PROPOSED HYDROPONICS DEVELOPMENT

FOR: GREEN HABITAT INITIATIVE, GHI

AT: ANCHAU, KUBAU LOCAL GOVERNMENT AREA, KADUNA STATE

STRUCTURAL WORKING DRAWINGS

OCTOBER 2024

GENERAL CONSTRUCTION NOTES

GENERAL

A1. ALL STRUCTURAL DRAWINGS AND SKETCHES MUST BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTS AND SERVICES ENGINEERS AND SPECIALIST DRAWINGS. WHERE DISCREPANCIES OCCUR, THESE ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECTS AND/OR ENGINEERS FOR RESOLUTION PRIOR TO EFFECTING CONSTRUCTION.

A2. WORK TO FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE TO BE CHECKED ON SITE.

A3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

A4. FOR DETAILS OF FLOOR SCREED AND FINISHES, WATERPROOFING E.T.C. AND CONCRETE FINISHES, SEE ARCHITECTS DETAILS.

A5. KINDLY NOTE THAT THE FIRM/OR THE ENGINEERS ARE NOT RESPONSIBLE FOR STRUCTURAL LIABILITY OF THE STRUCTURE DURING/AFTER CONSTRUCTION IF THE ENGINEER(S) OR THE FIRM IS NOT ENGAGED IN THE CONSTRUCTION SUPERVISION

REINFORCEMENT

B1. STEEL TO HAVE A MINIMUM YIELD STRESS OF BAR AS DESIGNATED:
Y = 460 N/MM^2 , R = 250 N/MM^2 .
BARS DESIGNATED "T" TO BE THE DEFORMED TYPE BARS.

B2. 'R" DENOTES PLAIN ROUND HOT-ROLLED MILD STEEL REINFORCEMENT ACCORDING TO BS 4449 AND BARS ARE IN MILLIMETER SIZE.
"Y" DENOTES DEFORMED HIGH BOND HOT-ROLLED HIGH YIELD STRESS REINFORCEMENT TO BS 4449 AND 4461.
ADDITIONAL ABBREVIATIONS USED ON DRAWINGS ARE AS FOLLOWS:

- AS = ALTERNATELY STAGGERED
- AP = ALTERNATELY PLACED
- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE

B3. NOTATIONS USED AS FOLLOWS: II HI009 - I50 B, IMPLY

- II - NUMBER OF BARS
- HI0 - TYPE AND DIAMETER OF BARS
- 09 - BAR MARK
- I50 - SPACING OF BARS IN MILLIMETRES
- B - LOCATION OF BAR E.G. BOTTOM, T - TOP.

B4. WHERE HOLES, FIXING, ETC. ARE REQUIRED, BARS MAY BE DISPLACED SLIGHTLY TO ACCOMODATE THESE BUT THEY MUST NOT BE CUT OR REMOVED.

HOLLOW CLAY POT CONSTRUCTION

C1. CLASSIC HOLLOW CLAY POTS SHALL BE 200MM HIGH x 400MM WIDE x 230MM LONG WITH A UNIT WEIGHT OF 8.6KG PER PIECE.

C2. UNLESS NOTED OTHERWISE, CLASSIC RIB WIDTH SHOULD NOT BE LESS THAN 100MM.

C3. MESH REINFORCEMENT SPECIFIED TO BE LAID IN THE MIDDLE OF ALL HOLLOW CLAY POT FLOOR TOPPINGS WHICH SHOULD IN ANY CASE NOT BE LESS THAN 50MM THICK.

C4. ALTERNATE CLAY POTS MAY BE OMITTED AT SUPPORTS TO IMPROVE THE SHEAR RESISTANCE OF THE RIBS.

C5. CONCRETE MIXES IN ALL CASES ARE ADVISED TO BE WITH COARSE AGGREGATE SIZE NOT EXCEEDING 15MM, FOR EASE OF PLACEMENT AND COMPACTION.

C6. MID-SPAN CROSS SPREADER RIB IS TO BE USED FOR THE "CLASSIC" IN-SITU SYSTEMS TO IMPROVE LOAD DISTRIBUTION FOR LONGER SPANS. ON NO ACCOUNT SHOULD CLAY POT SYSTEMS BE USED AS A WAFFLE (TWO-WAY) SYSTEM WITHOUT THE ENGINEERS WRITTEN CONSENT.

CONCRETE

D1. ALL STRUCTURAL CONCRETE TO BE GRADE .....25..... IN FOUNDATIONS
ALL STRUCTURAL CONCRETE TO BE GRADE .....25..... IN COLUMNS.
ALL STRUCTURAL CONCRETE TO BE GRADE .....25..... IN ALL OTHER SUPERSTRUCTURAL ELEMENTS, UNLESS OTHERWISE STATED.

D2. MINIMUM CEMENT AGGREGATE RATIO TO BE I:6. MAXIMUM SIZE OF COARSE AGGREGATE TO BE 20MM.

D3. ALL AGGREGATE TO BE SUITABLY GRADED AND APPROVED BY THE ENGINEER PRIOR TO USE IN CONSTRUCTION.

D4. ALL CONCRETE TO BE SUITABLY AND FULLY COMPACTED AND CURED IN AN APPROVED MANNER TO THE SATISFACTION OF THE ENGINEER.

D5. MINIMUM CONCRETE COVER TO MAIN REINFORCEMENT TO BE AS FOLLOWS:
FOUNDATION : ..... 50MM, COLUMNS&SHEAR WALLS: 30MM,
BEAMS : ..... 30MM, SLABS : 25MM,
RETAINING WALLS : 50MM,
STAIRCASES, ETC..... 25MM, UNLESS OTHERWISE STATED.

