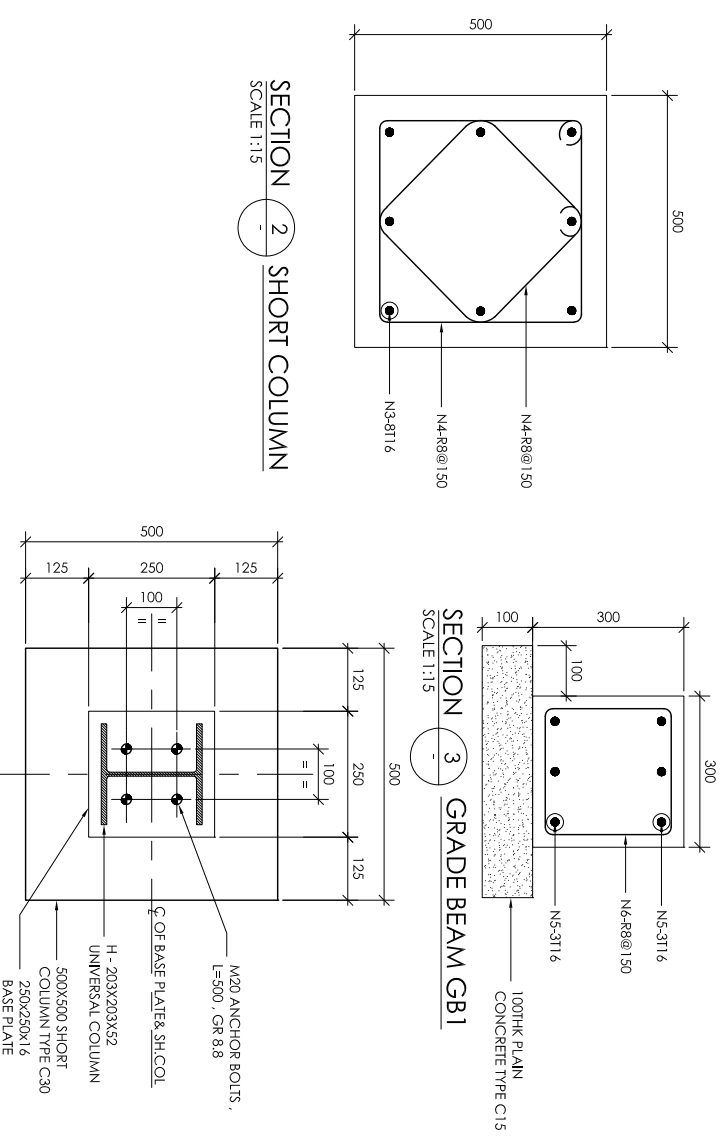
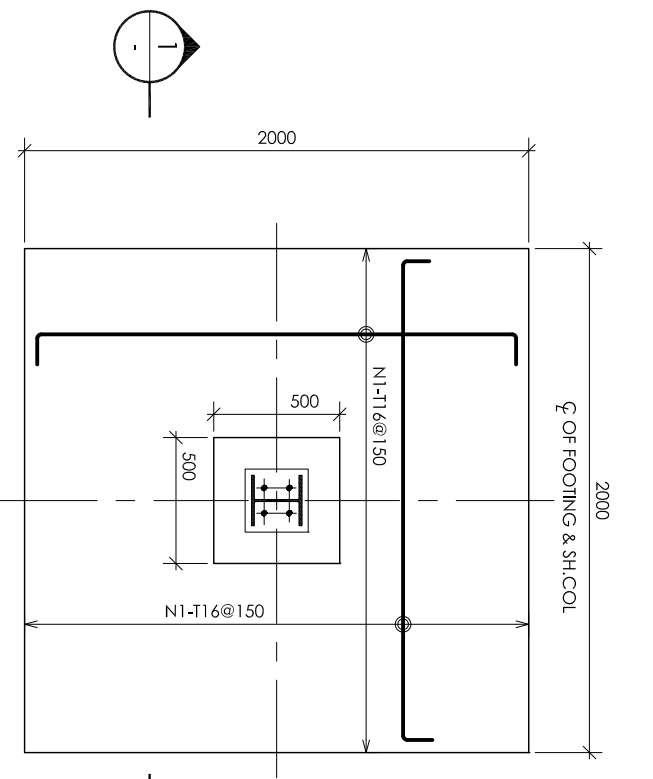


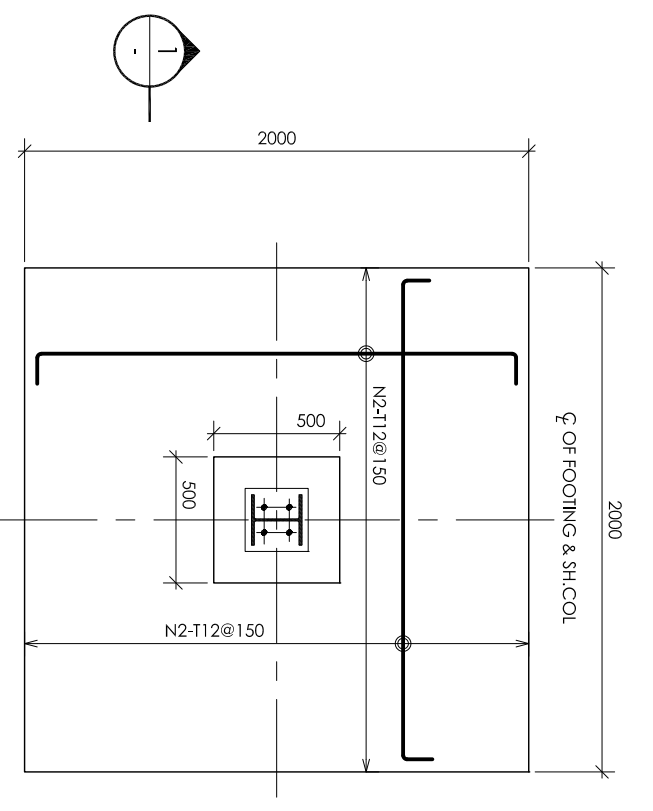
FOUNDATION PLAN
SCALE 1:50
(THE LOCATION & ORIENTATION TO BE DECIDED AT SITE)



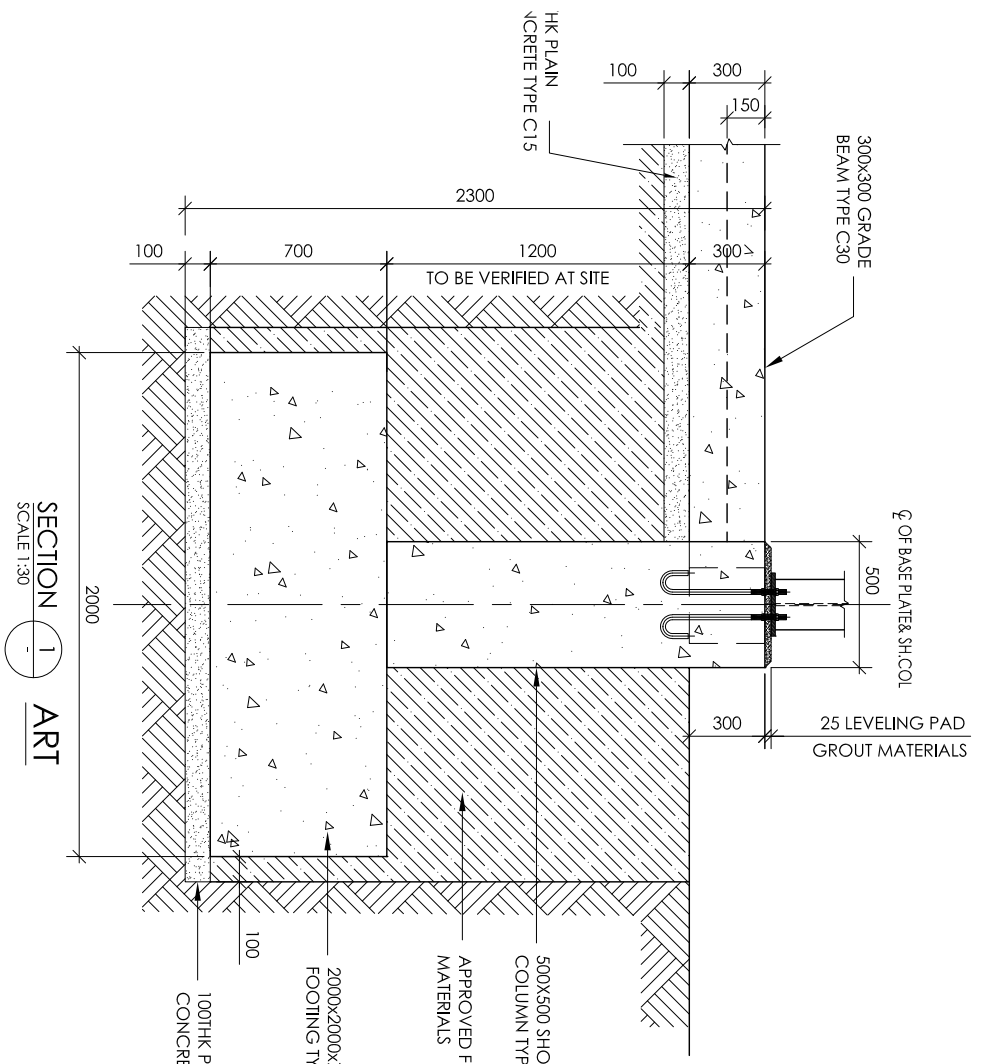
DETAIL
SCALE 1:1.5



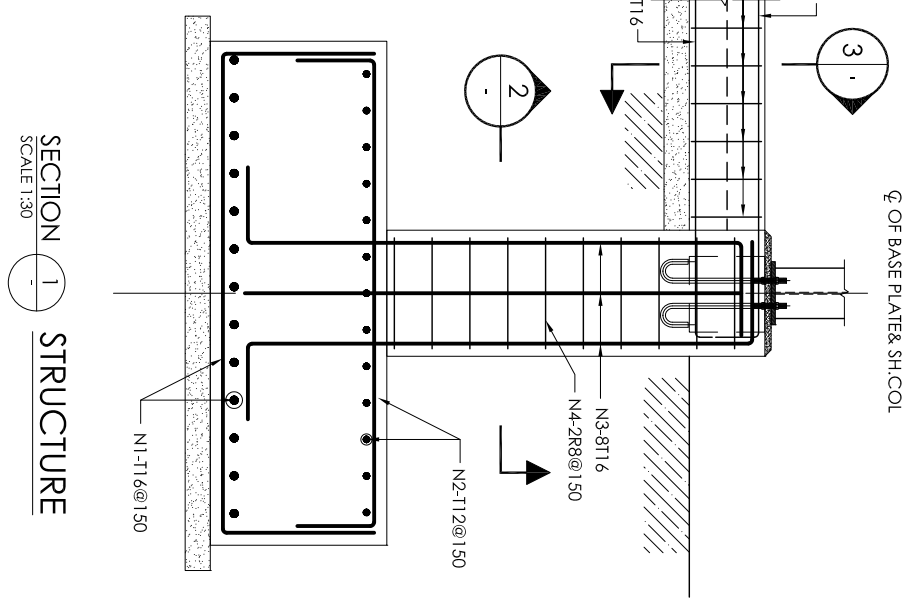
FOOTING TYPE 'F1' PLAN
BOTTOM REINFORCEMENT
SCALE 1:30



