



THE UNIVERSITY OF POONCH, RAWALAKOT

**COMPLETION OF LEFTOVER WORKS  
OF CHOTAGALA CAMPUS,  
UNIVERSITY OF POONCH,  
RAWALAKOT**

**PACKAGE – B1**

**PRICE BID**

**BIDDING DOCUMENTS  
VOLUME - IV**

LETTER OF PRICE BID  
BPREADABLE TO BILL OF QUANTITIES  
BILL OF QUANTITIES



SEPTEMBER, 2024

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## Letter of Price Bid

**Name of Contract:** "Completion of Leftover Works of Chotagala Campus, University of Poonch Rawalakot – Package – B1."

**To:** **Project Director**  
Chotagala Campus  
University of Poonch, Rawalakot  
Directorate of Works,  
Shamsabad Campus  
Hajira Road,  
Rawalakot, AJ&K  
Tel: 05824-960094

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (IB)9;
- (b) The total price of our Bid, excluding any discounts offered in item (c) below is:  
Rs.....
- (c) The discounts offered and the methodology for their application are:  
Rs.....
- (d) Our Bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (e) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
- (f) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed and we do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other bidder for the Works.
- (g) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (h) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.
- (i) If awarded the contract, the person named below shall act as Contractor's Representative.

Name .....

In the capacity of .....

Signed .....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

Address .....





**BILL OF QUANTITIES**  
(to be signed by the bidder)

**PREAMBLE**

1. **FOR SCHEDULED ITEMS, THE BIDDER SHALL QUOTE PERCENTAGE ABOVE OR BELOW ON THE AMOUNT PUT TO BID AND GIVEN IN THE SUMMARY OF BILL OF QUANTITIES.**
2. **FOR NON-SCHEDULED ITEMS, THE BIDDER SHALL QUOTE HIS RATES IN BILL OF QUANTITIES.**
3. The Estimate shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.
4. The Quantities given in the Bill of Quantities are estimated and provisional quantities and are given to provide a common basis for bidding. The basis for payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per Contract.
5. The rates and prices quoted in the BOQ, except insofar as it is otherwise provided under the Contract, include all costs of Contractor's plant, labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bid, shall be included in the rates and prices, and the total Bid Price submitted by the Bidder.
6. The whole cost of complying with the provisions of the Contract is included in the rates and prices given in the Priced BOQ. Where no items are provided, the cost is deemed to be distributed among the rates and prices for the other related items of the Works.
7. In case of any discrepancy in description or unit of any scheduled item provided in the BOQ with the description or unit of any scheduled item provided in MRS - 2<sup>nd</sup> Bi-annual 2024 Murree (Punjab), the description and unit of item as provided in MRS - 2<sup>nd</sup> Bi-annual 2024 Murree (Punjab) shall prevail.
8. General directions and description of work and materials are not necessarily repeated nor summarised in the Priced BOQ. References to the relevant sections of the Bidding Documents shall be made.
9. The items mentioned in the BOQ consist of furnishing all plant, labor, equipment, machinery, appliances, materials, fittings, fixtures, fabrication, erection and installation required for completing the items/works. The work shall be done in accordance with the Drawings, Technical Specifications, BOQ and directions of the Engineer complete in all respect.
10. MRS - Punjab Specifications and the Technical Specifications enclosed in Volume-II (Technical Provisions) of Bidding/Contract Documents shall be applicable for schedule items and the non-schedule items, respectively. "Ref Spec. No. indicates the specification section number which as a whole or part (for which the Engineer shall be the sole judge) of these specifications are to be followed during execution of the item of work in accordance with the applicable drawings.
11. Complete description of items of works in the BOQ, general directions, conditions and limitations of works, location and place of works, applicable methods, means to be adopted, type and quality of materials, use of tools, plant, and machinery are not necessarily mentioned in the BOQ. These shall be referred to in accordance with the Drawings and Technical Specifications.



12. The bidder may ensure himself of the correctness of quantities and application of the individual items of works as per the Drawings, Technical Specifications and Contract Documents.
13. Notwithstanding provision of Clause 51 of the General Conditions of Contract Part-I, no claim for extra payment will be admissible on account of anticipated profit or variation in overheads expenditure for the works not actually performed nor will any adjustment in the unit rate set forth in the Estimate be made because of any increase or decrease in the quantities indicated therein.
14. The following abbreviations for the Units have been used in the estimate:

<b>Unit</b>	<b>Abbreviations</b>
Running feet	Rft.
Square feet	Sft.
Cubic feet	Cft.
Kilogram	Kg.
Per Number	Each, Number, No.
Lump Sum Job	Job, Lot

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_







UNIVERSITY OF POONCH, RAWALAKOT (UPR)  
LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT

PACKAGE B1

SUMMARY OF COST

S. No.	Description of Works	Scheduled Items (MRS Murre-2024 2nd Bi-Annual) (Rs.)	Non-Scheduled Items (Rs.)
(a)	(b)	(c)	(d)
<b>A. Department of Agronomy &amp; Soil Science:</b>			
1.	Civil Works	178,421,268.22	
2.	Electrical Works	14,995,656.55	
3.	Plumbing Works	12,467,404.00	
4.	Retrofitting Works	18,469,485.00	
<b>B. Department of Veterinary &amp; Animal Sciences</b>			
5.	Civil Works	310,465,283.09	
6.	Electrical Works	16,376,650.95	
7.	Plumbing Works	11,588,515.55	
8.	Retrofitting Works	4,625,055.00	
<b>C. High-Tech Lab, Library 2 &amp; Girls Common Room</b>			
9.	Civil Works	64,335,749.44	
10.	Electrical Works	7,448,846.50	
11.	Plumbing Works	4,162,460.05	
12.	Retrofitting Works	6,366,834.00	
<b>Sub -Total Part-I= (1 to 12) = A=</b>		<b>649,723,208.34</b>	
<b>Premium (Percentage) Above or Below</b> (To be quoted on Scheduled Items) (Including all Overheads, Carriage, Dewatering & Removal of Slush Material)			
Amount of Premium (Scheduled Items)			
<b>Cost including Premium (Total-B)</b> (Cost of Scheduled Items and Non-Scheduled Items)			
<b>Bid Price (Total-C)</b> (Sum of Costs of Scheduled Items including Premium and Non-Scheduled Items)			

We, the undersigned, offer to execute and complete such Works and remedy any defects therein in conformity with the Conditions of Contract, Specifications, Drawings, Bill of Quantities and Addenda (if any) for the sum of Rs. \_\_\_\_\_/-  
(Rupees \_\_\_\_\_ only)

**Note:** The Bidder shall carry over the above quoted Bid Price to Form of Bid Page **FB-1**.

Name: \_\_\_\_\_





**UNIVERSITY OF POONCH, RAWALAKOT (UPR)**  
**LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**

**DEPARTMENT OF AGRICULTURE, AGRONOMY AND SOIL SCIENCES**

**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b><u>SCHEDULED ITEMS</u></b>						
<b><u>EARTH WORK (EXCAVATION &amp; EMBANKMENT) CHAPTER-03</u></b>						
A&SS-C-01	26-15(i)	Filling, watering and ramming earth under floors with surplus earth from foundations etc.	1000 Cft	1594 Cft	7563.60	12,056.38
A&SS-C-02	26-15(ii)	Filling, watering and ramming earth under floors with new earth excavated from outside, lead upto one chain (30 m).	1000 Cft	14346 Cft	16250.80	233,133.98
A&SS-C-03	26-17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m)				
		a) upto ¼ mile (400 m).	1000 Cft	29162 Cft	6678.00	194,743.84
A&SS-C-04		b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.)	1000 Cft	29162 Cft	838.20	24,443.59
A&SS-C-05		c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km).	1000 Cft	29162 Cft	6172.00	179,987.86
	27-21 (2.a)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming lead upto one chain (30 m) lift upto 5 ft (1.5m)				
A&SS-C-06		ii) Ordinary soil	1000 Cft	5000 Cft	10794.00	53,970.00
A&SS-C-07	29-27	Extra for slush or Daldal including dewatering.	1000 Cft	11410 Cft	12038.40	137,358.14
<b><u>DISMANTLING (DEMOLITION) CHAPTER-04</u></b>						
A&SS-C-08	31-14	Dismantling cement block masonry	100 Cft	29832 Cft	5643.00	1,683,419.76
<b><u>CONCRETE CHAPTER-06</u></b>						
A&SS-C-09	38-2	Dry rammed brick or stone ballast, 1½" to 2" (40 mm to 50 mm) gauge.	100Cft	11000 Cft	12837.00	1,412,070.00
	36-3	Cement concrete brick or stone ballast 1½" to 2" (40 mm to 50 mm) gauge, in foundation and plinth.-				



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
A&SS-C-10		(b) Ratio 1: 4: 8	100Cft	365 Cft	35406.40	129,233.36
	38-5	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate)				
A&SS-C-11	(f)	Ratio 1:2:4	100 Cft	358 Cft	48022.90	171,921.98
A&SS-C-12	(h)	Ratio 1:3:6	100 Cft	40 Cft	40795.80	16,318.32
A&SS-C-13	(i)	Ratio 1:4:8	100 Cft	3630 Cft	35528.50	1,289,684.55
	41-9	Placing, compacting, finishing and curing of concrete using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required, including screening, washing of aggregates and mixing of constituents using batching plant, Transportation by transit mixer, pouring with pump in the required proportions to achieve a nominal cylindrical strength in the field as per ACI 214, with the specified consistency, i/c the cost of shuttering, compaction with Viberator, excluding the cost of Admixture, as approved and directed by the Engineer Incharge.				
		(a) Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-				
A&SS-C-14		(iv) 4000 PSI	Per Cft	4000 Cft	850.80	3,403,200.00
A&SS-C-15		(vi) 3000 PSI	Per Cft	7710 Cft	751.40	5,793,294.00
		(c) Substructure (Foundations, Raft, Strip and Footing Beams)				
A&SS-C-16		(vi) 3000 PSI	Per Cft	9620 Cft	608.00	5,848,960.00
	43-12.b	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
A&SS-C-17		a) Plain bars	100kg	8288 Kg	34720.00	2,877,873.72
A&SS-C-18		b) Deformed bars (Grade-40)	100kg	0 Kg	35845.00	0.00



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
A&SS-C-19		c) Deformed bars (Grade-60)	100kg	105000 Kg	36040.95	37,842,997.5
A&SS-C-20	42-14	Precast cement concrete hollow blocks (1:2:4) in 1:5 C/S mortar at any height including cost of templates and constructing walls thereof	Per Cft	37290 Cft	446.70	16,657,443.00
A&SS-C-21	42-15	Providing and fixing ornamental cement jali 2" (50 mm) thick (1: 2: 4), without steel	Per Sft	1810 Sft	148.85	269,418.50
	44-36	Providing and laying 2" thick (50mm) damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating :-				
A&SS-C-22		(a.ii) with one coat bitumen and one coat polythene sheet 500gauge	100Sft	2373 Sft	13127.45	311,514.39
<b>ROOFING CHAPTER-09</b>						
A&SS-C-23	56-13 (a)	Providing & Fixing 20 SWG corrugated galvanized iron sheets with G.I bolts, nuts, limpet and bitumen washers, wind ties, complete in all respects without valleys and ridges:-	100Sft	12646 Sft	50582.35	6,396,588.36
A&SS-C-24		Add extra 6% on composite rates for 2nd floors, respectively,	100Sft	6323 Sft	3034.94	191,897.65
A&SS-C-25		Add extra 15% on composite rates for 3rd floors, respectively,	100Sft	6323 Sft	7587.35	479,744.13
A&SS-C-26		Add extra 23% on composite rates for 4th floors, respectively,	100Sft	50 Sft	11633.94	5,816.97
A&SS-C-27	59-18	Plain galvanized iron sheet flashing, 22 gauge	Per Sft.	4925 Sft	425.85	2,097,311.25
A&SS-C-28	61-46	Providing and applying torch-on water proofing bitumenous membrane of specified thickness (made of Roof-Grip/EuroBit) duly lapped/connected by heating with Torch over pe-6 primer i/c preparation/smoothen the surface complete in all respect as approved and directed by the Engineer Incharge ii) 4 mm thick	Per Sft.	20180 Sft	155.70	3,142,043.12





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**CIVIL WORKS**

ITEM No.	MURREE MRC, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
A&SS-C-29	62-48 (iv)	Providing and fixing false ceiling comprises of 12 mm thick Gypsum board laminated sheet of size 2'x2'/2'x3'/ 3'x3'of specified design and thickness i/c cost of fixtures i.e galvanized angle 1" x 1" at wall sides, galvanized tee 1 1/4" x 1"and 1 1/2" x 1" both at 4' c/c ( made of Taiwan CKM or equivalent), hanging with G.I/Copper wire 16 SWG, G.I hook, Rawal Plug etc complete in all respects as approved and directed by the Engineer Incharge	100Sft	592 Sft	137.20	812.22
<b>FLOORING CHAPTER-10</b>						
A&SS-C-30	63-3	Supplying and filling sand under floor; or plugging in wells.	100Cft.	19090 Cft	5787.00	1,104,738.30
	64-14	Cement concrete tiles laid in 1:2 cement mortar, over 3/4" (20 mm) thick bed of cement mortar 1:2.-				
A&SS-C-31		(a) 12"x12"x1" (300 x 300 x 25 mm)	100 Sft	8030 Sft	15,311.00	1,229,473.30
A&SS-C-32	85-24 (i)	Providing and laying superb quality Ceramic tile floors of Master/ Stile brand or approved equivalent manufacturer of specified size,Glossy/Matt/Texture of approved Color and Shade as per approved design with adhesive bond, over 3/4" thick (1:2) cement sand plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete in all respects and as approved and directed by the Engineer Incharge. size (12"x18"/12"x24"/10"x24" /8"x24"/12"x36")	Per Sft	1030 Sft	319.80	329,394.00
A&SS-C-33	85-24 (i) +64-19	First floor	Per Sft	1030 Sft	331.09	341,018.58
A&SS-C-34	85-24 (i) +2x64-19	Second floor	Per Sft	50 Sft	342.37	17,118.60
A&SS-C-35	85-25 (i)	Providing and laying superb quality Ceramic tiles dado of Master/ Stile brand or approved equivalent manufacturer of specified size,Glossy/Matt/Texture skirting/dado of approved Color and Shade with adhesive bond over 1/2"thick (1:2) cement plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete in all respects as approved and directed by the Engineer Incharge. i) 12"x18"/12"x24"/10"x24" /8"x24"/ 12"x36"	Per Sft	1040 Sft	391.50	407,576.00
A&SS-C-36	85-25 (i) +64-19	First floor	Per Sft	1040 Sft	403.19	419,313.44



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
A&SS-C-37	65-25 (i) +2x64-19	Second floor	Per Sft	50 Sft	414.47	20,723.60
A&SS-C-38	66-35 (b)	Mosaic Tile skirting laid in 1:2 cement mortar, over 3/4"(20 mm) thick cement mortar, 1:2 including cement washing and filling joints complete:-	100 Sft	2620 Sft	37,008.80	969,625.32
A&SS-C-39	67-37 (b)(iii)	1/2" (13mm) thick Mosaic dado or skirting with one part of white cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over 3/4"(13 mm) thick cement plaster 1:3, including rubbing and polishing, complete with finishing. (Stair Steps & Riser)	100 Sft	1000 Sft	20,107.15	201,071.50
A&SS-C-40	68-41 (a)(ii)	Providing and laying 1" thick terrazzo tile for specified colour & size full body, best quality with minimum 5000 PSI in approved design with adhesive bond over 3/4" thick 1:3 cement plaster i/c the cost of sealer for finishing the joints i/c cutting, grinding, rubbing, filling. Complete in all respect as approved and directed by the Engineer incharge. (Without Polishing)	Sft	31140 Sft	447.80	13,944,492.00
A&SS-C-41	69-52(i)	Providing and laying 3/4" thick Prepolished Granite of specified shade of full width of approved quality laid with adhesive bond over 3/4" thick (1:2) cement sand mortar bed, complete in all respect as approved and directed by the Engineer Incharge. (Marble Counter Top)	Per Sft	140 Sft	1,240.55	173,677.00
<b><u>SURFACE RENDERING CHAPTER-11</u></b>						
A&SS-C-42	71-9(b)	1/2" (13mm) thick Cement plaster 1:4 upto 20' (6.00 m) height	100 Sft	31057 Sft	4,730.80	1,469,244.56
A&SS-C-43	71-9(b) +72-28	1/2" (13mm) thick Cement plaster 1:4 from 20' to 30' height	100 Sft	37927 Sft	5,341.45	2,025,851.74
A&SS-C-44	71-9(b) +2x72-28	1/2" (13mm) thick Cement plaster 1:4 from 30' to 40' height	100 Sft	2498 Sft	5,952.10	148,653.70
A&SS-C-45	71-9(b) +3x72-28	1/2" (13mm) thick Cement plaster 1:4 from 40' to 50' height	100 Sft	1249 Sft	6,582.75	81,952.34
A&SS-C-46	71-9(b) +4x72-28	1/2" (13mm) thick Cement plaster 1:4 from 50' to 60' height	100 Sft	1249 Sft	7,173.40	89,577.83
A&SS-C-47	71-9(b) +5x72-28	1/2" (13mm) thick Cement plaster 1:4 from 60' to 70' height	100 Sft	150 Sft	7,776.00	1,166,400.00
A&SS-C-48	71-9(c)	3/4" (13mm) thick Cement plaster 1:4 upto 20' (6.00 m) height	100 Sft	10300 Sft	6,555.25	675,390.15



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
A&SS-C-49	71-9(c) +72-28	3/4" (13mm) thick Cement plaster 1:4 from 20' to 30' height	100 Sft	8590 Sft	6,973.70	599,040.83
A&SS-C-50	71-9(c) +2x72-28	3/4" (13mm) thick Cement plaster 1:4 from 30' to 40' height	100 Sft	6870 Sft	7,584.35	521,044.85
A&SS-C-51	71-9(c) +3x72-28	3/4" (13mm) thick Cement plaster 1:4 from 40' to 50' height	100 Sft	5150 Sft	8,195.00	422,042.50
A&SS-C-52	71-9(c) +4x72-28	3/4" (13mm) thick Cement plaster 1:4 from 50' to 60' height	100 Sft	2060 Sft	8,305.65	181,396.39
A&SS-C-53	71-9(c) +5x72-28	3/4" (13mm) thick Cement plaster 1:4 from 60' to 70' height	100 Sft	1380 Sft	9,416.30	129,944.94
A&SS-C-54	71-10(c)	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, upto 20' height.	100 Sft	19020 Sft	5,253.55	999,225.21
A&SS-C-55	71-10(c) +72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 20' to 30' height.	100 Sft	10569 Sft	5,864.20	619,763.84
A&SS-C-56	71-10(c) +2x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 30' to 40' height.	100 Sft	4529 Sft	6,474.85	293,271.86
A&SS-C-57	71-10(c) +3x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 40' to 50' height.	100 Sft	55 Sft	7,085.50	3,897.03
A&SS-C-58	71-10(c) +4x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 50' to 60' height.	100 Sft	55 Sft	7,696.15	4,232.88
A&SS-C-59	71-10(c) +5x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 60' to 70' height.	100 Sft	110 Sft	8,306.80	9,137.48
A&SS-C-60	73-41	Providing and fixing 3/4"(19mm) thick Sand Stone (12"x24") on interior and exterior wall and cladding of approved quality and shade, laid over pre-plastered surface with adhesive bond complete in all respect i/c the cost of matching sealer to finish the joints as approved and directed by the Engineer Incharge.	Sft	1400 Sft	307.55	430,570.00





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**CIVIL WORKS**

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(a)	(b)	(c)	(d)	(e)	(f)	(g)
		<b>WOOD WORK CHAPTER-12</b>				
	78-17	Providing and fixing 2" wide MS/ GI Chowkat singel/double rebate made of 16 SWG MS sheet pressed/welded / supported with M.S. flat 1- 1/4"x1/8" i/c 6"long M.S. Flat 1"x1/8"hold fasts (6-Nos) welded/ screwed, punching of lock hole covered with MS Box,coating with antirust paint including filling with cement sand mortar (1.8) and embedding hold fast in cement concrete (1.2.4) complete in all respect as approved and directed by Engineer Incharge.				
A&SS-C-61		(i) 15 " wide	Per Sft	2890 Sft	917.50	2,651,575.00
A&SS-C-62		(ii) 10.5 " wide	Per Sft	125 Sft	792.80	99,100.00
A&SS-C-63		(ii) 5.5 " wide	Per Sft	290 Sft	562.00	162,980.00
A&SS-C-64	79-22	Providing and fixing, approved quality mortice lock	Each.	93 No	1114.50	103,648.50
A&SS-C-65	79-24	b) Providing and fixing deodar wood almirah 9" to 12" (225 mm to 300 mm)depth with shelves, shutters, brass fittings, etc., without boxing and back, complete.	Per Sft	658 Sft	2152.70	1,416,476.60
A&SS-C-66	82-51	P/F 1-1/2" thick solid flush door comprising of 2.5 mm thick Commercial ply compressed over 2.5 mm thick commercial ply over 1" thick packing wood in style and rails under proper pressure i/c the cost of nails, tower bolt , handles, glue, sawing charges, Painting charges, sand papering and 3/8" thick matching wooden lipping as approved and directed by the Engineer Incharge.	Per Sft	3305 Sft	954.35	3,154,126.75
	83-58	Providing and fixing Vin board cabinet 3/4" thick with drawers 3"deep in Kitchen including termite proofing and polishing with synthetic enamel as specified, with handles hinges,screws etc., complete in all respects.				
A&SS-C-67		iii) 2' deep,without back	Per Sft	2176 Sft	1861.85	4,051,385.60
A&SS-C-68		iv) 2' deep,with back	Per Sft	2176 Sft	2011.85	4,377,785.60



**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	84-60	P/F 3/4' dia heavy duty sliding bolt of specified material i/c the cost of hardware complete in all respect as approved and directed by the Engineer Incharge.				
A&SS-C-69		b) Brass (ii) 12" (300 mm) long	Each	93 No	1206.15	112,171.95
		<b><u>PAINTING AND VARNISHING CHAPTER-13</u></b>				
	87-5 (d)	Preparing surface and painting guard bars, gates of iron bars, gratings, railing(including standards, braces, etc.) and in similar open work:-				
A&SS-C-70		i). Priming coat	100 Sft	6000 Sft	1207.75	72,465.00
A&SS-C-71		ii). 2 coats	100 Sft	12000 Sft	815.05	97,806.00
A&SS-C-72	88-9 (i)	Bitumen coating to plastered or cement concrete surface 2 coats @ 20 lbs per 100 sft per coat (Note:-Apply the above item twice to achieve the specified rate of 40 lbs/100Square foot.)	100 Sft	7820 Sft	2708.95	211,683.49
	89-31	Preparing surface and painting emulsion paint:				
A&SS-C-73		a) 1st coat	100 Sft	108467 Sft	1707.65	1,852,236.73
A&SS-C-74		b) 2nd & each subsequent coat.	100 Sft	216934 Sft	1321.85	2,867,542.08
	90-33(a)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect upto 20' height				
A&SS-C-75		i) 1st coat	100 Sft	10300 Sft	4752.80	489,517.80
A&SS-C-76		ii) 2nd & each subsequent coat.	100 Sft	20600 Sft	2869.40	549,896.40
	90-33(a) + (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect. 20' to 30' height.				
A&SS-C-77		i) 1st coat	100 Sft	8590 Sft	499.35	428,928.77
A&SS-C-78		ii) 2nd & each subsequent coat.	100 Sft	17180 Sft	2910.15	499,963.77



**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	90-33(a) + 2x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 30' to 40' height.				
A&SS-C-79		i) 1st coat	100 Sft	6870 Sft	5234.10	359,582.67
A&SS-C-80		ii) 2nd & each subsequent coat.	100 Sft	13740 Sft	3150.90	432,933.66
	90-33(a) + 3x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 40' to 50' height.				
A&SS-C-81		i) 1st coat	100 Sft	5150 Sft	5474.85	281,954.78
A&SS-C-82		ii) 2nd & each subsequent coat.	100 Sft	10300 Sft	3391.85	349,339.95
	90-33(a) + 4x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 50' to 60' height.				
A&SS-C-83		i) 1st coat	100 Sft	2060 Sft	5715.60	117,741.36
A&SS-C-84		ii) 2nd & each subsequent coat.	100 Sft	4120 Sft	3632.40	149,654.88
	90-33(a) + 5x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 60' to 70' height.				
A&SS-C-85		i) 1st coat	100 Sft	1380 Sft	5956.36	82,197.63
A&SS-C-86		ii) 2nd & each subsequent coat.	100 Sft	2760 Sft	3873.15	106,898.94
A&SS-C-87	91-48	Providing and applying wall putty of 2mm thickness over plastered surface (new surface) to prepare the surface even and smooth complete in all respect.	100 Sft	108467 Sft	544.75	590,873.98





**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b>IRON WORKS CHAPTER-25</b>						
A&SS-C-88	194-10	Fabrication of heavy steel work, with angle, tees, flat iron round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, rebitting, handling, assembling and fixing, but excluding erection in position.	100 Kg	40920 Kg	39419.85	16,130,602.62
A&SS-C-89	194-11	Erection and fitting in position iron trusses, staging of water tanks, etc.	100 Kg	40920 Kg	1891.10	773,838.12
A&SS-C-90	195-24	Fitting and erection of gutters of sheet iron.	Per Lft.	816 Rft	205.05	168,105.89
A&SS-C-91	195-34	Providing/fixing stair railing consisting of M.S. Box section size 1-1/2"x3" of 16 SWG welded with M.S. flat 1"x1/8" continuously and welded over M.S. square bars 5/8"x5/8" punched in M.S. flat 2 3/4" high @ 5 1/2" c/c fixed in steps of stair w/c painting 3 coats complete.	Per Rft.	330 Rft	1184.25	390,802.50
A&SS-C-92	198-51	Providing and fixing all types of partly fixed and partly openable glazed anodised/ powder coated aluminium doors, using deluxe section of M/s Al-Cop or Pakistan Cables, having chowkat frame of size 40 x 100 mm (1 1/2" x 4") and leaf frame of 60x40mm (2 1/2"x1 1/2") wide sections including the cost of 1/2" (5 mm) thick tinted glass with aluminium triangular gals and rubber gasket to support the glass and leaf edging, using approved standard fittings, locks, 3" (75 mm) wide long handles etc., and hardware any required as approved by the engineer in-charge	Per Sft	1050 Sft	1566.25	1,644,562.50
A&SS-C-93	199-52	Providing and fitting all types of glazed aluminium windows of anodised/ powder coated partly fixed and partly sliding using deluxe sections of approved manufacturer having frame size of 100 x 30 mm (4"x1-1/4") and leaf frame sections of 50 x 20 mm (2"x3/4"), all of 1.6mm thickness including 5 mm thick imported tinted glass with rubber gasket using approved standard latches, hardware etc., as approved by the Engineer in-charge.	Per Sft	7680 Sft	1312.45	10,079,616.00



**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
A&SS-C-94	199-53	Providing and fixing Aluminum Fly screen comprising of Fiber / Aluminum wire guaze (Malasian) fixed in aluminum frame of approved manufacturer / powder coated of size 1-1/2"x1/2" and 1.6mm thick with rubber gasket i/c cost of Hardwares as approved and directed by the engineer incharge. complete in all respect.	Per Sft	2245 Sft	544.15	1,221,616.75
A&SS-C-95	200-59(i)	Providing and fixing M.S. grill fabricated with MS Square polished Vertical/horizontal Bars of specified size @ 4" c/c ' passed through punched holes in MS Patti of 1-1/4"x1/8" i/c the cost of 1-1/4"x1/8" MS patti for Frame of windows and painting 3 coat complete in all respect as approved and directed by the Engineer Incharge. (i) 3/8" Square Bars	Per Sft	2645 Sft	1095.50	2,897,597.50
A&SS-C-96	201-65	Providing and fixing 2" dia 18 SWG non-magnetic Stain less steel pipe (304) wall mounted hand rail comprising fixed with 2' long steel bracket with screws i/c the cost of hardware etc. & stainless steel welding & polishing complete in all respects as approved and directed by the Engineer Incharge.	Per Rft	346 Rft	575.55	199,140.30
A&SS-C-97	202-70	Providing and fixing MS louvered door comprising of 3/4"x3/4"x2" louvers of 16 SWG MS sheet welded with door frame of size 2"x4" 16 SWG MS pipe with lock rail i/c the cost of handles, 1" dia MS sliding bolt ,three coats of fire proof paint complete in all respect as approved and directed by the Engineer Incharge.	Per Sft	305 Sft	1471.75	448,883.75
<b>MISCELLANEOUS CHAPTER-26</b>						
A&SS-C-98	206-45	Spraying termite proofing by using liquid FMC/ Biflex/ Terminex Exin/ Ms Hextar or equivalent @ specified suspension concentrate (SC). Mixing Ability-HEXTAR with Ratio (1:250) = 540 Sft or equivalent approved liquid applying with shower and certificate will be provided by the contractor for 10-years complete in all respect as approved by the Engineer Incharge	Per Sft	6760 Sft	12.55	84,838.00
<b>Total of Scheduled Items (Rs.)</b>						<b>178,421,268.22</b>



**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b>NON-SCHEDULED ITEM</b>						
<b>STRUCTURAL STEEL WORKS</b>						
<b>Ref.Spec. No: - 3000</b>						
A&SS-C-99	NS-01	Provide & fix expanded metal 1/2" to 3/4", 22 gauge fixed walls or on area as required and specified on drawings with steel nails with washers complete in all respects.	Sft	14282		
A&SS-C-100	NS-02	Providing and installing for complete m.s metal screen on external wall, comprising 16 swg 4" x 2" m.s tube metal rod and 2" x 2" best locally available wood bracing at specified c/c includes primer coats and three coats of approved enamel paints, fix approved local wood runners approx 6" center to center with 3 coat of approved enamel paints, complete as per drawing / detail, complete in all respect as per drawings, Technical Provisions and or as directed by the Engineer Incharge. (Metal Screen)	Sft	1500		
A&SS-C-101	NS-03	Providing fixing in position (Tower) m.s stair includes metal ladder, metal deck m.s hand railing i/c primer coats & 3 coats of enamel paint, complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge	No	1		
A&SS-C-102	NS-04	Providing fixing in position m.s monkey ladder i/c primer coats & 3 coats of enamel paint, complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge	No	3		
A&SS-C-103	NS-05	Providing and fixing of treatment of seismic joint at floor level comprising sika combiflex, thermopore sheet, stainless steel plate and polyurethane sealant etc. complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	Rft	1260		





**BILL OF QUANTITIES**  
**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
		<b>FLOORING</b> <b>Ref.Spec. No: - 6531, 6600</b>				
A&SS-C-104	NS-06	Providing and laying Chemically Pre-polished 1" thick Parino Micro Marble Slab on vanity, counter tops and side, with rounded nosing, and grouted with white/coloured cement using imported pigments, including cutting/cutting out area for basin, over and including 1¼" thick 1:3 cement sand mortar base, complete.	Sft	445		
		<b>MISCELLANEOUS</b> <b>Ref.Spec. No: - 2200, 2100, 4600</b>				
A&SS-C-105	NS-07	Additional extra cost for using form work / shuttring in retaining wall concrete (see item# 41-5,h) complete in all respect as per drawings, Technical Provisions and or as directed by the Engineer incharge.	Sft	80		
A&SS-C-106	NS-08	Providing & fixing Position polycarbonated / lexan sheet as approved by consultant fixed with approved aluminium framing for roof open area includes all fixing arrangement, complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	Sft	2911		
						Total of Non-Scheduled Items (Rs.) _____
						<b>TOTAL SCHEDULE AND NON SCHEDULED COST Rs.</b> _____



**UNIVERSITY OF POONCH, RAWALAKOT (UPR)**  
**LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**

**DEPARTMENT OF AGRICULTURE, AGRONOMY AND SOIL SCIENCES**

**BILL OF QUANTITIES**

Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
<b>Schedule Items</b>						
<b>Conduits &amp; Pipes</b>						
E-01	24/3	Supply and erection of PVC pipe for wiring recessed in walls, including inspection boxes, pull boxes, hooks, cutting jharries, and repairing surface, etc., complete with all specials.				
	ii	20 mm i/d	Rft.	12,000	114.40	1,372,800.00
	iii	25 mm i/d	Rft.	38,250	135.95	5,200,087.50
	iv)	32 mm i/d	Rft.	500	159.20	79,600.00
	v)	40 mm i/d	Rft.	500	189.40	94,700.00
	vi)	50 mm i/d	Rft.	100	234.40	23,440.00
<b>Conduit For Earthing Conductor</b>						
E-02	24/6	Supply and erection PVC pipe for recessed wiring (main and sub-main) purpose, including bends, specials, etc. in floor, wall or trenches:-				
	i	50 mm i/d	Rft.	200	237.70	47,540.00
	ii	80 mm i/d	Rft.	200	307.00	61,400.00
<b>Wiring</b>						
E-03	24/10	Supply and erection of single core PVC insulated copper conductor cables, in pre-laid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing an capping/G.I. wire/trenches (rate for cables only):-				
	c)	<b>450/750 volts, PVC insulated:</b>				
	ii)	1.5 mm sq (3/0.029")	Per Rft.	25,000	43.15	1,078,750.00
	iii)	2.5 mm sq (7/0.029")	Per Rft.	20,000	60.50	1,210,000.00
	iv)	4 mm sq (7/0.036")	Per Rft.	18,000	80.40	1,447,200.00
<b>LT Cables</b>						
E-04	24/13	Supply and erection of copper conductor cables for service connection, in pre-laid pipe/G.I. wire/trenches, etc. (rate for cable only):-				
	c)	PVC insulated, PVC sheathed 4 core, 600/1000 volt non armoured cable:-				
	v)	6 mm (7/0.044")	Per Rft.	200	379.90	75,980.00
	vi)	10 mm (7/0.052")	Per Rft.	200	590.70	118,140.00
E-13	vii)	16 mm (7/0.054")	Per Rft.	250	924.35	231,087.50
E-14	viii)	25 mm (19/0.052")	Per Rft.	100	1,423.85	142,385.00



**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-05	24/12	Supply and erection of single core PVC insulated, PVC sheathed copper conductor, 600/1000 volts grade cable, in prelaid G.I. pipe/M.S. conduits/PVC pipe/G.I. wire/trenches, etc (rate for cable only):-				
	ii)	6 mm sq (7/0.044")	Per Rft.	200	99.15	19,830.00
	iii)	10.00 mm sq (7/0.052")	Per Rft.	200	154.35	30,870.00
	iv)	16 mm sq (7/0.064")	Per Rft.	350	232.90	81,515.00
E-09	24/102	<b>Fans and Exhaust Fans</b> Providing and fixing Copper wound Exhaust fan with louver and shutter made of Pak/Younas/G.F.C. i/c the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge.				
	aj-ii	Plastic body - 12" dia	Each	9	5,508.10	49,572.90
E-10	24/161	<b>Grounding / Earthing System</b> Supply, Installation, Testing & Commissioning of complete grounding system:				
	vii)	50 mm <sup>2</sup> CU bare conductor	Per Rft.	2,500	654.40	1,636,000.00
E-11	24/76	<b>Lightning Protection System</b> Supply and erection of 25 mm (1") dia and one metre long lightning conductor copper rod with 5 spikes on ball and base, etc. complete.				
			Job	15	5,931.65	88,974.75
E-12	24/106	<b>Data Cabling System</b> Supply, Installation and commissioning of wiring with 4-pair data Cable, 23AWG UL/ EN listed cable *Conforming to following standards: TIA/EIA568/ISO/IEC11801, in prelaid conduit/ cable tray from including all accessories, Manufacturer/ OEM Authorization, Make: Schneider/ i-connect UK/ 3M Corning USA/ D-Link/ Pollo Australian or equivalent complete in all respect as approved and directed by Engineer Incharge.				
	a-ii)	UTP (Unshielded Twisted pair) CAT-6A (Min.1G/ 10G @ 500MHz or higher)	P.Rft	10,000	69.25	692,500.00





**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi- Annual) / Non- Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-13	24/110	Supply, installation and connections of CAT-6A UTP (Unshielded Twisted Pair), patch cord of specified length, Factory Fabricated and UL Listed with anti Snag Boots-Gold over nickel plated made of Schneider, Pollo Australia or equivalent as approved and directed by Engineer Incharge.				
	i)	1 meter Patch Cord	Each	105	2,601.40	273,147.00
	ii)	3 meter Patch Cord	Each	105	2,961.40	310,947.00
E-14	24/114	Supply and installation of Cable Metal Organizer, 19" Rack mounted with high graded epoxy powder coating and slideable top-UL Listed. Made of Schneider/ i-Connect UK/ 3M Corning Pollo Australia or equivalent approved manufacturer and directed by the Engineer Incharge.	Each	5	4,029.60	20,148.00
E-15	24/115	Supply, Installation and commissioning of 19" Rack Mounted of specified, UTP Patch Panel with specified toolless support & Rear Cable Management, ULlisted, Loaded with UTP of specified Keystone Jack Toolless Support, Made of Schneider/ Norden/ 3M Corning/ D-Link, Pollo Australia or equivalent approved manufacturer and Directed by Engineer Incharge.				
	ii)	CAT-6A (24 Port Patch Panel with Toolless Support 10-Gigabit)	Each	5	36,231.70	181,158.50
E-16	24/136	Supply, installation and connections of 42U Racks 800 x 1000 MM with Fans and 02 nos PDU-IMPORTED, Make Schneider as specified as approved and directed by Engineer's Incharge .	Each	1	221,615.40	221,615.40
E-17	24/131	Supply, Installation and commissioning of Simple type, Dual Shutter Face Plates having fully populated I/O: Option 1:RJ-11 with RJ45/8P8C I/Os supporting either Cat6 or Cat6a cables as required by project Option 2: Two RJ45/8P8C I/Os supporting either Cat6 or Cat6a cables as required by project.				
	i)	Single I/O	Each	100	1,783.20	178,320.00
	ii)	Double I/O	Each	10	2,794.80	27,948.00
<b>Sub-Total (Scheduled Items):</b>						<b>14,995,657</b>



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

E-36	NS-01	<p><b>Non - Schedule Items</b></p> <p><b>L.V. Distribution Boards</b></p> <p><b>Ref. Specs Sec. 8001, 8133</b></p> <p>Supply, installation, testing and commissioning of following LV Panels and Distribution Boards made with 14/16 SWG sheet steel housing (14 SWG for floor standing &amp; 16 SWG for wall mounted) with approved color and having specified circuit breakers as shown on drawing. (Refer Single Line Diagram)</p> <p>Supply, Installation, testing &amp; commissioning of following Free Standing Floor Mounted/ wall mounted totally Enclosed, Cubical type, Low Voltage Panel (LV Panel) with Incoming and Outgoing Circuit Breakers and other components as per SLD with cable terminations as per Technical Specification. Complete in all respects.</p>				
		i) MDB	No.	1		
		ii) EMDB	No.	1		
		iii) DB-1	No.	1		
		iv) DB-2	No.	1		
		v) DB-3	No.	1		
		vi) EDB-1	No.	1		
		vii) EDB-2	No.	1		
		viii) EDB-3	No.	1		
		ix) DB-UPS	No.	1		
		x) DB-AC	No.	1		



**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
		<b>Light Fixtures</b> <b>Ref. Specs Sec. 8001, 8150</b> Supply, installation, testing & commissioning of following LED Light fixtures complete with Electronic ballast (unless mention otherwise), lamps, lamp holders, SPD, Earth Protection and mounting accessories etc., as per specification, complete in all respects, as per drawings and specification, complete in all respect. Lighting fixtures sample must be submitted to consultant for approval. PF> 0.9, CRI>80, 100 Lumens/watt. Operating Life 50,000hrs, IEC Certified. Note: Refer light fixtures drawings/Schedule for complete light fixtures details.				
E-19	NS-02	Surface mounted LED batten Light Fixture with 4200 lumens min., 50000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	250		
E-20	NS-03	Surface mounted LED batten Light Fixture with 2000 lumens min., 50000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	100		
E-21	NS-04	12W Surface Mounted LED downlight with integrated driver and frosted glass diffuser	No.	175		
E-22	NS-05	10W Recessed/Celing Mounted LED Spot downlight of warm white color with integrated driver and frosted glass diffuser	No.	25		
		<b>WIRING ACCESSORIES</b> <b>(Ref. Spec. Sec. 8001, 8220)</b> Following types of switches and socket outlets including Face Plate, sheet steel back box made of 16 SWG finished in powder coated paint and all accessories, complete in all respect.				
E-24	NS-07	10A, 220V 1 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	100		
E-25	NS-08	10A, 220V 2 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	50		





**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-26	NS-09	10A, 220V 3 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	15		
E-27	NS-10	10A, 220V 4 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	10		
E-28	NS-11	10A, 220V 5 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	10		
E-29	NS-12	10A, 220V 6 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	10		
E-30	NS-13	10A, 220V 1 Gang 2 Way Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	4		
E-31	NS-14	10A, 220V Fan Control Dimer with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	120		
E-32	NS-15	13A, 3-Pin, 250V International Switched Socket.	No.	300		
E-33	NS-16	16A 2 pin (round) simplex schoku outlet plate.	No.	230		
E-34	NS-17	15A 3 pin socket outlet	No.	10		
E-35	NS-18	20A, 250V, DP switch with neon lamp + earth with weather protected Transparent deep cover. (for Water Heaters units)	No.	20		
E-36	NS-19	Supply, installation & connection of 25 Amp, SP&N weather proof load break switches with cover and sheet steel enclosure and all mounting accessories.	No.	1		



**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-37	NS-20	Supply & installation of floor outlet box Type A for 1No. 13A simplex switch socket outlet, 1 No. 16A 2 pin (round) simplex schoku outlet and 1 No. RJ-45 duplex outlet, as detailed in the drawings, complete in all respects.	No.	15		
E-38	NS-21	Supply & installation of floor outlet box of 18 SWG sheet steel with powder coating for 2No. 13A simplex switch socket outlet, 2 No. 16A 2 pin (round) simplex schoku outlet and 2 No. RJ-45 duplex outlet, including earthing as detailed in the drawings, complete in all respects.	No.	10		
E-39	NS-22	Supply & installation of floor outlet box Type B for 1No. 13A simplex switch socket outlet, 1 No. 16A 2 pin (round) simplex schoku outlet and 1 No. RJ-45 simplex outlet, as detailed in the drawings, complete in all respects.	No.	50		
E-40	NS-23	Supply, installation & connection of 20 Amp. SP&N load break switch with cover and sheet steel enclosure and all mounting accessories.	No.	7		

**Earthing System**  
(Ref. Spec. Sec. 8001, 8240)

E-41	NS-24	Earth Electrode for earthing shall comprise of 75mm x 4877 mm x 6 mm thick copper plate With 4 Nos. 6 mm dia brass nuts ,bolts and washers 70 sqmm HDHC copper wire as earthing leads.A 100 mm dia Medium Duty GI pipe shall be used with 10 mm dia holes @500 mm c-c. The total length of this GI pipe should be 45 ft. A 150 mm dia 60 ft long hole should be drilled in ground by percussion method and above mentioned 100 mm dia medium duty GI pipe should be fixed in this hole simultaneously up to the depth of 45 ft from NSL including 305 mm long, 50 mm wide and 6mm thick copper busbar as ECP (Earth connecting Point) complete with insulators, washers,nuts,bolts mounting installation and operational accessories as per site requirements.	No.	1		
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**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
		<b>Lightning Protection System</b> (Ref. Spec. Sec. 8001, 8250)				
		Supply, installation testing and commissioning of complete system consisting of following main items. Work includes supply and installation of all hard ware, joined termination, saddles, clams, etc.,				
E-42	NS-25	Bimetallic clamps of 8mm dia including connection of both ends.	No.	25		
E-43	NS-26	Test clamp of 8mm dia copper, including the connection with column Re-bars as shown on drawings.	No.	4		
E-44	NS-27	Welding works between Re-bars, providing MS rods, for welding together of cross Re-bars & extension of column re-bars to bimetallic clamps etc.,	Job	1		
		<b>Fans and Exhaust Fans</b>				
E-45	NS-28	Providing and fixing Copper winded ceiling fan, NEECA approved equivalent including the cost of necessary cable and hardware for connection as approved and directed by Engineer Incharge.  56" dia	Each	120		
		<b>Fire Alarm System</b>				
E-47	NS-30	Supply, Installation and commissioning of wiring with specified Fire Resistant Shielded Cable (Fire Rating for 2 hours) of required size from respective DB to Fire Alarm FACP (Fire Alarm Control Panel) in pre-laid conduit/ duct. Complete as required, approved and directed by the Engineer Incharge.				
E-48	i) NS-31	2C, 1.5 mm sq Supply, Installation and commissioning with Addressable Break Glass unit, (Manual Call Point) with key type EN-54 having a built in short circuit isolator and microprocessor to ensure a response time of max. 1 second, having an indication LED flash after pressing the button to acknowledge the activation and a key operation facility for testing purposes. Complete as required, approved and directed by the Engineer Incharge.	P.Rt	2,000		
			Each	4		





**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-49	NS-32	Supply, installation and commissioning of Addressable Type Indoor Loop Powered electronic Sounder/ Flasher/ Bell EN-54 with minimum sound output 100dB at 1meter with frequencies of variety of sounds as required and shall be loop wired and loop signaled, builtin short circuit isolator, configured via software. Complete as required, approved and directed by the Engineer Incharge.				
E-51	i) NS-33	With Flasher Supply, installation and commissioning of Addressable Optical Smoke Detectors EN 54, Photoelectric, incorporating an LED indication located in labyrinth within the housing of the detector. Sensing unit, adjustable via software between 0-90 seconds having builtin short circuit isolators on both inputs. Complete as required, approved and directed by the Engineer Incharge.	Each	4		
E-52	NS-34	Supply, installation and commissioning of Addressable Heat Detectors incorporating an LED indication located in labyrinth within the housing of the detector. Sensing unit, adjustable via software between 0-90 seconds having builtin short circuit isolators on both inputs. Complete as required, approved and directed by the Engineer Incharge.	Each	60		
E-53	i) NS-35	Fixed Heat Detector to Sense High Temperatures Supply, installation and commissioning of wired/ wireless Addressable Microprocessor based Fire Alarm Control Panel (FACP) Compact, capable of PC interface with window conforming to EN-54, consisting of specified loop circuit shaving 240 devices per loop, indicating circuits, builtin power supply with backup batteries, alarm and trouble indication, silence alarm and reset system, general alarm and reset system, general alarm facility. Complete as required, approved and directed by the Engineer Incharge.	Each	1		
E-54	i) NS-36	FACP 1-Loop Testing and commissioning of Fire Alarm System.	Each Job.	1 1		




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**Sub-Total (Non-Scheduled Items):**


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**Total (Scheduled + Non-Scheduled Items):**


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**UNIVERSITY OF POONCH, RAWALAKOT (UPR)**  
**LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**

**DEPARTMENT OF AGRICULTURE, AGRONOMY AND SOIL SCIENCES**

**BILL OF QUANTITIES**  
**PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**GENERAL NOTE**

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per drawings, specifications and as approved by the Engineer.

**SCHEDULED ITEMS**

**SANITARY FIXTURES AND FITTINGS**

AG-P-01	19 / 3	Providing and fitting one piece European Coupled set of Water Closet (WC) and flushing Cistern of PORTA brand (full size) i/c the cost of CP / rubber connection, thimble, normal seat cover and rawal bolts complete in all respects as approved and directed by the Engineer Incharge.	Each	9	58,465.50	526,190
AG-P-02	19 / 5	Providing and fitting white glazed earthen ware water closet, squatter type, with separate foot rest.	Each	12	9,889.65	116,276
AG-P-03	19 / 13 / i	Providing and fitting plastic made low down flushing cistern 13.63 litre (3 gallons) capacity, including bracket set, copper connection, etc. complete, white	Each	12	5,610.40	67,325
AG-P-04	19 / 4 / ii page 120	Providing and fixing, flushing bend of PVC, 4cm (1-1/2")	Each	12	390.25	4,683
	19 / 7	Providing and fitting glazed earthen ware wash hand basin 56x40 cm (22"x16") including bracket set, waste pipe and waste coupling, etc.				
AG-P-05	(i)	white with pedestal	Each	6	11,280.75	67,685
AG-P-06	(v)	Under Counter Vanity Basin	Each	27	11,880.75	320,780
AG-P-07	19 / 8	Providing and fixing stainless steel sink with drain board, size 120x60 cm (48"x24") including bracket set, waste pipe and waste coupling.	Each	2	15,228.50	30,457.00





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	19 / 10	Providing and fixing glazed earthen ware sink, including bracket set, waste pipe and waste coupling; (for laboratory sink)				
AG-P-08	(i)	60x45 cm (24"x18")	Each	97	6,007.20	582,698.40
AG-P-09	19 / 11	Providing and fixing glazed earthen ware flat back urinal.	Each	3	2,686.50	8,060
AG-P-10	19 / 30	Providing and fixing, chromium plated mixing valve, for wash hand basin, sink or shower.	Each	2	3,845.75	7,691.50
	19 / 32	Providing and fitting, chromium plated or brass oxidised, swan neck cock 15 mm (1/2") dia				
AG-P-11	(i)	single way	Each	97	861.40	83,555.80
AG-P-12	19 / 16	Providing and fixing, chromium plated soap dish.	Each	33	937.75	30,946
AG-P-13	19 / 18	Providing and fixing, chromium plated toilet paper holder.	Each	9	1,202.45	10,822
AG-P-14	19 / 19 / i	Providing and fixing, chromium plated towel rail, 60 cm (24") long, and 2 cm (1/4") dia	Each	10	1,254.75	12,548
AG-P-15	19 / 27 / ii	Providing and fixing chromium plated bib cock 1.5cm (1/2")	Each	10	1,641.40	16,414
AG-P-16	19 / 28	Providing and fixing chromium plated Tee stop cock 15mm (1/2")	Each	95	2,001.40	190,133
	19 / 52	Providing and fixing CP bath Room Set made of Sonex / Master / Faisal comprising of 3-NoTee stop cocks, lever type Basin Mixer, double Bib Cock, open wall shower, Muslim shower, waste coupling and bottle trap etc. complete in all respect as approved and directed by the Engineer incharge				
AG-P-17	i	Tee Stop Cock - Set of 03	Each	5	2,232.30	11,162
AG-P-18	ii	Lever Type Basin Mixer	Each	33	6,672.30	220,186
AG-P-19	iii	Double Bib Cock	Each	21	1,872.30	39,318
AG-P-20	iv	Open Type Wall Shower	Each	1	18,672.30	18,672
AG-P-21	v	Muslim shower	Each	21	2,352.30	49,398
AG-P-22	vi	waste coupling	Each	3	732.30	2,197





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
AG-P-23	vii	Bottle Trap	Each	30	1,452.30	43,569
AG-P-24	19 / 7 / ii page 121	Providing and fixing 1.5 cm (½") dia connection, including check nuts, etc, (copper connection)	Each	3	708.85	2,127
	19 / 55	Providing/fixing Electric water heater (Geyser) comprising of tank of 14 SWG, GI sheet and external cover of 22 SWG MS sheet, insulated with 4" thick high density glass wool, imported thermostat i/c electric rod, safety valve Ambassador / Canon) i/c cost of accessories& making connection complete in all respect as approved and directed by Engineer Incharge				
AG-P-25	i	15 Gal Capacity	Each	9	32,521.50	292,694
AG-P-26	ii	20 Gal Capacity	Each	4	34,441.50	137,766

**WATER SUPPLY PIPES AND FITTINGS**

	23 / 46 / b	Providing, laying, testing and commissioning of POLYPROPYLENE RANDOM COPOLYMER ( PPRC ) water supply pipe (Dadex / Popular / Beta or equivalent ) with specified pressure rating PN ( PRESSURE NOMINAL ) and conforming to DIN 8077 - 8078 code i/c cost of solvent, specials, making jharries complete in all respect as approved and directed by Engineer Incharge. ( Internal / External Diameters mentioned ). PN20				
AG-P-27	ii	¾ inch (25mm) dia	Rft	3,300	100.35	331,155
AG-P-28	iii	1 inch (32mm) dia	Rft	2,450	160.50	393,225
AG-P-29	iv	1-¼ inch (40mm) dia	Rft	1,650	245.90	405,735
AG-P-30	v	1-½ inch (50mm) dia	Rft	850	354.10	300,985
AG-P-31	vi	2 inch (63mm) dia	Rft	500	554.65	277,325
AG-P-32	vii	2-¼ inch (75mm) dia	Rft	10	846.00	8,460
AG-P-33	viii	2-½ inch (90mm) dia	Rft	10	1,219.75	12,198



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	27 / 16 / a	Supply & Installation of High Density ( 64 Kg/m <sup>3</sup> ) Aluminum foil faced fiberglass pipe insulation for chilled/hot water piping and fittings and protections of valves, strainers etc i/c the cost of canvas cloth as approved and directed by Engineer Incharge.				
AG-P-34	i	3/4" dia Pipe - 25 mm thick	Rft	10	407.20	4,072
AG-P-35	ii	1" dia Pipe - 25 mm thick	Rft	850	434.80	369,580
AG-P-36	iii	1-1/4" dia Pipe - 25 mm thick	Rft	1,250	467.70	584,625
AG-P-37	iv	1-1/2" dia Pipe - 25 mm thick	Rft	850	498.80	423,980
AG-P-38	v	2" dia Pipe - 25 mm thick	Rft	400	576.25	230,500
AG-P-39	vi	2-1/2" dia Pipe - 25 mm thick	Rft	250	705.15	176,288
	27 / 12	Supply & Installation of multi layer aluminium sheet jacketting of specified thickness, coated with UV ( Ultra Violet) protection & polymer backing having saltwater resistance and fire performance conforming to ASTM-C1729M over exposed duct/pipe insulations where required and specified i/c the cost of Metal banding solution sealant as approved and directed by Engineer Incharge				
AG-P-40	(ii)	0.4 mm thick	Sft	2,000	148.35	296,700
	23 / 51	Providing and fixing heavy duty Gate valve of specified diameter and material for pressure rating PN-16 mde of Crane (USA), Hatersly (UK) or Scon (Pakistan) i/c the cost of all accessories flanges, nut/bolt and gasket where required complete in all respect as approved and directed by the Engineer Incharge.				
AG-P-41	a-ii	3/4" dia Brass Threaded Valves	Each	30	4,628.40	138,852
AG-P-42	a-iii	1" dia Brass Threaded Valves	Each	20	6,608.40	132,168
AG-P-43	a-iv	1-1/4" dia Brass Threaded Valves	Each	10	9,308.40	93,084
AG-P-44	a-v	1-1/2" dia Brass Threaded Valves	Each	10	12,972.60	129,726
AG-P-45	a-vi	02" dia Brass Threaded Valves	Each	10	20,412.60	204,126



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	23 / 45	Providing and fixing CP heavy duty brass Ball valve with CP handle of specified diameter made of Faisal/Sonex / Master best quality or equivalent complete in all respect as approved and directed by the Engineer Incharge.				
AG-P-46	i	1/2" dia Brass Threaded Valves	Each	50	1,184.40	59,220
AG-P-47	ii	3/4" dia Brass Threaded Valves	Each	10	1,448.40	14,484
AG-P-48	iii	1" dia Brass Threaded Valves	Each	10	1,868.40	18,684
	23 / 53	Providing and fixing heavy duty Check valve of specified diameter and material for pressure rating PN-16 made of Crane (USA), Hatersly (UK), Scon (Pakistan) i/c the cost of all accessories flanges, nut/bolt and gasket where required complete in all respect as approved and directed by the Engineer Incharge				
AG-P-49	a-ii	3/4" dia Brass Threaded Valves	Each	9	6,188.40	55,696
AG-P-50	a-iii	1" dia Brass Threaded Valves	Each	4	8,888.40	35,554
	23 / 54	Supply & installation of heavy duty Brass PN-16 air Vents of specified size provided at the highest points (Pipe Risers) to expel air as approved and directed by the Engineer Incharge				
AG-P-51	a-ii	3/4 inches	Each	10	2,584.20	25,842
	23 / 42 / d	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE-100) working pressure pipe, Beta / Dadex / Popular / IIL or equivalent including the cost of specials, in trenches, as approved & directed by the engineer incharge, complete in all respects. PN-12.5				
AG-P-52	3	40mm dia	Rft	10	95.90	959
AG-P-53	4	50mm dia	Rft	10	142.35	1,424
AG-P-54	5	63mm dia	Rft	500	223.05	111,525
AG-P-55	6	75mm dia	Rft	200	313.10	62,620
AG-P-56	7	90mm dia	Rft	10	448.20	4,482





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
		<b>SOIL, WASTE AND VENT PIPES &amp; FITTINGS</b>				
	19 / 47 / b	Providing, fixing, testing and commissioning of uPVC (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Betaor approve dequivalent manufacturer ,plain/Bell Ended/ZJoints conforming to BS4514/ BS5255 EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.				
AG-P-57	ii	40mm	Rft	850	108.35	90,398
AG-P-58	iii	50mm	Rft	1,650	115.05	189,833
AG-P-59	iv	82mm	Rft	2,500	175.05	437,625
AG-P-60	v	110mm	Rft	1,850	274.20	452,430
AG-P-61	vi	160mm	Rft	450	528.00	237,600
AG-P-62	vii	200mm	Rft	750	564.80	423,450
	19 / 49	Providing, fixing, testing and commissioning of u-PVC (Unplasticized polyvinyl Chloride ) Nikasi / waste pipe Fittings make of Dadex / Popular / Beta or equivalent, conforming to code EN-1329 including the cost of Solvents complete in all respect as approved and directed by the Engineer Incharge.				
AG-P-63	a-i	P Trap 4"	Each	12	1,358.10	16,297
AG-P-64	a-ii	P Trap 3"	Each	21	1,020.90	21,439
AG-P-65	b-i	Multi-Trap 4"	Each	72	1,305.30	93,982
AG-P-66	c-ii	Vent Cowel 3"	Each	10	294.90	2,949
AG-P-67	d-i	Clean Outs 4"	Each	10	758.10	7,581
AG-P-68	d-ii	Clean Outs 3"	Each	10	609.30	6,093
AG-P-69	19 / 36	Providing and fitting 10 cm (4") gully trap, including cement concrete, cost of PVC grating 15x15 cm (6"x6") and masonry chamber 30x30 cm (12"x12").	Each	20	1,668.95	33,379



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**STORM DRAINAGE PIPES & FITTINGS**

19 / 47 / b Providing, fixing, testing and commissioning of  $\mu$ PVC (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Betaor approve dequivalent manufacturer ,plain/Bell Ended/Z.Joints conforming to BS4514/ BS5255 EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.

AG-P-70	iv	82mm	Rft	10	175.05	1,751
AG-P-71	v	110mm	Rft	250	274.20	68,550
AG-P-72	vi	160mm	Rft	50	528.00	26,400

**FIREFIGHTING**

23 / 48 Providing, laying, testing and commissioning of Grade-B,MS Seamless Schedule pipe of nominal diameter, conforming to ASTM-A106, Lontrin/ Hufaz / Peficic baolai or approved equivalent manufacturer, duly welded i/c the cost of specials complete as approved and directed by the Engineer Incharge

AG-P-73	iii	<b>Schedule-40</b> 01"	Rft	40	553.40	22,136
AG-P-74	vii	2-1/2"	Rft	80	1,760.65	140,852
AG-P-75	viii	03"	Rft	100	2,235.35	223,535
AG-P-76	ix	04"	Rft	300	3,044.35	913,305

23 / 58 Supply , installation and commissioning of Concealed/Open type fire Hose Reel cabinet of specified size made of 18 SWG MS sheet , single/double Cabin having demountable single/double doors of steel/glazed with 4 mm thick glass,with warning sign on it,duly painted with 70 micron electrostatic powder coated Red color, housing at least 100 ft length of pipe i/c the cost of specified valve , complete in all respects as approved and directed by Engineer Incharge ( The accessories will be paid separately).



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
AG-P-77	(ii)	Indoor/Outdoor Type 12" deep	P.Cft	110	2,573.75	283,113
	23 / 59	Supply , installation and commissioning of fire Hose reel Cabinet accessories of specified size and make, complete in all respects. As approved and directed by Engineer Incharge				
AG-P-78	(i)	(A) Ruber covered hose pipe 1" Dia	Rft	800	1,184.50	947,600
AG-P-79	(a)	(D) Fire Hose Spray Nozzle with Jet 1" dia Polycarbonate Nozzle(75gpm)	Each	8	3,813.25	30,506
<b>TOTAL (SCHEDULE ITEMS) =</b>						<b>12,467,404</b>

**NON-SCHEDULED ITEMS**

**SANITARY FIXTURES AND FITTINGS**

(Ref. Specs 5100)

AG-P-80	NS-01	05mm thick Glass mirror imported European make or approved equivalent including hard board behind it, approved beeding around it and all other fittings for complete installation	Sft	330		
AG-P-81	NS-02	Electric water coolers of 20gallons/hr capacity, minimum two taps, including Tee stop cock on inlet, and all other accessories for complete installation.	Each	2		
		Water filters of following type, including all accessories for complete installation.				
AG-P-82	NS-03	Triple type filter	Each.	2		
		Providing/fixing U-shape 1-1/4" dia Stainless Steel Grab bar of 14 SWG thickness and specified length for safety grip w/c the cost of Stainless Steel brackets, rawal plugs and hardware as approved and directed by Engineer Incharge				
AG-P-83	NS-04	18" long	Each	12		





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bl Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
<b><u>WATER SUPPLY PIPES AND FITTINGS</u></b>						
(Ref. Specs 5100, 5220, 5280)						
G.I. water pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, supports and hangers, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.						
AG-P-84	NS-05	3/4 inch (20mm) dia pipe	Rft	10		
AG-P-85	NS-06	1 inch (25mm) dia pipe	Rft	10		
AG-P-86	NS-07	1-1/4 inch (32mm) dia pipe	Rft	10		
AG-P-87	NS-08	1-1/2 inch (40mm) dia pipe	Rft	10		
AG-P-88	NS-09	02 inch (50mm) dia pipe	Rft	10		
<b><u>SOIL, WASTE AND VENT PIPES &amp; FITTINGS</u></b>						
AG-P-89	NS-10	Providing and Fixing of CP top tile strainer, complete in all respect as approved and directed by Engineer incharge	Each	93		
<b><u>STORM DRAINAGE PIPES &amp; FITTINGS</u></b>						
Providing and Fixing of SS 304 Roof / scupper Drain, complete in all respect as approved and directed by Engineer Incharge.						
AG-P-90	NS-11	04" dia	Each	10		
AG-P-91	NS-12	06" dia	Each	2		



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**NATURAL GAS SUPPLY PIPES AND FITTINGS**

(Ref. Specs 5100, 5220, 5280)

G.I. pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, supports and hangers, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.

AG-P-92	NS-13	1/2 inch (15mm) dia pipe	Rft	250		
AG-P-93	NS-14	3/4 inch (20mm) dia pipe	Rft	1,000		
AG-P-94	NS-15	1 inch (25mm) dia pipe	Rft	100		

**FIRE FIGHTING**

(Ref. Specs 5150)

Fire Extinguisher of following types.

AG-P-95	NS-16	DCP Type Fire Extinguisher of 6kg Capacity	Each	10		
AG-P-96	NS-17	Foam Type fire extinhuiser capacity 09litres (2gallons).	Each	10		
AG-P-97	NS-18	Wet chemical Type Fire Extinguisher of 06kg Capacity.	Each	2		
AG-P-98	NS-19	CO2 Type Fire Extinguisher of 05kg Capacity.	Each	10		

TOTAL (NON-SCHEDULED) = \_\_\_\_\_

TOTAL (SCHEDULE + NON-SCHEDULE ITEMS) = \_\_\_\_\_



UNIVERSITY OF POONCH, RAWALAKOT (UPR)  
LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT

DEPARTMENT OF AGRICULTURE, AGRONOMY AND SOIL SCIENCES

**BILL OF QUANTITIES  
RETROFITTING WORK**

ITEM NO.	MURREE MRS, 2nd BI Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)

**STANDARDIZED ITEMS**

AASS-C-01	41-9	Placing, compacting, finishing and curing of concrete using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; including screening, washing of aggregates and mixing of constituents using batching plant, Transportation by transit mixer, pouring with pump in the required proportions to achieve a nominal cylindrical strength in the field as per ACI 214, with the specified consistency i/c the cost of shuttering, compaction with Vibrator, excluding the cost of Admixture, as approved and directed by the Engineer Incharge.				
	(a)	Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-				
		(iv) 4000 PSI	Per Cft	9,000.00	850.80	7,657,200.00
AASS-C-02	42-12.b	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		ii) Deformed bars (Grade-60)	100kg	30,000.00	36040.95	10,812,285.00
<b>Cost of Standardized Items (Rs.)</b>						<b>18,469,485.00</b>





**BILL OF QUANTITIES  
RETROFITTING WORK**

ITEM NO.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)

**NON-STANDARDIZED ITEMS**

**GENERAL NOTE**

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per specifications and as approved by the Engineer.