D6. ALL MASS CONCRETE TO BE I : 3 : 6 MIX (CEMENT - SAND - COARSE AGGREGATE) ALL BLINDING TO BE I : 6 MIX (CEMENT- SAND AGGREGATE).

D7. IN WATER-TIGHT CONSTRUCTION, JOINTS IN CONCRETE WORK ARE TO HAVE WATER BAR AND CONTRACTOR IS TO TAKE SPECIAL CARE WITH THE CONCRETE SO AS TO PRODUCE A WATER-TIGHT CONSTRUCTION.
AN ADMIXTURE OF A PROPRIETARY BRAND MAY BE USED IF AGREED BY THE ENGINEER. HOWEVER, IF USED ADEQUATE CARE SHOULD BE EXERCISED THAT IT IS PLACED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.

D8. ALL CONSTRUCTION JOINT POSITIONS ARE TO BE APPROVED BY THE ENGINEER PRIOR TO CASTING WHERE NOT INDICATED ON THE DRAWING. THESE SHOULD NOT EXCEED I0.0M APART.

D9. CONCRETE SHALL NOT BE POURED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. HOPPERS, VERTICAL CHUTES OR TRUNKS SHALL BE USED IN SUFFICIENT NUMBERS SO THAT THE FREE UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED I800MM & TO ENSURE THAT THE CONCRETE IS KEPT LEVEL AT ALL TIMES.

DI0. BEFORE FRESH CONCRETE IS POURED AGAINST CONCRETE IN-PLACE, THE CONTACT SURFACES OF CONCRETE IN-PLACE SHALL BE THOROUGHLY CLEANED, ALL LAITANCE SHALL BE REMOVED & THE CONTACT SURFACES SHALL BE THOROUGHLY SLOSHED WITH GROUT CONSISTING OF ONE PART SAND TO ONE PART CEMENT WITH A MINIMUM AMOUNT OF WATER.

DII. CONCRETE CAST ON SLOPED SURFACES SHALL BEGIN AT THE LOWEST ELEVATION & CONTINUE MONOLITHICALLY TOWARD THE HIGHER ELEVATION UNTIL THE INTENDED POUR IS COMPLETED.

BLOCKWORK

E1. CAVITIES OF HOLLOW BLOCKWALLS BELOW GROUND SLAB LEVEL ARE TO BE FILLED WITH MASS CONCRETE. BACKFILLING TO EXCAVATED TRENCHES ARE TO BE CARRIED OUT SIMULTANEOUSLY ON BOTH SIDES OF WALL.

E2. THE WALL THICKNESS OF THE BLOCKS SHOULD NOT BE MORE THAN 25MM.

E3. THE MINIMUM CRUSHING STRENGTH OF THE NON-LOAD BEARING HOLLOW SANDCRETE BLOCKS IS TO BE 2.1 N/MM2 OF THE GROSS AREA OF BLOCK AT 28 DAYS.

E4. BLOCKWORK TIES BETWEEN BLOCKWALLS AND COLUMNS/STANCHIONS ARE TO BE PROVIDED AT EVERY COURSE. TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.

E5. MAXIMUM POUR HEIGHT FOR ALL FILLED BLOCKWORK TO BE 2 COURSES AT A TIME.

E6. ALL LOAD-BEARING SANDCRETE HOLLOW BLOCKWALLS TO HAVE A MINIMUM STRENGTH OF 2.76 N/MM2 OF NET AREA OF BLOCKWALL AT 28 DAYS.

E7. BLOCKWORK INDICATED THUS [redacted] DRAWINGS ARE LOAD BEARING AND ARE TO BE CONCRETE FILLED TO THE SPECIFIED OR SHOWN LEVEL(S) WITH CONCRETE AS PER NOTE D1 WITH 10MM MAXIMUM COARSE AGGREGATE SIZE.

BLOCKWORK CONT'D.

E8. CONCRETE FILLED LOAD-BEARING BLOCKWORK IS TO ACHIEVE A MINIMUM CRUSHING STRENGTH OF 6.5 N/MM2.

STRUCTURAL STEELWORK

F1. ALL STRUCTURAL STEELWORK DESIGN, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH BS 5950 : PARTS I - 7 : 1990 OR EQUIVALENT OTHER STANDARDS.

F2. ALL STRUCTURAL STEELWORK SHALL BE MILD STEEL TO BS 4360 GRADE 43A EXCEPT HOLLOW SECTIONS WHICH SHALL COMPLY WITH GRADE 43C.

F3. WELDING FABRICATION AND ERECTION OF STRUCTURAL STEELWORK SHALL CONFORM TO BS 449 PART 2.

F4. BEFORE COMMENCING FABRICATION OF STEELWORK THE SUPPLIER SHALL SUBMIT TWO COPIES OF SHOP DRAWINGS FOR THE APPROVAL OF THE ENGINEER.

F5. ALL BOLTED CONNECTIONS TO BE CAPABLE OF TRANSMITTING THE FULL STRESS LOADS OF THE SECTIONS JOINED. THE TYPE OF BOLT USED TO BE CLEARLY STATED ON THE SHOP DRAWINGS AND ONLY ONE GRADE OF BOLT TO BE USED FOR THE COMPLETE WORKS.

F6. UNLESS WHERE OTHERWISE NOTED, ALL BOLTS SHALL BE BLACK BOLTS TO BS 4190 AND WASHERS TO BS 4320 SHALL BE PROVIDED FOR ALL BOLTS.

