



Save the Children

Multipurpose Disaster Shelter Support (MPDS) Project

SUB STRUCTURAL DESIGN & DRAWINGS FOR


CONSTRUCTION OF MULTIPURPOSE DISASTER SHELTER AT LAMA ADORSHO GOVT. PRIMARY
SCHOOL UNDER LAMA POURASHAVA, UPAZILA: LAMA, DISTRICT: BANDARBAN

Issued for Tender

 Consultant:
SPACE SOLUTION FOR SOCIAL INTEGRATION LIMITED
1/12, Block G, Lalmatia, Dhaka

MARCH, 2023

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NAME OF PROJECT:	NAME OF WORK:	DESIGN PREPARED BY	DESIGN MODIFIED BY:	VERIFIED BY:	PACKAGE INFO.	DRAWING TITLE:		SHEET NO:
<div> MULTIPURPOSE DISASTER SHELTER SUPPORT (MPDS) PROJECT</div>	Construction of Multipurpose Disaster Shelter at Lama Adorsho Government Primary School under Lama Pourashava, Upazila: Lama, District: Bandarban FUNDED BY: USAID	MPDS Engineering Team	MD. FORKANUL HAQUE Manager-Engineering, MPDS Save the Children International	TUSHAR KANTI ROY Infrastructure Manager, MPDS CARE Bangladesh	Package No: SCI/MPDS/B10-19-01	INDEX (SUB STRUCTURE)	All Dimension are in Millimeter unless mentioned	SUB-00
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NOTES

THIS NOTE VALID FOR THE DRAWING RELATED TO THIS PROJECT:

1. PLEASE DO NOT SCALE FROM THE DRAWINGS.
2. ALL DIMENSIONS ON THIS DRAWINGS SHALL BE CHECKED ON SITE BEFORE WORK COMMENCES. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS.
3. NO KICKER SHALL BE MADE FOR COLUMNS UNDER ANY CONDITION.
4. ALL AGGREGATES SHALL BE PROPERLY WASHED.
5. PROJECT ENGINEER , SITE ENGINEER , CONTRACTORS & THE SUB CONTRACTORS SHALL CHECK AND CONFIRM THE FOLLOWING PARAMETERS AS PER DRAWINGS BEFORE BEGINNING THE WORKS:

a) REINFORCEMENT POSITION

a) DEVELOPMENT LENGTH

b) CLEAR COVER

c) CONCRETE MIX RATIO

d) ALL DIMENSIONS AND LEVEL
6. PROJECT ENGINEER , SITE ENGINEER , CONTRACTORS & THE SUB CONTRACTORS IS TO NOTIFY THE INFRASTRUCTURE MANAGER/MANAGER-ENGINEERING ABOUT ANY DISCREPANCIES / DIFFERENCES CONTAINED IN THE DRAWING (IN RELATION TO OTHER DRAWINGS) BEFORE BEGINNING THE WORK .

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DRAWINGS AND SPECIFICATIONS AS INSTRUMENTS OF SERVICE ARE AND SHALL REMAIN THE PROPERTY OF MPDS WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THEY ARE NOT TO BE USED ON OTHER PROJECTS OR EXTENSIONS TO THE PROJECT OR OTHER SIMILAR PROJECTS EXCEPT ANY WRITTEN AGREEMENT.

1. GENERAL INFORMATION:

- a) ALL STRUCTURAL DESIGN PARAMETERS ARE USED ACCORDING TO BNBC-2020.
- b) THE STRUCTURAL SYSTEM IS SPECIAL MOMENT RESISTING FRAME SYSTEM AND THE LATERAL FORCES ARE ANALYZED BY EQUIVALENT STATIC FORCE METHOD.
- c) FOLLOW BNBC-2020 FOR SPECIFICATIONS / STRUCTURAL REQUIREMENTS NOT MENTIONED IN THE DRAWINGS OR IN THIS NOTE SHEET.
- d) ANY DETAILS NOT SHOWN IN THE DRAWING SHOULD BE DONE ACCORDING TO BNBC 2020, BUILDING CODE & COMMENTARY - 2019, ACI 318-19/318R-19.
- e) DESIGN METHOD: ☒ USD. ☐ WSD.
- f) ALL THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL DRAWINGS.

2. LOAD CALCULATION DATA:

- a) ARIAL ZONE: ☒ BANDARBAN
- b) BASIC WIND SPEED: 62.5 m/s (FOR BANDARBAN)
- c) SEISMIC ZONE -3 (ZONE CO-EFFICIENT, Z=0.28)
- d) EXPOSURE CONDITION:☐ A ☐ B ☒ C

3. MATERIALS:

3a) ENGINEERING MATERIALS:

i) CEMENT:

ORDINARY PORTLAND CEMENT (PREFERABLE) CONFORMING TO BDS EN 197-1 : 2003 CEM-I 52.5N/ASTM C150 TYPE-1 OR
PORTLAND COMPOSITE CEMENT CONFORMING TO BDS EN 197-1 : 2003 CEM II/AM, 42.5NCOULD BE USED AS SPECIFIED IN SPECIFICATION.

ii). FINE AGGREGATE (SAND):

LOCAL SAND (ANGULAR SHAPE) F.M = 1.2~1.8
TO BE USED WALL, CEILING PLASTER & BRICK LAYING MORTAR.
FOR CONCRETE WORK F.M >1.8
FILLING SAND (ANGULAR SHAPE) F.M = 0.5~0.7
TO BE USED IN GROUND FLOOR FILLING, FOUNDATION FILLING ETC.

iii) COURSE AGGREGATE (CHIPS)

ALL COURSE AGGREGATE SIZE 20MM DOWN WELL GRADED OR OTHERWISE MENTION.
LAA VALUE WILL NOT EXCEEDING 30 WHERE NOT MENTIONED.

iv) REINFORCEMENT:

- a) STEEL TO BE USED WITH YIELD STRENGTH $f_y = 400$ MPa BUT NOT EXCEED 420 MPa DEFORMED BAR WITH MARKED BDS ISO 6935-2:2006
- b) ALL REINFORCEMENT SHOULD BE AS PER ASTM A775/, BDS ISO 14654: 2013 SPECIFICATION FOR A COATING THICKNESS (AFTER CURING) MINIMUM 175 MICRONS FOR 10MM TO 12MM REBAR AND MINIMUM 190 MICRONS FOR 16MM TO 50MM RE-BARS.




c) ALL REINFORCEMENT SHOULD BE TESTED AS PER TESTING SCHEDULE AND ITEM SPECIFICATIONS.

v) BRICK:

- a) ALL BRICK SHOULD BE AS PER BDS 208 : 2009

vi) CONCRETE FOR RCC Works in Sub Structure (except Pile casting)

CONCRETE COMPRESSIVE STRENGTH $f'_c = 30$ MPA. AT 28 DAYS
PROPOSED MIXING RATIO = 1:1.25:2.5 (Fixed)
MAXIMUM WATER CEMENT RATIO = 0.40
CEMENT (BDS EN 197-1 : 2003) = ORDINARY PORTLAND CEMENT (CEM-I)
ADMIXTURE (ASTM-C494) = TYPE-F OR APPROVED BY E-I-C
FINE AGGREGATE (SAND) FM = 2.5
COURSE AGGREGATE (CHIPS) = 20mm DOWN WELL GRADED CRUSHED STONE
LAA VALUE FOR COURSE AGGREGATE = ≤ 30
MIXING METHOD = USING CONCRETE MIXER

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FUNDED BY: USAID

vii) WATER:

POTABLE WATER TO BE USED IN CONCRETE MIX; W/C RATIO WILL NOT EXCEED 40%

Types of solids	Limits
Organic solids	≤ 200 mg/liter
Inorganic solids	≤ 3000 mg/liter
Sulphate	≤ 400 mg/liter
Chlorides	≤ 2000 mg/liter
Suspended matter	≤ 2000 mg/liter

3b) NON ENGINEERING MATERIALS:

- i) POLYTHENE SHEET: 0.18 MM THICK SINGLE LAYER POLYTHENE SHEET TO BE USED BELOW FOUNDATION, SEPTIC TANK OR WHERE MENTIONED