**STRENGTHENING / RETROFITTING OF RCC MEMBERS**

AASS-C-03	AASS-C-NS-02	Providing and fixing additional Grade-60 reinforcing steel bar(s) / pin(s) / shear connector(s) in RCC Column(s) by drilling up to the required depth and grouting using cementitious / epoxy chemicals at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing complete in all respect as per satisfaction of the Engineer.	Kg	1,000.00		
AASS-C-04	AASS-C-NS-03	Providing and fixing Grade-A50 mild steel strip(s) 4"-wide x 1/4"-thick at top and / or bottom of RCC Beam(s) using chemical anchors (3/8"-dia. and grouted at spacing specified by the manufacturer) at location(s) as per instructions of the Engineer (Structural Engineer). Job includes removal of concrete clear cover, surface preparation / cleaning and finishing with metal lath plaster, complete in all respect as per satisfaction of the Engineer.	Rft	2,500.00		
AASS-C-05	AASS-C-NS-05	Providing and fixing CFRP strips bonded to the chemical / substrate as per manufacturer's recommendation (SIKA CarbuDur S812 or equivalent) at top and / or bottom of RCC Beam(s) at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing with metal lath plaster, complete in all respect as per satisfaction of the Engineer.	Rft	800.00		



**BILL OF QUANTITIES  
RETROFITTING WORK**

ITEM NO.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
AASS-C-6	AASS-C-NS-07	Providing and fixing CFRP Wrap bonded to the chemical / substrate as per manufacturer's recommendation (SIKA Wrap Hex-230C or equivalent) on three sides of RCC Beam(s) at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing with metal lath plaster, complete in all respect as per satisfaction of the Engineer.	Sft	600.00		
AASS-C-7	AASS-C-NS-08	Providing and injection of epoxy resin (Sikadur-52 or equivalent) in minor cracks of RCC members as per manufacturer's recommendation at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing, complete in all respect as per satisfaction of the Engineer.	Kg	6.00		
AASS-C-8	AASS-C-NS-09	Providing and applying epoxy-based bonding agent (Sikadur-32 or equivalent) on existing concrete surface for bonding with new concrete as per manufacturer's recommendation at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing, complete in all respect as per satisfaction of the Engineer.	Sft	3,000.00		
AASS-C-9	AASS-C-NS-10	Providing and applying fiber-reinforced, cementitious, polymer-modified repair mortar (SIKA or equivalent) on minor-damaged or honey-combed existing concrete surface as per manufacturer's recommendation at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing, complete in all respect as per satisfaction of the Engineer.	Sft	7,200.00		

<b>Cost of Non-Standardized Items (Rs.)</b>	
<b>Total Cost of Standardized Items &amp; Non-Standardized Items (Rs.)</b>	



UNIVERSITY OF POONCH, RAWALAKOT (UPR)  
LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT

DEPARTMENT OF VETERINARY AND ANIMAL SCIENCE  
BILL OF QUANTITIES  
CIVIL WORKS

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b>SCHEDULED ITEMS</b>						
<b><u>EARTH WORK (EXCAVATION &amp; EMBANKMENT) CHAPTER-03</u></b>						
VAS-C-01	26-15(i)	Filling, watering and ramming earth under floors with surplus earth from foundations etc.	1000 Cft	500 Cft	7563.60	3,781.80
VAS-C-02	26-15(ii)	Filling, watering and ramming earth under floors with new earth excavated from outside, lead upto one chain (30 m).	1000 Cft	222581 Cft	16250.80	3,617,119.31
VAS-C-03	26-17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m)				
		a) upto ¼ mile (400 m).	1000 Cft	222581 Cft	6678.00	1,486,395.92
VAS-C-04		b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.)	1000 Cft	222581 Cft	838.20	186,567.39
VAS-C-05		c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km).	1000 Cft	222581 Cft	6172.00	1,373,769.93
	27-21 (2.a)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming lead upto one chain (30 m)lift upto 5 ft (1.5m).				
VAS-C-06		ii) Ordinary soil	1000 Cft	41259 Cft	10794.00	445,349.65
	27-21 (2.b)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming lead upto one chain (30 m)Lift from 5ft (1.5m) to 15 ft (4.5 m)				
VAS-C-07		ii) Ordinary soil	1000 Cft	41259 Cft	12928.20	533,404.60
VAS-C-08	28-27	Extra for slush or Dalidal including dewatering.	1000 Cft	35365 Cft	12038.40	425,738.02





**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b><u>DISMANTLING (DEMOLITION) CHAPTER-04</u></b>						
VAS-C-09	31-14	Dismantling cement block masonry	100 Cft	3543 Cft	5643.00	199,908.92
<b><u>CONCRETE CHAPTER-06</u></b>						
VAS-C-10	38-2	Dry rammed brick or stone ballast, 1½" to 2" (40 mm to 50 mm) gauge.	100Cft	22318 Cft	12837.00	2,864,961.66
	38-3	Cement concrete brick or stone ballast 1½" to 2" (40 mm to 50 mm) gauge, in foundation and plinth:-				
VAS-C-11		(b) Ratio 1: 4: 8	100Cft	50 Cft	35406.40	17,703.20
	38-5	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate)				
VAS-C-12	(f)	Ratio 1:2:4	100 Cft	188 Cft	48022.90	90,283.05
VAS-C-13	(h)	Ratio 1:3:6	100 Cft	3741 Cft	40795.80	1,526,170.88
VAS-C-14	(i)	Ratio 1:4:8	100 Cft	7632 Cft	35528.50	2,711,535.12
	41-9	Placing, compacting, finishing and curing of concrete using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required, including screening, washing of aggregates and mixing of constituents using batching plant, Transportation by transit mixer, pouring with pump in the required proportions to achieve a nominal cylindrical strength in the field as per ACI 214, with the specified consistency, i/c the cost of shuttering, compaction with Vibrator, excluding the cost of Admixture, as approved and directed by the Engineer Incharge.				
		(a) Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-				
VAS-C-15		(iv) 4000 PSI	Per Cft	11130 Cft	850.80	9,469,404.00
VAS-C-16		(vi) 3000 PSI	Per Cft	38704 Cft	751.40	29,082,185.60



**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
		(b) Retaining/ Shear walls laid in situ or precast laid in position, or prestressed members cast ( Formwork on both sides)				
VAS-C-17		v) 3000 PSI (i) Upto 9" thick	Per Cft	100 Cft	731.85	73,165.00
		(c) Substructure (Foundations, Raft, Strip and Footing Beams)				
VAS-C-18		(vi) 3000 PSI	Per Cft	20600 Cft	608.00	12,524,800.00
	42-12.b	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
VAS-C-19		a) Plain bars	100kg	6848 Kg	34720.95	2,377,796.58
VAS-C-20		b) Deformed bars (Grade-40)	100kg	0 Kg	35645.00	0.00
VAS-C-21		c) Deformed bars (Grade-60)	100kg	375190 Kg	38040.95	135,222,040.3
VAS-C-22	42-14	Precast cement concrete hollow blocks (1:2:4) in 1:5 C/S mortar at any height , including cost of templates and constructing walls thereof	Per Cft	35428 Cft	446.70	15,824,794.20
VAS-C-23	42-15	Providing and fixing ornamental cement jali 2" (50 mm) thick (1: 2: 4), without steel	Per Sft	1810 Sft	148.85	269,418.50
	44-36	Providing and laying 2" thick (50mm) damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating :-				
VAS-C-24		(a,ii) with one coat bitumen and one coat polythene sheet 500gauge	100Sft	2045 Sft	13127.45	268,456.35
<b>ROOFING CHAPTER-09</b>						
VAS-C-25	58-13 (a)	Providing & Fixing 20 SWG corrugated galvanized iron sheets with G.I bolts, nuts, limpet and bitumen washers, wind ties, complete in all respects without valleys and ridges:-	100Sft	17785 Sft	50582.35	8,996,164.59
VAS-C-26		Add extra 6% on composite rates for 2nd floors, respectively.	100Sft	8893 Sft	3034.94	269,884.94
VAS-C-27		Add extra 15% on composite rates for 3rd floors, respectively.	100Sft	8893 Sft	7500.00	674,712.34



**BILL OF QUANTITIES  
CIVIL WORKS**

MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)		DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
VAS-C-28		Add extra 23% on composite rates for 4th floors, respectively.	100Sft	50 Sft	11633.94	5,816.97
VAS-C-29	59-18	Plain galvanized iron sheet flashing, 22 gauge.	Per Sft	1490 Sft	425.85	634,516.50
VAS-C-30	61-46	Providing and applying torch-on water proofing bitumenous membrane of specified thickness (made of Roof-Grip/EuroBit) duly lapped/connected by heating with Torch over ps-6 primer i/c preparation/smoothen the surface complete in all respect as approved and directed by the Engineer Incharge ii) 4 mm thick	Per Sft.	15972 Sft	155.70	2,486,767.94
VAS-C-31	62-48 (iv)	Providing and fixing false ceiling comprises of 12 mm thick Gypsum board laminated sheet of size 2'x2'2'x3' / 3'x3' of specified design and thickness i/c cost of fixtures i.e galvanized angle 1" x 1" at wall sides, galvanized tee 1 1/4" x 1" and 1 1/2" x 1" both at 4' c/c ( made of Taiwan CKM or equivalent), hanging with G.I/Copper wire 16 SWG, G.I hook, Rawal Plug etc; complete in all respects as approved and directed by the Engineer Incharge.	100Sft	560 Sft	137.20	768.32
<b>FLOORING CHAPTER-10</b>						
VAS-C-32	63-3	Supplying and filling sand under floor, or plugging in wells.	100Cft.	188 Cft	5787.00	10,879.56
	64-14	Cement concrete tiles laid in 1:2 cement mortar, over 3/4" (20 mm) thick bed of cement mortar 1:2-				
VAS-C-33		(a) 12"x12"x1" (300 x 300 x 25 mm)	100 Sft	9232 Sft	15,311.00	1,413,511.52
VAS-C-34	65-24 (i)	Providing and laying superb quality Ceramic tile floors of Master/ Stile brand or approved equivalent manufacturer of specified size,Glossy/Matt/Texture of approved Color and Shade as per approved design with adhesive bond, over 3/4" thick (1:2) cement sand plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete n all respects and as approved and directed by the Engineer Incharge. size (12"x18"/12"x24"/10"x24"/8"x24"/12"x36")	Per Sft	561 Sft	319.80	179,407.80





**BILL OF QUANTITIES  
CIVIL WORKS**

MURREE MRS, 2nd BI Annual-2024 (Page No. Item No.)		DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
VAS-C-35	65-24 (i) +64-19	First floor	Per Sft	494 Sft	331.09	163,556.48
VAS-C-36	65-24 (i) +2x64-19	Second floor	Per Sft	50 Sft	342.37	17,118.60
VAS-C-37	65-25 (i)	Providing and laying superb quality Ceramic tiles dado of Master/ Stile brand or approved equivalent manufacturer of specified size Glossy/Matt/Texture skirting/dado of approved Color and Shade with adhesive bond over 1/2" thick (1:2) cement plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete in all respects as approved and directed by the Engineer Incharge. i) 12"x18"/12"x24"/10"x24" /8"x24"/12"x36"	Per Sft	2087 Sft	391.90	817,895.30
VAS-C-38	65-25 (i) +64-19	First floor	Per Sft	1757 Sft	403.19	708,397.80
VAS-C-39	65-25 (i) +2x64-19	Second floor	Per Sft	50 Sft	414.47	20,723.60
VAS-C-40	66-35 (b)	Mosaic Tile skirting laid in 1:2 cement mortar, over 3/4"(20 mm) thick cement mortar, 1:2 including cement washing and filling joints complete:-	100 Sft	1600 Sft	37,008.60	592,137.60
VAS-C-41	67-37 (b)(ii)	1/2" (13mm) thick Mosaic dado or skirting with one part of white cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over 1/2"(13 mm) thick cement plaster 1:3, including rubbing and polishing, complete with finishing. (Stair Steps & Riser)	100 Sft	1430 Sft	20,107.15	287,532.25
VAS-C-42	68-41 (a)(ii)	Providing and laying 1" thick terrazzo tile for specified colour & size full body, best quality with minimum 5000 PSI in approved design with adhesive bond over 3/4" thick 1:3 cement plaster i/c the cost of sealer for finishing the joints i/c cutting, grinding, rubbing, filling. Complete in all respect as approved and directed by the Engineer incharge. (Without Polishing)	Sft	38273 Sft	447.80	17,138,649.40
VAS-C-43	69-52(i)	Providing and laying 3/4" thick Prepolished Granite of specified shade of full width of approved quality laid with adhesive bond over 3/4" thick (1:2) cement sand mortar bed, complete in all respect as approved and directed by the Engineer Incharge. (Marble Counter Top)	Per Sft	105 Sft		130,257.75



**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b><u>SURFACE RENDERING CHAPTER-11</u></b>						
VAS-C-44	71-9(b)	1/2" (13mm) thick Cement plaster 1:4 upto 20' (6.00 m) height	100 Sft	39762 Sft	4,730.80	1,861,060.70
VAS-C-45	71-9(b) +72-28	1/2" (13mm) thick Cement plaster 1:4 from 20' to 30' height	100 Sft	7360 Sft	5,341.45	393,141.40
VAS-C-46	71-9(b) + 2x72-28	1/2" (13mm) thick Cement plaster 1:4 from 30' to 40' height	100 Sft	7360 Sft	5,952.10	438,086.46
VAS-C-47	71-9(b) + 3x72-28	1/2" (13mm) thick Cement plaster 1:4 from 40' to 50' height	100 Sft	7360 Sft	6,562.75	483,031.53
VAS-C-48	71-9(b) + 4x72-28	1/2" (13mm) thick Cement plaster 1:4 from 50' to 60' height	100 Sft	7360 Sft	7,173.40	527,976.59
VAS-C-49	71-9(b) + 5x72-28	1/2" (13mm) thick Cement plaster 1:4 from 60' to 70' height	100 Sft	7360 Sft	7,784.05	572,921.65
VAS-C-50	71-9(c)	3/4" (13mm) thick Cement plaster 1:4 upto 20' (6.00 m) height	100 Sft	8615 Sft	6363.05	548,176.76
VAS-C-51	71-9(c) +72-28	3/4" (13mm) thick Cement plaster 1:4 from 20' to 30' height	100 Sft	1831 Sft	6,973.70	127,702.39
VAS-C-52	71-9(c) + 2x72-28	3/4" (13mm) thick Cement plaster 1:4 from 30' to 40' height	100 Sft	1831 Sft	7,584.35	138,884.62
VAS-C-53	71-9(c) + 3x72-28	3/4" (13mm) thick Cement plaster 1:4 from 40' to 50' height	100 Sft	1831 Sft	8,195.00	150,066.84
VAS-C-54	71-9(c) + 4x72-28	3/4" (13mm) thick Cement plaster 1:4 from 50' to 60' height	100 Sft	1831 Sft	8,805.65	161,249.06
VAS-C-55	71-9(c) + 5x72-28	3/4" (13mm) thick Cement plaster 1:4 from 60' to 70' height	100 Sft	1831 Sft	9,416.30	172,431.29
VAS-C-56	71-10(c)	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, upto 20' height	100 Sft	21824 Sft	5,253.55	1,146,534.75
VAS-C-57	71-10(c) +72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 20' to 30' height	100 Sft	14003 Sft	5,864.20	821,175.65
VAS-C-58	71-10(c) +2x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 30' to 40' height	100 Sft	875 Sft	6,474.85	56,667.89
VAS-C-59	71-10(c) +3x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 40' to 50' height	100 Sft	875 Sft	7,065.50	62,012.30
VAS-C-60	71-10(c) +4x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 50' to 60' height	100 Sft	875 Sft	7,676.15	67,356.70





**UNIVERSITY OF POONCH, RAWALAKOT (UPR)**  
**LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**

**DEPARTMENT OF VETERINARY AND ANIMAL SCIENCE**

**BILL OF QUANTITIES**

**Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
<b>Schedule Items</b>						
<b>Conduits &amp; Pipes</b>						
E-01	24/3	Supply and erection of PVC pipe for wiring recessed in walls, including inspection boxes, pull boxes, hooks, cutting jharries, and repairing surface, etc., complete with all specials.				
	ii	20 mm i/d	Rft.	15,000	114.40	1,716,000.00
	iii	25 mm i/d	Rft.	17,500	135.95	2,379,125.00
	iv)	32 mm i/d	Rft.	1,000	159.20	159,200.00
	v)	40 mm i/d	Rft.	1,000	189.40	189,400.00
	vi)	50 mm i/d	Rft.	500	234.40	117,200.00
<b>Conduit For Earthing Conductor</b>						
E-02	24/6	Supply and erection PVC pipe for recessed wiring (main and sub-main) purpose, including bends, specials, etc. in floor, wall or trenches:-				
	i	50 mm i/d	Rft.	1,000	237.70	237,700.00
	ii	80 mm i/d	Rft.	500	307.00	153,500.00
<b>Wiring</b>						
E-03	24/10	Supply and erection of single core PVC insulated copper conductor cables, in pre-laid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing or capping/G.I. wire/trenches (rate for cables only):-				
	c)	<b>450/750 volts, PVC insulated:</b>				
	i)	1.5 mm sq (3/0.029")	Per Rft.	27,500	43.15	1,186,625.00
	ii)	2.5 mm sq (7/0.029")	Per Rft.	30,000	60.50	1,815,000.00
	iv)	4 mm sq (7/0.036")	Per Rft.	32,000	80.40	2,572,800.00
	v)	6 mm sq (7/0.044")	Per Rft.	3,500	111.40	389,900.00
<b>LT Cables</b>						
E-04	24/13	Supply and erection of copper conductor cables for service connection, in pre-laid pipe/G.I. wire/trenches, etc. (rate for cable only):-				
	c)	PVC insulated, PVC sheathed 4 core, 600/1000 volt non armoured cable:-				
	iv)	4 mm (7/0.036")	Per Rft.	500	267.35	133,675.00
	v)	6 mm (7/0.044")	Per Rft.	150	379.90	56,985.00
	vi)	10 mm (7/0.052")	Per Rft.	500	590.70	295,350.00
	vii)	25 mm (19/0.052")	Per Rft.	150	1,423.85	213,577.50





**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
VAS-C-61	71-10(c) +5x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 60' to 70' height.	100 Sft	875 Sft	8,306.80	72,701.11
VAS-C-62	73-41	Providing and fixing 3/4"(19mm) thick Sand Stone (12"x24") on interior and exterior wall and cladding of approved quality and shade, laid over pre-plastered surface with adhesive bond complete in all respect i/c the cost of matching sealer to finish the joints as approved and directed by the Engineer Incharge.	Sft	2435 Sft	307.55	748,868.87
<b><u>WOOD WORK CHAPTER-12</u></b>						
	78-17	Providing and fixing 2" wide MS/ GI Chowkat single/double rebate made of 16 SWG MS sheet pressed/welded / supported with M.S. flat 1- 1/4"x1/8" i/c 6"long M.S. Flat 1"x1/8"hold fasts (6-Nos) welded/ screwed, punching of lock hole covered with MS Box,coating with antirust paint including filling with cement sand mortar (1:8) and embedding hold fast in cement concrete (1:2:4) complete in all respect as approved and directed by Engineer Incharge.				
VAS-C-63		(i) 15 " wide	Per Sft	2710 Sft	917.50	2,486,425.00
VAS-C-64		(ii) 10.5 " wide	Per Sft	807 Sft	792.80	639,789.60
VAS-C-65		(iii) 5.5 " wide	Per Sft	50 Sft	562.00	28,100.00
VAS-C-66	79-22	Providing and fixing, approved quality mortice lock	Each.	63 No	1114.50	70,213.50
VAS-C-67	82-51	P/F 1-1/2" thick solid flush door comprising of 2.5 mm thick Commercial ply compressed over 2.5 mm thick commercial ply over 1" thick packing wood in style and rails under proper pressure i/c the cost of nails, tower bolt , handles, glue, sawing charges, Painting charges, sand papering and 3/8" thick matching wooden lipping as approved and directed by the Engineer Incharge.	Per Sft	3518 Sft	954.35	3,357,403.30



**BILL OF QUANTITIES  
CIVIL WORKS**

MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)						
ITEM No.	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	84-60	P/F 3/4" dia heavy duty sliding bolt of specified material i/c the cost of hardware complete in all respect as approved and directed by the Engineer Incharge.				
VAS-C-68	b) Brass (ii) 12" (300 mm) long	Each	63 No	1206.15	75,987.45	
		<b><u>PAINTING AND VARNISHING CHAPTER-13</u></b>				
	87-5 (d)	Preparing surface and painting guard bars, gates of iron bars, gratings, railing(including standards, braces, etc.) and in similar open work:-				
VAS-C-69	i). Priming coat	100 Sft	6000 Sft	1207.75	72,465.00	
VAS-C-70	ii). 2 coats	100 Sft	12000 Sft	815.05	97,806.00	
VAS-C-71	88-9 (i)	Bitumen coating to plastered or cement concrete surface 2 coats @ 20 lbs per 100 sft per coat. (Note: -Apply the above item twice to achieve the specified rate of 40 lbs/100Square foot.)	100 Sft	36125 Sft	2706.95	977,878.92
	89-31	Preparing surface and painting emulsion paint :				
VAS-C-72	a) 1st coat	100 Sft	115891 Sft	1707.65	1,979,012.66	
VAS-C-73	b) 2nd & each subsequent coat.	100 Sft	231782 Sft	1321.85	3,063,810.37	
	90-33(a)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect upto 20' height				
VAS-C-74	i) 1st coat	100 Sft	8615 Sft	4752.60	409,436.49	
VAS-C-75	ii) 2nd & each subsequent coat.	100 Sft	17230 Sft	2669.40	459,937.62	
	90-33(a) + (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect. 20' to 30' height.				
VAS-C-76	i) 1st coat	100 Sft	1831 Sft	4993.35	91,438.23	
VAS-C-77	ii) 2nd & each subsequent coat.	100 Sft	3662 Sft	2910.15	106,581.33	



**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	90-33(a) + 2x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect. 30' to 40' height.				
VAS-C-78		i) 1st coat	100 Sft	1831 Sft	5234.10	95,846.84
VAS-C-79		ii) 2nd & each subsequent coat.	100 Sft	3662 Sft	3150.90	115,398.56
	90-33(a) + 3x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect. 40' to 50' height.				
VAS-C-80		i) 1st coat	100 Sft	1831 Sft	5474.85	100,255.45
VAS-C-81		ii) 2nd & each subsequent coat.	100 Sft	3662 Sft	3391.65	124,215.79
	90-33(a) + 4x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect. 50' to 60' height.				
VAS-C-82		i) 1st coat	100 Sft	1831 Sft	5715.60	104,664.07
VAS-C-83		ii) 2nd & each subsequent coat.	100 Sft	3662 Sft	3632.40	133,033.02
	90-33(a) + 5x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect. 60' to 70' height.				
VAS-C-84		i) 1st coat	100 Sft	1831 Sft	5956.35	109,072.68
VAS-C-85		ii) 2nd & each subsequent coat.	100 Sft	3662 Sft	3873.15	141,850.25
VAS-C-86	91-46	Providing and applying wall putty of 2mm thickness over plastered surface (new surface) to prepare the surface even and smooth complete in all respect.	100 Sft	115891 Sft	544.75	631,316.22
<b>IRON WORKS CHAPTER-25</b>						
VAS-C-87	194-10	Fabrication of heavy steel work, with angle, tees, flat iron round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, riveting, handling, assembling and fixing, but excluding erection in position.	100 Kg	39000 Kg	39419.85	15,373,741.50
VAS-C-88	194-11	Erection and fitting in position iron trusses, staging of water tanks, etc.	100 Kg	39000 Kg	1891.10	737,529.00





**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
VAS-C-89	195-24	Fitting and erection of gutters of sheet iron.	Per Lft.	640 Rft	206.05	131,872.00
VAS-C-90	195-34	Providing/fixing stair railing consisting of M.S. Box section size 1-1/2"x3" of 16 SWG welded with M.S. flat 1"x1/8" continuously and welded over M.S. square bars 5/8"x5/8" punched in M.S. flat 2 3/4" high @ 5 1/2" c/c fixed in steps of stair i/c painting 3 coats complete.	Per Rft.	1277 Rft	1184.25	1,512,287.25
VAS-C-91	198-51	Providing and fixing all types of partly fixed and partly openable glazed anodised/ powder coated aluminium doors, using delux section of M/s Al-Cop or Pakistan Cables, having chowkat frame of size 40 x 100 mm (1 1/2" x 4") and leaf frame of 60x40mm (2 1/2"x1 1/2") wide sections including the cost of 3/4" (5 mm) thick tinted glass with aluminium triangular gola and rubber gasket to support the glass and leaf edging, using approved standard fittings, locks, 3" (75 mm) wide long handles etc., and hardware any required as approved by the engineer in-charge	Per Sft	100 Sft	1566.25	156,625.00
VAS-C-92	199-52	Providing and fitting all types of glazed aluminium windows of anodised/ powder coated partly fixed and partly sliding using delux sections of approved manufacturer having frame size of 100 x 30 mm (4"x1-1/4") and leaf frame sections of 50 x 20 mm (2"x3/4"), all of 1.6mm thickness including 5 mm thick imported tinted glass with rubber gasket using approved standard latches, hardware etc., as approved by the Engineer in-charge.	Per Sft	6319 Sft	1312.45	8,293,371.55
VAS-C-93	199-53	Providing and fixing Aluminum Fly screen comprising of Fiber / Aluminum wire guaze (Malasian) fixed in aluminum frame of approved manufacturer / powder coated of size 1-1/2"x1/2" and 1.6mm thick with rubber gasket i/c cost of Hardwares as approved and directed by the engineer incharge. complete in all respect.	Per Sft	3160 Sft	544.15	1,719,241.93
VAS-C-94	200-59(i)	Providing and fixing M.S. grill fabricated with MS Square polished Vertical/horizontal Bars of specified size @ 4" c/c ' passed through punched holes in MS Patti of 1-1/4"x1/8" i/c the cost of 1-1/4"x1/8" MS patti for Frame of windows and painting 3 coat complete in all respect as approved and directed by the Engineer incharge. (i) 3/8" Square Bars	Per Sft	2364 Sft	1095.50	2,589,762.00



**BILL OF QUANTITIES  
CIVIL WORKS**

<b>MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)</b>		<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QTY.</b>	<b>UNIT RATE (Rs.)</b>	<b>TOTAL AMOUNT (Rs.)</b>
<b>ITEM No.</b>	<b>Annual-2024 (Page No. Item No.)</b>					
<b>(a)</b>	<b>(b)</b>	<b>(c)</b>	<b>(d)</b>	<b>(e)</b>	<b>(f)</b>	<b>(g)</b>
VAS-C-95	201-65	Providing and fixing 2" dia 18 SWG non-magnetic Stain less steel pipe (304) wall mounted hand rail comprising fixed with 2" long steel bracket with screws i/c the cost of hardware etc. & stainless steel welding & polishing complete in all respects as approved and directed by the Engineer Incharge.	Per Rft	350 Rft	575.55	201,442.50
VAS-C-96	202-70	Providing and fixing MS louvered door comprising of 3/4"x3/4"x2" louvers of 16 SWG MS sheet welded with door frame of size 2"x4" 16 SWG MS pipe with lock rail i/c the cost of handles, 1" dia MS sliding bolt ,three coats of fire proof paint complete in all respect as approved and directed by the Engineer Incharge.	Per Sft	112 Sft	1471.75	164,836.00
<b>MISCELLANEOUS CHAPTER-26</b>						
VAS-C-97	206-45	Spraying termite proofing by using liquid FMC/ Biflex/ Terminex Exin/ Ma Hextar or equivalent @ specified suspension concentrate (SC), Mixing Ability-HEXTAR with Ratio (1:250) = 540 Sft or equivalent approved liquid applying with shower and certificate will be provided by the contractor for 10-years complete in all respect as approved by the Engineer Incharge	Per Sft	31804 Sft	12.55	399,140.20
<b>Total of Scheduled Items (Rs.)</b>						<b><u>310,465,283.00</u></b>
<b>NON-SCHEDULED ITEM</b>						
<b>STRUCTURAL STEEL WORKS</b>						
<b>Ref.Spec. No: - 3000</b>						
VAS-C-98	NS-01	Provide & fix expended metal 1/2" to 3/4", 22 guage fixed walls or on area as required and specified on drawings with steel nails with washers complete in all respects.	Sft.	13366		



**BILL OF QUANTITIES  
CIVIL WORKS**

MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)		DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)					
VAS-C-99	NS-02	Providing and installing for complete m.s metal screen on external wall, comprising 16 swg 4" x 2" m.s tube metal rod and 2' x 2' best locally available wood bracing at specified c/c includes primer coats and three coats of approved enamel paints, fix approved local wood runners approx 6" center to center with 3 coat of approved enamel paints, complete as per drawing / detail, complete in all respect as per drawings, Technical Provisions and or as directed by the Engineer Incharge. (Metal Screen)	Sft	2296		
VAS-C-100	NS-03	Providing fixing in position (Tower) m.s stair includes metal ladder, metal deck, m.s hand railing i/c primer coats & 3 coats of enamel paint, complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	No	1		
VAS-C-101	NS-04	Providing fixing in position m.s monkey ladder i/c primer coats & 3 coats of enamel paint, complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	No	4		
VAS-C-102	NS-05	Providing and fixing of treatment of seismic joint at floor level comprising sika combiflex, thermopore sheet, stainless steel plate and polyurethane sealant etc. complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	Rft	410		
<b>FLOORING</b>						
<b>Ref.Spec. No: - 6531, 6600</b>						
VAS-C-103	NS-06	Providing and laying Chemically Pre-polished 1" thick Parino Micro Marble Slab on vanity, counter tops and side, with rounded nosing, and grouted with white/coloured cement using imported pigments, including cutting/cutting out area for basin, over and including 1 1/4" thick 1:3 cement sand mortar base, complete.	Sft	112		





**BILL OF QUANTITIES  
CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
		<b>MISCELLANEOUS</b> Ref.Spec. No: - 2200, 2100, 4600				
VAS-C-104	NS-07	Additional extra cost for using form work / shuttering in retaining wall concrete (see item# 41-5,h) complete in all respect as per drawings, Technical Provisions and or as directed by the Engineer incharge.	Sft	6368		
VAS-C-105	NS-08	Providing & fixing Position polycarbonated / lexan sheet as approved by consultant fixed with approved aluminum framing for roof open area includes all fixing arrangement, complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	Sft	2910		

Total of Non-Scheduled Items (Rs.) \_\_\_\_\_

**TOTAL SCHEDULE AND NON SCHEDULED COST Rs.** \_\_\_\_\_



**BILL OF QUANTITIES**  
Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-05	24/12	Supply and erection of single core PVC insulated, PVC sheathed copper conductor, 600/1000 volts grade cable, in pre-laid G.I. pipe/M.S. conduits/PVC pipe/G.I. wire/trenches, etc (rate for cable only):-				
	i)	6 mm sq (7/0.044")	Per Rft.	500	99.15	49,575.00
	ii)	10.00 mm sq (7/0.052")	Per Rft.	50	154.35	7,717.50
	iv)	16 mm sq (7/0.064")	Per Rft.	650	232.90	151,365.00
E-09	24/102	<b>Fans and Exhaust Fans</b> Providing and fixing Copper winded Exhaust fan with louver and shutter made of Pak/Younas/G.F.C. ifc the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge.				
	a)-ii	Plastic body - 12" dia	Each	7	5,508.10	38,556.70
E-10	24/161	<b>Grounding / Earthing System</b> Supply, Installation, Testing & Commissioning of complete grounding system:				
	vii)	50 mm <sup>2</sup> CU bare conductor	Per Rft.	2,750	654.40	1,799,600.00
E-11	24/76	<b>Lightning Protection System</b> Supply and erection of 25 mm (1") dia and one metre long lightning conductor copper rod with 5 spikes on ball and base, etc. complete.				
			Job	15	5,931.65	88,974.75
E-12	24/106	<b>Data Cabling System</b> Supply, Installation and commissioning of wiring with 4-pair data Cable, 23AWG UL/ EN listed cable *Conforming to following standards: TIA/EIA568/ISO/IEC11801, in pre-laid conduit/ cable tray from including all accessories, Manufacturer/ OEM Authorization, Make: Schneider/ i-connect UK/ 3M Corning USA/ D-Link/ Pollo Australian or equivalent complete in all respect as approved and directed by Engineer Incharge.				
	a-i)	UTP (Unshielded Twisted pair) CAT-6A (Min.1G/ 10G @ 500MHz or higher)	P.Rft.	15,000	69.25	1,038,750.00



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-13	24/110	Supply, installation and connections of CAT-6A UTP (Unshielded Twisted Pair), patch cord of specified length, Factory Fabricated and UL Listed with anti Snag Boots-Gold over nickel plated made of Schneider, Pollo Australia or equivalent as approved and directed by Engineer Incharge.				
	ii	1 meter Patch Cord	Each	150	2,601.40	390,210.00
	ii	3 meter Patch Cord	Each	150	2,961.40	444,210.00
E-14	24/114	Supply and installation of Cable Metal Organizer, 19" Rack mounted with high graded epoxy powder coating and slideable top-UL Listed. Made of Schneider/ i-Connect UK/ 3M Coming Pollo Australia or equivalent approved manufacturer and directed by the Engineer Incharge.	Each	7	4,029.60	28,207.20
E-15	24/115	Supply, Installation and commissioning of 19" Rack Mounted of specified, UTP Patch Panel with specified toolless support & Rear Cable Management, UListed, Loaded with UTP of specified Keystone Jack Toolless Support. Made of Schneider/ Norden/ 3M Coming/ D-Link, Pollo Australia or equivalent approved manufacturer and Directed by Engineer Incharge.				
	ii	CAT-6A (24 Port Patch Panel with Toolless Support 10-Gigabit)	Each	7	36,231.70	253,621.90
E-16	24/136	Supply, installation and connections of 42U Racks 800 x 1000 MM with Fans and :02 nos PDU-IMPORTED. Make Schneider as specified as approved and directed by Engineer's Incharge .	Each	1	221,615.40	221,615.40
E-17	24/131	Supply, Installation and commissioning of Simple type, Dual Shutter Face Plates having fully populated I/O: Option 1:RJ-11 with RJ45/8P8C I/Os supporting either Cat6 or Cat6a cables as required by project Option 2: Two RJ45/8P8C I/Os supporting either Cat6 or Cat6a cables as required by project.				
	i)	Single I/O	Each	100	1,783.20	178,320.00
	ii)	Double I/O	Each	25	2,794.80	69,870.00
<b>Sub-Total (Scheduled Items):</b>					<b>16,376,651</b>	





**BILL OF QUANTITIES**  
Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

**Non - Schedule Items**

E-37 NS-01

**L.V. Distribution Boards****Ref. Specs Sec. 8001, 8133**

Supply, installation, testing and commissioning of following LV Panels and Distribution Boards made with 14/16 SWG sheet steel housing (14 SWG for floor standing & 16 SWG for wall mounted) with approved color and having specified circuit breakers as shown on drawing. (Refer Single Line Diagram)

Supply, Installation, testing & commissioning of following Free Standing Floor Mounted/ wall mounted totally Enclosed, Cubical type, Low Voltage Panel (LV Panel) with Incoming and Outgoing Circuit Breakers and other components as per SLD with cable terminations as per Technical Specification. Complete in all respects.

i) MDB	No.	1
ii) E MDB	No.	1
iii) DB-1	No.	1
iv) DB-2	No.	1
v) DB-3	No.	1
vi) EDB-1	No.	1
vii) EDB-2	No.	1
viii) EDB-3	No.	1
ix) DB-UPS	No.	2
x) DB-AC	No.	1



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi- Annual) / Non- Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

**Light Fixtures****Ref. Specs Sec. 8001, 8150**

Supply, installation, testing & commissioning of following LED Light fixtures complete with Electronic ballast (unless mention otherwise), lamps, lamp holders, SPD, Earth Protection and mounting accessories etc., as per specification, complete in all respects, as per drawings and specification, complete in all respect. Lighting fixtures sample must be submitted to consultant for approval. PF> 0.9, CRI>80, 100 Lumens/watt. Operating Life 50,000hrs, IEC Certified.

Note: Refer light fixtures drawings/Schedule for complete light fixtures details.

E-19	NS-02	Surface mounted LED batten Light Fixture with 4200 lumens min., 50000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	265		
E-20	NS-03	Surface mounted LED batten Light Fixture with 2000 lumens min., 50000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	80		
E-21	NS-04	12W Surface Mounted LED downlight with integrated driver and frosted glass diffuser	No.	135		
E-22	NS-05	10W Recessed/Celing Mounted LED Spot downlight of warm white color with integrated driver and frosted glass diffuser	No.	20		

**WIRING ACCESSORIES****(Ref. Spec. Sec. 8001, 8220)**

Following types of switches and socket outlets including Face Plate, sheet steel back box made of 16 SWG finished in powder coated paint and all accessories, complete in all respect.

E-24	NS-07	10A, 220V 1 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	110		
E-25	NS-08	10A, 220V 2 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	55		



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Nor-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-26	NS-09	10A, 220V 3 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	105		
E-27	NS-10	10A, 220V 4 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	25		
E-28	NS-11	10A, 220V 5 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	20		
E-29	NS-12	10A, 220V 6 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	10		
E-30	NS-13	10A, 220V 1 Gang 2 Way Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	4		
E-31	NS-14	10A, 220V Fan Control Dimer with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	135		
E-32	NS-15	13A, 3-Pin, 250V International Switched Socket.	No.	250		
E-33	NS-16	16A 2 pin (round) simplex schoku outlet plate.	No.	250		
E-34	NS-17	15A 3 pin socket outlet	No.	10		
E-35	NS-18	20A, 250V, DP switch with neon lamp + earth with weather protected Transparent deep cover. (for Water Heaters units)	No.	20		
E-36	NS-19	Supply, installation & connection of 25 Amp, SP&N weather proof load break switches with cover and sheet steel enclosure and all mounting accessories.	No.	1		





**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-37	NS-20	Supply & installation of floor outlet box Type A for 1No. 13A simplex switch socket outlet, 1 No. 16A 2 pin (round) simplex schoku outlet and 1 No. RJ-45 duplex outlet, as detailed in the drawings, complete in all respects.	No.	65		
E-38	NS-21	Supply & installation of floor outlet box of 16 SWG sheet steel with powder coating for 2No 13A simplex switch socket outlet, 2 No. 16A 2 pin (round) simplex schoku outlet and 2 No. RJ-45 duplex outlet, including earthing as detailed in the drawings, complete in all respects.	No.	10		
E-39	NS-22	Supply & installation of floor outlet box Type B for 1No. 13A simplex switch socket outlet, 1 No. 16A 2 pin (round) simplex schoku outlet and 1 No. RJ-45 simplex outlet, as detailed in the drawings, complete in all respects.	No.	30		
E-40	NS-23	Supply, installation & connection of 20 Amp, SP&N load break switch with cover and sheet steel enclosure and all mounting accessories.	No.	6		
		<b>Earthing System</b> (Ref. Spec. Sec. 8001, 8240)				
E-41	NS-24	Earth Electrode for earthing shall comprise of 75mm x 4877 mm x 6 mm thick copper plate With 4 Nos. 6 mm dia brass nuts ,bolts and washers 70 sqmm HDHC copper wire as earthing leads.A 100 mm dia Medium Duty GI pipe shall be used with 10 mm dia holes @500 mm c-c. The total length of this GI pipe should be 45 ft. A 150 mm dia 60 ft long hole should be drilled in ground by percussion method and above mentioned 100 mm dia medium duty GI pipe should be fixed in this hole simultaneously up to the depth of 45 ft from NSL including 305 mm long, 50 mm wide and 6mm thick copper busbar as ECP (Earth connecting Point) complete with insulators, washers,nuts,bolts mounting installation and operational accessories as per site requirements.	No.	1		



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
		<b>Lightning Protection System</b> (Ref. Spec. Sec. 8001, 8250)				
		Supply, installation testing and commissioning of complete system consisting of following main items. Work includes supply and installation of all hard ware, joined termination, saddles, clams, etc.,				
E-42	NS-25	Bimetallic clamps of 8mm dia including connection of both ends.	No.	30		
E-43	NS-26	Test clamp of 8mm dia copper, including the connection with column Re-bars as shown on drawings.	No.	4		
E-44	NS-27	Welding works between Re-bars, providing MS rods, for welding together of cross Re-bars & extension of column re-bars to bimetallic clamps etc.,	Job	1		
		<b>Fans and Exhaust Fans</b>				
E-45	NS-28	Providing and fixing Copper winded ceiling fan, NEECA approved equivalent including the cost of necessary cable and hardware for connection as approved and directed by Engineer Incharge. 56" dia	Each	135		
E-46	NS-29	Providing and fixing Copper winded wall bracket fan, NEECA approved equivalent including the cost of necessary cable and hardware for connection as approved and directed by Engineer  18" Sweep dia	Each	1		
		<b>Fire Alarm System</b>				
E-47	NS-30	Supply, Installation and commissioning of wiring with specified Fire Resistant Shielded Cable (Fire Rating for 2 hours) of required size from respective DB to Fire Alarm FACP (Fire Alarm Control Panel) in pre-laid conduit/ duct. Complete as required, approved and directed by the Engineer Incharge.				
	i)	2C, 1.5 mm sq	P.Rft	2,000		



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-48	NS-31	Supply, Installation and commissioning with Addressable Break Glass unit,(Manual Call Point) with key type EN-54 having a built in short circuit isolator and microprocessor to ensure a response time of max. 1 second, having an indication LED flash after pressing the button to acknowledge the activation and a key operation facility for testing purposes. Complete as required, approved and directed by the Engineer Incharge.	Each	8		
E-49	NS-32	Supply, installation and commissioning of Addressable Type Indoor Loop Powered electronic Sounder/ Flasher/ Bell EN-54 with minimum sound output 100dB at 1meter with frequencies of variety of sounds as required and shall be loop wired and loop signaled, builtin short circuit isolator, configured via software. Complete as required, approved and directed by the Engineer Incharge.				
E-51	i) NS-33	With Flasher Supply, installation and commissioning of Addressable Optical Smoke Detectors EN-54, Photoelectric, incorporating an LED indication located in labyrinth within the housing of the detector. Sensing unit, adjustable via software between 0-90 seconds having builtin short circuit isolators on both inputs. Complete as required, approved and directed by the Engineer Incharge.	Each	21		
E-52	NS-34	Supply, installation and commissioning of Addressable Heat Detectors incorporating an LED indication located in labyrinth within the housing of the detector. Sensing unit, adjustable via software between 0-90 seconds having builtin short circuit isolators on both inputs. Complete as required, approved and directed by the Engineer Incharge.	Each	45		
	i)	Fixed Heat Detector to Sense High Temperatures	Each	1		





**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-53	NS-35	Supply, installation and commissioning of wired/ wireless Addressable Microprocessor based Fire Alarm Control Panel (FACP) Compact, capable of PC interface with window conforming to EN-54, consisting of specified loop circuit shaving 240 devices per loop, indicating circuits, builtin power supply with backup batteries, alarm and trouble indication, silence alarm and reset system, general alarm and reset system, general alarm and reset system, general alarm facility. Complete as required, approved and directed by the Engineer Incharge.				
	j)	FACP 1-Loop	Each	1		
E-54	NS-36	Testing and commissioning of Fire Alarm System.	Job	1		
<b>Sub-Total (Non-Scheduled Items):</b>						
<b>Total (Scheduled + Non-Scheduled Items):</b>						



**UNIVERSITY OF POONCH, RAWALAKOT (UPR)  
LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**

**DEPARTMENT OF VETERINARY AND ANIMAL SCIENCE**

**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**GENERAL NOTE**

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per drawings, specifications and as approved by the Engineer.

**SCHEDULED ITEMS**

**SANITARY FIXTURES AND FITTINGS**

VS-P-01	19 / 3	Providing and fitting one piece European Coupled set of Water Closet (WC) and flushing Cistern of PORTA brand (full size) i/c the cost of CP / rubber connection, thimble, normal seat cover and rawal bolts complete in all respects as approved and directed by the Engineer Incharge.	Each	7	58,465.50	409,259
VS-P-02	19 / 5	Providing and fitting white glazed earthen ware water closet, squatter type, with separate foot rest.	Each	12	9,689.65	116,276
VS-P-03	19 / 13 / i	Providing and fitting plastic made low down flushing cistern 13.63 litre (3 gallons) capacity, including bracket set, copper connection, etc. complete , white	Each	12	5,610.40	67,325
VS-P-04	19 / 4 / ii page 120	Providing and fixing, flushing bend of PVC , 4cm (1-1/2")	Each	12	390.25	4,683
	19 / 7	Providing and fitting glazed earthen ware wash hand basin 56x40 cm (22"x16") including bracket set, waste pipe and waste coupling, etc.				
VS-P-05	(i)	white with pedestal	Each	4	11,280.75	45,123
VS-P-06	(v)	Under Counter Vanity Basin	Each	27	11,880.75	320,780
VS-P-07	19 / 8	Providing and fixing stainless steel sink with drain board, size 120x60 cm (48"x24") including bracket set, waste pipe and waste coupling.	Each	2	15,228.50	30,457.00



**BILL OF QUANTITIES**  
**PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	19 / 10	Providing and fixing glazed earthen ware sink, including bracket set, waste pipe and waste coupling; (for laboratory sink)				
VS-P-08	(i)	60x45 cm (24"x18")	Each	84	6,007.20	504,604.80
VS-P-09	19 / 11	Providing and fixing glazed earthen ware flat back urinal.	Each	4	2,686.50	10,746
VS-P-10	19 / 30	Providing and fixing, chromium plated mixing valve, for wash hand basin, sink or shower.	Each	2	3,845.75	7,691.50
	19 / 32	Providing and fitting, chromium plated or brass oxidised, swan neck cock 15 mm (1/2") dia				
VS-P-11	(i)	single way	Each	84	861.40	72,357.60
VS-P-12	19 / 16	Providing and fixing, chromium plated soap dish.	Each	31	937.75	29,070
VS-P-13	19 / 18	Providing and fixing, chromium plated toilet paper holder.	Each	7	1,202.45	8,417
VS-P-14	19 / 19 / i	Providing and fixing, chromium plated towel rail, 60 cm (24") long, and 2 cm (3/4") dia	Each	7	1,254.75	8,783
VS-P-15	19 / 27 / ii	Providing and fixing chromium plated bib cock 1.5cm (1/2")	Each	10	1,641.40	16,414
VS-P-16	19 / 28	Providing and fixing chromium plated Tee stop cock 15mm (1/2")	Each	88	2,001.40	176,123
	19 / 52	Providing and fixing CP bath Room Set made of Sonex / Master / Faisal comprising of 3-NoTee stop cocks, lever type Basin Mixer, double Bib Cock, open wall shower, Muslim shower, waste coupling and bottle trap etc. complete in all respect as approved and directed by the Engineer incharge				
VS-P-17	i	Tee Stop Cock - Set of 03	Each	3	2,232.30	6,697
VS-P-18	ii	Lever Type Basin Mixer	Each	31	6,672.30	206,841
VS-P-19	iii	Double Bib Cock	Each	19	1,872.30	35,574
VS-P-20	iv	Open Type Wall Shower	Each	1	18,672.30	18,672
VS-P-21	v	Muslim shower	Each	19	2,352.30	44,694
VS-P-22	vi	waste coupling	Each	4	732.30	2,929





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
VS-P-23	vii	Bottle Trap	Each	31	1,452.30	45,021
VS-P-24	19 / 7 / ii page 121	Providing and fixing 1.5 cm (½") dia connection, including check nuts, etc, (copper connection)	Each	4	708.85	2,835
	19 / 55	Providing/fixing Electric water heater (Geyser) comprising of tank of 14 SWG, GI sheet and external cover of 22 SWG MS sheet, insulated with 4" thick high density glass wool, imported thermostat i/c electric rod, safety valve Ambassador / Canon) i/c cost of accessories& making connection complete in all respect as approved and directed by Engineer Incharge				
VS-P-25	i	15 Gal Capacity	Each	7	32,521.50	227,651
VS-P-26	ii	20 Gal Capacity	Each	4	34,441.50	137,766

**WATER SUPPLY PIPES AND FITTINGS**

	23 / 46 / b	Providing, laying, testing and commissioning of POLYPROPYLENE RANDOM COPOLYMER ( PPRC ) water supply pipe (Dadex / Popular / Beta or equivalent ) with specified pressure rating PN ( PRESSURE NOMINAL ) and conforming to DIN 8077 - 8078 code i/c cost of solvent, specials, making jharries complete in all respect as approved and directed by Engineer Incharge. ( Internal / External Diameters mentioned ), PN20				
VS-P-27	ii	3/4 inch (25mm) dia	Rft	3,000	100.35	301,050
VS-P-28	iii	1 inch (32mm) dia	Rft	2,250	160.50	361,125
VS-P-29	iv	1-1/4 inch (40mm) dia	Rft	1,500	245.90	368,850
VS-P-30	v	1-1/2 inch (50mm) dia	Rft	750	354.10	265,575
VS-P-31	vi	02 inch (63mm) dia	Rft	450	554.65	249,593
VS-P-32	vii	2-1/4 inch (75mm) dia	Rft	10	846.00	8,460
VS-P-33	viii	2-1/2 inch (90mm) dia	Rft	10	1,219.75	12,198



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	27 / 16 / a	Supply & Installation of High Density ( 64 Kg/m <sup>3</sup> ) Aluminum foil faced fiberglass pipe insulation for chilled/hot water piping and fittings and protections of valves, strainers etc i/c the cost of canvas cloth as approved and directed by Engineer Incharge.				
VS-P-34	i	3/4" dia Pipe - 25 mm thick	Rft	10	407.20	4,072
VS-P-35	ii	1" dia Pipe - 25 mm thick	Rft	750	434.80	326,100
VS-P-36	iii	1-1/4" dia Pipe - 25 mm thick	Rft	1,100	467.70	514,470
VS-P-37	iv	1-1/2" dia Pipe - 25 mm thick	Rft	750	498.80	374,100
VS-P-38	v	2" dia Pipe - 25 mm thick	Rft	400	576.25	230,500
VS-P-39	vi	2-1/2" dia Pipe - 25 mm thick	Rft	250	705.15	176,288
	27 / 12	Supply & Installation of multi layer aluminium sheet jacketting of specified thickness, coated with UV ( Ultra Violet) protection & polymer backing having saltwater resistance and fire performance conforming to ASTM-C1729M over exposed duct/pipe insulations where required and specified i/c the cost of Metal banding solution sealant as approved and directed by Engineer Incharge				
VS-P-40	(ii)	0.4 mm thick	Sft	1,800	148.35	267,030
	23 / 51	Providing and fixing heavy duty Gate valve of specified diameter and material for pressure rating PN-16 mde of Crane (USA), Hatersly (UK) or Scon (Pakistan) i/c the cost of all accessories flanges, nut/bolt and gasket where required complete in all respect as approved and directed by the Engineer Incharge.				
VS-P-41	a-ii	3/4" dia Brass Threaded Valves	Each	30	4,628.40	138,852
VS-P-42	a-iii	1" dia Brass Threaded Valves	Each	20	6,608.40	132,168
VS-P-43	a-iv	1-1/4" dia Brass Threaded Valves	Each	10	9,308.40	93,084
VS-P-44	a-v	1-1/2" dia Brass Threaded Valves	Each	10	12,972.60	129,726
VS-P-45	a-vi	02" dia Brass Threaded Valves	Each	10	20,412.60	204,126



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	23 / 45	Providing and fixing CP heavy duty brass Ball valve with CP handle of specified diameter made of aisal/Sonex / Master best quality or equivalent complete in all respect as approved and directed by theEngineer incharge.				
VS-P-46	i	1/2" dia Brass Threaded Valves	Each	50	1,184.40	59,220
VS-P-47	ii	3/4" dia Brass Threaded Valves	Each	10	1,448.40	14,484
VS-P-48	iii	1" dia Brass Threaded Valves	Each	10	1,868.40	18,684
	23 / 53	Providing and fixing heavy duty Check valve of specified diameter and material for pressure rating PN-16 made of Crane (USA), Hatersty (UK), Scon (Pakistan) i/c the cost of all accessories flanges,nut/bolt and gaskit where required complete in all respect as approved and directed by the Engineer incharge				
VS-P-49	a-ii	3/4" dia Brass Threaded Valves	Each	7	6,188.40	43,319
VS-P-50	a-iii	1" dia Brass Threaded Valves	Each	4	8,888.40	35,554
	23 / 54	Supply & installation of heavy duty Brass PN-16 air Vents of specified sizeprovided at thehighest points (PipeRisers) to expel air as approved and directed by the Engineer incharge				
VS-P-51	a-ii	3/4 inches	Each	10	2,584.20	25,842
	23 / 42 / d	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE-100) working presure pipe, Beta / Dadex / Popular / IIL or equivalent including the cost of specials, in trenches, as approved & directed by the engineer incharge, complete in all respects. PN-12.5				
VS-P-52	3	40mm dia	Rft	10	95.90	959
VS-P-53	4	50mm dia	Rft	10	142.35	1,424
VS-P-54	5	63mm dia	Rft	500	223.05	111,525
VS-P-55	6	75mm dia	Rft	200	313.10	62,620
VS-P-56	7	90mm dia	Rft	10	448.20	4,462





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
<b>SOIL WASTE AND VENT PIPES &amp; FITTINGS</b>						
	19 / 47 / b	Providing, fixing, testing and commissioning of $\mu$ PVC (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Betaor approve dequivalent manufacturer ,plain/Bell Ended/ZJoints conforming to BS4514/ BS5255 EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.				
VS-P-57	ii	40mm	Rft	750	106.35	79,763
VS-P-58	iii	50mm	Rft	1,500	115.05	172,575
VS-P-59	iv	82mm	Rft	2,250	175.05	393,863
VS-P-60	v	110mm	Rft	1,500	274.20	411,300
VS-P-61	vi	160mm	Rft	400	528.00	211,200
VS-P-62	vii	200mm	Rft	700	564.60	395,220
	19 / 49	Providing, fixing, testing and commissioning of $\mu$ -PVC (Unplasticized polyvinyl Chloride ) Nikasi / waste pipe Fittings make of Dadex / Popular / Beta or equivalent, conforming to code EN-1329 including the cost of Solvents complete in all respect as approved and directed by the Engineer Incharge.				
VS-P-63	a-i	P Trap 4"	Each	12	1,358.10	16,297
VS-P-64	a-ii	P Trap 3"	Each	19	1,020.90	19,397
VS-P-65	b-i	Multi-Trap 4"	Each	64	1,305.30	83,539
VS-P-66	c-ii	Vent Cowel 3"	Each	10	294.90	2,949
VS-P-67	d-i	Clean Outs 4"	Each	10	758.10	7,581
VS-P-68	d-ii	Clean Outs 3"	Each	10	609.30	6,093
VS-P-69	19 / 36	Providing and fitting 10 cm (4") gully trap, including cement concrete, cost of PVC grating 15x15 cm (6"x6") and masonry chamber 30x30 cm (12"x12").	Each	15	1,668.95	



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**STORM DRAINAGE PIPES & FITTINGS**

19 / 47 / b Providing, fixing, testing and commissioning of uPVC (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Betaor approve dequivalent manufacturer ,plain/Bell Ended/Z.Joints conforming to BS4514/ BS5255 EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.

VS-P-70	iv	82mm	Rft	10	175.05	1,751
VS-P-71	v	110mm	Rft	300	274.20	82,260
VS-P-72	vi	160mm	Rft	50	528.00	26,400

**FIREFIGHTING**

23 / 48 Providing, laying, testing and commissioning of Grade-B,MS Seamless Schedule pipe of nominal diameter, conforming to ASTM-A106, Lontrin/ Hufaz / Peficic baolai or approved equivalent manufacturer, duly welded i/c the cost of specials complete as approved and directed by the Engineer Incharge.

VS-P-73	iii	<b>Schedule-40</b> 01"	Rft	40	553.40	22,136
VS-P-74	vii	2-1/2"	Rft	80	1,760.65	140,852
VS-P-75	viii	03"	Rft	100	2,235.35	223,535
VS-P-76	ix	04"	Rft	300	3,044.35	913,305

23 / 58 Supply , installation and commissioning of Concealed/Open type fire Hose Reel cabinet of specified size made of 18 SWG MS sheet , single/double Cabin having demountable single/double doors of steel/glazed with 4 mm thick glass,with warning sign on it,duly painted with 70 micron electrostatic powder coated Red color, housing at least 100 ft length of pipe i/c the cost of specified valve , complete in all respects as approved and directed by Engineer Incharge ( The accessories will be paid separately).



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd B Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
VS-P-77	(ii)	<b>Indoor/Outdoor Type</b> 12" deep	P.Cft	110	2,573.75	283,113
	23 / 59	Supply , installation and commissioning of fire Hose reel Cabinet accessories of specified size and make, complete in all respects. As approved and directed by Engineer Incharge				
VS-P-78	(i)	<b>(A) Ruber covered hose pipe</b> 1" Dia	Rft	800	1,184.50	947,600
VS-P-79	(a)	<b>(D) Fire Hose Spray Nozzle with Jet</b> 1" dia Polycarbonate Nozzle(75gpm)	Each	8	3,813.25	30,506
<b>TOTAL (SCHEDULE ITEMS) =</b>						<b>11,588,516</b>

**NON-SCHEDULED ITEMS**

**SANITARY FIXTURES AND FITTINGS**

(Ref. Specs 5100)

VS-P-80	NS-01	05mm thick Glass mirror imported European make or approved equivalent including hard board behind it, approved bedding around it and all other fittings for complete installation	Sft	310		
VS-P-81	NS-02	Electric water coolers of 20gallons/hr capacity, minimum two taps, including Tee stop cock on inlet, and all other accessories for complete installation.	Each	2		
		Water filters of following type, including all accessories for complete installation.				
VS-P-82	NS-03	Triple type filter	Each.	2		
		Providing/fixing U-shape 1-1/4" dia Stainless Steel Grab bar of 14 SWG thickness and specified length for safety grip i/c the cost of Stainless Steel brackets, rawal plugs and hardware as approved and directed by Engineer Incharge				
VS-P-83	NS-04	18" long	Each	12		





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bl Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
<b><u>WATER SUPPLY PIPES AND FITTINGS</u></b>						
(Ref. Specs 5100, 5220, 5280)						
G.I. water pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, supports and hangers, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.						
VS-P-84	NS-05	3/4 inch (20mm) dia pipe	Rft	10		
VS-P-85	NS-06	1 inch (25mm) dia pipe	Rft	10		
VS-P-86	NS-07	1-1/4 inch (32mm) dia pipe	Rft	10		
VS-P-87	NS-08	1-1/2 inch (40mm) dia pipe	Rft	10		
VS-P-88	NS-09	02 inch (50mm) dia pipe	Rft	10		
<b><u>SOIL, WASTE AND VENT PIPES &amp; FITTINGS</u></b>						
VS-P-89	NS-10	Providing and Fixing of CP top tile strainer, complete in all respect as approved and directed by Engineer Incharge	Each	83		
<b><u>STORM DRAINAGE PIPES &amp; FITTINGS</u></b>						
Providing and Fixing of SS 304 Roof / scupper Drain, complete in all respect as approved and directed by Engineer Incharge.						
VS-P-90	NS-11	04" dia	Each	12		
VS-P-91	NS-12	06" dia	Each	2		



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**NATURAL GAS SUPPLY PIPES AND FITTINGS**

(Ref. Specs 5100, 5220, 5280)

G.I. pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, supports and hangers, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.

VS-P-92	NS-13	1/2 inch (15mm) dia pipe	Rft	250		
VS-P-93	NS-14	3/4 inch (20mm) dia pipe	Rft	1,000		
VS-P-94	NS-15	1 inch (25mm) dia pipe	Rft	100		

**FIRE FIGHTING**

(Ref. Specs 5150)

Fire Extinguisher of following types.

VS-P-95	NS-16	DCP Type Fire Extinguisher of 6kg Capacity	Each	10		
VS-P-96	NS-17	Foam Type fire extinhuiser capacity 09litres (2gallons)	Each	10		
VS-P-97	NS-18	Wet chemical Type Fire Extinguisher of 06kg Capacity.	Each	2		
VS-P-98	NS-19	CO2 Type Fire Extinguisher of 05kg Capacity.	Each	10		

TOTAL (NON-SCHEDULED) = \_\_\_\_\_

TOTAL (SCHEDULE + NON-SCHEDULE ITEMS) = \_\_\_\_\_



UNIVERSITY OF POONCH, RAWALAKOT (UPR)  
LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT

DEPARTMENT OF VETERINARY AND ANIMAL SCIENCE

**BILL OF QUANTITIES**  
RETROFITTING WORKS

ITEM NO.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)

**STANDARDIZED ITEMS**

VAS-C-01	41-9	Placing, compacting, finishing and curing of concrete using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; including screening, washing of aggregates and mixing of constituents using batching plant, Transportation by transit mixer, pouring with pump in the required proportions to achieve a nominal cylindrical strength in the field as per ACI 214, with the specified consistency. ivc the cost of shuttering, compaction with Viberator, excluding the cost of Admixture, as approved and directed by the Engineer Incharge.				
	(a)	Reinforced cement concrete in roof slab, beams, columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-				
		(iv) 4000 PSI	Per Cft	1,200.00	850.80	1,020,960.00
VAS-C-02	42-12.b	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
		i) Deformed bars (Grade-60)	100kg	10,000.00	36040.95	3,604,095.00
<b>Cost of Standardized Items (Rs.)</b>						<b>4,625,055.00</b>





**BILL OF QUANTITIES  
RETROFITTING WORKS**

ITEM NO.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)

**NON-STANDARDIZED ITEMS**

**GENERAL NOTE**

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per specifications and as approved by the Engineer.