FOOTING TYPE 'F1' PLAN
TOP REINFORCEMENT
SCALE 1:30



SECTION 1
ART
SCALE 1:30



SECTION 1
STRUCTURE
SCALE 1:30

- NOTE:**
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
 2. ALL LEVELS ARE IN METRE UNLESS OTHERWISE NOTED.
 3. THE ACTUAL LOCATION SHOULD BE VERIFIED AT SITE.
 4. THE REINFORCING STEEL TENSILE YIELD STRENGTH IS:
 - IV = 460 MPa FOR DEFORMED BARS.
 - IV = 250 MPa FOR PLAIN BARS.
 5. THE REINFORCED CONCRETE SHOULD BE GRADE C30.
 6. THE PLAN CONCRETE SHOULD BE GRADE C15
 7. COVER FOR FOOTING IS 50mm AND FOR SH COLUMN AND GRADE BEAMS IS 40mm.
 8. THE LAP OF BARS SHALL BE MINIMUM 50D.

CAD PRODUCED DRAWING - NO MANUAL REVISION ALLOWED

DRAWING NO.	REFERENCE DRAWING	REV.	REVISIONS	DATE	DRAWN	CHKD	CLIENT
		A	ISSUED FOR APPROVAL	SEP.2019	H.HAMAD	H.HAMAD	
		B	RE-ISSUED FOR APPROVAL	SEP.2019	H.HAMAD	H.HAMAD	
		C	RE-ISSUED FOR APPROVAL	SEP.2019	H.HAMAD	H.HAMAD	

CLIENT:

CONCERN worldwider

CONCERN E. GHERENA, SUDAN, A HUMANITARIAN, NON-GOVERNMENT ORGANIZATION-HEAD OFFICE IN KHARTOUM EAST, KHARTOUM 2, STREET 37, PLOT NO 25

PROJECT: GRUO ELEVATED TANK FOUNDATION **LOCATION:** WEST DARPUR

DRAWING TITLE: ELEVATED TANK STRUCTURAL DETAILS

ORIGINAL DRAWING SIZE: A3

DWG. NO.: CON-GE-EVA-SRT-2019-001 **SCALE:** AS SHOWN **SH. 1 OF 7** **REV. B**

BAR BINDING SCHEDULE

BS 8666:2005 Standard Shapes

Sheet 1 of 2

BS 8666:2005 Standard Shapes

Sheet 2 of 2

Site ref : CONCERN World Wide Bar schedule ref : Rev letter A
 Date prepared : 25/8/2019
 Job no : 50m3 Elevated Steel Tanks Prepared by : H/H Checked by : SA

Member	Bar mark	Type and size	No. of mbs in each	No. of bars in	Total no.	Length of each bar f mm	Shape code	A * mm	B * mm	C * mm	D * mm	E/R * mm	Rev letter
Footling F-1	N1	T 16	4	28	112	3050	21	600	1900	600			
Footling F-1	N2	T 12	4	28	112	2475	21	300	1900	300			
SH.COL	N3	T 16	4	8	32	2425	23	400	1770	300			
SH.COL	N4	T 8	4	22	88	1975	51	450	450	100			
GB1	N5	T 16	4	6	24	3650	21	300	3100	300			
GB1	N6	T 8	4	16	64	1175	51	250	250	100			

Shape and total length of bar (L) measured along centre-line

00		$L = A$
01		$L = A$, stock lengths
12		$L = A$
13		$L = A + 0.57 B + (C) - 1.6 d$
14		$L = A + (B) - 0.5 r - d$
15		$L = A + (B) - 0.43 R - 1.2 d$
21		$L = A + (C) - r - 2 d$
22		$L = A + (C) - 4 d$
23		$L = A + (C)$
24		$L = A + B + (C) - r - 2 d$
25		$L = A + B + C + (D) - 1.5 r - 3 d$
26		$L = A + B + (C) - r - 2 d$
27		$L = A + B + (C) - 0.5 r - d$
28		$L = A + B + (C) - 0.5 r - d$
29		$L = A + B + (C)$
30		$L = A + B + C + (D) - 1.5 r - 3 d$
31		$L = A + B + (C) - 0.5 r - d$
32		$L = A + B + (C) - 0.5 r - d$
33		$L = A + B + (C) - r - 2 d$
34		$L = A + B + C + (D) - 1.5 r - 3 d$
35		$L = A + B + C + (E) - 0.5 r - d$
36		$L = A + B + C + (E) - 0.5 r - d$
37		$L = A + B + C + (D) - 1.5 r - 3 d$
38		$L = A + B + C + (E) - 0.5 r - d$

Shape and total length of bar (L) measured along centre-line

41		$L = A + B + C + (D) + (E) - 2 r - 4 d$
42		$L = A + B + C + (D) - r - 2 d$
43		$L = A + B + C + (D) + 2(E) - 2.5 r - 5 d$
44		$L = A + B + C + (D) - 2 r - 4 d$
45		$L = A + B + C + (D) - 1.5 r - 3 d$
46		$L = A + B + C + (D) + 2(E) - 2.5 r - 5 d$
47		$L = A + B + C + (D) - 2 r - 4 d$
48		$L = A + B + C + (D) - r - 2 d$
49		$L = A + B + C + (D) - 1.5 r - 3 d$
50		$L = A + B + C + (D) - 1.5 r - 3 d$
51		$L = A + B + C + (D) + (E) - 2 r - 4 d$
52		$L = A + B + C + (D) - r - 2 d$
53		$L = 2 A + B + \max(21 d, 240)$ *see note
54		$L = 2 A + B + \max(16 d, 160)$ *see note
55		$L = 2 A + 3 B + \max(14 d, 150)$ *see note
56		$L = A + 2 B + C + (E)$
57		$L = 3.14 (A - d) + B$
58		$L = 3.14 (A - d) + B$
59		$L = 3.14 (A - d) + B$
60		$L = 3.14 (A - d) + B$
61		$L = 3.14 (A - d) + B$
62		$L = 3.14 (A - d) + B$
63		$L = 3.14 (A - d) + B$
64		$L = 3.14 (A - d) + B$
65		$L = 3.14 (A - d) + B$
66		$L = 3.14 (A - d) + B$
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82		$L = 3.14 (A - d) + B$
83		$L = 3.14 (A - d) + B$
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85		$L = 3.14 (A - d) + B$
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96		$L = 3.14 (A - d) + B$
97		$L = 3.14 (A - d) + B$
98		$L = 3.14 (A - d) + B$
99		$L = 3.14 (A - d) + B$

For a bar scheduling spreadsheet for Microsoft Excel visit the web site: www.structural-engineering.fsnet.co.uk

Shape code table 15 May 06
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 Chris Bucknell, freemore.co.uk

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 fy = 460 MPa FOR DEFORMED BARS.
 fy = 250 MPa FOR PLAIN BARS.
 5. THE REINFORCED CONCRETE SHOULD BE GRADE C30.
 6. THE PLAIN CONCRETE SHOULD BE GRADE C15
 7. COVER FOR FOOTING IS 50mm AND FOR SH COLUMN AND GRADE BEAMS IS 40mm.
 8. THE LAP OF BARS SHALL BE MINIMUM 500.