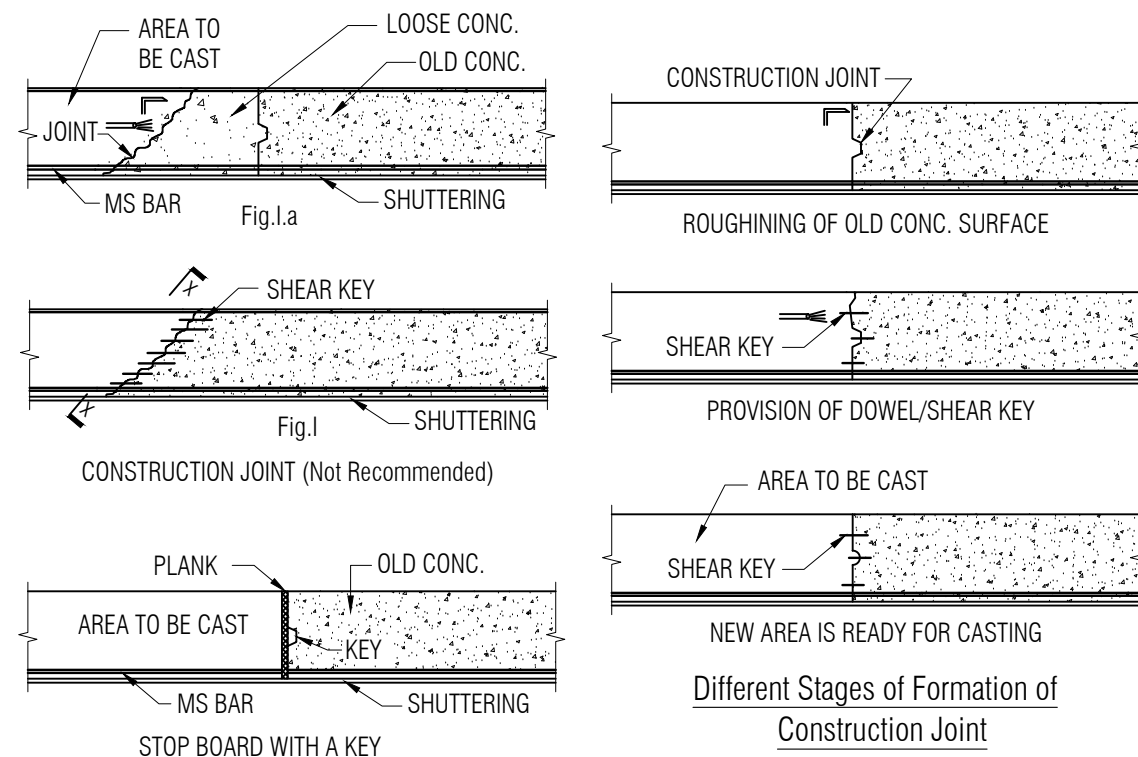
4. SUB STRUCTURE:

4a) FOUNDATION:

- i) THE BUILDING HAS BEEN DESIGNED FOR (G+1) 2 - STORIED MULTIPURPOSE DISASTER SHELTER BUILDING.
 ii) FOUNDATION TYPE - R.C.C. INDIVIDUAL FOOTING.
 iii) ANY LOOSE POCKET FOUND IN FOUNDATION BED IS TO BE FILLED UP WITH COMPACTED SAND OF MIN FM 2.5 .
 iv) DEPTH OF FOUNDATION: AS PER DRAWING.

4b) CHAIRS:

- i) USE CHAIRS OF NECESSARY DIMENSION MADE OF 10Ø /12Ø/16Ø BAR TO SUPPORT TOP BARS @ 750mm c/c.



5. CONCRETE CLEAR COVER FOR REINFORCING BARS:

Member	Location / Condition	Thickness of Cover	Figure
Footing	Bottom	75	
	Side	75	
Column	Above Ground Level	*40	
	Below ground level	*75	
U.Ground R.C.C (200mm & above)	Exterior	50	
	Interior	50	

6. CURING OF R.C.C WORK :

11a) CURING TIME MINIMUM 21 DAYS (UNLESS OTHERWISE SPECIFIED)

11b) METHOD OF CURING :

- i) HORIZONTAL SURFACE - BY POUNDING OF WATER
 ii) OTHER SURFACES - BY WRAPPING MOIST JUTE FABRIC OR SPRINKLING WATER BY HOSE PIPE FREQUENTLY.

7. SCHEDULE FOR REMOVING FORM WORK:

12a) VERTICAL SIDES

- i) FOR BEAM = 48 hr.
 ii) COLUMN = 72 hr.

12b) BOTTOM SIDES : ALLOW MINIMUM ONE DAY PER FEET OF BEAM SPAN LENGTH BUT NOT LESS THAN 10 DAYS.

12c) SLAB : MINIMUM 28 DAYS.

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All Dimension are in Millimeter unless mentioned

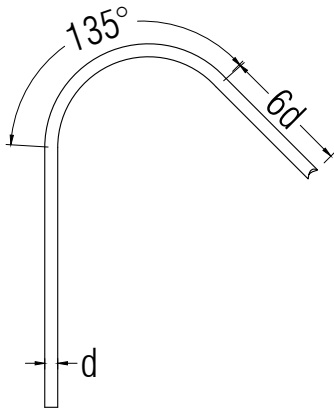
8. EARTH QUAKE CONSIDERATION:

8a) LAP OR DEVELOPMENT LENGTH (SPECIALLY FOR EARTHQUAKE CONSIDERATION):
UNLESS OTHERWISE MENTIONED IN THE DRAWINGS, LAP LENGTH OF BARS SHALL BE :

BAR DIA (mm)	TENSION (mm)		COMPRESSION (mm)
	TOP BARS (50d)	BOTTOM BARS (50d)	ALL BARS (50d)
8Ø	400	400	400
10Ø	500	500	500
12Ø	600	600	600
16Ø	800	800	800
20Ø	1000	1000	1000
22Ø	1100	1100	1100
25Ø	1250	1250	1250
28Ø	1400	1400	1400
32Ø	1600	1600	1600

8b) FOR SEISMIC CONSIDERATION MAXIMUM 50% LAP SPLICE FOR COLUMN MUST BE LOCATED WITHIN CENTER HALF OF LENGTH IN EACH FLOOR.

8c) FOR SEISMIC CONSIDERATION ALL TIE BAR IN COLUMN MUST BE BEND AS SHOWN IN FIG.



8d) STIRRUP & MAIN BAR MUST BE KEPT IN RIGHT ANGLE.


9. SOME MORE NOTE :

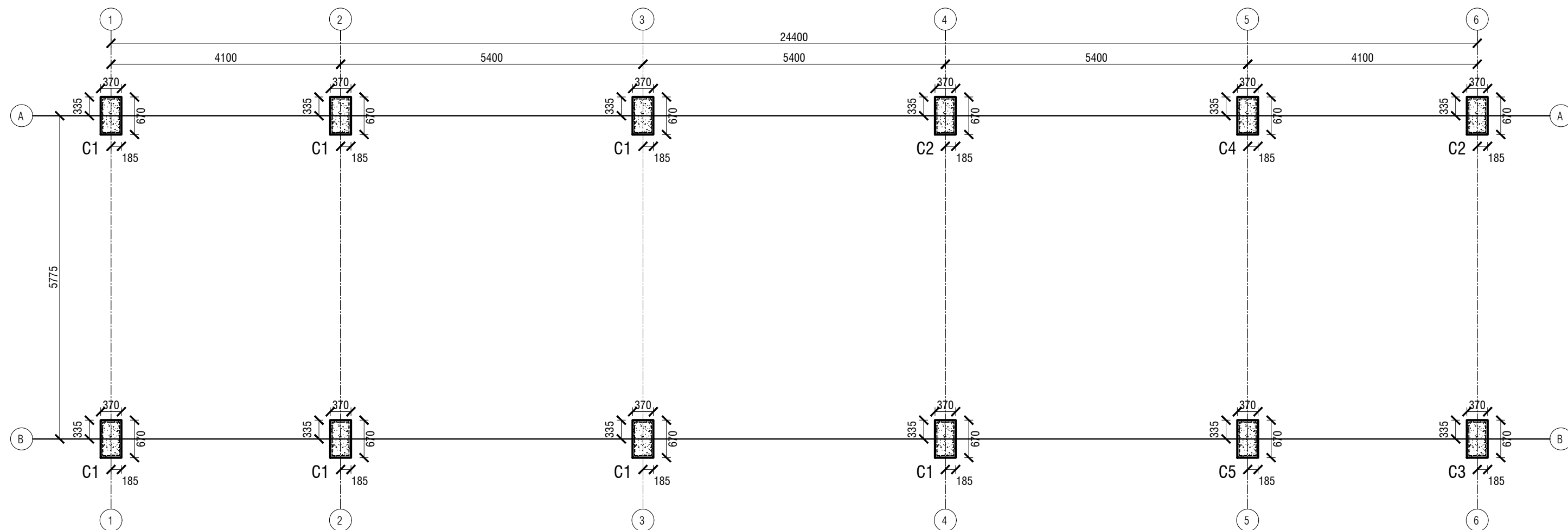
- a) REINFORCEMENT FOR FALSE SLAB ARE 10mmØ @ 150mm c/c.
- b) ALL FALSE SLAB THICKNESS ARE 75mm UNLESS INDICATED WITHIN THE DRAWING.
- c) ALL FALSE SLAB AND LINTEL BOTTOM LEVEL SHOULD BE MAINTAINED AS PER INSTRUCTION OF ARCHITECTURAL DRAWINGS.
- d) ALL OUT SIDE MEASUREMENT OF FALSE SLAB MUST BE RE-CHECKED FROM ARCHITECTURAL DRAWING.
- e) TEST FREQUENCY OF MATERIALS:

SL	Item Work	Type of Test	Test Frequency
01	Concrete	Sand FM	One/50m³
		W/A Coarse Aggregate	One/50m³
		LAA / ACV	One/50m³
		Gradation of CA	One/50m³
		Setting Time of Cement	One/50m³
		Compressive Strength of Cement (7, 28 days)	One/50m³ (Before Construction)
		Compressive Strength of Concrete (7, 28 days)	One/50m³ (During Construction)
02	Brick Work	Compressive Strength of Brick	One set /300 m³
		Water Absorption of Brick	One set /300 m³
		Efflorescence of Brick	One set /300 m³
		Setting Time of Cement	One set /300 m³
		CS of Cement (7, 28 days)	One set /300 m³
		Sand FM	One set /300 m³
03	Reinforcement	Unit weight, Elongation & Tensile Strength	One set / Dia/ 10000Kg
04	Plaster	Sand FM	One/3000m²
		Setting Time of Cement	One/3000m²
05	Others Item	Any	As per CODE/Schedule



































Note: If the number of tests to be performed as per specified test frequency for any item becomes a whole number with a fraction equal to 0.20 or less in that case the actual number of the test shall be the whole number only. On the other hand, if the fraction is more than 0.20 then the actual number of tests for that item shall be rounded to the next whole number. The engineer in Charge has the right to increase the no of tests for any item beyond the set frequency as deemed necessary to ensure the quality and the contractor is to perform the additional tests on his own. For any additional test by the Engineer in charge required to ensure the quality, the bill will be as per the actual voucher of the recognized testing institute.