**STRENGTHENING / RETROFITTING OF RCC MEMBERS**

VAS-C-03	VAS-C-NS-03	Providing and injection of epoxy resin (Sikadur-52 or equivalent) in minor cracks of RCC members as per manufacturer's recommendation at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing, complete in all respect as per satisfaction of the Engineer.	Kg	5.00		
VAS-C-04	VAS-C-NS-04	Providing and applying epoxy-based bonding agent (Sikadur-32 or equivalent) on existing concrete surface for bonding with new concrete as per manufacturer's recommendation at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing, complete in all respect as per satisfaction of the Engineer.	Sft.	3,000.00		
VAS-C-05	VAS-C-NS-05	Providing and applying fiber-reinforced, cementitious, polymer-modified repair mortar (SIKA or equivalent) on minor-damaged or honey-combed existing concrete surface as per manufacturer's recommendation at location(s) as per instructions of the Engineer (Structural Engineer). Job includes surface preparation / cleaning and finishing, complete in all respect as per satisfaction of the Engineer.	Sft.	1,200.00		

<b>Cost of Non-Standardized Items (Rs.)</b>	
<b>Total Cost of Standardized Items &amp; Non-Standardized Items (Rs.)</b>	



**UNIVERSITY OF POONCH, RAWALAKOT (UPR)  
LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**

**HI- TECH LAB, LIBRARY 2 & GIRLS COMMON ROOM**

**BILL OF QUANTITIES**

**CIVIL WORKS**

ITEM No.	MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
<b><u>SCHEDULED ITEMS</u></b>						
<b><u>EARTH WORK (EXCAVATION &amp; EMBANKMENT) CHAPTER-03</u></b>						
HTL-C-01	26-15(i)	Filling, watering and ramming earth under floors with surplus earth from foundations etc.	1000 Cft	195 Cft	7563.60	1,474.90
HTL-C-02	26-15(ii)	Filling, watering and ramming earth under floors with new earth excavated from outside, lead upto one chain (30 m).	1000 Cft	1755 Cft	16250.80	28,520.15
HTL-C-03	26-17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m)				
		a) upto ¼ mile (400 m).	1000 Cft	2060 Cft	6678.00	13,756.68
HTL-C-04		b) for every 330 ft. (100 m) additional lead or part thereof, beyond ¼ mile (400 m) upto one mile. (1.6 Km.)	1000 Cft	2060 Cft	838.20	1,726.69
HTL-C-05		c) for every ¼ mile (400 m) additional lead or part thereof, beyond one mile (1.6 Km.) upto 5 mile (8 Km).	1000 Cft	2060 Cft	6172.00	12,714.32
	27-21 (2.a)	Excavation in foundation of building, bridges and other structures, including dagbelling, dressing, refilling in layers around structure with excavated earth, watering and ramming lead upto one chain (30 m) lift upto 5 ft (1.5m).				
HTL-C-06		ii) Ordinary soil	1000 Cft	500 Cft	10794.00	5,397.00
<b><u>DISMANTLING (DEMOLITION) CHAPTER-04</u></b>						
HTL-C-07	31-14	Dismantling cement block masonry	100 Cft	7513 Cft	5643.00	423,930.38
<b><u>CONCRETE CHAPTER-06</u></b>						
HTL-C-08	38-2	Dry rammed brick or stone ballast, 1½" to 2" (40 mm to 50 mm) gauge.	100Cft	1470 Cft	12637.00	188,703.90
	38-3	Cement concrete brick or stone ballast 1½ " to 2" (40 mm to 50 mm) gauge, in foundation and plinth:-				
HTL-C-09		(b) Ratio 1: 4: 8	100Cft	65 Cft	35416.40	23,041.66



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
	38-5	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate)				
HTL-C-10	(f)	Ratio 1:2:4	100 Cft	66 Cft	48022.90	31,695.11
HTL-C-11	(h)	Ratio 1:3:6	100 Cft	50 Cft	40795.80	20,397.90
HTL-C-12	(i)	Ratio 1:4:8	100 Cft	605 Cft	35528.50	214,947.43
	41-9	Placing, compacting, finishing and curing of concrete using Ordinary Portland Cement / Sulphate resisting cement / Slag cement as may be required; including screening, washing of aggregates and mixing of constituents using batching plant, Transportation by transit mixer, pouring with pump in the required proportions to achieve a nominal cylindrical strength in the field as per ACI 214, with the specified consistency. inc the cost of shuttering, compaction with Viberator, excluding the cost of Admixture, as approved and directed by the Engineer Incharge.				
		(a) Reinforced cement concrete in roof slab, beams, columns, lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-				
HTL-C-13	(iv)	4000 PSI	Per Cft	1490 Cft	850.80	1,267,692.00
HTL-C-14	(vi)	3000 PSI	Per Cft	9425 Cft	751.40	7,081,945.00
		(c) Substructure (Foundations, Raft, Strip and Footing Beams)				
HTL-C-15	(vi)	3000 PSI	Per Cft	2580 Cft	608.00	1,568,640.00
	42-12.b	Fabrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):-				
HTL-C-16	a)	Plain bars	100kg	3808 Kg	34720.95	1,322,117.24





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(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-17		b) Deformed bars (Grade-40)	100kg	0 Kg	35645.00	0.00
HTL-C-18		c) Deformed bars (Grade-60)	100kg	60470 Kg	36040.95	21,793,962.5
HTL-C-19	42-14	Precast cement concrete hollow blocks (1:2:4) in 1:5 C/S mortar at any height, including cost of templates and constructing walls thereof	Per Cft	15025 Cft	446.70	6,711,667.50
HTL-C-20	42-15	Providing and fixing ornamental cement jali 2" (50 mm) thick (1: 2: 4), without steel.	Per Sft	300 Sft	148.85	44,655.00
	44-36	Providing and laying 2" thick (50mm) damp proof course of cement concrete 1:2:4 (using cement, sand and shingle), including bitumen coating :-				
HTL-C-21		(a,ii) with one coat bitumen and one coat polythene sheet 500gauge	100Sft	537 Sft	13127.45	70,494.41
<b>ROOFING CHAPTER-09</b>						
HTL-C-22	58-13 (a)	Providing & Fixing 20 SWG corrugated galvanized iron sheets with G.I. bolts, nuts, limpet and bitumen washers, wind ties, complete in all respects without valleys and ridges:-	100Sft	100 Sft	50582.35	50,582.35
HTL-C-23		Add extra 6% on composite rates for 2nd floors, respectively,	100Sft	50 Sft	3034.94	1,517.47
HTL-C-24		Add extra 15% on composite rates for 3rd floors, respectively,	100Sft	50 Sft	7587.35	3,793.68
HTL-C-25	59-16	Plain galvanized iron sheet flashing, 22 gauge.	Per Sft.	4075 Sft	425.85	1,735,338.75
HTL-C-26	61-46	Providing and applying torch-on water proofing bitumenous membrane of specified thickness (made of Roof-Grip/EuroBit) duly lapped/connected by heating with Torch over ps-6 primer i/c preparation/smoothen the surface complete in all respect as approved and directed by the Engineer incharge ii) 4 mm thick	Per Sft.	9190 Sft	155.70	1,430,883.00



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-27	62-48 (iv)	Providing and fixing false ceiling comprises of 12 mm thick Gypsum board laminated sheet of size 2'x2'2"x3' / 3'x3'of specified design and thickness i/c cost of fixtures i.e galvanized angle 1" x 1" at wall sides, galvanized tee 1½" x 1"and 1 ½" x 1" both at 4' c/c ( made of Taiwan CKM or equivalent), hanging with G.I/Copper wire 16 SWG, G.I hook, Rawal Plug etc: complete in all respects as approved and directed by the Engineer Incharge.	100Sft	166 Sft	137.20	227.75
<b>FLOORING CHAPTER-10</b>						
	64-14	Cement concrete tiles laid in 1:2 cement mortar, over ¾" (20 mm) thick bed of cement mortar 1:2:-				
HTL-C-28		(a) 12"x12"x1" (300 x 300 x 25 mm)	100 Sft	1570 Sft	15,311.00	240,382.70
HTL-C-29	64-16(e)	Providing and laying 2" thick topping of cement concrete 1:2:4, including surface finishing and dividing in panels:- (Ramp)	100 Sft	1180 Sft	12,381.35	146,099.93
HTL-C-30	65-24 (i)	Providing and laying superb quality Ceramic tile floors of Master/ Stile brand or approved equivalent manufacturer of specified size,Glossy/Matt/Texture of approved Color and Shade as per approved design with adhesive bond, over ¾" thick (1:2) cement sand plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete n all respects and as approved and directed by the Engineer Incharge. size (12"x18"/12"x24"/10"x24" /8"x24"/12"x36")	Per Sft	170 Sft	319.80	54,366.00
HTL-C-31	65-24 (i) +64-19	First floor	Per Sft	170 Sft	331.09	56,284.62
HTL-C-32	65-24 (i) +2x64-19	Second floor	Per Sft	50 Sft	342.37	17,118.60



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-33	65-25 (i)	Providing and laying superb quality Ceramic tiles dado of Master/ Stile brand or approved equivalent manufacturer of specified size, Glossy/Matt/Texture skirting/dado of approved Color and Shade with adhesive bond over 1/2" thick (1:2) cement plaster i/c the cost of sealer for finishing the joints i/c cutting grinding complete in all respects as approved and directed by the Engineer Incharge. i) 12"x18"/12"x24"/10"x24" /8"x24"/12"x36"	Per Sft	410 Sft	391.90	160,679.00
HTL-C-34	65-25 (i) +64-19	First floor	Per Sft	410 Sft	403.19	165,306.26
HTL-C-35	65-25 (i) +2x64-19	Second floor	Per Sft	50 Sft	414.47	20,723.60
HTL-C-36	66-35 (b)	Mosaic Tile skirting laid in 1:2 cement mortar, over 3/4"(20 mm) thick cement mortar, 1:2 including cement washing and filling joints complete:-	100 Sft	560 Sft	37,008.60	207,248.16
HTL-C-37	67-37 (b)(ii)	1/2" (13mm) thick Mosaic dado or skirting with one part of white cement and marble powder in the ratio of 3:1 and two parts of marble chips, laid over 3/4"(13 mm) thick cement plaster 1:3, including rubbing and polishing, complete with finishing. (Stair Steps & Riser)	100 Sft	400 Sft	20,107.15	80,428.60
HTL-C-38	68-41 (a)(ii)	Providing and laying 1" thick terrazzo tile for specified colour & size full body, best quality with minimum 5000 PSI in approved design with adhesive bond over 3/4" thick 1:3 cement plaster i/c the cost of sealer for finishing the joints i/c cutting, grinding, rubbing, filling, Complete in all respect as approved and directed by the Engineer incharge. (Without Polishing)	Per Sft	10034 Sft	447.80	4,493,225.20
HTL-C-39	69-52(i)	Providing and laying 3/4" thick Prepolished Granite of specified shade of full width of approved quality laid with adhesive bond over 3/4" thick (1:2) cement sand mortar bed, complete in all respect as approved and directed by the Engineer Incharge. (Marble Counter Top)	Per Sft	73 Sft	90,560.15	90,560.15
<b><u>SURFACE RENDERING CHAPTER-11</u></b>						
HTL-C-40	71-9(b)	1/2" (13mm) thick Cement plaster 1:4 upto 20' (6.00 m) height	100 Sft	9000 SR	4,730.80	425,772.00





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ITEM No.	MURREE MRS, 2nd Bl Annual-2024 (Page No. Item No.)	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-41	71-9(b) +72-28	1/2" (13mm) thick Cement plaster 1:4 from 20' to 30' height	100 Sft	9890 Sft	5,341.45	528,269.41
HTL-C-42	71-9(b) + 2x72-28	1/2" (13mm) thick Cement plaster 1:4 from 30' to 40' height	100 Sft	890 Sft	5,952.10	52,973.69
HTL-C-43	71-9(c)	3/4" (13mm) thick Cement plaster 1:4 upto 20' (6.00 m) height	100 Sft	5340 Sft	6363.05	339,786.87
HTL-C-44	71-9(c) +72-28	3/4" (13mm) thick Cement plaster 1:4 from 20' to 30' height	100 Sft	4458 Sft	6,973.70	310,915.44
HTL-C-45	71-9(c) + 2x72-28	3/4" (13mm) thick Cement plaster 1:4 from 30' to 40' height	100 Sft	1115 Sft	7,584.35	84,535.17
HTL-C-46	71-10( c )	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, upto 20 ' height.	100 Sft	5740 Sft	5,253.55	301,553.77
HTL-C-47	71-10( c ) +72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 20 ' to 30' height.	100 Sft	2840 Sft	5,864.20	166,566.74
HTL-C-48	71-10( c ) +2x72-28	3/8" (10mm) thick 1:4 Cement plaster under soffit of R.C.C. roof slabs only, 30 ' to 40' height.	100 Sft	1894 Sft	6,474.85	122,607.76
HTL-C-49	73-41	Providing and fixing 3/4"(19mm) thick Sand Stone (12"x24") on interior and exterior wall and cladding of approved quality and shade, laid over pre-plastered surface with adhesive bond complete in all respect i/c the cost of matching sealer to finish the joints as approved and directed by the Engineer Incharge.	Sft	2000 Sft	307.55	615,100.00
<b>WOOD WORK CHAPTER-12</b>						
	78-17	Providing and fixing 2" wide MS/ GI Chowkat singel/double rebate made of 16 SWG MS sheet pressed/welded / supported with M.S. flat 1- 1/4"x1/8" i/c 6"long M.S. Flat 1"x1/8"hold fasts (6-Nos) welded/ screwed, punching of lock hole covered with MS Box,coating with antirust paint including filling with cement sand mortar (1:8) and embedding hold fast in cement concrete (1:2:4) ,complete in all respect as approved and directed by Engineer Incharge.				
HTL-C-50		(i) 15 " wide	Per Sft	430 Sft	917.50	394,525.00
HTL-C-51		(ii) 10.5 " wide	Per Sft	50 Sft	792.80	39,640.00



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-52		(ii) 5.5" wide	Per Sft	240 Sft	582.00	134,880.00
HTL-C-53	79-22	Providing and fixing, approved quality mortice lock	Each.	21 No	1114.50	23,404.50
HTL-C-54	79-24	b) Providing and fixing deodar wood almirah 9" to 12" (225 mm to 300 mm) depth with shelves, shutters, brass fittings, etc., without boxing and back, complete.	Per Sft	992 Sft	2152.70	2,135,478.40
HTL-C-55	82-51	P/F 1-1/2" thick solid flush door comprising of 2.5 mm thick Commercial ply compressed over 2.5 mm thick commercial ply over 1" thick packing wood in style and rails under proper pressure i/c the cost of nails, tower bolt, handles, glue, sawing charges, Painting charges, sand papering and 3/8" thick matching wooden lipping as approved and directed by the Engineer Incharge.	Per Sft	720 Sft	954.35	687,132.00
	83-58	Providing and fixing Vin board cabinet 3/4" thick with drawers 3" deep in 'Kitchen including termite proofing and polishing with synthetic enamel as specified, with handles hinges, screws etc., complete in all respects.				
HTL-C-56		iii) 2' deep, without back	Per Sft	400 Sft	1861.85	744,740.00
HTL-C-57		iv) 2' deep, with back	Per Sft	372 Sft	2011.85	748,408.20
	84-60	P/F 3/4" dia heavy duty sliding bolt of specified material i/c the cost of hardware complete in all respect as approved and directed by the Engineer Incharge.				
HTL-C-58		b) Brass (ii) 12" (300 mm) long	Each	21 No	1206.15	25,329.15
<b><u>PAINTING AND VARNISHING CHAPTER-13</u></b>						
	37-5 (d)	Preparing surface and painting guard bars, gates of iron bars, gratings, railing (including standards, braces, etc.) and in similar open work:-				
HTL-C-59		i). Priming coat	100 Sft	100 Sft	207.75	207.75
HTL-C-60		ii). 2 coats	100 Sft	200 Sft	8.15	1,630.10





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(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-61	88-9 (i)	Bitumen coating to plastered or cement concrete surface 2 coats @ 20 lbs per 100 sft per coat. (Note:-Apply the above item twice to achive the specified rate of 40 lbs/100Square foot.)	100 Sft	620 Sft	2706.95	16,783.09
	89-31	Preparing surface and painting emulsion paint :				
HTL-C-62	a) 1st coat		100 Sft	30254 Sft	1707.65	516,632.43
HTL-C-63	b) 2nd & each subsequent coat.		100 Sft	60508 Sft	1321.85	799,825.00
	90-33(a)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: upto 20' height				
HTL-C-64	i) 1st coat		100 Sft	5340 Sft	4752.60	253,788.84
HTL-C-65	ii) 2nd & each subsequent coat.		100 Sft	10680 Sft	2669.40	285,091.92
	90-33(a) +(90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 20' to 30' height.				
HTL-C-66	i) 1st coat		100 Sft	4458 Sft	4993.35	222,623.52
HTL-C-67	ii) 2nd & each subsequent coat.		100 Sft	8917 Sft	2910.15	259,492.26
	90-33(a) + 2x (90-41)	Providing and applying weather shield paint of approved quality on external surface of building including preparation of surface, application of primer complete in all respect: 30' to 40' height.				
HTL-C-68	i) 1st coat		100 Sft	1115 Sft	5234.10	58,339.28
HTL-C-69	ii) 2nd & each subsequent coat.		100 Sft	2229 Sft	3150.90	70,239.86
HTL-C-70	91-46	Providing and applying wall putty of 2mm thickness over plastered surface (new surface) to prepare the surface even and smooth complete in all respect.	100 Sft	30254 Sft	544.75	164,808.67
<b>IRON WORKS CHAPTER-25</b>						
HTL-C-71	194-10	Fabrication of heavy steel work, with angle, tees, flat iron round iron and sheet iron for making trusses, girders, tanks, etc., including cutting, drilling, rivetting, handling, assembling and fixing, but excluding erection in position.	100 Kg	371 Kg	39419.85	146,377.06





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MURREE MRS, 2nd Bi Annual-2024 (Page No. Item No.1)		DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)	(b)					
HTL-C-72	195-24	Fitting and erection of gutters of sheet iron.	Per Lft.	372 Rft	206.05	76,588.79
HTL-C-73	195-34	Providing/fixing stair railing consisting of M.S. Box section size 1-1/2"x3" of 16 SWG welded with M.S. flat 1"x1/8" continuously and welded over M.S. square bars 5/8"x5/8" punched in M.S. flat 2 3/4" high @ 5 1/2" c/c fixed in steps of stair I/C painting 3 coats complete.	Per Rft.	80 Rft	1184.25	94,740.00
HTL-C-74	198-51	Providing and fixing all types of partly fixed and partly openable glazed anodised/ powder coated aluminium doors, using delux section of M/s Al-Cop or Pakistan Cables, having chowkat frame of size 40 x 100 mm (1 1/2" x 4") and leaf frame of 60x40mm (2 1/2"x1 1/2") wide sections including the cost of 1/4" (5 mm) thick tinted glass with aluminium triangular gola and rubber gasket to support the glass and leaf edging, using approved standard fittings, locks, 3" (75 mm) wide long handles etc., and hardware any required as approved by the engineer in-charge	Per Sft	50 Sft	1566.25	78,312.50
HTL-C-75	199-52	Providing and fitting all types of glazed aluminium windows of anodised/ powder coated partly fixed and partly sliding using delux sections of approved manufacturer having frame size of 100 x 30 mm (4"x1-1/4") and leaf frame sections of 50 x 20 mm (2"x3/4"), all of 1.6mm thickness including 5 mm thick imported tinted glass with rubber gasket using approved standard latches, hardware etc., as approved by the Engineer in-charge.	Per Sft	1530 Sft	1312.45	2,008,048.50
HTL-C-76	199-53	Providing and fixing Aluminum Fly screen comprising of Fiber / Aluminum wire guaze (Malasian) fixed in aluminum frame of approved manufacturer / powder coated of size 1-1/2"x1/2" and 1.6mm thick with rubber gasket i/c cost of Hardwares as approved and directed by the engineer incharge. complete in all respect.	Per Sft	765 Sft	544.15	416,274.75
HTL-C-77	200-59(i)	Providing and fixing M.S. grill fabricated with MS Square polished Vertical/horizontal Bars of specified size @ 4" c/c ' passed through punched holes in MS Patti of 1-1/4"x1/8" i/c the cost of 1-1/4"x1/8" MS patti for Frame of windows and painting 3 coat complete in all respect as approved and directed by the Engineer Incharge. (i) 3/8" Square Bars	Per Sft	730 Sft	1095.50	799,715.00



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(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-78	201-65	Providing and fixing 2" dia 18 SWG non-magnetic Stain less steel pipe (304) wall mounted hand rail comprising fixed with 2" long steel bracket with screws i/c the cost of hardware etc. & stainless steel welding & polishing complete in all respects as approved and directed by the Engineer Incharge.	Per Rft	200 Rft	575.55	115,110.00
HTL-C-79	202-70	Providing and fixing MS louvered door comprising of 3/4"x3/4"x2" louvers of 16 SWG MS sheet welded with door frame of size 2"x4" 16 SWG MS pipe with lock rail i/c the cost of handles, 1" dia MS sliding bolt ,three coats of fire proof paint complete in all respect as approved and directed by the Engineer Incharge.	Per Sft	190 Sft	1471.75	279,632.50
<b>MISCELLANEOUS CHAPTER-26</b>						
HTL-C-80	206-45	Spraying termite proofing by using liquid FMC/ Biflex/ Terminex Exin/ Ms Hextar or equivalent @ specified suspension concentrate (SC), Mixing Ability-HEXTAR with Ratio (1:250) = 540 Sft or equivalent approved liquid applying with shower and certificate will be provided by the contractor for 10-years complete in all respect as approved by the Engineer Incharge	Per Sft	530 Sft	12.55	6,651.50
<b>Total of Scheduled Items (Rs.)</b>						<b>64,335,749.44</b>

**NON-SCHEDULED ITEM****STRUCTURAL STEEL WORKS**

Ref.Spec. No: - 3000

HTL-C-81	NS-01	Provide & fix expended metal 1/2" to 3/4", 22 guage fixed walls or on area as required and specified on drawings with steel nails with washers complete in all respects.	Sft.	4120		
HTL-C-82	NS-02	Providing and installing for complete m.s metal screen on external wall, comprising 16 swg 4" x 2" m.s tube metal rod and 2" x 2" best locally available wood bracing at specified c/c includes primer coats and three coats of approved enamel paints, fix approved local wood runners approx 6" center to center with 3 coat of approved enamel paints, complete as per drawing / detail, complete in all respect as per drawings, Technical Provisions and or as directed by the Engineer Incharge. (Metal Screen)	Sft	300		



**BILL OF QUANTITIES**  
**CIVIL WORKS**

MURREE MRS, 2nd Bi Annual-2024 (Page No. (10/10/2024))		DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
ITEM No.						
(a)	(b)	(c)	(d)	(e)	(f)	(g)
HTL-C-83	NS-02	Providing and fixing of treatment of seismic joint at floor level comprising sika combiflex, thermopore sheet, stainless steel plate and polyurethane sealant etc. complete in all respect as per drawings Technical Provisions and or as directed by the Engineer Incharge.	Rft	630		
<b>FLOORING</b>						
Ref.Spec. No: - 6531, 6600						
HTL-C-84	NS-04	Providing and laying Chemically Pre-polished 1" thick Parlino Micro Marble Slab on vanity, counter tops and side, with rounded nosing, and grouted with white/coloured cement using imported pigments, including cutting/cutting out area for basin, over and including 1¼" thick 1:3 cement sand mortar base, complete.	Sft	60		

Total of Non-Scheduled Items (Rs.) \_\_\_\_\_

**TOTAL SCHEDULE AND NON SCHEDULED COST Rs.** \_\_\_\_\_





**UNIVERSITY OF POONCH, RAWALAKOT (UPR)**  
**LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**  
**DEPARTMENT OF HI-TECH LAB AND GIRLS COMMON ROOM**

**BILL OF QUANTITIES**

Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
<b>Schedule Items</b>						
<b>Conduits &amp; Pipes</b>						
E-01	24/3	Supply and erection of PVC pipe for wiring recessed in walls, including inspection boxes, pull boxes, hooks, cutting jharries, and repairing surface, etc., complete with all specials.				
	i	20 mm i/d	Rft.	5,500	114.40	629,200.00
	ii	25 mm i/d	Rft.	12,500	135.95	1,699,375.00
	iv)	32 mm i/d	Rft.	500	159.20	79,600.00
	v)	40 mm i/d	Rft.	500	189.40	94,700.00
	vii)	50 mm i/d	Rft.	100	234.40	23,440.00
<b>Conduit For Earthing Conductor</b>						
E-02	24/5	Supply and erection PVC pipe for recessed wiring (main and sub-main) purpose, including bends, specials, etc. in floor, wall or trenches:-				
	i	50 mm i/d	Rft.	200	237.70	47,540.00
	ii	80 mm i/d	Rft.	200	307.00	61,400.00
<b>Wiring</b>						
E-03	24/10	Supply and erection of single core PVC insulated copper conductor cables, in pre-laid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing and capping/G.I. wire/trenches (rate for cables only):-				
	c)	<b>450/750 volts, PVC insulated:</b>				
	ii)	1.5 mm sq (3/0.029")	Per Rft.	10,000	43.15	431,500.00
	iii)	2.5 mm sq (7/0.029")	Per Rft.	18,500	60.50	1,119,250.00
	iv)	4 mm sq (7/0.036")	Per Rft.	12,000	80.40	964,800.00
	v)	6 mm sq (7/0.044")	Per Rft.	2,000	111.50	223,000.00
<b>LT Cables</b>						
E-04	24/13	Supply and erection of copper conductor cables for service connection, in pre-laid pipe/G.I. wire/trenches, etc. (rate for cable only):-				
	c)	PVC insulated, PVC sheathed 4 core, 600/1000 volt non armoured cable:-				
	iv)	4 mm (7/0.036")	Per Rft.	400	267.35	106,940.00
	v)	6 mm (7/0.044")	Per Rft.	400	379.90	151,960.00
	vii)	10 mm (7/0.052")	Per Rft.	100	590.70	59,070.00



**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref. MRS-2024 (2:nd Bi-Annual) / Mon Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-05	24/12	Supply and erection of single core PVC insulated, PVC sheathed copper conductor, 600/1000 volts grade cable, in pre-laid G.I. pipe/M.S. conduits/PVC pipe/G.I. wire/trenches, etc (rate for cable only):-				
E-06	i)	4.00 mm sq (7/0.036")	Per Rft.	400	73.35	29,340.00
E-07	ii)	6 mm sq (7/0.044")	Per Rft.	400	99.15	39,660.00
E-08	iii)	10.00 mm sq (7/0.052")	Per Rft.	100	154.35	15,435.00
E-09	24/102	<b>Fans and Exhaust Fans</b> Providing and fixing Copper wound Exhaust fan with louver and shutter made of Pak/Younas/G.F.C. i/c the cost of necessary cable and hardware for connection from ceiling rose complete as approved and directed by Engineer Incharge.				
	a)-i)	Plastic body - 12" dia	Each	5	5,508.10	27,540.50
E-10	24/161	<b>Grounding / Earthing System</b> Supply, Installation, Testing & Commissioning of complete grounding system:				
	vii)	50 mm <sup>2</sup> CU bare conductor	Per Rft.	1,500	654.40	981,600.00
E-11	24/76	<b>Lightning Protection System</b> Supply and erection of 25 mm (1") dia and one metre long lightning conductor copper rod with 5 spikes on ball and base, etc. complete.				
			Job	6	5,931.65	35,589.90
E-12	24/106	<b>Data Cabling System</b> Supply, Installation and commissioning of wiring with 4-pair data Cable, 23AWG UL/EN listed cable *Conforming to following standards: TIA/EIA568/ISO/IEC11801, in pre-laid conduit/ cable tray from including all accessories, Manufacturer/ OEM Authorization, Make: Schneider/ i-connect UK/ 3M Corning USA/ D-Link/ Pollo Australian or equivalent complete in all respect as approved and directed by Engineer Incharge.				
	a)-i)	UTP (Unshielded Twisted pair) CAT-6A (Min.1G/ 10G @ 500MHz or higher)	P.Rft.	1,500	69.25	103,875.00



**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Nos- Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-13	24/110	Supply, installation and connections of CAT-6A UTP (Unshielded Twisted Pair), patch cord of specified length, Factory Fabricated and UL Listed with anti Snag Boots-Gold over nickel plated made of Schneider, Pollo Australia or equivalent as approved and directed by Engineer Incharge.				
	i)	1 meter Patch Cord	Each	16	2,601.40	41,622.40
	ii)	3 meter Patch Cord	Each	16	2,961.40	47,382.40
E-14	24/114	Supply and installation of Cable Metal Organizer, 19" Rack mounted with high graded epoxy powder coating and slideable top-UL Listed. Made of Schneider/ i-Connect UK/ 3M Coming :Pollo Australia or equivalent approved manufacturer and directed by the Engineer Incharge.	Each	2	4,029.60	8,059.20
E-15	24/115	Supply, Installation and commissioning of 19" Rack Mounted of specified, UTP Patch Panel with specified toolless support & Rear Cable Management, ULlisted, Loaded with UTP of specified Keystone Jack Toolless Support, Made of Schneider/ Norden/ 3M Coming/ D-Link, Pollo Australia or equivalent approved manufacturer and Directed by Engineer Incharge.				
	i)	CAT-6A (24 Port Patch Panel with Toolless Support 10-Gigabit)	Each	5	36,231.70	181,158.50
E-16	24/136	Supply, installation and connections of 42U Racks 800 x 1000 MM with Fans and :02 nos PDU-IMPORTED. Make Schneider as specified as approved and directed by Engineer's Incharge .	Each	1	221,615.40	221,615.40
E-17	24/131	Supply, Installation and commissioning of Simple type, Dual Shutter Face Plates having fully populated I/O: Option 1:RJ-11 with RJ45/8P8C I/Os supporting either Cat6 or Cat6a cables as required by project Option 2: Two RJ45/8P8C I/Os supporting either Cat6 or Cat6a cables as required by project.				
	i)	Single I/O	Each	12	1,783.20	21,398.40
	ii)	Double I/O	Each	1	2,794.80	2,794.80
<b>Sub-Total (Scheduled Items):</b>						<b>7,448,847</b>





**BILL OF QUANTITIES**

Electrical works

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / No. Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-37	NS-01	<p><b>Non - Schedule Items</b></p> <p><b>L.V. Distribution Boards</b></p> <p>Supply, installation, testing and commissioning of following LV Panels and Distribution Boards made with 14/16 SWG sheet steel housing (14 SWG for floor standing &amp; 16 SWG for wall mounted) with approved color and having specified circuit breakers as shown on drawing. (Refer Single Line Diagram)</p> <p>Supply, Installation, testing &amp; commissioning of following Free Standing Floor Mounted/ wall mounted totally Enclosed, Cubical type, Low Voltage Panel (LV Panel) with Incoming and Outgoing Circuit Breakers and other components as per SLD with cable terminations as per Technical Specification. Complete in all respects.</p> <p>i) MDB</p> <p>ii) EMOB</p> <p>iii) DB-1</p> <p>iv) EDB-1</p> <p>v) DB-AC</p> <p><b>Light Fixtures</b></p> <p><b>Ref. Specs Sec. 8001, 8150</b></p> <p>Supply, installation, testing &amp; commissioning of following LED Light fixtures complete with Electronic ballast (unless mention otherwise), lamps, lamp holders, SPD, Earth Protection and mounting accessories etc., as per specification, complete in all respects, as per drawings and specification, complete in all respect. Lighting fixtures sample must be submitted to consultant for approval. PF&gt; 0.9, CRI&gt;80, 100 Lumens/watt Operating Life 50,000hrs, IEC Certified.</p> <p>Note: Refer light fixtures drawings/Schedule for complete light fixtures details.</p>	No.	1		
E-19	NS-02	Surface mounted LED batten Light Fixture with 4200 lumens min., 50000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	75		



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref. MRS-2024 (2nd Bi-Annual) / Non Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-20	NS-03	Surface mounted LED batten Light Fixture with 2000 lumens min., 50000 Life Hrs. fixed output LED driver, IP20 rated, complete in all respects.	No.	25		
E-21	NS-04	12W Surface Mounted LED downlight with integrated driver and frosted glass diffuser	No.	45		
E-22	NS-05	10W Recessed/Celing Mounted LED Spot downlight of warm white color with integrated driver and frosted glass diffuser	No.	10		
E-23	NS-06	Decorative Single LED 1x12W Light Wall bracket type, E27, complete with all accessories or approved equivalent. The fitting shall be approved by the Engineer.	No.	5		
<b>WIRING ACCESSORIES</b>						
<b>(Ref. Spec. Sec. 8001, 8220)</b>						
Following types of switches and socket outlets including Face Plate, sheet steel back box made of 16 SWG finished in powder coated paint and all accessories, complete in all respect.						
E-24	NS-07	10A, 220V 1 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	35		
E-25	NS-08	10A, 220V 2 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	35		
E-26	NS-09	10A, 220V 3 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	20		
E-27	NS-10	10A, 220V 4 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	15		
E-28	NS-11	10A, 220V 5 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	5		
E-29	NS-12	10A, 220V 6 Gang Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	5		



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref. MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-30	NS-13	10A, 220V 1 Gang 2 Way Switch Unit with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	4		
E-31	NS-14	10A, 220V Fan Control Dimer with Face Plate including sheet steel back box shall make of 16 SWG shall be finished in powder coated paint.	No.	40		
E-32	NS-15	13A, 3-Pin, 250V International Switched Socket.	No.	75		
E-33	NS-16	16A 2 pin (round) simplex schoku outlet plate.	No.	75		
E-34	NS-17	15A 3 pin socket outlet	No.	5		
E-35	NS-18	20A, 250V, DP switch with neon lamp + earth with weather protected Transparent deep cover. (for Water Heaters units)	No.	15		
E-36	NS-19	Supply, installation & connection of 25 Amp, SP&N weather proof load break switches with cover and sheet steel enclosure and all mounting accessories.	No.	1		
E-40	NS-23	Supply, installation & connection of 20 Amp, SP&N load break switch with cover and sheet steel enclosure and all mounting accessories.	No.	3		





**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref. MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g

**Earthing System**  
(Ref. Spec. Sec. 8001, 8240)

E-41	NS-24	Earth Electrode for earthing shall comprise of 75mm x 4877 mm x 6 mm thick copper plate With 4 Nos. 6 mm dia brass nuts ,bolts and washers 70 sqmm HDHC copper wire as earthing leads.A 100 mm dia Medium Duty GI pipe shall be used with 10 mm dia holes @500 mm c-c. The total length of this GI pipe should be 45 ft. A 150 mm dia 60 ft long hole should be drilled in ground by percussion method and above mentioned 100 mm dia medium duty GI pipe should be fixed in this hole simultaneously up to the depth of 45 ft from NSL including 305 mm long, 50 mm wide and 6mm thick copper busbar as ECP (Earth connecting Point) complete with insulators, washers,nuts,bolts mounting installation and operational accessories as per site requirements.	No.	1		
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**Lightning Protection System**  
(Ref. Spec. Sec. 8001, 8250)

Supply, installation testing and commissioning of complete system consisting of following main items. Work includes supply and installation of all hard ware, joined termination, saddles, clamps, etc.,

E-42	NS-25	Bimetallic clamps of 8mm dia including connection of both ends.	No.	20		
E-43	NS-26	Test clamp of 8mm dia copper, including the connection with column Re-bars as shown on drawings.	No.	4		
E-44	NS-27	Welding works between Re-bars, providing MS rods, for welding together of cross Re-bars & extension of column re-bars to bimetallic clamps etc.,	Job	1		
E-45	NS-28	<b>Fans and Exhaust Fans</b> Providing and fixing Copper winded ceiling fan, NEECA approved equivalent including the cost of necessary cable and hardware for connection as approved and directed by Engineer Incharge. 56" dia	Each	40		



**BILL OF QUANTITIES****Electrical works**

Sr. No.	Ref: MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-46	NS-29	Providing and fixing Copper winded wall bracket fan, NEECA approved equivalent including the cost of necessary cable and hardware for connection as approved and directed by Engineer 18" Sweep dia	Each	2		
E-47	NS-30	<b>Fire Alarm System</b> Supply, Installation and commissioning of wiring with specified Fire Resistant Shielded Cable (Fire Rating for 2 hours) of required size from respective DB to Fire Alarm FACP (Fire Alarm Control Panel) in pre-laid conduit/ duct. Complete as required, approved and directed by the Engineer Incharge.				
E-48	i) NS-31	2C, 1.5 mm sq	P.Rft	750		
E-49	NS-32	Supply, Installation and commissioning with Addressable Break Glass unit (Manual Call Point) with key type EN-54 having a built in short circuit isolator and microprocessor to ensure a response time of max. 1 second, having an indication LED flash after pressing the button to acknowledge the activation and a key operation facility for testing purposes. Complete as required, approved and directed by the Engineer Incharge.	Each	4		
E-51	i) NS-33	With Flasher Supply, installation and commissioning of Addressable Optical Smoke Detectors EN-54, Photoelectric, incorporating an LED indication located in labyrinth within the housing of the detector. Sensing unit, adjustable via software between 0-90 seconds having builtin short circuit isolators on both inputs. Complete as required, approved and directed by the Engineer Incharge.	Each	6		
			Each	15		



**BILL OF QUANTITIES**

## Electrical works

Sr. No.	Ref. MRS-2024 (2nd Bi-Annual) / Non-Schedule	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
a	b	c	d	e	f	g
E-52	NS-34	Supply, installation and commissioning of Addressable Heat Detectors incorporating an LED indication located in labyrinth within the housing of the detector. Sensing unit, adjustable via software between 0-90 seconds having builtin short circuit isolators on both inputs. Complete as required, approved and directed by the Engineer Incharge.	Each			
	i)	Fixed Heat Detector to Sense High Temperatures	Each	1		
E-53	NS-35	Supply, installation and commissioning of wired/ wireless Addressable Microprocessor based Fire Alarm Control Panel (FACP) Compact, capable of PC interface with window conforming to EN-54, consisting of specified loop circuit shaving 240 devices per loop, indicating circuits, builtin power supply with backup batteries, alarm and trouble indication, silence alarm and reset system, general alarm and reset system, general alarm facility. Complete as required, approved and directed by the Engineer Incharge.	Each			
	i)	FACP 1-Loop	Each	1		
E-54	NS-36	Testing and commissioning of Fire Alarm System.	Job	1		

Sub-Total (Non-Scheduled Items): \_\_\_\_\_

Total (Scheduled + Non-Scheduled items): \_\_\_\_\_





**UNIVERSITY OF POONCH, RAWALAKOT (UPR)**  
**LEFTOVER WORKS OF CHOTAGALA CAMPUS, RAWALAKOT**  
**DEPARTMENT OF HI-TECH LAB AND GIRLS COMMON ROOM**

**BILL OF QUANTITIES**  
**PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**GENERAL NOTE**

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per drawings, specifications and as approved by the Engineer.

**SCHEDULED ITEMS**

**SANITARY FIXTURES AND FITTINGS**

HT-P-01	19 / 3	Providing and fitting one piece European Coupled set of Water Closet (WC) and flushing Cistern of PORTA brand (full size) i/c the cost of CP / rubber connection, thimble, normal seat cover and rawal bolts complete in all respects as approved and directed by the Engineer incharge.	Each	6	58,465.50	350,793
HT-P-02	19 / 5	Providing and fitting white glazed earthen ware water closet, squarrier type, with separate foot rest.	Each	2	9,689.65	19,379
HT-P-03	19 / 13 / i	Providing and fitting plastic made low down flushing cistern 13.63 litre (3 gallons) capacity, including bracket set, copper connection, etc. complete, white	Each	2	5,610.40	11,221
HT-P-04	19 / 4 / ii page 120	Providing and fixing, flushing bend of PVC, 4cm (1-1/2")	Each	2	390.25	781
	19 / 7	Providing and fitting glazed earthen ware wash hand basin 56x40 cm (22"x16") including bracket set, waste pipe and waste coupling, etc.				
HT-P-05	(v)	Under Counter Vanity Basin	Each	12	11,880.75	142,569
HT-P-06	19 / 8	Providing and fixing stainless steel sink with drain board, size 120x60 cm (48"x24") including bracket set, waste pipe and waste coupling.	Each	1	15,228.50	15,228.50



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	19 / 10	Providing and fixing glazed earthen ware sink, including bracket set, waste pipe and waste coupling: (for laboratory sink)				
HT-P-07	(i)	60x45 cm (24"x18")	Each	36	6,007.20	216,259.20
	19 / 32	Providing and fitting, chromium plated or brass oxidised, swan neck cock 15 mm (1/2") dia				
HT-P-08	(i)	single way	Each	36	861.40	31,010.40
HT-P-09	19 / 16	Providing and fixing, chromium plated soap dish.	Each	12	937.75	11,253
HT-P-10	19 / 18	Providing and fixing, chromium plated toilet paper holder.	Each	6	1,202.45	7,215
HT-P-11	19 / 19 / i	Providing and fixing, chromium plated towel rail, 60 cm (24") long, and 2 cm (3/4") dia	Each	4	1,254.75	5,019
HT-P-12	19 / 27 / ii	Providing and fixing chromium plated bib cock 1.5cm (1/2")	Each	2	1,641.40	3,283
HT-P-13	19 / 28	Providing and fixing chromium plated Tee stop cock 15mm (1/2")	Each	36	2,001.40	72,050
	19 / 52	Providing and fixing CP bath Room Set made of Sonex / Master / Faisal comprising of 3-No Tee stop cocks, lever type Basin Mixer, double Bib Cock, open wall shower, Muslim shower, waste coupling and bottle trap etc. complete in all respect as approved and directed by the Engineer incharge				
HT-P-14	i	Tee Stop Cock - Set of 03	Each	3	2,232.30	6,697
HT-P-15	ii	Lever Type Basin Mixer	Each	12	6,672.30	80,068
HT-P-16	iii	Double Bib Cock	Each	8	1,872.30	14,978
HT-P-17	iv	Open Type Wall Shower	Each	1	18,672.30	18,672
HT-P-18	v	Muslim shower	Each	8	2,352.30	18,818
HT-P-19	vii	Bottle Trap	Each	12	1,452.30	17,428



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	19 / 55	Providing/fixing Electric water heater (Geyser) comprising of tank of 14 SWG, GI sheet and external cover of 22 SWG MS sheet, insulated with 4" thick high density glass wool, imported thermostat i/c electric rod, safety valve Ambassador / Canon) i/c cost of accessories& making connection complete in all respect as approved and directed by Engineer Incharge				
HT-P-20	i	15 Gal Capacity	Each	6	32,521.50	195,129
<b><u>WATER SUPPLY PIPES AND FITTINGS</u></b>						
	23 / 46 / b	Providing, laying, testing and commissioning of POLYPROPYLENE RANDOM COPOLYMER ( PPRC ) water supply pipe (Dadex / Popular / Beta or equivalent ) with specified pressure rating PN ( PRESSURE NOMINAL ) and conforming to DIN 8077 - 8078 code i/c cost of solvent, specials, making jharries complete in all respect as approved and directed by Engineer Incharge. ( Internal / External Diameters mentioned ). PN20				
HT-P-21	ii	3/4 inch (25mm) dia	Rft	1,200	100.35	120,420
HT-P-22	iii	1 inch (32mm) dia	RR	900	160.50	144,450
HT-P-23	iv	1-1/4 inch (40mm) dia	Rft	600	245.90	147,540
HT-P-24	v	1-1/2 inch (50mm) dia	Rft	300	354.10	106,230
HT-P-25	vi	02 inch (63mm) dia	Rft	200	554.65	110,930
	27 / 16 / a	Supply & Installation of High Density ( 64 Kg/m3) Aluminum foil faced fiberglass pipe insulation for chilled/hot water pipeing and fittings and protections of valves, strainers etc i/c the cost of canvas cloth as approved and directed by Engineer Incharge.				
HT-P-26	i	3/4" dia Pipe - 25 mm thick	Rft	10	407.20	4,072
HT-P-27	ii	1" dia Pipe - 25 mm thick	Rft	300	434.80	130,440
HT-P-28	iii	1-1/4" dia Pipe - 25 mm thick	Rft	450	467.70	210,465
HT-P-29	iv	1-1/2" dia Pipe - 25 mm thick	Rft	300	498.80	149,640
HT-P-30	v	2" dia Pipe - 25 mm thick	Rft	150	576.28	86,442





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
HT-P-31	vi	2-1/2" dia Pipe - 25 mm thick	Rft	100	705.15	70,515
	27 / 12	Supply & installation of multi layer aluminium sheet jacketting of specified thickness,coated with UV ( Ultra Violet) protection & polymer backing having saltwater resistance and fire performance conforming to ASTM-C1729M over exposed duct/pipe insulations where required and specified i/c the cost of Metal banding solution sealant as approved and directed by Engineer Incharge				
HT-P-32	(ii)	0.4 mm thick	Sft	750	148.35	111,263
	23 / 51	Providing and fixing heavy duty Gate valve of specified diameter and material for pressure rating PN-16 mde of Crane (USA), Hatersly (UK) or Scon (Pakistan) i/c the cost of all accessories flanges,nut/bolt and gasket where required complete in all respect as approved and directed by the Engineer Incharge.				
HT-P-33	a-ii	3/4" dia Brass Threaded Valves	Each	10	4,628.40	46,284
HT-P-34	a-iii	1" dia Brass Threaded Valves	Each	10	6,608.40	66,084
HT-P-35	a-iv	1-1/4" dia Brass Threaded Valves	Each	2	9,308.40	18,617
HT-P-36	a-v	1-1/2" dia Brass Threaded Valves	Each	2	12,072.60	25,945
HT-P-37	a-vi	02" dia Brass Threaded Valves	Each	2	20,412.60	40,825
	23 / 45	Providing and fixing CP heavy duty brass Ball valve with CP handle of specified diameter made of Faisal/Sonex / Master best quality or equivalent complete in all respect as approved and directed by theEngineer Incharge.				
HT-P-38	i	1/2" dia Brass Threaded Valves	Each	20	1,184.40	23,688
HT-P-39	ii	3/4" dia Brass Threaded Valves	Each	10	1,448.40	14,484
HT-P-40	iii	1" dia Brass Threaded Valves	Each	2	1,868.40	3,737



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
	23 / 53	Providing and fixing heavy duty Check valve of specified diameter and material for pressure rating PN-16 made of Crane (USA), Hatersly (UK), Scon (Pakistan) i/c the cost of all accessories flanges,nut/bolt and gasket where required complete in all respect as approved and directed by the Engineer Incharge				
HT-P-41	a-ii	3/4" dia Brass Threaded Valves	Each	6	6,188.40	37,130
	23 / 54	Supply & installation of heavy duty Brass PN-16 air Vents of specified sizeprovided at thehighest points (PipeRisers) to expel air as approved and directed by the Engineer Incharge				
HT-P-42	a-ii	3/4 inches	Each	6	2,584.20	15,505
	23 / 42 / d	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE-100) working presure pipe, Beta / Dadex / Popular / ILL or equivalent including the cost of specials, in trenches, as approved & directed by the engineer incharge, complete in all respects.				
HT-P-43	5	PN-12.5 63mm dia	Rft	300	223.05	66,915
HT-P-44	6	75mm dia	Rft	10	313.10	3,131
<b><u>SOIL, WASTE AND VENT PIPES &amp; FITTINGS</u></b>						
	19 / 47 / b	Providing, fixing, testing and commissioning of uPVC (Unplastized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Betaor approve dequivalent manufacturer ,plain/Bell Ended/ZJoints conforming to BS4514/ BS5255 EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.				
HT-P-45	ii	40mm	Rft	300	106.35	31,905
HT-P-46	iii	50mm	Rft	600	115.05	69,030
HT-P-47	iv	82mm	Rft	600	175.05	105,030
HT-P-48	v	110mm	Rft	300	274.20	82,260
HT-P-49	vi	160mm	Rft	100	528.00	52,800



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bl Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
HT-P-50	vii	200mm	Rft	300	564.60	169,380
	19 / 49	Providing, fixing, testing and commissioning of $\mu$ -PVC (Unplasticized polyvinyl Chloride ) Nikasi / waste pipe Fittings make of Dadex / Popular / Beta or equivalent, conforming to code EN-1329 including the cost of Solvents complete in all respect as approved and directed by the Engineer Incharge.				
HT-P-51	a-i	P Trap 4"	Each	2	1,358.10	2,716
HT-P-52	a-ii	P Trap 3"	Each	8	1,020.90	8,167
HT-P-53	b-i	Multi-Trap 4"	Each	24	1,305.30	31,327
HT-P-54	c-ii	Vent Cowel 3"	Each	6	294.90	1,769
HT-P-55	d-i	Clean Outs 4"	Each	6	758.10	4,549
HT-P-56	d-ii	Clean Outs 3"	Each	6	609.30	3,656
HT-P-57	19 / 38	Providing and fitting 10 cm (4") gully trap, including cement concrete, cost of PVC grating 15x15 cm (6"x6") and masonry chamber 30x30 cm (12"x12").	Each	5	1,668.95	8,345
<b><u>STORM DRAINAGE PIPES &amp; FITTINGS</u></b>						
	19 / 47 / b	Providing, fixing, testing and commissioning of $\mu$ PVC (Unplasticized Polyvinyl Chloride Nikasi /SWV pipe, Dadex /Popular /Betaor approve dequivalent manufacturer ,plain/Bell Ended/ZJoints conforming to BS4514/ BS5255 EN1329 including the cost of specials and Solvents complete in all respects ,as per drawings & specifications and /or as approved and directed by the Engineer Incharge.				
HT-P-58	iv	82mm	Rft	10	175.05	1,751
HT-P-59	v	110mm	Rft	200	274.20	54,840
HT-P-60	vi	160mm	Rft	10	528.00	5,280





**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bl Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)
		<b>FIREFIGHTING</b>				
	23 / 48	Providing, laying, testing and commissioning of Grade-B,MS Seamless Schedule pipe of nominal diameter, conforming to ASTM-A106, Lontrin/ Hufaz / Pacific baolai or approved equivalent manufacturer, duly welded i/c the cost of specials complete as approved and directed by the Engineer Incharge				
		<b>Schedule-40</b>				
HT-P-61	iii	01"	Rft	10	553.40	5,534
HT-P-62	vii	2-1/2"	Rft	20	1,760.65	35,213
HT-P-63	viii	03"	Rft	10	2,235.35	22,354
HT-P-64	ix	04"	Rft	50	3,044.35	152,218
	23 / 58	Supply , installation and commissioning of Concealed/Open type fire Hose Reel cabinet of specified size made of 18 SWG MS sheet , single/double Cabin having demountable single/double doors of steel/glazed with 4 mm thick glass,with warning sign on it,duly painted with 70 micron electrostatic powder coated Red color, housing at least 100 ft length of pipe i/c the cost of specified valve , complete in all respects as approved and directed by Engineer Incharge ( The accessories will be paid separately).				
HT-P-65	(ii)	<b>Indoor/Outdoor Type</b> 12" deep	P.Ct	30	2,573.75	77,213
	23 / 59	Supply , installation and commissioning of fire Hose reel Cabinet accessories of specified size and make, complete in all respects. As approved and directed by Engineer Incharge				
HT-P-66	(i)	<b>(A)</b> Ruber covered hose pipe 1" Dia	Rft	200	1,184.50	236,900
HT-P-67	(a)	<b>(D)</b> Fire Hose Spray Nozzle with Jet 1" dia Polycarbonate Nozzle(75gpm)	Each	2	3,813.25	7,627
<b>TOTAL (SCHEDULE ITEMS) =</b>					<b>4,162,460</b>	



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**NON-SCHEDULED ITEMS**

**SANITARY FIXTURES AND FITTINGS**

(Ref. Specs 5100)

HT-P-68	NS-01	05mm thick Glass mirror imported European make or approved equivalent including hard board behind it, approved beeding around it and all other fittings for complete installation	Sft	120		
HT-P-69	NS-02	Electric water coolers of 20gallons/hr capacity, minimum two taps, including Tee stop cock on inlet, and all other accessories for complete installation.  Water filters of following type, including all accessories for complete installation.	Each	1		
HT-P-70	NS-03	Triple type filter  Providing/fixing U-shape 1-1/4" dia Stainless Steel Grab bar of 14 SWG thickness and specified length for safety grip i/c the cost of Stainless Steel brackets,rawal plugs and hardware as approved and directed by Engineer Incharge	Each	1		
HT-P-71	NS-04	18" long	Each	2		

**SOIL, WASTE AND VENT PIPES & FITTINGS**

HT-P-72	NS-05	Providing and Fixing of CP top tile strainer, complete in all respect as approved and directed by Engineer Incharge	Each	32		
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**STORM DRAINAGE PIPES & FITTINGS**

		Providing and Fixing of SS 304 Roof / scupper Drain, complete in all respect as approved and directed by Engineer Incharge.				
HT-P-73	NS-06	04" dia	Each	8		
HT-P-74	NS-07	06" dia	Each	1		



**BILL OF QUANTITIES  
PLUMBING WORKS**

ITEM NO.	MRS-Punjab Murree, 2nd Bi Annual-2024	DESCRIPTION	UNIT	QTY.	UNIT RATE (Rs.)	TOTAL AMOUNT (Rs.)
(a)		(b)	(c)	(d)	(e)	(f)

**NATURAL GAS SUPPLY PIPES AND FITTINGS**

(Ref. Specs 5100, 5220, 5280)

G.I. pipes conforming to BS-1387, Medium Grade, i/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, supports and hangers, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.

HT-P-75	NS-08	1/2 inch (15mm) dia pipe	Rft	100		
HT-P-76	NS-09	3/4 inch (20mm) dia pipe	Rft	300		
HT-P-77	NS-10	1 inch (25mm) dia pipe	Rft	20		

**FIRE FIGHTING**

(Ref. Specs 5150)

Fire Extinguisher of following types.

HT-P-78	NS-11	DCP Type Fire Extinguisher of 6kg Capacity	Each	4		
HT-P-79	NS-12	Foam Type fire extinhuisher capacity 09litres (2gallons).	Each	4		
HT-P-80	NS-13	CO2 Type Fire Extinguisher of 05kg Capacity.	Each	4		

TOTAL (NON-SCHEDULED) = \_\_\_\_\_

TOTAL (SCHEDULE + NON-SCHEDULE ITEMS) = \_\_\_\_\_







THE UNIVERSITY OF POONCH, RAWALAKOT

**COMPLETION OF LEFTOVER WORKS OF  
CHOTAGALA CAMPUS, UNIVERSITY OF  
POONCH, RAWALAKOT PACKAGE – B1**

**TECHNICAL BID**

**BIDDING DOCUMENTS  
VOLUME – I**

INSTRUCTIONS TO BIDDERS  
BIDDING DATA  
FORM OF BID & APPENDICES TO BID  
FORMS  
CONDITIONS OF CONTRACT  
SPECIAL PROVISIONS



SEPTEMBER, 2024

Clearance Code : 4753/321/BID/026(24)  
Doc No : 4753-03  
Rev No : 1



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THE UNIVERSITY OF POONCH, RAWALAKOT

**COMPLETION OF LEFTOVER WORKS OF  
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VOLUME – I

**TABLE OF CONTENTS**

- Instructions to Bidders
- Bidding Data
- Forms of Bid & Appendices to Bid
- Form of Bid Security, Performance Security, Contract Agreement, Mobilization Advance Guarantee
- Conditions of Contract, Part-I - General Conditions.
- Conditions of Contract, Part II – Particular Conditions of Contract
- Specifications - Special Provisions



**INSTRUCTIONS  
TO  
BIDDERS**



## INSTRUCTIONS TO BIDDERS

(Note: These Instructions to Bidders along with Bidding Data will not be part of the Contract and will cease to have effect once the contract is signed.)

### A. GENERAL

- |             |                           |   |
|-------------|---------------------------|---|
| <b>IB.1</b> | <b>Scope of Bid</b>       | <p>1.1 The Employer as defined in the Bidding Data Sheet hereinafter called "the Employer" wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarized in the Bidding Data Sheet hereinafter referred to as the "Works".</p> <p>1.2 The successful bidder will be expected to complete the Works within the time specified in Appendix-A to Bid.</p>  |
| <b>IB.2</b> | <b>Source of Funds</b>    | <p>2.1 The Employer has applied for/received a loan/credit from the source (s) indicated in the Bidding Data Sheet in various currencies towards the cost of the project specified in the Bidding Data Sheet and it is intended that part of the proceeds of this loan/credit will be applied to eligible payments under the Contract for which these Bidding Documents are issued.</p>   |
| <b>IB.3</b> | <b>Eligible Bidders</b>   | <p>3.1 This Invitation for Bids is open to all bidders meeting the following requirements:</p> <p style="margin-left: 40px;">a. Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the Works.</p>   |
| <b>IB.4</b> | <b>One Bid per Bidder</b> | <p>4.1 Each bidder shall submit only one bid either by himself, or as a partner in a joint venture. A bidder who participates in more than one bid (other than alternatives pursuant to Clause IB.16) will be disqualified.</p>   |
| <b>IB.5</b> | <b>Cost of Bidding</b>    | <p>5.1 The bidders shall bear all costs associated with the preparation and submission of their respective bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.</p>   |
| <b>IB.6</b> | <b>Site Visit</b>         | <p>6.1 The bidders are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. All cost in this respect shall be at the bidder's own expense.</p> <p>6.2 The bidders and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the bidders, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.</p> |



## B. BIDDING DOCUMENTS

- IB.7 Contents of Bidding Documents**
- 7.1 The Bidding Documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.
1. Instructions to Bidders.
  2. Bidding Data Sheet.
  3. General Conditions of Contract, Part-I(GCC).
  4. Particular Conditions of Contract, Part-II(PCC).
  5. Specifications – Special Provisions.
  6. Specifications – Technical Provisions.
  7. Form of Bid & Appendices to Bid.
  8. Bill of Quantities (Appendix-D to Bid).
  9. Form of Bid Security.
  10. Form of Contract Agreement.
  11. Forms of Performance Security and Mobilization Advance Guarantee/Bond and Form of Indemnity Bond for Secured Advance
  12. Drawings.
- 7.2 The bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of bid submission will be at the Bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.
- IB.8 Clarification of Bidding Documents**
- 8.1 Any prospective bidder requiring any clarification (s) in respect of the Bidding Documents may notify the Employer in writing at the Employer's address indicated in the Invitation for Bids. The Employer will respond to any request for clarification which he receives earlier than 28 days prior to the deadline for submission of bids.
- Copies of the Employer's response will be forwarded to all purchasers of the Bidding Documents, including a description of the enquiry but without identifying its source.
- IB.9 Amendment of Bidding Documents**
- 9.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the Bidding Documents by issuing addendum.
- 9.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to IB 7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer.
- 9.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20

## C. PREPARATION OF BIDS

- IB.10 Language of Bid**
- 10.1 The bid and all correspondence and documents related to the bid exchanged by a bidder and the Employer shall be in the bid language stipulated in the Bidding Data Sheet and Particular Conditions of Contract. Supporting documents and printed literature furnished by the bidders may be in any other language





provided the same are accompanied by an accurate translation of the relevant parts in the bid language, in which case, for purposes of evaluation of the bid, the translation in bid language shall prevail.

**IB.11 Documents  
Comprising the  
Bid**

- 11.1 The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Bid and the other the Price Bid, containing the documents listed in Bidding Data Sheet under the heading of IB 11.1 A & B respectively. Both envelopes to be enclosed together in an outer single envelope called the Bid. Each bidder shall furnish all the documents as specified in Bidding Data Sheet 11.1 A & B.
- 11.2 Bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement. The role to be played by each partner to be specified therein. Bids submitted by a joint venture of two (2) or more firms shall comply with the following requirements:
- (a) In case of a successful bid, the Form of JV Agreement shall be signed so as to be legally binding on all partners within 7 days of the receipt of letter of acceptance failing which the contract and the letter of acceptance shall stand void and redundant.
  - (b) One of the joint venture partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;
  - (c) The partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and Conditions of JV Agreement and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;
  - (d) All partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para (b) above as well as in the Form of Bid and in the Form of JV Agreement (in case of a successful bid); and
  - (e) A copy of JV agreement shall be submitted before signing of the Contract, stating the conditions under which JV will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. The JV Agreement shall be made part of the contract. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partners without prior written consent of the Employer.





- 11.3 The Bidder shall furnish, as part of the Technical Bid, a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time referred to in Sub-Clause 1.2 hereof.
- IB.12 Bid Prices**
- 12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole of the Works as described in IB 1.1 hereof, based on the unit rates and / or prices submitted by the bidder.
- 12.2 The bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by a bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities.
- 12.3 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to the deadline for submission of bids shall be included in the rates and prices and the total Bid Price submitted by a bidder.
- Additional / reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed / deducted as per Sub-Clause 70.2 of the General Conditions of Contract Part-I.
- 12.4 The rates and prices quoted by the bidders are subject to adjustment during the performance of the Contract in accordance with the provisions of Clause 70 of the Conditions of Contract. The bidders shall furnish the prescribed information for the price adjustment formulae in Appendix C to Bid and shall submit with the bids such other supporting information as required under the said clause.
- IB.13 Currencies of Bid and Payment**
- 13.1 The unit rates and the prices shall be quoted by the bidder entirely in Pak rupees. A bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as the "Foreign Currency Requirements") shall indicate the same in Appendix-B to Bid. The proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the currency of the Bidder's home country or, (ii) at the bidder's option, entirely in Pak rupees provided always that a bidder expecting to incur expenditures in a currency or currencies other than those stated in (i) and (ii) above for a portion of the foreign currency requirements, and wishing to be paid accordingly, shall indicate the respective portions in his bid.
- 13.2 The rates of exchange to be used by the bidder for currency conversion shall be the TT & OD Selling Rates published or authorized by the State Bank of Pakistan prevailing on the date 28 days prior to the deadline for submission of bids.
- For the purpose of payments, the exchange rates used in bid preparation shall apply for the duration of the Contract.
- IB.14 Bid Validity**
- 14.1 Bids shall remain valid for the period stipulated in the Bidding Data Sheet after the Date of Bid Opening specified in Clause IB.23.



- 14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period which shall in no case be more than the original bid validity period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiting his Bid Security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.15 in all respects.

**IB.15 Bid Security**

- 15.1 Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in the Bidding Data Sheet in Pak Rupees or an equivalent amount in a freely convertible currency.
- 15.2 The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favor of the Employer valid for a period 28 days beyond the Bid Validity date.
- 15.3 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.
- 15.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than 28 days after the expiration of the period of Bid Validity.
- 15.5 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security and signed the Contract Agreement.
- 15.6 The Bid Security may be forfeited:
- (a) if the bidder withdraws his bid except as provided in IB 22.1;
  - (b) if the bidder does not accept the correction of his Bid Price pursuant to IB 27.2 hereof; or
  - (c) In the case of successful bidder, if he fails within the specified time limit to:
    - (i) furnish the required Performance Security
    - (ii) sign the Contract Agreement ; or
    - (iii) Furnish the required JV agreement within 7 days of the receipt of letter of acceptance.

**IB.16 Alternate Proposals by Bidder**

- 16.1 Should any bidder consider that he can offer any advantages to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his bid to be submitted in strict compliance with the Bidding Documents, submit any Alternate Proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Letter of Price Bid shall be that which represents complete compliance with the Bidding Documents. The technical details and financial implication involved are to be submitted in two separate sealed envelopes as to be followed in main bid proposals.
- 16.2 Alternate Proposal(s), if any, of the lowest evaluated responsive bidder only may be considered by the Employer as the basis for the award of Contract to such bidder.





- IB.17 Pre-Bid Meeting**
- 17.1 The Employer may, on his own motion or at the request of any prospective bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of pre-bid meeting, if convened, is as stipulated in the Bidding Data Sheet. All prospective bidders or their authorized representatives shall be invited to attend such a pre-bid meeting.
- 17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than seven (7) days before the proposed pre-bid meeting.
- 17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in IB 7.1 hereof, which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.
- 17.4 Absence at the pre-bid meeting will not be a cause for disqualification of a bidder.
- IB.18 Format and Signing of Bid**
- 18.1 Bidders are particularly directed that the amount entered on the Letter of Price Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.
- 18.2 All appendices to Bid are to be properly completed and signed.
- 18.3 No alteration is to be made in the Letters of Price and Technical Bids nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the bid may be rejected.
- 18.4 The Bidder shall prepare one original of the Technical Bid and one original of the Price Bid comprising the Bid as described in Bidding Data Sheet against IB 11 and clearly mark it "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID". In addition, the Bidder shall submit two (2) copies of the Bid and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.
- 18.5 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the Bidding Data Sheet and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for unamended printed literature, shall be signed or initialed by the person signing the bid.
- 18.6 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.
- 18.7 Bidders shall indicate in the space provided in the Letter of Technical and Price Bids, their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent.





- 18.8 Bidders should retain a copy of the Bidding Documents as their file copy.

#### D. SUBMISSION OF BIDS FOR SINGLE STAGE TWO ENVELOPE BIDDING PROCEDURE

##### IB.19 Sealing and Marking of Bids

- 19.1 Each bidder shall submit his bid as under:
- ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.
  - The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in IB 19.2 hereof.
  - The technical bid should comprise of documents listed in IB11.1 (A) & the price bid should comprise of documents listed in IB 11.1 (B) which shall be placed in separate envelopes in accordance with IB 11.1.
- 19.2 The inner and outer envelopes shall:
- be addressed to the Employer at the address provided in the Bidding Data sheet;
  - bear the name and identification number of the contract as defined in the Bidding Data sheet; and
  - provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data sheet.
- 19.3 In addition to the identification required in IB 19.2 hereof, the inner envelope shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared "late" pursuant to Clause IB.21
- 19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

##### IB.20 Deadline for Submission of Bids

- 20.1
- Bids must be received by the Employer at the address specified no later than the time and date stipulated in the Bidding Data Sheet.
  - Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of bids. No claims will be entertained for refund of such expenses.
  - Where delivery of a bid is by mail and the bidder wishes to receive an acknowledgment of receipt of such bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed bid package.
  - Upon request, acknowledgment of receipt of bids will be provided to those making delivery in person or by messenger.
- 20.2 The Employer may, at his discretion, extend the deadline for submission of Bids by issuing an amendment in accordance with



Clause IB.9, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will thereafter be subject to the deadline as extended.

- IB.21 Late Bids**
- 21.1 (a) Any bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 will be returned unopened to such bidder.
- (b) Delays in the mail, delays of person in transit, or delivery of a bid to the wrong office shall not be accepted as an excuse for failure to deliver a bid at the proper place and time. It shall be the bidder's responsibility to determine the manner in which timely delivery of his bid will be accomplished either in person, by messenger or by mail.
- IB.22 Modification, Substitution and Withdrawal of Bids**
- 22.1 Any bidder may modify, substitute or withdraw his bid after bid submission provided that the modification, substitution or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.
- 22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.
- 22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with IB 22.1 and 27.2.
- 22.4 Withdrawal of a bid during the interval between the deadline for submission of bids and the expiration of the period of bid validity specified in the Form of Bid may result in forfeiture of the Bid Security in pursuance to Clause IB.15.

## E. BID OPENING AND EVALUATION FOR SINGLE STAGE TWO ENVELOPE BIDDING PROCEDUR

- IB.23 Bid Opening**
- 23.1 The Employer will open the Technical Bids in public at the address, date and time specified in the Bidding Data Sheet in the presence of Bidders' designated representatives and anyone who choose to attend. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening.
- 23.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding Withdrawal Notice contains a valid authorization to request the withdrawal and is read out at bid opening.
- 23.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with IB 23.1. No envelope shall be substituted unless the corresponding Substitution Notice contains a valid authorization





to request the substitution and is read out and recorded at bid opening.

- 23.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original and Modification, will remain unopened in accordance with IB 23.1. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.
- 23.5 Other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:
- the name of the Bidder;
  - whether there is a modification or substitution;
  - the presence of a Bid Security, if required; and
  - Any other details as the Employer may consider appropriate.

No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with IB 21.1. Only Technical Bids read out and recorded at bid opening, shall be considered for evaluation.

#### Preliminary Examination of Technical Bids

- 23.6 (a) The Employer shall first examine qualification and experience Data as per appendix M and N submitted by the Bidder. The technical proposal examination of those bidders only shall be taken in hand who meet the minimum requirement as mentioned in appendix M and N. Only substantially responsive qualification shall be considered for further evaluation.
- (b) The Employer shall examine the Technical Bid to confirm that all the documents have been provided, and to determine the completeness of each document submitted.
- 23.7 The Employer shall confirm that all the documents and information have been provided for evaluation of Technical bid as required under these bidding documents.
- 23.8 At the end of the evaluation of the Technical Bids, the Employer will invite only those bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids.
- The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice for the opening of Price Bids.
- 23.9 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document and return their Price Bids unopened before inviting





others, who are determined as being qualified, to attend the opening of Price Bids.

23.10 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, publically in the presence of Bidders' representatives who choose to attend at the address, date and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.

23.11 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded:

- (a) The name of the Bidder;
- (b) Whether there is a modification or substitution;
- (c) The Bid Prices, including any discounts and alternative offers; and
- (d) Any other details as the Employer may consider appropriate.

Only Price Bids and discounts, read out and recorded during the opening of Price Bids shall be considered for evaluation. No Bid shall be rejected at the opening of Price Bids.

23.12 If this Bidding Document allows Bidders to quote separate prices for different contracts, and the award to a single Bidder of multiple contracts, the methodology to determine the lowest evaluated price of the contract combinations is that which is most economical to the Employer.

**IB.24 Process to be Confidential**

24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report which shall be done at least ten 10 days prior to issue of Letter of Acceptance. The announcement to all Bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the bids evaluated. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the rejection of such bidder's bid. Whereas any bidder feeling aggrieved may lodge a written complaint not later than fifteen (15) days after the announcement of the bid evaluation report. However mere fact of lodging a complaint shall not warrant suspension of the procurement process.

**IB.25 Clarification of Bids**

25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of his bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with Clause IB.28.

25.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its bid may be rejected.

**IB.26 Examination of Bids and**

26.1 Prior to the detailed evaluation of bids, the Employer will determine whether each bid is substantially responsive to the requirements of the Bidding Documents.



**Determination of  
Responsiveness**

- 26.2 A substantially responsive bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; (iv) Includes signed Integrity Pact where required as per clause IB.35 and (v) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one (i) which affect in any substantial way the scope, quality or performance of the Works; (ii) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the bidder's obligations under the Contract; (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids. Only substantially responsive bid shall be considered for further evaluation.
- 26.3 If a bid is not substantially responsive, it may not subsequently be made responsive by correction or withdrawal of the non-conforming material deviation or reservation. The Employer may, however, seek confirmation/ clarification in writing which shall be responded in writing.
- IB.27 Correction of Errors**
- 27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:
- (a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and
  - (b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.
- 27.2 The amount stated in the Letter of Price Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid Security shall be forfeited in accordance with IB.15.6 (b) hereof.
- IB.28 Evaluation and Comparison of Bids**
- 28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26.
- 28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:
- (a) making any correction for errors pursuant to Clause IB.27;
  - (b) excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Day work; and
  - (c) making an appropriate adjustment for any other acceptable variation or deviation.
- 28.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of





the Contract, shall not be taken into account in Bid evaluation.

- 28.4 If the Bid of the successful bidder is seriously unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the bidder to produce detailed price analyses for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in Clause IB.32 be increased at the expense of the successful bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the Contract.

## F. AWARD OF CONTRACT

- IB.29 Award**
- 29.1 Subject to Clauses IB.30 and IB.34, the Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price, provided that such bidder has been determined to be eligible in accordance with the provisions of Clause IB.3 and qualify pursuant to IB 29.2.
- 29.2 The Employer, at any stage of the bid evaluation, having credible reasons for or prima facie evidence of any defect in bidder's capacities, may require the bidders to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not.
- Provided that such qualification shall only be laid down after recording reasons in writing. They shall form part of the records of that bid evaluation report.
- IB.30 Employer's Right to Accept any Bid and to Reject any or all Bids**
- 30.1 Notwithstanding Clause IB.29, the Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidders or any obligation except that the grounds for rejection of all bids shall upon request be communicated to any bidder who submitted a bid, without justification of grounds. Rejection of all bids shall be notified to all bidders promptly.
- IB.31 Notification of Award**
- 31.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder in writing ("Letter of Acceptance") that his Bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Contract Price").
- 31.2 No Negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted.
- 31.3 The notification of award and its acceptance by the bidder will constitute the formation of the Contract, binding the Employer and the bidder till signing of the formal Contract Agreement.
- 31.4 Upon furnishing by the successful bidder of a Performance Security, the Employer will promptly notify the other bidders that their Bids have been unsuccessful and return their bid securities.





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|---|------|---|
| <b>IB.32 Performance Security</b>               | 32.1 | The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Bidding Data Sheet and the Conditions of Contract within a period of 28 days after the receipt of Letter of Acceptance.   |
|   | 32.2 | Failure of the successful bidder to comply with the requirements of IB.32.1 or IB.33 or IB.35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.  |
| <b>IB.33 Signing of Contract Agreement</b>      | 33.1 | Within 14 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful bidder the Contract Agreement in the form provided in the Bidding Documents, incorporating all agreements between the parties.  |
|   | 33.2 | The formal Agreement between the Employer and the successful bidder shall be executed within 14 days of the receipt of the Contract Agreement by the successful bidder from the Employer.   |
| <b>IB.34 General Performance of the Bidders</b> | 34.1 | The Employer reserves the right to obtain information regarding performance of the bidders on their previously awarded contracts/works. The Employer may in case of consistent poor performance of any Bidder as reported by the employers of the previously awarded contracts, inter alia, reject his bid and/or refer the case to the Pakistan Engineering Council (PEC). Upon such reference, PEC in accordance with its rules, procedures and relevant laws of the land take such action as may be deemed appropriate under the circumstances of the case including black listing of such Bidder and debaring him from participation in future bidding for similar works. |
| <b>IB.35 Integrity Pact</b>                     | 35.1 | The Bidder shall sign and stamp the Integrity Pact provided at Appendix-L to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding Rupees ten million. Failure to provide such Integrity Pact shall make the bidder non-responsive.   |
| <b>IB.36 Instructions not part of Contract</b>  | 36.1 | Bids shall be prepared and submitted in accordance with these Instructions which are provided to assist bidders in preparing their bids, and do not constitute part of the Bid or the Contract Documents.   |



**BIDDING DATA SHEET**

## BIDDING DATA SHEET

The following specific data for the Works to be bid shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

**Instructions to  
Bidders**  
Clause Reference

**Clause IB.1**                      **Scope of Bid**

**Sub Clause 1.1**                **Name and address of the Employer**

The Employer is:

**The Registrar University of Poonch, Rawalakot**

(Hereinafter called "The Employer" Which expression shall include the successors, legal representatives and permitted assignees).