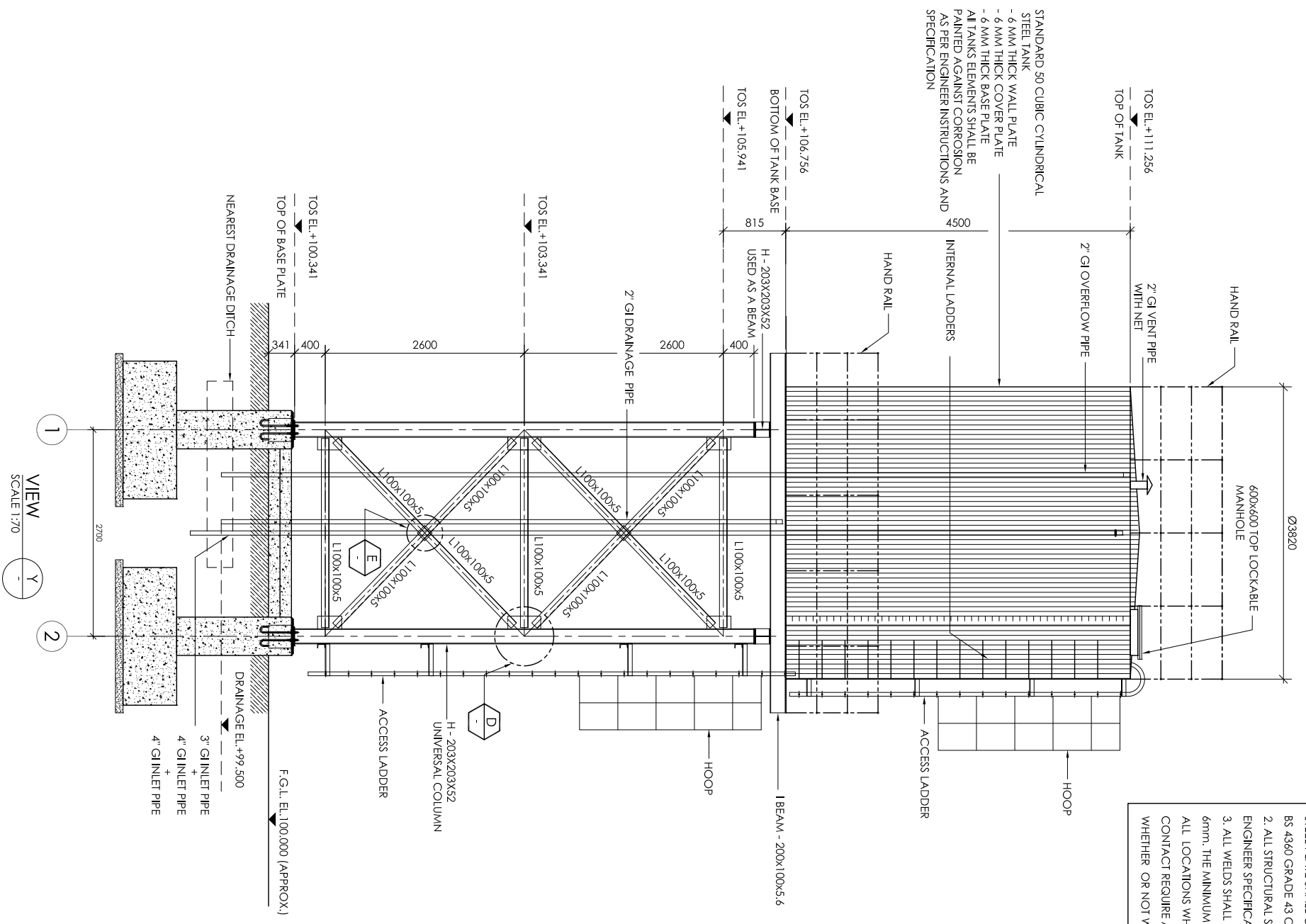
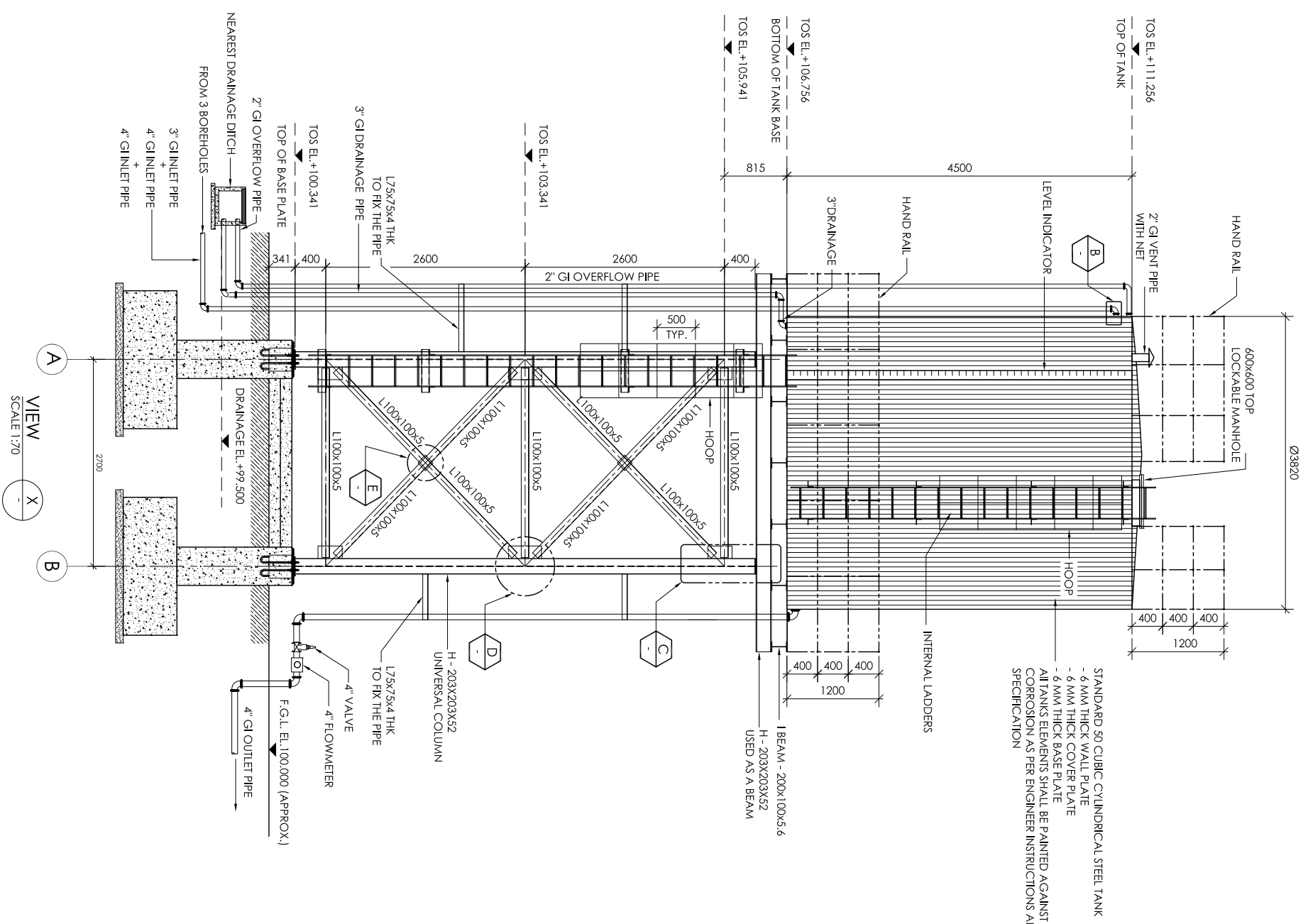
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		B	RE-ISSUED FOR APPROVAL	SEP.2019	H/HAMM	H/HAMM		
		C	RE-ISSUED FOR APPROVAL	SEP.2019	H/HAMM	H/HAMM		
		A	ISSUED FOR APPROVAL	SEP.2019	H/HAMM	H/HAMM		
			REVISIONS					

CAD PRODUCED DRAWING - NO MANUAL REVISION ALLOWED

CLIENT: CONCERN E. GERENA, SUDAN, A HUMANITARIAN NON-GOVERNMENT ORGANIZATION- HEAD OFFICE IN KHARTOUM EAST, KHARTOUM 2, STREET 37, PLOT NO 25
 PROJECT: GEULO ELEVATED TANK FOUNDATION LOCATION: WEST DARFUR
 DRAWING TITLE: ELEVATED TANK STRUCTURAL DETAILS
 ORIGINAL DRAWING SIZE : A3
 DWG. NO.: CON-GE-EIA-SRT-2019-001 SCALE AS SHOWN SH. 2 OF 7 REV. B

STRUCTURAL STEEL NOTES:

1. ALL STRUCTURAL STEEL SECTIONS INCLUDING STEEL PLATE SHALL CONFORM TO ASTM A36 OR BS 4360 GRADE 43 OR EQUIVALENT.
2. ALL STRUCTURAL STEEL SHALL BE PAINTED AS PER CLIENT/ENGINEER SPECIFICATION.
3. ALL WELDS SHALL BE CONTINUOUS. THE MAIN WELD SIZE IS 6mm. THE MINIMUM SIZE FOR SEAL WELDS SHALL BE 3mm. ALL LOCATIONS WHERE PLATES OR SHAPES ARE IN CONTACT REQUIRE AT LEAST A CONTINUOUS SEAL WELD WHETHER OR NOT WELD IS INDICATED ON THE DRAWING.



NOTE:

1. ALL DIMENSIONS ARE IN mm
2. THE CONTRACTOR SHOULD THAT THE COLUMN BASE PLATES ARE AT ONE PLANE AND LEVEL. COLUMNS MEMBERS ARE STRAIGHTENED TO ENSURE PLUMBNESS AND ALL KINKS AT JOINTS CORRECTED TO APPROVAL.
3. MAXIMUM TOLERANCE FOR VERTICALITY TO BE 40mm.
4. ALL BOLTS SHALL BE GALVANIZED BOLTS OR PAINTED FOR ANTI-RUST TO ENGINEER'S APPROVAL.
5. THE TANK SHALL BE SUPPLIED BY APPROVED/SPECIALIST SUPPLIERS AND BE INSTALLED BY QUALIFIED/SPECIALIST CONTRACTOR.
6. TANK AND TOWER FABRICATION/SHOP DRAWINGS TO BE CHECKED AND APPROVED BY ENGINEER PRIOR TO FABRICATION AND SUPPLY.
7. UNLESS OTHERWISE STATED ALL WELDS TO BE 8mm FILLET WELDS.
8. ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE BY STEEL FABRICATOR BEFORE COMMENCEMENT OF ANY WORK.
9. FINISHED GRADE ELEVATION LEVEL IS ASSUMED AS EQUAL TO 100.000.

DRAWING NO.	REFERENCE DRAWING	REV.	REVISIONS
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		B	RE-ISSUED FOR APPROVAL
		C	RE-ISSUED FOR APPROVAL