F7. ALL WELDED JOINTS TO BE FORMED WITH CONTINUOUS FILLET WELDS. ALL WELDS ARE TO BE 6MM FILLET WELDS CONTINUOUS UNLESS WHERE OTHERWISE INDICATED.

F8. ALL STEELWORK TO BE THOROUGHLY CLEANED AFTER FABRICATION AND COATED WITH AN APPROVED PRIMER. UPON COMPLETION OF ERECTION AND PRIOR TO HAND-OVER, THE SUPPLIER SHALL MAKE GOOD ANY DAMAGE TO THE PRIMER CAUSED DURING TRANSPORT AND ERECTION.

F9. UNLESS NOTED OTHERWISE THE COMPOSITION OF THE PROTECTIVE SYSTEM SHALL BE :-

- (A) SURFACE TREATEMENT - D
- (B) METAL COATING - NONE
- (C) PRE-TREATMENT - NONE
- (D) PRIMING PAINT - IH
- (E) FINISHING PAINT - 2T

AS CLASSIFIED IN TABLE 4 KEY TO TREATMENT CP 2008 1966.

F10. THE FIRST BAY OF ERECTED STEELWORK IS TO BE LINED AND LEVELLED BY MEANS OF TEMPORARY BRACING, BEFORE FURTHER ERECTION SHALL CONTINUE.

F11. ANTI-SAG RODS ARE TO BE PROVIDED AS SHOWN ON DRGS. WHERE ANTI-SAG RODS ARE NOT SHOWN ON THE DRGS., THEY ARE TO BE PROVIDED AND PLACED AT MID-SPAN OF PURLINS OR TO PURLIN MANUFACTURERS SPECIFICATION.

F12. ALL STEEL SURFACES IN CONTACT WITH ALUMINIUM SHEETING ARE TO BE GIVEN TWO COATS OF AN APPROVED BITUMASTIC PAINT BEFORE FIXING SHEETING.

F13. ALL BOLTS IN TENSION SHOULD BE PROVIDED WITH EITHER DOUBLE COILED SPRING WASHERS OR LOCK NUTS.

FOUNDATION

H1. FOR SHALLOW FOUNDATIONS, THE DETAILS INDICATED ON THE RELEVANT DRAWINGS HAVE BEEN BASED ON AN ASSUMED GROUND BEARING CAPACITY OF .....150..... KN/M2.

H2. FOR PILED FOUNDATIONS, THE DETAILS INDICATED ON THE RELEVANT DRAWINGS HAVE BEEN BASED ON CONFIRMED DEEP SUBSOIL CONDITIONS AND THE RECOMMENDATIONS OF A SPECIALIST SUBSOIL INVESTIGATION.

H3. SITE PREPARATION AND TREATMENT TO BE CONFIRMED ON SITE BY SUPERVISING ENGINEER AT COMMENCEMENT OF FOUNDATION CONSTRUCTION.

H4. RELATIONSHIP OF THE GROUND FLOOR SLAB, EXISTING GROUND LEVEL AND THE FOUNDATION FORMATION LEVEL ARE TO BE CONFIRMED ON SITE AND APPROVED PRIOR TO CONSTRUCTION OF THE FOUNDATION.

H5. ALL SOLID BLOCKWORK BELOW GROUND FLOOR SLAB TO BE CONCRETE FILLED WITH GOOD QUALITY CONCRETE AS PER NOTE E7 .

EARTHWORK

G1. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR SHORING AND BRACING OF THE BUILDING EXCAVATIONS & EMBANKMENTS, INCLUDING EXCAVATION FOR UTILITIES, AND IS ALSO FULLY RESPONSIBLE FOR THE DESIGN & PERFORMANCE OF SHORING AND BRACING DURING CONSTRUCTION.

G2. CONTRACTOR SHALL COORDINATE THE EXTENT OF THE EXCAVATION, SHORING AND BRACING WITH CIVIL DRAWINGS. CONTRACTOR SHALL ALSO REFER TO CIVIL DRAWINGS, SPECIFICATIONS & GEOTECHNICAL REPORT FOR DEWATERING AND RELATED INFORMATION NOT COVERED IN THE STRUCTURAL DRAWINGS.