**The Employer's Representative is:**

**Project Director**

Chotagala Campus  
University of Poonch, Rawalakot  
Directorate of Works,  
Shamsabad Campus  
Hajira Road, ,  
Rawalakot, AJ&K  
Tel: 05824-960094

**Name of the Project & Summary of the Works**

The name of the Project is:

**"Completion of Leftover Works of Chotagala Campus, University of Poonch Rawalakot – Package – B1. "**

The Summary of Works:

The University of Poonch Rawalakot intends to complete Leftover Works of its Chotagala Campus site in Rawalakot City.

The scope of works mainly comprises construction of leftover works of department of Agronomy and Soil Sciences, Department of Veterinary and Animal Sciences, Library, 2 Hi-Tech Lab & Girls Common Room, allied External Development Works and related ancillary works lying within the boundaries and limits shown on the Drawings and any such additional areas adjacent thereto as may be designated by the Engineer from time to time for the construction to be performed under the Contract, and all such areas and additional areas shall comprise the Site.

**Sub Clause 1.2**                **Time for Completion**

546 days

*Completion of Leftover Works of Chotagala Campus, Package – B1, University of Poonch, Rawalakot*





<b>Clause IB.2</b>	<b>Source of Funds</b>
<b>Sub Clause 2.1</b>	The project is being funded by Kuwait Fund for ARAB Economic Development (KFAED) through Economic Affairs Division Government of Pakistan. Government of Pakistan will disburse eligible payments under the Contract for these works.
<b>Clause IB.7</b>	<b>Contents of Bidding Documents</b>
<b>Sub-Clause 7.1</b>	Delete the text of Sub-Clause 7.1 and substitute with the following  The Bidding Documents are those stated below, and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.  <b><u>Technical Bid</u></b>  7.1.1 <b>Volume - I</b> <ul style="list-style-type: none"> <li>• Instruction to Bidders.</li> <li>• Bidding Data</li> <li>• Letter of Technical Bid &amp; Appendices to Bid (excluding Appendix-D)</li> <li>• Forms of Bid Security Performance Security, Contract Agreement, Mobilization Advance Bank Guarantee</li> <li>• Part-I - General Conditions of Contract.</li> <li>• Part-II - Particular Conditions of Contract.</li> <li>• Specifications - Special Provisions.</li> </ul> 7.1.2 <b>Volume - II</b> <ul style="list-style-type: none"> <li>• Specifications - Technical Provisions.</li> </ul> 7.1.3 <b>Volume - III</b> <ul style="list-style-type: none"> <li>• Drawings</li> </ul> <b><u>Price Bid</u></b>  7.1.4 <b>Volume - IV</b> <ul style="list-style-type: none"> <li>• Letter of Price Bid</li> <li>• Preamble to Bill of Quantities (BOQ)</li> <li>• Appendix - D to Bid (Bill of Quantities)</li> </ul>
<b>Clause IB.8</b>	<b>Clarification of Bidding Documents</b>
<b>Sub-Clause 8.1</b>	<b>Time limit for clarification</b>  Delete the word "28 days" and replace with "07 days".
<b>Clause IB.10</b>	<b>Language of Bid</b>
<b>Sub-Clause 10.1</b>	English.
<b>Clause IB.11</b>	<b>Documents Accompanying the Bid</b>
<b>11.1(A)</b>	The Bidder shall submit with its <b>Technical Bid</b> the following documents:  <b>Volume - I, II &amp; III</b> <ul style="list-style-type: none"> <li>(i) Letter of Technical Bid</li> <li>(ii) Bid Security in accordance with clause IB.15.</li> </ul>



- (iii) Written power of attorney authorizing the signatory of the Bid
- (iv) Original Bidding Documents (Volume – I, II & III)
- (v) Dully filled in Appendices to Bid (except Appendix-D to Bid)
- (vi) Qualification documents establishing bidders' eligibility as per Appendix M and N.

**11.1(B)**

The Bidder shall submit with its **Price Bid** the following documents:

**Volume – IV**

- (i) Letter of Price Bid
- (ii) Preamble to Bill of Quantities
- (iii) Appendix – D to Bid (Bill of Quantities)

**Clause IB.12****Bid Prices****Sub-Clause 12.2**

Delete the text of Sub-Clause 12.2 and substitute with the following:

For Scheduled Items, Bidder Shall Quote Premium in the Form of Percentage Above or Below the estimated price put to bid provided in the Summary of Estimate. Prices provided in the estimate against items are complete inclusive value of the finished work without any hidden technical and/ or financial reservations or implications. Bidders shall not modify, change, nor add any footnotes or any conditions to the Estimate.

For Non-Scheduled Items, Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by a bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities. Corrections in rates and prices, if any, shall be made by crossing out, initialing, dating and re-writing.

**Sub-Clause 12.3**

Delete the text of Sub-Clause 12.3 and substitute with the following:

The Bidder shall obtain all information as to Pakistan Income Tax/AJK Tax Department, Sales Tax, Salaries Tax, Company Taxes, Municipal Octories, Levies and any other taxes imposed by the Government of Pakistan/Provincial Governments/local bodies, export and import duties and necessary permits and conform the requirements thereof at his own responsibility and include the same in quoted Bid Price. The quoted Bid Price shall also include the cost of accepting the general risks/ liabilities and obligations set forth or implied in the Contract. No claim at any later stage on this account will be entertained.

All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, during currency of Contract shall be included in the rates and prices and the total Bid Price submitted by a bidder.

No additional duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed as per Sub-Clause 70.2 of the General Conditions of Contract Part-I.

**Sub-Clause 12.4**

Delete the text of Sub-Clause 12.4 and substitute with the following:

The rates and prices quoted by the bidders are subject to adjustment during the performance of the Contract in accordance with the provision of Clause 70 of the Conditions of Contract.





<b>Clause IB.13</b>	<b>Currencies of Bid and Payment</b>
<b>Sub-Clause 13.1</b>	Delete the text of Sub-Clause 13.1 and substitute with the following: The payments to the Contractor for the works done shall be made in Pakistani Rupees.
<b>Sub-Clause 13.2</b>	The Sub-Clause is deleted in its entirety.
<b>Clause IB.14</b>	<b>Bid Validity</b>
<b>Sub-Clause 14.1</b>	<b>Period of Bid validity:</b> One hundred twenty (120) days.
<b>Clause IB.15</b>	<b>Amount of Bid Security</b>
<b>Sub-Clause 15.1</b>	Rs. 10,000,000/-
<b>Sub-Clause 15.2</b>	Delete the text of Sub-Clause 15.2 and substitute with the following: The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan having its branches in AJK or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan having its branches in AJK in favor of the Employer valid for a period 28 days beyond the Bid Validity date. The Bid Security shall be from Bidder's own account and in case of JV the Bid Security shall be from joint account of JV firm or from the lead partner.
<b>Clause IB.16</b>	<b>Alternate Proposals by Bidder</b> The Clause is deleted in its entirety.
<b>Clause IB.17</b>	<b>Pre-Bid Meeting</b>
<b>Sub-Clause 17.1</b>	<b>Venue, time, and date of the pre-Bid meeting:</b> The Bidder or his official representative are invited to attend a Pre-Bid meeting which will take place on the date, time as stated in Notice Inviting Bids. <b>Venue:</b> Office of the Project Director Chotagala Campus Project, University of Poonch, Shamsabad Campus, Hajira Road, Rawalakot AJ&K
<b>Sub-Clause 17.2</b>	Delete the text of Sub-Clause 17.2 and substitute with the following: The Bidders are requested to submit questions, if any, in writing or by email, so as to reach the Employer/Engineer before pre-bid meeting.
<b>Clause IB.18</b>	<b>Format and Signing of Bid</b>
<b>Sub-Clause 18.4</b>	<b>Number of copies of Bid:</b> The Bidder shall prepare and submit the original (duly signed and stamped) and two copies documents comprising the Bid as described in Clause 7 of these instructions to Bidders, and clearly marked "ORIGINAL" and COPY.





<b>Sub-Clause 18.5</b>	<p>Delete the text of Sub-Clause 18.5 and substitute with the following:</p> <p>The Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder pursuant to Sub-Clause 11.1(a) hereof. All pages of the Bid shall be initialed and stamped by the person or persons signing the Bid. One (1) copy of Power of Attorney must be attached to the Bid submitted to the Employer if this Bid is signed / executed by a person other than the President, Partner or Owner of the Bidder's Company.</p>
<b>Clause IB.19</b>	<b>Sealing and Marking of Bids</b>
<b>Sub-Clause 19.1</b>	<p>Delete the text of Sub-Clause 19.1 (c) and substitute with the following:</p> <p>(c) the technical bid shall comprise of documents listed in IB-11.1 (A) and the price bid shall comprise of documents listed in IB-11.1 (B) which shall be placed in separate envelopes in accordance with IB-11.1. Both the envelopes of Technical Bid and Price Bid shall be placed in single sealed envelope.</p>
<b>Sub-Clause 19.2</b>	<p>(a) Employer's address for the purpose of Bid submission is as follows:</p> <p style="margin-left: 40px;"><b>Project Director</b> Chotagala Campus University of Poonch, Rawalakot Directorate of Works, Shamsabad Campus Hajira Road, . Rawalakot, AJ&amp;K Tel: 05824-960094</p> <p>(b) Name &amp; identification number of the Contract is as follows:</p> <p style="margin-left: 40px;"><b>Name: "Completion of Leftover Works of Chotagala Campus, University of Poonch Rawalakot – Package – B1".</b></p> <p style="margin-left: 40px;"><b>Identification Number : <u>Not Applicable</u></b></p>
<b>Clause IB.20</b>	<b>Deadline for Submission of Bids</b>
<b>Sub-Clause 20.1(a)</b>	Time and date of bid submission and bid opening shall be as per the data provided in the Notice Inviting Bids.
<b>Clause IB.23</b>	<b>Bid Opening</b>
<b>Sub-Clause 23.1</b>	<b>Venue, time, and date of Bid opening.</b>
	As provided in Notice Inviting Bids.
<b>Clause IB-26</b>	<b>Examination of Bids and Determination of Responsiveness</b>
<b>Sub-Clause 26.1</b>	<p>Delete the text of Sub-Clause 26.1 and substitute with the following:</p> <p>Prior to the detailed evaluation of bids, the Employer will determine whether each bid is substantially responsive to the following mandatory requirements:</p> <p style="margin-left: 40px;">i. Valid registration with PEC in C-2 or above, having CE 01, CE 09, CE-10 &amp; EE-04 as codes of specialization.</p>



- ii. Bidders who were terminated on this Project due to any reason will not be eligible for qualification.
- iii. Information on any black-listing resulting from contracts completed or under execution by the Bidder. In case the firm has never been blacklisted, an Affidavit to such effect should be provided.
- iv. Information on any litigation or arbitration resulting from contracts completed or under execution by the Bidder. In case, the firm has never been involved in litigation, an affidavit to such effect should be provided.
- v. Registration with income tax department (Valid NTN).
- vi. Registration with Sales Tax Department (Valid GST).
- vii. On Active Tax Payer's List of Federal Board of Revenue/AJK Tax Department at the time of submission of Bids.

**Note:**

In case, applicant Bidder is JV, all partners of Joint Venture should be registered in category **C-2 or above** with Pakistan Engineering Council and shall meet individually the above requirements.

**Clause IB-27**

**Correction of Errors**

**Sub-Clause 27.1**

Delete the text of Sub-Clause 27.1 and substitute with the following:

Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

where there is a discrepancy between the quoted amount provided by the bidder in the Summary of Cost and in the Form of Bid, the amount stated in the Form of Bid shall govern; and

where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and

**For Scheduled Items:**

(a) where there is a discrepancy between the Premium/amount in figures and in words mentioned in the Summary of Cost, the premium/amount in words shall govern; and

(b) where there is a discrepancy between the percentage premium and the total amount quoted by the Bidder by multiplying the percentage premium with the price put to Bid, the value provided as premium shall govern and total amount shall be corrected.

**For Non-Scheduled Items:**

(a) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.





<b>Clause IB-28</b>	<b>Evaluation and Comparison of Bids</b>
<b>Sub-Clause 28.2</b>	Delete the sub-clause IB-28.2 (c) in its entirety.
<b>Sub-Clause 28.4</b>	Delete the text of Sub-Clause 28.4 and substitute with the following:  If the bid of successful bidder is seriously unbalanced, i.e. more than 10% below of the Engineer's Estimate, the bidder shall furnish and provide extra Performance Security in shape of deposit at call (CDR) from any scheduled bank of Pakistan having its branches in AJK of an amount equal to the difference of bid cost and Engineer's Estimate. This additional Performance Security will be provided along with performance security, after evaluation of financial proposal. Failure of the successful bidder to provide such additional Performance Security shall constitute sufficient grounds for the rejection of bid and forfeiture of the bid security. This additional Performance Security can be released within 14 days after issuance of taking over certificate.
<b>Clause IB.32</b>	<b>Performance Security</b>
<b>Sub-Clause 32.1</b>	Delete the text of Sub-Clause 32.1 and substitute with the following:  The successful bidder shall obtain and provide to the Employer a Performance Security in the prescribed Form annexed to these Bidding Documents. The said Security shall be furnished to the Employer by the successful bidder with fourteen (14) days after the receipt of Letter of Acceptance. The Performance Security shall be of an amount equal to ten percent (10%) of the Contract Price in the currency of the Contract in the form of Bank Guarantee either from any Scheduled Bank in Pakistan or from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan.
<b>Clause IB.35</b>	<b>Integrity Pact</b>
<b>Sub-Clause 35.1</b>	Delete the text of Sub-Clause 35.1 and substitute with the following:  The bidder shall sign and stamp integrity pact provided of appendix-L to bid on stamp paper attested by Oath Commissioner / Notary Public. Failure to provide such Integrity Pact shall make the bidder non-responsive.





**LETTER OF TECHNICAL BID  
& APPENDICES TO BID**

**FORM OF BID AND APPENDICES TO BID  
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LETTER OF TECHNICAL BID

Date .....

Name of Contract: "Completion of Leftover Works of Chotagala Campus, University of Poonch Rawalakot – Package – B1."

To: Project Director  
 Chotagala Campus  
 University of Poonch, Rawalakot  
 Directorate of Works,  
 Shamsabad Campus  
 Hajira Road,  
 Rawalakot, AJ&K  
 Tel: 05824-960094

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (IB) 9;
- (b) We offer to execute and complete in conformity with the Bidding Documents the following Works:  
 Completion of Leftover Works of Chotagala Campus, University of Poonch, Rawalakot – Package – B1
- (c) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (d) As security for due performance of the under takings and obligations of our bid, we submit here with a Bid security, in the amount specified in Bidding Data Sheet, which is valid (at least) 148 days from the date of submission of Bids.
- (e) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process, other than alternative offers submitted in accordance with IB16 (as applicable).
- (f) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.

Name .....

In the capacity of .....

Signed .....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

Address .....

Completion of Leftover Works of Chotagala Campus. Package – B1, University of Poonch, Rawalakot





## SPECIAL STIPULATIONS

## Clause

## Conditions of Contract

1.	Engineer's Authority to issue Variation in emergency	2.1	2% of the Contract Price stated in the Letter of Acceptance
2.	Variation	2.1(b) (viii) (b)	No approval is required by the engineer if the amount needed is up to or less than Rs.500, 000.00 (Five Hundred thousand only)
3.	Law applicable	5.1(b)	The law to be applied is the law of State of Azad Jammu And Kashmir.
4.	Amount of Performance Security	10.1	10% of Contract Price stated in the Letter of Acceptance.
5.	Time for Furnishing Programme	14.1	Within forty two (42) days from the date of Letter of Acceptance
6.	Minimum amount of Third Party Insurance	23.2	Rupees Five hundred thousand (Rs. 500,000) per occurrence with number of occurrences unlimited.
7.	Time for Commencement	41.1	Within fourteen (14) days from the date of receipt of Engineer's Notice to Commence which shall be issued within fourteen (14) days after signing of Contract Agreement.
8.	Time for Completion	43.1 48.2	Five hundred forty six (546) days from the date of receipt of Engineer's Notice to Commence.
9.	Amount of Liquidated Damages	47.1	0.073% of the Contract Cost for each day of delay in completion of each part/ section of the Works subject to a maximum of ten percent (10%) of Contract Price stated in Letter of Acceptance.
10.	Amount of Bonus	47.3	0.01% for each day the Works are completed before the specified completion date of the Works subject to a maximum of 1% of Contract Price.
11.	Defects Liability Period	49.1	Three hundred and sixty four (364) days from the effective date of Taking Over Certificate.
12.	Percentage of Retention Money	60.2	10% of the amount of Interim Payment Certificate



**BA-2**  
**Appendix-A to Bid**

13. Limit of Retention Money	60.2	5 % of Contract Price stated in the Letter of Acceptance
14. Minimum amount of Interim Payment Certificates	60.2	Minimum amount of Interim Payment Certificate shall be Rupees forty (40) Million.
15. Time of Payment from delivery of Engineer's Interim Payment Certificate to the Employer	60.10	Twenty eight (28) days.
16. Mobilization Advance (Interest Free)	60.12	@ 15 % of the Contract Price mentioned in the Letter of Acceptance against Bank Guarantee, of an equivalent amount, from Scheduled Bank of Pakistan having branches in AJK.



**FOREIGN CURRENCY REQUIREMENTS**  
(If required and only in case of International Bidding)

**NOT APPLICABLE**

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Completion of Leftover Works of Chotegala Campus, Package – B1, University of Poonch, Rawalakot*





PRICE ADJUSTMENT UNDER CLAUSE 70  
OF CONDITIONS OF CONTRACT

The source of prices and the weightages for use in the adjustment formula under Clause 70 shall be as follows:

Cost Element	Description	Weightages	Applicable Price
(i)	(ii)	(iii)	(iv)
A	Fixed Portion	0.44	
b	Labour <i>(Labourer (un-skilled) per day, shall be taken as representative of all types of Labour (skilled/unskilled) deployed at site)</i>	0.17	Government of Pakistan (GP) Federal Bureau of Statistics (FBS) Monthly Statistical Bulletin.
c	Cement <i>(OPC cement per bag shall be taken as representative of all types of cement used at the site)</i>	0.08	- do -
d	Reinforcement & structure Steel <i>(<math>\frac{1}{2}</math>" <math>\varnothing</math> round M.S. Bars per tonne shall be taken as representative of all types and diameters of Steel Reinforcement)</i>	0.26	- do -
e	High Speed Diesel (HSD) <i>(HSD shall be taken as representative of all kind of fuels used in connection with the Contract)</i>	0.05	-do-
	Total	1.00	

**Notes:**

- Prices for "(b)" to "(e)" shall be taken from the Government of Pakistan, Federal Bureau of Statistics, Monthly Statistical Bulletin. The base prices shall be those applying 28 days prior to the latest day for submission of Bids. Current prices shall be those applying 28 days prior to the start of the execution month to which a particular monthly statement is related.
- The prices for the cost elements of (b) to (e) shall be used for the City of Rawalpindi.
- Any fluctuation in the prices of materials other than those given above shall not be subject to adjustment of the Contract Price.



- 4) The prices of materials provided in this Appendix are for the purpose of price adjustment only. The Contractor shall base his rates entered in the Bill of Quantities on current market prices

Authorized Signature and official Seal. \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Completion of Leftover Works of Chatogale Campus, Package - B1, University of Poonch, Rawalakot



**PROPOSED CONSTRUCTION SCHEDULE**  
(to be filled and signed by the Bidder)

Pursuant to Sub-Clause 43.1 of the General Conditions of Contract, the Works shall be completed on or before the date stated in Appendix-A to Bid. The Bidder shall provide as Appendix-E to his Bid Construction Schedule in the bar chart (Primavera / MS Project) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the works and parts of the works may meet Employer's completion targets in days noted below and counted from the date of receipt of Engineer's Notice to Commence. (Attach sheets as required for the specified form of Construction Schedule):

<u>Description</u>	<u>Time for Completion</u>
Completion of Leftover Works of Chotagala Campus, University of Poonch, Rawalakot – Package – B1	546 days

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Completion of Leftover Works of Chotagala Campus, Package – B1, University of Poonch, Rawalakot





**METHOD OF PERFORMING THE WORK**  
(to be filled and signed by the Bidder)

The Bidder is required to submit a narrative outlining the method of performing the Work. The narrative should indicate in detail and include but not be limited to:

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.
2. Mobilization, the type of facilities, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.
3. The method of executing the Works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site and providing all services including but not limited to supply of power, water, maintenance of facilities, safety and security and all what is required for completion of works in accordance with the Contract.
4. Quality control / Quality assurance measures to be adopted including procedures to be followed for carrying out all tests required under specifications.
5. **The Bidder while preparing his methodology for performing and executing the works shall also consider the following:**
  - a) The timely completion of the Project as per the time provided in Appendix-A to this Bid.
  - b) The Contractor while filling out the list of major equipment required at site, shall ensure that the equipment requirement is in consonance with the construction requirement.
  - c) The portions of the Site shall be made available to the Contractor in coordination with other Contractors working at site. The Contractor shall prepare the work programme accordingly.

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_



**LIST OF MAJOR EQUIPMENT – RELATED ITEMS**

(to be filled and signed by the Bidder)

The Bidder will provide a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the Works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications.

**LIST OF MAJOR EQUIPMENT**

Owned Purchased or Leased	Description of Unit (Make, Model, Year)	Capacity HP Rating	Condition	Present Location or Source	Date of Delivery at Site	Period of Work on Project
1	2	3	4	5	6	7
a. Owned						
b. To be Purchased						
c. To be arranged on Lease						

**Note:**

The bidder while preparing his methodology for performing and executing the works and listing out Major Equipment (required to complete the Works in the specified Time Schedule) in this Appendix shall consider the above mentioned minimum requirement of Construction Equipment to be brought/installed/erected at site.

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_



**LIST OF MAJOR EQUIPMENT – RELATED ITEMS**  
(to be filled and signed by the Bidder)

**Equipment:**

The Bidder must demonstrate that it has the key equipment listed hereafter and shall be brought/installed/erected for site.

S.No	PLANT/EQUIPMENT					
	Equipment Type and Characteristics	Min. Number Required for this Project	Minimum Mandatory Equipment to be brought / installed / erected at site prior to release of 2 <sup>nd</sup> Part of Mobilization Advance	Total Nos. available	Under Utilization on other projects, if applicable	Nos. waiting to be shifted to new project(s)
1.	Central Concrete Batching Plant having 0.5 cum capacity with all accessories	01 No.	01 No.			
2.	Transit Mixer	03 Nos.	02 No.			
3.	Concrete Mixer Machine (Single Bag)	01 No.	01 No.			
4.	Steel Cutting & Bending Machine	02 No.	01 No.			
5.	Hoist	01 No.	-			
6.	Concrete Pump	01 No.	01 No.			
7.	Concrete Vibrator	01 No.	01 No.			
8.	Mobile Crane (40 Ton)	01 No.	-			
9.	Plate Compactor	01 No.	01 No.			
10.	Tractor Trolley	02 No.	01 No.			
11.	Scaffolding	20,000Rft	10,000Rft			
12.	Shuttering	15,000Sft	8,000Sft			
13.	Loader	01 No.	01 No.			
14.	Excavator	01 No.	01 No.			
15.	Generator (10 KVA)	01 No.	01 No.			
16.	Welding Plant	01 No.	-			
17.	Water Bowser	01 No.	01 No.			
18.	Total Station	01 No.	01 No.			





S.No	PLANT/EQUIPMENT					
	Equipment Type and Characteristics	Min. Number Required for this Project	Minimum Mandatory Equipment to be brought / installed / erected at site prior to release of 2 <sup>nd</sup> Part of Mobilization Advance	Total Nos. available	Under Utilization on other projects, if applicable	Nos. waiting to be shifted to new project(s)
19.	Lab Equipment for FDT, Compressive strength test, sieve analysis etc.	01 set each	01 set			

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Completion of Leftover Works of Chatagala Campus, Package – B1, University of Poonch, Rawalakot



**CONSTRUCTION CAMP AND HOUSING FACILITIES**  
(to be filled and signed by the Bidder)

The Contractor in accordance with Clause 34 of the Conditions of Contract shall provide description of his construction camp's facilities and staff housing requirements.

The Contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the Contractor's construction camp.

The Bidder shall list or explain his plans for providing these facilities for the service of the Contract as follows:

1. Site Preparation (clearing, land preparation, etc.).
2. Provision of Services.
  - a) Power (expected power load, etc.).
  - b) Water (required amount and system proposed).
  - c) Sanitation (sewage disposal system, etc.).
3. Construction of Facilities
  - a) Contractor's Office, Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
  - b) Warehouses and Storage Areas (area required, type of construction and layout).
  - c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.).
4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).
5. Other Items Proposed (Security services, etc.). The Contractor should mention here what are his proposed environmental measures for the project as per EPA rules like treatment of wastewater and water quality etc. The Contractor shall submit a detailed EMP (Environmental Management Plan) to describe how materials are removed from site and disposed off at a safe location, prevention for the contamination of ground and surface water in neighboring areas etc. including remedial measures for adoption.
6. Detail of testing Lab with testing equipment etc.

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_



**LIST OF SUBCONTRACTORS**  
(to be filled and signed by the Bidder)

I/We intend to subcontract the following parts of the Work to subcontractors. In my/our opinion, the subcontractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the Contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

**NOT APPLICABLE**

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_





**ESTIMATED PROGRESS PAYMENTS**

Bidder's estimate of the value of work which would be executed by him during each of the periods stated below, based on his Programme of the Works and the Rates in the Bill of Quantities, expressed in percentage:

<b>Months</b>	<b>% to be executed</b>
<b>(a)</b>	<b>(b)</b>
1 <sup>st</sup> quarter	
2 <sup>nd</sup> quarter	
3 <sup>rd</sup> quarter	
4 <sup>th</sup> quarter	
5 <sup>th</sup> quarter	
6 <sup>th</sup> quarter till completion of project	
<b>Total</b>	<b>100 %</b>

Authorized Signature and official Seal: \_\_\_\_\_

Name \_\_\_\_\_

Date: \_\_\_\_\_

Completion of Leflover Works of Chategale Campus, Package – B1, University of Poonch, Rawalakot



**ORGANIZATIONAL CHART  
FOR THE SUPERVISORY STAFF AND LABOUR  
CIVIL & ELECTRICAL WORKS  
(to be signed by the Bidder)**

The Bidder shall provide detailed organizational chart including the supervisory staff and labour for execution of works.

Following is the list of Minimum Mandatory Staff Requirement to be deployed at site immediately by the Contractor upon commencement of Works till completion of the Project.

**MINIMUM MANDATORY STAFF REQUIREMENT:**

<i>Designation</i>	<i>Nos.</i>	<i>Minimum Qualification</i>	<i>Min. Relevant Working Experience</i>
<i>(A)</i>	<i>(B)</i>	<i>(C)</i>	<i>(D)</i>
Project Manager	01	B.Sc. Civil Engr. with valid PEC Registration	10 years
Site Engineer / Planning Engineer	01	B.Sc. Civil Engr. with valid PEC Registration	06 years
Material Engineer	01	B.Sc. Civil Engineer / Geological Engineering with valid PEC Registration	06 years
Site Supervisor	02	DAE (Civil)	07 years
Site Supervisor	01	DAE (Electrical)	07 years
Quantity Surveyor	01	DAE (Civil)	07 years
Surveyor	01	Survey Certificate	07 years
Safety Inspector	01	Graduate with NEBOSH / OSH certification	05 years
Lab Technician	01	DAE (Civil)	05 years

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Completion of Leftover Works of Chotagata Campus, Package – B1, University of Poonch, Rawalakot



(INTEGRITY PACT)

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE  
SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH **RS.**  
10.00 MILLION OR MORE

Contract No. \_\_\_\_\_ Dated \_\_\_\_\_  
Contract Value: \_\_\_\_\_  
Contract Title: \_\_\_\_\_

..... [Name of Contractor] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan (GoP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoP through any corrupt business practice.

Without limiting the generality of the foregoing, [name of Contractor] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

[Name of Contractor] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[Name of Contractor] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Contractor] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.

Name of Employer: .....

Name of Contractor: .....

Signature: .....

[Seal]

Signature: .....

[Seal]





### FINANCIAL COMPETENCE AND ACCESS TO FINANCIAL RESOURCES

The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credits, and other financial means, other than any contractual advance payments, to meet the financial requirements of the contract in the amount of his bid.

The Bidder shall submit copies of annual audit reports for the last three years duly certified by the Chartered Accounts/ Bank, line(s) of credits and must indicate the soundness of the Applicants financial position. The financial position of the bidder shall be checked as per following details:

#### A- Annual Construction Turnover

The minimum annual volume of construction work (Annual Turn-Over) during any of the last three years shall be as under:

Annual Construction Turn Over	Total Marks	Qualifying/ Passing Marks
i. Rs. 500 million to 600 million	7.5	
ii. Above Rs. 600 million	15	
<b>Maximum Marks Allocated</b>	<b>15</b>	<b>7.5</b>

#### Notes:

- In the case of a Joint Venture, all partners combined must meet the minimum required qualification marks of Annual Construction Turnover and each partner must obtain 50% of the minimum required qualification marks i.e. 3.75 marks.
- Since the Employer (UPR) intends to invite bids for the remaining works of Chotagalla Campus Package-B1 and B2 simultaneously, if a bidder applies for both packages, the minimum annual turnover required will be PKR 1,000 million to qualify for both packages.

#### B- Working Capital & Credit Facility

The minimum amount of Working Capital (current) & credit facilities (in specific name of project), shall be as under:

Working Capital & Credit Facility	Marks	Qualifying/Passing Marks
i. Rs. 100 million to 130 million	7.5	
ii. Above Rs. 130 million	15	
<b>Maximum Marks Allocated</b>	<b>15</b>	<b>7.5</b>

Working capital is the difference between current assets and current liabilities and measures the firm's ability to generate cash in the short term.

Any line of credit indicated for this (tendered) project needs to have been certified by the Bank and the said certificate is enclosed with this Appendix.



**Notes:**

- i. In the case of a Joint Venture, all partners combined must meet the minimum required qualification marks and each partner must obtain 50% of the minimum required qualification marks i.e. 3.75 marks.
- ii. Since the Employer (UPR) intends to invite bids for the remaining works of Chotagalla Campus Package-B1 and B2 simultaneously, if a bidder applies for both packages, the minimum amount of Working Capital & Credit facility required will be PKR 300 million to qualify for both packages.

Provisions of any fake and bogus information in Appendix M & N if found during scrutiny of bids shall lead to make the bidder technically non-responsive and action will be taken against the bidder as per PPRA rules.

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Completion of Leftover Works of Chotagala Campus, Package – B1, University of Poonch, Rawalakot*



**PAST PERFORMANCE, CURRENT COMMITMENT, QUALIFICATION AND EXPERIENCE**

Qualification of Bidders shall be evaluated on the basis of below mentioned criteria regarding the Bidder's experience record and personnel capabilities in addition to fulfillment of mandatory requirements mentioned in Sub-Clause 26.1 of the Bidding Data Sheet.

The Employer reserves the right to waive minor deviations, if they do not materially affect the capability of the Bidder to perform the Contract.

**1) General Construction Experience**

Requirement	Bidder to Provide details (Name, cost etc.)	Role	Submission Requirements
Experience under construction contracts in the role of contractor/sub-contractor/management contractor for the last 10 years prior to the bid submission deadline.	i.		Letter of Award,  %age Progress of Project
	ii.		
	iii.		
	iv.		

**Note:**

Bidders shall provide detail of projects executed/in-hand. However, General Construction experience will not be considered for evaluation of qualification of bidders.

**2) Contracts of Similar Size and Nature**

Points for experience of similar size and nature will be given on the basis of the following criteria:

Sr. No.	Sub-Category	Max. Marks	Marks Allocation	Min. Qualifying/ Passing Marks
a)	Experience in execution of Building Projects of similar nature and complexity completed during last ten (10) years.	30	<ul style="list-style-type: none"> <li>• 15 marks will be awarded for each completed project having cost <math>\geq</math> Rs. 600M up to maximum of 30 marks.</li> <li>• 10 marks will be awarded for each completed project having cost from Rs. 500M to Rs. 599.99M up to maximum of 30 marks.</li> <li>• 7.5 marks will be awarded for each completed project having cost from Rs. 400M to Rs. 499.99M up to maximum of 30 marks.</li> <li>• No marks will be awarded for completed projects having cost &lt; Rs. 400M.</li> </ul>	





Sr. No.	Sub-Category	Max. Marks	Marks Allocation	Min. Qualifying/ Passing Marks
b)	Experience in execution of Building Projects of similar nature and complexity currently in-hand.	10	<ul style="list-style-type: none"> <li>• 5 marks will be awarded for each in-hand project having cost <math>\geq</math> Rs. 600M up to maximum of 10 marks.</li> <li>• 3.5 marks will be awarded for each in-hand project having cost from Rs. 500M to Rs. 599.99M up to maximum of 10 marks.</li> <li>• 2.5 marks will be awarded for each in-hand project having cost from Rs. 400M to Rs. 499.99M up to maximum of 10 marks.</li> <li>• No marks will be awarded for in-hand projects having cost <math>&lt;</math> Rs. 400M.</li> </ul>	
<b>Total Marks Allocated</b>		<b>40</b>		<b>20</b>

**Note:**

- i. Applicant shall provide complete information of the projects including "Letter of Award" of in-hand and completed projects and Taking Over/Completion Certificate of completed projects scope, cost and covered area, name address, phone number, email etc. as per Performa attached at Page No. **BN-5 Appendix-N to Bid**. No marks will be given to the projects for which above letter/certificate is not provided.
- ii. In the case of a Joint Venture, all partners combined must obtain the minimum required qualification marks and each partner must obtain 50% of the minimum required qualification marks i.e. 10 marks.
- iii. Provisions of any fake and bogus information in Appendix M & N if found during scrutiny of bids shall lead to make the bidder technically non-responsive and action will be taken against the bidder as per PPRA rules.

**3) Personnel Capabilities**

The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:



Sr. No	Designation	Min. Requirement	Max. Marks	Marks Allocation	Min. Qualifying/ Passing Marks
1.	Project Manager B.Sc. Civil Engineering	1 No.	3	• 3 Marks will be awarded for B.Sc. Civil Engineer registered with Pakistan Engineering Council having at least 10 years' experience.	
2.	Site / Planning Engineer B.Sc. Civil Engineering	1 No.	2	• 2 Marks will be awarded for B.Sc. Civil Engineer registered with Pakistan Engineering Council having at least 06 years' experience.	
3.	Material Engineer B.Sc. Civil Engineering/ B.Sc. Geology	1 No.	2	• 2 Marks will be awarded for B.Sc. Civil Engineer registered with Pakistan Engineering Council having at least 06 years' experience.	
4.	Site Supervisor - Associate Engineer having B-Tech /DAE (Civil)	2 No.	3	• 1.5 Marks will be awarded for each Associate Engineer B-Tech / DAE (Civil) having at least 07 years' experience.	
5.	Site Supervisor - Associate Engineer having B-Tech /DAE (E/M)	1 No.	1.5	• 1.5 Marks will be awarded for Associate Engineer B-Tech / DAE (E/M) having at least 07 years' experience.	
6.	Quantity Surveyor having B-Tech / DAE (Civil)	1 No.	1.5	• 1.5 Marks will be awarded for Quantity Surveyor having B-Tech / DAE and at least 07 years' experience.	
7.	Surveyor	1 No.	1	• 1 mark will be awarded for surveyor having certificate and at least 07 years' experience.	
8.	Lab Technician	1 No.	1	• 1 mark will be awarded for Lab Technician having certificate and at least 05 years' experience.	
<b>Total Marks Allocated</b>			<b>15</b>		<b>9</b>

**Notes:**

- The applicant must provide verifiable proof of employment of the staff (i.e. appointment letter / salary slip) and attach detailed CVs & valid PEC Registration Certificates / Diploma / Certificates of the Engineer, DAEs staff.
- The Bidder shall meet 60% of personnel marks i.e. 9 out of 15.
- In the case of a Joint Venture, all partners combined must obtain the minimum required qualification marks and each partner must obtain 50% of the minimum required qualification marks i.e. 4.5 marks.



4) Data regarding past performance and present commitments of the Bidders

Past Performance/Present Commitments								
S. No	Name of ongoing project(s) including cost of project	Name, address, phone no. and email of Employer	Date of		Progress		Remarks regarding delays if applicable	Satisfactory performance certificate from employer (Minimum requirement)
			Start	Completion	%age planned	%age completed		
1.								
2.								
3.								
4.								





**Details of Contracts of Similar Nature and Complexity**

Name of Applicant \_\_\_\_\_

- Attach Taking Over Certificate / Completion Certificate
- Use separate sheet for each project.

1.	Name of Contract
	Country
2.	Name of Employer
3.	Employer Address with Telephone number and email .....
4.	Nature of works and special features relevant to the contract for which the Applicant wishes to qualify ..... .....
5.	Contract Role (Tick One) (a) Sole Contractor    (b) Sub- Contractor    (c) Partner in a Joint Venture
6.	Value of the total contract (in specified currencies) at completion, or at date of award for current contract Currency.....                      Currency.....                      Currency.....
7.	Covered Area (Sft)
8.	Equivalent in Pak/Rs.
9.	Date of Award
10.	Date of Completion
11.	Contract Duration (Years and Months) _____ Years                      _____ Months
12.	Scope of Work..... ..... .....

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_



**LIST OF DRAWINGS**  
(to be signed by the Bidder)

As provided in Volume – III

Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Completion of Leftover Works of Chatagala Campus, Package – B1, University of Poonch, Rawalakot*



## FORMS



## FORMS

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**FORM OF BID SECURITY  
(BANK GUARANTEE)**

Security Executed on \_\_\_\_\_  
(Date)

Name of Surety with Address: \_\_\_\_\_  
(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address \_\_\_\_\_

Penal Sum of Security Rupees. \_\_\_\_\_ (Rs. \_\_\_\_\_)

Bid Reference No: \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto

(hereinafter called the 'Employer') in the sum stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying Bid dated \_\_\_\_\_ for \_\_\_\_\_

\_\_\_\_\_ to the said Employer, and  
(Particulars of Bid)

WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the Employer, conditioned as under:

- (1) that the Bid Security shall remain in force upto and including the date 28 days after the deadline for validity of Bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived.
- (2) that the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and
- (3) that in the event of failure of the successful Bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to Clause 15.6 of the Instruction to Bidders for the successful Bidder's failure to perform.

NOW THEREFORE, if the successful Bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a formal Contract with the said Employer in accordance with his Bid as accepted and furnish within fourteen (14) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non withdrawal of the said Bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

*Completion of Leftover Works of Chotagala Campus, Package – B1, University of Poonch, Rawalakot*



PROVIDED THAT the Surety shall forthwith pay the Employer the said sum upon first written demand of the Employer (without cavil or argument) and without requiring the Employer to prove or to show grounds or reasons for such demand, notice of which shall be sent by the Employer by registered post duly addressed to the Surety at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Bidder) has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated above, or has defaulted in fulfilling said requirements and the Surety shall pay without objection the said sum upon demand from the Employer forthwith and without any reference to the Principal (Bidder) or any other person.

IN WITNESS WHEREOF, the above bounden Surety has executed the instrument under its seal on the date indicated above, the name and seal of the Surety being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

SURETY (Bank)

WITNESS:

1. \_\_\_\_\_  
\_\_\_\_\_

Corporate Secretary (Seal)

2. \_\_\_\_\_  
\_\_\_\_\_

Name, Title & Address

Signature \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Corporate Guarantor (Seal)





**FORM OF PERFORMANCE SECURITY  
BANK GUARANTEE (UNCONDITIONAL)**

Guarantee No. \_\_\_\_\_  
Executed on \_\_\_\_\_  
Expiry date \_\_\_\_\_

Name of Guarantor (Bank) with address: \_\_\_\_\_

Name of Principal (Contractor) with address: \_\_\_\_\_

Penal Sum of Security (express in words and figures) \_\_\_\_\_

Letter of Acceptance No:- \_\_\_\_\_ Dated \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the \_\_\_\_\_ (hereinafter called the Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance for \_\_\_\_\_ (Name of Contract) for the \_\_\_\_\_ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 49, Defects Liability, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, \_\_\_\_\_ (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Employer's designated Bank & Account Number.

Completion of Leftover Works of Chofagala Campus, Package - B1, University of Poonch, Rawafskot



PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above-bounden Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

\_\_\_\_\_  
Guarantor (Bank)

Witness:

1. \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

2. \_\_\_\_\_

\_\_\_\_\_  
Name, Title & Address

Signature \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

\_\_\_\_\_  
Corporate Guarantor (Seal)



## FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the \_\_\_\_\_ day of \_\_\_\_\_ (month), 2024 between \_\_\_\_\_ (hereafter called the "Employer" which expression shall include the successors, legal representatives and permitted assignees) of the one part and \_\_\_\_\_ (hereafter called the "Contractor" which expression shall include the successors, legal representatives and permitted assignees) of the other part.

WHEREAS the Employer is desirous that certain Works, viz \_\_\_\_\_ should be executed by the Contractor and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW this Agreement witnesseth as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents after incorporating addenda, if any, except those parts relating to Instructions to Bidders shall be deemed to form and be read and construed as part of this Agreement, viz:
  - (a) The Contract Agreement;
  - (b) The Letter of Acceptance;
  - (c) The Completed Form of Bid;
  - (d) Special Stipulations (Appendix-A to Bid);
  - (e) The Particular Conditions of Contract – Part II;
  - (f) The General Conditions of Contract– Part I;
  - (g) The Specifications - Special Provisions;
  - (h) The Completed Appendices to Bid (B to N), (excluding Appendix-D to Bid);
  - (i) The Drawings; (Volume-III)
  - (j) The Specifications, Technical Provisions;
  - (k) The Priced Bill of Quantities; (Appendix-D to Bid)
  - (L) The Addenda Nos. \_\_\_\_\_ dated \_\_\_\_\_ issued by the Employer/ Engineer;
  - (M) Performance Security (Bank Guarantee (Unconditional));
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.





4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

**For and on behalf of  
Contractor**

**For and on behalf of  
Employer**

Signature (with Seal): \_\_\_\_\_

Signature (with Seal): \_\_\_\_\_

Name :- \_\_\_\_\_

Name :- \_\_\_\_\_

Title :- \_\_\_\_\_

Title :- \_\_\_\_\_

Signed, Sealed and Delivered in the presence of:

**Witness**

**Witness**

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Name :- \_\_\_\_\_

Name :- \_\_\_\_\_

Title :- \_\_\_\_\_

Title :- \_\_\_\_\_

Address :- \_\_\_\_\_

Address :- \_\_\_\_\_



**MOBILIZATION ADVANCE BANK GUARANTEE**

Guarantee No \_\_\_\_\_ Date \_\_\_\_\_

WHEREAS \_\_\_\_\_ (hereinafter called the 'Employer') has entered into a Contract for \_\_\_\_\_  
(Particulars of Contract)  
 with \_\_\_\_\_ (hereinafter called the "Contractor").

AND WHEREAS, the Employer has agreed to advance to the Contractor, at the Contractor's request, an amount of Rupees \_\_\_\_\_ (Rs \_\_\_\_\_) which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS, the Employer has asked the Contractor to furnish Guarantee to secure the mobilization advance for the performance of his obligations under the said Contract.

AND WHEREAS, \_\_\_\_\_  
(Scheduled Bank in Pakistan)  
 (hereinafter called the "Guarantor") at the request of the Contractor and in consideration of the Employer agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

NOW, THEREFORE, the Guarantor hereby guarantees that the Contractor shall use the advance for the purpose of above mentioned Contract and if he fails and commits default in fulfilment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the Employer for payment not exceeding the aforementioned amount.

Notice in writing of any default, of which the Employer shall be the sole and final judge, on the part of the Contractor, shall be given by the Employer to the Guarantor, and on such first written demand, payment shall be made by the Guarantor of all sums then due under this Guarantee without any reference to the Contractor and without any objection.

This Guarantee shall remain in force until the advance is fully adjusted against payments from the Interim Payment Certificates of the Contractor or until \_\_\_\_\_ whichever is earlier.  
(Date)

The Guarantor's liability under this Guarantee shall not in any case exceed the sum of Rupees \_\_\_\_\_ (Rs \_\_\_\_\_).

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

**GUARANTOR**

- 1. Signature \_\_\_\_\_
- 2. Name \_\_\_\_\_
- 3. Title \_\_\_\_\_

**WITNESS**

1. \_\_\_\_\_  
 Corporate Secretary (Seal)

2. \_\_\_\_\_  
 (Name Title & Address)

\_\_\_\_\_ Corporate Guarantor(Seal)



INDEMNITY BOND  
FOR SECURED ADVANCE  
AGAINST MATERIALS BROUGHT AT SITE

**NOT APPLICABLE**





**PART- I**

**GENERAL CONDITIONS OF CONTRACT**

## PART-1

### GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract (Part-1) are based on the FIDIC "Conditions of the Contract for Works of Civil Construction, Part-1 General Conditions" Fourth Edition (1987) Reprinted in 1988, with editorial amendments, Reprinted in 1992 with further amendments. These Conditions of Contract are published by the "FEDERATION OF INTERNATIONALE DES INGENIEURS-CONSEILS" (FIDIC), P.O. Box 86, CH 1000 Lausanne, 12-Chailly, SWITZERLAND. email.fidic.pub@fidic.org

The prospective Bidders are required to obtain copy of the above mentioned Conditions of Contract directly from Head Office of FIDIC, on the address indicated above against payment of their usual charges. However, the aforesaid FIDIC Conditions of Contract are available in the PEC Standard Form of Bidding Documents (Civil Works) which may be purchased from PEC Head office, Islamabad, for ready reference.

The successful Bidder after award of work shall have to provide three (3) copies of the said FIDIC Conditions of Contract for Works of Civil Construction, all in original obtained from the publishers for incorporation of the same in the Contract Documents of the Work.



**PART - II**

**PARTICULAR CONDITIONS OF CONTRACT**



**PART II - PARTICULAR CONDITIONS OF CONTRACT**  
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**PART II  
PARTICULAR CONDITIONS OF CONTRACT**

These Particular Conditions Of Contract - Part II are additions, deletions and amendments to General Conditions of Contract - Part I and shall be taken into consideration in interpreting or construing such clauses. Sub-Clause numbers, if similar as of Part-I, are amendments therein otherwise these are additional Clauses or Sub-Clauses thereto.

- Definitions 1.1** (a) (i) The **"Employer"** is Registrar, University of Poonch, Shamsabad Campus, Hajira Road, Rawalakot AJ&K, the legal successors and any assignee of such person.

**"Employer's Representative" is:**

**Project Director**  
Chotagala Campus  
University of Poonch, Rawalakot  
Directorate of Works,  
Shamsabad Campus  
Hajira Road, .  
Rawalakot, AJ&K  
Tel: 05824-960094

or any other competent person appointed in writing by the Employer and shall take effect on delivery of such appointment to the Engineer and the Contractor. The Employer may from time to time delegate to the Employer's Representative any of the duties and authorities vested in the Employer and may at any time revoke such delegation.

Any communication given by the Employer's Representative to the Engineer and the Contractor in accordance with such delegation shall have the same effect as though it had been given by the Employer.

- (a) (iv) The **"Engineer"** is 'National Engineering Services Pakistan (Pvt.) Limited (**NESPAK**)' Islamabad, as nominated by the Consultants and approved by the Employer or any other competent person appointed by the Employer, and notified to the Contractor, to act in replacement of the Engineer. Provided always that except in cases of professional misconduct, the outgoing Engineer to formulate his certifications/recommendations in relation to all outstanding matters, disputes and claims relating to the execution of the Works during his tenure.

Add the following paragraphs:

- (a) (vi) **"Bidder or Tenderer"** means any person or persons, company, corporation or firm submitting a Bid or Tender.
- (b) (v) Add the following at the end of the paragraph:

The word **"Tender"** is synonymous with **"Bid"** and the word **"Tender Documents"** with **"Bidding Documents"**.

Add the following paragraph:

- (b) (ix) **"Programme"** means the programme to be submitted by the Contractor in accordance with Sub-Clause 14.1 and any approved revisions thereto.
- (e) (i) Delete the text and substitute with the following:





**"Contract Price"** means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works subject to such additions thereto or deductions therefrom as may be made and remedying of any defects therein in accordance with the provisions of the Contract.

**Engineer's Duties and Authority 2.1**

- (b) With reference to Sub-Clause 2.1(b), the following provisions shall also apply:

The Engineer shall obtain the specific approval of the Employer before carrying out his duties in accordance with the following Clauses:

- (i) Consenting to the sub-letting of any part of the Works under Sub-Clause- 4.1 "Subcontracting".
- (ii) Certifying additional cost determined under Sub-Clause 12.2 "Not Foreseeable Physical Obstructions or Conditions".
- (iii) Any action under Clause 10 "Performance Security" and Clauses 21,23,24 & 25 "Insurance" of sorts.
- (iv) Any action under Clause 40 "Suspension".
- (v) Any action under Clause 44 "Extension of Time for Completion."
- (vi) Any action under Clause 47 "Liquidated Damages for Delay".
- (vii) Issuance of "Taking Over Certificate" under Clause 48.
- (viii) Issuing a Variation Order under Clause 51, except:
  - a) in an emergency\* situation, as stated here below, or
  - b) if such variation would increase the Contract Price by an amount equal to or less than the amount stated in the Appendix-A to bid.
- (ix) Fixing rates or prices under Clause 52.
- (x) Extra payment as a result of Contractor's claims under Clause 53.
- (xi) Release of Retention Money to the Contractor under Sub-Clause 60.3 "Payment of Retention Money".
- (xii) Issuance of "Final Payment Certificate" under Sub-Clause 60.8.
- (xiii) Issuance of "Defect Liability Certificate" under Sub-Clause 62.1.
- (xiv) Any change in the ratios of Contract currency proportions and payments thereof under Clause 72 "Currency and Rate of Exchange".

\* (If in the opinion of the Engineer an emergency occurs affecting the safety of life or of the Works or of adjoining property, the Engineer may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk.



The Contractor shall forthwith comply with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.

**Engineer's Representative**

2.2 Following paragraph is added.

The Employer shall ensure that the Engineer's Representative is a professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)

Add the following Sub-Clauses:

**Engineer not Liable**

2.7 Approval, reviews and inspection by the Engineer of any part of the Works does not relieve the Contractor from his sole responsibility and liability for the supply of materials, plant and equipment for construction of the Works and their parts in accordance with the Contract and neither the Engineer's authority to act nor any decision made by him in good faith as provided for under the Contract whether to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any of their representatives or employees or any other person performing any portion of the Works.

**Replacement of the Engineer**

2.8 "If the Employer intends to replace the Engineer, the Employer shall, not less than 14 days before the intended date of replacement, give notice to the Contractor, of the name, address and relevant experience of the intended replacement Engineer. The Employer shall not replace the Engineer with a person against whom the Contractor raises reasonable and logically convincing objection by notice to the Employer, with supporting particulars and verifiable documentary evidence."

**Language(s) and Law**

5.1 (a) The Contract Documents shall be drawn up in the English language.  
(b) The Contract shall be subject to and construed according to the Laws of Azad Jammu & Kashmir (AJK).

**Priority of Contract Documents**

5.2 Delete the documents listed at (1) to (6) of the Sub-Clause and substitute with the following:

- (a) The Contract Agreement;
- (b) The Letter of Acceptance;
- (c) The completed Form of Bid;
- (d) Addenda (if any);
- (e) Special Stipulations (Appendix-A to Bid);
- (f) The Particular Conditions of Contract – Part II;
- (g) The General Conditions of Contract – Part I;
- (h) The Specifications - Special Provisions
- (i) The completed Appendices to Bid (B to N), (excluding Appendix-D to Bid);
- (i) **For Scheduled Items:**
  - 1) Priced Bill of Quantities (BOQ) (Appendix-D to Bid)
  - 2) Drawings (Volume III)
  - 3) Punjab MRS Specifications

**For Non-Scheduled Items:**

- 1) Priced Bill of Quantities (BOQ) (Appendix-D to Bid)
- 2) Drawings (Volume – III)
- 3) Technical Specifications





- (j) Any other document forming part of the Contract by reference;

In case of discrepancies between drawings, those of larger scale shall govern unless they are superseded by a drawing of later date regardless of scale. All Drawings and Specifications shall be interpreted in conformity with the Contract and these Conditions. Addendum, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract.

Add the following Sub-Clauses:

**Shop Drawings 6.6** The Contractor shall submit to the Engineer for review 3 copies of all shop and erection drawings applicable to this Contract as per provision of relevant Sub-Clause of the Contract.

Review and approval by the Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and that the Engineer's review or approval shall not relieve the Contractor of any of his responsibilities under the Contract.

**As-Built Drawings 6.7** At the completion of the Works under the Contract, the Contractor shall furnish to the Engineer 6 copies and one reproducible of all drawings amended to comply with the Works as built. The price of such Drawings shall be deemed to be included in the Contract Price.

**Contract Agreement 9.1** Delete the text of Sub-Clause 9.1 in its entirety and substitute with the following:

The Contractor shall enter into and execute the Contract Agreement in the form annexed to the Bidding / Contract Documents. The Contract Agreement, Performance Security, Insurance Policies / Bonds and other Bond/Guarantees/Sureties including Agreement fee shall be prepared and completed at the cost of the Contractor. The Contractor shall prepare six (6) copies of the Contract Document (including all the volumes / documents listed in the Contract Agreement) along-with copies of all the bonds/Guarantees/Sureties, at his cost and shall submit the same to the Employer.

**Performance Security 10.1** Delete the text and substitute with the following:

The Contractor shall provide Performance Security to the Employer in the prescribed form. The said Security shall be furnished or caused to be furnished by the Contractor within 28 days after the receipt of the Letter of Acceptance. The Performance Security shall be of an amount equal to 10% of the Contract Price stated in the Letter of Acceptance. Such Security shall be in the form of either (a) bank guarantee from any Scheduled Bank in Pakistan or (b) bank guarantee from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan.

In case of Bid Price is more than 10% below the Engineer's Estimate, the Contractor shall furnish an additional Performance Security in shape of deposit at call (CDR) from any scheduled bank of Pakistan having its branches in AJK of an amount equal to the difference of Bid Cost and Engineer's Estimate. Additional Performance Security shall be released within 14 days after issuance of taking over certificate.

The cost of complying with requirements of this Sub-Clause shall be borne by the Contractor.





Add the following Sub-Clause:

**Performance Security Binding on Variations and Changes**      **10.4**      The Performance Security shall be binding irrespective of changes in the quantities or variations in the Works or extensions in Time for Completion of the Works which are granted or agreed upon under the provisions of the Contract.

**Programme to be Submitted**      **14.1**      Delete the text and substitute with the following:  
  
The Contractor shall prepare and submit the programme of the work acceptable to the Engineers within forty two (42) days of the receipt of Letter of Acceptance for agreement of the Engineer and approval of the Employer. This programme shall identify and highlight those activities which are on the critical path.

The time schedule may be adjusted from time to time but the contractual completion date (Time for Completion) shall remain unchanged in accordance with the Bidding documents unless extensions of time for completion of the Works are approved in accordance with the provisions of the Contract.

The programme should be computerized and drawn-up on the critical path method (CPM). Progress reporting by the Contractor should be supported, on a monthly basis with an updated analysis of the progress including a statement on items, which are or are going to become critical to the progress of the Work, along with the proposal on how the Contractor intends to alleviate the situation. Programme should include complete sequence of activities. Programme to be Primavera based and updated with actual progress continually.

**Cash Flow Estimate to be Submitted**      **14.3**      Delete the text of Sub-Clause 14.3 and substitute with the following:  
  
The detailed Cash Flow Estimate shall be submitted by the Contractor to the Engineer within forty two (42) days from the date of receipt of Letter of Acceptance. The Cash Flow Estimate shall be provided, in monthly periods, of all payments to which the Contractor will be entitled under the Contract and the Contractor shall subsequently supply revised cash flow estimates at monthly intervals, if required to do so by the Engineer.

Add the following Sub-Clause:

**Detailed Programme and Monthly Progress Report**      **14.5**      a) For purposes of Sub-Clause 14.1, the Contractor shall submit to the Engineer detailed programme for the following:

- (1) Execution of Works;
- (2) Labour Employment;
- (3) Material Procurement;
- (4) Schedule for submittals of shop drawings/bar-bending schedule, samples of material/literature for approval; and
- (5) Other details as required by the Engineer.

(b) During the period of the Contract, the Contractor shall submit to the Engineer not later than the 5<sup>th</sup> day of the following month, 04 copies each of Monthly Progress Reports covering:

- (1) A Construction Schedule indicating the monthly progress in percentage;
- (2) Description of all work carried out since the last report;
- (3) Description of the work planned for the next 28 days sufficiently detailed to enable the Engineer to determine his



- programme of inspection and testing;
- (4) Monthly summary of daily job record;
- (5) Photographs to illustrate progress; and
- (6) Information about problems and difficulties encountered, if any, and proposals to overcome the same.

- (c) During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be made available to the Engineer as and when requested. The daily record shall include particulars of weather conditions, number of men working, deliveries of materials, quantity, location and assignment of Contractor's equipment.

Add the following Sub-Clauses:

- |  |             |   |
|--|-------------|---|
| <b>Language Ability of Contractor's Representative</b> | <b>15.2</b> | The Contractor's authorised representative shall be fluent in the English language. Alternately an interpreter with ability of English language shall be provided by the Contractor on full time basis.                   |
| <b>Contractor's Representative</b>                     | <b>15.3</b> | The Contractor's authorized representative and his other professional engineers working at Site shall register themselves with the Pakistan Engineering Council.  |
|  |             | The Contractor's authorized representative at Site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract. |

Add the following Sub-Clauses:

- |   |             |  |
|---|-------------|--|
| <b>Language Ability of Superintending Staff of Contractor</b> | <b>16.3</b> | A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the English language. If the Contractor's superintending staffs is not fluent in English language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer. |
| <b>Employment of Local Personnel</b>                          | <b>16.4</b> | The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour preferably from sources within AJ&K.  |

Add the following Sub-Clauses:

- |                               |             |  |
|-------------------------------|-------------|--|
| <b>Safety Precautions</b>     | <b>19.3</b> | In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the Safety Requirements of the Government of Pakistan with such modifications thereto as the Engineer may authorise or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose. |
|                               |             | The Contractor shall make, maintain and submit reports to the Engineer concerning safety, health and welfare of persons and damage to property, as the Engineer may from time to time prescribe.   |
| <b>Lighting Work at Night</b> | <b>19.4</b> | In the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night-work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer's Representative.  |





**Employer's Risks**    20.4    Delete the text and substitute with the following:

The Employer's risks are:

- (a) insofar as they directly affect the execution of the Works in Pakistan:
  - (i) war and hostilities (whether war be declared or not), invasion, act of foreign enemies,
  - (ii) rebellion, revolution, insurrection, or military or usurped power, or civil war,
  - (iii) ionizing radiations, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof,
  - (iv) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
  - (v) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors and arising from the conduct of the Works;
- (b) loss or damage due to the use or occupation by the Employer of any Section or part of the Permanent Works, except as may be provided for in the Contract;
- (c) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible; and
- (d) any operation of the forces of nature (insofar as it occurs on the Site) which an experienced contractor:
  - (i) could not have reasonably foreseen, or
  - (ii) could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measures:
    - (a) prevent loss or damage to physical property from occurring by taking appropriate measures, or
    - (b) insure against.

**Insurance of Works and Contractor's Equipment**    21.1

The Contractor is bound to provide all the below mentioned insurance policies, as mentioned below, for the persons, works and equipment, etc. on the Contract.

(a) General Requirements

The Engineer/Engineer's Representative and their designate staff for supervision of work shall be included as an insured party against all risks and liabilities. The Contractor shall insure with any one of the Insurance Companies approved for this purpose by the Employer in the joint names of the Employer, the Engineer, and the Contractor against all loss or damages as stated in the General Conditions and as stated herein.

Notwithstanding the responsibilities of the Contractor for indemnities and insurance as described above, the Contractor before commencing work on the Site, must discuss fully with the Engineer and the Employer the Insurance coverage provided by each under any general policies which are to be applied to this Contract to ensure that there are no contingencies left uncovered and to reduce, as far as practicable, duplication of coverage. Should any areas of possible damage or loss be discovered that





are not covered by definition of responsibilities set out in these conditions, the addition or reduction in premiums required to give such insurance coverage will be paid by the Contractor and the policies obtained by the mutual agreement of the Employer and the Contractor.

All payments will be in Pakistan Rupees required to replace the damaged items.

The Contractor shall be responsible for deductibles and losses not covered by insurance.

An insurance loss shall not affect the Employer's or Contractor's rights and obligations under the Contract.

All policies shall state that:

- i. the Employer shall receive at least fourteen (14) days written notice of intended cancellation or change affecting coverage.
- ii. the Contractor is fully protected so as to provide full indemnity to Employer in respect of liability against loss or damage assumed by the Contractor under the Contract.
- iii. the inclusion of more than one Insured shall not affect the rights of any other insured.

The Contractor shall be responsible for observance by his Sub Contractor(s) of insurances noted herein. Before each Sub Contractor starts work the Contractor shall give the Employer proof that the Sub contractor(s) are covered by insurance equivalent to that specified herein for the Contractor.

(b) The Contractor shall include the following insurances:

- i. **Third Party Liability Insurance**  
Risks insured: bodily injury, death and property damage.  
Scope of coverage: contractual liability, tortuous liability, premises and operations liability, Contractor's contingent liability with respect to Sub Contractor's operations.  
Minimum limit: as indicated in Appendix 'A' to the Form of Bid inclusive, each occurrence.
- ii. **All Risk Property Insurance:**  
All risks including fire, flood, storm and earthquake.  
Scope of coverage: the Works, during the entire duration of the Contract including the Period of Maintenance / Defects Liability Period, and all permanent, temporary and consumable materials related to the Works which are in storage, in transit or at site of the Works.  
Minimum limit: the sum of the Contract Price plus fifteen percent (15%). This policy shall state that :
  - (a) if a loss occurs the Contractor, the Employer and the Engineer shall be paid in relation of their share of the loss.
  - (b) (Waiver of subrogation) the Insurer has no subrogation rights against any person, corporation or organization (including directors, officers, employees, servants and agents thereof) which: is an Insured under the policy, or is controlled by, owned by, or associated with an Insured, or is a Sub Contractor on the Works, or has, before a loss occurs, been released from liability by an Insured.



"Hold harmless" provisions: The Employer and the Contractor shall be indemnified against all losses.

Employer use or occupancy: If the Employer uses or occupies all or part of the Works during the life of the Policy the Contractor shall ensure that the policy continues in full force and the Employer shall pay any resulting extra cost of insurance.

Loss Procedure: If a loss occurs the Contractor shall, on behalf of the Employer and himself negotiate the value of the loss with the insurer. Unless directed otherwise by the Engineer, when agreement is reached the Contractor shall repair all damage and the Employer shall pay him, in accordance with the Engineer's certificates, for that part of the repairs which is the Employers responsibility.

If directed by the Engineer, instead of carrying out repairs, the Contractor shall pay to the party suffering the loss that part of the agreed value of the loss which is the Contractor's responsibility.

iii. All Risk Contractor's Plant Insurance

Scope of coverage: all construction machinery plant used by the Contractor for the Works.

iv. Automobile Liability Insurance.

Risks insured: Bodily injury, death, property damage and theft.

Scope of coverage: all licensed vehicles owned, hired or operated or licensed by the Contractor.

Minimum limit: as indicated in Appendix 'A' to the form of Bid inclusive each occurrence.

Cost of compliance with the requirements of this sub-clause and providing all insurance policies shall be borne by the Contractor.

**Exclusions 21.4**

Delete the text and substitute with the following:

There shall be no obligation for the insurances in Sub-Clause 21.1 to include loss or damage caused by the risks listed under Sub-Clause 20.4 paras (a) (i) to (iv).

Add the following Sub-Clause:

**Insurance Companies 25.5**

The Contractor shall be obliged to place all insurances relating to the Contract including, but not limited to, the insurances referred to in Clauses 21, 23 and 24 with either National Insurance Company of Pakistan or any other insurance company operating in Pakistan and acceptable to the Employer.

Costs of such insurances shall be borne by the Contractor.

Add the following Sub-Clause:

**Co-operation with other Contractors 31.3**

During the execution of the Works, the Contractor shall co-operate fully with other contractors working for the Employer at and in the vicinity of the Site and also shall provide adequate precautionary facilities not to make himself a nuisance to local residents and other Contractors.

Add the following Sub-Clauses:

**Rates of Wages and Conditions of 34.2**

The Contractor shall pay rates of wages and observe conditions of labour not less favourable than those established for the trade or





<b>Labour</b>		industry where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable than the general level of wages and conditions observed by other employers whose general circumstances in the trade or in industry in which the Contractor is engaged are similar.
<b>Employment of Persons in the Service of Others</b>	<b>34.3</b>	The Contractor shall not recruit his staff and labour from amongst the persons in the services of the Employer or the Engineer, except with the prior written consent of the Employer or the Engineer, as the case may be.
<b>Housing for Labour</b>	<b>34.4</b>	Save insofar as the Contract otherwise provides; the Contractor shall provide and maintain such housing accommodation and amenities as he may consider necessary for all his supervisory staff and labour, employed for the purposes of or in connection with the Contract including all fencing, electricity supply, sanitation, cookhouses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities. On completion of the Contract, unless agreed with the Employer, the temporary camps or housing provided by the Contractor shall be removed and the Site reinstated to its original condition, all to the approval of the Engineer.
<b>Health and Safety</b>	<b>34.5</b>	Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour at all times throughout the period of the Contract. The Contractor shall further ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.
<b>Epidemics</b>	<b>34.6</b>	In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for purpose of dealing with and overcoming the same.
<b>Supply of Water</b>	<b>34.7</b>	The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer or his representative, adequate supply of drinking and other water for the use of his staff and labour.
<b>Alcoholic Liquor or Drugs</b>	<b>34.8</b>	The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his Subcontractors, agents, staff or labour.
<b>Arms and Ammunition</b>	<b>34.9</b>	The Contractor shall not give, or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.
<b>Festivals and Religious Customs</b>	<b>34.10</b>	The Contractor shall in all dealings with his staff and labour have due regard to all recognised festivals, days of rest and religious and other customs.
<b>Disorderly Conduct</b>	<b>34.11</b>	The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst staff and labour and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.
<b>Compliance by Subcontractors</b>	<b>34.12</b>	The Contractor shall be responsible for compliance by his Subcontractors of the provisions of this Clause.