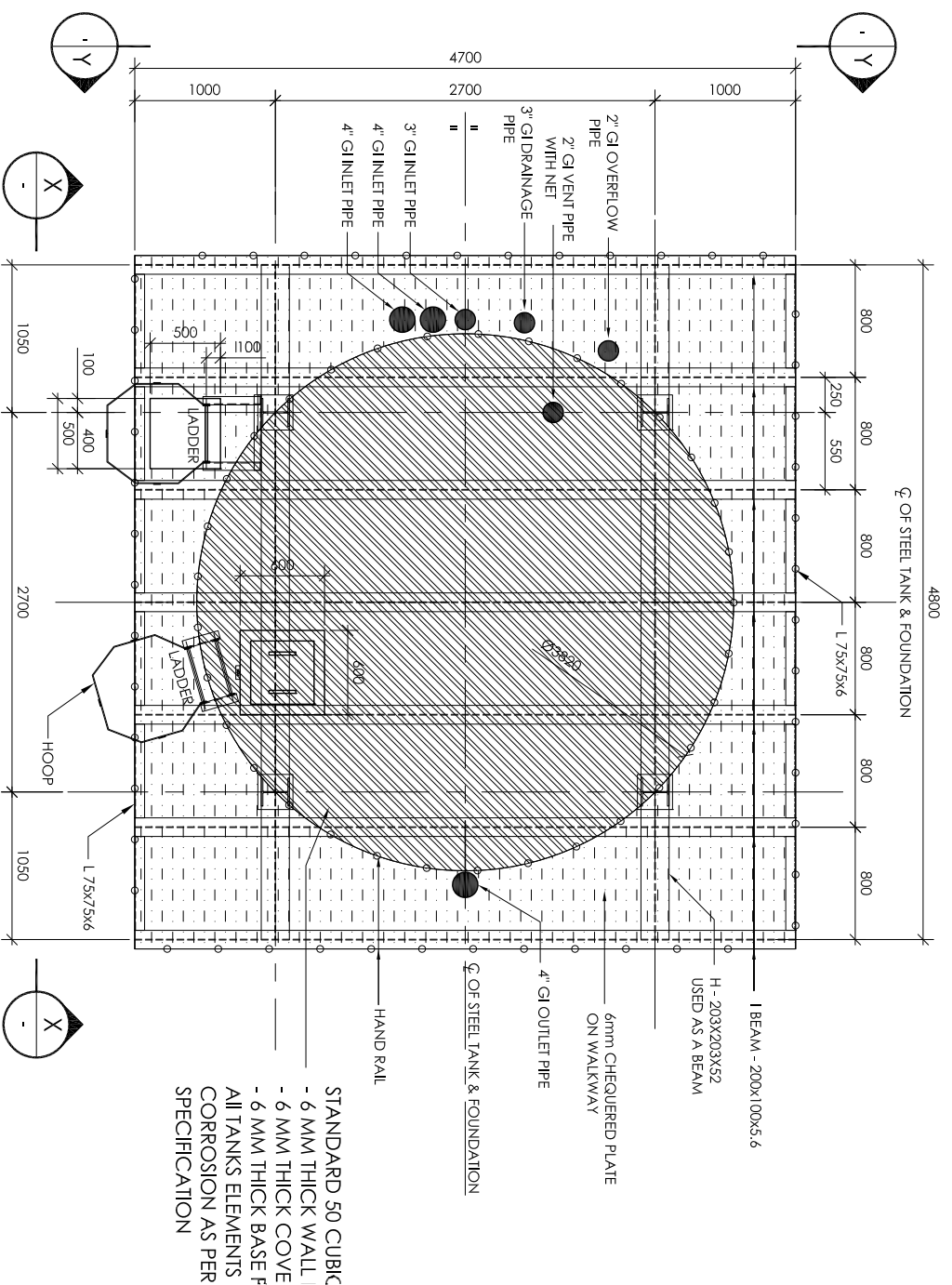
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DESIGN CONSULTANT: ENG. HUSHEM HAMDAN CONSULTANT NO 718 Mobile: 0912899360 0123795271 E-mail: husheh@yahooc.com

PROJECT: GRUO ELEVATED TANK FOUNDATION **LOCATION:** WEST DARFUR

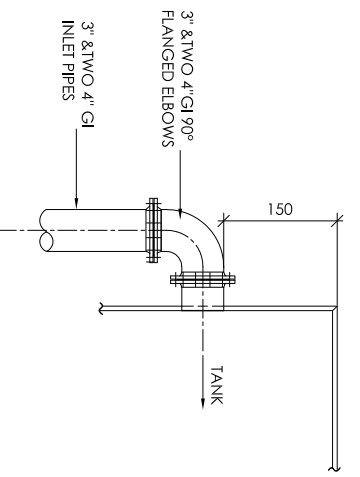
DRAWING TITLE: ELEVATED TANK STRUCTURAL DETAILS

DWG. NO.: CON-GE-ETM-SRT-2019-001 **SCALE:** AS SHOWN **SH.:** 3 OF 7 **REV.:** B

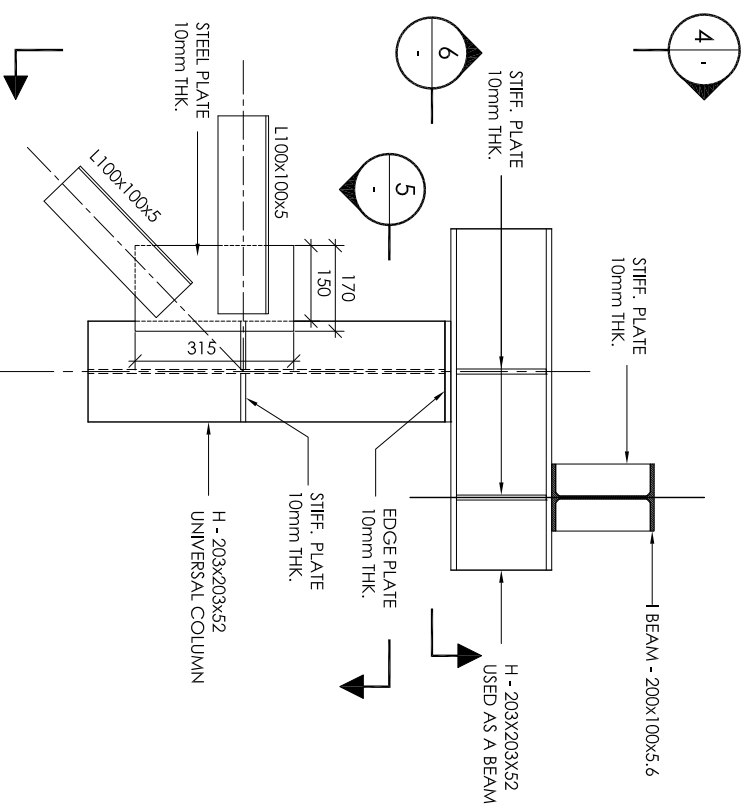


STANDARD 50 CUBIC
 - 6 MM THICK WALL
 - 6 MM THICK COVER
 - 6 MM THICK BASE F
 ALL TANKS ELEMENTS
 CORROSION AS PER
 SPECIFICATION

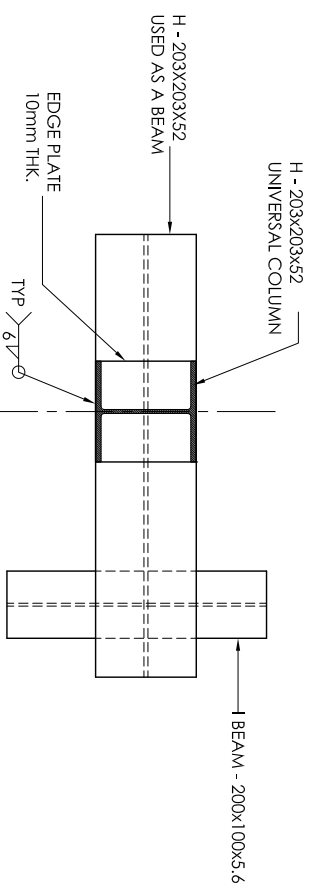
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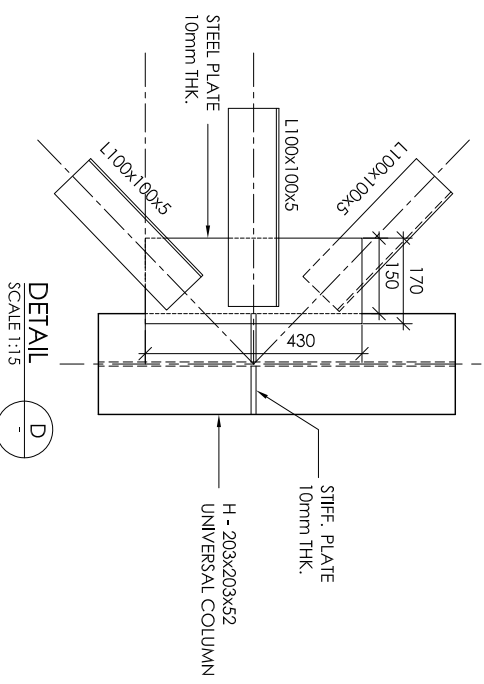
DETAIL B
 SCALE 1:10



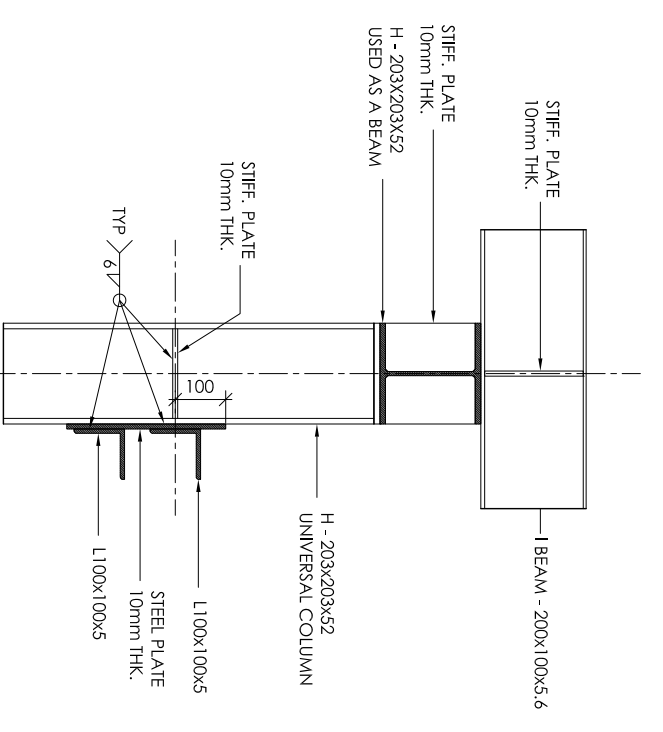
SECTION 4
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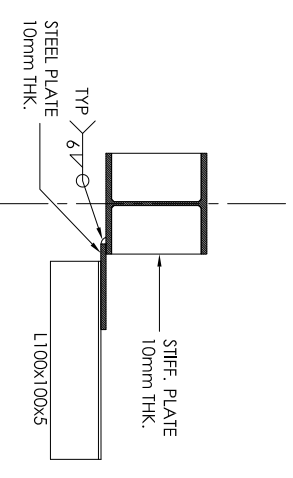
SECTION 5
 SCALE 1:15