MPDS has the right to test any materials in their own laboratory with or without the presence of the contractor or his representative. No payment and voucher will be made for any test in the MPDS laboratory.

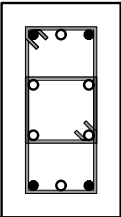
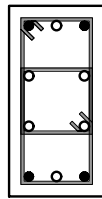
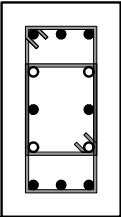
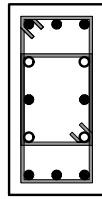
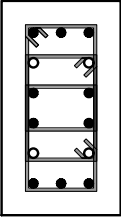
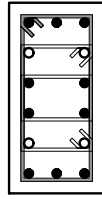
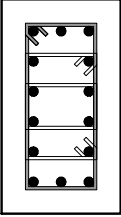
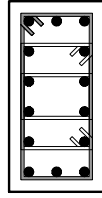
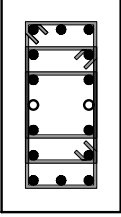
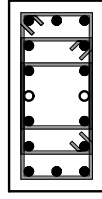
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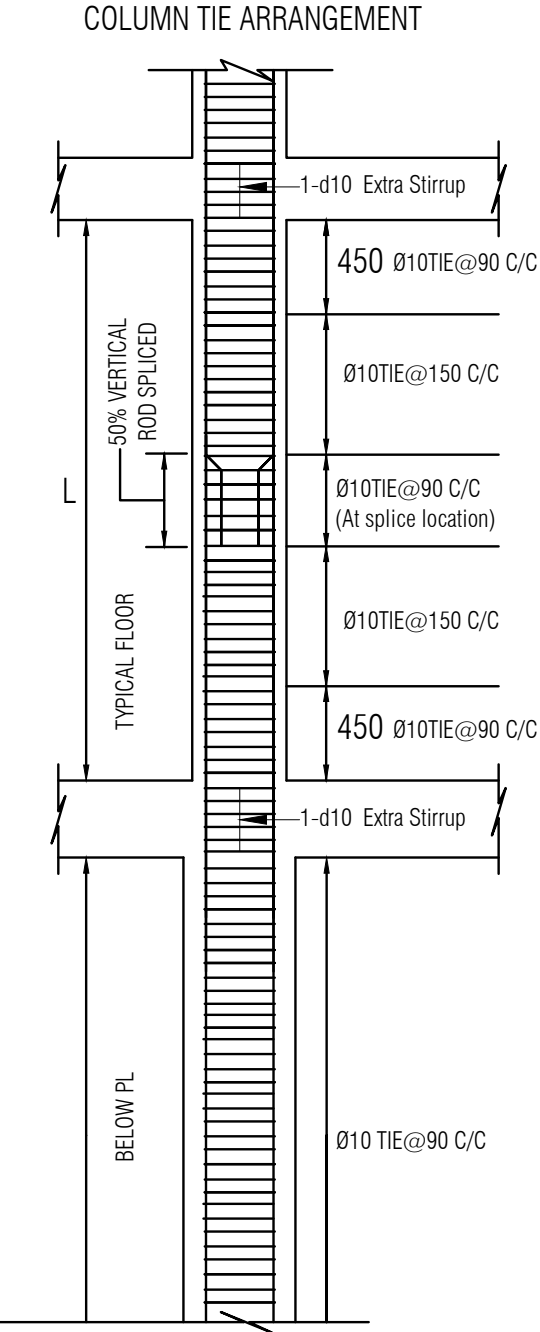


COLUMN LAYOUT PLAN
SCALE: 1:75

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COLUMN SCHEDULE:

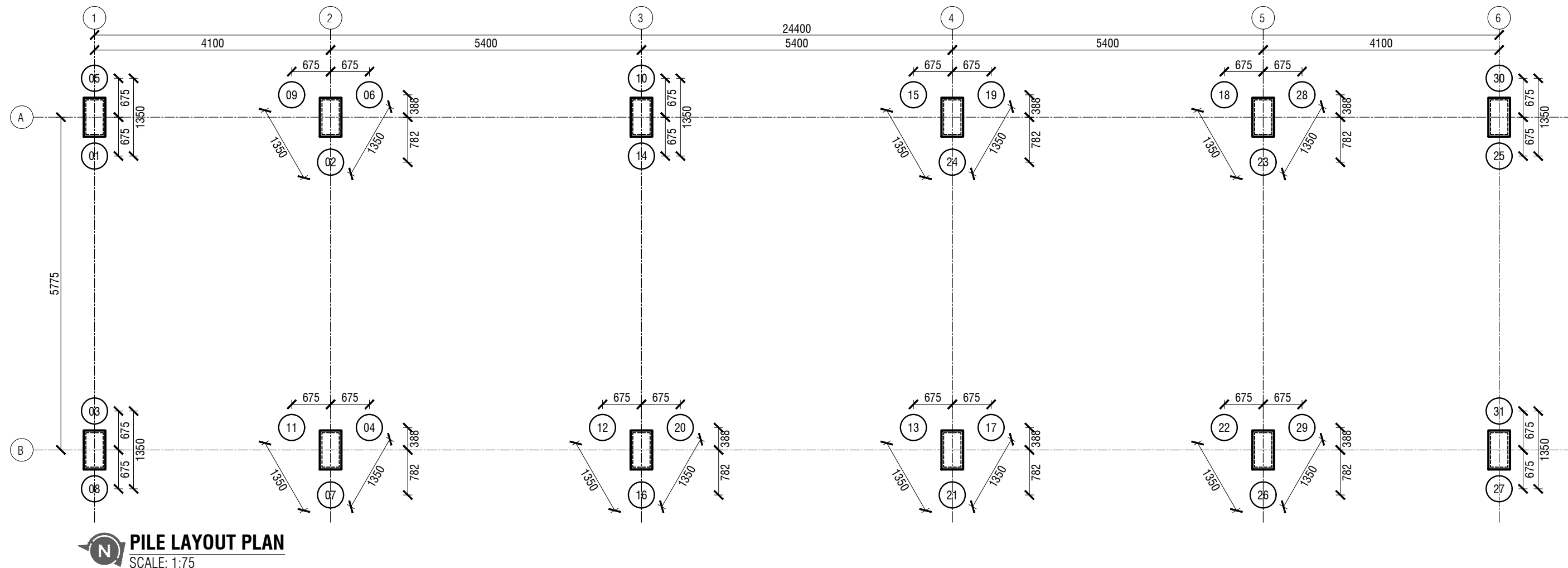
COL.ID	Below PL	Above PL
C1	<div>370</div> <div></div> <div>670</div> <div>75mm clear cover (From out side of Tie)</div> <div>● 4-20mmØ ○ 6-16mmØ Tie 10mmØ @90 c/c</div>	<div>300</div> <div></div> <div>600</div> <div>40mm clear cover (From out side of Tie)</div> <div>● 4-20mmØ ○ 6-16mmØ Tie 10mmØ @90/150 c/c</div>
C2	<div>370</div> <div></div> <div>670</div> <div>75mm clear cover (From out side of Tie)</div> <div>● 8-20mmØ ○ 4-16mmØ Tie 10mmØ @90 c/c</div>	<div>300</div> <div></div> <div>600</div> <div>40mm clear cover (From out side of Tie)</div> <div>● 8-20mmØ ○ 4-16mmØ Tie 10mmØ @90/150 c/c</div>
C3	<div>370</div> <div></div> <div>670</div> <div>75mm clear cover (From out side of Tie)</div> <div>● 10-20mmØ ○ 4-16mmØ Tie 10mmØ @90 c/c</div>	<div>300</div> <div></div> <div>600</div> <div>40mm clear cover (From out side of Tie)</div> <div>● 10-20mmØ ○ 4-16mmØ Tie 10mmØ @90/150 c/c</div>
C4	<div>370</div> <div></div> <div>670</div> <div>75mm clear cover (From out side of Tie)</div> <div>● 14-20mmØ Tie 10mmØ @90 c/c</div>	<div>300</div> <div></div> <div>600</div> <div>40mm clear cover (From out side of Tie)</div> <div>● 14-20mmØ Tie 10mmØ @90/150 c/c</div>
C5	<div>370</div> <div></div> <div>670</div> <div>75mm clear cover (From out side of Tie)</div> <div>● 14-20mmØ ○ 2-16mmØ Tie 10mmØ @90 c/c</div>	<div>300</div> <div></div> <div>600</div> <div>40mm clear cover (From out side of Tie)</div> <div>● 14-20mmØ ○ 2-16mmØ Tie 10mmØ @90/150 c/c</div>



NOTES FOR CRUSHING STRENGTH OF CONCRETE




Concrete Compressive Strength Fc'	= 30 MPa. at 28 Days
Proposed Mixing Ratio	= 1:1.25:2.5 (Fixed)
Maximum Water Cement Ratio	= 0.40
Cement (BDS EN 197-1 : 2003)	= Ordinary Portland Cement (CEM-I)
Admixture (ASTM-C494)	= Type-F or approved by E-I-C
Fine Aggregate (Sand) FM	= 2.5
Course Aggregate (Chips)	= 20mm Down Well Graded Crushed stone
LAA value for Course Aggregate	= ≤ 30
Mixing Method	= Using Concrete Mixer

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NOTE : Piles Shall Not be Drilled /Bored within a Clear Distance 3.00 m from an Adjacent Pile with Concrete less than 48 hours old.