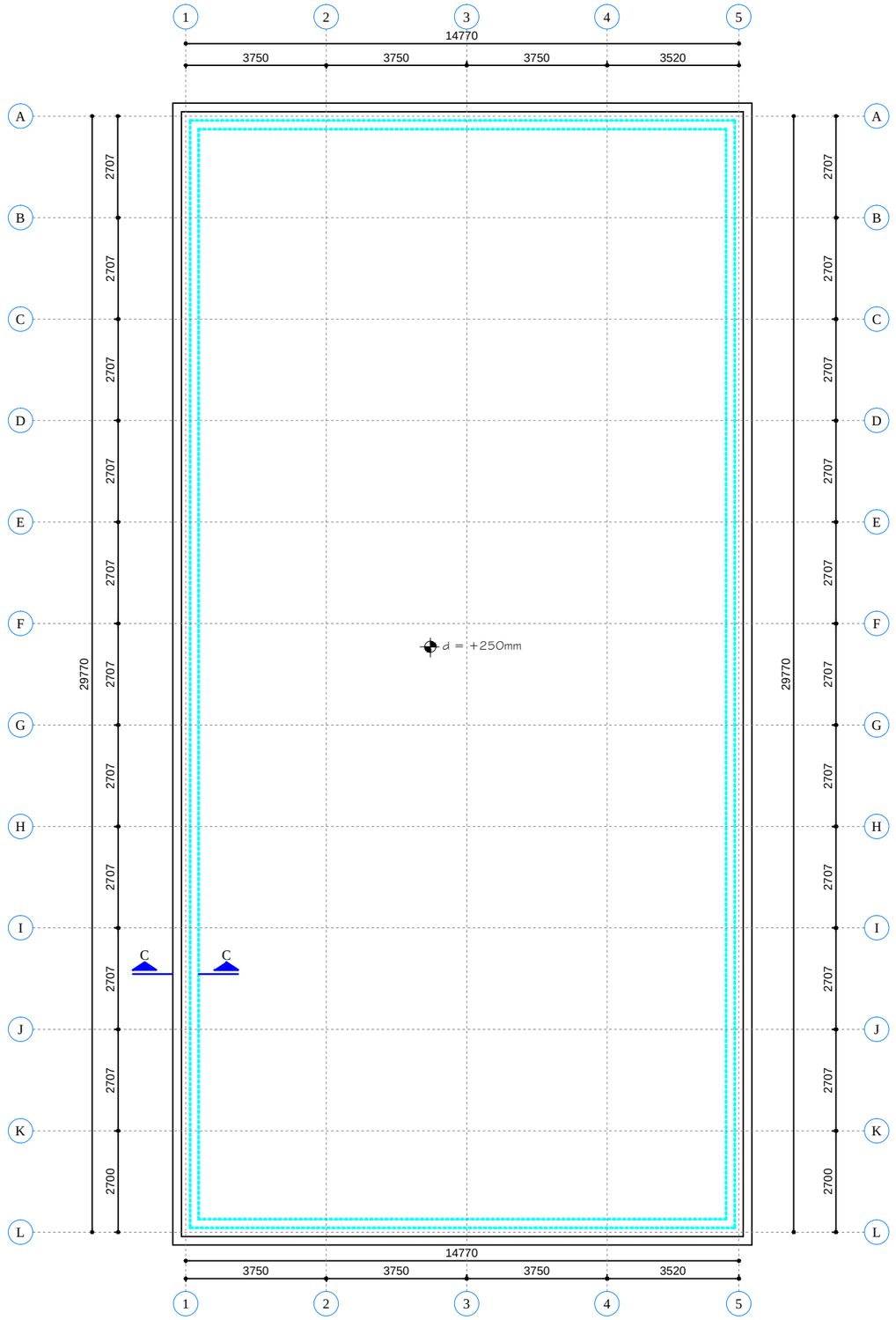
G3. EARTHWORK COMPACTION SHALL BE IN ACCORDANCE WITH CIVIL DRAWINGS AND SPECIFICATIONS AS WELL AS WITH THE GEOTECHNICAL REPORT.