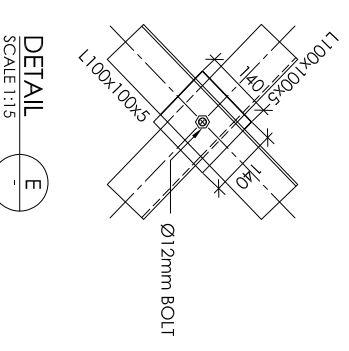
SECTION 6
 SCALE 1:15



DETAIL C
 SCALE 1:15



DETAIL D
 SCALE 1:15



DETAIL E
 SCALE 1:15

NOTE:
 1. ALL DIMENSIONS ARE IN mm
 2. THE CONTRACTOR SHOULD THAT THE COLUMN BASE PLATES ARE AT ONE PLANE AND LEVEL. COLUMN MEMBERS ARE STRAIGHTENED TO ENSURE PLUMBNESS AND ALL KINKS AT JOINTS CORRECTED TO APPROVAL.
 3. MAXIMUM TOLERANCE FOR VERTICALITY TO BE 40mm.
 4. ALL BOLTS SHALL BE GALVANIZED BOLTS OR PAINTED FOR ANTI-RUST TO ENGINEER'S APPROVAL.
 5. THE TANK SHALL BE SUPPLIED BY APPROVED/SPECIALIST SUPPLIERS AND BE INSTALLED BY QUALIFIED/SPECIALIST CONTRACTOR.
 6. TANK AND TOWER FABRICATION/SHOP DRAWINGS TO BE CHECKED AND APPROVED BY ENGINEER PRIOR TO FABRICATION AND SUPPLY.
 7. UNLESS OTHERWISE STATED ALL WELDS TO BE 8mm FILLET WELDS.
 8. ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE BY STEEL FABRICATOR BEFORE COMMENCEMENT OF ANY WORK.
 9. FINISHED GRADE ELEVATION LEVEL IS ASSUMED AS EQUAL TO 100.000.

DRAWING NO.	REFERENCE DRAWING	REV.	REVISIONS
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		B	RE-ISSUED FOR APPROVAL
		C	RE-ISSUED FOR APPROVAL

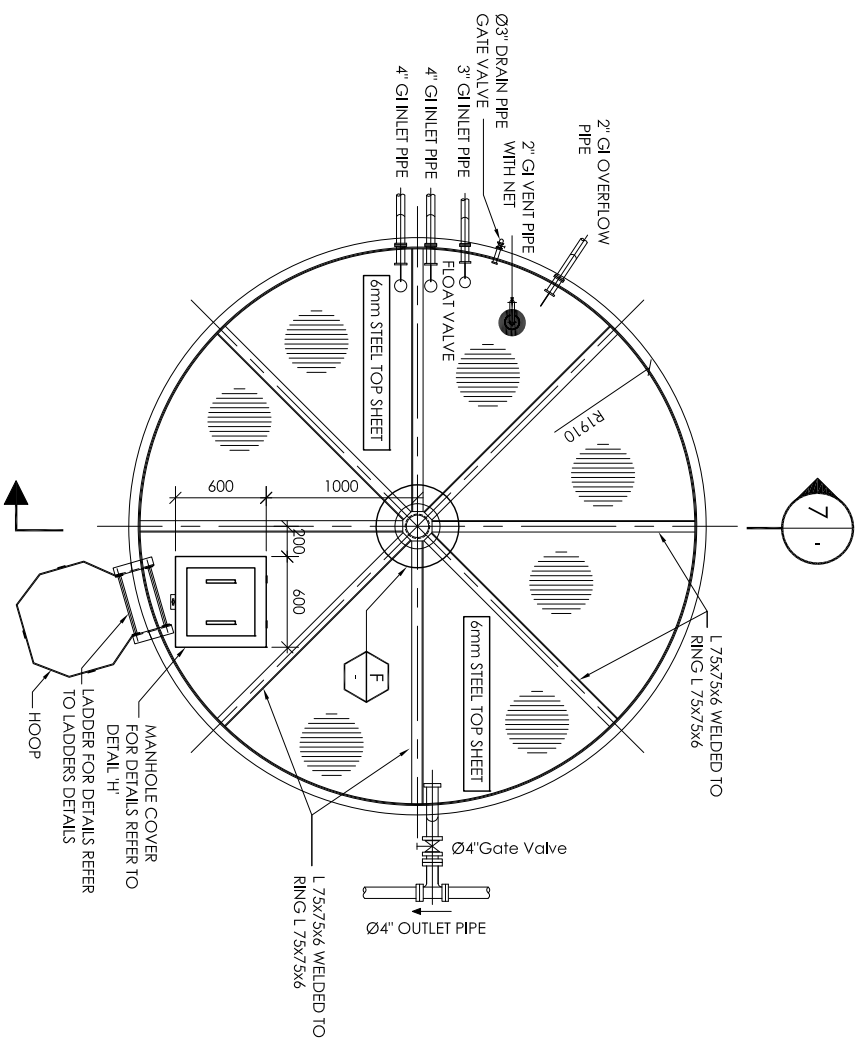
DESIGN CONSULTANT
 ENG. HUSHAM HAMDAN
 CONSULTANT NO 718
 Mobile: 0912593960 0123795271
 E-mail: husshamh@yahooc.co.uk

CLIENT:
 CONCERN E. GERENA, SUDAN, A HUMANITARIAN
 NON-GOVERNMENT ORGANIZATION- HEAD OFFICE IN
 KHARTOUM EAST, KHARTOUM 2, STREET 37, PLOT NO 25

PROJECT: **CONCERN worldwde** ELEVATED TANK FOUNDATION LOCATION: WEST DARFUR

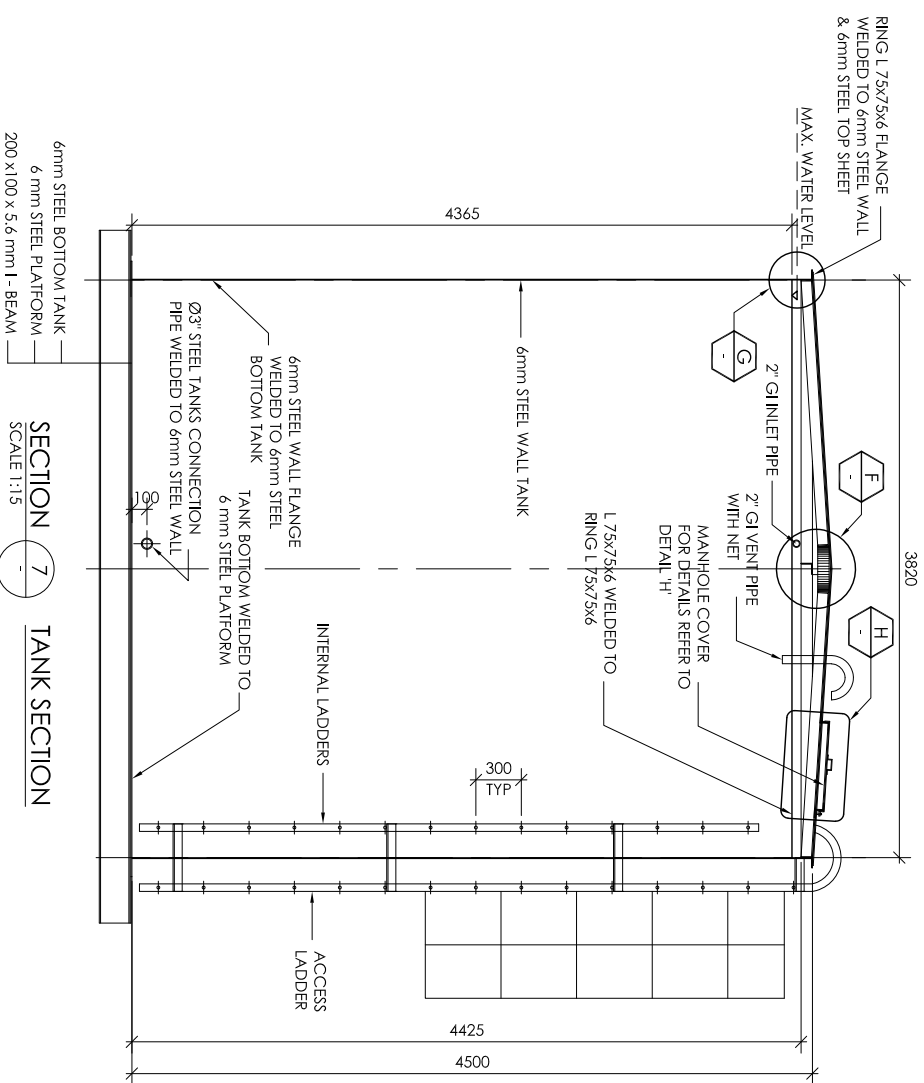
DRAWING TITLE: **ELEVATED TANK STRUCTURAL DETAILS**