The above pile numbering only for identification. Drilling schedule shall be prepared by E-I-C.

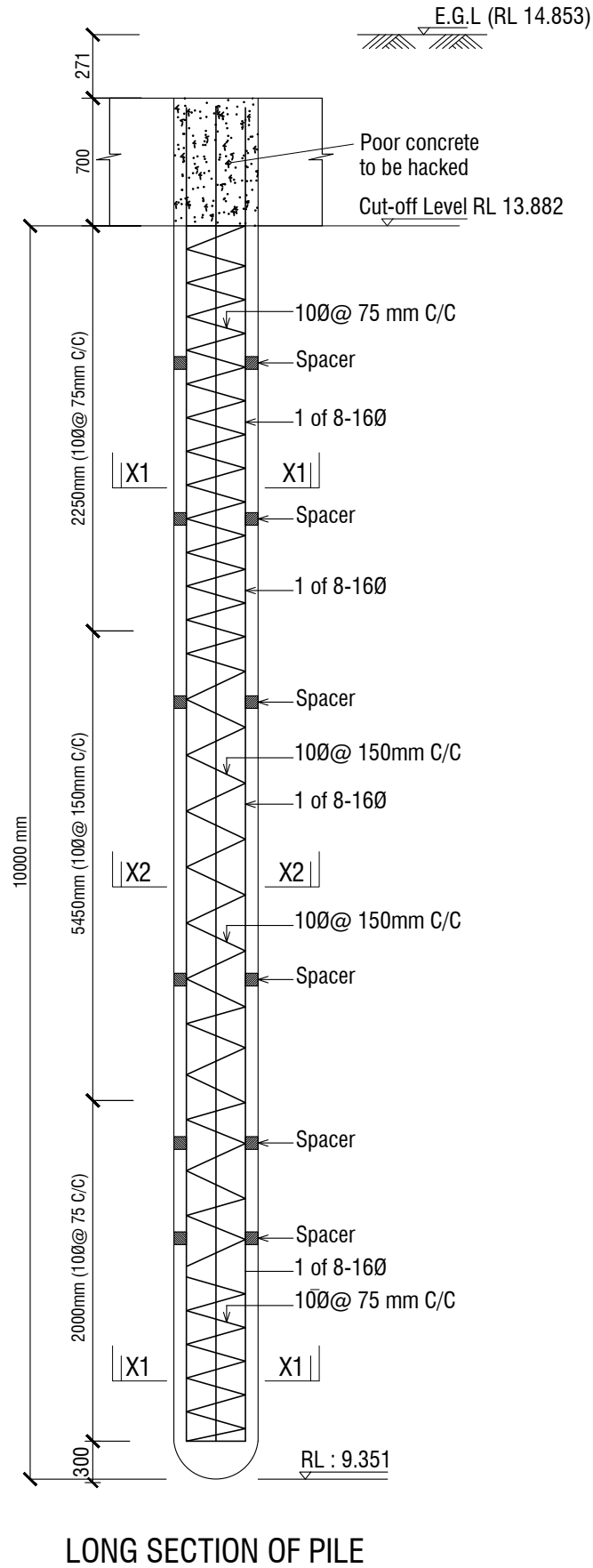
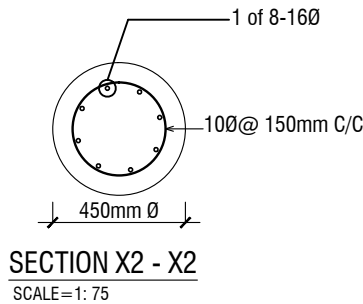
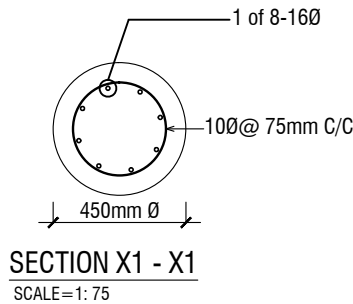
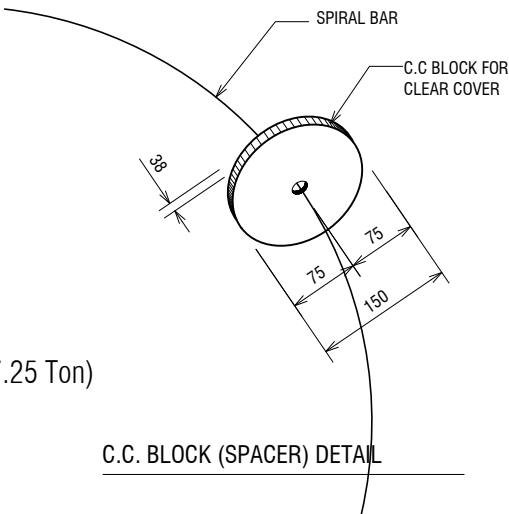
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SCEDULE OF PILE & PILE CAP

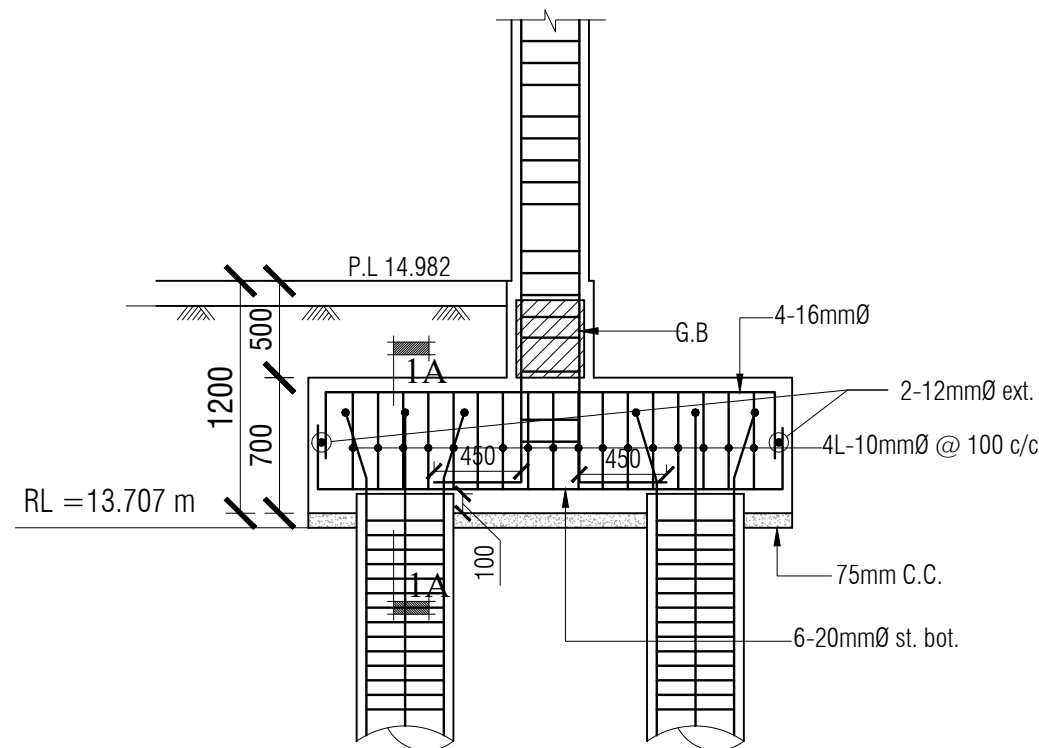
Type of Pile-cap	Size of Pile-cap		Reinforcement of pile cap		Number Of pile	Dia Of pile	Length of pile below cut off level (H)	Cut off Length
	Length	Th="T"	Long direction(P)	Short direction(Q)				
PC-2	2250X900	700 mm	SEE DETAILS	SEE DETAILS	2	450mmØ	10000 mm	750 mm
PC-3	2250X2070	750 mm	20mmØ@ 125 c/c	20mmØ@ 125mm c/c	3	450mmØ	10000 mm	750 mm