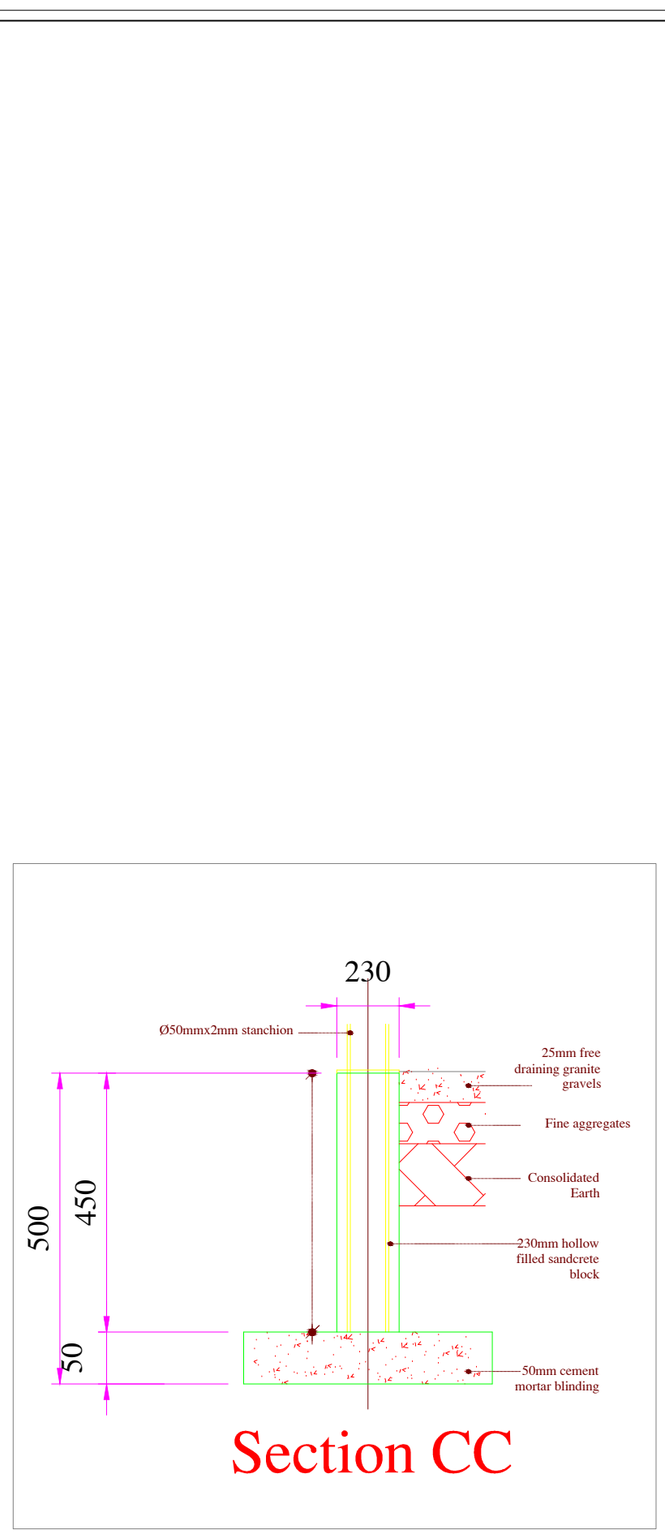
SITE PREPARATION

J1. REMOVE ALL EXISTING TOPSOIL UNDER SLABS, PROVIDE 150MM WELL RAMMED AND CONSOLIDATED NATURALLY OCCURRING HARDCORE MATERIAL OR ROCK LATERITE UNDER ALL GROUND BEARING SLAB. WELL CONSOLIDATED SELECTED FILL OR MASS CONCRETE TO BE USED TO MAKE UP LEVELS WHERE NECESSARY AS AGREED WITH THE ENGINEER. WHERE LEVELS ARE TO BE MADE UP USING FILL, THICKNESS OF LAYERS SHOULD NOT EXCEED 225MM.

J2. WHERE BAD GROUND IS ENCOUNTERED BELOW FOUNDATION LEVEL, THE DIFFERENCE IN LEVEL BETWEEN APPROVED BEARING STRATUM AND ORIGINAL LEVEL IS TO BE MADE UP USING MASS CONCRETE TO THE APPROVAL OF THE SUPERVISING ENGINEER.

J3. EXTERNAL WALL STRIP FOOTING TO BE 1000MM MINIMUM DEPTH BELOW EXISTING GROUND LEVEL OR FINAL GROUND LEVEL WHICHEVER IS LOWER, UNLESS OTHERWISE STATED.





Section CC

General notes

- All dimension are in milimetres
- All Work must be supervised by an Engineer.
- This drawing is only allowed to be used for its intended purpose. Handing out this to a third party is not permitted nor usage for other purposes permitted without our special permission.

drawn	Engr. A. S. Umar
designed	Engr. B. Jamaare
checked	Engr. I. M. Ojekpo
scale	1:150
date	October 2024