DWG. NO.: CON-GE-EFA-SRT-2019-001 SCALE AS SHOWN SH. 4 OF 7 REV. B



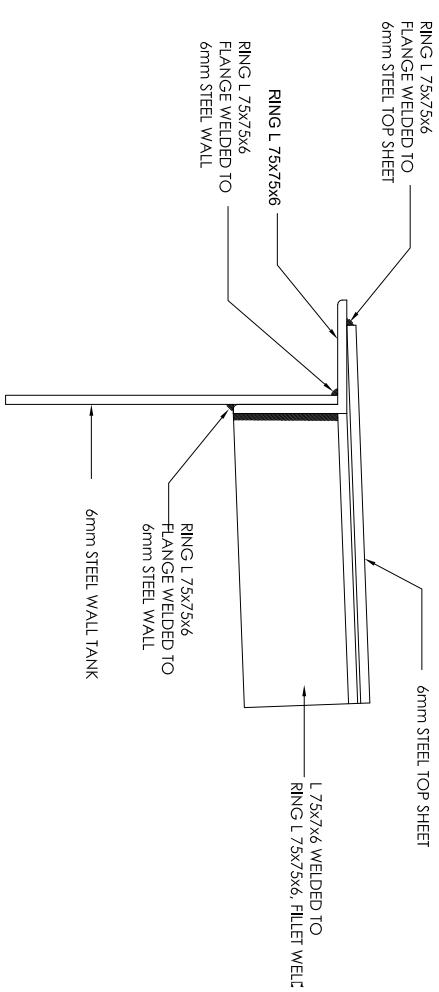
TANK ROOF PLAN @ TOS EL.+111.256

SCALE 1:50

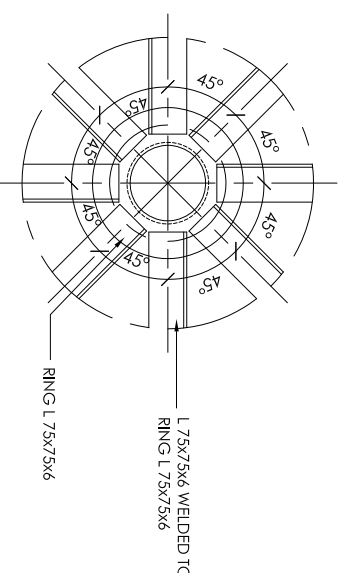


SECTION 7-7 TANK SECTION

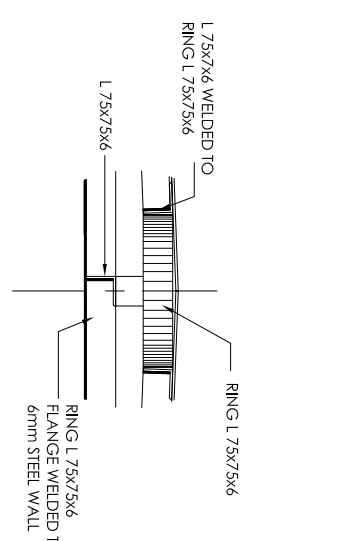
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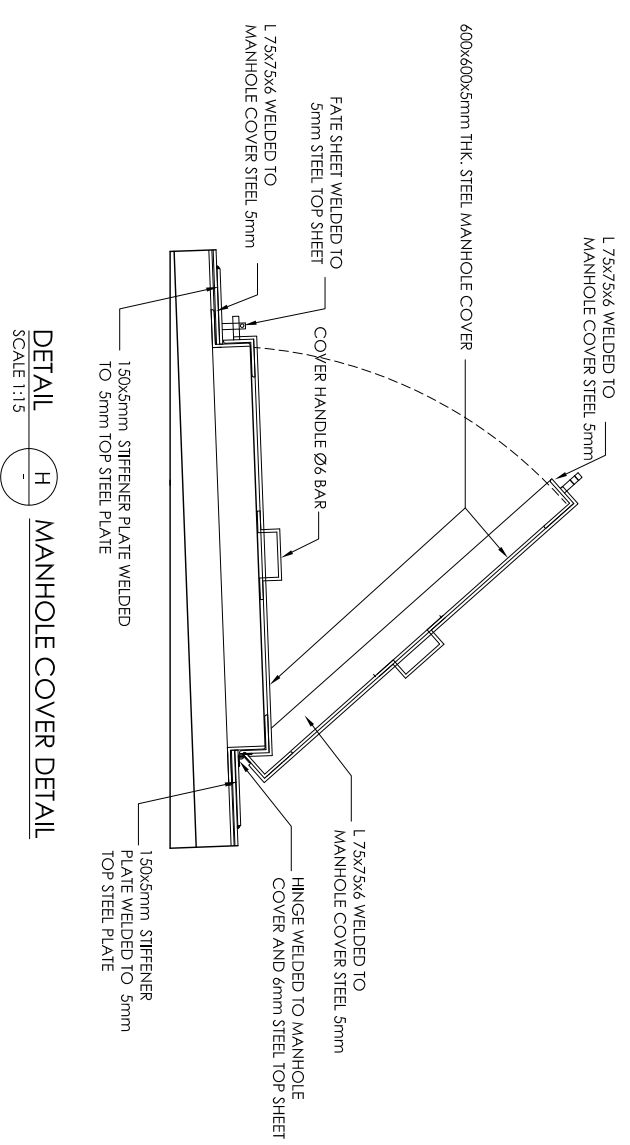
DETAIL G



DETAIL F PLAN



DETAIL F SECTION



DETAIL H MANHOLE COVER DETAIL

- NOTE:
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CAD PRODUCED DRAWING - NO MANUAL REVISION ALLOWED

DRAWING NO.	REFERENCE DRAWING	REV.	REVISIONS
		A	ISSUED FOR APPROVAL
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		C	RE-ISSUED FOR APPROVAL

DESIGN CONSULTANT	CLIENT:
ENG. HUSHAM HAMDAN CONSULTANT NO 718 Mobile: 09128993860 0123795271 E-mail: husshamh@yahoocouk	CONCERN E. GERENA, SUDAN, A HUMANNITARIAN NON-GOVERNMENT ORGANIZATION- HEAD OFFICE IN KHARTOUM EAST, KHARTOUM 2, STREET 37, PLOT NO 25

CONCERN worldwide

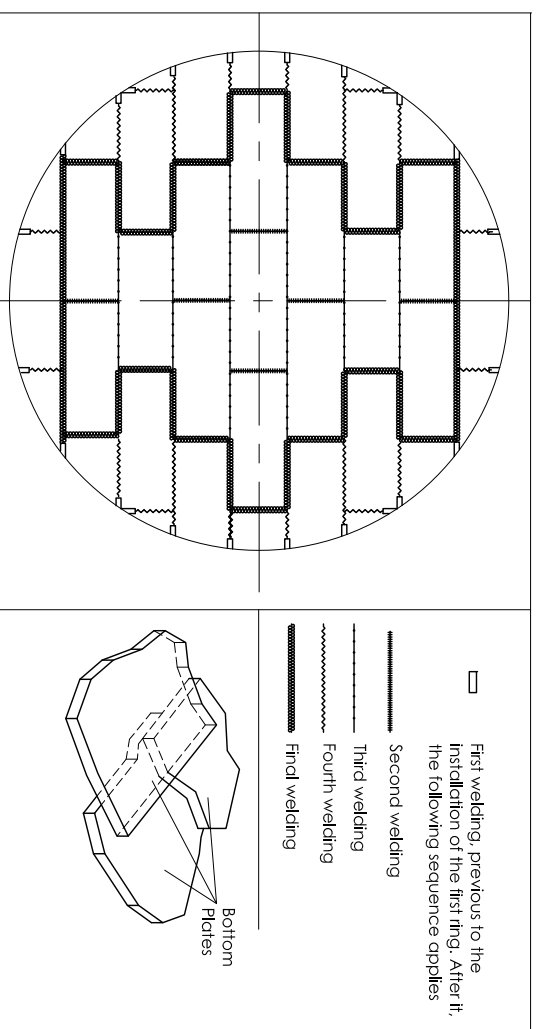
PROJECT: **GEULO ELEVATED TANK FOUNDATION** LOCATION: **WEST DARRUR**

DRAWING TITLE: **ELEVATED TANK STRUCTURAL DETAILS**

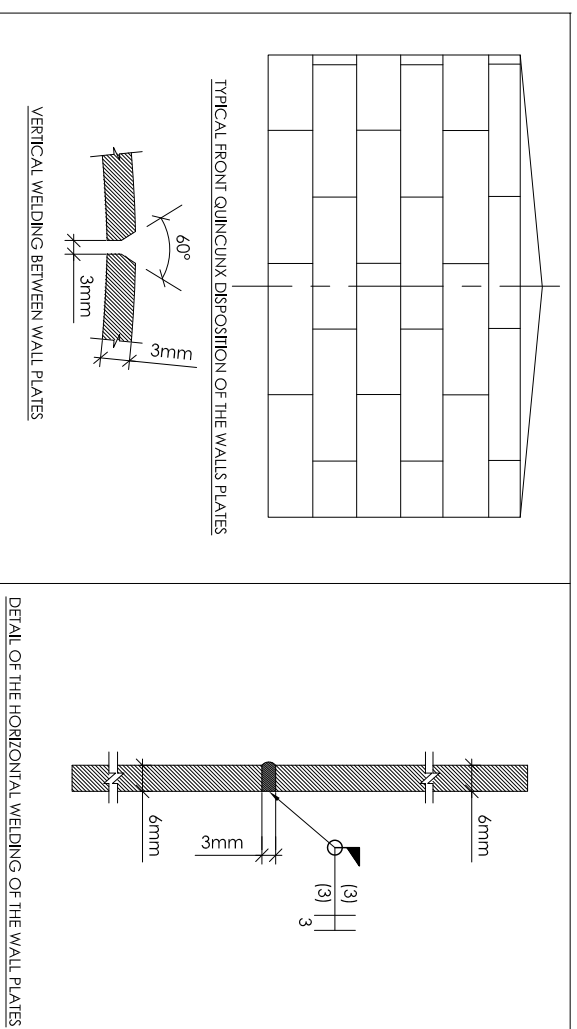
DWG. NO.: CON-GE-EFA-SRT-2019-001 SCALE AS SHOWN SH. 5 OF 7 REV. B

TANK Structural Notes:

- 1) The steel tank material shall follow the standard type in Sudan : " Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates A283/A283M- 13" Grade D : Tensile Strength = 41.5 Mpa and Yield Strength =230Mpa
- 2) The bottom of the tank shall be welded to the steel platform that welded to the I-beams
- 3) The tank shall be manufactured on ground at site or at a workshop and be fixed on top of the steel tower using a suitable lifting equipment
- 4) Welding of Connection as following:
 - a. Ensure that the welding procedure and the welding properties meet or exceed the material properties of pieces being joined.
 - b. As much as possible reduce welding points within the bottom and wall plates by using longer industrial sheets.
- 5) In the event of inevitable joints use the following sequence:
 - b. 1 Bottom Plate Welding Sequence
 - " Minimum overlap between bottom plates = 1in "



b.2 Wall plate welding



- 5) Additional stiffening plates of equivalent thickness shall be used at connection points between the steel ladder and the surface of the tank wall as well as the edges of openings and penetrations.
- 6) Manufacturing inspection, by visual examination, must cover most aspects: bending, groove preparation, alignment before and after welding, welding process, penetration, tolerances for circumference, straightness and circularity, double sided welds, heat treatment, small diameter welds around the nozzles, detecting of undercut, excessive convexity, distortions, etc. Defects acceptance criteria shall be in accordance with ES ISO 5817:2014
- 7) Fillet weld shall be used at the circumferential connection between the wall and bottom plates.
- 8) Vertical and horizontal welding between wall plates shall be butt weld, full penetration.
- 9) ALL TANKS ELEMENTS SHALL BE PAINTED AGAINST CORROSION AS PER ENGINEER INSTRUCTIONS AND SPECIFICATION