Add the following Sub-Clauses:





<b>Records of Safety and Health</b>	<b>35.2</b>	The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.
<b>Reporting of Accidents</b>	<b>35.3</b>	The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.
		Add the following Sub-Clause:
<b>Use of Pakistani Materials and Services</b>	<b>36.6</b>	The Contractor shall, so far as may be consistent with the Contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services, available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard and conform to the prescribed specifications.
<b>Commencement of Works</b>	<b>41.1</b>	Delete the text and substitute with the following:  The Contractor shall commence the Works on the Site within the period named in Appendix – A to Bid from the date of receipt by him from the Engineer of a written Notice to Commence. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.
<b>Bonus for Early Completion of Works</b>	<b>47.3</b>	The Contractor shall in case of earlier completion for whole of the Works pursuant to Sub-Clauses 48.1 of the General Conditions of Contract, be paid bonus up-to a limit and at a rate stated in Appendix-A to Bid "Special Stipulations".
<b>Instructions for Variations</b>	<b>51.2</b>	At the end of the first sentence, after the word "Engineer", add the words "in writing"
<b>Valuation of Variations</b>	<b>52.1</b>	Delete the words "after due consultation....Engineer and the Contractor" in seventh to ninth line and replace with following:  For Scheduled and Non-Scheduled items, the valuation will be carried out on the basis of similar items covered in the Bill of Quantities, in so far as such rates or prices apply with the application of awarded premium / rebate and where such rates or prices do not directly apply, the value shall be based on the rates or prices deduced therefrom so far as it is practicable to do so. If the same is not provided in the Bill of Quantities, the valuation will be carried out on the basis of applicable item rates of MRS 2 <sup>nd</sup> Bi-Annual – 2024 Murree (Punjab) for Murree region). Failing all above, the valuation will be carried out on the basis of actual with the application of current market rates for labour and material. No escalation on account of material or labour wages etc. shall be allowed on such items if the valuation is carried out on the basis of latest available (contemporary) MRS-Murree (Punjab) and current market rates. The percentage (%) of overheads, income tax, sales tax & profit etc. all-inclusive to be allowed in such cases shall be twenty percent (20%).  Add the following Para at the end of Sub-Clause 52.1 of Part-I:  The approval / finalization of rates of all variations shall not relieve the Contractor of his obligations under the Contract. The Contractor shall neither stop the work nor slow down the progress of the Works in awaiting the approval of rates of all variations.
<b>Failure to Comply</b>	<b>53.4</b>	Delete this Sub-Clause in its entirety.



<b>Conditions of Hire of Contractor's Equipment</b>	<b>54.5</b>	<p>Add the following paragraph:</p> <p>The Contractor shall, upon request by the Engineer at any time in relation to any item of hired Contractor's Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.</p>
<b>Payments to Nominated Subcontractors</b>	<b>59.4</b>	<p>The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with Clause 58 [Provisional Sums], except as stated in Sub-Clause 59.5 [Certification of Payments].</p>
<b>Certification of Payments &amp; Nominated Subcontractors</b>	<b>59.5</b>	<p>Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer shall be entitled to demand from the Contractor reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:</p> <p>a) submits reasonable evidence to the Engineer, or</p> <p>b)           i) satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay those amounts, and</p> <p>              ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified in writing of the Contractor's entitlement,</p>

then the Employer may (at his sole discretion) pay direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

**Time for Payment**    **60.10**    Delete the text and substitute with the following:

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other terms of the Contract, shall, subject to Clause 47, be paid by the Employer to the Contractor within twenty eight (28) days after such Interim Payment Certificate has been delivered to the Employer, or, in the case of the Final Certificate referred to in Sub Clause 60.8, within fifty six (56) days after such Final Payment Certificate has been delivered to the Employer. In the event of failure of the Employer to make payment within the times stated due to circumstances beyond his control, the Employer shall not pay to the Contractor any interest or compensation of any sort.

Add the following Sub-Clauses:

**Secured Advance on Materials**    **60.11**    Not applicable.





**Financial Assistance to Contractor** 60.12 Financial assistance shall be made available to the Contractor by the Employer by adopting the following method.

**Mobilization Advance**

- a) Mobilization Advance @ fifteen percent (15%) of the Contract Price stated in the Letter of Acceptance shall be paid by the Employer to the Contractor in two equal parts upon submission by the Contractor of a Mobilization Advance Guarantee for the full amount of the Advance in the specified form from a Scheduled Bank in Pakistan. Mobilization Advance Guarantee shall remain valid till full recovery of the Mobilization Advance. The Mobilization Advance Guarantee shall be progressively reduced to the balance amount of Mobilization Advance indicated in the IPCs certified by the Engineer.
- (1) First part within 14 days after signing of the Agreement or the date of receipt of Engineer's Notice to Commence, whichever is earlier; and
  - (2) Second part within 42 days from the date of payment of the first part, subject to the satisfaction of the Engineer as to the state of mobilization of the Contractor, bringing/installing/erecting of equipment mentioned in Appendix-G to Bid to complete full requirement for the entire work, having fulfilled his obligation under the contract agreement for provision of facilities for the Engineer and after achievement of progress to the extent of two percent (2%) value of the Works.
- b) This Advance shall be recovered @ 15% of the gross payable amount from Interim Payment Certificates (IPC) and shall be fully recovered before completion of the project.

**Default of Contractor**

63.1 Add the following para at the end of the Sub-Clause:

Provided further that in addition to the action taken by the Employer against the Contractor under this Clause, the Employer may also refer the case of default of the Contractor to Pakistan Engineering Council for punitive action under the Construction and Operation of Engineering Works Bye-Laws 1987, as amended from time to time.

**Special Risks**

65.2 Delete the text and substitute with the following:

The Special Risks are the risks defined under Sub-Clause 20.4 paragraph a (i) to (v).

**Out Break of War**

65.6 In sub-clause 65.6, delete "in any part of the World" from the second line of the paragraph.

**Arbitration**

67.3 In the sixth to eight lines, delete the words "shall be finally settled ..... appointed under such Rules" and substitute with the following:

"shall be finally settled under the provisions of the Arbitration Act, 1940 as amended or any statutory modification or re-enactment thereof for the time being in force".

Add the following paragraph:

The place of arbitration shall be **Rawalakot, AJ&K, Pakistan.**





<b>Notices to Contractor</b>	<b>68.1</b>	<p>Add the following paragraph:</p> <p>For the purposes of this Sub-Clause, the Contractor shall, immediately after receipt of Letter of Acceptance, intimate in writing to the Employer and the Engineer by registered post, the address of his principal place of business or any change in such address during the period of the Contract.</p>
<b>Notice to Employer and Engineer</b>	<b>68.2</b>	<p>For the purposes of this Sub-Clause, the respective addresses are:</p> <p><b>a) The Employer:</b></p> <p><b>Project Director</b>          Chotagala Campus          University of Poonch, Rawalakot          Directorate of Works,          Shamsabad Campus          Hajira Road, ,          Rawalakot, AJ&amp;K          Tel: 05824-960094</p> <p><b>b) The Engineer:</b></p> <p>National Engineering Services Pakistan (Pvt.) Ltd          NESPAK House,          G-5/2, Islamabad          Ph: 051-9221910-13</p>
<b>Increase or Decrease of Cost</b>	<b>70.1</b>	<p>Delete Sub-Clause 70.1 in its entirety, and substitute with the following:</p> <p>The amounts payable to the Contractor, pursuant to Sub-Clause 60.1, shall be adjusted in respect of the rise or fall in the cost of labor, materials, and other inputs to the Works, by applying to such amount the formula prescribed in this Sub-Clause.</p> <p><b>(a) Other Changes in Cost</b></p> <p>To the extent that full compensation for any rise or fall in costs to the Contractor is not covered by the provisions of this or other Clauses in the Contract, the unit rates and prices included in the Contract shall be deemed to include amounts to cover the contingency of such other rise or fall of costs.</p> <p><b>(b) Adjustment Formula</b></p> <p>The adjustment to the monthly statements in respect of changes in cost shall be determined from the following formula:-</p> $P_n = A + b \frac{L_n}{L_o} + c \frac{M_n}{M_o} + d \frac{E_n}{E_o} + \dots$ <p>Where:</p> <p><math>P_n</math> is a price adjustment factor to be applied to the amount for the payment of the work carried out in the subject month, determined in accordance with Paragraph 60.1 (a), and with Paragraphs 60.1 (b) and (e), where any variations and daywork are not otherwise subject to adjustment;</p> <p><math>A</math> is a constant, specified in the Appendix-C to Bid, representing the nonadjustable portion in contractual payments;</p>



b, c, d, etc., are weightages or coefficients representing the estimated proportion of each cost element (labour, cement and reinforcing steel etc.) in the Works or Sections thereof, net of Provisional Sums and Prime Cost, the sum of A, b, c, d, etc., shall be one;

Ln, Mn, En, etc., are the current cost indices or reference prices of the cost elements for month "n", determined pursuant to Sub-Clause 70.1(d), applicable to each cost element; and

Lo, Mo, Eo, etc., are the base cost indices or reference prices corresponding to the above cost elements at the date specified in Sub-Clause 70.1(d).

**(c) Sources of Indices and Weightages**

The sources of indices shall be those listed in the Appendix-C to Bid.

**(d) Base, Current, and Provisional Indices**

The base cost indices or prices shall be those prevailing on the day 28 days prior to the latest date for submission of bids. Current indices or prices shall be those prevailing on the day 28 days prior to the start of execution month to which a particular monthly statement is related. If at any time the current indices are not available, provisional indices as determined by the Engineer will be used, subject to subsequent correction of the amounts paid to the Contractor when the current indices become available.

**(e) Adjustment after Completion**

If the Contractor fails to complete the Works within the Time for Completion prescribed under Clause 43, adjustment of prices thereafter until the date of completion of the Works shall be made using either the indices or prices relating to the prescribed time for completion, or the current indices or prices, whichever is more favorable to the Employer, provided that if an extension of time is granted pursuant to Clause 44, the above provision shall apply only to adjustments made after the expiry of such extension of time.

**(f) Weightages**

The weightages for each of the factors of cost given in the Appendix-C to Bid shall be adjusted if, in the opinion of the Engineer, they have been rendered unreasonable, unbalanced, or inapplicable as a result of varied or additional work executed or instructed under Clause 51. Such adjustment(s) shall have to be agreed in the variation order.

<b>Subsequent Legislation</b>	<b>70.2</b>	Delete the Sub-Clause in its entirety.
<b>Currency And Rates Of Exchange</b>	<b>71 &amp; 72</b>	Delete the Clauses in their entirety.

Add the following Sub-Clauses:

<b>Payment of Income Tax</b>	<b>73.1</b>	The Contractor, Subcontractors and their employees shall be responsible for payment of all their income tax, super tax and other
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Completion of Leftover Works of Chatagala Campus, Package – B1, University of Poonch, Rawalakot





taxes on income arising out of the Contract and the rates and prices stated in the Contract shall be deemed to cover all such taxes.

<b>Cost inclusive of duties and taxes</b>	<b>73.2</b>	The rates and prices stated in the priced Bill of Quantities shall be deemed to include every element of duty or tax leviable on or in relation to the production, import, purchase, sale, delivery and transportation of materials and to the bringing thereof to the Site and no such duty or tax shall be separately reimbursable. The additional taxes/duties due to any subsequent addition or change in legislation by the Government shall have to be borne by the Contractor.
<b>Integrity Pact</b>	<b>74.1</b>	<p>If the Contractor or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Appendix-L to his Bid, then the Employer shall be entitled to:</p> <ul style="list-style-type: none"> <li>(a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Subcontractors, agents or servants;</li> <li>(b) terminate the Contract; and</li> <li>(c) recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants.</li> </ul> <p>The termination under Sub-Para (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clauses 63.1 to 63.4 and the payment under Sub-Clause 63.3 shall be made after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause</p>
<b>Termination of Contract for Employer's Convenience</b>	<b>75.1</b>	<p>The Employer shall be entitled to terminate the Contract at any time for the Employer's convenience after giving 28 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor:</p> <ul style="list-style-type: none"> <li>(a) shall proceed as provided in Sub-Clause 65.7 hereof; and</li> <li>(b) shall be paid by the Employer as provided in Sub-Clause 65.8 hereof.</li> </ul>
<b>Liability of Contractor</b>	<b>76.1</b>	The Contractor or his Subcontractors or assigns shall follow strictly, all relevant labour laws including the Workmen's Compensation Act and the Employer shall be fully indemnified for all claims, damages etc. arising out of any dispute between the Contractor, his Subcontractors or assigns and the labour employed by them.
<b>Joint and Several Liability</b>	<b>77.1</b>	If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfilment of the terms of the Contract and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.
<b>Details to be Confidential</b>	<b>78.1</b>	The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the prior consent in writing of the Employer or the Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the decision of the Engineer whose award shall be final.





<b>Precaution for Pollution</b>	<b>79.1</b>	Precautionary measures and facilities shall be provided by the Contractor at his own cost in carrying out the Works including dumping and disposal of spoils, in the manner approved by the Engineer to prevent environmental pollution.
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## **SPECIAL PROVISIONS**

## SPECIFICATIONS – SPECIAL PROVISIONS

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## SPECIFICATIONS – SPECIAL PROVISIONS

### 1. GENERAL

- 1.1 Specifications – Special Provisions shall form an integral part of Bid and the Contract documents.
- 1.2 The Contractor shall notify all sub-contractors of the provisions of these Special Provisions.

### 2. DESCRIPTION OF PROJECT, WORKS INVOLVED AND SITE

The University of Poonch Rawalakot intends to complete Leftover Works of its Chotagala Campus site in Rawalakot City.

The scope of works mainly comprises completion of leftover works of department of Agronomy and Soil Sciences, Department of Veterinary and Animal Sciences, Library, 2 Hi-Tech Lab & Girls Common Room, allied External Development Works and related ancillary works lying within the boundaries and limits shown on the Drawings and any such additional areas adjacent thereto as may be designated by the Engineer from time to time for the construction to be performed under the Contract, and all such areas and additional areas shall comprise the Site.

### 3. CODES, STANDARDS AND CERTIFICATES

#### A. Applicable Standards

Except as otherwise provided by these Specifications or the Drawings, all materials, equipment and fabrication and testing thereof shall conform to the latest applicable standards and codes referred in the Specifications by use of the abbreviations explained below:

ASCE	American Society of Civil Engineers
ASA	American Standard Association
ACI	- American Concrete Institute (USA)
AISI	- American Iron and Steel Institute (USA)
AISC	- American Institute of Steel Construction (USA)
ANSI	- American National Standard Institute (USA)
ASTM	- American Society for Testing and Materials (USA)
AASHTO	- American Association of State Highway & Transportation Officials.
AWS	- American Welding Society (USA)
BS	- British Standards (UK)
CP	- Codes of Practice (UK)
ICAO	International Civil Aviation Organization
BSICP	British Standard Institute Code of Practice
PS	- Pakistan Standards (Pak)
PCA	Portland Cement Association
PSI	Pakistan Standard Institute
SSPC	- Steel Structures Painting Council (USA)
UBC	- Uniform Building Code (USA)
USBR	- United States Bureau of Reclamation (USA)

If the Contractor, at any time and for any reason, wishes to deviate from the above standards or desires to use material or equipment not covered by the above standards, he shall state the exact nature of the changes, the reason for making the change and shall submit complete specifications of the materials and equipment to the Engineer for approval.

#### B. Standards other than those Specified

Where requirements for materials or equipment are specified by reference to a standard which has its origin in one country, it is not the intention to restrict the requirements solely to that standard and that country. Other standards, including



standards of other countries, will be accepted provided the requirements thereof, in the sole opinion of the Engineer, are at least equal to the requirements of the standard specified. The Contractor may propose to the Engineer an equivalent standard other than that specified, in which case he shall submit the proposed standard and all other information required and shall submit written proof that his proposed standard is equivalent in all significant respects to the standard specified. All submissions must be made in the English language.

#### C. Codes and Standards at Site

The Contractor shall supply and have at his site office:-

- a) Copies of all latest editions of codes and standards referred to in these Specifications or equivalent codes and standards as approved by the Engineer.
- b) Catalogues and published recommendations from manufacturers supplying products and materials for the project.
- c) The Contractor shall provide manufacturer's or supplier's materials which must meet the requirements of a specific code or standard as stated in these Specifications.

#### 4. MANUFACTURER'S RECOMMENDATIONS

Installation of manufactured items shall be in accordance with procedures recommended by the manufacturer or as approved by the Engineer.

#### 5. UNITS OF MEASUREMENTS

The FPS System of Units shall be used throughout the Project.

#### 6. EXISTING CONDITION AT SITE

Drawings and information pertaining to existing project conditions are furnished for reference. Neither the Employer nor the Engineer warrants the adequacy or correctness of these. The Contractor's are encouraged to visit the project site to assess the existing site conditions.

#### 7. PROTECTION AND PRECAUTIONS

The Contractor and his sub-contractors shall afford all necessary protection to existing structures and will be required to make good at his own expense any damage done to such structures through his own or his representatives or subcontractors' fault and negligence.

The Contractor and his sub-contractors shall afford all necessary protection to existing roads in the area. He will clear and make good at his own expense any damage to or debris on these roads through his own fault and negligence. He must at all time ensure the free and normal flow of traffic and shall not cause obstruction to the traffic system. The Contractor and his sub-contractors shall provide and maintain necessary protection and precautionary measures such as warning signs, warning lamps and barricades etc. to prevent accidents.

The Contractor shall promptly correct all such damage to original condition at no additional expense to the Employer.

The Contractor shall cooperate with trades performing work under other Contracts as necessary for completion.

#### 8. SEQUENCE OF CONSTRUCTION

The Contractor shall submit his proposal for approval of the Engineer the sequence of Construction, prior to starting the works. The works shall be executed as per approved sequence of construction





## 9. LINES AND LEVELS

Survey control points will be established by the Engineer. The Contractor shall be responsible for verifying these and shall be responsible for all requirements necessary for the execution of any work to the locations, lines, and levels specified or shown on the drawings, subject to such modifications as the Engineer may require as work progresses.

## 10. PLANT, EQUIPMENT AND TOOLS

The Contractor shall provide at his cost modern plant, equipment and tools, adequate and befitting to the nature, magnitude and size of this Contract, in strict compliance with the requirements of the General Conditions of Contract, Conditions of Particular Applications and Technical Specifications.

## 11. PARTIAL POSSESSION

Whenever, as determined by the Employer any portion of work performed by the Contractor is in a condition suitable for use, the Employer may take possession of or use such portion.

Such use by the Employer shall in no instance be construed as constituting final acceptance, and shall neither relieve the Contractor of any of his responsibilities under the Contract, nor acts a waiver by the Employer of any of the conditions thereof, provided that the Contractor shall not be liable for the cost of repairs, re-work, or renewals which may be required due to ordinary wear and tear resulting from such use. However, if such use increase the cost or delays to the completion of remaining portions of work, the Contractor will be entitled to an equitable adjustment.

If, as a result of the Contractor's failure to comply with the provision of the Contract, such use proves to be unsatisfactory, the Employer will have the right to continue such use until such portion of the work can, without injury to the Employer, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary for such work to comply with the Contract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve months unless otherwise mutually agreed upon in writing between the parties.

## 12. EXISTING SERVICES

The Contractor shall search for, find, locate and protect any wiring, cable, duct, pipework, etc., within or immediately adjoining the site area.

The Contractor shall take full responsibility for safety of existing service lines, utilities and utility structures uncovered or encountered during excavation and construction operations.

The Contractor shall take full responsibility for damaging any such service lines, utility/utility structure and any cost and/or expense that arises or issues from any such damage shall be borne directly by himself. Should any damage to any such service occur the Contractor shall forthwith take remedial action, initiate safety precautions, install temporary services and carryout repair all at his own cost and expense and inform the Engineer and notify all relevant authorities.

Existing utilities which are to remain in service for or after the works are to be determined by the Contractor. If any existing service lines, utilities and utility structures which are to remain in service are uncovered or encountered during these operations, they shall be safeguarded, protected from damage, and supported. The Contractor shall preserve, maintain and keep in perfect working conditions, any existing facilities required to be preserved by the Employer/the Engineer.





**13. CONSTRUCTION AREA AND ACCESS**

The Employer will provide the Contractor possible space within or nearby the area of site of works for the storage of plant, equipment and materials and for Contractor's temporary office, during the currency of the Contract. In case the adjacent area as required by the Contractor is not available within the Project boundary for storage of plant, equipment and machines then the Contractor shall arrange at his own expense possible space for storage of plant, equipment and machines at his own cost and expense. On no account shall such temporary installations conflict/interfere with any of the permanent installations, services and any operational function of Employer. The handling and storage of all plants, equipment and materials at site shall be the sole responsibility of the Contractor and at no risk and cost to the Employer.

The Contractor shall protect all material against corrosion, mechanical damage or deterioration during storage and erection on site. The protection methods shall be to the approval of the Engineer.

**14. CONSTRUCTION AND CHECKING AT SITE**

The Contractor shall submit to the Engineer in due time for approval and discussion, his proposals and plans as to the method and procedure to be adopted for the temporary and permanent works involved.

The submitting to these suggestions and arrangements, and the approval thereof by the Engineer shall not relieve the Contractor of his responsibilities and duties under the Contract.

The carrying out of all work included in the Contract is to be supervised by a sufficient number of qualified representatives of the Contractor and full facilities and assistance are to be afforded by the Contractor for the Engineer or his Representative to check and examine the execution of the work.

The Engineer reserves the right to inspect all parts of the works but may at his discretion waive inspection on certain items. This shall in no way absolve the Contractor from his responsibilities. This particularly applies to the checking of materials, the accurate setting out of foundations, and to the leveling, setting and aligning of the various parts, and to the proper fitting and adjustment of manufactured and finished materials and fixtures in position.

If the Engineer or his Representative find that the work progress is slow in such a way that the works or parts thereof will not be completed in the time specified, then he shall order the Contractor to work overtime or in shifts and the Contractor shall comply. These arrangements will be free of all financial encumbrances and at no additional costs to the Employer.

In the event of night work, the Contractor shall provide sufficient and adequate lighting to the satisfaction of the Engineer or his Representative and shall supply the necessary manpower for satisfactory continuation of the work after normal hours.

**15. STORAGE & HANDLING FACILITIES**

The Contractor shall make his own arrangements for providing the necessary space for the storage of plant, equipment and materials and for Contractor's temporary office, in and around the site of works, during the currency of the Contract.

**16. PRODUCT DATA**

Manufacturer's standard schematic drawings shall be modified or deleted to indicate only information which is applicable to the project. Such standard information shall be supplemented to provide all additional applicable information.

Manufacturer's catalogue sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive literature shall be clearly marked to identify pertinent materials products or models. Dimensions and required clearances shall be indicated. Shop performance characteristics and capacities shall be noted.





## 17. PRODUCT QUALITY AND HANDLING

Suppliers of local and foreign products and installations specified shall have been regularly engaged in the business of manufacturing, fabricating, installing and / or servicing work required for a period not less than 5 years. In addition, the Engineer may request as appropriate a:

- list of similar installations that describes project, scope and date of completion.
- complete literature, performance data, and technical data.
- list of services record within Pakistan.
- location of service office from which this installation could be maintained.

For the actual fabrication, installation and testing of the specified work use only thoroughly trained and experienced workmen completely familiar with the items required and with the manufacturers recommended methods of installation. In acceptance or rejection, no allowance will be made for the lack of skill on the part of workmen.

Use all means necessary to protect materials before, during and after installation and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacement necessary for approval and at no additional cost to the Employer.

## 18. INSPECTION & TESTS REPORTS

All equipment and materials furnished under these specifications and all work performed in connection therewith will be subject to rigid inspection by the Engineer or the Engineer's Representative. Acceptance of equipment and material or the waiving off inspection thereof shall in no way relieve the Contractor of his responsibility for meeting the requirements of the Contract.

The Contractor shall furnish the Engineer with certified true copies of test reports of all materials used in the manufacture and fabrication of all equipment and material including metal work, steel pipes, fire bricks etc. The result of these test shall be in such form as to show compliance with the applicable Specifications, standards and codes for the material used.

## 19. FIELD LABORATORY AND TESTING

### 19.1 General

The Contractor shall provide and maintain a field laboratory equipped with approved equipment to perform all the tests required by the Engineer. The quality control testing shall be performed by the Contractor's competent personnel in accordance with a site testing and quality control programme to be established by the Contractor and approved by the Engineer. The Engineer may however, require certain tests to be performed in any other laboratory designated by him.

The Contractor shall provide laboratory helpers to the Engineer for testing. The laboratory shall be run by a qualified material Engineer and Laboratory Technician to be employed by the Contractor.

The Field Laboratory, including all equipment and staff shall be placed at the disposal and direction of the Engineer during the Contract.

The Contractor shall keep a complete record of all quality tests performed on site.

All quality control and tests shall be carried out in accordance with applicable standards and codes.



**19.2. Field Laboratory Equipment Requirements**

The Laboratory shall be equipped with new unused and latest Equipment to perform tests as per Technical Specifications and General Conditions of Contract. Additional equipment/materials shall be supplied by the Contractor as and when required by the Engineer to perform any specified test, at no additional cost to the Employer.

The laboratory shall also be equipped with new unused furniture, fittings and fixtures. If any equipment, furniture, fitting or fixture becomes unserviceable for any reason what so ever, the Contractor shall promptly replace the same as and when directed by the Engineer.

**19.3. Testing Laboratory Certificates**

The Engineer may accept a certificate from a commercial testing laboratory, satisfactory to him, certifying that the product has been tested within a period acceptable to the Engineer and that it conforms to the requirements of these specifications.

**19.4. Method of Payment**

The cost of providing running and maintenance of the laboratory, equipment, materials and staff, testing charges for materials supplied by the Employer and all other tests to be performed in any other laboratory designated by the Engineer shall be deemed to be included in the price quoted by the Contractor and no separate claim for payment on this account shall be entertained by the Engineer. Furthermore, the cost of any additional laboratory, field and shop tests required through the resubmission of samples because of failure of compliance with Specifications shall be borne by the Contractor.

In case the Contractor does not provide the specified equipment and testing facility, cost of testing plus 100 percent overheads shall be recovered from his bills.

**20. SURVEYING INSTRUMENTS****20.1 General**

The minimum quantity of survey equipment is stated below which shall be available with the Contractor at site of Works along with qualified Surveyors and Survey Helpers. The equipment shall be maintained throughout the Contract Period and replaced by the Contractor in case of damage or loss. The survey equipment shall be made available to the Engineer when requested. All surveying equipment shall be in good working condition.

**20.2 Surveying Equipment Required**

The Contractor shall provide and maintain the following surveying equipment at site.

- |    |   |        |
|----|---|--------|
| a) | Total Station with staff  | 01 No. |
| b) | Automatic Levels with tripods & staff   | 01 No. |
| c) | All other miscellaneous tools, equipment and materials required in surveying. |        |

**21. APPROVAL OF MATERIALS AND PLANT****21.1 Quality of Materials**

All materials, fixtures, fittings, supplies and plant furnished under the Contract shall be new and unused, standard first grade quality and of the best workmanship and design. No inferior or low-grade materials, supplies or articles will be either approved or accepted, and all work of assembly and construction shall be done in a first-class and workmanlike manner. In asking for prices for materials intended for delivery to the Site and incorporation in the Works under any portion of these Specifications, the





Contractor shall provide the manufacturer or supplier with complete information as may be necessary to secure compliance to this Clause and, in every case, he shall quote this Clause in full to each such manufacturer or supplier.

## 21.2 Submission of Samples and Data

- 21.2.1 The Contractor shall furnish for approval of the Engineer with reasonable promptness all samples as directed by the Engineer or specifically called for in the Specifications and in accordance with the time schedule provided in the schedule of submittals. The Engineer shall check and approve such samples with reasonable promptness only for conformance with the design concept of the Works and for compliance with the information given in the Contract Documents. All work shall be in accordance with approved samples.
- 21.2.2 Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for consideration of the sample submitted.
- 21.2.3 Each sample shall be properly labeled with the name and quality of the material, manufacturer's name, name of the project, the Contractor's name and the date of submission, and the Specifications Article number to which the sample refers.
- 21.2.4 The manufacturer's installation directions shall be provided with each sample. The Contractor shall pay all transportation costs and deliver samples to the Engineer's office, Site or testing laboratory as directed by the Engineer.
- 21.2.5 Samples shall be of adequate size to permit proper evaluation of the material by the Engineer. Where variations in colour, texture, dimensions or other characteristics are to be expected, the Contractor shall submit samples showing the maximum range of variation. Materials exceeding the range of variation of the approved samples shall not be used on the Work.
- 21.2.6 In order to permit coordinated selection of colours and finishes, the Contractor shall deliver samples of all related items to the Engineer at one time. Samples of such materials will not be approved until all related samples have been submitted.
- 21.2.7 If both Shop Drawings and samples are required for the same item, the Engineer may require both to be submitted before approving either.
- 21.2.8 The Contractor shall erect Mock-up samples of finished items where specifically called for in the documents or as directed by the Engineer.
- The Mock-up samples shall be preserved/protected by the Contractor till the end of the project or as directed by the Engineer.
- 21.2.9 No acceptance or approval of any Shop Drawings or sample, or any indication or request by the Engineer on any Shop Drawings shall constitute an authorization for any increase in the Contract Sum.

## 21.3 Inspection

All material and Plant furnished and all work performed under this Contract will be subject to inspection by the Employer and the Engineer at all times and in all states of completion both off-Site and on-Site. The Contractor shall furnish promptly without additional charge, all facilities, labour and materials reasonably needed for performing such inspection and testing as may be required by the Engineer.

## 21.4 Approved Sample At Site

The Contractor shall, at all times, keep on the Site approved samples. All such samples shall be made available to the Engineer as and when required.



## 22. BAR BENDING SCHEDULE

Bar bending (reinforcement bars) schedule of all structural drawings shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval.

## 23. DRAWINGS

### 23.1 Bid Drawings

Bid Drawings issued with the Bid Documents, called the Bid Drawings, show scope of the work to be performed by the Contractor. The Drawings are generally in sufficient detail so as to be used as a basis for construction, fabrication and for placing orders for materials subject to corrections based on the future issue of supplementary Drawings as provided under Sub-Clause 23.2 hereof.

### 23.2 Construction Drawings, Supplementary Drawings

Upon commencement of the works and furnishing by the Contractor stake out survey plan and natural ground levels, the Engineer shall issue Construction Drawings to the Contractor. The Construction drawings may be issued in stages, where necessary.

The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Works and the remedying of any defects therein. The Contractor shall follow these drawings.

When additional information regarding the geological formations or other conditions becomes available, the Engineer may find it desirable to change dimensions or design of one or more of the features of the Works to conform to the newly disclosed conditions. The Engineer reserves the right to make such reasonable changes, and the Contractor's operations shall be conducted so as to accommodate any such reasonable changes in the Works.

### 23.3 Definition of Term Drawings

The term Drawings as used in the Specifications means the Drawings referred in Clauses 23.1 and 23.2 above.

### 23.4 Checking of Drawings

The Contractor shall check all Drawings carefully as soon as practicable after receipt thereof, and shall promptly notify the Engineer of any errors discovered.

### 23.5 Copies of Drawings

Drawings will be issued to the Contractor as described below:

#### 23.5.1 Construction Drawings

Two (2) sets of the Construction Drawings will be issued to the Contractor as stated above, free of charge. Additional sets will be provided at cost of reproduction upon written request of the Contractor.

#### 23.5.2 Supplementary Drawings

Two (2) prints of each supplementary Drawing will be issued to the Contractor free of charge. Additional sets will be provided at cost of reproduction upon written request of the Contractor.





## 23.6 Drawings to Be Furnished By the Contractor

The Contractor shall submit to the Engineer for review, such drawings as are required under the Contract, sufficiently in advance of the work intended to be executed.

### 23.6.1 Reinforcement Drawings

Reinforcement placement drawings and bar bending schedules (to be provided by the Contractor as per clause 22 above) of all RCC work shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval, sufficiently in advance of the works in which they are intended to be used.

### 23.6.2 Shop Drawings

- (a) The Contractor shall submit to the Engineer for review three (3) copies of all drawings to be issued for setting out, fabrication, supply order and construction; based on data, requirements, dimensions, details, codes, standards and design provided in the drawings issued by the Engineer. Such drawings shall be submitted at least seven (7) days before they are required for use. If within a period of seven (7) days after submission, the Engineer notifies the Contractor that a drawing fails to comply with the relevant requirement of the Contract, it shall be rectified and resubmitted for approval at the Contractor's cost. Fabrication or construction shall not commence on any part of the Works until the shop drawings or construction drawings for that part of the Works have been approved by the Engineer.

The Works shall be executed in accordance with the drawings as approved by the Engineer. If the Contractor wishes to modify any approved drawings, he shall immediately notify the Engineer and submit revised drawings for approval. If the Engineer instructs that further drawings are necessary for executing the Works, the Contractor shall prepare such drawings and submit them for approval.

The Contractor at his cost shall rectify errors, omission, ambiguities, inadequacies and other defects.

Approval by the Engineer, in accordance with this paragraph, shall not relieve the Contractor of any of his responsibilities under the Contract.

- (b) The shop drawings shall be properly identified indicating the part of the Works, the name of the contractor / supplier etc., the date of preparation and the dates of all revisions. The Shop Drawings shall be complete and shall show the design dimensions, proposed materials to be used, finishes, type of shop paint and all other details in connection thereto.
- (c) Where adjoining work requires shop drawings, the Contractor shall prepare and submit composite shop drawings, which shall show and define the work under all affected trades. If the Contractor executes work before coordinating with other trades so as to cause interference with work of those trades, he shall make changes necessary to correct the conditions without extra cost to the Employer.
- (d) No changes shall be made by the Contractor in the resubmitted shop drawings in excess of the corrections spelled out by the Engineer and in a separate note on the shop drawings.





- (e) No work in the shop shall be started and no material or plant ordered until the Engineer has approved the shop drawings. It shall be the responsibility of the Contractor to submit the shop drawings on a schedule that allows reasonable time for checking and approval and subsequent fabrication. Failure to submit shop drawings in ample time for checking, correcting, and rechecking will not justify extension of time for completion of the Works.
- (f) The Contractor shall also check and verify all site measurements whenever requested by other Specialist Contractors or by other Sub-Contractors to enable them to prepare their own shop drawings and pass on the information with sufficient promptness, so as not to delay the work in any way. A copy of all such information passed on shall be given to the Engineer.

### 23.6.3 As-Built Drawings

The Contractor shall, at all times, keep on Site a separate set of prints of all drawings on which all significant changes between the work shown on the Drawings and that which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. The Subcontractor(s) for plumbing, mechanical and electrical shall, at all times, keep on Site, a separate set of prints of the drawings (showing their parts of the Works) on which all significant changes between the work shown on the Drawings and that which is actually constructed, shall be noted neatly, accurately and promptly as the work progresses. Such drawings shall show the exact physical location and configuration of the works as actually installed.

The Contractor shall, within fourteen (14) days of issuance of Taking-Over Certificate for whole of the Works, furnish to the Engineer for his approval two (2) copies of such marked up drawings. One (1) copy of each of the marked up drawings approved by the Engineer shall be returned to the Contractor by the Engineer and these shall be used for the preparation of the As - Built Drawings.

The Contractor shall furnish to the Engineer six (6) complete sets and one reproducible copy of all As -Built Drawings within twenty eight (28) days of receipt of drawings stated above, from the Engineer.

## 24. PROTECTION OF THE WORKS

The Contractor shall whenever necessary cover up and protect the works from weather and damage by his own or other workmen performing subsequent operation. The Contractor shall provide all necessary dustsheets, barriers and guard rails and clear away the same at completion.

## 25. RESTORATION AND CLEANING

Upon completion of the works the Contractor shall restore all items covered by the Contract to the satisfaction of the Engineer.

The Contractor shall do regular cleaning and clear away all rubbish and excess materials that may accumulate from time to time on completion and before handing over. Upon completion of the works he shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stock piles of excess or waste materials, or any other vestiges of construction, as directed by the Engineer. All buildings shall be cleaned; floors and paving scrubbed and the works and site shall be left in a clean and satisfactory state for immediate use and occupation. Care shall be taken not to use any cleaning materials, which may cause damage to the surface to be cleaned.

The Contractor shall also take all necessary precautions to keep the works and site free from vermin during construction and he shall leave the works vermin free on completion. Application of





pest control agents shall not commence until the specific product, name, method and extent of application have been submitted to and approved of by the Engineer.

## **26. SITE OFFICE AND TEMPORARY FACILITIES TO BE PROVIDED BY THE CONTRACTOR**

### **26.1 Contractor's Office, Facilities Etc.**

The Contractor shall establish and maintain a Site office. The Contractor shall provide all facilities in connection with the execution, completion, of the Works, remedying defects therein and maintenance of the utilities services. The facilities shall not be limited to the Contractor's Site Office, labour camps, work yard and storage areas, temporary water supply, waste water disposal, temporary electricity, medical unit, temporary roads, fire protection and fire fighting equipment etc. The Contractor shall be solely responsible for arranging all utilities and the Contractor shall setup, maintain and operate an architectural and engineering facility at site with adequate number of technical and support staff as well as equipment required for particular nature of job covered under the Contract to prepare drawings/shop drawings for approval of the Engineer.

The Contractor shall arrange his labour camp, work yard, storage area and site office.

### **26.2 Temporary Roads**

The Contractor shall prepare and maintain such temporary roads as may be necessary, from the site to the nearest road and also within the plot. Such roads shall be positioned strictly in accordance with the Engineer's instructions and the Contractor shall reduce or control any dust nuisance by regularly spraying water and compaction as directed.

### **26.3 Temporary Services**

#### **26.3.1 Temporary Water Supply**

The Contractor shall supply in sufficient quantity all necessary potable and other water for construction purposes for all trades at points within a reasonable distance of any building being constructed. The Contractor shall make arrangements and pay charges for water service installation, maintenance and removal thereof, and pay the costs of water for all trades.

At completion of the work, the temporary water services equipment and piping shall be removed by the Contractor at his own expense.

#### **26.3.2 Temporary Electricity**

The Contractor shall make all the necessary arrangements for a temporary electricity service, pay all expense in connection with the installation, operation and removal thereof and pay the costs of electricity consumed by all trades. The Contractor shall arrange and furnish an Electric Power Generating set at site and maintain the generating set in perfect working condition through-out the duration of Contract. The generating power of the set shall be sufficient to operate all plant and equipment as well as the camps and offices of the Contractor and the offices of the Engineer/Employer, during construction at site. Should the set fail to meet the required demand at site or fail to function or operate, the Contractor shall immediately replace the same with other generating set/s to the satisfaction of the Employer as well as the Engineer.

A temporary lighting system shall be furnished, installed and maintained by the Contractor as required to satisfy the minimum requirements for safety and security and to the satisfaction of the Engineer.

When the permanent electrical power and lighting systems are in an operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor obtains the written approval of the



Engineer and the Employer and assumes full responsibility for the entire power and lighting system and pays all costs for operation and maintenance of the system.

At completion of construction work, or at such time as the Contractor makes use of permanent electrical equipment and devices, temporary electricity services shall be removed by the Contractor at his own expense.

### 26.3.3 Waste Disposal

The Contractor shall make such temporary provisions as may be required in order to dispose of any chemicals, fuels, oils, grease, bituminous materials, waste and soil waste and the like without causing pollution to either the site or the environment. Disposal of any materials, wastes, effluent, garbage, oil, grease, chemicals and the like shall be in areas specified by the concerned local authority proposed by the Contractor and subject to the approval of the Engineer. If any waste material is dumped in unauthorized areas the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed off as directed by the Engineer and replaced with suitable fill material compacted and finished with topsoil all at the expense of the Contractor.

### 26.3.4 Fire Protection

The Contractor shall provide and maintain adequate fire protection in the form of barrels of water with buckets, fire bucket tanks, fire extinguisher, or other effective means ready for instant use, distributed around the project and in and about temporary inflammable structures during construction of the works.

Gasoline and other flammable liquids shall be stored in and dispensed from safety containers approved by the Engineer and storage shall not be within building.

Torch-cutting and welding operations performed by the Contractor shall have the approval of the Engineer before such work is started and a chemical extinguisher is to be available at the location where such work is in progress.

The Contractor shall follow the instructions and specifications of the Civil Defense Department or any other local department concerned with such activities.

## 27 CONSTRUCTION SCHEDULE

A Construction schedule shall be maintained in accordance with the provisions of the General Conditions of Contract.

The schedule shall be accompanied with sufficient data and information including all necessary particulars of constructional plant, equipment machinery, temporary Works, arrival of plant, equipment at site and their installation, method of operation, work forces employed, etc., for an activities of the Works.

Should the Engineer consider any alteration or addition in the programme and time schedule, the Contractor shall conform thereto without any cost to the Employer.

Whenever necessary and wherever the progress of the actual work shows departure, the programme and time schedule shall be undated and submitted to the Engineer for his approval.





**28 SUBMISSION REQUIREMENTS**

- 28.1 Schedule submission at least sixty days before the dates when reviewed submittals will be needed.
- 28.2 Submit Shop Drawings as per provision given in Sub-Clause 23.6.2 and number of copies of Product Data which the Contractor requires for distribution plus four copies which will be retained by the Engineer.
- 28.3 Submit three samples unless otherwise specified.
- 28.4 Accompany submittals with transmittal letter, in duplicate, containing:
- Date
  - Project title and number
  - Contractor's name and address
  - The number of each Shop Drawing, Product Data and the Sample submitted
  - Notification of deviations from Contract Documents.
  - Other pertinent data.

**29 RESUBMISSION REQUIREMENTS**

Shop Drawings:

- Revise initial drawings as required and resubmit as specified for initial submittal.
- Indicate on drawings any changes which have been made by the Engineer.
- Product Data and Samples: Submit new data and samples as required for initial submittal.

**30 MONTHLY PROGRESS REPORT AND PHOTOGRAPHS**

- 30.1 During the continuance of the Contract, the Contractor shall submit monthly progress on forms as approved by the Engineer. Such monthly reports shall show the actual progress completed as of date of the report plotted against the schedule as given by the Contractor at the start of work and shall be broken down so as to indicate status of all activities associated with mobilization, design, material procurement, manufacture, surveys works, tests with regard to the agreed contract programme.
- 30.2 The Employer and the Engineer reserve the right to coordinate the schedules of this Contractor and other Contractors working at the Site, and to adjust and/or change any and all such schedules as required during the course of construction in order to achieve a coordinated project in harmony with the Employer's completion date.
- 30.3 Commencing after the first week of construction, and continuing every week until completion, the Contractor shall take and submit photographs to the Engineer's Representative, to show progress of his work and completion of each structure or major feature.

**31 CONTRACTOR TO NOTIFY DELAYS ETC.**

Any delay which will affect the completion of Works shall be detailed by the Contractor who shall state the action he is taking for effective completion of the Contract programme.



The Contractor shall submit a report in respect of the various sections of the Works, the equipment in use or held in readiness, a return of labour and supervisory staff, and details of any matters arising which may generally affect the progress of the work.

The Contractor shall give a summary of the detailed progress report giving the position with regard to the agreed Contract programme.

The progress reports shall be set out in a format to the approval of the Engineer, and forwarded promptly so that on receipt the information contained therein is not more than 21 days out of date.

If during execution of the Contract, the Employer considers the progress position of any section of the work to be unsatisfactory, or for any other reason relating to the Contract, he will be at liberty to convene a meeting and the Contractor's Representatives are to attend such meeting.

The Contractor's Site Office shall prepare and submit 6 copies of a weekly progress report to the Employer and Engineer's Site Office. This report shall summarize site activities and record and details where difficulties in maintaining the agreed programme are being experienced or are likely to cause subsequent delay.

The Contractor's Site Office shall also prepare and submit to the Engineer's Site Office 2 copies of Daily Activity Report summarizing the main activities to be undertaken each day, noting special activities such as tests, alignment checks, etc. The Contractor shall be responsible for expediting the delivery of all material and equipment to be provided by him and his subcontractors.

### 32 PHOTOGRAPHS

As soon as work commences on Site, the Contractor shall provide at least 10 to 12 photographs (alongwith soft copy) of the works from positions to be selected by the Engineer. Each photographic print shall not be less than 297mm x 210mm and shall bear a printed description, a serial number and the date when taken.

The negatives/soft copy of all photographs shall be held at the Contractor's Site Office, numbered and handed over to the Employer at the completion of the Contract.

### 33 Sign Board

The Contractor shall erect and maintain at the Site in a location to be approved by the Engineer two (2) Sign Boards of dimensions approved by the Engineer. The Sign Boards shall be made of metal. It shall be mounted on steel posts securely anchored and braced. The Contractor shall paint on the Sign Boards, the name of the Works, and the names of the Employer, Engineer and the Contractor both in English and Urdu Language.

### 34 Site Office for Engineer/Engineer's Staff

Not used

### 35 Transport for the Employer and The Engineer

Not used

### 36 Coordination of Work at Site

The Contractor shall take cognizance that during the execution of the project, other Contractor will be working concurrently on this Site.

All works of his responsibility shall be coordinated by the Contractor so as to give the necessary facilities to other Contractor or their workman or any other employ, who execute or supervise any work on the Site.





The Contractor shall ensure that the necessary safety precaution will be observed and interferences shall be avoided specially for the works executed side by side by different Contractors.

Due consideration must be given to permit access to sections of the work as required by other Contractors for the extension of their works. With a view to coordinate the works, the Engineer may from time to time direct the order of the works to be carried out.

No payment shall be made to the Contractor for the works involved under this sub clause.

### **37 Site Facilities to Be Provided By The Contractor**

#### **37.6.1 General**

Without prejudice to the generality of the various clauses of the Contract, particular attention is drawn to the obligation of the Contractor to make his own arrangement at his own expense for the following.

#### **37.6.2 Labour Camps and Staff Residences**

The Contractor shall provide, operate and maintain labour camps and staff residences and are required for the proper and efficient progress of the work to house his own employees. For the purposes of operation and maintenance of the Camps and Residences, the Contractor shall comply with the rules of Pakistan Labour Camp Rules 1960 and all other applicable provisions of the Pakistan Labour Laws.

#### **37.6.3 Administrative and Field Office**

The Contractor shall provide, operate and maintain administrative and field offices required for his staff and would be responsible for Operation and Maintenance, furniture, equipment, appliances, janitor services and security of the same.

#### **37.6.4 Work yards and Storage Areas**

The Contractor shall provide, operate and maintain all sheds, fencing, foundations and all above ground structures required to store material or equipment brought on to the site by him. The Contractor shall be responsible for the security of his entire camps, residence, site and field offices work yard and storage area.

#### **37.6.5 Water Supply, Sewerage System and Electricity**

The Contractor shall make his own arrangement, at his own expense for provision, operation and maintenance of electric supply, reasonable supplies of raw and potable water and sewerage system at the site of works and his labour camps, staff residences and offices. The Contractor shall pay all fees, and charges (including bills) of whatsoever nature to the concerned departments (if any) in order to procure connections of the above facilities and thereafter using these facilities.

#### **37.6.6 Medical Care**

The Contractor shall arrange provision of adequate medical facilities for his employees.

Adequately equipped and properly staffed first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations, to administer first aid treatment at all times free of charge to all persons on the Site, including personnel of the Engineer and the Employer. The nature, number and location of facilities furnished and the Contractor's staff for administering first-aid treatment shall meet the requirements of the Health





Services of the Government of Pakistan and of Section III of the Manual "Safety Requirements for Construction by Contract", published by the Employer, and shall be subject to approval by the Engineer.

#### 37.6.7 Other Facilities

The Contractor shall also be responsible for providing at his own cost other facilities for his own staff and labour such as educational, recreational, transport, telephone and catering if required.

### 38. CONSTRUCTION PROCEDURES

The Contractor shall advise the Engineer of proposed construction procedures in accordance with the General Conditions of Contract.

If the Engineer shall see that the work progress is slow in such a way that the work will not be completed in the time specified, then he shall order the Contractor to work overtime or in more shifts and the Contractor shall obey these orders without any additional payments and without any objections or request for compensation.

### 39. NOTIFICATION TO ENGINEER

The Engineer shall be notified daily in writing of the nature and location of the Works the Contractor intends to perform the next day so as to enable necessary inspection and measurement to be carried out. The Engineer may, if necessary, direct that longer notice be given of certain operations.

### 40. NIGHT WORK

When work is done at night the Contractor shall maintain from sunset to sunrise such lights on or about his work and plant as the Engineer may deem necessary for the proper observations of the work and the efficient execution thereof.

### 41. WEATHER

No work is to be undertaken when, in the opinion of the Engineer, the weather is so unsuitable that proper protection of the work cannot be ensured.

### 42. CO-ORDINATION WITH OTHER CONTRACTORS

It shall be the responsibility of the Contractor to keep-up good relations with other Contractors employed on site by the Employer. The Contractor shall cooperate and coordinate his work with that of the other Contractors working at the Site, to whatever extent may be necessary to complete the Project in accordance with the approved programme of the Works and in accordance with the Engineer's instructions. Should a disagreement or dispute arise between the Contractor and other contractors, the same shall be referred without delay to the Engineer for his decision. Upon such decision, the Contractor shall proceed with the work in accordance therewith. In case the access to the works of other contractors is through the Site area of the Contractor, the Contractor shall coordinate with and permit all reasonable access to other Contractors.

### 43. ACCIDENT PREVENTION, SAFETY MEASURES AND PROTECTIVE EQUIPMENT

The Contractor shall comply and enforce compliance by all his sub- contractors with the highest standards of safety and accident prevention in accordance with international standards and in compliance with all applicable laws, ordinances and statutory provisions.

All requisite barriers, fences, warning signs, lights and other safety precautions as required for the protection of persons and property on or adjacent to the site shall be provided at the Contractor's cost.



All false work, scaffolding and handrails shall be well constructed and secured at all times. Where overhead work is being carried out, warning signs shall be installed at ground level clearly warning of the overhead work.

All warning signs shall be in two languages, English and Urdu, and shall at all times be maintained in a clean and legible condition, to the satisfaction of the Engineer.

Trash shall be removed at frequent intervals to the satisfaction of the Engineer.

Netting shall be provided at all levels where work is in progress, all around the building.

#### 44. SETTING OUT OF WORK AND SURVEY

##### 44.1 Reference Points, Lines

The Contractor shall establish benchmarks and / or reference line at the Site in accordance with the instructions of the Engineer. The Contractor shall set out its work from these benchmarks and lines. The Contractor shall supply plant, equipment, materials and labour for checking if required of the survey control by the Engineer. Slope stakes will be set by the Contractor before commencement of excavation and will be re-established as required during progress of work using established benchmarks and reference points.

##### 44.2 Verification

The Engineer may make checks as the work progress to verify lines and grades established by the Contractor and to determine the conformance of the work as it progresses with the requirements of the Drawings and Specifications. Such checking by the Engineer shall not relieve the Contractor of his responsibility to perform all work in accordance with the Drawings and Specifications and the lines and grades given therein.

Based upon the basic control, the Contractor shall provide his own primary control points, as needed for the Works, and shall preserve and maintain them until otherwise authorized.

The Contractor shall be responsible for maintaining all survey markers/monuments, and property corners. If any markers/monuments are destroyed by the Contractor, the Contractor shall arrange, at his own cost, to retrace and replace them to the entire satisfaction of the Engineer. If a monument cannot be replaced in its original position, the Contractor shall install a witness corner. The Contractor shall complete and file monument reference cards on all monuments as per instructions of the Engineer.

The Contractor shall provide experienced construction surveyors with adequate experience in the construction surveys similar in nature as required by this Contract.

Based upon established basic control monuments the Contractor shall establish all lines and grades necessary to control the Works, and shall be responsible for all measurements that may be required for execution of the Works to the tolerance prescribed below.

The Contractor shall perform such surveys and computations as are necessary to determine quantities of work performed or placed during each progress payment period, and shall also perform all surveys necessary for the Engineer to determine final quantities of work in place. The Engineer will determine final quantities based on original ground levels determined by the Contractor and agreed by the Engineer.

The Contractor shall notify the Engineer at least 24 hours before performing a quantity survey and, unless specifically waived, quantity surveys shall be performed in the presence of an authorized representative of the Engineer.

Degree of accuracy for the survey works shall satisfy the following specified tolerances:





- (a) Structure points shall be set within 0.01 foot accuracy from point to point, except where tighter tolerances are required.
- (b) Cross-section points shall be located within 0.10 foot, horizontally and 0.01 foot vertically.
- (c) Permissible closing error for a levelling line meant for establishing Temporary Bench Mark (TBMs) shall not exceed  $0.045 \times \sqrt{M}$  foot, where M is in miles. The permissible closing error shall be duly adjusted.

The Contractor shall provide all materials, equipment and labour required for surveying work, including, but not limited to, instruments, stakes, spikes, steel pins, templates, platforms, and tools, and except as required to be incorporated in the work or left in place, all such materials and equipment, shall remain the property of the Contractor. Surveying instruments shall be in perfect working condition and shall be subject to rigid inspection for proper operation at least after every two weeks of use. Defective instruments shall be promptly replaced or repaired and adjusted to the satisfaction of the Engineer.

Survey data shall be recorded in accordance with recognized professional surveying standards. Original field notes, computations, and other surveying data shall be recorded in the Contractor furnished field books. Notes or data not in accordance with standard formats will be rejected. Illegible notes or data, or use of erasures on any page of a field book will be considered sufficient cause for rejection of part or the entire field book. Copied notes or data will not be permitted; therefore, rejection of part or all of a field book may necessitate re-surveying. Corrections by ruling or lining out errors will be satisfactory.

The cost of all materials, equipment, surveyors and labour required for surveys for the Works and quantity surveys required by this clause shall be deemed to be included in the rates and prices of the various items in the Bill of Quantities and no separate measurement and payment in their respect shall be made.

#### 44.3 Survey Instruments

The Contractor shall maintain at the Site the requisite surveying instruments in perfect working conditions to enable the Engineer's Representative to check levels and lines of the work at all times.

#### 45. PAYMENT OF WORK

No payment shall be made for the works involved within the scope of this section of specification unless otherwise specifically stated in the Bills of Quantities or herein.

The cost thereof shall be deemed to have been included in the total price quoted by the Contractor.

#### 46. ENVIRONMENTAL PROTECTION

The Contractor shall exercise care to protect the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of works. Except where clearing is required for the Permanent works, approved construction roads and the Temporary Works, and for excavation operations, all trees and native vegetation shall be preserved and shall be protected from damage which may be caused by the Contractor's construction operations and equipment. On completion of the works, all work areas shall be smoothed and graded in a manner to conform to the natural appearance of the landscape. Where unnecessary destruction, scarring, damage or defacing may occur as a result of the Contractor's operations, it shall be repaired, replanted, or otherwise corrected as directed by the Engineer at no additional cost to the Employer.





**LIST OF RECOMMENDED MANUFACTURERS**

(For Non-Scheduled Items)

**(to be signed by the Bidder)**

Equipment and materials specified with brand names have been provided in order to establish a standard of performance and do not necessarily indicate a preference for a particular manufacturer or material.

The names of manufacturers given below are to indicate the level of quality and performance anticipated by the Engineer/ Employer. Other makes may be accepted provided that the quality and performance of such equipment, in the sole opinion of the Engineer, are at least equal to or better than the equipment/ product offered by the recommended manufacturer.

The acceptance of equipment/ materials offered by these manufacturers will be subject to compliance of offered models/materials with the specifications, capacity and/or performance requirements.

Onus lies with the Contractor for establishing the genuineness of any material/product for its make and origin.

S.No.	Item	Manufacturer
<b>CIVIL WORKS</b>		
1	ALUMINUM	i CHAWLA ALUMINUM ii PRIME ALUMINUM iii AL-FATTAH ALUMINUM iv ALCO v PAKISTAN CABLES
2	EXTRUDED POLYSTYRENE (XEPS)	i DIAMOND JUMBOLON BOARD ii INSUGREEN
3	EXPANDED POLYSTYRENE (EPS)	i DIAMOND JUMBOLON ii THERMO FOAM iii STYROBOARD
4	WALL COATINGS	i GRITTWALL ii ROCKSHIELD iii ROCKWALL
5	CONCRETE FLOOR TILE & PAVERS	i PRIME CRETE ii IZHAR iii ENVICRETE
6	PAINTS PLASTIC EMULSION, VINYL EMULSION, ENAMEL, WEATHER SHIELD, DECORATIVE PAINT FOR FEATURE WALL SPECIAL EFFECT PAINT	i ICI DULUXE PAINTS ii BERGER PAINTS iii KANSAI PAINTS iv JOTUN PAINTS v NIPPON
7	WALL COATINGS (EXTERNAL)	i JOTUN COATING ii ROCK SHIELD EXTERIOR WALL COATING iii ICI DULUXE PAINTS iv BERGER PAINTS v KANSAI PAINTS vi NIPPON



S.No.	Item	Manufacturer
8	CERAMIC TILES, PORCELAIN TILES	
a	LOCAL MANUFACTURER	i MASTER TILES ii STILE CERAMICS iii TIMES
9	PVC FLOOR	i MARFLEX ii DECORA
10	LAMINATED MDF FLOOR TILES	i ALNOOR MDF ii INTERWOOD iii ZRK
11	ALUMINUM CEILING	i OWA ii DAMPA
12	CARPET FLOOR	i INTERFACR ii WOOLEN CARPETS
13	GLASS LOCAL	i GHANI GLASS ii TARIQ FLOAT GLASS iii AL-FATTAH GLASS
14	GLASS IMPORTED	i SAINT GOBAIN ii GUARDIAN iii PELKINGTON
15	FALSE CEILING GYPSUM BOARD INCLUDING SUSPENSION SYSTEM	i DFB ii UNITED GYPSUM iii ARISH
16	HARDWARE STAYS, HINGES, HANDLES & DOOR LOCK	i YALE HARDWARE ii KRB iii MANDELLI iv ALFA
17	LAMINATION BOARD/VENEER BOARD/FORMICA	i AL-NOOR ii ZRK
18	TERMITE PROOFING FOR SOIL	i TERMCURE ii BIFLEX iii FRONT LINE PLUS iv MIRAGE
b	FOR WOOD	i BIO-WOOD ii POWER-MAX iii WOOD LINE
19	CONSTRUCTION CHEMICALS & STRUCURAL ANCHORAGE & SPECIALIZED CONNECTIONS	i SIKA ii BASF iii HILTI



S.No.	Item	Manufacturer
<b>PLUMBING WORKS</b>		
1	G.I. & MS Pipes	i M/S International Industries Ltd. ii M/S Bashir Pipe Industries Pvt. Ltd. iii M/S Jamal Pipe Industries Pvt. Ltd.
2	G.I.Pipe Fittings	i M/S HE China ii M/S TG China
3	Sanitary accessories	i M/S Faisal ii M/S Sonex
4	Bronze/Brass/CI Valves	i M/S Kitz ii M/S Scon iii ITAP (ITALY)
5	Electric water cooler	i M/S Mecco ii M/S Canon
6	Pumping Machinery	i M/S KSB ii M/S Ebara
7	C.I. Pipe and Fittings C.I. Roof Drains & Covers	i M/S Alpine ii M/S JAWS iii TEEPU
8	Hangers & Supports	i M/S Fischer. ii M/S Hilti.
9	Firefighting	i M/S Naffco ii M/S Safeco
<b>ELECTRICAL WORKS</b>		
1	DISTRIBUTION BOARDS AND MAIN AND SUB MAIN PANEL BOARDS	i ERCON ii POWERTEK iii BILAL SWITCH GEAR iv TECMENS
2	POWER CABLES	i PAKISTAN CABLES ii NEWAGE CABLES iii FAST CABLES iv GM CABLES
3	WIRING CABLES	i PAKISTAN CABLES ii NEWAGE CABLES iii FAST CABLES iv GM CABLES
4	MCCBs AND MCBs ELCBs	i SCHNEIDER ii ABB iii SIEMENS iv TERASAKI
5	LV Magnetic Contactor, Starters & Thermal Overload Relay	i SCHNEIDER ii ABB





S.No.	Item	Manufacturer
		iii SIEMENS iv FUJI
6	Timer	i NATIONAL / PANASONIC ii ENTES iii FUJI iv ABB
7	CURRENT TRANSFORMER/ VOLTAGE TRANSFORMER	i CIRCUTOR ii REVALCO iii ENTES iv FICO
8	MEASURING INSTRUMENT	i CIRCUTOR ii REVALCO iii ENTES iv JANITZA
9	SWITCHES, SOCKETS etc.	i CLIPSAL ii ABB iii LEGRAND iv MILANO
10	LIGHT FIXTURES	i PHILIPS (Signify) ii GE iii PIERLITE iv SUNLIGHT
11	FLOOR BOXES	i ABB ii LEGRAND
12	LIGHTNING PROTECTION & EARTHING	i APLICACIONES TECNOLOGICAS ii FURSE
13	BACK BOXES	i 16 SWG POWDER COATED WITH EARTH POINT



Authorized Signature and official Seal: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_



THE UNIVERSITY OF POONCH, RAWALAKOT

**COMPLETION OF LEFTOVER WORKS  
OF CHOTAGALA CAMPUS,  
UNIVERSITY OF POONCH,  
RAWALAKOT**

**PACKAGE – B1**

**TECHNICAL BID**

**BIDDING DOCUMENTS  
VOLUME - II**

TECHNICAL SPECIFICATIONS



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**SECTION - 0120**

**CONTRACTOR'S CAMP**

1. SCOPE
2. PAYMENT OF WORK





## 1. SCOPE

The work to be done under this item consists of construction, erection, installation and maintenance of the Contractor's Project Site Offices or main camp and the Contractor's sub-camps or temporary camps, if any, and shall include all offices, shops, warehouses, and other operational buildings; all housing and related facilities including accommodations for the Contractor's personnel.

The location of the Contractor's camps, including all buildings, utilities and facilities thereof, and of the camps or establishments of all persons/parties in the vicinity operating or associated with the Contractor shall be subject to approval of the Engineer.

The work to be done under this item will terminate upon the actual Completion Date. However, if directed by the Engineer or the Employer, the Contractor shall continue such work to the extent required by the Contractor's personnel during the period of maintenance. No compensation shall be paid for the continued operation and maintenance of the Contractor's Camps during the period of maintenance.

Upon completion of the Works, or at such time within the period of maintenance as directed by the Engineer, the Contractor shall remove all buildings utilities and other facilities from the Site and restore all camp areas to a neat and clean condition.

The construction, operation and maintenance of all camps of the Contractor shall comply with all applicable provisions of current Pakistan Labor Camp Rules.

Adequately equipped and properly staffed portable first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations to administer first aid treatment at any time required and free of charge to all persons on the Site, including employees of the Engineer and the Employer.

## 2. PAYMENT OF WORK

No payment shall be made for the work involved within the scope of this section of Specifications unless otherwise specifically stated in the Bill of Quantities or herein.

The cost thereof is included in the quoted rate of other items of the Bill of Quantities.

\*\*\* End of Section 0120 \*\*\*



**SECTION - 0130**  
**STAKE-OUT SURVEY**

1. **SCOPE**
2. **MATERIAL AND EQUIPMENT**
3. **SUBMITTALS**
4. **EXECUTION**
5. **PAYMENT OF WORK**





## 1. SCOPE

Under this item the Contractor shall make the stakeout survey for construction purposes with competently qualified men, consistent with the current practices. The work shall proceed immediately upon the award of the contract and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer fully informed as to the progress of the stakeout survey. The scope of this section of specifications is covered by detailed specifications as laid down herein.

## 2. MATERIAL AND EQUIPMENT

All instruments, equipment, stakes and other material necessary to perform all work shall be provided by the Contractor. These instruments and equipment shall be available to Engineer at all times for the purpose of checking the work of the Contract.

All stakes used shall be of a type approved by the Engineer, clearly and permanently marked so as to be legible at all times. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times. Any existing stakes or markers defining property lines and survey monuments which may be disturbed during construction shall be properly tied into fixed reference point before being disturbed and accurately reset in their proper position upon completion of the work.

## 3. SUBMITTALS

Submit all survey data, computations, field notes, drawings and all other survey records necessary to accomplish the work.

## 4. EXECUTION

The Contractor shall trim trees, bushes and other interfering objects, not consistent with the plan, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stake-out survey crews and the Engineer's survey crews. The exact position of all work shall be established from control points, which are shown on the plans or modified by the Engineer. Any error, apparent discrepancy in or absence of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc. throughout the life of the contract. Damaged, destroyed or inaccessible reference points, bench marks or stakes shall be replaced by the Contractor. Existing or new control points that will be or are destroyed during construction shall be re-established and all reference ties recorded thereon shall be furnished to the Engineer. All stakeout survey work shall be referenced to the centerlines shown on the Plans. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work shall be kept neatly and made available to the Engineer upon request and furnished to the Employer upon Contract completion.

The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor and any necessary correction to the work shall be immediately made. Such checking by the Engineer shall not relieve the Contractor of any of his responsibilities for the accuracy or completeness of his work.

Reference points, base lines, stakes and benchmarks for borrow pits shall be established by the Contractor.

All required right-of-way and easement limits shall be established, staked and referenced by the Contractor concurrent with the construction stakeout survey.

The Contractor shall place at least two offset stakes or references at each centre lines station and at such intermediate stations as the Engineer may direct. From computations and





measurements made by the Contractor, these stakes shall be clearly marked with the correct centre line, station number, offset and cut or fill so as to permit the establishment of the true centre line location during construction. He shall locate and place all cut, fill, slope, line grade or other stakes and points as the Engineer may direct to be necessary for the proper progress of the work.

**5. PAYMENT OF WORK**

No payment shall be made for the Works involved within the scope of this section of Specifications unless otherwise specifically stated in the Bill of Quantities or herein.

The cost thereof is included in the quoted unit rate of other items of the Bill of Quantities.

\*\*\* End of Section 0130 \*\*\*



**SECTION - 2100**

**FORMWORK**

1. SCOPE
2. GENERAL
3. MATERIALS
4. DELIVERY AND STORAGE
5. WORKMANSHIP
6. MEASUREMENT & PAYMENT



## SECTION - 2100

### FORMWORK

#### 1.0 SCOPE

The work under this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with the supply and installation of formwork for the purpose of containing concrete during placement and consolidation in the required shape and form.

#### 2.0 GENERAL

It shall be the responsibility of the Contractor to perform the work by engaging well trained and experienced staff.

#### 3.0 MATERIALS

The Contractor shall use the following materials for different purposes as stated below:

##### 3.1 Timber

Form framing, sheathing and shoring.

##### 3.2 Plywood

Form sheathing and panels.