client

GREEN HABITAT INITIATIVE, GHI

Job tittle

Proposed Hydroponics Development

location

Anchau, Kubau Local Government Area, Kaduna State, Nigeria

consultant

abni Engineering Ltd.
Real Estate | Construction and Consultancy

Adress: Plot 301, Emirates Prime Apartments, Katampe Abuja

Contact: 08135328223, 07037787867

sheet title

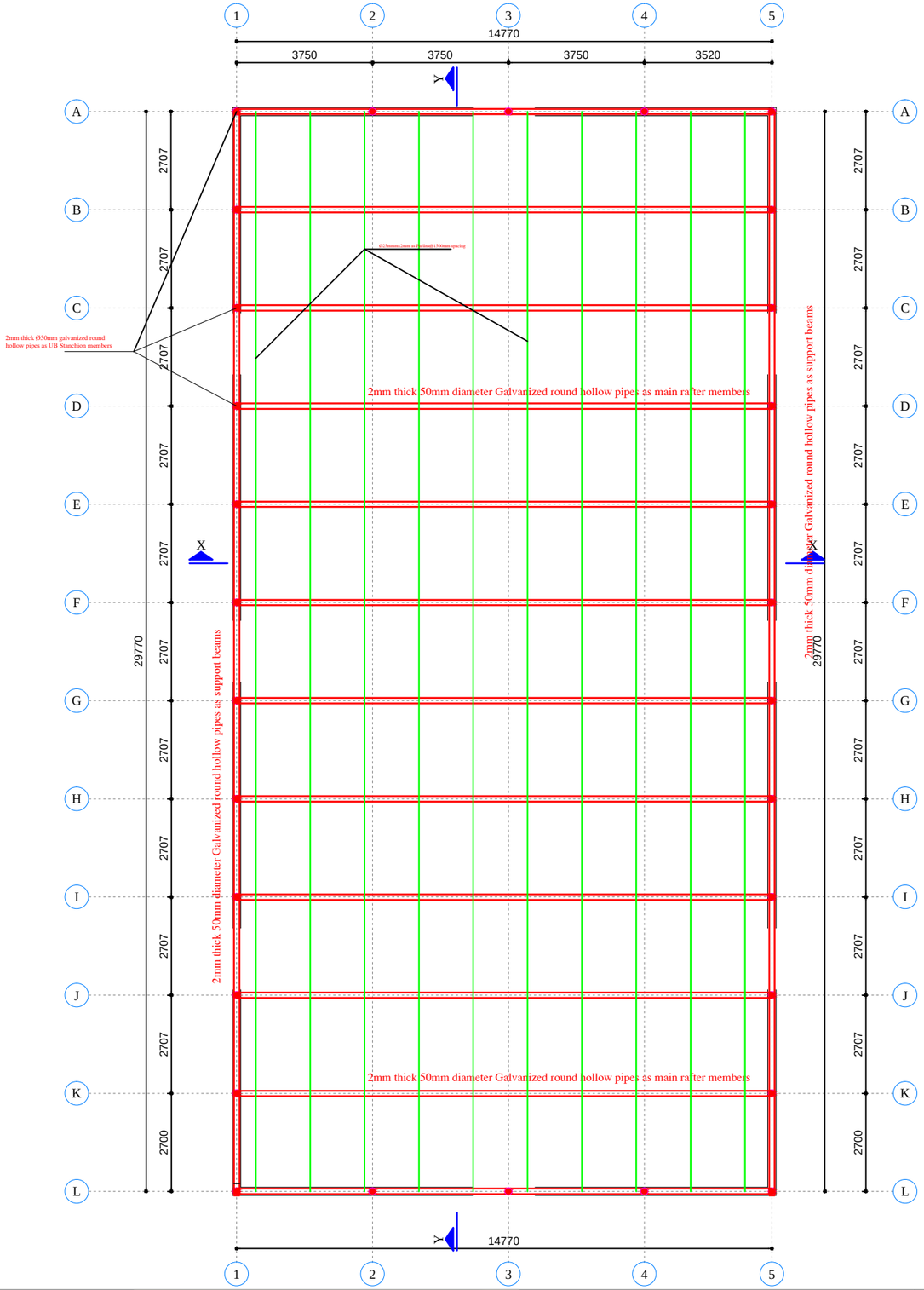
Foundation Layout

Job no.

sheet no.

STRC 01

Seal