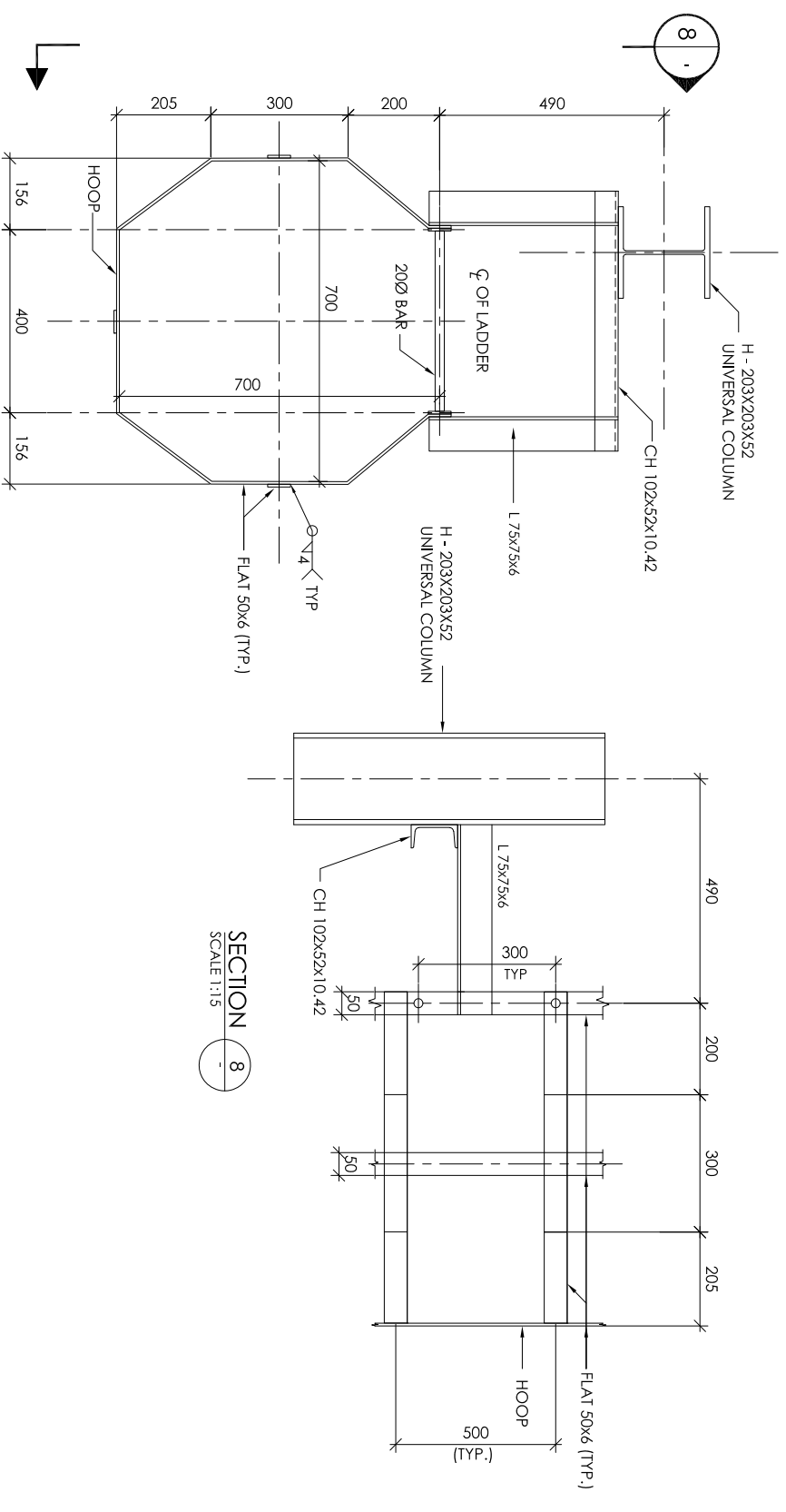
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1. ALL DIMENSIONS ARE IN mm
2. THE CONTRACTOR SHOULD THAT THE COLUMN BASE PLATES ARE AT ONE PLANE AND LEVEL. COLUMNS MEMBERS ARE STRAIGHTENED TO ENSURE PLUMBNESS AND ALL KINKS AT JOINTS CORRECTED TO APPROVAL.
3. MAXIMUM TOLERANCE FOR VERTICALITY TO BE 40mm.
4. ALL BOLTS SHALL BE GALVANIZED BOLTS OR PAINTED FOR ANTI-RUST TO ENGINEERS APPROVAL.
5. THE TANK SHALL BE SUPPLIED BY APPROVED/SPECIALIST SUPPLIERS AND BE INSTALLED BY QUALIFIED/SPECIALIST CONTRACTOR.
6. TANK AND TOWER FABRICATION/SHOP DRAWINGS TO BE CHECKED AND APPROVED BY ENGINEER PRIOR TO FABRICATION AND SUPPLY.
7. UNLESS OTHERWISE STATED ALL WELDS TO BE 8mm FILLET WELDS.
8. ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE BY STEEL FABRICATOR BEFORE COMMENCEMENT OF ANY WORK.
9. FINISHED GRADE ELEVATION LEVEL IS ASSUMED AS EQUAL TO 100.000.

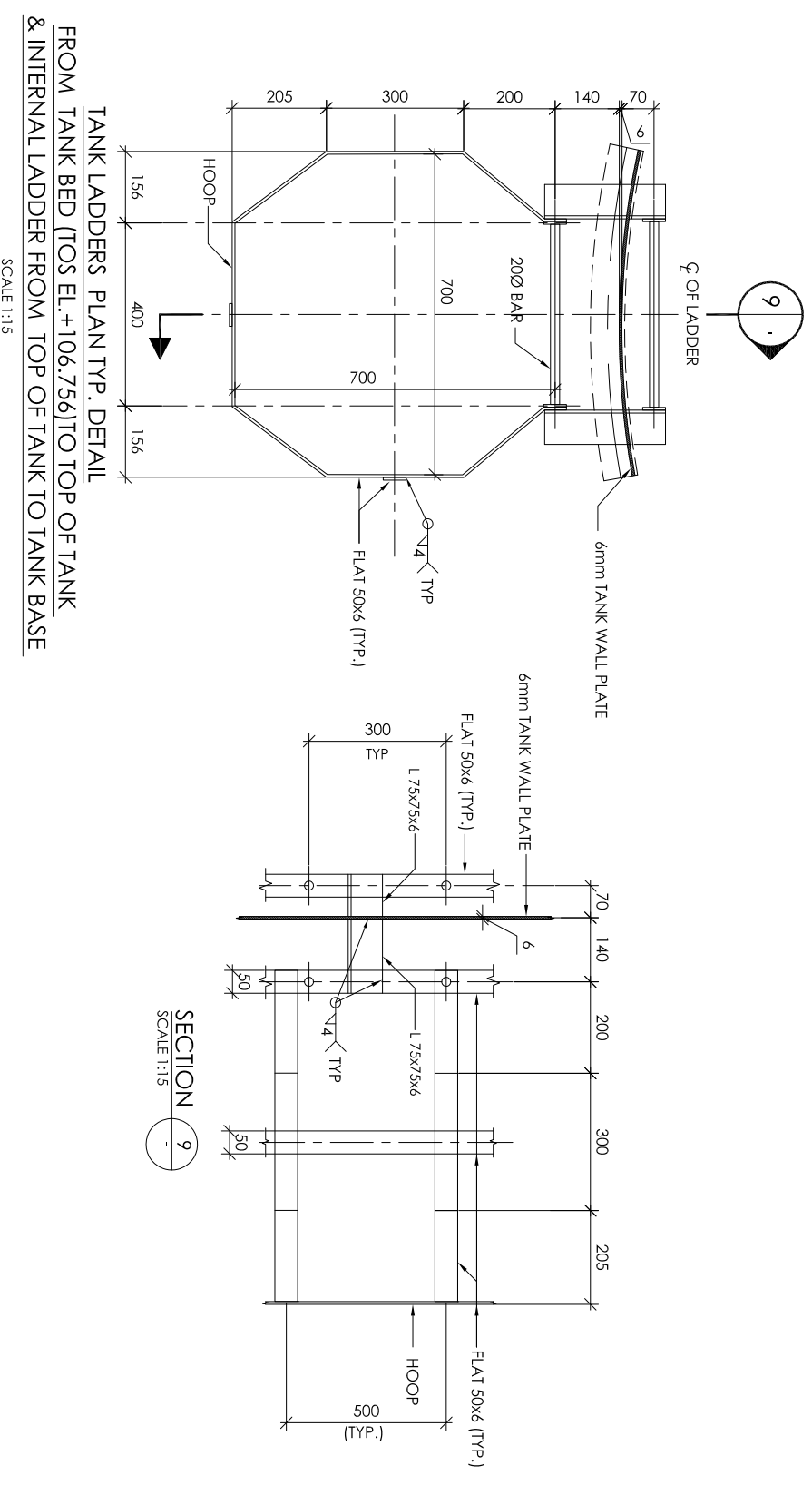
CAD PRODUCED DRAWING - NO MANUAL REVISION ALLOWED

DRAWING NO.	REFERENCE DRAWING	REV.	REVISIONS
		A	ISSUED FOR APPROVAL
		B	RE-ISSUED FOR APPROVAL
		C	RE-ISSUED FOR APPROVAL

DESIGN CONSULTANT	CLIENT:
ENG. HUSHAM HAMDAN	CONCERN E. GERENA, SUDAN, A HUMANITARIAN
CONSULTANT NO 718	NON-GOVERNMENT ORGANIZATION-HEAD OFFICE IN
Mobile-09128993860 0123795271	KHARTOUM EAST, KHARTOUM 2, STREET 37, PLOT NO 25
E-mail: husshamh@yahoocouk	
PROJECT: GEULO ELEVATED TANK FOUNDATION	LOCATION: WEST DARRUR
DRAWING TITLE: ELEVATED TANK STRUCTURAL DETAILS	
ORIGINAL DRAWING SIZE : A3	
DWG. NO.: CON-GE-E-TA-SRT-2019-001	SCALE AS SHOWN
	SH. 6 OF 7
	REV. B

