aluminum Beam Layout & Section.	1	DBC/A/2022/1347
3	Under Ground Holding Tank SLAB Scaffolding Aluminum Beam Layout & Section.	1	DBC/A/2022/1348
	1 Hard Copy and Soft copy		

Project Manager : Eng. Mohammad Imran **Stamp / Signature**

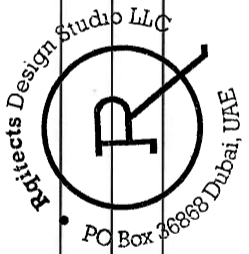
Approved Approved As Noted Not Approved

FOR CONSULTANTS USE

Consultant Comments / Notes:

- 1- Scaffolding and shuttering work to be as per the project specs, DM regulations and subjected to the consultant Engr approval.
- 2- Materials to be free from any defects.
- 3- Dismantling IR to be submitted (after concrete casting by 21 days and subjected to the Engr approval).
- 4- Back proppacks to be maintained below slabs until receiving passed results of the cubes test for 28 days.
- 5- Prequalification of the supplier to be submitted for review and approval.

Consultant : Eng. Mohamed Oraby **Signature** 23/11/2022
 LEED Consultant Comments / Notes:



LEED Consultant : **Signature**

Consultant Received Signature Contractor Received Signature

Date: Date:



SHOP DRAWINGS SUBMITTAL FORM

PROJECT :	Commercial Building & Warehouses on Plot No 2150119 at Umm Ramuol		
CONSULTANT :	R.Qitects Design Studio LLC		
CONTRACTOR :	Arifco Building Contracting		

Date: 15/Nov/ 2022	Ref: ABC-S114-SD-13
---------------------------	----------------------------

S/R	Drawing Title	Copy	Drawings Ref.
1	FORMWORK DETAILS FOR STAIRCASE & LIFT	1	DBC/B/2022/3003

Project Manager : Eng. Mohammad Imran		Stamp / Signature
FOR CONSULTANTS USE		

<input type="checkbox"/> Approved	<input checked="" type="checkbox"/> Approved As Noted	<input type="checkbox"/> Not Approved
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Consultant Comments / Notes:

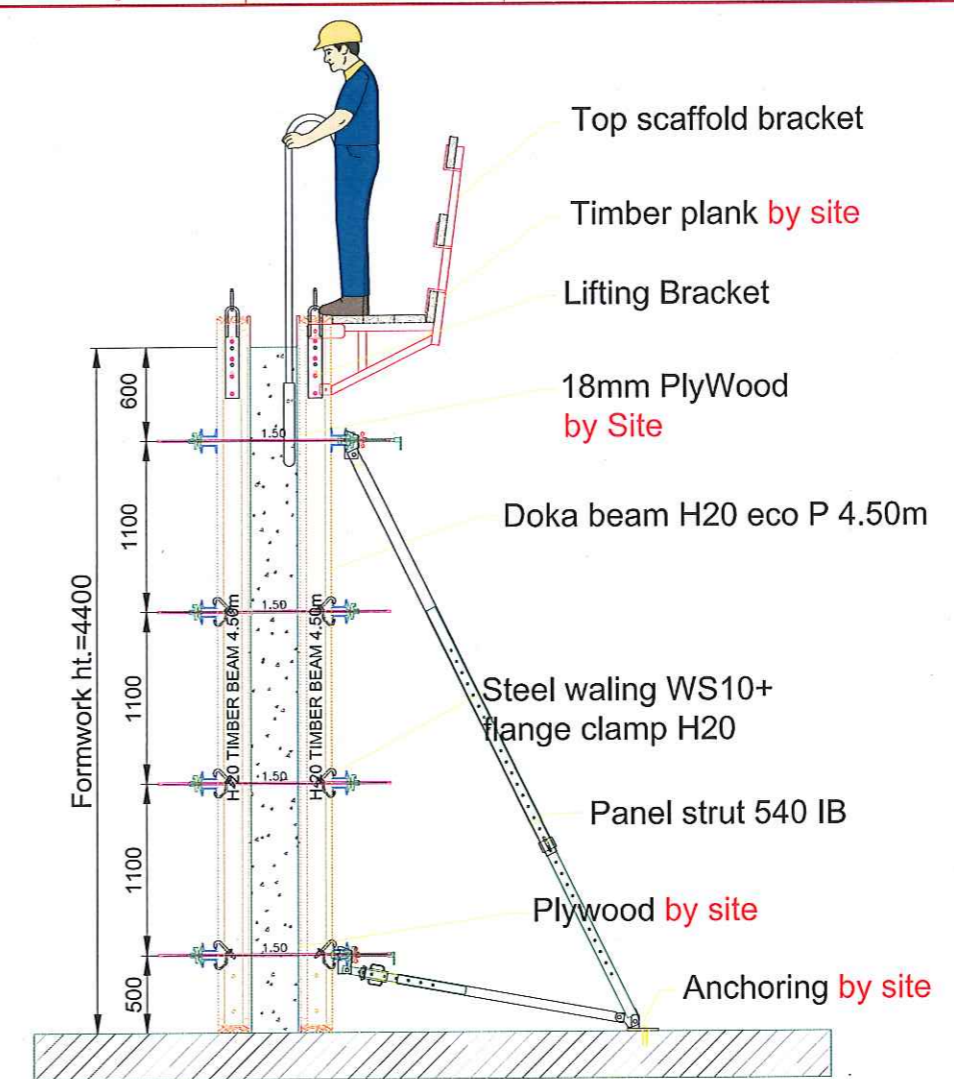
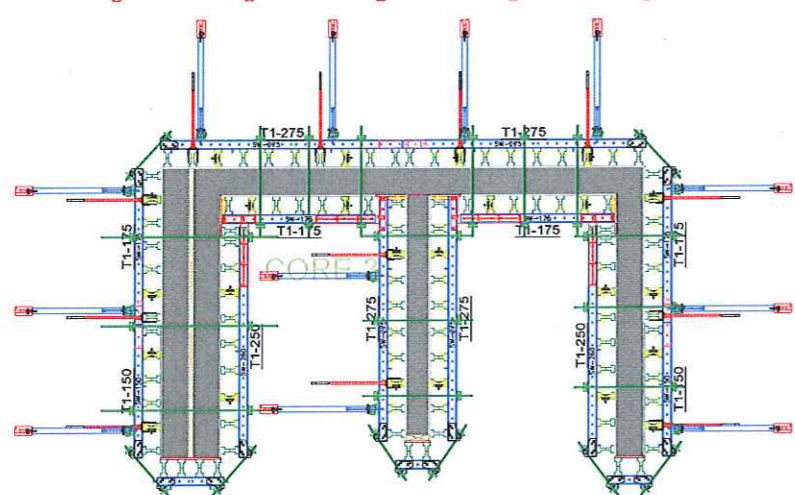
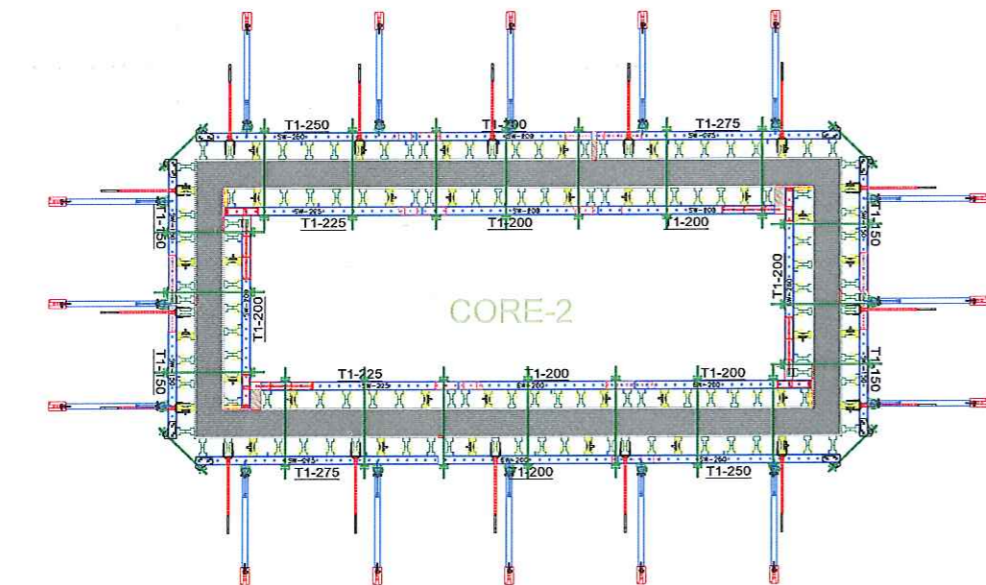
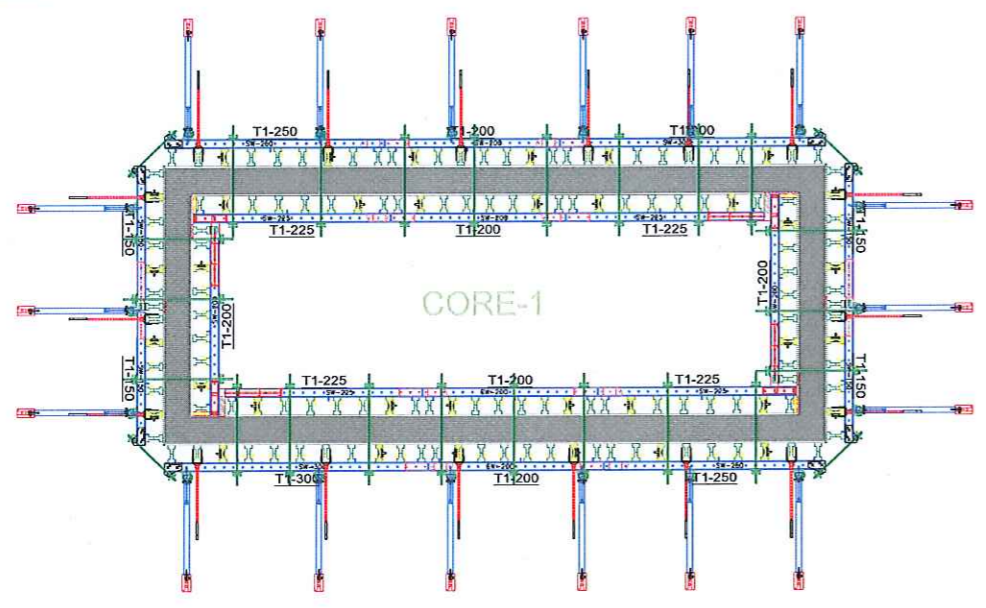
1- Shuttering material subjected to the Engr approval.
 2- Spacing between props shall be not more than 1.5m.