##### 3.3 Steel

- Heavy forms and false work
- Column and joint forms
- Permanent forms
- Welding of permanent forms

##### 3.4 Form Ties Anchors and Hangers

For securing formwork against placing loads and pressures.

##### 3.5 Coatings

Facilitate form removal.

##### 3.6 Steel Joints

For formwork support.

##### 3.7 Steel frame shoring

For formwork support.

#### 4.0 DELIVERY AND STORAGE

##### 4.1 Delivery

The delivery of formwork components shall be made in a manner so as not to cause damage.





#### 4.2 Storage

Form work should be stored, after cleaning and preparing for re-use, if used before in such a manner that access to all different component is available.

Form work component which can be affected by weathering shall be stored in appropriate building or under covers and shade.

#### 5.0 WORKMANSHIP

- 5.1 Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall have sufficient rigidity to maintain specified tolerances.

Where required details and locations of special forms to be used are set out on the drawings. The Engineer shall reject any formwork in any part of the work which has been constructed with a non- approved formwork. Approval of form work by the Engineer shall be one of these conditions to be fulfilled before concreting. The Engineer shall reject any concreting which may not conform to the approved model.

- 5.2 Earth cuts shall not be used as forms for vertical surfaces of reinforced concrete work unless required as such or permitted by the Engineer.

- 5.3 Formwork shall be of timber, steel, plywood, proprietary building boards and such special materials, as may be approved by the Engineer, which give the required finish and shape to the surface of concrete. Wooden formwork shall be free from loose knots and shall be well seasoned.

- 5.4 The formwork shall conform to the shape, lines and dimensions as shown on the plans, and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete, and shall be sufficiently tight to prevent loss of liquid from the concrete.

The design and engineering of the formwork, as well as its construction, shall be the responsibility of the Contractor. Where necessary, to maintain the specified tolerances, the formwork shall be cambered to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads.

The Contractor shall establish and maintain in an undisturbed condition and until final completion and acceptance of the project, sufficient control points and bench marks to be used as references for checking upon tolerances.

- 5.5 Requirements for 'facing materials' are given in the Section relevant to 'Finishing of Formed Surfaces.'

- 5.6 Where natural plywood-form-finish, grout-cleaned-finish, smooth-rubbed-finish, scrubbed-finish, or sand-floated-finish is required, forms shall be smooth (faced with plywood, liner sheets, or prefabricated panels) and true to line, in order that the surfaces produced will require little dressing to arrive at true surfaces. Where any as-cast finish is required, no dressing shall be permitted in the finishing operation.

- 5.7 Where as-cast surfaces, including natural plywood- form-finish are specified, the panels of material against which concrete is cast shall be orderly in arrangement, with joints between panels planned in approved relation to openings, building corners, and other architectural features.

- 5.8 Where panels for as-cast surfaces are separated by recessed or otherwise emphasized joints, the structural design of the forms shall provide for locating form ties, where possible, within the joints so that patches of tie holes will not fall within the panel areas.





- 5.9 Forms shall not be re-used if there is any evidence of surface wear and tear or defect which would impair the quality of the surface finish. Forms shall be thoroughly cleaned and properly coated before re-use.
- 5.10 Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Unless otherwise specified in the Contract documents chamfer strips shall be placed in the corners of forms to produce beveled edges on permanently exposed surfaces. Interior corners on such surfaces and the edges of formed joints will not require beveling unless required by the Contract documents.
- 5.11 Positive means such as wedges or jacks for accurate adjustment and for proper removal of shores and struts shall be provided and all settlement shall be monitored during concrete placing operation. Forms shall be securely braced against lateral deflections.
- 5.12 Where concreting of thin members is required to be carried out within formwork of considerable depth, temporary openings in the sides of the formwork shall be provided where necessary to facilitate the placing and consolidation of concrete. Small temporary openings shall also be provided at the bottom of the formwork for columns, walls and deep beams to permit the cleaning out of debris and observation immediately before concrete is deposited.
- 5.13 Form ties shall be constructed so that the ends or end fasteners can be removed without causing appreciable spalling at the faces of the concrete. After the ends or end fasteners of form ties have been removed, the embedded portion of the ties shall terminate not less than twice the diameter or twice the minimum dimension of the tie from the formed faces of concrete to be permanently exposed to view and in no case shall this distance be less than 19mm (3/4 in.) when the formed face of the concrete is not to be permanently exposed to view from ties may be cut off flush with the formed surfaces.
- Through bolts may be permitted provided that they are greased to allow for easy withdrawal and the holes subsequently made good. Through bolts are not to be used on water-retaining structures.
- 5.14 At construction joints contact surface of the form sheathing for flush surfaces exposed to view shall overlap the hardened concrete in the previous placement by no less than 25mm (1 in.). The forms shall be held against the hardened concrete to prevent offsets or loss of mortar at the construction joint so as to maintain a true surface.
- 5.15 Wood forms for wall opening shall be constructed to facilitate loosening, if necessary, to counteract swelling of the forms.
- 5.16 Wedges used for final adjustment of the forms prior to concrete placement shall be fastened in position after the final check.
- 5.17 Formwork shall be so anchored to shores or to other supporting surfaces or members that upward or lateral movement of any part of the formwork system during concrete placement will not occur.
- 5.18 Runways or planks for moving labour and equipment shall be provided with struts or legs and shall be supported directly on the formwork or upon the structural member without resting on the reinforcing steel.
- 5.19 All surfaces of forms and embedded materials shall be cleaned of any accumulated mortar or grout from previous concreting and of all other foreign material before placing fresh concrete.
- 5.20 Forms shall be sufficiently tight to prevent leakage of grout or cement paste. Board forms having joints opened by shrinkage of the wood shall be removed and replaced. Plywood and other wood surfaces not subject to shrinkage shall be sealed against





absorption of moisture from the concrete by either (1) a field applied, approved form oil or sealer, or (2) a factory applied non-absorptive liner. When forms are coated to prevent bond with concrete, it shall be done prior to placing of the reinforcing steel. Excess coating material shall not be allowed to stand in puddles in the forms nor allowed to come in contact with the concrete against which fresh concrete will be placed. Care shall be taken that such approved composition is kept out of contact with the reinforcement. Where as-cast finishes are required, materials, which will impart a stain to the concrete, shall not be applied to the form surfaces. Where the finished surface is required to be painted, the material applied to form surfaces shall be compatible with the type of paint to be used.

- 5.21 For reinforced concrete, in no circumstances shall forms be struck until the concrete attains a strength of at least twice the stress to which the concrete may be exposed at the time of striking.

The strength referred to shall be that of concrete using the same cement and aggregates, with the same proportions, and cured under conditions of temperature and moisture similar to those obtaining in the work. Where possible, the formwork should be left for longer time as it would assist the curing.

In normal circumstances (generally where temperature are above 20<sup>o</sup> C and where ordinary cement is used) forms may be struck after expiry of the following periods:

- Walls, columns and vertical 48 hours or as may sides of beams decided by the Engineer.
- Side of slab (shores of 6 days props left under)
- Beams soffits (shores or 12 days props left under)
- Removal of shores or props to slabs:
  1. Spanning upto 4 metre (13 ft.) 10 days.
  2. Spanning over 4 metre (13 ft.) 16 days.
- Removal of shores or props to beams:
  1. Spanning upto 6 metre (20 ft.) 18 days.
  2. Spanning over 6 metre (20 ft.) 25 days.

For rapid hardening cement 3/7 of the above period will be sufficient in all cases except vertical sides of slabs, beams and columns which should be retained for a minimum of 24 hours.

The number of shores or props, their sizes and disposition shall be such as to be able to safely carry the full dead load of the slab and beams, as the case may be.

Proper allowance shall be made for the decrease in rate of hardening of concrete in cold weather and the above minimum duration must be increased when the mean daily temperature is below 20<sup>o</sup> C.

- 5.22 When repair of surface defects or finishing is required at an early age, forms shall be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.
- 5.23 Top forms on sloping surfaces of concrete shall be removed as soon as the concrete has attained sufficient stiffness to prevent sagging. Any needed repairs or treatment required on such slopping surfaces shall be performed at once and be followed by the specified curing.





- 5.24 Wood forms for wall openings shall be loosened as soon as this can be accomplished without damage to the concrete.
- 5.25 All formwork shall be removed without such shock or vibration as would damage the reinforced concrete. Before the top plank and struts are removed, the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occurs with all cement in the cold weather.
- 5.26 When reshoring or repropping is permitted or required, the operations shall be planned in advance and shall be subject to approval. While reshoring is underway no live loads shall be permitted on the new construction.

In no case during reshoring shall concrete in beams, slab, columns or any other structural member be subjected to combined dead and construction loads in excess of the load permitted by the Engineer for the developed concrete strength at the time of reshoring.

Reshores shall be placed as soon as practicable after stripping operations are complete but in no case later than the end of working day on which stripping occurs.

Reshores shall be tightened to carry their required loads without overstressing the construction. Reshores shall remain in place at least until tests representative of the concrete being supported have reached the strength specified in sub-clause 5.23 hereof.

- 5.27 Floors supporting props or shores under newly placed concrete shall have their original supporting props or shores left in place or shall be reshored. The reshoring system shall have a capacity sufficient to resist the anticipated loads and in all cases shall have a capacity equal to at least one half the capacity of the shoring system above. The reshores shall be located directly under a shore position above unless other locations are permitted.

The reshoring or re-propping shall extend over a sufficient number of storeys to distribute the weight of newly placed concrete, forms, and construction live loads in such a manner that the design superimposed loads of the floors supporting shores or props are not exceeded.

- 5.28 It is generally desirable to give forms for reinforced concrete an upward camber to ensure that the beams or slabs (specially cantilever slabs) do not have a sag when they have taken up their deflection, but this should not be done unless permitted by the Engineer.
- 5.29 No loads, other than man and light plant required in connection with the actual work in hand, shall be allowed on suspended floors until 28 days after concreting where ordinary Portland Cement is used and 14 days when rapid hardening Portland Cement is used.
- 5.30 Prior to placing concrete, all forms shall be inspected and all debris and extraneous matter removed. The form oil or release agent shall not react with concrete to affect the strength nor shall it give any colour. It shall be applied in such a manner as not to contaminate the reinforcement and other fixtures to be embedded in concrete.
- 5.31 Formwork for concrete pavement shall be made of steel of an approved section, with a base width of at least 200 millimeters (8 in.) and the depth shall be equal to the thickness of the pavement at the edge as shown on the plans. The forms shall be staked with steel stakes, and stakes shall be of a length approved by the Engineer. Each section of forms shall have a stake pocket at each end and at intervals of not more than 1.5 meters (5 ft.) between ends. The stake pockets shall have approved devices for locking the form to the steel stakes. Each section of forms shall be straight and free from bends and warps at all times. No section shall show a variation greater than 3 millimeter in 3 meters (1/8 inch in



10 ft.) from a true plane surface on the top of the form, and the inside face shall not vary more than 6 millimeters (1/4 in.) from a plane surface.

Before placing forms, the underlying base shall be to the required grade, and shall be firm and compact. The forms shall have full bearing upon the foundation throughout their length and shall be placed with exactness to the required grade and alignment of the edge of the finished pavement. They shall be so supported during the entire operation of placing, tamping and finishing the pavement that they will not deviate vertically at any time more than 3 millimeters (1/8 in.) from the proper elevation.

Forms shall not be removed for at least twelve (12) hours after the concrete has been placed. Forms shall be carefully removed in a manner to avoid damage to the pavement. Under no circumstances will the use of pry bars between the forms and the pavement be permitted. Pavement, which in the opinion of the Engineer, is damaged due to the careless removal of forms shall be repaired by the Contractor, as directed by the Engineer, at the Contractor's own expense. Forms shall be thoroughly cleaned and oiled each time they are used.

When pavement is placed adjoining existing concrete pavement upon which the finishing machine will travel, any irregularities in the old pavement shall be ground down to a true, uniform surface, of sufficient width to accommodate the wheels of the finishing equipment, if necessary to obtain proper smoothness of the pavement.

#### 6.0 MEASUREMENT AND PAYMENT

Except otherwise specified in the Bill of Quantities no payment will be made for the works involved within the scope of this section of the specifications.

The cost thereof shall be deemed to have been included in the quoted unit rate of relevant concrete items of the Bills of Quantities.

\*\*\* End of Section 2100 \*\*\*





**SECTION - 2200**  
**REINFORCEMENT**

1. SCOPE
2. APPLICABLE STANDARDS
3. MATERIALS
4. COMPLIANCE WITH SPECIFICATIONS
5. DELIVERY & STORAGE
6. BAR BENDING SCHEDULES
7. FABRICATING, BENDING AND PLACING
8. MEASUREMENT & PAYMENT





**SECTION - 2200**  
**REINFORCEMENT**

**1.0 SCOPE**

The work under this section of specification consists of furnishing all plant, labour, equipment, appliances and materials and performing all operations in connection with the supply, transporting, cutting, bending and placing steel reinforcement, welded wire-fabric, dowels, tie-bars and assemblies in concrete structures, pavement or elsewhere, at any floor and at any height as shown in the drawings, as specified herein and as required by the site conditions or as directed by the Engineer.

**2.0 APPLICABLE STANDARDS**

Latest editions of the following Pakistan, British and ASTM Standards are relevant to these specifications wherever applicable.

**Pakistan Standard**

P.S 241	Tensile Testing of Steel.
P.S 244	Bend test for Steel
P.S 580	Rolled deformed Steel bars (intermediate grade) for concrete reinforcement.
P.S 605	Rolled deformed steel bars (hard grade) for concrete reinforcement.
P.S 606	Rolled deformed Steel bars (structural grade) for concrete reinforcement.
P.S 607	General technical delivery requirement for steel.

**British Standard**

B.S 4449	Carbon steel bars for reinforcement of concrete
B.S 4466	Specifications for Bending dimensions and scheduling of bars for the reinforcement of concrete.

**ASTM Standard**

A 185	Standard specification for welded steel wire fabric for concrete reinforcement.
A 305	Minimum requirement for the deformations of deformed steel bars for concrete reinforcement.
A 615	Standard specification for deformed and plain billet steel bars for concrete reinforcement.

**ACI Codes**

ACI 315	Details and Detailing of Concrete Reinforcement (ACI Publication SP-66)
ACI 318	Building Code Requirements for Reinforced Concrete.



In addition to the above, the latest editions of other Pakistan Standards, British standards, American Concrete Institute Standards, American Society for Testing and Materials Standards and other standard as may be specified by the Engineer for Special Material and construction are also relevant.

### 3.0 MATERIALS

#### 3.1 Reinforcement

##### 3.1.1 General

Reinforcement shall be obtained only from manufacturers approved by the Engineer. Each consignment of reinforcement steel shall be accompanied by the manufacturer's certificate or shall refer to a previous certificate. If the consignment is from the same batch, showing that the reinforcement steel complies with the specified requirement. If such certificate is not made available, the Engineer may direct testing of different consignments of reinforcing steel at the Contractor's cost. Should the result of such tests show that the sample does not meet with the specifications the whole consignment shall be rejected and removed from the site at the Contractor's cost.

Reinforcement shall be free from all loose or flaky rust and mill scale or coating, and any other substance that would reduce or destroy the bond. Reduced section steel reinforcement shall not be used.

##### 3.1.2 Reinforcing Steel

Unless otherwise specified, all plain reinforcing bars shall comply with the requirements of B.S 4449 for plain mild steel bars and shall have a minimum characteristic strength of 36,000 psi (250 MPa).

Unless otherwise specified, all deformed reinforcing bars shall comply with the requirements of ASTM A-615 for deformed hot rolled new stock billet steel bars and shall have a minimum characteristic strength of 40,000 psi (276 Mpa) and 60,000 psi (414 MPa), as shown on drawings.

##### 3.1.3 Spacers and Supports

Spacers and supports shall be approved standard products of types best suited for the purpose.

##### 3.1.4 Welding

The bars shall not be welded, unless prior approval of the Engineer is obtained in writing. If permitted, welding shall be done in accordance with relevant codes and standards taking all necessary precautions and safeguards. Where welding is unavoidable the Engineer may require substitution of the high strength deformed bars by plain round steel bars of lower grade, conforming to BS 4449, of equivalent strength.

### 4.0 COMPLIANCE WITH SPECIFICATIONS

The Contractor shall submit certificates of compliance from the manufacturer stating that the supplied reinforcement conforms to the Specifications. In addition, wherever and as directed by the Engineer, conformance of the supplied reinforcing bars with the specifications shall be demonstrated by the Contractor through laboratory tests, in accordance with the relevant standards.





## 5.0 DELIVERY & STORAGE

### 5.1 Delivery

Steel reinforcement bars shall be kept in bundles firmly secured and tagged. Each bar or bundle of bars shall be identified by marks as per relevant BS standard.

### 5.2 Storage

The method of storage shall be approved by the Engineer. Reinforcing bars shall be stored in racks or platforms above the surface of ground and shall be protected free from scaling, rusting, oiling, coatings, damage, contamination and structural defects prior to placement in works. Bars of different diameters and grades of steel reinforcement shall be kept separately.

## 6.0 BAR BENDING SCHEDULES

The Contractor shall prepare bar bending schedules of all the reinforcing steel bars and shall obtain approval of the Engineer before proceeding with the work.

The Engineer's approval, however, will not relieve the Contractor of his responsibility in this regard.

## 7.0 FABRICATING, BENDING & PLACING

7.1 Reinforcement shall be accurately placed as shown in drawings and secured against displacement by using 16 gauge steel wire ties or suitable clips at intersections and supported from the formwork by using concrete, metal or plastic chains, spacers or hangers of an approved pattern. Where concrete blocks are used for ensuring the cover, they shall be made of mortar not leaner than one part of cement to two parts of sand.

Where the concrete surface will be exposed to the weather in the finished structure, the portions of all accessories in contact with the form work shall be galvanized or shall be made of plastic.

7.2 Bars used for concrete reinforcement shall be fabricated in accordance with the dimensions shown in the bar bending schedule approved by the Engineer.

7.3 The cutting tolerance for all reinforcing bars shall be 19 mm (3/4 in.).

7.4 Fabricating tolerance shall be as per ACI - 315.

7.5 Placing tolerances shall be as per ACI-318 & 317.

7.6 Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. If bars are moved more than one bar diameter or enough to exceed the above tolerances, the resulting arrangement of bars shall be subject to approval of Engineer.

7.7 Vertical bars in columns shall be offset at least one bar diameter at lapped splices. To ensure proper placement, templates shall be furnished for all columns dowels.

7.8 Reinforcement shall not be bent or straightened in a manner that will injure the material.

No bars shall be bent twice in the same place, nor shall they be straightened after bending.

Unless permitted, by Engineer, reinforcement shall not be bent after being partially embedded in hardened concrete.





- 7.9 No splice of reinforcement shall be made except as approved by the Engineer.
- 7.10 Welding of reinforcement shall not be done unless permitted and approved by the Engineer.
- 7.11 Exposed reinforcement intended for bonding with future extensions is to be effectively protected from corrosion. Protection is also to be provided to reinforcement partly built into concrete where the exposed part is to be built into later concrete.
- 7.12 No concreting is to be carried out until the reinforcement has been checked and approved by the Engineer.
- 7.13 All detailing shall be done as per ACI standards ACI-315, ACI-318 & ACI-350R, as and where required.
- 7.14 Standard or actual unit weight whichever is lesser shall be used for calculation of weights.

## 8.0 MEASUREMENT & PAYMENT

### 8.1 General

Except otherwise specified herein or elsewhere in the Contract Documents no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bills of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bills of Quantities.

- 8.1.1 Providing and installing chairs, supports, hooks, spacers, binding wires, corrosion protection sleeves, wire cage or basket for tie bars and dowels and laps not shown on drawings including wastage and rolling margin.
- 8.1.2 Testing of mild steel, deformed steel, welded wire fabric, dowels, tie bars and assemblies.

### 8.2 Reinforcing Bars.

#### 8.2.1 Measurement

Measurement for acceptably completed works of reinforcement shall be made by weight in metric ton according to bar bending schedules approved by the Engineer.

#### 8.2.2 Payment

Payment will be made for acceptable measured quantity of reinforcement provided and placed in position on the basis of unit rate per metric ton quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 2200 \*\*\*



**SECTION - 2300**

**PLAIN AND REINFORCED CONCRETE**

1. **SCOPE**
2. **APPLICABLE CODES AND STANDARDS**
3. **SUBMITTALS**
4. **MATERIALS**
5. **MATERIAL TESTING**
6. **EXECUTION**
7. **FINISHING OF FORMED SURFACES**
8. **REPAIR OF DEFECTS**
9. **CONCRETE CONSTRUCTION TOLERANCES**
10. **ACCEPTANCE OF STRUCTURE**
11. **MEASUREMENT & PAYMENT**



## SECTION - 2300

### PLAIN AND REINFORCED CONCRETE

#### 1.0 SCOPE

The work under this section of the specification consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with the supply, manufacture, transporting, placing, consolidating, finishing and curing of plain and reinforced concrete for pavements and other structures as shown in the drawings, as specified herein and as required by the site conditions or as directed by the Engineer, for a complete job. Reinforcement does not form part of this section.

#### 2.0 APPLICABLE CODES AND STANDARDS

The latest edition of following ACI, ASTM, Pakistan & British Standard are relevant to these specification wherever applicable:

#### 2.1 ACI (American Concrete Institute)

- 117 Standard Specification for tolerances for concrete construction and materials.
- 201.2 Guide to durable concrete
- 211.1 Recommended Practice for Selecting Proportions for Normal and Heavy Weight Concrete.
- 214 Recommended Practice for Evaluation of Strength Test Results of Concrete.
- 301 Specifications for Structural Concrete for Buildings
- 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
- 305 Hot Weather Concreting
- 308 Recommended Practice for Curing Concrete
- 309 Recommended Practice for Consolidation of Concrete
- 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures
- 318 Building Code Requirements for Reinforced Concrete
- 347 Recommended Practice for Concrete Formwork
- 350R Concrete Sanitary Engineering Structures
- 544.1R State-of-the-Art Report on Fiber Reinforced Concrete
- 544.2R Measurement of Properties of Fiber Reinforced Concrete
- SP-2 Manual of Concrete Inspection
- SP-142 Fiber Reinforced Concrete Developments and Innovation
- SP-155 Testing of Fiber Reinforced Concrete
- SP-182 Structural Applications of Fiber Reinforced Concrete





UBC Uniform Building Code

COE CRD 48-92 Method of Test for Water Permeability of Concrete; U.S Army Corps of Engineers

NACE National Association of Corrosion Engineering

- A199.1 Construction and Industrial Plywood

2.2 ASTM (American Society for Testing and Materials)

- A 185 Standard Specification for Welded Steel Wire, Fabric for Concrete Reinforcement

- A 305 Minimum Requirements for the Deformations of Deformed Steel bars for Concrete Reinforcement

- A 499 Hot-Rolled Rail Carbon Steel Bars and Shapes

- A 615 Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

- A 616 Standard Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement

- A 617 Standard Specification for Axle Steel Deformed and Plain Bars for Concrete Reinforcement

- A 675 Steel Bars and Bar Size Shapes, Carbon, Hot-Rolled, Special Quality, Subject to Mechanical Property Requirements

- A 615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

- A706 Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

- A767 Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement

- A775 Epoxy-Coated Reinforcing Steel Bars

- C 31 Making and Curing Concrete Test Specimens in the Field

- C 33 Concrete Aggregates

- C 39 Compressive Strength of Cylindrical Concrete Specimens

- C 40 Organic impurities in sand for concrete.

- C 42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

- C 78 Flexural Strength of Concrete (Using Simple Beam with Third Point Loading)

- C 87 Effect of organic impurities in fine aggregates on strength of mortar.

- C 88 Soundness of Aggregates

- C 94 Ready-Mixed Concrete

- C 109 Compressive Strength of Hydraulic Cement Mortars

- C 117 Materials Finer than No.200 Sieve in Mineral Aggregates by washing

- C 123 Light weight pieces in aggregates



- C 125 Concrete and Concrete Aggregates
- C 127 Test method for Specific Gravity and Absorption of Coarse Aggregate
- C 128 Test method for Specific Gravity and Absorption of Fine Aggregate
- C 131 Resistance to Degradation of small size Aggregate by Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
- C 136 Sieve or Screen Analysis of Fine and Coarse Aggregates
- C 138 Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
- C 142 Clay Lumps and Friable Particles in Aggregates
- C 143 Slump of Portland Cement Concrete
- C 144 Aggregate for Masonry Mortar
- C 150 Portland Cement
- C 156 Test Method for Water Retention of Concrete Curing Materials
- C 157 Length Change of Hardened Hydraulic Cement Mortar or Concrete
- C 171 Sheet Materials for Curing Concrete
- C 172 Method of Sampling Fresh Mixed Concrete
- C 173 Air Content of Freshly Mixed Concrete by the Volumetric Method
- C 185 Air Content of Hydraulic Cement Mortar
- C 186 Heat of Hydration of Hydraulic Cement
- C 188 Density of Hydraulic Cement
- C 191 Time of Setting of Hydraulic Cement by Vicat Needle
- C 217 Weather resistance of Natural Stone
- C 227 Potential Alkali Reactivity of cement - Aggregate Combination.
- C 231 Air Content of Freshly Mixed Concrete by the Pressure Method
- C 260 Air-Entraining Admixtures for Concrete
- C 289 Potential reactivity of Aggregate
- C 293 Standard test method for Flexural Strength of Concrete (using simple beam with center Point Loading)
- C 309 Liquid Membrane-Forming Compounds for Curing Concrete
- C 321 Standard Test method for Bond Strength of Chemical Resistant material
- C 330 Light Aggregates for Structural Concrete
- C 332 Light weight aggregates for insulating concrete.
- C 348 Standard Test method for Flexural strength of Hydraulic Cement Mortar





- C 400 Requirements for water use in mixing and curing concrete
- C 494 Chemical Admixtures for Concrete
- C 535 Resistance to Abrasion of Large Size Coarse Aggregates
- C 595 Specification for Blended Hydraulic Cements
- C 596 Standard Test method for Drying, shrinkage of Mortar Containing Hydraulic Cement
- C 685 Concrete Made by Volumetric Batching and Continuous Mixing
- C 881 Epoxy-Resin-Base Bonding Systems for Concrete
- C 989 Ground Granulated Blast – Furnace Slag for use in Concrete
- C 995 Standard Test Method for Time of Flow of Fiber Reinforced Concrete Through Inverted Slump Cone
- C 1018 Standard Test Method for Flexural Toughness and First- Crack Strength of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading)
- C 1116 Standard specification for Fiber-Reinforced Concrete and Shotcrete)
- C 1399 Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete
- D 75 Sampling Aggregates
- D 512 Chloride Ion in Water and Waste Water
- D 516 Sulphate Ion in Water and Waste Water
- D 596 Reporting Results of Analysis of Water
- D 1190 Concrete Joint Sealer, Hot-Poured Elastic Type
- D 1411 Water-Soluble Chlorides Present as Admixes in Graded Aggregate Road Mixes
- D 1751 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- D 1752 Preformed sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Concrete
- D 1850 Concrete joint sealer (cold application type)
- E 11 Wire-Cloth Sieves for Testing Purposes
- E 96 Water Vapour Transmission of Materials in Sheet Form
- E 154 Materials for Use as Vapour Barriers under Concrete Slab
- E 337 Relative Humidity by Wet and Dry Bulk Psychrometer
- CALIF 217 Method of Test for Sand Equivalent
- CALIF 227 Method of Test for Evaluating Cleanness of Coarse Aggregate





- CE CRD C 119 Method of Test for Flat and Elongated Particles in Coarse Aggregate
- CE CRD C400 Requirements for Water for Use in Mixing and Curing Concrete
- CE CRD C 513 Rubber Waterstops
- CE CRD C 572 Polyvinyl Chloride Waterstops
- CE CRD C 588 Expansive Grout
- FF MM G 650 Epoxy-Resin Grout

### 2.3 B.S (British Standard)

- 12 Portland cement (Ordinary & Rapid Hardening)
- 146 Portland Blast Furnace Slag Cement
- 410 Test Sieves
- 693 General Requirements for Oxy-acetylene Welding
- 812 Methods for the sampling and testing of mineral aggregates, sand fillers.
- 882 Coarse and fine aggregates from natural sources.
- 1305 Batch Mixer.
- 1881 Methods of Testing Concrete
- 3148 Tests for water for making concrete.
- 4027 Sulphate Resisting Portland Cement
- 4449 Carbon Steel Bars for the Reinforcement
- 4483 Steel fabric for the reinforcement of concrete
- 8110 Structural use of concrete.



In addition, the latest editions of other Pakistan Standard, ACI, ASTM & British Standard and other Standards as may be specified by the Engineer for Special Materials and construction are also relevant.

### 3.0 SUBMITTALS

All submittals shall be in accordance with the schedule of submittals prepared by the Contractor and approved by the Engineer.

#### 3.1 Proposed Mix Designs

Submit proposed designs for trial design batches for each grade of concrete along with samples of proposed material.

Submit proposed final mix designs for each grade of concrete at least 7 calendar days before the date planned for the start of concrete placement, along with samples of proposed materials which differ from those submitted previously, and reports of successful 3, 7 and 28 calendar day strength tests, for Engineer's approval.

### 3.2 Construction Procedure

Submit to the Engineer procedures for the following:

- a) Both hot and cold weather concreting procedures shall be submitted to the Engineer by Contractor regardless of the need for the immediate implementation of such not less than two weeks before beginning the work. Procedures shall include requirements for insulation, enclosures and the like. Finishing procedures and timing and duration of curing shall be described.
- b) Contractor's construction procedures shall be computer word processed procedure and shall include charts and diagrams as applicable and necessary, to fully explain the subject procedures, methods and equipment operation in order to allow effective review by the Engineer, assist the Testing Agency's evaluation of the work, and to allow Contractor's personnel to perform work in full conformance to the Tender & Contract Document.
- c) Protection of concrete against injury due to mechanical contact and construction operation.
- d) Protection of work by other trades.

### 3.3 Placement Schedule

Submit a placement schedule for approval prior to start of concrete placement operations. Daily concrete pour schedules shall be submitted 24 hours in advance of planned pours.

### 3.4 Formwork

Submit for approval copies of manufacturer's data and installation instructions for proprietary materials including form coatings, manufactured form systems, ties and accessories.

### 3.5 Certificates of Compliance

Submit certificates of compliance covering cement types, reinforcement, grout materials, additives, epoxy-resin materials etc. The certificates of compliance shall include the material or product manufacturer's statements that supplied items conform to Specifications.

### 3.6 Testing Programme

Submit test programme for all specified requirements alongwith the testing schedule for approval of the Engineer.

### 3.7 Test Reports

Submit test reports showing the result of required tests and compliance with specified standards and codes, for approval. Test reports shall be certified by the Contractor and the Testing Agency.

### 3.8 Samples

Submit to the Engineer for acceptance prior to purchase, fabrication or delivery, samples of materials for his approval.

Substitute products materials or fixtures proposed by the Contractor shall be submitted as samples for approval. The samples shall be accompanied by detailed information about materials.





### 3.9 Shop Drawings

- a) Shop drawings shall be submitted to the Engineer for approval in accordance with the requirements of the Contract Documents and as specified herein under;
- b) Shop drawings furnished for this section shall conform to the best standards of the construction industry. Shop drawings shall be prepared under the supervision of competent engineering personnel. Prior to submittal, the Contractor shall check each shop drawing for compliance with the requirements of the Contract Documents. As evidence of conformance with this requirement, each shop drawing shall bear the seal and the self-written signature of Contractor's registered Professional Engineer.
- c) Shop drawings shall include plans, elevations, sections and complete details to describe clearly, at an ample scale for all works to be provided. Drawings shall be accurately dimensioned, where applicable, and shall be noted clearly.
- d) Work of Other Trades: Show in the shop drawings, and dimension thereon, holes required for passage of work of other sections through Cast-In-Place Concrete Work. Prepare and submit to the Engineer field work drawings for holes not shown in shop drawings.
- e) Submit shop drawings for curved and radial concrete formwork and identify the formwork materials proposed for use.
- f) Construction Joint, Expansion Joint and contraction Joint Drawings: Show all joints given in the drawings, specified herein, and required by Contractor to provide for the sequence of pourings. Submit in sufficient time to allow the orderly detailing of reinforcing steel. Reinforcement shop drawings shall be prepared in conformance with the accepted Construction Joint, Expansion Joint and contraction Joint Drawings. Measures to control cracks e.g. shrinkage strips, admixture as per relevant ACI codes shall be shown on the drawings.
- g) Reinforcing Steel, including welded wire fabric (WWF), shall be detailed in strict accordance with the methods and procedures provided in "ACI Detailing Manual". Reinforcing steel drawings shall be submitted simultaneously with related shop drawings.

Prepare shop drawings which provide for reinforcement, including dowels, properly positioned in all concrete work, so that material can be properly cut, bent and placed. Form not be removed for at least twelve (12) hours after the concrete has been placed. Forms shall be carefully given in shop drawings. Reinforcing steel drawings shall show, to scale, all concrete work including pits, kerbs, trenches, pads, equipment bases, steps, slopes, radii, curves, openings, holes, blockouts and the like. Provide schedules and details showing placing sequences, bending, lengths and locations of all reinforcement.

- h) Detailing: All reinforcing steel shall be detailed in strict compliance with ACI 318 and ACI 315.

### 3.10 Coordination Drawings

Submit coordinated drawings of the following:

All sleeve locations, whether round or of other shape, penetrating exterior and interior walls, pits, slabs, beams, other structural systems and pavements.

The position of all embedded items required to receive the work of other trade, including details needed to assure correct placement of both the embedded items and the reinforcing steel.





The Contractor shall coordinate and crosscheck for accuracy, completeness and correct relationship to the work of other sections, each shop drawing prepared for the work of this section, including each shop drawing prepared by nominated subcontractors. Contractor's check shall include a verification of strict compliance with the Contract Documents and shall be performed prior to submission of each shop drawing for review by the Engineer. The Contractor shall certify the co-ordination, accuracy, and Contract compliance of each shop drawing by a written statement placed in each drawing and attested by the responsible person in charge of the work for Contractor. The personally inscribed initials of the person(s) preparing each drawing as well as the detailing agency's supervisor and chief checker shall be included in the title block or similar prominent location.

### 3.11 Mill Test

Furnish the Engineer with certified mill test report for cement and for steel reinforcement, including bars, welded wire fabric, dowels, anchors and splices for approval.

### 3.12 Name of Manufacturers/Suppliers

Submit for acceptance by the Engineer:

- Aggregates
- Ready mix concrete
- Reinforcing bars
- Welded steel wire fabric
- Concrete accessories
- Cement
- Admixture
- Joint filler
- Joint sealants
- Water stops
- Membrane curing, sealing, hardening compound
- Bonding compound
- Form oil
- Anchors

## 4.0 MATERIALS

### 4.1 Cement

4.1.1 The cement shall be fresh and of approved origin and manufacturer. It shall be one of the following as may be specified by the Engineer.

- Sulphate Resistant Portland Cement ( low alkali) complying with the requirements of BS-4027 or ASTM C-150 Type V.
- Ordinary Portland Cement Type II (low alkali) complying with the requirements of BS-12 or ASTM C-150.
- Portland Blast-Furnace Slag Cement shall conform to BS-146 or to ASTM C-595. Slag shall consist of finely ground granulated iron blast-furnace slag and shall conform to ASTM C-989 Grade 80, 100, or 120.
- The proportioning of OPC and Portland Blast Furnace Slag material shall be in the ratio of 60 OPC to 40 Slag or as approved by the Engineer.\*

4.1.2 Unless otherwise specified, ordinary Portland Cement complying with the requirements of BS12 shall be used.



- 4.1.3 The Contractor shall supply to the Engineer at fortnightly intervals, reports of tests for conformance with the relevant specified standard in respect of the samples of cement from the work-site. These tests shall be carried out in a laboratory approved by the Engineer.
- 4.1.4 Only one brand of each type of cement shall be used for concrete in any individual member of the structure. Cement shall be used in the sequence of receipt of shipment, unless otherwise directed.
- 4.1.5 There shall be sufficient cement at site to ensure that each section of work is completed without interruption.
- 4.1.6 Cement reclaimed from cleaning of bags or from leaky containers shall not be used.
- 4.1.7 The Contractor shall provide and erect (at his cost) in a suitable plain, dry, well ventilated, weather-proof and water proof shed of sufficient capacity to store the cement.
- 4.1.8 The cement shall be used as soon as possible after delivery and cement which the Engineer consider has become stale or unsuitable through absorption of moisture from the atmosphere or otherwise shall be rejected and removed immediately from the site at the Contractor's expense. Any cement in containers damaged so as to allow the contents to spill or permitting access of the atmosphere prior to opening of the container at the time of concrete mixing shall be rejected and removed immediately from the site at the Contractor's expense.
- 4.1.9 Mixing together of different types of cement shall not be permitted.

#### 4.2 **Aggregates**

The sources of supply of all fine and coarse aggregates shall be subject to the approval of the Engineer.

Aggregates shall conform with ASTM C33 (including applicable ASTM Documents referenced therein) and as specified. Coarse aggregates shall be well graded from fine to coarse within the prescribed limits of this specification. Fine aggregate shall consist of natural sand, manufactured sand or combination of the two and shall be composed of clean, hard, and durable spherical or cubical particles. Coarse aggregate shall consist of crushed or uncrushed gravel, crushed stone, or a combination thereof and shall be clean, hard, uncoated particles of maximum nominal size as specified for each grade of concrete.

All fine and coarse aggregates shall be clean and free from clay, loam, silt and other deleterious matter. If required, the Engineer reserves the right to have them washed by the Contractor at no additional expense. Coarse and fine aggregates shall be delivered and stored separately at site. Aggregates shall not be stored on muddy ground or where they are likely to become dirty or contaminated. The materials shall be stock piled for a period before use for at least a day so as to drain nearly to constant moisture content. The grading of the coarse and fine aggregates shall be tested at least once for every 100tons supplied, to ensure that grading is uniform and same as that of the samples used in preliminary tests.

The sulphate content of aggregates shall not exceed 0.40 percent by weight for each individual source of coarse and fine aggregate. The chloride content of aggregates shall not exceed 0.05 percent by weight for each source of coarse and fine aggregate. The total sulphate content of concrete shall not exceed 4.0 percent by weight of the cement. The total chloride content of concrete shall not exceed 0.40 percent by weight of the cement.

Aggregates, when tested in accordance with CRD C119 shall contain not more than 8 percent by weight of thin, flat and elongated particles.

Petrographic analysis of aggregate shall be carried out initially for each source and periodically whenever directed by the Engineer.





The specific gravities and absorption of aggregates shall be identified in accordance with ASTM C 127 and ASTM C 128.

Prior to the initial use of each source of aggregates, certified tests shall be performed on aggregates to verify compliance with these specifications and submitted for Engineer's review and approval.

Gradation of coarse aggregates for concrete shall conform to the gradations given in Table-I.

The gradation of combined coarse and fine aggregates shall be within the grading limit specified in Table-II.

The Fineness Modulus of fine aggregate (sand) shall be not less than 2.6 nor more than 3.1. In at least four out of five successive test samples, the modulus shall vary by not more than 0.20 from the moving average for the last five tests. The gradation of the coarse aggregate will be suitable if the results of four out of the last five consecutive tests comply with the gradation requirements.

Furnish certified test reports for aggregate tests listed in Table-III, Quality Tests.

#### 4.3 Water

Only clean water from the sources approved by the Engineer shall be used. The Contractor shall supply sufficient water for all purposes, including mixing the concrete, curing and cleaning plant and tools. Water analysis shall be performed in accordance with ASTM D596.

#### 4.4 Concrete Patching Compound

Use an approved epoxy-resin compound applied according to manufacturer's instructions. Compound shall be paintable material which produces no evidence of bleeding and which, after final set, shall not be affected by high humidity and moisture. Epoxy-resin compound shall comply with FSMM-G-650, Type 1, Grade C.

#### 4.5 Fibre Reinforced Concrete

Duracrete Polypropylene Fiber or equivalent concrete reinforcing: Concrete shall be treated with Duracrete polypropylene synthetic reinforcing fibers or equivalent when indicated on the drawings or as otherwise specified by the Architect/Consultant in accordance with the fiber manufacturer's recommendations.

- a. Synthetic reinforcing fibers shall be manufactured from virgin polypropylene.
- b. The dosage rate shall be 1.8 kg/cu.m (3.0 Lb/ Cu yd) of concrete.
- c. Fiber supplier shall provide technical assistance, if required.
- d. All fibers must meet or exceed the standards and specifications set forth in ACI 544, Fiber Reinforced Concrete.
- e. Listed below are the minimum properties of the polypropylene fibers for use. All fibers must meet or exceed the characteristics described in ACI-544, IR, table 1.1, Fiber Reinforced Concrete.

1. Tensile Strength: 4.4 grams/denier
2. Elongation at break: 12%
3. Fiber: 100% Fibrillated / Monofilament Polypropylene (as per site requirement)
4. Lengths: 19 mm
5. Absorption: Nil
6. Specific gravity: 0.9
7. Ignition point: 593 °C
8. Melting point: 160-170 °C





9. Heat & UV stabilization: Long term
10. Thermal conductivity: Low
11. Electrical conductivity: Low
12. Salt resistance: High
13. Acid resistance: High
14. Alkali resistance: 100% (alkali proof)

#### 4.6 Additives

All additives shall be from a manufacturer approved by the Engineer.

Air Entraining Admixtures shall conform to ASTM C 260. Other admixtures shall conform to ASTM C 494.

Liquid Crystalline Water Proofing Bitocrete C-16 for Schomborg Germany or equivalent.

#### 4.7 Vapour Barrier

Polyethylene sheeting conforming with ASTM E154 and 0.2mm thick as a minimum. Other similar material having a vapour permeance rating not exceeding 0.5per meter as determined by ASTM E96, will be considered unless noted otherwise.

#### 4.8 Grout

- a) Damp Pack Bedding Grout: Mix of one part portland cement and 2« parts of fine aggregate proportioned by weight and not more than 4« gal. (17 liters) of water per bag of cement.
- b) Pre-mixed, Non-Shrink, Non-Metallic Grout: "Masterflow 713" manufactured by Master Builders, "Euco-N.S." manufactured by the Euclid Chemical Company or other approved equal.
- c) Pre-mixed, Non-Shrink, Metallic Grout: "Embeco636" manufactured by Master Builders, "Firmix" manufactured by the Euclid Chemical Co., or other approved product.
- d) Expansive Grout: CE CRD-C588, Type A or M, as required.

#### 4.9 Cover Material for Curing

Curing material shall conform to the following:

- a) Impervious Sheeting: ASTM C171, type optional, except that polyethylene sheeting shall be 0.1mm minimum thickness, white opaque. Where the work is exposed to high winds the impervious sheeting shall not be used.
- b) Burlap: Cloth made of jute or kenaf shall conform with AASHTO M182 and shall weigh a minimum 0.3kg/m<sup>2</sup>.
- c) Liquid Membrane Forming Compound: ASTM C309, Type 2.

#### 4.10 Joint Fillers

ASTM D 1751, preformed, resilient bituminous type or ASTM D1752, preformed sponge rubber.

#### 4.11 Joint Sealants

ASTM D 1190, ASTM D 3569, ASTM D 3406, hot-pour type.



#### 4.12 Waterstops

Provide flat, dumbbell type or center bulb type water stops at construction joints where shown. Web thickness not less than 6mm (1/4 in.) for units up to 125mm (5 in.) wide, and not less than 10mm (3/8 in.) for widths over 125mm (5 in.). Provide polyvinyl chloride (PVC) waterstops of approved manufacturer.

#### 4.13 Epoxy Resin

ASTM C 881, type, Grade 3, Class C.

#### 4.14 Formwork

##### a) Formwork for Concrete Pavement

Forms shall be made of steel of an approved section, with a base width of at least 200 millimeters (8 in.) and the depth shall be equal to the thickness of the pavement at the edge as shown on the plans. The forms shall be staked with steel stakes, and stakes shall be of a length approved by the Engineer. Each section of forms shall have a stake pocket at each end and at intervals of not more than 1.5 metres (5 ft.) between ends. The stake pockets shall have approved devices for locking the form to the steel stakes. Each section of forms shall be straight and free from bends and warps at all times. No section shall show a variation greater than 3 millimeter in 3 metres (1/8 inch in 10 ft.) from a true plane surface on the top of the form, and the inside face shall not vary more than 6 millimeters (1/4 in.) from a plane surface.

Before placing forms, the underlying base shall be to the required grade, and shall be firm and compact. The forms shall have full bearing upon the foundation throughout their length and shall be placed with exactness to the required grade and alignment of the edge of the finished pavement. They shall be so supported during the entire operation of placing, tamping and finishing the pavement that they will not deviate vertically at any time more than 3 millimeters (1/8 in.) from the proper elevation.

Forms shall not be removed for at least twelve (12) hours after the concrete has been placed. Forms shall be carefully removed in a manner to avoid damage to the pavement. Under no circumstances will the use of pry bars between the forms and the pavement be permitted. Pavement, which in the opinion of the Engineer, is damaged due to the careless removal of forms shall be repaired by the Contractor, as directed by the Engineer, at the Contractor's own expense.

Forms shall be thoroughly cleaned and oiled each time they are used.

When pavement is placed adjoining existing concrete pavement upon which the finishing machine will travel, any irregularities in the old pavement shall be ground down to a true, uniform surface, of sufficient width to accommodate the wheels of the finishing equipment, if necessary to obtain proper smoothness of the pavement.

##### b) Formwork for Structures

Material, workmanship etc. of formwork for structures, refer specification Section 2100.

#### 4.15 Reinforcement

Materials for reinforcing steel, welded wire fabric, dowels and tie bars, refer specification Section 2200.





## 5.0 MATERIAL TESTING

### A. Samples and Testing

Samples from stock on the site or suppliers materials shall be taken by the Contractor in presence of the Engineer. Furnish tests and certificates as specified.

### B. Cement

Sampled cement shall be tested by a testing laboratory. Certified copies of laboratory test reports shall be furnished for each lot of cement and shall include all test data, results and certification that the sampling and testing procedures are in conformance with the Specifications for approval. No cement shall be used until test results are satisfactory. Cement that has been stored for more than four months after being tested shall be re-tested before use. Cement found unsatisfactory under test shall be immediately removed from the construction site or supplier stock.

### C. Aggregates

Aggregate sampling shall conform to ASTM D 75. Aggregates shall be sampled and tested by a testing laboratory. No aggregate shall be used until test results are satisfactory to the Engineer.

### D. Water

Water analysis shall be performed in accordance with ASTM D 596, and the report shall be submitted for Engineer's approval.

### E. Admixtures

Sampling and testing of all admixtures used in concrete mix shall be in accordance with the standard procedure recommended by an approved testing laboratory. No admixture shall be used until test results are satisfactory and approval.

### F. Concrete

- a) **Compressive Strength:** The Contractor shall provide and test three sets of specimens taken under the supervision of the Engineer from each 125 cubic metres (4,500 Cft.) or not less than once a day each grade of concrete placed. Samples shall be secured in accordance with ASTM C 172. Test specimens shall be made and cured in accordance with ASTM C 31. Specimens shall be tested in accordance with ASTM C 39 or ACI 214. Test specimens shall be evaluated for each grade of concrete specified in conformance with ACI 318, chapter "Concrete Quality". The standard age of concrete for tests shall be 3, 7 and 28 calendar days.
- b) **Slump and Entrained Air:** Slump test and entrained air tests shall be performed in the field under the supervision of the Engineer. Slump test shall conform to ASTM C 143 and entrained air content shall be determined in accordance with ASTM C 231 or C 173 as applicable.
- c) **Concrete removed for the Structure :** When the results of the strength test of the specimen indicate deficiency in specified requirements or where there is other evidence that the quality of concrete is below specified requirements, core boring tests shall be made in conformance with ASTM C-42. If a deficiency is discovered, the Contractor may be allowed to make load test, at his expense, and results shall be evaluated in conformance with ACI 318, Chapter 20.





## 5.1 Frequency of Testing

a) The following tests shall be performed initially for approval and as per required frequency thereafter:

-	Aggregates	ASTM C 33	-----
-	Soundness	ASTM C 88	bi-weekly
-	Specific Gravity	ASTM C 127	weekly
-	Absorption	ASTM C 128	weekly
-	Abrasion	ASTM C 131	weekly
-	Gradation	ASTM C 136	daily
-	Sand Equivalent	ASTM C 217	weekly
-	Cleanliness	ASTM C 227	weekly
-	Elongation	CRD C 119	bi-weekly
-	Chloride Ion	ASTM D 512	bi-weekly
-	Water Analysis	ASTM D 596	bi-weekly

b) The following tests shall be performed initially for approval and thereafter as specified:

- Concrete Compressive Strength: ASTM C39. Three sets of specimens for each **75 cu.m (2,625 Cft.)** of each grade of concrete placed or at least three sets for each grade per work shift.
- Concrete Sulphate (S03), Chloride Content **and pH value**:  
One test **per month** for each grade of concrete. Broken laboratory specimens from strength tests shall be used for hardened concrete Sulphate, Chloride content and **pH Value** tests.\*

## 6.0 EXECUTION

### 6.1 Nominal Concrete Mixes

6.1.1 The cement, fine aggregate and the coarse aggregate shall be weighed separately. The proportions of cement to fine aggregate and coarse aggregate shall be adjusted as per ACI 211 & ACI 318 so as to provide the concrete of the required crushing strength when tested as set out in Table 1.

6.1.2 The Contractor shall regulate and arrange mixing of the ingredients for the designed mix of the concrete by weight-batching.

#### 6.1.3 Water/Cement Ratio

The quantity of water used shall be just sufficient to produce a dense concrete of the specified strength. For all exterior exposed work and foundations the water/cement ratio shall not exceed 0.45, allowance being made for any water in the fine and coarse aggregates.

#### 6.1.4 Workability

Admixtures may be used where necessary to achieve required workability, with the Engineer's approval. For concrete pavements, the mix determined shall be workable concrete having a slump between 13mm (1/2 in.) and 50mm (2 in.), as determined by ASTM C143. For other structures the concrete shall be proportioned and produced to have a slump of 75mm (3 in.) or less if consolidation is to be by vibration, and 125mm (5 in.) or less if consolidation is to be by methods other than vibration.



## 6.2 Strength and Durability Requirements for Concrete

Strength and Durability Requirements for Concrete are given below:

Class of Concrete	Specified Cylinder Compressive Strength at 28 days MPa / psi
A1	35.0 / 5,000
A	28.0 / 4,000
B	21.0 / 3,000
C	17.0 / 2,465
D	8.0 / 1,160
E	5.0 / 725

6.2.1 The Contractor shall adopt all necessary measures as per ACI201.2, like proper grading of aggregates, control of water cement ratio and cement content, proper compaction and curing, to achieve dense and durable concrete.

6.2.2 The Contractor shall submit mix design by weight for each grade of concrete at least 45 calendar days before any placement of concrete, alongwith samples of the proposed materials. Manufacture 12nos. test cylinders 12" (305mm)x6"(152mm) in accordance with ASTM C-31, and in accordance with the mix design batching by weight and test 3 cylinders each at 3, and 28 days in the presence of Engineer's Representative, in accordance with ASTM C-39 and submit all relevant data and results of tests for approval of the Engineer. The Contractor shall obtain approval from the Engineer in writing for each mix design before producing the actual concrete for the works.

## 6.3 Batching, Mixing and Delivery

a) Batching: The Contractor shall submit to the Engineer for review the plans and capacity of the concrete batching plant and delivery equipment, which shall comply with ASTM C-94.

The Contractor shall furnish test certificates for the scales and metering devices before producing concrete and at least every six weeks thereafter.

b) Accuracy of Plant Batching: Cement measured by weight in individual batchers shall be within  $\pm 1.0$  percent of the desired intermediate and final weights in cumulative batchers. The minimum batching accuracy shall be  $\pm 0.3$  percent of scale capacity for small loads below 30 percent of scale capacity.

Aggregate measured by weight in individual batchers shall be within  $\pm 2.0$  percent of the desired weight, or within  $\pm 1.0$  percent of the desired intermediate and final weights in cumulative batchers; but in either case, the minimum batching accuracy shall be  $\pm 0.3$  percent of scale capacity for small loads below 15 percent and 30 percent of scale capacity, respectively.

Water measured by volume or by weight shall be within  $\pm 1.0$  percent of the desired amount.

Liquid admixtures measured by volume or by weight shall be within  $\pm 1.0$  percent of the desired amount.

Compensation for changes of moisture content in fine and coarse aggregate shall be made by devices which shall correct the batch water and the weight of the affected aggregate simultaneously without changing the batch setting.





- c) **Mixing and Delivery:** Concrete shall be mixed completely in the batching plant. Records shall be kept of water added in normal batching.

Concrete shall be transported to the point of discharge in agitator-mixer trucks, or by other approved means.

Trip tickets shall be provided for each delivery. The tickets shall show the designation of the materials in each batch, measured weight or volume of materials, methods of cooling concrete, class of concrete, batch number, mixer number, batch volume, date and time water was added to the mix, time of discharge from the mixer, and delivery truck number.

When it is necessary to add water to the agitator-mixer, it shall be done in accordance with ASTM C 94 and recorded.

## 6.5 **Embedded Items**

- 6.5.1 Suitable templates or instructions or both shall be provided for setting out items not placed in the forms. Embedded items and other materials for electrical, mechanical or other operations shall have been completed, inspected tested and approved before concrete is placed.

Joints at intersections and at ends of pieces shall be made in the manner most appropriate to the material being used. Joints shall develop effective water-tightness fully equal to that of the continuous waterstop material, shall permanently develop mechanical strength not less than that of the parent section, and shall permanently retain their flexibility.

- 6.5.2 Electric conduits and other pipes which are planned to be embedded shall not, with their fittings, displace more than four percent of the area of the cross section of a column on which stress is calculated or which is required for fire protection. Sleeves, conduits, or other pipes passing through floors, walls, or beams shall be of such size or in such location as not to impair unduly the strength of the construction; such sleeves, conduits, or pipes may be considered as replacing structurally in compression the displaced concrete, provided that they are not exposed to rusting or other deterioration, are of uncoated or galvanized iron or steel not thinner than standard steel pipe, have a nominal inside diameter not over 50mm (2 in.) and are spaced not less than three diameters on centres. Except when plans of conduits and pipes are approved by the Engineer, embedded pipes and conduits other than those merely passing through, shall not be larger in outside diameter than one third the thickness of the slab, wall, or beams in which they are embedded nor so located as to impair unduly the strength of the construction. Sleeve pipes, or conduits of any material not harmful to concrete and within the limitations of this section may be embedded in concrete with the approval of the Engineer provided they are not considered to replace the displaced concrete.

- 6.5.3 All sleeves, inserts, anchors, and embedded items required for adjoining work or for its support shall be placed prior to concreting.

All Contractors whose work is related to the concrete or must be supported by it shall be given ample notice and opportunity to introduce and/or furnish embedded items before the concrete is placed.

- 6.5.4 Expansion joint material, waterstops and other embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with approved readily removable material to prevent the entry of concrete into the voids.

- 6.5.5 **Non Shrink Grout**

Grout of placement under base and bearing plates of steel, machinery and equipment, for grouting anchor bars and dowels and for similar uses shall be as specified. The grout shall be used in accordance with the following and as per manufacturer's recommendations, and as directed by the Engineer.





Concrete surfaces to receive non-shrink grout shall be roughened, cleaned and dampened. Form shall be provided to retain the grout until sufficiently hard to support itself. Grout shall be poured in place and thoroughly rodded or strapped to prevent air entrapment and formation of voids. After non-shrink grout has received its initial set, it shall be kept damp for at least 24 hours.

**TABLE I : Gradation of Concrete Aggregates**

Particle Size Square Openings (Equivalent U.S. Sieve Designation)	Percentage by Weight Passing				(Sand)
	Coarse		Fine		
	19 mm to 5 mm	25 mm to 5 mm	37.5 mm to 19 mm	50 mm to 25 mm	
	¾"-No.4	1"-No.4	1½"-3/4"	2"-1"	
63.0 mm (2 1/2 in.)	-	-	-	100	-
50.0 mm (2 in.)	-	-	100	95 - 100	-
37.5 mm (1 1/2 in.)	-	100	90 - 100	35 - 70	-
25.0 mm (1 in.)	100	94 - 100	20 - 55	0 - 15	-
09.0 mm (3/4 in.)	090 - 100	-	0 - 15	-	-
12.5 mm (1/2 in.)	-	25 - 60	-	0 - 5	-
09.5 mm (3/8 in.)	20 - 55	-	0 - 5	-	100
05.0 mm (No.4)	0 - 10	0 - 10	-	-	95 - 100
02.36 mm (No. 8)	0 - 5	0 - 5	-	-	-
1.18 mm (No. 16)	-	-	-	45 - 80	-
0.60 mm (No. 30)	-	-	-	25 - 55	-
0.30 mm (No. 50)	-	-	-	10 - 30	-
0.15 mm (No. 100)	-	-	-	02 - 10	-

**TABLE II : Gradation of Combined Coarse and Fine Aggregates for Concrete**

Particle Size Square Openings (Equivalent U.S. Sieve Designation)	Percentage by Weight Passing Sieves Maximum Aggregate Size				
	50mm	37.5mm	25mm	19mm	9.5mm
63.00 mm (2 1/2 in.)	100	-	-	-	-
50.00 mm (2 in.)	90 - 100	100	-	-	-
37.05 mm (1 1/2 in.)	70 - 90	90-100	100	-	-
25.00 mm (1 in.)	50 - 75	50 - 86	90 - 100	100	-



Particle Size Square Openings (Equivalent U.S. Sieve Designation)	Percentage by Weight Passing Sieves Maximum Aggregate Size				
	50mm	37.5mm	25mm	19mm	9.5mm
19.00 mm (3/4 in.)	45 - 70	45 - 75	55 - 100	90 - 100	-
12.05 mm (1/2 in.)	-	-	-	-	100
09.05 mm (3/8 in.)	38 - 55	38 - 55	45 - 75	60 - 80	90 - 100
05.00 mm (No. 4)	30 - 45	30 - 45	35 - 60	40 - 60	50 - 85
02.36 mm (No. 8)	22 - 35	23 - 38	27 - 45	30 - 45	37 - 52
01.18 mm (No. 16)	15 - 27	17 - 33	20 - 35	20 - 35	25 - 40
00.60 mm (No. 30)	10 - 18	10 - 22	12 - 25	13 - 23	15 - 25
00.30 mm (No. 50)	4 - 10	4 - 10	5 - 15	5 - 15	5 - 15
00.15 mm (No. 100)	1 - 3	1 - 3	1 - 5	1 - 5	1 - 5
0.075 mm (No. 200)	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2

**TABLE III : Quality Tests For Aggregates**

<u>Material</u>	<u>Test</u>	<u>Requirement</u>	<u>Test Designation</u>
Coarse	Abrasion	Loss 40% max.	ASTM C 131
Coarse	Absorption	2.0% max.	ASTM C 127
Coarse	Clay Lumps	1.0% max.	ASTM C 142
Coarse	Surface Coating	0.5% max.	ASTM C 117
Coarse and Fine	Soundness	Loss 10% max.	ASTM C 88
Coarse and Fine	Sieve	As specified	ASTM C 136
Fine	Absorption	4.0% max.	ASTM C 128
Coarse	Cleanliness	75% min.	CALIF 227
Fine	Sand equivalent	70% min.	CALIF 217

## 6.5 Concrete for Structures

### 6.5.1 Placing

6.5.1.1 Before placing of concrete, formwork shall have been completed; water shall have been removed; reinforcement shall have been secured in place; expansion joint material, anchors and other embedded items shall have been kept in position; and the entire preparation shall have been approved.





No concrete shall be placed into the foundation pits and trenches until the ground to receive the same has been examined and approved by the Engineer for this purpose.

- 6.5.1.2 Concrete shall be deposited continuously, or in layer of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located as shown in the Contract Documents or as approved by the Engineer. Placing shall be carried out at such a rate that the concrete, which is being integrated with fresh concrete, is still plastic. Concrete, which has partially hardened, shall not be deposited. Temporary spreaders in forms shall be removed when the concrete placing has reached an elevation rendering their services unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior approval has been obtained.
- 6.5.1.3 The actual sequence of construction proposed by the Contractor shall be subject to the Engineer's approval before construction starts on any part of the structure, and this sequence shall not be varied without the Engineer's approval.
- 6.5.1.4 The concrete shall be placed as soon after it has been mixed as is practicable. Once the concrete has left the mixer, no more water shall be added, although the concrete may be mixed or agitated to help maintain workability. The concrete shall not be used if, through any cause, the workability of the mix at the time of placing is too low for it to be compacted fully and to an acceptable finish by whatever means available.

The time between mixing and placing should be reduced if the mix is richer or the initial workability of the mix is lower than normal, if a rapid hardening cement or an accelerator is used, or if the work is carried out at a high temperature or exposed to a drying atmosphere.

The Contractor shall ensure that the delay between mixing and placing does not exceed 45 minutes under any circumstances. Any concrete, which does not satisfy this requirement shall be discarded.

- 6.5.1.5 Concrete shall be deposited as nearly as possible in its final position to avoid re-handling. In no circumstances may concrete be railed or made to flow along the forms by the use of vibrators. Concreting shall be carried on as a continuous operation using methods, which shall prevent segregation or loss of ingredients.
- 6.5.1.6 The free fall of concrete shall not be allowed to exceed two metre and where it is necessary for the concrete to be placed more than this depth, it shall not be dropped into its final position, but shall be placed through pipes fed by a hopper. When a pipe is used for placing concrete the lower end shall be kept inside, or close to the freshly deposited concrete. The diameter of the pipe shall be not less than 225 mm (9 in.).
- 6.5.1.7 Workmen carrying concrete to the site, and all other workmen, shall move only along runways or planks placed for the purpose and no person shall be allowed to walk on the reinforcement.

#### 6.5.2 Consolidation

- 6.5.2.1 All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Only competent workmen shall operate vibrators. Use of vibrators to transport within forms shall not be allowed.

Vibrators shall be inserted and withdrawn at points approximately 450 mm (18 in.) apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not excessive so as to cause segregation, generally from 5 to 15 sec. A spare Vibrator shall be kept on the job site during all concrete placing operations. Where the concrete is to have an as-cast finish, a full surface of mortar shall be brought against the form by the vibration process, supplemented, if necessary, by spading to work the coarse aggregate back from the formed surface.





6.5.2.2 If there is any tendency for the mix to segregate during consolidation, particularly if this produces excessive laitance, the mix proportions shall be modified to effect an improvement in the quality of the concrete to the satisfaction of the Engineer and in conformity with the provisions of Clause 5.

6.5.2.3 Vibrator shall not be allowed to contact the formwork for exposed concrete surfaces.

6.5.2.4 Mechanical vibrators shall be of a type approved by the Engineer to suit particular conditions.

6.5.3.5 Over-vibration or vibration of very wet mixes shall be avoided.

### 6.5.3 Curing and Protection

6.5.3.1 Beginning immediately after placement, concrete shall be protected from premature drying, excessively hot or cold temperatures and mechanical injury, and shall be maintained with minimum moisture loss at a relative constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing shall be subject to approval of the Engineer.

6.5.3.2 For concrete surfaces not in contact with forms, one of the following procedures shall be applied immediately after completion of placement and finishing, as approved by the Engineer.

- Ponding or continuous sprinkling.
- Application of absorptive mats or fabric kept continuously wet.
- Application of waterproof sheet materials approved by the Engineer.
- Application of other moisture-retaining covering as approved.
- Application of a curing compound conforming to ASTM C309.

The compound shall be applied in accordance with the recommendations of the manufacturer immediately after any water sheet, which may develop after finishing has disappeared from the concrete surface. It shall not be used on any surface against which additional concrete or other material is to be bonded unless it is proved that the curing compound will not prevent bond, or unless positive measures are taken to remove it completely from areas to receive bonded applications.

6.5.3.3 Moisture loss from surface placed against wooden forms or metal forms, and exposed to heating by the sun, shall be minimized by keeping the forms wet until they can be safely removed. After form removal, the concrete shall be cured until the end of the time prescribed as follows by one of the methods specified above.

6.5.3.4 Curing in accordance with sub-clauses above shall be continued for at least 10 days in the case of all concrete except concrete with rapid-hardening Portland Cement, for which the period shall be at least 3 days. Alternatively, if tests are made of cubes kept adjacent to the structure and cured by the same methods and to the same intensity, moisture retention measures may be terminated when the average compressive strength has reached 70 percent of the minimum specified works cube strength. If one of the first four curing procedures specified above is used initially, it may be replaced by one of the other specified procedures any time after the concrete is one day old provided the concrete is not permitted to become surface dry during the transition.

6.5.4.5 When the mean daily outdoor temperature is less than 5°C (41°F), temperature of the concrete shall be maintained between 10 and 20 degrees C (50°F-68°F) for the required curing period specified above.

When necessary, arrangements for heating, covering insulation or housing the concrete work shall be made in advance of placement and shall be adequate to maintain the required





temperature with measures to avoid concentration of heat. Combustion heaters shall not be used during the first 24 hours, unless precautions are taken to prevent exposure of the concrete to exhaust gasses, which contain carbon dioxide.

- 6.5.4.6 When necessary, provision for wind-breaks, shading, spraying, sprinkling, ponding or wet covering with a light coloured material shall be made in advance of placement, and such protective measures shall be taken as quickly as concrete hardening and finishing operation will allow.
- 6.5.4.7 Changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible and shall not exceed 3°C (5.4°F) in any one hour or 10°C (18°F) in any 24 hour period.
- 6.5.4.8 Concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock and excessive vibrations, during the curing period. All finished concrete surfaces shall be protected from damage by construction equipment, materials or methods by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

### 6.5.5 Works in Extreme Weather

- 6.5.5.1 Unless adequate protection is provided, and approval is obtained, concrete shall not be placed during rain.

Rain water shall not be allowed to increase the mixing water nor to damage the surface finish.

- 6.5.5.2 When the temperature of the surrounding air is expected to be below 5°C during placing or within 24 hours thereafter, the temperature of the plastic concrete, as placed, shall be no lower than 13°C for sections less than 300 mm (12 in.) in any dimensions nor 10°C for any other sections.

When necessary, concrete material should be heated before mixing and carefully protected after placing. In general, heating of mixing water alone to about 60°C may be sufficient for this purpose. Dependence should not be placed on salt or other chemicals. Calcium chloride up to a maximum of 1-1/2 percent of the weight of cement may be used to accelerate the rate of hardening only with prior written permission of the Engineer. Use of calcium chloride in excess of 1-1/2 percent is harmful. No frozen material or concrete damaged by frost shall be removed. It is recommended that concrete exposed to the action of freezing weather should have entrained air and the water content of the mix should not exceed 25 litres per bag of cement.

If water of aggregate is heated above 38°C, the water shall be combined with the aggregate in the mixer before cement is added. Cement shall not be mixed with water or with mixtures of water and aggregate having a temperature greater than 38°C.