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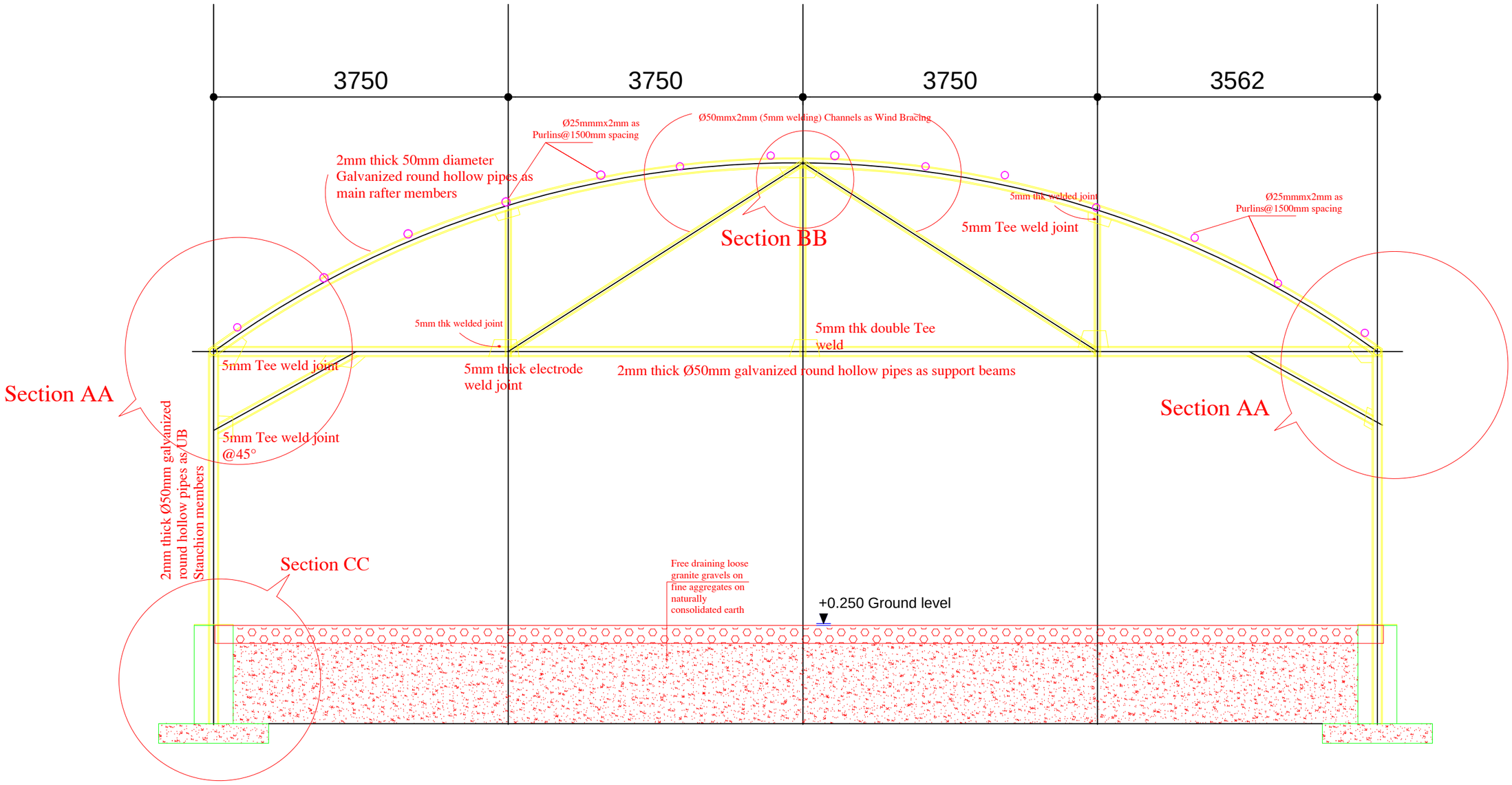
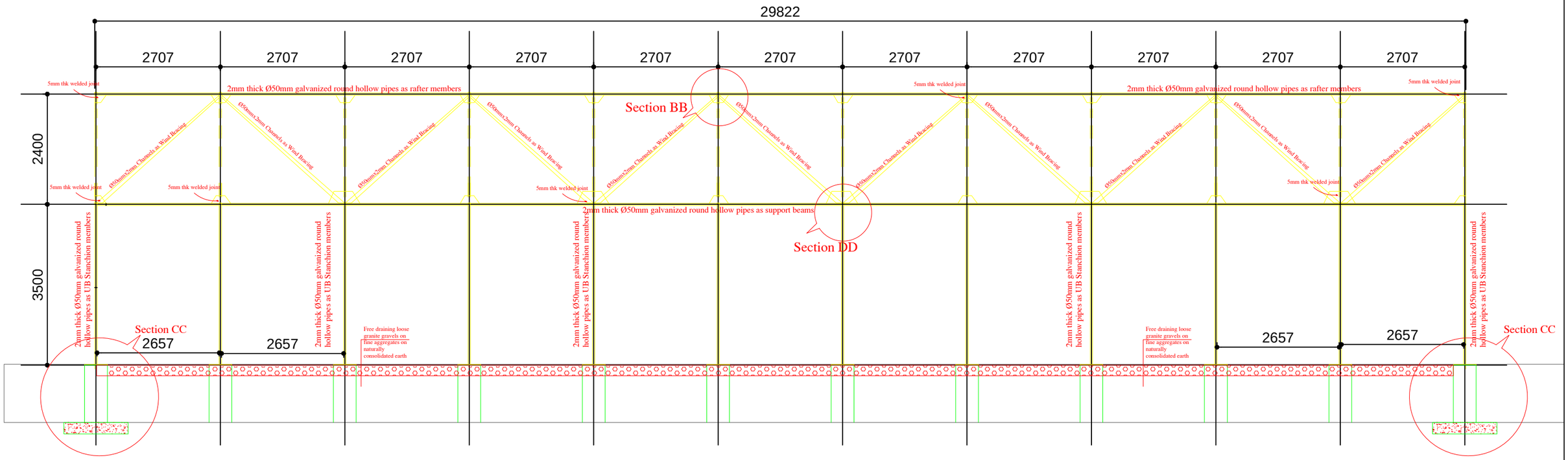
	designed	Engr. B. Jamaare			location	Anchau, Kubau Local Government Area, Kaduna State, Nigeria	Adress	Plot 301, Emirates Prime Apartments, Katampe Abuja
	checked	Engr. I. M. Ojekpo					Contact	08135328223, 07037787867
	scale	1:150					sheet title	Roof Layout
	date	October 2024					Job no.	sheet no. STRC 02
							Seal	