Consultant : Eng. Mohamed Oraby	Signature 17/11/2022
--	-----------------------------

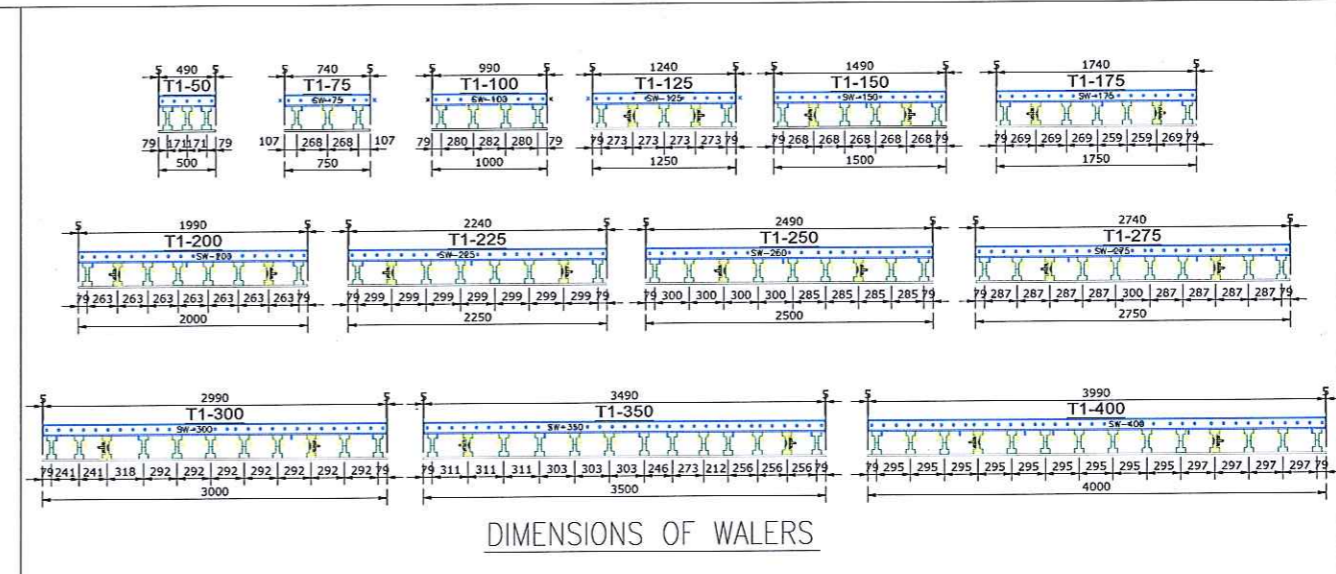
LEED Consultant Comments / Notes:

LEED Consultant : _____ **Signature** _____

Consultant Received Signature		Contractor Received Signature
Date:		Date:



TYPICAL SECTION
(DOUBLE SIDED WALL)



DIMENSIONS OF WALERS

NOTE: PUSH-PULL PROP SPACING CENTER TO CENTER NOT MORE THAN 1.50m
 NOTE: UNIVERSAL BRACKET SPACING CENTER TO CENTER NOT MORE THAN 1.50m
 NOTE: TIEROD SPACING CENTER TO CENTER NOT MORE THAN 1.00m

Rev	Description	Date	Checked	Authorized

GENERAL:

- THIS DRAWING IS NOT TO BE SCALED. ONLY THE WRITTEN DIMENSIONS TO BE FOLLOWED.
- ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF 'DA' BEFORE COMMENCEMENT OF CONCRETING.
- SCAFFOLDING FOR MAKE-UP AREAS BY PROPS BY CONTRACTOR.
- ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE NOTED.

CONTRACTOR:

ARIFCO BUILDING CONTRACTING LLC

CONSULTANT:

R.QITECTS DESIGN STUDIO

CLIENT:

GREEN COAST

SCAFFOLDING SUPPLIER:

DESARCH SCAFFOLDING

P.O. BOX 71957, DUBAI, UAE
 Tel: 00971 4 3337012 | Fax: 00971 4 3337154
 Email: desarchscscaffolding@gmail.com

P.O. BOX 92269, ABU DHABI, UAE
 Tel: 00971 2 5538330 | Fax: 00971 2 5538331
 Email: desarchscscaffolding@gmail.com

P.O. BOX 2611, AJMAN, UAE
 Tel: 00971 6 5396955 | Fax: 00971 6 5396972
 Email: desarchscscaffolding@gmail.com

Project Number: DBC/B/2022/3003






Project: GREEN COAST REAL ESTATE COMMERCIAL BUILDING & WAREHOUSE

Drawing title: DOUBLE SIDED WALL LAYOUT AND SECTION (COREWALL 1,2 &3)

Rev	Original Scale	Drawn	Checked	Authorized	Date
00	M/S				14-11-2022

Size: A1

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   		Description: Document Transmittal Form			
PROPOSED COMMERCIAL BUILDING & WAREHOUSES FOR GREEN COAST REAL ESTATE ON PLOT NO 2150119 UMM RAMOOL					
Ref No. ABC/S114/DT/42		Date:	23 Nov 2022		
From: Name: Eng. Mohammad Imran Designation: Project Manager		To: Name: Eng. Mohammed Nasrat Designation: Construction Projects Manager			
Please find enclosed documents:					
Sr. No.	Document Description	Document No.	Rev. No.	No. of Copies	Action Code
1	Prequalification for Scaffolding		0	1	C
2	Company Name : DESARCH - UAE		0	1	C
	1 Hard & Soft Copy				
Remarks (If Any):					
					
Signature:					
Date:					
Legend for Action Code					
A - Issued for Information		B - Issued for Comments		C - Issued for Approval	
D - Returned with Comments		E - Approved for Construction		F - Comments Incorporated and reissued for Approval	
G - Issued for Records					
Received & Acknowledged: (By Consultant) Signature: Name: Date:			Received & Acknowledged: (By LEED Consultant) Signature: Name: Date:		
For Consultant Comments: Approved & Noted					
1- Material to be submitted as per the project specs and DM regulations.					
Signature: Eng. Mohamed Oraby			Date: 24/11/2022		
For LEED Consultant (GRFN) Comments:					
Signature:					
Date:					
Acknowledgement: (By Contractor) Signature: Date:					
Distribution : Original - Originator (after signature return to originator)					
Name:					
Date:					
Distribution : Original - Originator (after signature return to originator)					