Notes for pile

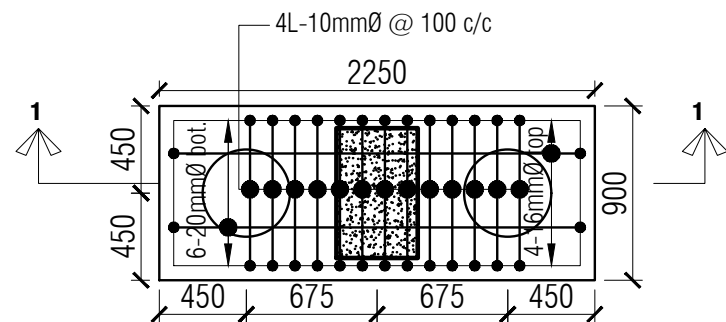
- 1) Reinforcement: Deformed bar $f_y = 400$ MPa
- 2) Lapping of reinforcement, if required should be of $45D$ (D =diameter of bar) or Specified
- 3) R.C.C. Work: Mix ratio (1:1.5:3) Fixed, $f_c' = 25$ MPa or Rich with minimum slump of 150mm, Cement: CEM-II, sand of minimum FM 2.5 and 20mm down well graded crushed stone chips (LAA value not exceeding 30),
- 4) Concrete cover = 75mm
- 5) 2 Tack welding for every pitch of welding
- 6) Use sand of minimum FM=2.5 as fine aggregate & 20mm down well graded crushed stone chips (LAA value not exceeding 30)
- 7) The length of the trimme pipe should be equal or grater than to the length of pile.
- 8) During vibration of trimme pipe the height of fall should be not more than 150mm.
- 9) Pile Capacity=305 KN (31.10 Ton) F.S-2.5 (has to be confirmed by load test)
- 10) Pile Static Load Test shall perform with 1.5 Times Load of Pile Capacity (457.5 KN / 47.25 Ton)



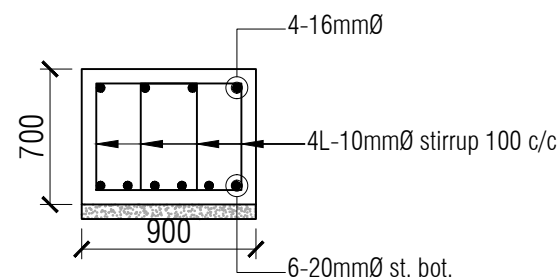
NAME OF PROJECT:	NAME OF WORK:	DESIGN PREPARED BY	DESIGN MODIFIED BY:	VERIFIED BY:	PACKAGE INFO.	DRAWING TITLE:		SHEET NO:
   MULTIPURPOSE DISASTER SHELTER SUPPORT (MPDS) PROJECT	Construction of Multipurpose Disaster Shelter at Lama Adorsho Government Primary School under Lama Pourashava, Upazila: Lama, District: Bandarban FUNDED BY: USAID	MPDS Engineering Team	MD. FORKANUL HAQUE Manager-Engineering, MPDS Save the Children International	TUSHAR KANTI ROY Infrastructure Manager, MPDS CARE Bangladesh	Package No: SCI/MPDS/B10-19-01 Revision No: Issued for Tender	DETAILS OF PILE	All Dimension are in Millimeter unless mentioned	SUB-08 SCALE As Shown