- 6.5.5.3 During hot weather, the temperature of the concrete as placed shall not be so high as to cause difficulty from loss of slump, flash set, or cold joints and should not exceed 32°C. For mass concreting, this temperature should not exceed 21°C. When the temperature of the concrete exceeds 32°C, precautionary measures approved by the Engineer shall be put into effect. When the temperature of the steel is greater than 50°C, steel forms and reinforcement shall be sprayed with water just prior to placing the concrete. The ingredients shall be cooled before mixing, or ice flakes, or well crushed ice may be substituted for all part of the mixing water if, due to high temperature, low slump, flash set or cold joints are encountered.

Other precautions recommended by ACI Standard 305 shall also be adopted.

### 6.5.6 Construction Joints

- 6.5.6.1 Concreting shall be carried out continuously up to construction joints, the position and arrangement of which shall be approved by the Engineer.





- 6.5.6.2 Joints not shown on the drawings shall be so made and located as to least impair the strength of the structures and shall need prior approval of the Engineer. In general, they shall be located near the middle of the spans of slabs and beams unless a secondary beam intersects a main beam at this point, in which case the joint in the main beam shall be offset a distance equal to twice the width of the secondary beam. Joints in walls and columns shall be at the underside of floor slabs or beams, and at the top of footings or floor slabs. Beams, brackets, column, capitals, haunches and drop panels shall be placed at the same time as slabs. Joints shall be placed at the same time as slabs. Joints shall be perpendicular to the main reinforcement.
- 6.5.6.3 Reinforcing steel shall continue across the joints. Key and inclined dowels shall be provided as, and where directed by Engineer. Longitudinal keys at least 40 mm (1-5/8 in.) deep shall be provided in all joints in walls and between walls and slabs or footings.
- 6.5.6.4 When the work has to be resumed on a surface which has hardened, such surface shall be roughened in an approved manner which will expose the aggregate uniformly and will not leave laitance, loosened particles of aggregate or damaged concrete at the surface.
- 6.5.6.5 The hardened concrete of construction joints and of joints between footings and walls or columns, between walls or columns and beams or floors they support, joints in un-exposed walls and all others not mentioned herein shall be dampened (but not saturated) immediately prior to placing of fresh concrete.
- 6.5.6.6 The hardened concrete of joints in exposed work, joints in the middle of beams, and slabs; and joints in work designed to contain liquids shall be dampened (but not saturated) and then thoroughly covered with a coat of cement grout similar in proportions to the mortar in the concrete. The grout shall be as thick as possible on vertical surfaces and at least 13 mm (1/2 in.) thick on horizontal surfaces. The fresh concrete shall be placed before the grout has attained initial set.
- 6.5.6.7 When the concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle, and brushed, care being taken to avoid dislodgement of particles of aggregate. The surface shall then be coated with neat cement grout. The first layer of concrete to be placed on this surface shall not exceed 150 mm (6 in.) in thickness, and shall be well rammed against old work, particular attention being paid to corners and closed spots.
- 6.5.6.8 Stop ends for movement joints or construction joints shall be made by splitting them along the lines of reinforcement passing through them, so that each portion can be positioned and removed separately without disturbance or shock to the reinforcement or the concrete. Stop ends made of expanded metal or similar material may only be left permanently in the concrete with prior written approval of the Engineer. Where such stop ends are used, no metal may be left permanently in the concrete closer to the surface of the concrete than the specified cover to the reinforcement. Wood strips inserted for architectural treatment shall be kerfed to permit swelling without pressure on the concrete.

#### 6.5.7 Expansion Joints

Expansion joints shall be provided wherever indicated on the Drawings or as directed by the Engineer. In no case shall the reinforcement, or other embedded items be run continuous or through an expansion joint. All expansion joints shall be carefully placed so as not to be displaced during concreting. The method of placing the expansion joints shall be strictly in accordance with the Drawings and/or as directed by the Engineer. All materials for use in the expansion joints shall have, prior approval of the Engineer before placing order for supply.

#### 6.5.8 Embedded Items

- 6.5.8.1 Sleeves, inserts, anchors, and embedded items required for adjoining work or for its support shall be placed prior to concreting.





All Contractors whose work is related to the concrete or must be supported by it shall be given ample notice and opportunity to introduce and/or furnish embedded items before the concrete is placed.

- 6.5.8.2 All embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with approved readily removable material to prevent the entry of concrete into the voids.

## 7.0 FINISHING OF FORMED SURFACES

### 7.1 General

- 7.1.1 After removal of forms, the surfaces of concrete shall be given one or more of the finishes specified below in locations designated by the Contract Documents.
- 7.1.2 When finishing is required to match a small sample furnished to the Contractor, the sample finish shall be reproduced on an area at least 10 square metres (108 Sft.) in an inconspicuous location Designated by the Engineer before proceeding with the finish in the specified location.
- 7.1.3 Allowable deviations from plumb or level and from the alignment, profile grades, and dimensions are specified in Clause 9. Tolerances for concrete construction defined as 'tolerances' are to be distinguished from irregularities in finish as described herein. The finish requirements for concrete surfaces shall be as generally specified in this clause and as indicated on the Drawings. Finishing of concrete surfaces shall be performed only by workmen who are skilled in concrete finishes. The Contractor shall keep the Engineer informed as to when finishing of concrete will be performed. Unless inspection is waived in each specific case, finishing of concrete shall be performed only in the presence of the Engineer. Concrete surfaces will be tested by the Engineer where necessary to determine whether surface irregularities are within the limits herein after specified.

Surface irregularities are classified as abrupt or gradual. Offsets caused by displaced or misplaced form sheathing or lining or sections, or otherwise defective form lumber will be considered as abrupt irregularities, and will be tested by direct measurements. All other irregularities will be considered as gradual irregularities, and will be tested by use of a template, consisting of a straight edge or the equivalent thereof for curved surfaces. The length of the template will be 2 metres (6.5 ft.) for testing of formed surfaces and 3 metres (10 ft.) for testing of unformed surfaces.

### 7.2 As-cast Finishes

Unless otherwise specified or indicated on the Drawings the classes of finish shall apply as follows:

#### 7.2.1 Rough form finish:

No selected form facing materials shall be specified for rough form finish surfaces. The holes and defects shall be patched. Fins exceeding 6 mm (1/4 in.) in height shall be chipped off or rubbed off. Otherwise, surfaces shall be left with the texture imparted by the forms.

#### 7.2.2 Fair face finish:

Fair face finish applies to concrete formed surfaces, the appearance of which is considered by the Engineer to be of special importance, such as surfaces of structures prominently exposed to public view. Location of surfaces of concrete structures requiring fair face finish are shown in the Drawings. Surface irregularities, measured as described in sub-clause 7.2.1, 'Rough form finish', all not exceed 6 mm (1/4 in.) for gradual irregularities and 3 mm (1/8 in.) for abrupt irregularities, except that abrupt irregularities will not be permitted at construction joints. Abrupt irregularities at construction joints and elsewhere in excess of 3 mm (1/8 in.) and gradual irregularities in excess of 6 mm (1/4 in.) shall be reduced by grinding so as to conform to the





specified limits. Abrupt irregularities at construction joints shall be ground on 1 to 20 ratio of height to length.

Unless otherwise approved, repair of imperfections in formed concrete shall be completed within 24 hours after removal of forms. The form facing material shall produce a smooth, hard, uniform texture on the concrete. It may be plywood, hardboard, metal, plastic paper, or other approved material capable of producing the desired fair face finish. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. It shall be supported by studs or other backing capable of preventing excessive deflection. Material with raised grain, torn surfaces, worn edge, patches, dents, or other defects, which will impair the texture of the concrete surface shall not be used. The holes and defects shall be patched. All fins shall be completely removed.

## 8.0 REPAIR OF DEFECTS

### 8.1 General

8.1.1 Any concrete failing to meet the specified strength or not formed as shown on drawings, concrete out of alignment, concrete with surfaces beyond required tolerances or with defective surfaces which cannot be properly repaired or patched in the opinion of the Engineer shall be removed at Contractor's cost.

The Engineer may reject any defective concrete and order it to be cut out in part or in whole and replace at the Contractor's expense.

8.1.2 All ties, bolt holes, and all repairable defective areas shall be patched immediately after form removal.

### 8.2 Repair of Defective Areas

8.2.1 Defective and honeycombed concrete shall be removed down to sound concrete. The area to be patched and an area at least 150 mm (6 in.) wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately 1 part cement to 1 part fine sand passing No.25 BS Sieve and shall then be well brushed into the surface.

8.2.2 The patching mixture shall be made of the same material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not less than 1 part cement to 2-1/2 parts sand by weight. White Portland cement shall be substituted for a part of the gray Portland cement on exposed concrete in order to produce a colour matching the color of the surrounding concrete, as determined by a trial patch.

8.2.3 The quantity of mixing water shall be no more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.

8.2.4 After surface water has evaporated from the area to be patched, the bond coat shall be well brushed into the surface. When the bond coat begins to lose the water sheen, the premixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to leave the patch slightly higher than the surrounding surface to permit initial shrinkage; it shall be left undisturbed for at least 1 hour before being finally finished. The patched area shall be kept damp for at least 7 days. Metal tools shall not be used in finishing a patch in a formed wall, which will be exposed.

8.2.5 Where as-cast finishes are specified, the quantity of patched area shall be strictly limited. The combined total of patched areas in as-cast surfaces shall not exceed 0.2 square metre (2 square foot) in each 100 square metres (1076 square foot) of as-cast surface. This is in addition to form tie patches, if the project design permits ties to fall within as-cast areas.





8.2.6 Any patches in as-cast architectural concrete shall be indistinguishable from surrounding surfaces. The mix formula for patching mortar shall be determined by trial to obtain a good colour match with the concrete when both patch and concrete are cured and dry. After initial set, surfaces of patches shall be dressed manually to obtain the same texture as surrounding surfaces.

8.2.7 Patches in architectural concrete surfaces shall be cured for at least 7 days. Patches shall be protected from premature drying to the same extent as the body of the concrete.

### 8.3 Tie and Bolt Holes

After being cleaned and thoroughly dampened, the tie and bolt holes shall be filled solid with patching mortar. If architectural appearance requires, these holes may be filled partially creating the desired round clear holes pattern on surfaces exposed to view.

### 8.4 Proprietary Materials

If permitted or required by the Engineer, proprietary compounds for adhesion or as patching ingredients may be used in lieu of or in addition to the foregoing patching procedures. Such compounds shall be used in accordance with the manufacturer's recommendations with prior approval of the Engineer.

## 9.0 CONCRETE CONSTRUCTION TOLERANCES

All tolerances shall be as per ACI 317.

Where tolerances are not stated in the specifications or drawings for any individual structure or feature thereof, maximum permissible deviations from established lines, grades, and dimensions shall conform to the following. The Contractor is expected to set and maintain concrete forms so as to ensure complete work within tolerance limits. These allowable tolerances shall not relieve the Contractor of his responsibility for correct fitting of indicated materials and components. These tolerances are not cumulative.

9.1 Variation from the plumb (or the specified batter for inclined walls). (allowable variation)

9.1.1 In the lines and surfaces of columns and walls, and in arises

In any 3 metres (10 ft.) of length or height 6 mm (1/4 in.)

Maximum for the entire length or height 25 mm (1 in.)

9.1.2 For exposed corner columns, control joint grooves and other conspicuous lines

In any bay or 6 metres (20 ft.) maximum 6 mm (1/4 in.)

Maximum for the entire length or height 13 mm (1/2 in.)

9.2 Variation from the level or from the grades indicated on the drawings.

9.2.1 In beam soffits, and in arises measured before removal of supporting shores.

In any 3 metres (10 ft.) of length 6 mm (1/4 in.)

In any bay or in any 6 metres (20 ft.) maximum 10 mm (3/8 in.)

Maximum for the entire length 19 mm (3/4 in.)





- 9.3 Variation of the linear structure lines from established position in plan and related position of columns and walls.
- |                               |  |
|-------------------------------|--|
| In any bay or 6 metres        | $\pm 13 \text{ mm } (\pm 1/2 \text{ in.})$ |
| Maximum for the entire length | $\pm 25 \text{ mm } (\pm 1 \text{ in.})$   |
- 9.4 Variation in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls.
- |                       |   |
|-----------------------|---|
| Up to 12" (300mm)     | - 6 mm ( - ¼ in.)<br>+10 mm ( + 3/8 in.)  |
| More than 12" (300mm) | - 10 mm ( - 3/8 in.)<br>+13 mm ( + ½ in.) |
- 9.5 **Footings**
- 9.5.1 Variation in dimensions in plan
- |   |                |
|---|----------------|
| Minus   | 13mm (1/2 in.) |
| Plus (plus variation applied to concrete only, not to the reinforcing bars or dowels), (formed) | 50mm (2 in.)   |
- 9.5.2 Misplacement or eccentricity
- |  |                   |
|--|-------------------|
| 2 percent of the footing width in the direction of misplacement but not more than (applies to concrete only, not to reinforcing bars or dowels). | + 50mm ( + 2 in.) |
|--|-------------------|
- 9.5.3 Reduction in thickness
- Minus 5 percent of specified thickness
- 10.0 **ACCEPTANCE OF STRUCTURE**
- 10.1 **General**
- 10.1.1 Completed concrete work, which meets all applicable requirements will be accepted subject to the other terms of the Contract Documents.
- 10.1.2 Completed concrete work, which fails to meet one or more of the requirements and which has been repaired to bring it into compliance will be accepted subject to the other terms of the Contract Documents.
- 10.1.3 Completed concrete work, which fails to meet one or more of the requirements and which cannot be brought into compliance may be accepted or rejected as provided in these Specifications or in the Contract Documents. In this event, modifications may be required to assure that remaining work complies with the requirements.
- 10.2 **Dimensional Tolerances**
- 10.2.1 Formed surfaces resulting in concrete outlines smaller than permitted by the tolerances of clause 9 shall be considered potentially deficient in strength and subject to the provisions of sub clause 10.4.



- 10.2.2 Formed surfaces resulting in concrete outlines larger than permitted by the tolerances of clause 9 may be rejected and the excess material shall be subject to removal. If removal of the excess material is permitted, it shall be accomplished in such a manner as to maintain the strength of the section and to meet all other applicable requirements of function and appearance. Permission is required if excess material is to be removed in accordance with this clause.
- 10.2.3 Concrete members cast in the wrong location may be rejected if the strength, appearance or function of the structure is adversely affected as decided by the Engineer or if misplaced items interfere with other construction.
- 10.2.4 Inaccurately formed concrete surfaces exceeding the limits of Clause 9 or of Clause 6.5 of Section 'Formwork' shall be removed and replaced, and those that are exposed to view, may be rejected, or shall be repaired, or removed and replaced, as directed by the Engineer.

### 10.3 Appearance

- 10.3.1 Architectural concrete with surface defects exceeding the limitations described in relevant Clauses of this section shall be removed and replaced.
- 10.3.2 Other concrete exposed to view with defects which adversely affect the appearance of the specified finish may be repaired only by approved methods.
- 10.3.3 Concrete not exposed to view is not subject to rejection for reason of defective appearance.

### 10.4 Strength of Structure

- 10.4.1 Strength of the structure in place will be considered potentially deficient if it fails to comply with any requirement which is relevant to the strength of the structure, including but not necessarily limited to the following conditions:
- Concrete strength requirements not considered to be satisfied in accordance with Clause 6 hereof.
  - Reinforcing steel size, quantity, strength, position or arrangement at variance with the requirements as specified under section 'Reinforcement' or in the Contract Documents.
  - Concrete, which differs from the required dimensions or location in such a manner as to reduce the strength.
  - Curing less than that specified.
  - Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.
  - Mechanical injury, construction fires, premature removal of formwork, likely to result in deficient strength.
  - Poor workmanship likely to result in deficient strength.
- 10.4.2 Structural computations and/or additional testing may be required when the strength of the structure is considered potentially deficient.
- 10.4.3 Core tests may be required when the strength of the concrete in place is considered deficient.
- 10.4.4 If core tests are inconclusive or impractical to obtain or if structural computations do not confirm the safety of the structure, load tests may be required and their results evaluated, in accordance with ACI Standard 318.
- 10.4.5 Concrete work judged inadequate by structural computations or by results of a load test shall be reinforced with additional construction, if so directed by the Engineer or shall be replaced, at the Contractor's expense.
- 10.4.6 The Contractor shall bear all costs incurred in providing the additional testing and/or computations required by this section.





## 11.0 MEASUREMENT AND PAYMENT

### 11.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

- 11.1.1 All types of formwork including shoring/bracing/scaffolding etc.
- 11.1.2 All types of expansion, construction and contraction joints
- 11.1.3 All sampling, mixing and testing as specified.
- 11.1.4 Concrete mix design.
- 11.1.5 Vapour barrier.
- 11.1.6 Impervious sheeting, burlap covering, liquid membranes compound, additives, non-shrink grout and epoxy resins.
- 11.1.7 Anchor bolts and other embedded parts.
- 11.1.8 All submittals including shop drawings, co-ordination drawings etc.
- 11.1.9 Repair and replacement of defective work.
- 11.1.10 Surface texture, skid resistant surfaces & surface test.
- 11.1.11 Curing
- 11.1.12 Installation / fixing in position of all precast / prefabricated concrete elements, as shown on drawings.
- 11.1.13 Tie bars, dowel bars, dowel bar sleeves and welded wire mesh.
- 11.1.14 Concrete Admixtures

### 11.2 Plain and Reinforced Concrete

#### 11.2.1 Measurement

Measurement of acceptably completed works of plain and reinforced concrete will be made on the basis of number of cubic metre / cubic foot of concrete actually provided, placed, consolidated, finished, cured in position, complete as shown on drawings or as directed.

#### 11.2.2 Payment

Payment will be made for the acceptable measured quantity of plain and reinforced concrete on the basis of unit rate per cubic metre / cubic foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.





### 11.3 Water Stopper

#### 11.3.1 Measurement

Measurement of acceptably completed works of water stopper will be made on the basis of running metre / running foot of water stopper actually provided, placed in position, complete as shown on drawings or as directed.

#### 11.3.2 Payment

Payment will be made for the acceptable measured quantity of water stopper on the basis of unit rate per running metre / running foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

### 11.4 C.C Jali

#### 11.4.1 Measurement

Measurement of acceptably completed works of c.c jali will be made on the basis of square metre / square foot of cement concrete jali actually provided, placed in position, complete as shown on drawings or as directed.

#### 11.4.2 Payment

Payment will be made for the acceptable measured quantity of c.c jali on the basis of unit rate per square metre / square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 2300 \*\*\*



**SECTION - 3000**  
**STRUCTURAL STEEL WORKS**

1. SCOPE
2. APPLICABLE CODES AND STANDARDS
3. MATERIALS
4. CONNECTIONS
5. ALLOWABLE STRESSES
6. SHOP DRAWINGS
7. FABRICATION
8. WELDER QUALIFICATIONS
9. WELDERS IDENTIFICATION
10. TEST ASSEMBLY
11. SURFACE PREPARATION AND PAINTING
12. INSPECTION AND TESTS
13. ERECTION
14. MEASUREMENT AND PAYMENT



## SECTIONS – 3000

### STRUCTURAL STEEL WORKS

#### 1.0 SCOPE

The work under this section consists of furnishing all material, labour, plant, equipment and appliances, fabricating, erecting, installing, testing, painting and all other items incidental to steel work for a complete job as shown on the drawings, specified herein and/or as directed by the Engineer.

#### 2.0 APPLICABLE CODES AND STANDARDS

Latest edition of the following codes and standards are applicable to the work of this section:

AISC                      Specifications for the design, fabrication and erection of structural steel for buildings.

ANSI / AISC 360 Manual of steel construction, LRFD & ASD.

AISC 303                Code of Standard Practice, for Steel Buildings and Bridges.

AISC                      Specifications for structural joints using ASTM A325 or A490 bolts.

AISC                      Guide to shop painting of Structural Steel.

ASTM A6                Standard specifications for general requirements for rolled steel plates, shapes, sheets, piling and bars for structural use.

ASTM A36              Standard Specifications for Carbon Structural Steel.

ASTM A53              Standard Specifications for Pipe, Steel, Black & Hot Dipped, Zinc Coated, Welded and Seamless

ASTM A307            Carbon steel externally and internally threaded standard fasteners.

ASTM A325            High strength bolts for structural steel joints including suitable nuts and plain hardened washers.

ASTM A446            Specifications for steel sheet zinc coated (galvanized) by the hot dipped process.

ASTM A490            Quenched and tempered alloy steel bolts for structural steel joints.

ASTM A501            Hot formed welded and seamless carbon steel structural tubing.

ANSI / NAAMM Metal Bar Grating  
MBG 531

ASTM A563            Carbon and alloy steel nuts.

ASTM A572            Standard Specifications for High - Strength Low - Alloy Columbium - Vanadium Structural Steel

ASTM E109            Dry powder magnetic particle inspection.

AWS D1.1              Specifications for welding of steel structures.





ANSI  
B 18.2.2.1 Plain Washers.

SSPC – SP6 Steel structures painting council – surface preparation specifications.

### 3.0 MATERIALS

Except otherwise stated on the drawings, the material specifications shall conform to the following. Wherever necessary the Contractor may use equivalent alternative material subject to approval of the Engineer.

#### 3.1 Structural Steel

- Structural steel shall conform to the requirements of ASTM A-36, or ASTM A-572.
- Steel pipes shall conform to the requirements of ASTM A 53 Class B, ASTM A501 or shall be made of plates spirally welded.
- All material shall be supplied chirpy V-Notch testing in accordance with ASTM A6, Supplementary Requirement S5.
- Grating shall conform to ANSI / NAAMM MBG 531.

#### 3.2 Welding

Welding electrodes shall match the base metal and shall conform to the requirements of AWS D1.1 specifications.

#### 3.3 High Strength Bolts

All shop connections, except as noted herein or on the drawings, shall be made with High Strength Bolts in friction type connections, or by welding.

High strength bolts, heavy hexagonal nuts and hardened washers shall conform to the requirements of ASTM A325. All field connections, except noted, shall be made with high strength bolts in friction type connection.

#### 3.4 Washers

Washers shall conform to the requirements of ANSI B18.2.2.1 and shall be of structural grade steel appropriate for the type of bolts for which they are used. For oversized holes, the washers shall be large enough to cover the entire hole by at least 6mm (1/4 in.) or as directed by the Engineer.

#### 3.5 Studies

Steel Studies Shear Connectors shall conform to the requirements of Structural Welding Code-Steel, AWS D1.1.

### 4.0 CONNECTIONS

All connections shall be designed and detailed for 75% of the effective capacity of the member. A minimum of two bolts or equivalent welding shall be used per connection.

Shop connection may be welded or bolted. Field connections shall be bolted unless noted otherwise on design drawings or approved by the engineer.



## 5.0 ALLOWABLE STRESSES

Allowable design stresses for structural steel members and their connections, including temporary bracings and shorings shall be in accordance with AISC Specifications.

## 6.0 SHOP DRAWINGS

6.1 Shop drawings shall be submitted by the Contractor, for structural steel works, for acceptance in accordance with the requirements of the Contract Documents.

6.2 Shop drawings furnished for this section shall conform to the best standards of the construction industry. Shop drawings shall be prepared by and under the supervision of competent engineering personnel. Prior to submittal, the Contractor shall check each shop drawing for compliance with the requirements of the Contract Documents.

6.3 Shop drawings shall include plans, elevations, sections and complete details to describe clearly, at an ample scale, all work to be provided. Drawings shall be accurately dimensioned and shall be noted clearly.

6.4 All connections shall be designed and detailed as, per sub-section 4 above, by the contractor on the shop drawings. Design calculations for connections shall be made as per AISC specifications and shall be submitted along with the shop drawings after checking and signing by the Contractor for approval of the Engineer.

6.5 The shop drawings shall include

(i) An erection scheme, in suitable size, having the following information:

- Location of erection elements in respect of axis and Marks as well as picking points of these elements with respect to each other or with the existing steel or reinforced concrete structures.
- Joints showing erection welding sizes and lengths, bolts diameter and numbers.
- Chart showing list of assembling marks having columns such as Mark, Description, Quantity, Weight of each Mark, total weight and Remarks with grand total in the end.
- Chart showing List of Erection Bolts, Nuts and Washers in tabulated form, detailing information such as size, quantity, weight and their grand totals.
- Quality of materials.
- Quality and type of welding electrodes.
- Measures to be adopted against unscrewing of bolts.
- Painting instructions.
- Erection sequence.
- References to relevant drawings.





- Except in special cases all scheme drawings shall be made in single fairly thick lines.
  - The recommended scale of erection scheme is 1:50, 1:100, 1:200, for joints 1:5, 1:10 or 1:20.
- (ii) Fabrication drawings in suitable size shall contain the following information:
- Each Shop Assembly (Mark) shall be drawn separately showing necessary lines, elevations, sections with reference to axis, center lines, location of holes, cleats, plates, lugs etc. fully dimensioned with part numbers.
  - Bolts and holes sizes.
  - Welding symbols and welded joints requirements, in accordance with AISC manual of steel construction and AWS specifications.
  - Geometrical Setting out dimensions necessary for the assembly of an element. Location and details of joints as calculated by the Contractor.
  - Instruction for welding, dimensions of weld, edge preparations methods of welding, and methods for control of distortions.
  - List of symbols for bolts and holes uses.
  - List of symbols for welds used.
  - Edge distance (general).
  - Welding sizes and lengths (general).
  - Standards and quality of materials.
  - Type and quality of welding electrodes.
  - Tests for welding.
  - Reference to related erection scheme drawings.
  - Reference to design and working drawings.
  - Part list.
  - Instructions for surface preparation, painting, primer and finish coats.

Recommended scales for fabrication drawings are preferably 1:10 or 1:20, and for joints and details 1:1, 1:2, or 1:5.

## 7.0 FABRICATION

The Contractor shall notify the Engineer about any problems or doubts/errors, if any, in the drawings for clarifications/rectification well in time to prevent any fabrication errors. Fabrication shall not be commenced until approval has been obtained from the Engineer.



### 7.1 Straightening of Material

Rolled material, before being worked upon shall be straightened within tolerances as per ASTM specifications A6. Straightening, necessarily shall be done by mechanical means or by the application of a limited amount of localized heat. The temperature of heated areas, as measured by approved methods, shall not exceed 1200 °F.

### 7.2 Cutting

As far as practicable cutting shall be done by shearing. Oxygen cutting shall be done where shear cutting is not practicable and shall preferably be done by Machine. All edges shall be free from notches or burs. If necessary, the same shall be removed by grinding.

### 7.3 Holes Punching/Drilling

Holes shall be punched where thickness of the material is not greater than the diameter of bolt + 3mm ( + 1/8 in.). Where the thickness of the material is greater the holes shall either be drilled or sub-punched and reamed to size. The die for all sub-punched holes and the drill for all sub-drilled holes shall be at least 2mm smaller than the nominal diameter of the rivet or bolt.

### 7.4 Welding

7.4.1 All execution and inspection of welding shall be done in accordance with the provisions of the American Welding Society Specifications. No welding for piping/electrical supports shall be made transversely to any tension flanges or beams or columns.

7.4.2 Maximum and minimum size and lengths of fillet welds shall be in accordance with AISC specifications, or as mentions on drawing.

7.4.3 Surface to be welded shall be free from loose scale, slag, rust, grease, paint or any other foreign matter.

7.4.4 Butt welds shall be full penetration welds, unless otherwise specified and permitted.

7.4.5 Avoid the use of temporary welded attachments during fabrication as much as possible. After fabrication is completed, remove flush with the base material without encroaching on the minimum required base material thickness. After the surface has been restored, examine all areas from which temporary attachments have been removed by the same methods required for permanent fillet welds.

7.4.6 Do not begin structural welding until joint elements are tacked in intimate contact and adjusted to dimensions shown with allowance for any weld shrinkage that is expected. Weld heavy sections and those having a high degree of restraint with low hydrogen type electrodes. No member shall be spliced without approval.

7.4.7 For notch-toughness specified material, all weld metal, processes and preheat requirements shall be compatible to assure notch-tough composite weld metal.

7.4.8 Shop splices of webs and flanges in built-up girder shall be made before the webs and flanges are joined to each other.





## 7.5 Tolerances

Tolerances for Structural Steel be as per AISC Specifications unless noted otherwise.

## 8.0 WELDER QUALIFICATIONS

- 8.1 All welders contracted to perform work shall be required to show written evidence that they have been properly tested in compliance with the approved welding procedures.
- 8.2 Welders shall have been qualified in the proposed procedure by an established laboratory acceptable to the Engineer within the preceding 90 days.
- 8.3 All welders shall be qualified for the type of weldment, grade of steel, thickness of steel, welding process and welding position that they are employed to weld. Welders and welding operators that have not been performance qualified, for all material and thickness ranges used on the job, shall be restricted to welding only that portion of the work for which they are qualified.
- 8.4 Engineer reserves the right to have welders or welding operators requalified or removed from the job as he deems necessary during the progress of work. Engineer's decision regarding the qualifications of any welder shall be final.

## 9.0 WELDERS IDENTIFICATION

- 9.1 Each welder shall be assigned a unique identifying number or symbol that he shall use to identify all welding resulting from his skills.
- 9.2 Stenciled markings shall be applied within 40mm (1-5/8 in.) of the weld using low stress concentration dies. Written symbols are also acceptable.
- 9.3 A record shall be kept of these symbols by the Contractor. The records shall show welder's name, symbol assigned, procedures to which qualified, employment and test dates. This record shall be available to the Engineer's Representative at all times.

## 10.0 TEST ASSEMBLY

- 10.1 Fabricated components such as Beams Girders, Bracing, as and where required by planning, shall be test assembled in the shop prior to transportation to site.
- 10.2 Test assembly work and procedure should be planned during fabrication process.
- 10.3 Each test assembly shall be got inspected from the Engineer's Representative and shall be dismantled only after his approval in writing.

## 11.0 SURFACE PREPARATION AND PAINTING

Surface preparation and painting shall be in accordance with the provisions of the Code of Standard Practice of the American Institute of Steel Construction, Inc.



### 11.1 Surface Preparation

- a) All steel shall be cleaned free from loose scale, rust, burrs slag, etc. by means of sand blasting and/or other approved means as recommended by the manufacturer of paint.
- b) The sand used for this purpose shall conform to the type as specified in SSPC-SP.6. It should be free from earth, dust, clay and moisture. For this, the Contractor shall submit the gradation (no less than that passing through a 16 mesh screen U.S. sieve series) and source of sand along with the sample for approval by the Engineer prior to commencing the sand blasting operation.
- c) The size of sand particles, air pressure and size of the hose nozzle shall be correlated to give proper and acceptable surface.
- d) Material which is to be used for fabrication of components to be galvanized later on shall not be cleaned (See clause 11.3).

### 11.2 Painting

- a) After fabrication, assembly and surface preparation all assembled units shall be given two shop coats of epoxy primer and two coats of epoxy enamel paint in the fabrication shop.
- b) One final coat of epoxy enamel paint shall be applied after erection of all components.
- c) The thickness of each coat of paint shall be in accordance with the paint manufacturer's recommendation.
- d) All other requirements for the specified paint system shall be in accordance with the paint manufacturer's specifications/ recommendations.
- e) The type of primer & paints to be applied shall be as specified in clause 11.2.1.
- f) The Contractor shall use the best quality of the type of paint specified and shall get the same approved by the Engineer.
- g) Steel work/Surfaces not to be painted
  - i) Steel work to be encased/embedded in concrete or surface in contact with concrete or grout shall not be painted, but shall be given a cement wash after surface preparation.
  - ii) Machined finished surfaces shall not be painted but shall be coated with rust preventive compound, approved by the Engineer immediately after finishing. Such surfaces shall also be protected with wooden pads or other suitable means for transportation. Unassembled pins, keys, and bolt thread shall be greased and wrapped with moisture resistant paper.
  - iii) Contact surfaces of connections using high strength bolts in friction type connections shall not be painted. Such surfaces of all components after fabrication shall be cleaned free of paint. No coating whatsoever shall be applied to such surface. The surface roughness for high strength friction grip bolts is a





very important factor therefore components shall not be erected unless approved by the Engineer.

#### 11.2.1 Primer and Paint

##### 11.2.1.1 Primer:

Primer shall be epoxy primer of a proven quality. The type of primer to be used shall be approved by the Engineer.

##### 11.2.1.2 Paint:

Paint shall be epoxy enamel of a proven quality. The type of paint to be used shall be approved by the Engineer.

#### 11.3 Galvanizing (Zinc Coating)

Galvanizing, wherever specified, shall be applied in a manner and of a thickness and quality conforming to the requirements of ASTM A123 standard specifications for zinc (Hot galvanized) coating on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips.

Components shall be galvanized i.e. zinc coated after complete fabrication i.e. welding, drilling etc. the process shall consist of removal of rust and mill scale by pickling in hydrochloric acid or sulphuric acid followed by water wash and prefluxing in tanks containing zinc ammonium chloride and then fluxing with ammonium chloride. The fluxed components shall then be passed through a drying oven prior to immersion in a bath of virtually pure molten zinc.

#### 12.0 INSPECTION AND TESTS

- 12.1 Manufacturer's Test Certificate for all material used shall be furnished by the Contractor for Engineer's scrutiny and approval.
- 12.2 Rolling tolerance of all shapes and profile according to AISC shall be in accordance with the provisions of ASTM A6 specifications. These shall be checked by the Contractor before commencing work and shall be rejected if found not within limits.
- 12.3 Materials shall be tested for conformance with the specified standards at an approved testing laboratory as and when directed by Engineer.
- 12.4 Contact surfaces of connections using high strength bolts in friction type connections shall be got inspected and approved from the Engineer before bolting.
- 12.5 All bolted connections shall be got inspected and approved from the Engineer for types, size, number of bolts and installation including tightening.
- 12.6 Inspection and Testing - Welding

##### 12.6.1 General

Welding shall be inspected and tested by an approved testing laboratory during fabrication and erection of structural steel as follows:

The testing laboratory shall be responsible for conducting and interpreting the tests. It shall state in each report whether or not the test



specimens conform to all requirements of the Contract Document and shall specifically note any deviations therefrom.

Certify all welders and make 100 percent visual inspections and tests as follows:

- Record types and locations of all defects found in the welding work.
- The measures required and performed to correct such defects.

In addition to the requirements of AWS D 1.1, paragraph 8.15, each weld shall be visually free of slag, inclusions and porosity.

In addition to visual inspection of all welds magnetic particle, ultra-sonic and radiographic inspection shall be made of all welds as specified below. Magnetic particle tests shall be made on the root pass and finished weld.

The method of magnetic particle test shall be in accordance with ASTM E109. Any type of crack or zone of in-complete fusion or penetration shall not be acceptable.

Radiographic testing technique and standards of acceptance shall be in accordance with AWS D 1.1.

Ultra-sonic testing shall be performed in accordance with AWS D 1.1.

Welding inspection and test report showing evidence of the quality of welding shall be submitted by the Contractor. For each section of weld inspected and tested, furnish a report which clearly identifies the work, the welder's identification, the areas of inspections and test, the acceptability of the welds, and signature of the inspector or laboratory incharge. Each report shall be completed at the time of inspection or test. For radiographic examination, furnish a complete set of radiographs in addition to the reports. All inspection and testing shall be carried out in presence of the Engineer or his representative.

#### 12.6.2 Test Methods

Use the following test methods as specified. The following list is in descending order. When a particular test method is specified for a joint and the method is impractical to use, use the next highest method practicable. The alternative method will be subject to approval, NDT procedures and techniques shall be in accordance with AWS D 1.1, section 6.7.

- a) Radiographic Method: In addition to the requirements of AWS D 1.1, comply with ASTM E94.
- b) Ultrasonic method.
- c) Magnetic particle method.
- d) Liquid Penetration Method: Visible-dye, solvent removable method only.

#### 12.6.3 Members Designated for Tests

- a) Built – up Members:





Examine 100 percent of flange-to-flange and web-to-web welding by the radiographic method. For all web-to-flange and pipe column seam welding, examine ten percent of each welder's work as follows:

- Full penetration groove welds by the ultrasonic.
  - fillet welds and partial penetration groove welds by the magnetic particle method.
- b) Moment Connection Joints:
- Examine 100 percent of all flange-to-flange and web-to-web welding as follows:
    - Full penetration groove welds by the ultrasonic method or other method as designated by the Engineer.
    - Fillet welds and partial penetration groove welds by the magnetic particle method.
  - For all web-to-flange welding, examine ten percent of each welder's work as follows:
    - Full penetration groove welds by the ultrasonic method or radiographic method as approved by the Engineer.
    - Fillet welds and partial penetration groove welds by the magnetic particle method.
- c) Column Base Plates.
- Examine 100% of all welding for connection of base plate to column.
- d) Bracing Connections: Examine 100 percent of all welding for connection of diagonal bracing as follows:
- Groove welds by the ultrasonic method.
  - Fillet welds by the magnetic particle method.

#### 12.6.4 Requirement for ten percent Examination

- a) Examine a 300mm (12 in.) section of weld in each 3m (10 ft.) increment of each welder's work as directed by the Engineer. If the examination meets the acceptance standards of AWS D 1.1, the 3m (10 ft.) of weld represented will be accepted.
- b) if the examination fails to meet the acceptance standards, examine two additional 300mm (12 in.) sections in the 3m (10 ft.) increment as directed by the Engineer. If both of these examinations meet the acceptance standards, the 3m of weld represented will be accepted. Repair the defects detected in the first examination and re-examine.
- c) If one or both of the examinations fails to meet the acceptance standards, examine the remaining weld of the 3m (10 ft.) increment. Repair the areas that do not meet the acceptance standards and re-examine.



#### 12.6.5 Repair and Re-Testing of Welds

Repair defective welds in accordance with AWS D 1.1, or replace the weld, and Re-test repaired and replaced welds by the same method and acceptance standard used to examine the original weld. In addition, when defective welds are found, the testing laboratory shall determine the cause of the defective welding and institute immediate corrective action.

All defective welding shall be repaired or replaced at the Contractor's expense.

#### 12.7 Rejection

Neither the fact that the materials have been tested nor that the manufacturers test certificates have been furnished shall effect the liberty of the Engineer to reject material found not according to these specifications.

Materials or workmanship not in conformance with the provisions of these specifications shall be rejected at any time, after delivery or during the progress of the work or the completion and erection at site.

### 13.0 ERECTION

#### 13.1 Bracing

All steel structures shall be carried up true and plumb within the limits defined in the AISC code of standard practice, and temporary bracing shall be introduced wherever necessary to take care of all construction loads to which the structure may be subjected including the equipment and the operation of the same. Such bracing shall be left in place as long as required for safety.

Wherever piles of materials, erection equipment and other loads are carried during erection, proper provision shall be made by the Contractor to take care of the stresses resulting from such loads.

#### 13.2 Alignment

No permanent bolting or welding shall be done at site during erection until as much of the structure as will be stiffened thereby has been properly aligned and approved by the Engineer.

#### 13.3 Joints Using High Strength Bolts

All structural joints using high strength bolts shall be executed and inspected in accordance with "AISC Specification for structural joints using ASTM A325 or A490 bolts". High strength bolts and nuts, loosened after tightening, shall be discarded and replaced with unused bolts and nuts.

### 14.0 MEASUREMENT AND PAYMENT

#### 14.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.





14.1.1 Nuts, bolts, screws, washers, weld metal and welding rods.

14.1.2 Testing of materials and welds, and repair of defects.

14.1.3 Surface preparation including cleaning with sand blasting.

14.1.4 Painting system including primer coats.

14.1.5 Galvanizing

14.1.6 Fabrication

14.1.7 Erection

#### 14.2 **Structural Steel Works**

##### 14.2.1 Measurement

Measurement of acceptably completed works of structural steel will be made on the basis of weight in kilogram, according to approved shop drawings, after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract and approved shop drawings.

##### 14.2.2 Payment

Payment will be made for acceptable measured quantity of structural steel works on the basis of unit rate per kilogram quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

#### 14.3 **MS Railing**

##### 14.3.1 Measurement

Measurement of acceptably completed works of MS railing will be made on the basis of actual length in running meter/ running foot, according to approved shop drawings, after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract and approved shop drawings.

##### 14.3.2 Payment

Payment will be made for acceptable measured quantity of MS railing works on the basis of unit rate per running meter / running foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

#### 14.4 **Steel Door**

##### 14.4.1 Measurement

Measurement of acceptably completed works of Steel door will be made on the basis of net actual area in square meter / square foot, according to approved shop drawings, after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract and approved shop drawings.



#### 14.4.2 Payment

Payment will be made for acceptable measured quantity of Steel door on the basis of unit rate per square meter / square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

### 14.5 Steel Grating

#### 14.5.1 Measurement

Measurement of acceptably completed works of Steel grating will be made on the basis of number of gratings, according to approved shop drawings, after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract and approved shop drawings.

#### 14.5.2 Payment

Payment will be made for acceptable measured quantity of Steel grating on the basis of number of gratings quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

### 14.6 Steel Gate

#### 14.4.1 Measurement

Measurement of acceptably completed works of Steel Gate will be made on the basis of number of Gates, according to approved shop drawings, after verification at site to the satisfaction of the Engineer that the items fabricated, supplied and erected in position conform with the contract and approved shop drawings.

#### 14.4.2 Payment

Payment will be made for acceptable measured quantity of Steel Gate on the basis of number of Gates quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 3000 \*\*\*





**SECTION - 4600**  
**CARPENTRY AND JOINERY**

1. SCOPE
2. APPLICABLE STANDARDS
3. MATERIALS
4. SAMPLES
5. FABRICATION
6. PROTECTION OF MATERIALS
7. WOODEN DOORS
8. WOODEN CABINETS
9. DEFECTIVE WORK
10. SURFACE PREPARATION
11. MOCK-UP SAMPLE
12. MEASUREMENT AND PAYMENT



## SECTION - 4600

### CARPENTRY AND JOINERY

#### 1.0 SCOPE

The work covered under this section of Specifications consists of providing all material, labour, plant, equipment, appliances and performing all operations in any floor and at any height connected with the fabrication and erection of all woodwork, mill work, construction assembly, surface finish treatment and building in of all cabinet type items, supports etc. of wood or metal and incidentals, associated woodwork appurtenances, procuring and applying preservatives, installation of "Finish Hard Ware" in connection with finish woodwork as per details shown on the Drawings or as directed by the Engineer.

#### 2.0 APPLICABLE STANDARDS

Latest editions of following British and ISO Standards are relevant to these specifications wherever applicable.

##### 2.1 ISO (International Organization for Standardization)

- 1891 Bolts, screens, nuts and accessories-Terminology and nomenclature.
- 1097 Plywood - Measurement of dimensions of panels.
- 1098 Veneer ply wood for general use-General requirements.
- 2427 Veneer ply wood with rotary cut veneer for general use-Classification by appearance of panels with outer veneer of beech.
- 2429 Ply wood -Veneer ply wood with rotary cut veneer for general use-Classification by appearance of panels with outer veneers of brand leaved species of tropical Africa.
- 3804 Ply wood-Determination of dimension of test pieces.
- 3805 Ply wood-Determination of density.
- 3806 Ply wood-Determination of moisture content.
- 6442 Door leaves-Measurement of defects of general flatness.
- 6443 Door leaves-Measurement of dimensions and of defects of squareness.
- 6444 Door leaves-Test of behaviour under humidity variations.

##### 2.2 BSI (British Standards Institution)

- 459 Wooden doors.
- 1186 Quality of timber and workmanship in joinery.
- 1127 Hinges
- 1331 Builder's hardware for housing.
- 1567 Wood door frames and linings nails.
- 1202 Nails
- 1203 Specifications for synthetic resin adhesive for ply wood.





- 1204 Synthetic resin adhesives for wood.
- 1282 Guide to choice, use and application of wood preservatives.
- 1494 Fixing accessories for building purposes.
- 1579 Connectors for timber.
- 3842 Treatment of ply wood with preservatives.

### 3.0 MATERIALS

#### 3.1 Timber

##### 3.1.1 Hard Wood:

Hard wood shall comprise of Oak, Beech, Walnut Mahogany, Teak, Iroko and Sheesham.

##### 3.1.2 Soft Wood:

All soft wood shall consist of Pines, Spruce, Hemlock and Douglas fir or Cedrous Deodar (referred in the document as deodar), wood locally known as 'Partal' to be used in shutter core where specified.

##### 3.1.3 General Characteristics:

All the timber shall be in accordance with the requirements of BSI No: 1186, 'Quality of Timber and Workmanship in Joinery'.

The whole of the timber shall be from the heart of sound and fully grown tree, uniform in substance, straight in fibre, first class quality properly seasoned, free from large or loose dead-knots, open shakes and excessive sapwood. The scantlings of all timbers shall be bright, sound and square edged. The moisture content of timber shall not be more than 10 (ten) percent in case of soft wood and 7 (seven) percent in case of hard wood.

##### 3.1.4 Preservation of Wood:

Prior to installation of all finish wood works in their respective positions, preservatives shall be applied to safeguard the wood work against fungus, termite and bores.

The preservatives shall be of the best available quality as approved by the Engineer. The method of application shall be strictly in accordance with the manufacturer's instructions. The treatment and application of all the preservatives shall comply with the requirements of BS-CP 98:1964.

##### 3.1.5 Adhesive:

The adhesives shall conform to the requirements of BSI No. 745 "Animal Glues for Wood" or as directed and approved by the Engineer.

##### 3.1.6 Nails and Screws:

All nails and screws shall comply with requirements of BSI No. 1202 and BSI No. 1210 respectively.



### 3.2 Ply Wood

The ply wood shall comply in all respects with BSI No. 1455:1963. Before procurement, the supplier should be got approved by the Engineer. All plywood shall be manufactured with phenol pharamaldihide or any other approved water proof adhesive but not with urea pharamaldihide.

Ply wood used for doors, and other similar works shall be to the thickness and size as shown on the Drawings or as directed by the Engineer. The grade shall be first quality and the face and back shall be free from end joints, dead knots, overlaps, patches and other similar defects. The surfaces shall be free, smooth for painting or polishing.

### 3.3 Medium Density Fiber (MDF) Board

Medium density fiber board to be used on the project shall be LASANI make or approved equivalent of thicknesses as specified in the drawings. Board shall be manufactured with water proof resinous glues and shall be guaranteed by the manufacturer. All boards required for the exterior surfaces of cabinets shall be laminated with Formica in approved colour and texture in factory as specified elsewhere.

## 4.0 **SAMPLES**

All samples of the material used for the work under this Section of Specification shall be approved by the Engineer and same type of material shall be used throughout the work. If the Engineer desires to get the material tested, this will be got done by the Contractor at his own cost from a laboratory approved by the Engineer.

## 5.0 **FABRICATION**

'Unwrought' timber shall be used. Sawing shall be done with sufficient oversize margin to finally meet the requirements of specified sizes and dimensions of the finished work.

All framing shall be joined and glued properly as shown on the Drawings or as directed by the Engineer. All joints shall be secured with sufficient number of nails. The Contractor shall perform all necessary mortizing, tenoning, grooving, matching, tangoing, housing, rebating and all operations required for the correct jointing. The Contractor shall also provide all metal plates, screws, nails and other fixing material that may be ordered by the Engineer for the proper execution of the joinery work. Fabrication that develop defects due to bad workmanship or unsound materials not conforming to these specifications and the directions of the Engineer, shall be cut out and replaced at Contractor's own expense before the expiry of the maintenance period.

## 6.0 **PROTECTION OF MATERIALS**

All materials and assembled units shall be protected from weather and stored in such a way as to prevent decay, warping and attack by fungus and termites.

## 7.0 **WOODEN DOORS**

### 7.1 Materials

7.1.1 First class wood as indicated on drawings or as approved by the Engineer shall be used for door shutters except the core of shutters which shall be honeycomb fiber to form 12mm air cell as specified and shown on drawings. Door frames shall be of painted steel/hard wood as shown on drawings.

7.1.2 Architraves, beads, lippings shall be of wood as indicated on drawings or as approved by the Engineer of specified sizes and fixed as per details shown on Drawings.





## 7.2 Ground, Blocking & Nailing Strips

Ground, blocking and nailing strips shall be provided as necessary to receive the work included herein and as required for the work of other trades.

Except as otherwise shown or specified, ground blocking and nailing strips shall be secured in place as follows:

- 7.2.1 To steel: by means of 10mm diameter bolts spaced not over 1 meter.
- 7.2.2 To block wall: by the use of cut nails spaced not more than 0.5 meter apart and driven directly into the block.
- 7.2.3 To poured concrete: by means of 6 mm diameter galvanized expansion bolts spaced not more than 0.5 meter part or by any approved method.

## 7.3 Exterior and Interior Door Frames

All exterior and interior door frames shall be fabricated of steel sections or wood as shown on drawings.

All exposed surfaces of metal frames shall be painted with synthetic matt finished enamel paint of approved shade as per the instructions of the Engineer.

## 7.4 Door Shutters

The shutters will be fixed to the frames with approved quality fittings as per hardware schedule.

- 7.4.1 All doors, shutters shall be fabricated in a workman like manner strictly to the correct sizes and shapes as shown on the Drawings or as directed by the Engineer.
- 7.4.2 The door shutters shall be built in sections, properly jointed and glued together. The surfaces shall be prepared for painting or polishing.
- 7.4.3 Each door shall be constructed so as to permit the installation of hinges, knobs and locks in the position shown on the Drawings. Lock rails should also be provided with all flush doors.
- 7.4.4 Completed doors shall be sound, rigid and free from defects and warp. All edges shall be aligned and smooth, joints shall be close fitting, hard wood doweled or mortised framed and of strength to maintain frame and of strength to maintain the structural properties of the member connected. All adjoining faces and edges shall be flush and smooth. Edges shall be rectangular and solid.
- 7.4.5 All exposed surfaces of wooden frames and wooden shutters shall be lacquered or painted with synthetic matt finished enamel paint of approved shade as per the instructions of the Engineer.
- 7.4.6 Chamfers shall be made as shown on the drawings or as directed by the Engineer.

## 7.5 Fitting, Hanging and trimming

All the doors shall be fitted, hung and trimmed as hereinafter specified and as indicated on the Drawings.

Doors shall have a clearance of 3mm (1/8 in.) at sides and top unless otherwise directed by the Engineer and shall have 5mm (1/4 in.) clearance at bottom. For external doors provide dust proof strip at bottom and for sound proof/ fire rated door provide neoprene strip at door frame interface. Doors shall be hung and trimmed with hardware as specified. All the locks



shall be installed at the same height and shall be located at height as directed by the Engineer. Where directed by the Engineer margin for carpet shall be incorporated in the door shutter.

#### 7.6 Hardware

Hardware shall be of best quality local make extra heavy duty and first class finished material except door locks and door closures which shall be imported of Japanese origin as per attached hardware schedule. The Contractor shall obtain prior approval from the Engineer for quality, shape, pattern, and brand of all the hardware materials by providing samples and catalogues, etc., and shall provide and fix only the approved hardware materials.

Hardware shall be carefully and securely fitted. Upon handing over the work, hardware shall be demonstrated to operate freely. Keys shall be placed into respective locks and upon acceptance of the work keys shall be tagged and delivered to the Engineer.

#### 7.7 Quality Assurance

7.7.1 Tolerances: Doors shall be fabricated to following tolerances

- Size: Plus or minus 1.5mm (1/16 in.) in overall dimensions
- Maximum Warp: 3mm (1/8 in.)
- Squareness: Maximum diagonal difference 3mm (1/8 in.) of (between length of diagonal measured on face of door from upper right corner to lower left corner and length of diagonal measured from upper left corner to lower right corner).

7.7.2 Manufacturer's Qualifications: The manufacturer of doors herein specified shall have been in business of manufacturing doors of type specified for minimum period of five years.

#### 7.8 Submittal

7.8.1 Provide manufacturer's literature completely describing products.

7.8.2 Provide shop drawings showing door types, details and locations, referred to the door type and hardware group shown on door and hardware schedules.

7.8.3 Provide certificates stating that doors were constructed with timber of the species specified having moisture content and meeting equilibrium and relative humidity requirements.

7.8.4 Submit samples of plywood for selection of colour and grain.

7.8.5 Procurement of materials shall be made only after the shop drawings and samples have been approved by the Engineer.

#### 7.9 Product Delivery, Storage and Handling

7.9.1 Deliver and store products in waterproof, protective containers with seals unbroken and labels intact until time to use.

7.9.2 Keep products dry, stack products off ground on level platforms, fully protected from weather, including direct sunlight.

7.9.3 Identify type, size and location of each door before delivery in order to permit installation at correct location.





7.10 Installation

7.10.1 Install doors at correct openings and assure smooth swing and proper closer with frames.

7.10.2 Install finish hardware in accordance with manufacturer directions.

**8.0 WOODEN CABINETS**

All cabinet including fittings, fixtures and hardware shall be supplied of approved manufacturer and shall be of best quality fabricated by using materials and details as shown on the drawings.

8.1 Shop Drawings

The Contractor shall submit detailed shop drawings on the basis of the manufacturer's specifications including all fittings, fixtures and hardware and the same shall be got approved from the Engineer before fabrication. Samples of materials to be used in cabinets together with specifications and literature shall be supplied to the Engineer for his approval prior to start of works. The colour shade shall be as approved.

8.2 Installation

All cabinets shall be installed in position by the manufacturer's skilled workmen specialized in the job. Works shall be executed in accordance with approved shop drawings and the manufacturer's instructions.

The Contractor shall inspect the delivered cabinets and related parts for indication or location, size required by field measurements, finishing hardware and similar preliminary works. Verify locations for installation, required floor and wall finishes, painting and all other related work. Cabinet shall exactly flush wall surfaces. Cut and fit accurately scribe strips at wall surfaces. Secure wall cabinet to blocking. Concealed fasteners, all joints surfaces shall be smooth and even. Doors and other moving parts shall exactly fit in the frame. Refit, as necessary to ensure proper and easy operation. Refit, if necessary, all cabinet and shelves hardware, test for proper operation, remove for painting and other finishing and properly replace in position with all fittings and accessories.

All work shall be thoroughly protected from damage at all times by suitable methods approved by the Engineer. Adjacent work shall similarly be protected from, damage. Any damage or disfigurement shall immediately be corrected at Contractor's expense.

8.3 The works offered under this item should allow a reasonable choice variation of design/ colour etc. to suit individual test/ needs, i.e. one standard design may not apply to all buildings of one type.

8.4 Cabinet work, generally all framing will be in treated hardwood with portions etc. in best quality commercial plywood. All exposed surfaces will be covered by approved laminates. Exposed edges, if any, will be covered by polished hardwood lipping.

**9.0 DEFECTIVE WORK**

In the event of non-conformance to specification and drawings, the wood works shall be rejected by the Engineer and the Contractor shall remove and replace the rejected work by new work of same specifications.

**10.0 SURFACE PREPARATION**

The surfaces of all wood works shall be prepared in the manner as directed by the Engineer for polishing or painting.



## 11.0 MOCK-UP SAMPLE

After approval of shop drawings and tests etc., the contractor shall submit at his own cost one mock-up sample of each type of wood works complete with all fixing, fixtures accessories prior to the actual fabrication of the bulk.

The samples shall be returned to the Contractor for incorporation in the works after installation of at least 80% of the works.

## 12.0 MEASUREMENT & PAYMENT

### 12.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bills of Quantities.

The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under these specification in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.

12.1.1 Glazing where required and all finished hardware fittings in carpentry and joinery works, including locks, door closers, kick and push plate, architrave, beading, handles, lock rail and locking arrangements etc.

12.1.2 Prime coat, final finishing painting with enamel paint/ lacquer polishes in carpentry and joinery works/ hand railing.

12.1.3 Anti termite treatment to wood works and adhesives

12.1.4 Steel balusters, steel base and steel strip for wooden railing.

12.1.5 Deodar wood blocking, shipping & base frame work in cabinets/hand railing.

12.1.6 Wastage of material.

12.1.7 Deodar wood beading/architraves, commercial ply, veneered block board shutter

### 12.2 Wooden Door & Wooden Glazed Partition

#### 12.2.1 Measurement

Measurement of acceptably completed works of all types of wooden doors and wooden glazed partitions will be made on the basis of actual area of doors in square meter / square foot fabricated and installed in position as shown on the Drawings or as directed by the Engineer. Net area will be measured in accordance with plastered masonry opening in between jambs and plastered head and bottom of shutter.

#### 12.2.2 Payment

Payment will be made for acceptable measured quantity of all types of wooden doors and wooden glazed partitions on the basis of unit rate per square meter / square foot quoted in the respective items of Bill of Quantities against respective item and shall constitute full compensation for all the works including all hardwares & fittings like locks, tower bolts, push plates etc. as per details mentioned in Bidding & Contract Document related to the item.





12.3 Wooden Cabinets (floor/wall mounted)

12.3.1 Measurement

Measurement of acceptably completed work of floor/wall mounted wooden cabinets will be made on the basis of net actual running meter / running foot of kitchen cabinets provided and installed in position as shown on the Drawings or as directed by the Engineer.

12.3.2 Payment

Payment will be made for acceptable measured quantity of floor/wall mounted wooden cabinets on the basis of unit rate per running meter / running foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

12.4 Wooden Partitions

12.4.1 Measurement

Measurement of acceptably completed work of wooden partitions will be made on the basis of net actual area in square meter / square foot of partitions provided and installed in position as shown on the Drawings or as directed by the Engineer.

12.4.2 Payment

Payment will be made for acceptable measured quantity of wooden partitions on the basis of unit rate per square meter / square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 4600 \*\*\*



**SECTION - 6531**  
**MARBLE WORKS**

1. SCOPE
2. SUBMITTALS
3. DELIVERY, STORAGE AND HANDLING
4. MATERIALS
5. EXECUTION
6. MEASUREMENT AND PAYMENT





## SECTION - 6531

### MARBLE WORKS

#### 1.0 SCOPE

The work under this section of specifications, consists of providing all material, labour, plant, equipment, appliances in any floor and at any height and performing all operations required for providing and installing marble natural stone slab for toilet counters, where shown on the drawings, complete in strict accordance with this section of the specification and the applicable Drawings.

#### 2.0 SUBMITTALS

The Contractor shall submit manufacturer's specifications and other product data for each type of marble stone and fixtures required, including instructions for handling, storage, installation and protection.

Shop Drawings shall be submitted showing sizes, dimensions, sections and profiles of slab, arrangement and provisions for jointing, anchoring, fastening and supports and other necessary fixing details. Indicate locations, layouts and pattern arrangements for each stone type and colour.

Submit three ranges samples 300mm x 300mm (12 in. x 12 in.) in size of each type of stone showing colour, grade, finishing and texture for approval of the Engineer.

#### 3.0 DELIVERY, STORAGE AND HANDLING

Materials shall be protected from damage during loading, shipment, delivery and storage. Non-staining materials for blocking and packing shall be used. Stack marble at site in accordance with manufacturer's recommendations and as required to prevent staining, scratching, etching or breakage.

#### 4. MATERIALS

##### 4.1 General

Marble shall be compact, dense, metamorphic rock of lime stone origin obtained from quarries within Pakistan. It shall have a specific gravity of 2.7 and hardness number on Moh's scale shall range from 3 to 4.

Obtain each marble stone type from a single quarry and ensure consistent colour range and texture throughout the work. All pieces shall be of uniform thickness and truly square in shape.

Provide marble slabs/sills and tiles of specified sizes in floors, stair tread & risers and counter tops as shown on drawings.

Provide marble slabs/sills and tiles of type, colour and finish for each area as directed by the Engineer.

Provide stone of specified thickness. Saw cut the back surfaces that are meant to be concealed in finished work.

Provide irregular shaped units, staircase units and skirting base units to the profiles of required shapes & sizes and polished exposed surfaces wherever specified.



#### 4.2 Marble Stone Type

All marble stone types are to be selected and approved by the Engineer for quality, colour and texture.

Marble: Marble of approved type and colour of local origin, first class quality and high class finish acceptable to the Engineer.

#### 4.3 Beds and Backings

Where applicable, standard cementitious screed and mortar beds and backings, mixed and proportioned by volume shall be as follows: -

Grey ordinary Portland Cement	: 1 part
Sand	: 2 parts
Water	: Clean, fresh and free from deleterious substances

#### 4.4 Adhesives, Grouts and Sealants

Proprietary adhesives, joint grouts and sealants of approved type as required and recommended by the manufacturer for specific application shall be used. The colour of the joint grout and the sealants shall match with the colour of stone.

### 5.0 EXECUTION

#### 5.1 Flooring, Skirting, Dado and Stair/Counter tops

Apply cement slurry coat over surfaces of concrete substrate immediately prior to placing setting bed which shall comprise cement sand mortar 1:2 and shall be 1" thick or as specified and shall be spread uniformly. Limit area of application to avoid premature drying out. Install setting bed of required thickness and set stone units before initial set occurs. Apply a thin layer of cement paste to bottom of each unit. Set tamps and level units immediately so that cement mortar slurry rises up in the joint. Set units in required pattern with uniform joint widths. The levels and lines shall be checked with very fine twine and the defects removed immediately. After the tiles/slabs have initially set, the joints shall be raked out and coloured cement of required shade shall be spread in the form of slurry to fill all joints.

Point joints as soon as possible after initial set. Force grout into joints, strike flush and tool slightly concave.

Remove mortar and grout from surfaces while still moist and as the work progresses.

Do not permit traffic on finished surface during setting and for a minimum of 24 hours after final pointing of joints.

#### 5.2 Marble Toilet Counters

Marble toilet counter tops of the specified size shall be installed in areas shown on Drawings with M.S. angle framing and fixing accessories in accordance with approved shop drawing. Joints shall be cement grouted with matching colour or with matching colour sealant.

#### 5.3 Repair and Cleaning

Remove and replace stone units which are broken, chipped, stained or otherwise damaged. Where directed, remove and replace units which do not match adjoining stonework or are not in line and level as shown on Drawings. Provide new matching units, install and point joints to eliminate evidence of replacement. Repoint defective and unsatisfactory joints to provide neat, uniform appearance.





Clean stonework not less than 6 days after completion of work, using clean water and bristle brushes. Do not use wire brushes, acid or caustic type cleaning agents or other cleaning compounds which may be detrimental to the stone finish or joint grout.

#### 5.4 Protection

Provide covers, boards, supports and all other necessary materials to protect finished work from collapse, deterioration, discolouration or damage during installation and until contract completion.

#### 5.5 Polishing

The finished surface after drying shall be grinded and chemically polished, acceptable to the Engineer.

The finished surface shall not show any depressions in individual tiles or any undulation in the floor.

Do not permit traffic on finished surface during setting and for a minimum of 72 hours.

### 6. MEASUREMENT AND PAYMENT

#### 6.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under these specification in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.

6.1.1 Finishing, washing, polishing, repair cleaning and protection of marble stone/tiles in position.

6.1.2 Proprietary adhesives, joint grouts and sealants for fixing marble stone where specified on the Drawings or directed by the Engineer.

6.1.3 Class 'C' cement concrete screed bed and 1:2 cement sand mortar for marble stone/tiles in floors, skirting, steps, etc.

6.1.4 Preparation of concrete substrate for laying marble sills/slabs and tiles.

6.1.5 M.S. angle framing and fixing accessories for marble counters.

6.1.6 Chemical polishing on marble surfaces.

#### 6.2 Marble Flooring, Dado and Stair/Counter tops

##### 6.2.1 Measurement

Measurement of acceptably completed works of marble Flooring, Dado and Stair/Counter tops will be made on the basis of net actual area in square meter / square foot of marble Flooring, Dado and Stair/Counter tops, provided and installed in position as shown on the Drawings or as directed by the Engineer.



### 6.2.2 Payment

Payment will be made for acceptable measured quantity of marble Flooring, Dado and Stair/Counter tops on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

## 6.3 Marble Skirting

### 6.3.1 Measurement

Measurement of acceptably completed works of marble skirting will be made on the basis of actual length in running meter / running foot of marble skirting provided and installed in position as shown on the Drawings or as directed by the Engineer.

### 6.3.2 Payment

Payment will be made for acceptable measured quantity of marble skirting on the basis of unit rate per running meter / running foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

## 6.4 Marble Vanity Top

### 6.4.1 Measurement

Measurement of acceptably completed works of marble vanity top including precast slab, masonry and other related civil works, will be made on the basis of net actual area in square meter / square foot of marble vanity top provided and installed in position as shown on the Drawings or as directed by the Engineer.

### 6.4.2 Payment

Payment will be made for acceptable measured quantity of marble vanity top including precast slab, masonry and other related civil works, on the basis of unit rate per square meter / square foot quoted against respective item in the Bills of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 6531 \*\*\*





**SECTION - 6560**

**FALSE CEILING**

1. SCOPE
2. GENERAL
3. MATERIALS
4. SUBMITTALS
5. PRODUCT DELIVERY, STORAGE AND HANDLING
6. JOB SITE CONDITIONS
7. INSTALLATION AND WORKMANSHIP
8. FIXTURES
9. FINISHING
10. MEASUREMENT AND PAYMENT



## SECTION - 6560

### FALSE CEILING

#### 1.0 SCOPE

The work under this section of the specifications, consists of furnishing all plant, labour, equipment, appliances and materials in any floor and at any height and in performing all operations in connection with providing and installing different types of false ceiling including suspension system complete, in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the Contract.

#### 2.0 GENERAL

False ceiling shall be installed wherever indicated on the drawings by skilled technicians experienced in this type of work. Installation shall not commence in any room or space before completion of plasterwork on structural roofing/internal walling/external surfaces.

#### 3.0 MATERIALS

##### 3.1 Tiles

Tiles shall be of approved size, shape and colour as shown on drawing or as approved by the Engineer shall be used.

All four edges shall be revealed to be installed by an approved recessed suspension system, strictly in accordance with the approved shop drawings, manufacturer's recommendations or instructions of the Engineer.

##### 3.2 Aluminum Panels

Aluminum panel ceiling (1 hour fire rated) shall be linear or flat, perforated or un-perforated with grooved joints and sound insulation, as specified, manufactured by DAMPA (Denmark), OWA or DAIKEN (Japan).

##### 3.3 Hardwood Ceiling

This ceiling shall comprise of decorative geometrical patterned hardwood, gypsum plaster relief panels infill and stainless steel panels with cut mirrors and itched glass panels.

##### 3.4 Suspension System

The suspension system for all types of false ceiling shall be in accordance with the recommendations of the approved false ceiling manufacturer and approved shop drawings, consisting of aluminum universal U-channels/ main T/Cross-T Bars, wall mouldings/ edge trims, hold down/adjustment clips, galvanized hanger strips with adjustment mechanism, etc.

#### 4.0 SUBMITTALS

4.1 Shop drawings shall be submitted showing reflected ceiling plan, locations of built in products and access facilities, dimensions, layout arrangements, hanger locations, structural connection, details of level changes, direction of pattern and panel joint details. The shop drawings shall be got approved by the Contractor from the Engineer in advance of under taking this item of works.