TYPICAL PORTAL FRAME
(Front and Rear Elevation)
(Section X-X)

General notes ○ All dimension are in milimetres ○ All Work must be supervised by an Engineer. ○ This drawing is only allowed to be used for its intended purpose. Handing out this to a third party is not permitted nor usage for other purposes permitted without our special permission.	drawn designed checked scale date	Engr. A. S. Umar Engr. B. Jamaare Engr. I. M. Ojekpo N.T.S October 2024	client **GREEN HABITAT INITIATIVE, GHI**	Job tittle Proposed Hydroponics Development location Anchau, Kubau Local Government Area, Kaduna State, Nigeria	consultant Adress Contact	abni Engineering Ltd. Real Estate | Construction and Consultancy Plot 301, Emirates Prime Apartments, Katampe Abuja 08135328223, 07037787867	sheet title Portal Frame Job no. sheet no. STRC 03	Seal



TYPICAL PORTAL FRAME
(Side Elevation)
(Section Y-Y)

General notes	
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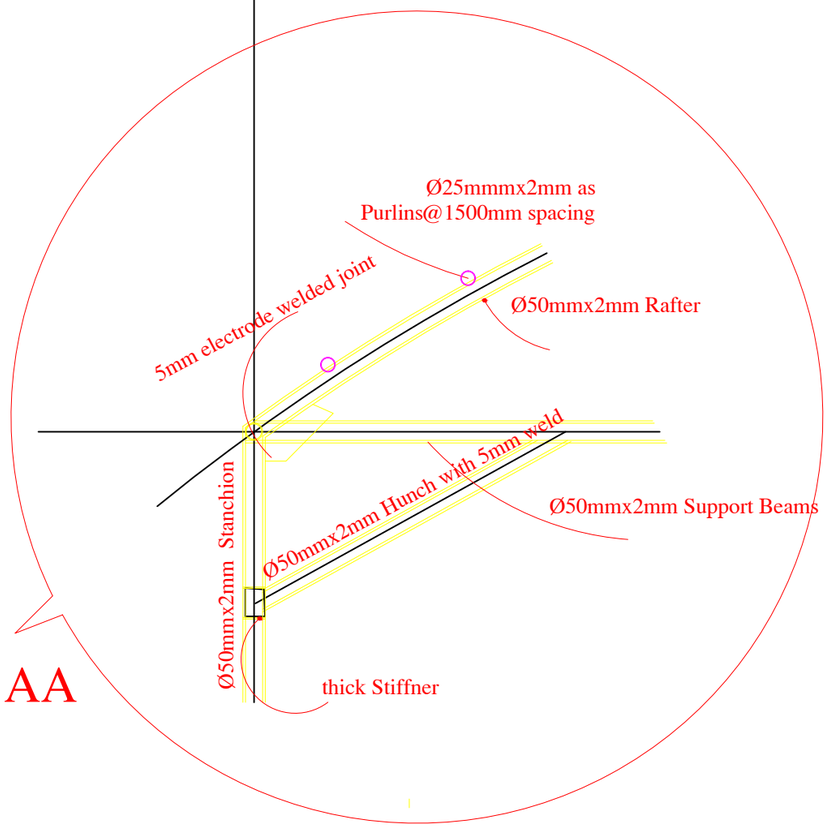
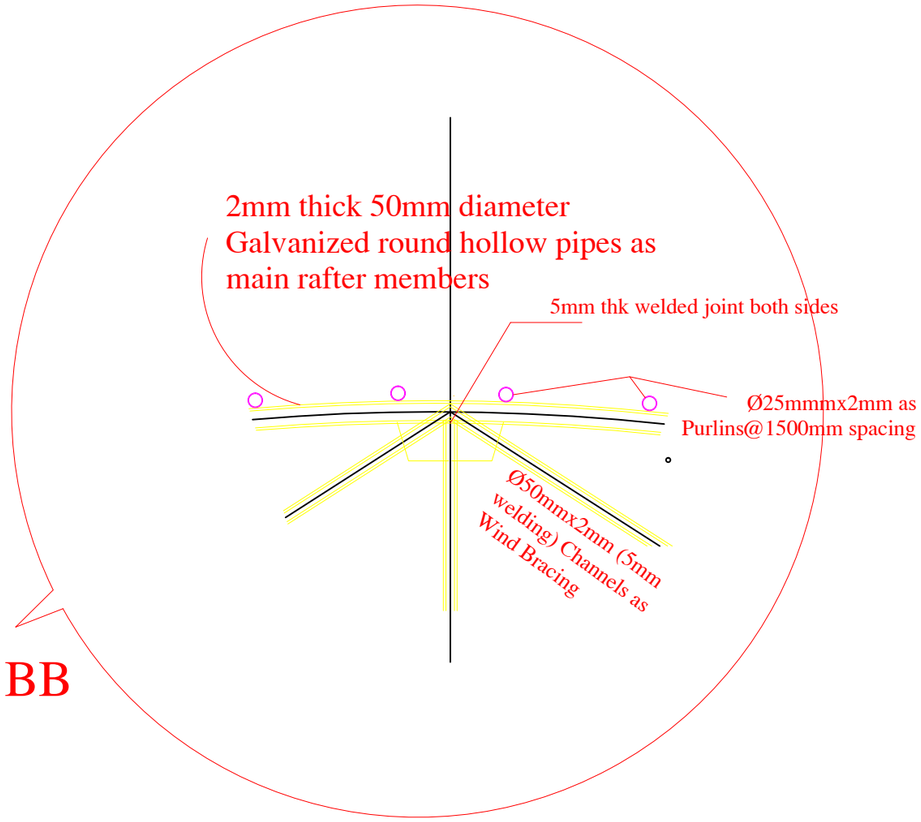
drawn	Engr. A. S. Umar
designed	Engr. B. Jamaare
checked	Engr. I. M. Ojekpo
scale	N.T.S
date	October 2024
client	GREEN HABITAT INITIATIVE, GHI
Job tittle	Proposed Hydroponics Development
location	Anchau, Kubau Local Government Area, Kaduna State, Nigeria
consultant	abni Engineering Ltd. Real Estate | Construction and Consultancy
Adress	Plot 301, Emirates Prime Apartments, Katampe Abuja
Contact	08135328223, 07037787867
sheet title	Portal Frame
Job no.	
sheet no.	STRC 04
Seal	



Section AA



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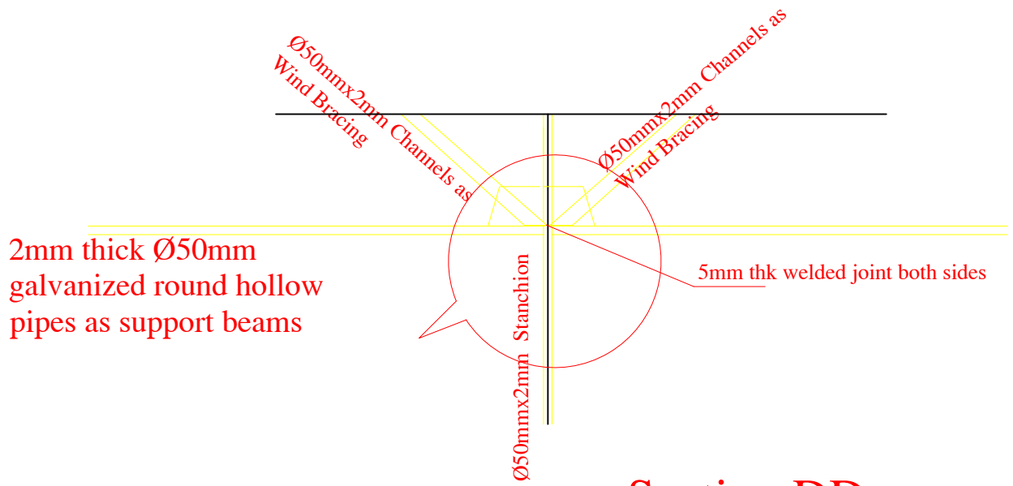

Section DD

General notes	drawn	Engr. A. S. Umar	client	Job tittle	consultant	sheet title	Seal
◦ All dimension are in milimetres	designed	Engr. B. Jamaare	GREEN HABITAT INITIATIVE, GHI	Proposed Hydroponics Development	abni Engineering Ltd. Real Estate | Construction and Consultancy	Portal Frame Section Details	
◦ All Work must be supervised by an Engineer.	checked	Engr. I. M. Ojekpo		location			
◦ This drawing is only allowed to be used for its intended purpose. Handing out this to a third party is not permitted nor usage for other purposes permitted without our special permission.	scale	N.T.S		Anchau, Kubau Local Government Area, Kaduna State, Nigeria	Adress: Plot 301, Emirates Prime Apartments, Katampe Abuja	Job no.	sheet no. STRC 05
	date	October 2024			Contact: 08135328223, 07037787867		