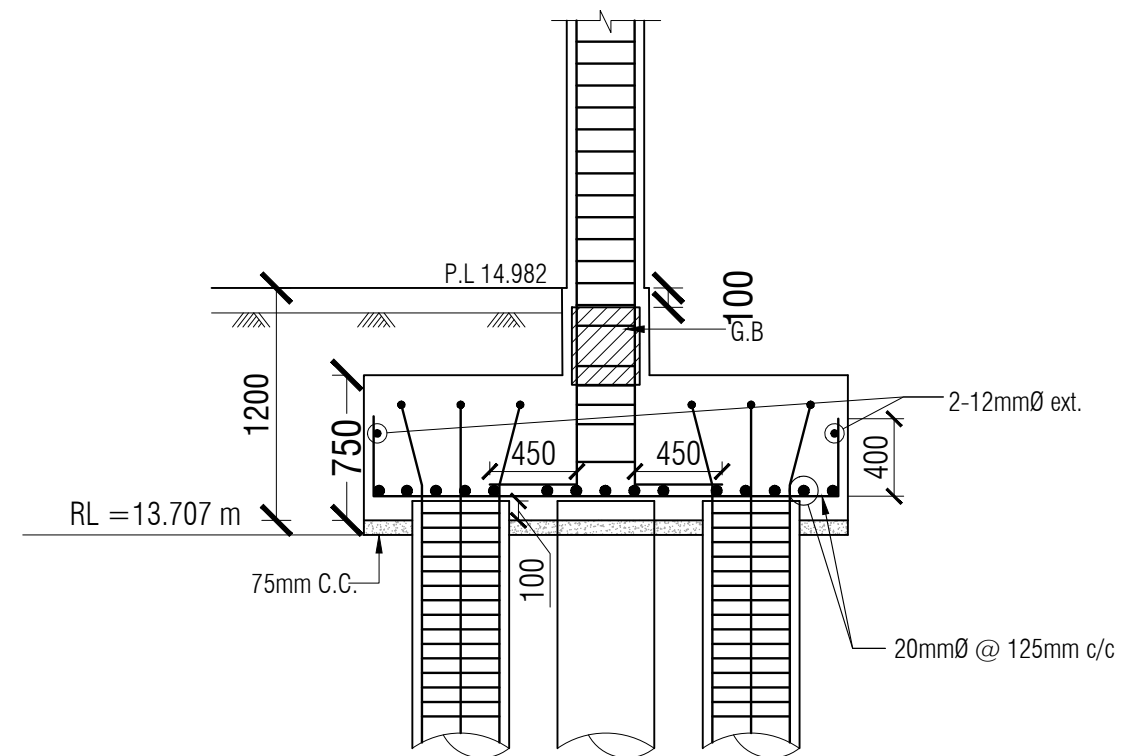
SECTION OF 1-1



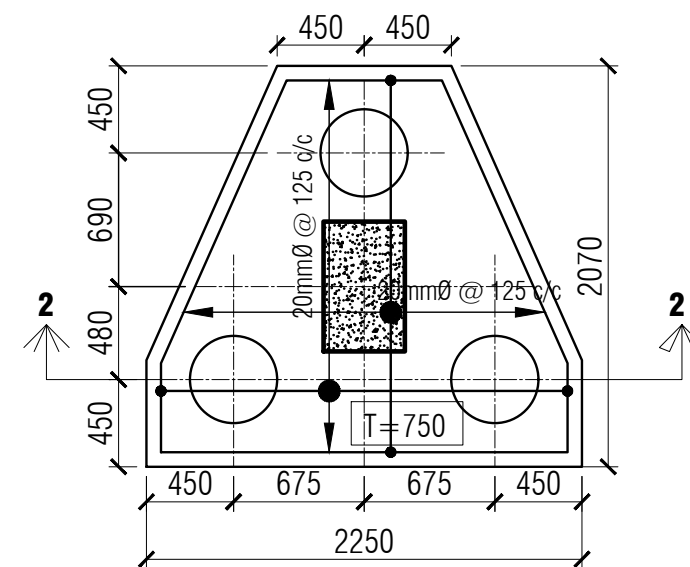
PLAN OF PC2






SEC OF 1A-1A

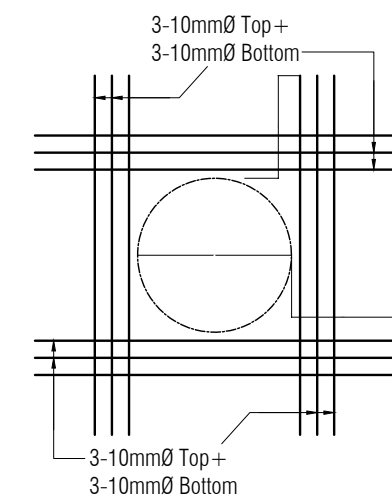


SECTION OF 2-2

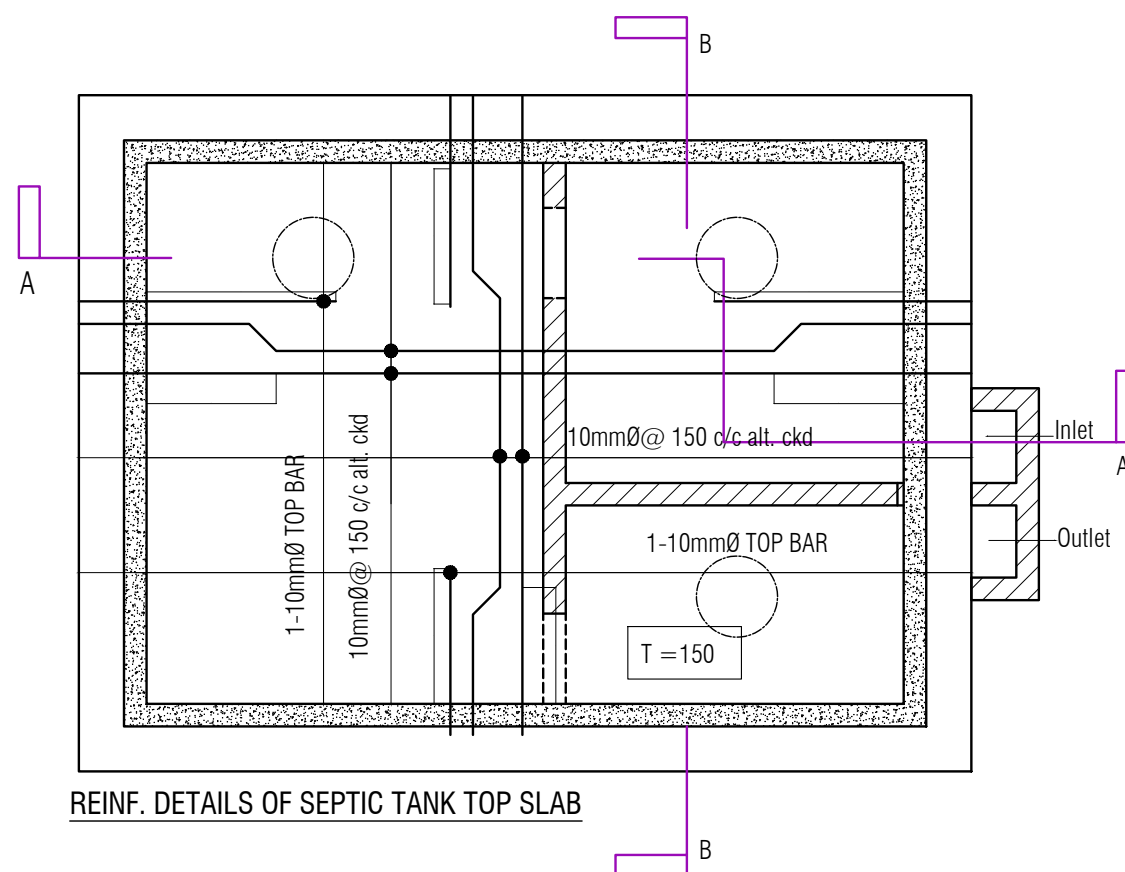


PLAN OF PC3

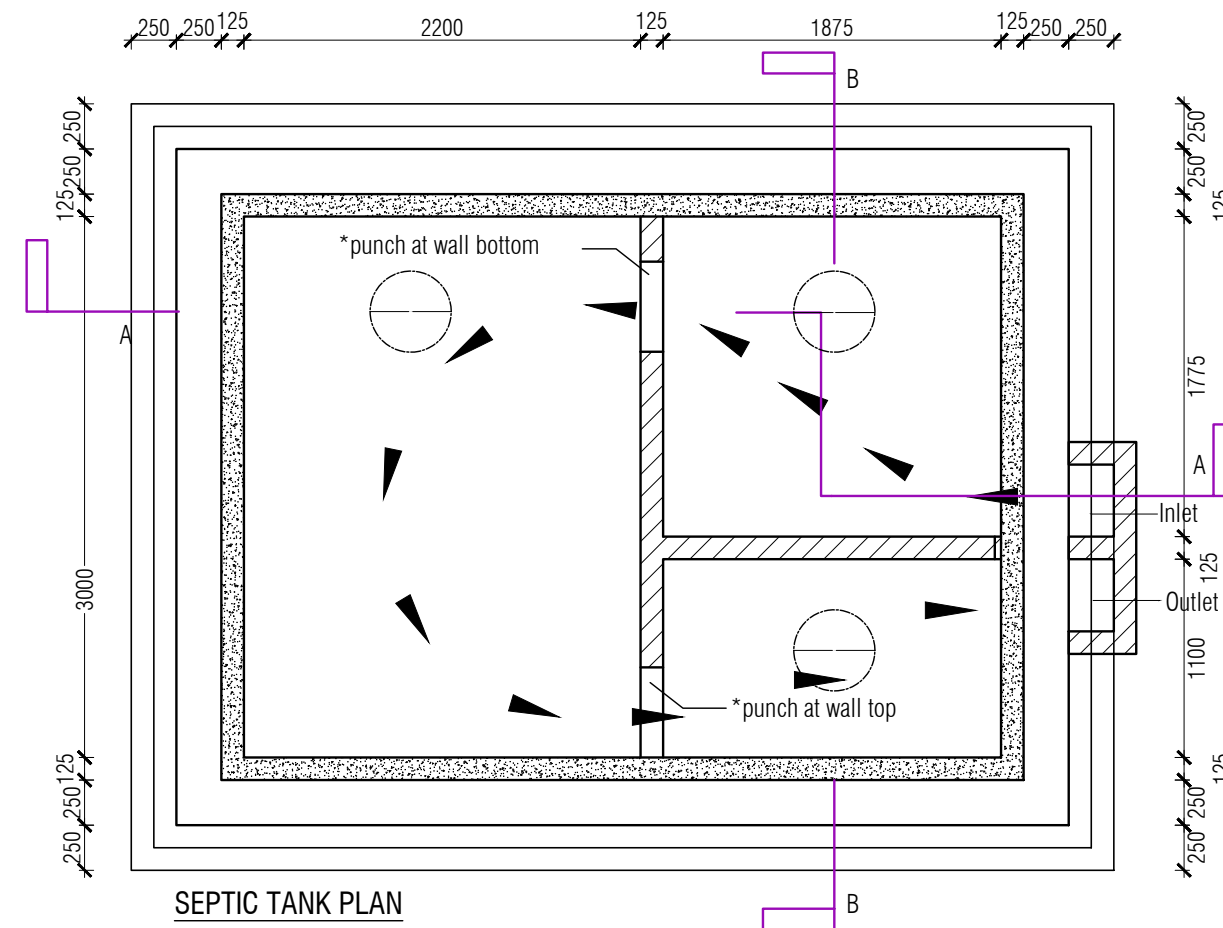
NAME OF PROJECT:	NAME OF WORK:	DESIGN PREPARED BY	DESIGN MODIFIED BY:	VERIFIED BY:	PACKAGE INFO.	DRAWING TITLE:		SHEET NO:
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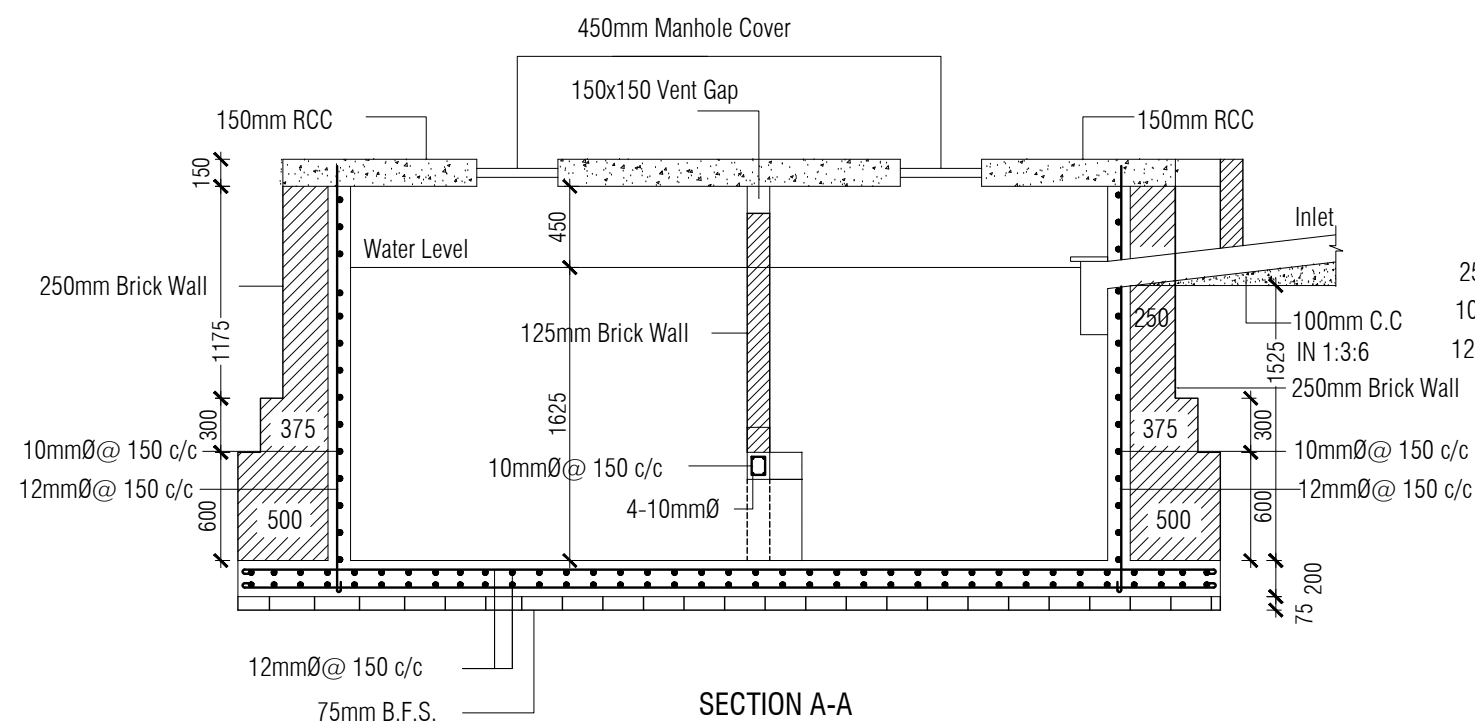
**SPECIAL REINFORCEMENT DETAILS
FOR MANHOLE COVER**