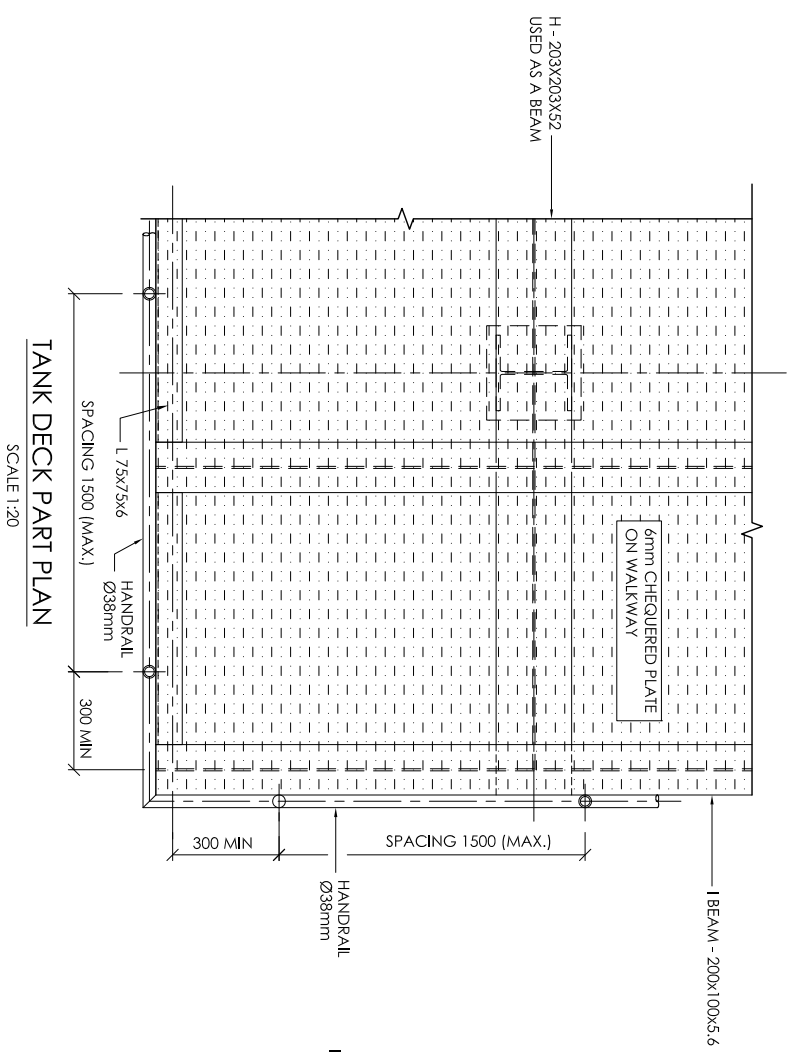


LADDER ACCESS PLAN TYP. DETAIL
FROM GROUND TO TANK BED (TOS EL.+106.756)
SCALE 1:15

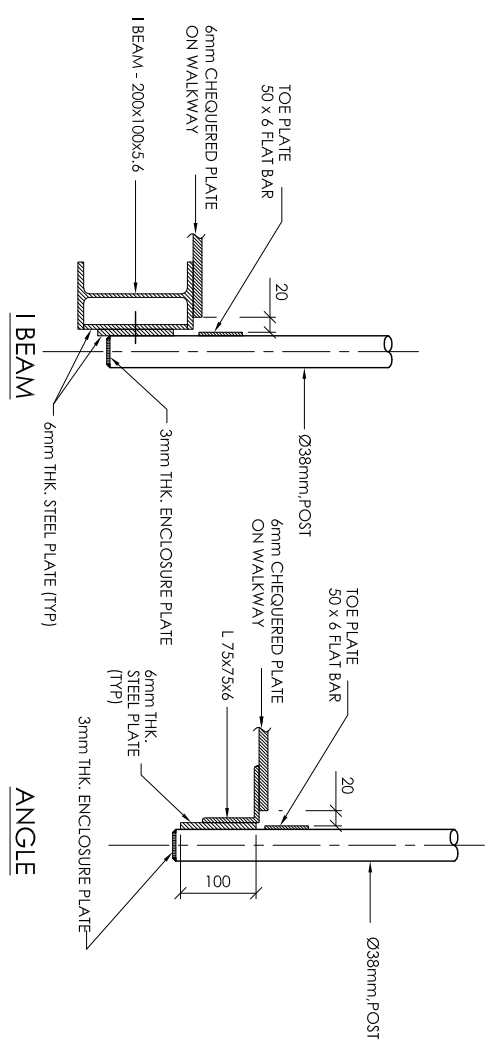


TANK LADDERS PLAN TYP. DETAIL
FROM TANK BED (TOS EL.+106.756) TO TOP OF TANK
& INTERNAL LADDER FROM TOP OF TANK TO TANK BASE
SCALE 1:15

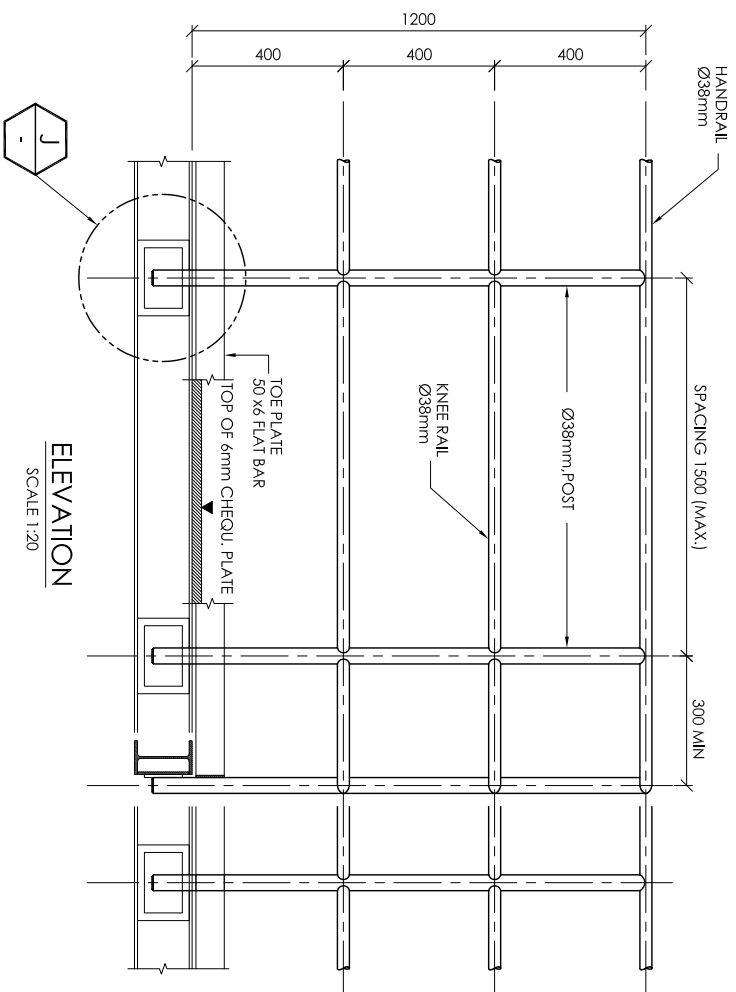
DWG. NO.: CON-GE-E-TA-SRT-2019-001



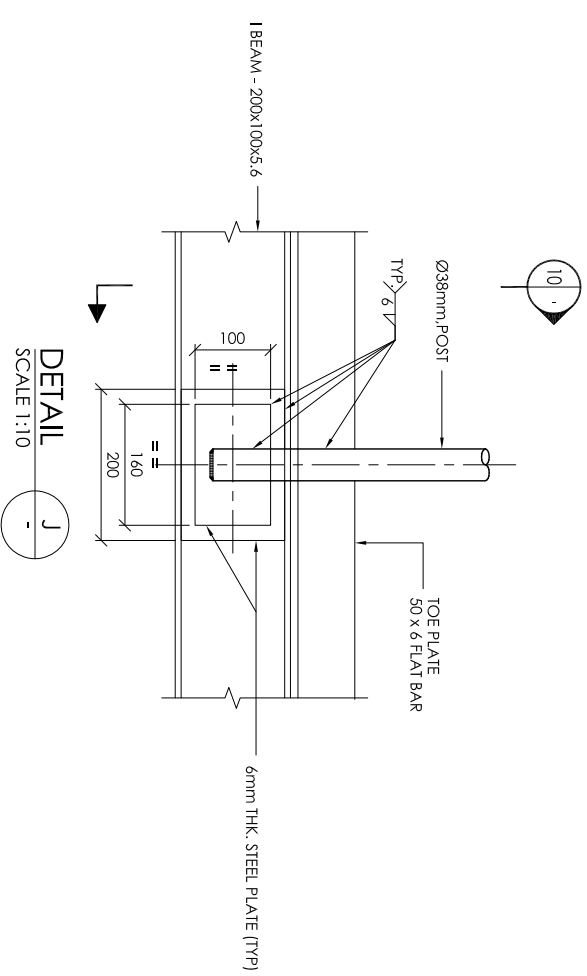
TANK DECK PART PLAN
SCALE 1:20



SECTION 10
SCALE 1:10



ELEVATION
SCALE 1:20



DETAIL
SCALE 1:10

TYPICAL HANDRAIL DETAIL FOR PLATFORM

NOTE:

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CAD PRODUCED DRAWING - NO MANUAL REVISION ALLOWED

DRAWING NO.	REFERENCE DRAWING	REV.	REVISIONS	DATE	DRAWN	CHKD	APPD.
		A	ISSUED FOR APPROVAL	SEP.2019	H.H.AMID	H.H.AMID	
		B	RE-ISSUED FOR APPROVAL	SEP.2019	H.H.AMID	H.H.AMID	
		C	RE-ISSUED FOR APPROVAL	SEP.2019	H.H.AMID	H.H.AMID	

DESIGN CONSULTANT
 ENG. HUSHAM HAMDAN
 CONSULTANT NO 718
 Mobile: 09125939860 0123795271
 E-mail: husshamhmdan@yahoo.co.uk

CLIENT:
 CONCERN E. GBERENA, SUDAN, A HUMANITARIAN,
 NON-GOVERNMENT ORGANIZATION- HEAD OFFICE IN
 KHARTOUM EAST, KHARTOUM 2, STREET 37, PLOT NO 25

PROJECT: **CONCERN worldwide** GEULO ELEVATED TANK FOUNDATION LOCATION: WEST DARFUR

DRAWING TITLE: **ELEVATED TANK STRUCTURAL DETAILS**

DWG. NO. CON-GE-EA-SRT-2019-001 SCALE AS SHOWN SH. 7 OF 7 REV. B