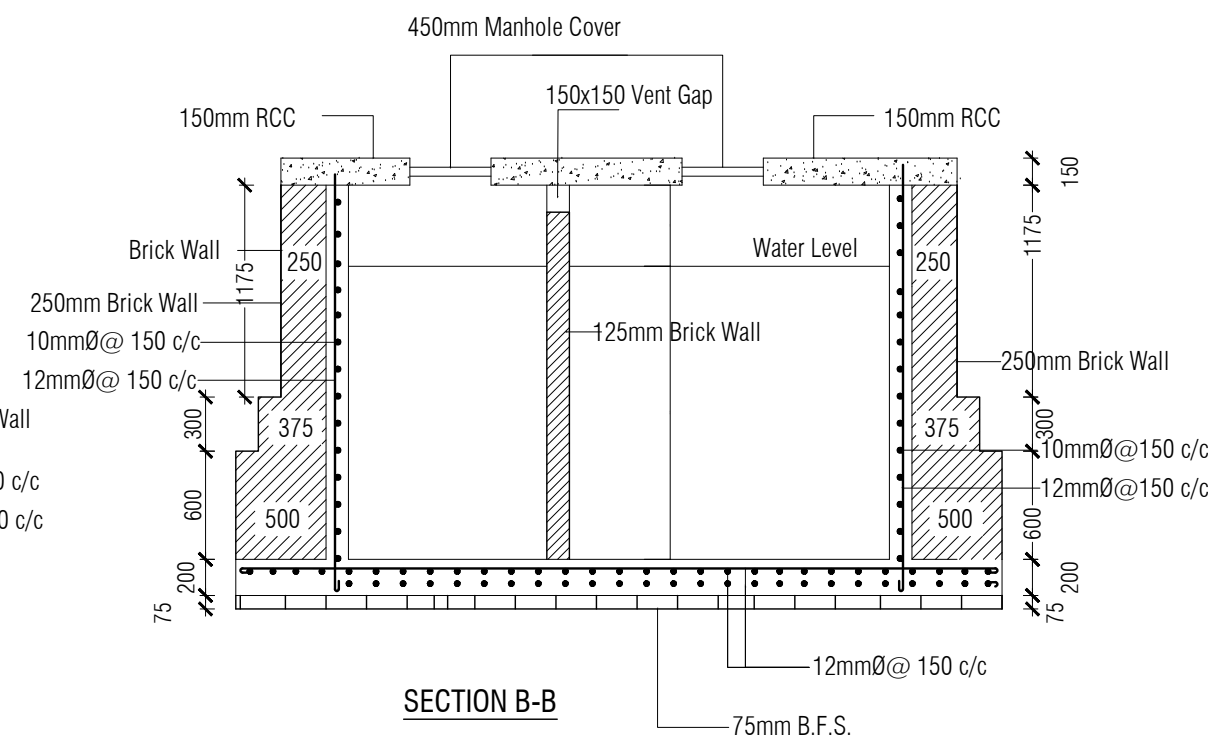
REINF. DETAILS OF SEPTIC TANK TOP SLAB



SEPTIC TANK PLAN












SECTION A-A



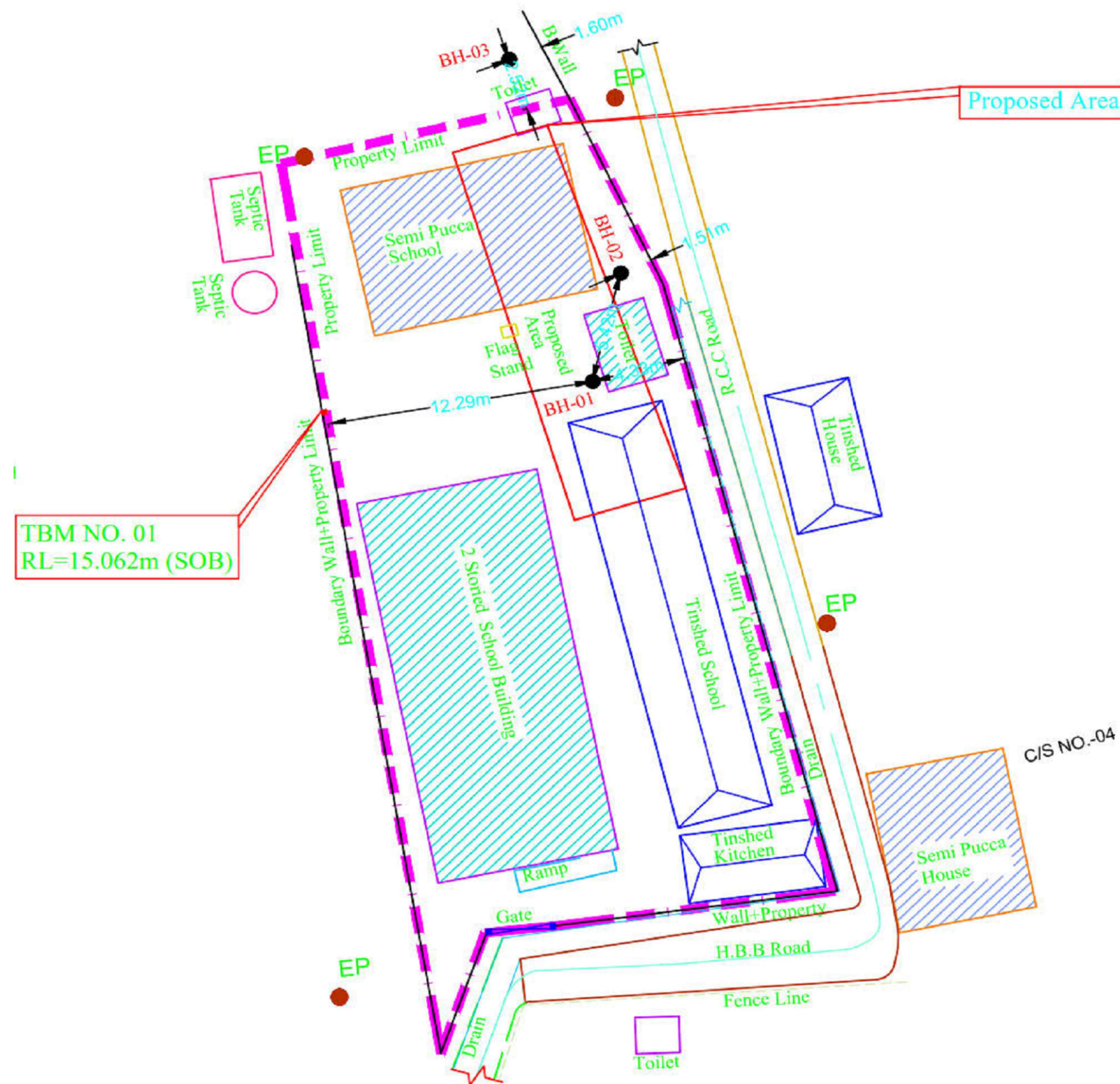
SECTION B-B

Note:
* Please refer to plumbing design drawing for more details on septic tank

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Location of Bore Holes

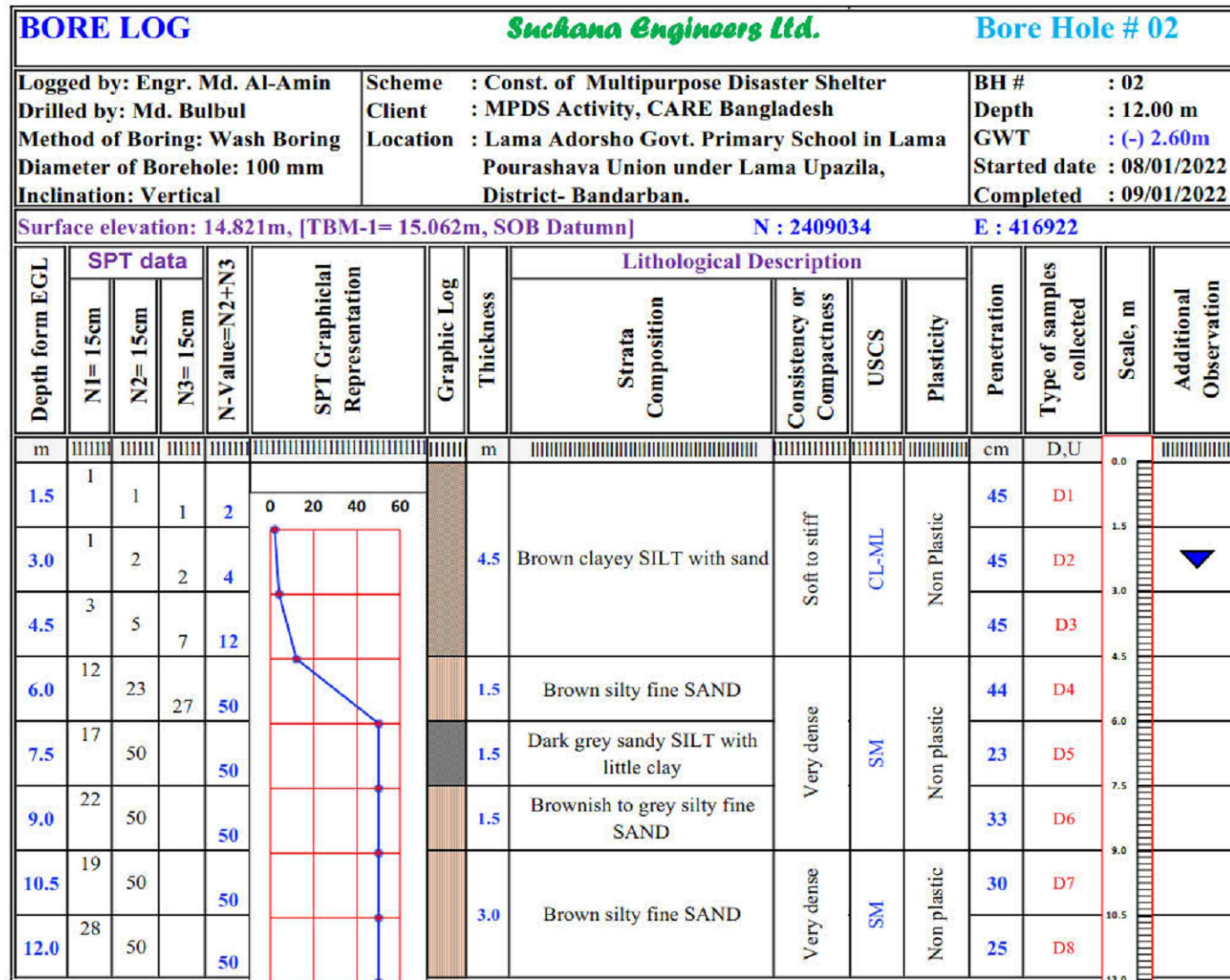


BORE LOG				Suchana Engineers Ltd.				Bore Hole # 01							
Logged by: Engr. Md. Al-Amin				Scheme : Const. of Multipurpose Disaster Shelter				BH # : 01							
Drilled by: Md. Bulbul				Client : MPDS Activity, CARE Bangladesh				Depth : 15.00 m							
Method of Boring: Wash Boring				Location : Lama Adorsho Govt. Primary School in Lama				GWT : (-) 2.50m							
Diameter of Borehole: 100 mm				Pourashava Union under Lama Upazila,				Started date : 08/01/2022							
Inclination: Vertical				District- Bandarban.				Completed : 08/01/2022							
Surface elevation: 14.863m, [TBM-1= 15.062m, SOB Datum]								N : 2409057		E : 416908					
Depth form EGL	SPT data				SPT Graphical Representation	Graphic Log	Thickness	Lithological Description				Penetration	Type of samples collected	Scale, m	Additional Observation
	N1= 15cm	N2= 15cm	N3= 15cm	N-Value=N2+N3				Strata Composition	Consistency or Compactness	USCS	Plasticity				
m							m					cm	D,U		
1.5	1	1	2	3			1.5	Brown clayey SILT with little sand	Soft	CL-ML	Non Plastic	45	D1		
3.0	1	1	1	2			1.5	Brown sandy SILT with little clay	Very loose	SM	Non plastic	45	D2		
4.5	4	6	8	14			3.0	Brown silty fine SAND with little clay	Medium dense to very dense	SM	Non plastic	45	D3		
6.0	9	24	26	50								40	D4		
7.5	12	28	22	50			1.5	Brownish to grey clayey SILT with sand	Hard	CL-ML	Plastic	38	D5		
9.0	20	50		50			1.5	Dark grey sandy SILT with little clay	Very dense	SM	Non plastic	30	D6		
10.5	21	50		50								30	D7		
12.0	23	50		50			6.0	Brownish to grey silty fine SAND	Very dense	SM	Non plastic	29	D8		
13.5	24	50		50								28	D9		
15.0	27	50		50								23	D10		

Legend:		Disturbed Sample: D		Undisturbed Sample: U	
Gravel		Sand		Silt	
Sandy Silt		Silty Sand		Sandy clay	
Silty Clay		Clayey Silt		Organic	
				Clay	
				Clayey sand	
				GWL	

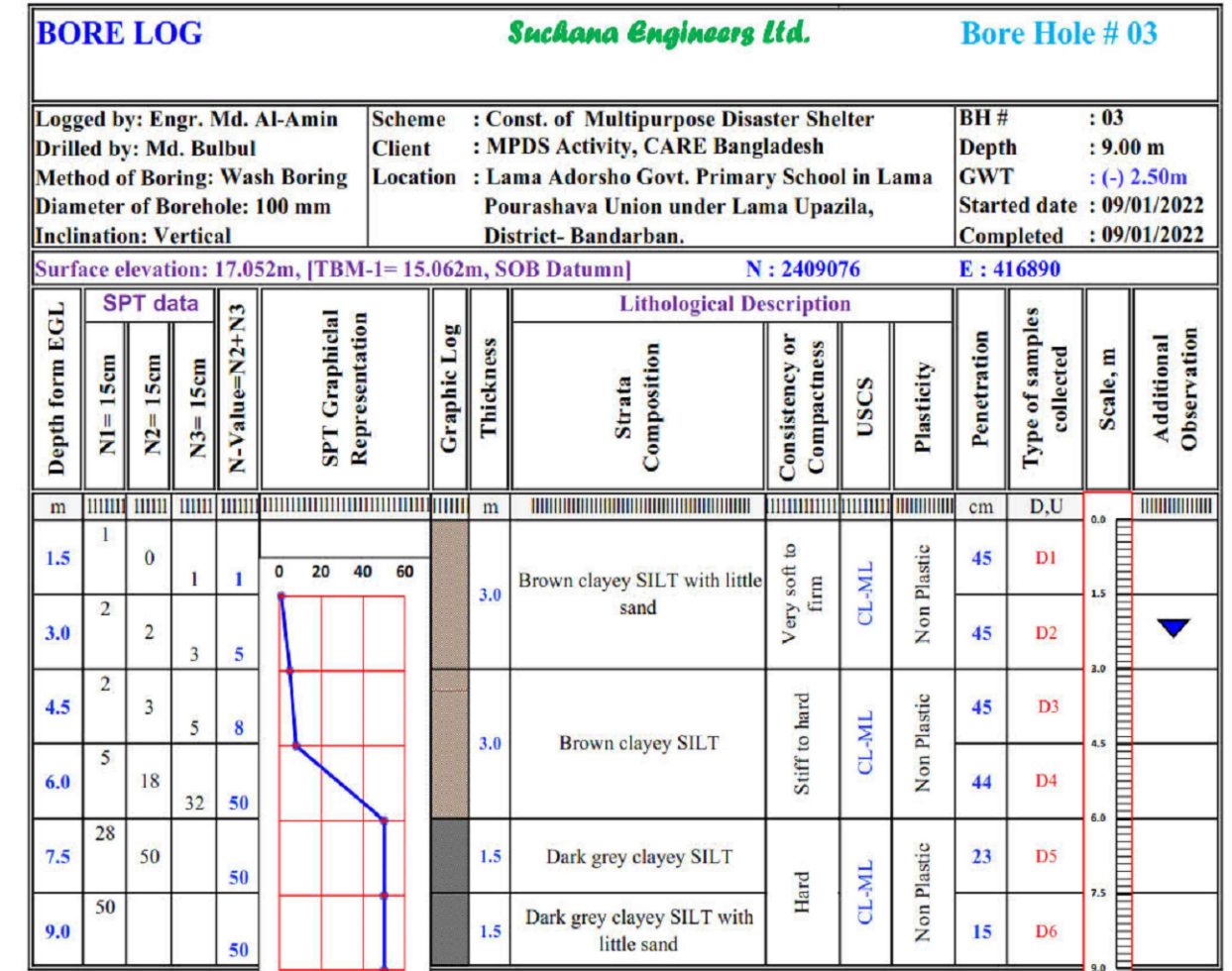


NAME OF PROJECT:	NAME OF WORK:	DESIGN PREPARED BY:	DESIGN MODIFIED BY:	VERIFIED BY:	PACKAGE INFO.	DRAWING TITLE:		SHEET NO:
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Legend:

Gravel		Sand		Silt		Clay	
Sandy Silt		Silty Sand		Sandy clay		Clayey sand	
Silty Clay		Clayey Silt		Organic Clay		GWL	



Legend:

Gravel		Sand		Silt		Clay	
Sandy Silt		Silty Sand		Sandy clay		Clayey sand	
Silty Clay		Clayey Silt		Organic Clay		GWL	



NAME OF PROJECT: MULTIPURPOSE DISASTER SHELTER SUPPORT (MPDS) PROJECT	NAME OF WORK: Construction of Multipurpose Disaster Shelter at Lama Adorsho Government Primary School under Lama Pourashava, Upazila: Lama, District: Bandarban FUNDED BY: USAID	DESIGN PREPARED BY: MPDS Engineering Team	DESIGN MODIFIED BY: MD. FORKANUL HAQUE Manager-Engineering, MPDS Save the Children International	VERIFIED BY: TUSHAR KANTI ROY Infrastructure Manager, MPDS CARE Bangladesh	PACKAGE INFO. Package No: SCI/MPDS/B10-19-01 Revision No: Issued for Tender	DRAWING TITLE: SUB-SOIL SPT LOG 2 & 3	All Dimension are in Millimeter unless mentioned	SHEET NO: SUB-13 SCALE As Shown
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