4.2 No materials shall be procured prior to approval of shop drawings and details.

4.3 The Contractor shall incorporate the required access panels of false ceiling as per approved shop drawings.





## 5.0 PRODUCT DELIVERY, STORAGE AND HANDLING

- 5.1 Material shall be delivered in original, unopened, protective packaging, with manufacturer's labels indicating brand name, pattern, size, thickness and fire rating.
- 5.2 Material shall be stored in original protective packaging to prevent soiling, physical damage or wetting.
- 5.3 Cartons shall be stored in the installation area, opened at each end to stabilize moisture content and temperature, for 48 hours prior to installation.

## 6.0 JOB SITE CONDITIONS

- 6.1 Work which will be concealed by false ceilings shall be completed, tested, inspected and accepted before ceiling work is started.
- 6.2 False ceiling installation shall not begin until the area has been closed in, and temperature and humidity approximate occupancy conditions. Wet work shall be cured and dry before ceiling work is started.
- 6.3 Surface which will support the ceilings, and those to which the ceiling abut, shall be inspected and accepted for completeness and adequacy to receive the ceilings before the work begins.

## 7.0 INSTALLATION AND WORKMANSHIP

False ceiling suspension system and panels shall be installed in accordance with the requirements of BSI-CP.290 and with the manufacturer's recommendations as approved by the Engineer.

### 7.1 Suspension System

The hangers as specified shall be evenly disposed as per drawings, details and place and position as indicated. The suspension system should be installed by making holes directly in the roof and shall be made good as directed by the Engineer. Their lengths clear of roofing slab shall be as per shop drawing details.

The framing of the specified section and run at spacing as per shop drawings. The jointing of runners to hangers shall be as per approved shop drawing details. The extra framing if required shall be provided for light receptacles as per approved shop drawing details.

Wall hangers shall be positively and rigidly connected to the structure and to cross runners.

### 7.2 False Ceiling tiles

Tiles shall be installed in the grid system after completion of installation of the suspension of lighting and air conditioning fixtures.

Forming ceiling panels shall be laid out in pattern including border of uniform width around all sides of each ceiling area. The pattern shall be as per shop drawings approved by the Engineer.

All panels shall be furnished and installed in an approved manner and as per approved types, sizes and surface design.

## 8.0 FIXTURES

Light fixtures shall be installed as per approved pattern and supported in accordance with manufacturer's recommendations.



## 9.0 FINISHING

After installation, dirty, soiled or discoloured surfaces shall be cleaned and left free from defects and ready to receive any painted finish if required.

The panels which are damaged or improperly installed shall be removed and replaced by the Contractor at his cost.

## 10.0 MEASUREMENT AND PAYMENT

### 10.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

- The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under these specification in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.
- Aluminum approved suspension system including main channels, main tee/cross tee bars, wall moulding and edge trims, hanger strips and accessories, hold down clips, Aluminum tiles / strips etc. complete for aluminum tile / strips ceiling.

### 10.2 False Ceiling

#### 10.2.1 Measurement

Measurement of acceptably completed works of respective types of false ceiling will be made on the basis of net actual area in square meter / square foot of false ceiling provided and installed in position as shown on the Drawings or as directed by the Engineer.

#### 10.2.2 Payment

Payment will be made for acceptable measured quantity of respective type of false ceiling on the basis of unit rate per square meter / square foot quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 6560 \*\*\*





**SECTION - 6600**  
**FLOOR AND WALL FINISHES**

1. **SCOPE**
2. **MATERIALS**
3. **CEMENT CONCRETE FLOORING**
4. **INSTALLATION OF TILE FLOORING**
5. **IRONITE FLOOR TOPPING**
6. **MEASUREMENT AND PAYMENT**



## SECTION - 6600

### FLOOR AND WALL FINISHES

#### 1.0 SCOPE

The work under this section of the Specification consists of furnishing all plant, labour, equipment, appliances and materials and performing all operations in any floor and at any height in connection with the installation of cement concrete floors and floor finishes including bases, skirting and external surface treatments, complete in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the Contract.

#### 2.0 MATERIALS

##### 2.1 Cement

Cement shall be ordinary Portland cement conforming to B.S. 12 or PS 232.

##### 2.2 Sand

All fine sand shall be obtained from sources approved by the Engineer. The grading shall conform to B.S 882 Grading Zone 1 and 2 of which the gradation limits are as follows:

Percentage (by weight) passing

B.S. Sieve	Grading Zone 1	Grading Zone 2
3/8" (9.53 mm)	100	100
3/16" (4.765 mm)	90-100	90-100
No. 7	60-95	75-100
No. 14	30-70	55-90
No. 25	15-34	35-59
No. 52	5-20	8-30
No. 100	0-10	0-10

##### 2.3 Coarse Aggregate

Coarse aggregate shall be crushed or uncrushed gravel or crushed stone, angular or rounded in shape and shall have granular, crystalline or smooth surface free from friable, flaky and laminated pieces, mica and shale. It shall not contain matters injurious to concrete. All coarse aggregate shall conform to BSS NO.882 and shall be graded as follows:

B.S. Sieve	% Passing by weight
1" (25.40 mm)	100
3/4" (19.05 mm)	90-100
3/8" ( 9.53 mm)	20-55
3/16"(4.765 mm)	0-10

The aggregate shall be stored on properly constructed paving or as directed by the Engineer.

There shall be a physical partition between the stockpiles of coarse and fine aggregate. If required aggregates shall be washed and screened to the satisfaction of the Engineer. Sieve analysis of all the aggregates to be used in the works shall be carried out as and when required by the Engineer. All aggregate shall be subject to the approval of the Engineer.





Any aggregates not found to be of the specified/approved standard shall be rejected by the Engineer and all such rejected material shall be removed from site with-out delay.

Floors, sub-base or base constructed with rejected aggregates shall be dismantled and rebuilt at the expense of the Contractor.

#### 2.4 Stone Ballast

50 mm (2 in.) and down gauge graded Stone ballast shall be used under flooring.

#### 2.5 Water

Water used for mixing concrete, curing or any other operation of the works specified herein shall be fresh, clean and free from organic or inorganic matters in solutions or in suspension. Only water of the approved quality shall be used for all constructional purposes:

#### 2.6 Ceramic/Porcelain tiles

Ceramic tiles shall be local, premium quality, plain, white/colored or printed from one of the approved manufacturer. The ceramic tile shall be acid resistant, glazed or non skid tiles as shown on drawings. Porcelain tiles shall be imported best quality plain colored / textured from one of the approved manufacturers. The tiles shall be of sizes as specified on the drawings and shall conform to BS 1281 as per samples.

#### 2.7 Cleaning Compound

The compound used for all cleaning of terrazzo shall be an approved neutral chemical cleaner free from acid and alkali or any other material that will affect the colour or otherwise damage the terrazzo and shall not affect the conductivity of terrazzo floors.

#### 2.8 Terrazzo Tiles

Terrazzo tiles shall be first grade mechanically compressed type conforming to PS-531. Tiles shall be 30x30xcm (12 in. x 12 in.) with a topping of 19mm (3/4 in.) thickness composed of 1:2 cement marble chips the bases being 1:2 cement mortar. The colour, quality and size of chips shall be as per Engineer's direction.

#### 2.9 Ironite Floor Hardener Topping

Ironite Floor Hardener Topping shall be a graded, processed, non-oxidizing, non-rusting, inert metallic aggregate compatible with ordinary Portland cement designed for use in industrial pavings and floors to produce heavy duty, dense and tough floor surfaces able to wear, abrasion and dusting.

#### 2.10 Concrete Split Block

Concrete split block shall be of Primecrete or Envicrete make or approved equivalent.

### 3.0 CEMENT CONCRETE FLOORING

The materials for C.C flooring shall be same as already specified under clause 3, "Materials".

#### 3.1 Composition of Concrete

Concrete shall be composed of Portland Cement, sand, coarse, aggregate and water, all well mixed and brought to the proper consistency. The Contractor shall mix the ingredients as indicated on the Drawings. The proportions of the various ingredients shall be determined from time to time during the progress of the work and tests shall be made of





samples of the aggregates and the resulting concrete. The mix proportions and appropriate water-cement ratio will be determined on the basis of the production of concrete having required workability, density, impermeability, durability and required strength.

### 3.2 **Mixing Concrete**

The concrete ingredients shall be mixed in a batch mixer for not less than 1-1/2 minutes after all ingredients, except the full amount of water, are in the mixer. The Engineer reserves the right to increase the mixing time when the charging and mixing operations fail to produce a concrete batch in which the ingredients are uniformly distributed and the consistency is not uniform. The concrete shall be uniform in composition and consistency from batch to batch except when changes in composition or consistency are required. Water shall be added prior to, during and following the mixer charge. Excessive over-mixing requiring addition of water to preserve the required concrete consistency will not be permitted. The concrete ingredients shall be mixed by volumetric measurement in purpose made boxes approved by the Engineer.

### 3.3 **Construction**

The base course of the floor shall comprise of stone ballast of 2 inches (approx: 50 mm) mesh size. The base course shall be thoroughly compacted by suitable power rammers to the total consolidated thickness as shown on the Drawings and as approved by the Engineer. The interstices shall be filled with smaller size stones. The base course shall be blinded with sand and the whole surface watered. Over the well compacted base course, a layer of concrete of the required grade and thickness shall be laid, in panels of the sizes as indicated on the Drawing and as approved by the Engineer.

After the C.C bed has been cured, as directed by the Engineer, it shall be roughened and well watered before floor finishing is laid. The floor finish shall comprise of cement concrete of required grade and shall be laid in panels to the required thickness as shown on the Drawings or as directed by the Engineer. The concrete after laying will be thoroughly rammed and mortar worked up to the top and smoothed with a steel trowel. The edge of each section into which the floor is divided should be defined by wooden screeds of the approved width and of a depth equal to the depth of the floor concrete.

Freshly placed concrete floor and completed floor portions as finished shall be protected to prevent loss of water by covering with damp hessian, water proof paper, damp sand or other approved material, and shall be kept constantly damp for a period of four days or longer after concreting as directed by the Engineer. The concrete shall be allowed to dry out slowly over a period of three days after wet curing is completed.

The expansion joints shall be filled in with hot bitumen, of the approved grade, as directed by the engineer.

## 4.0 **INSTALLATION OF TILE FLOORING**

When setting out the tiles, care shall be taken to establish the correct elevation for the floor. A gauge rod shall be used, indicating the overall measurement of a given number of tiles with specified joint width to reduce cutting.

After the floor has been machine finished, it should be covered with white, non-staining sand or rags to protect it while other work is being done. After removal, the floor shall be thoroughly scrubbed.

### 4.1 **General**

The base shall be prepared by laying cement concrete of specified grade and of thickness as shown on the drawings, or specified in the Bill of Quantities.





The curing period of the setting bed shall be as directed by the Engineer. As large an area of setting bed shall be spread at one time as can be covered with tiles before the mortar has set. Surplus mortar shall be removed. The thickness of setting bed in any space shall not be less than 13mm (1/2").

Floor and wall surfaces to receive the tiles shall be thoroughly cleaned of all dirt, dust, oil and other objectionable matters. Tiles shall be laid out from the centre line of each space in an outward direction and the pattern should be made symmetrical with a minimum number of cut tiles as directed by the engineer.

Joints between the tiles shall be of uniform width. Tiles shall be cut with a suitable cutting tool and rough edges shall be rubbed smooth. Tiles shall be laid to the straight edges.

#### 4.2 Ceramic/Porcelain Tiles

The ceramic/porcelain tiles shall be laid to the required lines, levels and grades over a setting bed of cement sand mortar comprising of one part of cement and 4 parts of sand by volume and the joints filled with neat white or grey cement including vertical and horizontal covers. The tile floor shall be kept wet for at least 72 hours and no traffic should be allowed on the tiles during curing period.

#### 4.3 Terrazzo Tiles Flooring

The tiles shall be well soaked in water and kept in a vertical position to drain out all surplus water. The bed over which the tiles would be laid shall be 25mm thick cement sand mortar as specified by the Engineer. The cement sand mortar shall be prepared and mixed with clean granular sand in the proportion of 1:2 and spread uniformly on the thoroughly wetted and moist surface. The tiles shall be laid on this cement mortar slurry rises up in the joint. The tiles shall be laid in the pattern as specified by the Engineer. The levels and lines shall be checked with very fine twine and the defects removed then and there. After 3 or 4 days the slurry from the joints shall be raked out and colored cement of required shade shall be spread in the form of slurry to fill all joints. It shall be neatly wiped out of the surface when still wet. After about 10 days the area shall be rubbed and ground with Carborundum stone and the whole surface rendered smooth and washed with plenty of water. After allowing to dry the surface shall be wax polished. The finished surface shall not show any depressions in individual tiles or undulations in the floor.

### 5.0 IRONITE FLOOR TOPPING

#### 5.1 Base Preparation

Ironite (floor hardener) flooring is directly laid over fresh green concrete. The base concrete shall be placed in accordance with good concrete practice and extra care should be exercised at corners and edges to obtain good compaction. Any free water from the surface of the base slab shall be removed prior to the application of ironite topping.

#### 5.2 Mixing & Application

The floor hardener shall be mixed well with cement in a ratio as specified by the manufacturer. The water cement ratio of ironite topping shall be kept as low as per site conditions. Ironite topping shall be laid within three hours of laying of the base slab. Surface shall be toweled till all pores and pinholes thus formed have disappeared. Final toweling shall be delayed for as long as possible.

#### 5.3 Curing

Ironite flooring shall be cured for at least 14 days with a spray of clean water or a suitable curing compound. During the curing period the surface should be protected from traffic and other potential hazards.



## 6. MEASUREMENT AND PAYMENT

### 6.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities.

The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

- 6.1.1 Loss and wastage of material due to consolidation, erosion and settlement.
- 6.1.2 All type of joints (expansion, contraction and construction joint etc.).
- 6.1.3 Class 'C' cement concrete screed base and 1:4 cement sand mortar under floor.
- 6.1.4 Rough plaster base under skirting / dado.
- 6.1.5 Finishing/grinding, washing & polishing works of ceramic, concrete, terrazzo tile, terrazzo floors and marble tiles.
- 6.1.6 Marble strips in terrazzo floors
- 6.1.7 1:2 and 1:4 cement sand rough cast plaster.
- 6.1.8 Sand cushion under concrete pavers
- 6.1.9 Pigmented grouting.
- 6.1.10 Cleaning of tiles after installation.
- 6.1.11 Bull-nozing, chamfering of edges of marble tops including base mortar and making holes for wash basin including all necessary fixing accessories.
- 6.1.12 Liquid water proofing, if required.

### 6.2 Cement Concrete Floor

#### 6.2.1 Measurement

Measurement of acceptably completed works of cement concrete floor steel trowelled finish will be made on the basis of net actual area in square meter / square foot laid in position as shown on the Drawings or as directed by the Engineer.

#### 6.2.2 Payment

Payment will be made for acceptable measured quantity of cement concrete floor steel trowelled finish on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

### 6.3 Ceramic/Porcelain Tile Floor

#### 6.3.1 Measurement

Measurement of acceptably completed works of ceramic/porcelain tile in floor will be made on the basis of net actual area in square meter / square foot of floor laid in position as shown on the drawing or as directed by the Engineer.





### 6.3.2 Payment

Payment will be made for acceptable measured quantity of ceramic/porcelain tile floor on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

## 6.4 Ceramic/Porcelain Tile Dado/Skirting/Cladding

### 6.4.1 Measurement

Measurement of acceptably completed works of ceramic/Porcelain tile in dado/skirting/cladding will be made on the basis of net actual area in square meter / square foot of dado/skirting laid in position as shown on the Drawing or as directed by the Engineer.

### 6.4.2 Payment

Payment will be made for acceptable measured quantity of ceramic/porcelain tile in dado/skirting/cladding on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities. The unit rate shall include all cost of cement, sand, mortar and shall constitute full compensation for all the works related to the items.

## 6.5 Terrazzo Tile Floor/skirting/dado

### 6.5.1 Measurement

Measurement of acceptably completed works of terrazzo tile in floor/skirting/dado will be made on the basis of net actual area in square meter / square foot of floor laid in position as shown on the Drawing or as directed by the Engineer.

### 6.5.2 Payment

Payment will be made for acceptable measured quantity of terrazzo tile in floor/skirting/dado on the basis of unit rate per square meter / square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

## 6.6 Ironite Floor Topping

### 6.6.1 Measurement

Measurement of acceptably completed works of ironite floor topping will be made on the basis of net actual area in square meter / square foot laid in position as shown on the Drawings or as directed by the Engineer.

### 6.6.2 Payment

Payment will be made for acceptable measured quantity of ironite floor topping on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

## 6.7 Concrete Split Block Cladding

### 6.7.1 Measurement

Measurement of acceptably completed works of pigmented concrete split block cladding will be made on the basis of net actual area in square meter / square foot laid in position as shown on the Drawings or as directed by the Engineer.



**6.7.2 Payment**

Payment will be made for acceptable measured quantity of pigmented split block cladding on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities and shall constitute full compensation for all the works related to the item.

**6.8 Concrete Skirting****6.8.1 Measurement**

Measurement of acceptably completed works of concrete in skirting will be made on the basis of net actual area in square meter / square foot of dado/skirting laid in position as shown on the Drawing or as directed by the Engineer.

**6.8.2 Payment**

Payment will be made for acceptable measured quantity of concrete in skirting on the basis of unit rate per square meter / square foot quoted in the respective items of Bills of Quantities. The unit rate shall include all cost of cement, sand, mortar and shall constitute full compensation for all the works related to the items.

\*\*\* End of Section 6600 \*\*\*





**SECTION - 6700****PAINTING**

1. SCOPE
2. APPLICABLE STANDARDS
3. GENERAL
4. MATERIALS
5. DELIVERY, STORAGE AND CONTAINER SIZES
6. SURFACE PREPARATION
7. APPLICATION
8. JOB CONDITIONS
9. QUALITY ASSURANCE
10. SCHEDULE OF MEASUREMENT OF PAINT AREA
11. MEASUREMENT AND PAYMENT



## SECTION - 6700

### PAINTING

#### 1.0 SCOPE

The work under this section of the Specifications consists of furnishing all materials, plant, labour, equipment, appliances and performing all operations in any floor and at any height in connection with surface preparation, mixing, painting concrete works, gates, frames, walls, ceilings and all such surfaces as shown on the Drawings and/or as directed by the Engineer. The scope of this section of specification is covered with detailed specifications as laid down herein.

#### 2.0 APPLICABLE STANDARDS

Latest editions of following British Standards are relevant to these specifications wherever applicable.

#### 2.1 BSI (British Standards Institution)

- |         |  |
|---------|--|
| 245     | Specification for mineral solvents (white spirits and related hydrocarbon solvents) for paints and other purposes. |
| 2521    | Lead-based priming paint for wood work.  |
| 2523    | Lead based priming paint for iron and steel.   |
| 2569    | Sprayed metal coatings.  |
| 4800    | Paint colours for building purposes.   |
| CP.231  | Painting of building.  |
| CP.3012 | Cleaning and preparation of metal surfaces.  |

#### 3.0 GENERAL

- 3.1 Except as otherwise specified, all painting shall be applied in conformity with BS CP 231 "Painting of Building" as applicable to the work.
- 3.2 The Contractor shall repair at his own expense all damaged or defective areas of shop-painted metal work and structural steel work. Metal surfaces against which concrete is to be placed will be furnished shop-painted and shall be cleaned prior to being embedded in concrete.
- 3.3 Except as otherwise specified all concrete and plastered surfaces are to be painted.
- 3.4 The Engineer will furnish a schedule of colours for each area and surface. All colours shall be mixed in accordance with the manufacturer's instructions.
- 3.5 Colours of priming coat (and body coat) where specified, shall be lighter than those of finish coat. The Engineer shall have unlimited choice of colours.
- 3.6 Samples of all colours, and finishes shall be prepared in advance of requirement so as not to delay work and shall be submitted to the Engineer for approval before any work is commenced. Any work done without such approval shall be redone to the Engineer's satisfaction, without additional expense to the Employer. Samples of each type of paint shall be on separate 12" x 12" x 1/8" tempered hard board panels. Manufacturer's colour chart shall be submitted for colour specifications and selection.





#### 4.0 MATERIALS

- 4.1 All materials shall be acceptable, proven, first grade products and shall meet or exceed the minimum standards of reputable manufacturers as approved by the Engineer.
- 4.2 Colours shall be pure, non-fading pigments, mildew-proof sun-proof, finely ground in approved medium. Colours used on-plaster and concrete surfaces shall be lime-proof. All materials shall be subject to the Engineer's approval.
- 4.3 All synthetic enamel paints and primers for structural steel works, metal work and wood works will be the best available of its type and shall be approved by the Engineer prior to its procurement.
- 4.4 Approved quality Weather Shield/Weather Coat paint shall be used for painting the exteriors of the structures or other surfaces where specified on the drawings as directed by the Engineer.
- 4.5 The plastic emulsion paint, vinyl emulsion paint or similar as approved by the Engineer shall be used for interior surfaces.
- 4.6 Texture coating wherever specified shall be acrylic resin based coating composed of acrylic copolymers, natural quartz, natural marble chips, metallic oxides, antibacterial and antifungal additives, and expanders, foaming and setting agents and shall be applied in accordance with approved manufacturer's recommendations.
- 4.7 Only paints manufactured by ICI, Berger, Nippon Paints or approved equivalent shall be used in this Project.
- 4.8 All material shall be delivered to site in their original unbroken containers or packages & bear the manufacturer's name, label, brand & formula & will be mixed and applied in accordance with his directions.

#### 5.0 DELIVERY STORAGE AND CONTAINER SIZES

Paints shall be delivered to the site in sealed containers, which plainly show the type of paint, colour (formula or specifications number) batch number, quantity, date of manufacture, name of manufacturer and instructions for use. Pigmented paints shall be supplied in containers not larger than 20 liters. All materials shall be stored under cover in a clean storage space, which should be accessible at all times to the Engineer. If storage is allowed inside the building, floors shall be kept clean and free from paint spillage.

#### 6.0 SURFACE PREPARATION

- 6.1 All oil, grease, dirt, dust, loose mill scale and any other foreign substance shall be removed from the surface to be painted, polished and white washed by the use of a solvent and clean wiping material. Following the solvent cleaning, the surfaces shall be cleaned by scraping, chipping, blasting, wire brushing or other effective means as approved by the Engineer.
- 6.2 In the event the surfaces become otherwise contaminated in the interval between cleaning and painting, re-cleaning will be done by the Contractor at no additional cost.
- 6.3 Surfaces of stainless steel, aluminum, bronze, and machined surfaces adjacent to metal work being cleaned or painted shall be protected by effective masking or other suitable means, during the cleaning and painting operations.
- 6.4 All the surfaces to be painted with approved quality paint shall be free from dust, dirt, fungus, lichen, algae etc. Oil paint, varnish and lime wash should always be removed by scraping and washing.





- 6.5 All surfaces to be bitumen painted shall be thoroughly cleaned of any accretion, dust, dirt etc. by scraping, wire-brushing or as directed by the Engineer. The surface shall be primed with a coat of asphalt oil used at the rate of not less than 0.50 pound per square foot.

No work in this section shall be allowed until all surfaces or conditions have been inspected and approved by the Engineer.

## 7.0 APPLICATION

- 7.1 All paint and coating materials shall be in a thoroughly mixed condition at the time of application. All work shall be done in a workman like manner, leaving the finished surface free from drips, ridges, waves, laps, and brush marks. All paints shall be applied under dry and dust free conditions. Unless approved by the Engineer paint shall not be applied when the temperature of the metal or of the surrounding air is below 7 degrees Centigrade. Surfaces shall be free from moisture at the time of painting.

All primary paint shall be applied by brushing. The first coat of paint shall be applied immediately after cleaning. When paint is applied by spraying, suitable measures shall be taken to prevent segregation of the paint in the container during painting operation.

Effective means shall be adopted for removing all free oil and moisture from the air supply lines of the spraying equipment. Each coat of paint shall be allowed to dry or harden thoroughly before the succeeding coat is applied. Surfaces to be painted that will be inaccessible after installation shall be completely painted prior to installation.

Coats of Weather Shield/Weather Coat paint shall be applied in accordance with the manufacturer's instructions or as directed by the Engineer.

Only as much material should be mixed as can be used up in one hour. Over-thinning will not be permitted. After the first coat the surfaces will be soaked evenly four or five times and the second coat shall be applied after leaving for at least overnight.

- 7.2 Where shown on Drawings all exterior finishes shall be painted with Weather Shield/weather coat paint or acrylic based textured coating (graffito) as shown on drawings in approved colours as per manufacturer's specifications. The number of coats shall be as shown on the drawings or as directed by the Engineer.
- 7.3 Plastic emulsion paint, vinyl emulsion paint or matt enamel paint of the approved make and shade shall be applied to surfaces as shown on Drawings as per manufacturer's instructions. The number of coat shall be as indicated on the Drawings or as directed by the Engineer.

## 8.0 JOB CONDITIONS

- 8.1 Observe manufacturer's recommended minimum and maximum temperature but do not apply paint or finish to any surface unless ambient temperature is 10 degree C or above and less than 43 degree C. No painting shall be done above 90% relative humidity.
- 8.2 Place drop cloths to adequately protect all finished work.
- 8.3 Remove and replace all items of finish hardware, device plates, accessories, lighting fixtures or other removable items.
- 8.4 In no case shall any finish hardware or other finished item that is already fitted into place be painted, unless otherwise specified.





## 9.0 QUALITY ASSURANCE

All paint for any one surface shall be top quality, of one manufacturer and approved by the Engineer. Deep tone accent colours shall be used and the unavailability of final coat colours may be the basis for rejecting materials for any one surface.

## 10.0 SCHEDULE OF MEASUREMENT OF PAINT AREA:

10.1 Irrespective of prime coats and number of paint coats applied to exposed painting surface area of column, walls, projections, ceilings, false ceilings and other surfaces (Except gates, doors windows and ventilators) shall be measured as per actual paint surface area for single time only and paid in accordance with quoted rate of Bill of Quantities.

## 11. MEASUREMENT AND PAYMENT

### 11.1 General

Except otherwise specified herein or elsewhere in Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of Bill of Quantities.

The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under these specification in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.

11.1.1 Preparatory works, including preparatory materials, scraping, scratching, sand blasting, cleaning, prime coating, priming, protection of finished works etc.

11.1.2 Polishing works, including preparatory materials, scraping, cleaning, sanding etc.

11.1.3 Before application of paint on existing surface the old paint surface shall be removed existing paint, filling of cracks, surface preparation and application of primer coat, if any.

### 11.2 Painting / Acrylic based textured Coating

#### 11.2.1 Measurement

Measurement of acceptably completed respective type of painting works / Acrylic based textured coating (graffito) will be made on the basis of net actual length in square meter / square foot of the surface painted / coated as shown on the Drawings or as directed by the Engineer.

#### 11.2.2 Payment

Payment will be made for acceptable measured quantity of respective type of painting / acrylic based textured coating (graffito) on the basis of unit rate per square meter / square foot quoted in the respective items of Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 6700 \*\*\*



**SECTION - 5100**

**PLUMBING**

- 1.0 SCOPE
- 2.0 APPLICABLE STANDARDS
- 3.0 SUBMITTALS AND SHOP DRAWINGS
- 4.0 MATERIAL AND EQUIPMENT
- 5.0 EXECUTION
- 6.0 TESTING AND COMMISSIONING
- 7.0 MEASUREMENT AND PAYMENT





## 1.0 SCOPE

The work under this section consists of providing all material and equipment and performing all the work necessary for the complete execution (jointing, clamping, cleaning, painting etc. both above and underground and embedded in walls) and completion, including testing and commissioning of all systems of plumbing works as shown on the Drawings and/or as specified herein and/or as directed by the Engineer. The system includes plumbing works as follows:

- i) Cold and Hot Water Supply
- ii) Building Drainage
- ii) Rain Water Drainage

All the above named systems shall be completed in all respects including extension of these internal systems upto the specified limits outside the building as indicated on the drawings.

## 2.0 APPLICABLE STANDARDS

Galvanized iron (GI) Pipes threaded	BS- 1387 (1985) Medium duty
Galvanized iron (GI) Pipes welded	ASTM A-53 ERW Schedule 40
Polypropylene Random (PPR) pipes	DIN 8077-78
Cast iron (CI) Pipes	BS- 416 & 2494
uPVC Pipes (Building)	ISO- 3633 & BS- 4514/ 5255.
uPVC Pipes (External)	BS-5481/ BS-4660 (EN-1401)

## 3.0 SUBMITTALS & SHOP DRAWINGS

All the materials and equipment shall be of the specifications mentioned herein and the Contractor shall submit the sample, necessary catalogues, sketches, the name of manufacturer and guarantee if necessary, before installation. The system shall be installed after the Engineer approves it. All material and equipment shall be new and unused.

It is specifically intended and must be agreed to by each Contractor submitting a bid, that any material or labor which is usually furnished as a part of such equipment and which is necessary for its proper completion and best operation shall be furnished as a part of this Contract without any additional cost whether or not shown in detail on the drawings or described in detail, in the specifications.

Approval of material and equipment by the Engineer shall not absolve the Contractor of the responsibility of furnishing the same of proper size, quantity, quality and all performance characteristics to efficiently fulfill the requirements and intent of the Contract Documents.

Prior to commencement of works on site and at least 3 weeks in advance of all the drawing being required for actual execution the Contractor shall submit on larger scale as approved by Engineer, shop drawings in triplicate for approval to the Engineer. The Engineer shall review the drawing and (i) approve the drawing or, (ii) approve the drawing with comments or, (iii) disapproved the drawings with comments for rectification/revision of the drawing and resubmit 3 copies to the Consultant for approval. On a drawing being approved, the Contractor shall submit 6 copies for formal approval and distribution to relevant offices.



All drawings shall have plan and section and with sufficient details to clearly reflect the installation of the system. All material specifications shall be provided on the drawings. All information required for preparing suitable foundation, for providing suitable access to the system, for making openings in building structure, for coordination with electrical, air-conditioning and other designs etc., shall be clearly provided.

Installation shall not be allowed to commence unless approved shop drawings are in possession of the Contractor, for which purpose shop drawings shall be submitted by the Contractor to the Engineer sufficiently in advance of actual requirements to allow for ample time in checking and approval and no claim for extension of the contract time will be considered by reason of the Contractor's failure to submit the drawings on time.

Each shop drawing submitted by the Contractor shall include a certificate by the Contractor that all related conditions on site relevant to that particular installation have been checked and that no conflict exists.

Any expenses resulting from an error mistake or omission in or delay in delivery of the drawings and information mentioned above shall be borne by the Contractor.

Drawings approved shall not be departed from except on the instructions of the Engineer.

The approval by the Engineer for any submitted data, working drawings, performance curves, test certificates for any items, arrangements and/or layout shall not relieve the Contractor from any responsibility regarding the performance of the Contract. Such approval shall not also relieve the Contractor from responsibility of any error in the submitted data and workings, brought to light at any time subsequent to any approvals.

Relevant specified imported item, model cuts will be available with the authority concern for execution of work for contractor to check the models for fabrication or import.

#### **4.0 MATERIAL & EQUIPMENT**

##### **4.1 G.I. COLD, HOT WATER PIPES AND FITTINGS**

The galvanized pipes shall be of medium grade and conform to British Standard Specifications 1387 for "Steel Tubes and Tubular suitable for screwing to BS 21 pipe threads".

All screwed tubes and sockets shall have BS pipes thread in accordance with BS 21. In order to prevent damage to the leading thread, the ends of the sockets shall be chamfered internally.

A complete and uniform adherent coating of zinc will be provided for galvanized pipes.

Every tube shall be tested at the manufacturer's works to a hydraulic test pressure of 4.90 MPa (710psi) and shall be maintained at the test pressure sufficiently long for proof and inspection.





Tubes which are bundled shall be secured together by rope or soft iron or other suitable material.

The threads of all tubes shall be effectively covered with a good quality grease or other suitable compound, and each tube above 50 mm nominal bore shall have a protecting ring affixed to the unsocketed screwed end.

All pipe fittings upto 75 mm dia. shall conform to BS 21 and shall be of malleable cast iron. Pipe fittings above 75 mm dia. shall be of approved material and specifications as decided by the Engineer.

#### 4.2 POLYPROPYLENE RANDOM (PPR) PIPES AND FITTINGS

Polypropylene Random Pipes and fittings shall conform to the following standard

DIN	8077-8078	Resistible to all chemical elements
DIN	16961	Smooth inner surface
DIN	19560	Usability for hot water all levels
DIN	4279	Durable to inner pressure
DIN	16962	Conforms to connections by welding process

#### 4.3 SOIL, WASTE, VENT & RAIN WATER DRAINAGE PIPES & PIPE FITTINGS (C.I. & uPVC)

##### a. Cast Iron (CI) PIPES & FITTINGS

The cast iron pipe shall conform to British Standard Specifications No.416 for "Cast Iron spigot and socket soil, waste and vent pipes and fittings with spigot and socket or hubless ends. The joint shall be lead caulked or elastomeric (Rubber rings) to BS- 2494.

Cast iron pipes shall be centrifugally (SPUN) cast.

The quality of material shall be according to B.S.S. No.1452 for Grade 10.

The contractor shall supply coated pipes and fittings. The coating composition shall be of tar basis or a mixture of natural bitumen with a suitable hardener and natural asphalt. The coatings shall be smooth, tenacious, sufficiently hard, not to flow when exposed to a temperature of 63 Degrees Celsius and not so brittle at zero degrees Celsius that it chips soft when scribed lightly with the point of a pen knife.

Every pipe shall be tested at the manufacturer's work to a hydraulic test pressure of 0.07 MPa (10psi). Every pipe and fitting shall ring clearly when tested for soundness by being struck all over with a light hammer.

##### b. uPVC PIPES & FITTINGS

The material shall substantially consist of un-plasticized poly vinyl chloride (PVC) as per the requirements of aforesaid standard. Pipes



and fittings shall be sufficiently stabilized against thermal ageing and ultraviolet (UV) light.

#### uPVC Pipes

- There are two types of pipes and fittings, type A and type B, as per ISO 3633 for drainage systems. Only type B shall be used for soil, waste and venting systems.
- As per BS4514/5255, sanitary pipes and fittings shall be class "A" wall thickness 3.2mm.

#### uPVC Fittings

All fittings shall be compatible with the pipe material as recommended by the pipe manufacturer. However, there are two types of fittings available as per ISO 3633:

- uPVC fittings with Solvent Cement (SC) socket joint conforming to ISO 3633:1991.
- uPVC fittings with rubber ring socket joint conforming to DIN 19560, which is compatible with ISO 3633/PS 3214.

#### Rubber Rings

The rubber rings may either be Synthetic or natural conforming to PS 1915:1987 & ISO 4633/1983 (E).

The material shall consist substantially of poly vinyl chloride (PVC) to which may be added only those additives that are needed to facilitate the manufacture of pipes and fittings having good mechanical strength and opacity.

The pipes and fittings shall be tested mechanically and physically in accordance with the relevant Standards as and when directed by the Engineer, before and during installation.

## 4.4 PLUMBING FIXTURES

### 4.4.1 General Requirements

Materials shall conform to the latest referenced standard specifications and other provisions stipulated herein and shall be new and unused.

All fixtures shall be of the best quality and finish.

Prior to procurement of the materials, the Contractor shall be required to prepare and submit to the Engineer for his approval, a complete schedule of materials to be used in the works together with a list of the names and addresses of the manufacturers and the trade names of the materials. The schedule shall include diagrams, drawings and such other technical data as may be required by the Engineer to satisfy himself as to the suitability, durability, quality and usefulness of the material to be purchased.





Approval of the schedule shall not be construed as authorizing any deviations from the specifications unless the attention of the Engineer has been invited to the specific changes. If the material or equipment offered under this provision is, in the opinion of the Engineer, equal to or better than specified, it will be given consideration.

Plumbing fixtures shall have smooth impervious surfaces, be free from defects and concealed fouling surface. They shall be true to line, angles, curves and colour etc. Normally they shall be of local make and of the best quality available, provided.

All taps and cocks to be installed with plumbing fixtures shall be chrome plated (CP) and shall be of appropriate class to work without damage or leakage on the specified pressure of potable water system, which is 0.88 MPa (128 psi). The taps and cocks shall be of the best quality locally manufactured.

When any fixture is provided with an overflow, the waste shall be so arranged that the standing water in the fixture cannot rise in the over flow when the stopper is closed or remain in the overflow when the fixture is empty.

Plumbing fixtures shall be installed in a manner to afford easy access for cleaning. The space between the fixture and the wall shall be closely fitted and pointed so that there is no chance for dirt or vermin to collect.

When practical, all pipes from fixtures shall be run to the nearest wall. Where fixture comes in contact with wall and floors, the joint shall be watertight.

Wall hung fixtures shall be rigidly supported by metal supporting members so that no strain is transmitted to the connections. Flush tanks and similar appurtenances shall be secured by approved non-corrosive screws or bolts.

Fixtures shall be set level and in proper alignment with reference to adjacent walls. No water closet shall be set closer than 400 mm from its centre to any side wall. No urinal shall be set neither closer than 300 mm from its centre to any side wall or partition nor closer than 600 mm centre to centre. The supply lines or fittings for every plumbing fixture shall be so installed as to prevent backflow. All cuttings, making holes etc. and making it good shall be included in the work.



Other physical/chemical properties of the fixtures are as below:

S. No.	Physical/Chemical Properties	Pakistan Standards	European Standards
1	Water absorption	Less than 0.50%	Maximum 0.50%
2	Scratch Resistance	Maximum 5.5 MOH's scale	Maximum 5 MOH's scale
3	Resistance to Chemicals	Resistant to acids, alkalies, bases & other household cleaning chemicals	Resistant to chemicals.
4	Crazing Resistance	Crazing "NIL"	Crazing "NIL"
5	Warpage	Maximum 5.5-6mm	Maximum 6mm
6	Strength against bending	More than 700 kg/cm	450kg/cm - 700 kg/cm
7	Thermal shock	More than 10 cycles of thermal shock from hot to cold water 15°C-200°C	More than 2 cycles of thermal shock from hot to cold water 20°C-110°C
8	Durability	Permanently durable	Durable for ever

#### 4.4.2 Wash Basins

Wash basin shall be vitreous China, best quality, local make of colour, size and type as approved by the Engineer. It shall be installed as a complete unit including 15 mm mixer for hot and cold water supply or CP brass faucet for cold water only, 15 mm stop-cocks, C.P brass chain with 32 mm rubber plug, C.P brass bottle trap for individual wash basin and C.P brass P trap for battery of wash basins as applicable, C.P brass strainer, heavy duty cast iron brackets with bolts, screws etc. approved water inlet connection pipe, waste pipe, jointing and sealing material, etc., with all other minor accessories required to complete the job in all respect.

#### 4.4.3 Vanity Wash Basins & laboratory sink

Wash basin Vanity type & Laboratory Sink shall be vitreous China, best quality, local make of colour, size and type as approved by the Engineer. Other necessary fittings shall be same as described for above Wash basin.

#### 4.4.4 Water Closets (European type)

European type water closet shall be best quality local make of colour, size and type as approved by the Engineer. It shall be installed as a complete unit including all accessories. Flush tank (13.5 liters) shall be of low level type - it shall be fitted with either



single push button or double push button type. Trap shall be cast integral with pan. The seat shall be of smooth non-combustible non-absorbent materials like Bakulite and of the open front type fixed to the pan with hinges. The fittings shall also include approved water inlet connection pipe, nuts bolts, 15mm dia stop cock etc. required for complete installation.

#### 4.4.5 Water Closets (Orissa)

Squatting (Asian/Orissa) type water closet shall be vitreous China, best quality local make of colour, size and type approved by the Engineer. It shall be installed as a complete unit including, 15 mm stop cock, approved water inlet connection pipe, low level or high level Flush tank (13.5 liters), as required. All fittings shall be installed at low level, or high level as required including interconnecting flush piping. Foot rests, cast iron P trap, making joints, jointing and sealing materials, 15mm dia stop cock etc. with all other minor accessories for complete installation.

#### 4.4.6 Kitchen Sinks

Kitchen sink shall be stainless steel of best quality local make of colour, and type as approved by the Engineer, single bowl or double bowl with integral drain board of at least 1000 x 500 mm size. It shall be installed as a complete unit with arrangement for both cold and hot water supply, 15 mm C.P. mixer for cold and hot water, approved water inlet connection C.P. brass strainer, waste outlet pipe, heavy duty cast iron brackets with bolts screws etc., jointing & sealing material, etc., with all other minor accessories required for complete installation.

#### 4.4.7 Shower Tray

Shower trays shall be of glass reinforced polyester with hard glass finish best quality local make of colour and type as approved by the Engineer. It shall be installed as a complete unit including C.P. brass strainer, waste outlet pipe, bolts screws, jointing & sealing material, etc.

#### 4.4.8 Shower Head

Shower head shall be installed on the wall at a suitable height including installation of chromium plated extension pipe, C.P. brass Mixer for cold & hot water etc. with all other minor accessories required for complete installation.

#### 4.4.9 Bath Tub

Bath Tub shall be of the approved material such as Fiberglass, cast iron or acrylic. It shall be installed as a complete unit including chromium plated brass overflow sluice 1-1/4" in dia., chromium plated waste 1-1/2" dia. with chromium plated chain & rubber stopper (Plug), etc. complete in all respects for complete installation. Its colour shall match with that of other fixtures in the toilet.



#### 4.4.10 Urinals

Urinals shall be vitreous China of approved make and size and of wall hung type either with integral water seal trap or with separate brass P-Trap. The complete unit shall be installed including 15mm Tee-stop cock, plastic water inlet/outlet connections, CP Flush Valve or 13.5 liters flushing cistern, heavy duty CI brackets, bolts, screws, and all internal accessories or CP steel flush pipe, CP steel waste pipe, joints, jointing and sealing materials etc. with all other minor accessories.

### 4.5 MISCELLANEOUS ITEMS

#### 4.5.1 Taps and Cocks

All taps and cocks shall be of brass, gun metal or other equally suitable corrosion resisting alloy conforming to BS 1010 and shall be best quality local make. The nominal size specified shall be the nominal bore of the seating. Washers for cold water cocks shall be of specially selected leather, rubber asbestos composition or other equally suitable material. Washers for hot water cocks shall be of good quality fiber, rubber - asbestos composition or other equally suitable material. Every tap/cock shall be tested, complete with its component parts, to a hydraulic pressure of at least 1.96 MPa (284.4 psi) During test it shall neither leak nor sweat.

#### 4.5.2 Floor traps/drains

Floor traps/drains shall be of cast iron or uPVC or of other anti-corrosive material, compatible with the material of pipe. They shall have minimum water seal of 40 mm and shall be provided with removable metal/uPVC strainers. The traps shall be of self-clearing type. The open area of the strainer shall be greater than the cross section area of the drain line to which it connects. Floor traps shall be well set in position so that there is no leakage at the joint between trap and the floor.

#### 4.5.3 Roof Drains

Roof drains shall be of bitumen coated cast iron, compatible with the material of pipe. They shall have strainers extending at least 15 mm above the roof surface immediately adjacent to them, when installed on flat part. Bottom of strainer shall be flush with the roof surface, when installed on vertical part. Strainer shall have an available inlet area, above roof level, of not less than 1-1/2 times the area of the down-pipe to which the drain is connected.

The connection between roof and roof drain shall be made watertight by the use of proper flashing material.

#### 4.5.4 Cleanouts

Cleanout shall be of the same nominal size as that of the pipe on which it is installed. Cast Iron Cleanout shall consist of tapped



heavy duty cast iron ferrule caulked into cast iron fitting and heavy duty brass tapered even plug. uPVC cleanout shall consist of either two 45° bends or one long radius bend both with a removable end cap and other necessary fittings/material for complete installation in floor Cleanouts shall be turned up through floors by long sweep fittings, wherever the space so permits. Top finish of cleanout shall be flush with the floor by means of finished metal plate secured in position and screwed firmly to the plug. Cleanout shall be so installed that there is a clearance of at least 300 mm for pipes less than 75 mm diameter and at least 457 mm for pipes of 75 mm and larger diameter, for the purpose of Roding.

Pipe used with cleanout shall be measured and paid under pipe item. All other work of ferrule, plug, concrete work, frame and cover etc. shall be measured and paid under cleanout item.

#### 4.5.5 Grease Trap/Interceptor

a. The grease trap shall be of stainless steel of specified capacity with cover, baffles and strainers to separate grease from water effectively. The grease trap shall be of approved make or equivalent and installed in the position as shown on drawings or as specified by the Engineer.

or

b. The grease interceptor shall be built in masonry or reinforced cement concrete as per relevant drawings including excavation, RCC class "C", steel reinforcement, PCC class "E", 15mm thick cement sand plaster in 1:3 c/s, 15mm thick C.I. trap & plate having holes (screen) 25mm c/c of standard diameter, 20mm G.I. pipe for lifting trap, inlet & outlet connections, 600x600 mm C.I. cover with frame, 25mm legs for supporting screen system, painting three coats to steel works with synthetic enamel paint, nuts, bolts etc. complete in all respects as desired by the engineer.

#### 4.5.6 Glass Mirror

The glass mirror shall be of specified size, 5 mm thick, securely fixed on hard board packing and of best quality Belgium make. The mirror shall be fixed on wall as shown on the drawing or as directed by the Engineer. All accessories required for complete fixing of mirror on wall shall be included in Contractor's scope of work.

#### 4.5.7 Towel Rail, Toilet Paper Holder, Soap Trays, Mirror Trays

The towel rail, toilet paper holder, soap trays & mirror trays shall be of best quality All accessories for complete installation of towel rail, toilet paper holder, soap tray and mirror tray shall be included in the Contractor's scope of work.



#### 4.5.8 Gully Trap

Gully trap shall be of cast iron with specified size outlet. The inlet shall be provided with cast iron, medium duty grating. The open area of the grating shall be at least 1-1/2 times the area of the outlet. The trap shall be of P-Type with a minimum water seal of 50 mm. It shall be installed as a complete unit including all civil works as shown on relevant details and drawings.

#### 4.5.9 Cast Iron Grating

Cast iron grating shall be of the specified size. The specified size shall mean the clear span. Cast iron grating shall be complete with frame. They shall be of Light/medium duty type to resist normal traffic loads, the casting shall be sound and free from all defects. The frame shall be set in place at the time of pouring of concrete. Openings in grating shall be in approved pattern.

#### 4.5.10 Electric Water Cooler

Cabinet shall be of heavy gauge mild steel construction painted with non-corrosive paint from inside and with special hammer finish paint from outside.

Push button type water taps shall be chrome plated. Drain pot shall be made of hard plastic with stain-less steel tray. Back panel shall be easily remove-able for cleaning and servicing top cover shall be of scratch proof Formica.

Water storage tank shall be either of stainless steel or copper alloy, tinned inside and outside with present insulation to maintain water temperature, with special arrangement for cleaning the tank.

Condensing unit shall be heavy duty, hermetically sealed with thermal overload protection for refrigerant F-12 and capillary expansion with valves for easy gas charging. Thermostat and other control necessary for proper functioning of the unit shall be provided. The thermostat shall control the temperature of cooled water between + 11°C & + 20°C.

#### 4.5.11 Water Filters

Water filters shall be installed on wall near the water coolers. Each filter shall have a crystal housing of a durable material. The flow rate shall be 2 to 6 gpm with a maximum pressure of 70psi and a temperature of 35°F to 100°F.

Stage 1:- Stage 1 shall use a "poly propylene Yarn Indepth Sediment filter cartridge", for removal of dust, rust, silt, scale and unseen suspended particles. It shall have a filtration rating of 5-micron.

Stage 2:- In this stage a "Granular Activated Carbon (GAC) cartridge" equipped with a post-filter of 1-micron is recommended, for removal of chemicals and unpleasant taste and odor.





Stage 3:- This stage must provide 30,000 MW.sec/sq.cm energy to guarantee 100% sterilization and ensure effective control of microbiological contamination.

#### 4.5.12 Gas or Electric Water Heaters

Water heater shall be of automatic storage type Electric or Gas operated, including all necessary fittings for complete installation & operation. The heater shall be of best quality, local make as approved by the Engineer.

The working and test pressure of the heater to be of 6 bar and 10 bar respectively and shall deliver water at 150 °F. It shall be capable to reach the peak demand, storage capacity.

Heater shall be provided with following accessories.

- i) Thermostatic control
- ii) Temperature & pressure relief valve  
High limit Control.

Other specifications of **Water Heater** are as given below:

Inner tank shall be extra heavy gauge anti-rust G.I. sheet metal to hold maximum inside water pressure. As an insulation, imported genuine glass wool shall be used to maintain the desired temperature that controls the lighting up of the burner. The outer body shall be made of requisite gauge M.S. sheet shaped into reinforced circumference. Flow and delivery pipes shall be of high quality G.I. pipes fabricated with heavy gauge anti-rust baffle plate. *The thermostat shall be of Robershaw (U.S.A) make or approved equivalent.* The burner shall be made of cast iron with drilled ports. It shall be easy to be detached. Special anti-rust-baked primer-heavy coated stove enamel paint with high gloss automotive shine shall be used on sheet metal.

Standard type gas water heaters shall have following specs:

Capacity	Inner Tank	Outer body
8-15 gallons	G.I. sheet 14-16 swg	M.S sheet painted 22 swg
30 gallons	G.I. sheet 10-12 swg	M.S sheet painted 22 swg
50 gallons	G.I. sheet 10-12 swg	M.S sheet painted 22 swg
100 gallons	G.I. sheet 8-10 swg	M.S sheet painted 22 swg

## 5.0 EXECUTION

### 5.1 GENERAL

The Contractor shall be responsible for his work until its completion and final acceptance, and shall replace any of those that may be damaged, lost or stolen without any additional cost.

All openings left in floor for passage of lines of water supply, soil, waste, vent, etc. shall be covered and protected.

All open ends of pipes shall be properly plugged to prevent any foreign material from entering the pipe. Misuse of plumbing fixtures to be



installed under this Contract is prohibited during the currency of the contract.

All metal fixture trimmings shall be thoroughly covered with non-corrosive grease which shall be maintained until all work is completed.

Upon the completion of work, all fixtures and trimmings shall be thoroughly cleaned, polished and left in first class condition.

Before erection, all pipes, valves, fittings, etc. shall be thoroughly cleaned of oil, grease or other material.

All special tools for proper operation and maintenance of the equipment provided under this Contract shall be delivered at no additional cost.

The Contractor shall allow in his bid for cost of all cutting, making holes and subsequent making it good to the desired finish as per approval of the Engineer. No separate payment shall be made for this item.

The Contractor shall allow in his bid for the cost of providing protective painting or coating as specified in the relevant sections and no claim shall be entertained for this item.

All pipes shall be properly installed as shown on the drawings and/or as directed by the Engineer, and shall be as straight as possible forming right angles and parallel lines with the walls and other pipelines. The position, gradients, alignment and inverts shall be as shown on the drawings and/or as directed in writing and set out by the Engineer.

The arrangement, positions and connections of pipe fittings and appurtenances shall be as shown on the drawings. The Engineer reserves the right to change the location etc. Special precautions shall be taken for the installation of concealed pipes as shown on the drawings and/or as required. Should it be necessary to correct piping so installed, the Contractor shall be held liable for any injury caused to other works in the correction of piping. The Contractor shall closely coordinate with other works during the entire stage of execution.

A minimum distance between different services shall be maintained as shown on the Drawings and/or as approved by the Engineer.

Pipes should be installed in such a manner that minimum distance should always be maintained between pipe and wall, beams, columns, etc. Pipes shall be supported on hangers and brackets as shown on the drawings or as directed by the Engineer.

Waste-water outlet from each fixture shall be individually trapped. Each vent terminal shall extend to the outer air and be so installed as to minimize the possibilities of clogging and the return of foul air to the building.

When the roughing-in is completed, the plumbing system shall be subjected to test prior to concealing the roughing-in, in order to ascertain that all threads and connections are watertight.





Cast iron soil and drainage fittings for change in direction shall be used as follows:-

\*Vertical to horizontal: short sweep or long-turn for diameter 75 mm and larger; long sweep or extra-long-turn for less than 75 mm. dia.

\*Horizontal to vertical: quarter bend or short turn.

All fittings with hubs shall be aligned so that the hub faces upstream. No drainage or vent piping shall be drilled.

All exterior openings provided for the passage of piping shall be properly sealed with snugly fitting collars of metal or other approved rodent-proof material securely fastened into place.

Joints at the roof, around vent pipes, shall be made water-tight by the use of lead, copper, galvanized iron, or other approved flashing or flashing material. Exterior wall openings shall be made watertight.

Each length of pipe & each pipe fitting, trap, fixture, & device used in a plumbing system shall have cast, stamped or indelibly marked on it the maker's mark or name, the weight, type & classes of the product, when such marking is required by the approved standard that applies.

Where different sizes of pipes, or pipes and fittings are to be connected, the proper size increasers or reducers or reduced fittings shall be used between the two sizes.

Any fitting or connection which has an enlargement, chamber, or recess with a ledge, shoulder, or reduction of pipe area that offers an obstruction to flow through the drain pipe is prohibited. The vertical distance from the fixture outlet to the trap weir shall not exceed 600 mm. Each fixture trap shall have a water seal of not less than 50 mm and not more than 100 mm.

Full S, bell, crown vented traps and traps/depending for their seal upon the action of movable parts are prohibited. No fixture shall be double trapped. Where fixture comes in contact with wall and floors, the joint shall be water-tight. Piping in ground shall be laid on a firm bed for its entire length.

Piping in the plumbing system shall be installed without undue strains and stresses. Vertical piping shall be securely held to keep the pipe in alignment and carry the weight of the pipe and contents. Horizontal piping shall be supported to keep it in alignment and prevent sagging. Hangers and anchors shall be of metal of sufficient strength to maintain their proportional share of pipe alignments and prevent rattling. Hangers and anchors shall be securely attached to the building under construction. It must be clearly understood that the Contractor shall be fully responsible for hangers and supports and shall obtain prior approval of design as to the shape, material, dimensions, spacing etc.

Piping in concrete or masonry walls or footings shall be placed or installed in sleeves which will permit access to the piping for repair or replacement.



## 5.2 G.I. COLD, HOT WATER PIPES AND FITTINGS

The run and arrangement of all pipes shall be as shown on the Drawings and as directed during installation. All vertical pipes shall be erected plumb and shall be parallel to wall and other pipes. All horizontal runs of piping shall be kept close to walls. If required to change the location etc. during the currency of the work, the Contractor will do so at no additional cost. Screwed joints in G.I. pipes shall be made perfectly tight, without the use of any filler except approved jointing compound or tape. Wherever required to make flanged joints, they shall conform to BS 10 Table D.

Furnish and install all pipe passing through floors and walls with sleeves of G.I. sheet, 18 gauge, the inside dia. of which shall be at least 1/2" greater than the outside dia of the pipe passing through it. Sleeves in exterior walls and pits shall have anchor flanges and space between pipe and sleeve shall be caulked and sealed watertight. At waterproof locations, an approved water-proof type pipe sleeve shall be provided.

All embedded water supply piping shall be wrapped with approved anti-corrosion polyethylene tape. All exposed piping shall be painted with two coats of enamel paint over a coat of red oxide.

Pipes laid in trenches (external) shall be protected by applying coating of primer grade 10/20 bitumin+hyacinth cloth mopped with bitumen (50% grade 80/100 & 50% grade 10/20).

### Insulation

All hot water supply and return piping shall be insulated as specified herein. Prior to insulation the pipes shall be hydraulically tested and cleaned.

Nominal Pipe Dia. (mm)	Thickness of per-form Fiber glass pipe insulation. (mm)
15 (1/2")	25
20 (3/4")	25
25 (1")	25
32 (1-1/4")	25
40 (1-1/2")	25
50 (2")	25
65 (2-1/2")	25
75 (3")	25

Insulation shall consist of pre-formed fiberglass pipe insulation, with factory applied reinforced aluminum vapor barrier, single layer in semi-circular halves, consisting of long, fine glass fibers, bonded with a temperature resistant binder, free from shot or coarse fibers, damage resistant, light in weight, easy to handle, cut and fit. The product shall comply with the requirements of B.S. 3958: Part 4. The insulation shall be rotproof, odorless, non-hygroscopic, and shall not sustain vermin. The fiberglass insulation shall be covered with a layer of approved polyethylene tape in the field. Further reinforcement shall be provided by the use of 20 mm wide soft aluminum bands, generally spaced at 457



mm and on either side of elbows and tees. All butt joints shall be sealed with self-adhesive type of approved quality adhesive tape.

All trimmed sections shall be secured by wrapping of approved type of self adhesive tape to form a complete waterproof seal. All work shall be done in a neat and workmanlike manner, and should reflect recommended practice.

All Hot water and Hot water return lines concealed in walls only, shall be provided with Glass wool blanket insulation.

### Pipe work Supports

All supports, clips, steel rods and hangers shall be of mild steel painted with two coats of approved metallic zinc primer. All clips and brackets shall be equipped with 9 mm sectional rubber liners (shore-hardness A 40+5°).

Pipe work supports shall be installed in order to allow free movement due to expansions and contraction. Supports shall be arranged adjacent to joints, changes of direction and branches. Each support shall carry the overall weight of pipe work and water to be borne by it. The intervals between pipe supports shall not exceed the following:

#### Maximum interval between supports (metres)

Nominal Dia mm	Steel pipes	
	Horizontal	Vertical
10	1.7	1.7
15	2.0	2.0
20	2.4	2.4
25	2.7	2.7
32	2.7	2.7
40	3.0	3.5
50	3.4	3.9
65	3.7	4.3
80	3.7	4.3
100	4.1	4.6

#### Dimensions of Support Materials

Nominal Dia mm	Flat iron bands mm	Support rods mm	U-bolts mm
10	25 x 3	6	6
15	25 x 3	6	6
20	25 x 3	6	6
25	25 x 3	6	6
32	40 x 5	10	10
40	40 x 5	10	10
50	40 x 5	10	10
65	50 x 6	12	12



80	50 x 6	12	12
100	50 x 6	12	12

Single pipes hung from floor slabs shall be supported on rod hangers. Where two or more pipes are involved a channel or angle from shall be fitted to the underside of slab by two hangers and the pipes shall be supported from the channel iron by rod hangers and flat iron hands.

All hanger rods shall have double nuts and beveled washers to allow the hanger rod to swing.

Multiple pipe runs along walls shall be supported on purpose made substantial angle and channel frames securely fixed to the wall, floor and ceiling as necessary. All pipes shall be arranged to slide on the steel supports and U-bolts shall be provided to form a rigid guide.

Exposed pipe work shall be supported on channel, angle iron or with U-bolts to form a rigid guide.

All U-bolts, except used as anchors, shall have a pair of nut and washers on each leg with the supporting steel flange clamped tight between the pair of nuts to form a rigid guide and allowing the pipe to slide axially. U-bolts shall be provided on alternate pipe bracket.

Small pipe work running along skirting shall be supported by standard built-in or screw-on type clips.

Pipes shall be individually supported. Pipes shall not hung from other pipes.

Points at which pipes pass through walls, floors, connections to plant, equipment and heat emitters, etc. do not constitute points of supports for the pipes.

Vertical pipes shall be supported at the base or at anchor points to withstand the total weight of the riser. Brackets from risers shall not be used as a means-of support for the riser.

Vibration isolators to be provided with the hangers as approved by the Engineer.

### 5.3 POLYPROPYLENE RANDOM PIPES & JOINTING

#### 5.3.1 Jointing Techniques

The surfaces of the pipes and fittings must be clean and without impurities. Pipe ends must be clean, cut at right angles. It is recommended to cut 1cm from the pipe ends in order to prevent possible micro-cracking due to incautious handling.

Before carrying out the welding, check that the poly-fusion device operates correctly and that it reaches the required welding temperature ( $260^{\circ}\text{C} \pm 5$ ).



Joining is done by heat fusion (welding) by means of welding machine. Welding is carried out by means of heating simultaneously the male and female parts to be joined together, once the welding temperature is reached the joint is made and held for cooling time. (see table I below )

### 5.3.2 Welding Instructions Using Socket Welding Machine

- i. Check whether the welding tool corresponds to the size you need to join.
- ii. The welding tool/device has reached the necessary operating temperature of  $260^{\circ}\text{C} \pm 10$
- iii. Cut the pipe at right angles to the pipe axis by using cutter or a hack saw.
- iv. Clean the pipe from burrs, cutting and chips
- v. Mark the welding depths at the end of pipe
- vi. Push the end of pipe up to the marked welding depths in the welding tool, at the same time push the fitting, into the welding tool.
- vii. After the stipulated heating time quickly remove pipe and fitting from the welding tools and join them immediately, forcing the pipe into the fitting until the marked welding depth is covered by the bead of Polypropylene from the fitting
- viii. The joint elements have to be fixed and aligned within the specified assembly time.
- ix. After the cooling time the fused joint is ready for use. The heating time starts when pipe and fitting have been pushed to the correct welding depth in the welding tool

Est. Diameter (mm)	Welding Depth (mm)	Heating Time DVS 2207* (sc.)		Heating time (sc.)	Cooling Time (min.)
20	14.0	5	8	4	2
25	15.0	7	11	4	2
32	16.5	8	12	6	4
40	18.0	12	18	6	4
50	20.0	18	27	6	4
63	24.0	24	36	8	6

The heating time have to be increased 50% if average temperature is under  $+ 5^{\circ}\text{C}$

### 5.3.3 Welding of PPR Pipes

- i. Cutting of pipe at right angle with a cutter.
- ii. Marking of welding depth on the pipe end.
- iii. Simultaneous heating of both pipe and fittings according to required heating time (as per given data).
- iv. Pushing of pipe end into the fitting and alignment of the assembly within specified time period
- v. Finish joint.



### 5.3.4 Installation Principles

#### 5.3.4.1 Fastening technique for open installation

The selection of fastening material and its application have to be determined as:-

- Fixed Point
- Sliding Point

Pipe clamps are such as to meet all requirements and ensure that no mechanical damage on the pipe surface can occur.

#### 5.3.4.2 Fixed Point

Valves and connections resisting to bending stresses have to be fastened by means of points. In particular cases the fixed points are to be positioned closed to branches or wall passages. The axial expansion will be compensated between two points. To assess the resistance of the fixed points one has to take into account the stresses to which they will be subjected, caused by linear expansion, weight of the piping and weight of the transportation fluid. Fixed points should be delimited on both sides of the clamp, availing oneself of the rim fittings or valves.

#### 5.3.4.3 Sliding Point

The sliding points must keep the system aligned and support it, and allow the axial sliding of the piping as well. The sliding are to be firmly mounted in order to prevent vibration and transmission of noise.

Distance between the supports points in cm.

Pipe diameter	Temperature in °C		
	20	50	80
20mm	85	70	60
25mm	85	80	70
32mm	100	85	85
40mm	110	100	90
50mm	125	110	90
65mm	140	125	105

### 5.4 WATER PIPES AND FITTINGS OUTSIDE BUILDING (EXTERNAL WORKS)

#### 5.4.1 Handling

Pipe and accessories shall be handled in such a manner as to ensure their delivery to the trench in sound, un-damaged condition. If any pipe or fitting is damaged, the repair or



replacement shall be made by the Contractor at his expenses in a satisfactory manner. No other pipe or material of any kind shall be placed inside of a pipe or fittings. Pipe shall be carried into position and not dragged. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Employer. Rubber gaskets that are not to be installed immediately shall be stored in a cool dark place and protected against the direct rays of the sun.

#### 5.4.2 Cutting of Pipe

This shall be done in a neat and workman-like manner without damage to the pipe. Unless otherwise authorized by the Engineer or recommended by the manufacturer, cutting shall be done with a mechanical cutter of approved type. Wheel cutters shall be used wherever practicable.

#### 5.4.3 Location

Where the location of the water pipe is not clearly defined by dimensions on the Drawings, the water pipe shall be located as directed by the Engineer.

#### 5.4.4 Deflection

Maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets will be 2° degrees unless otherwise recommended by the manufacturer. If the alignment requires deflections in excess of the specified limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth, as approved.

#### 5.4.5 Placing and Laying

Pipe and accessories shall be carefully lowered into the trench by means of derrick ropes, belt slings, or other suitable equipment. Under no circumstances shall any of the water line materials be dropped or dumped into the trench. Care shall be taken to avoid abrasion of the pipe coating. Poles used as levers shall be of wood and shall have broad flat faces to prevent damage to the pipe. Except where necessary in making connections with other lines or authorized by the Engineer pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bell coupling and joints. Pipe that has the grade or the joint disturbed after laying shall be taken out and re-laid. Pipe shall not be laid in water shall be kept out of the trench until the materials in the joints have hardened or until caulking or jointing is completed. When work is not in progress, open ends of



pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substances will enter the pipes or fittings. Where any part of a coating or lining is damaged, the repair shall be made by the Contractor at his expense in a satisfactory manner. Pipes shall be installed in accordance with recommendations of the pipe manufacturer. Pipe ends left for future connections shall be valved, plugged or capped, and anchored, as shown or as directed, where connections shall be made by using specials and fittings to suit the actual conditions.

#### 5.4.6 Jointing

The joints shall be in accordance with the recommendations of the manufacturer or as approved by the Engineer.

Connections between different types of pipes and accessories shall be made with transition fittings where recommended by the pipe manufacturer.

Service connections shall be made as indicated and in accordance with the recommendations of the pipe manufacturer.

#### 5.4.7 Thrust Blocks

Plugs, caps, tees, bends and fire hydrants shall be provided with concrete thrust blocks. Backing shall be placed between solid ground and the hydrant or fitting to be anchored. The area of bearing shall be as shown on the Drawing. The backing shall be so placed that fitting joints shall be accessible for repair. The concrete shall be class C plain cement concrete.

#### 5.4.8 Pipe Bedding

Fine sand as pipe bedding material shall be used for bedding of pipes and fittings. The sand shall be free from clay, silt, salts, organic impurities and debris. Approval of pipe bedding materials shall be obtained by the site Engineer prior to placing.

#### 5.4.9 Flushing

The Contractor shall provide facilities for flushing the line. Water for flushing the line shall be arranged by the Contractor. Flushing of line shall be done section by section. For each valved section of pipeline the Contractor shall make a temporary hose connection between the water pipeline and the pipeline under test. Water shall be pumped into the section flushed. Other arrangements for storing and pumping of water shall be subject to the approval of Engineer. Due precautions shall be taken by the Contractor for the disposal of water. The pipeline shall be flushed by keeping all the branching pipes open. Flushing shall be continued until clean water starts flowing through the other end. Section by section, the entire pipeline shall be flushed at a minimum flushing velocity of 2.5 ft/sec.





#### 5.4.10 Pipeline Disinfection

The Contractor shall furnish all equipment, labour and material for the proper disinfection of the pipeline. Disinfection shall be accomplished by chlorination after the lines have been tested for leakage but before they have been connected to the main system. Disinfections of the pipelines shall be done in the presence of the Engineer's representative with equipment approved by him.

- **Chlorination** A chlorine and water mixture shall be supplied by means of a solution feed chlorination device. The chlorine solution shall be applied at one end of the pipeline through a trap, in such a manner that as the pipeline is filled with water, the dosage applied to the water entering the pipe shall be atleast (25 p.p.m) or enough to meet the requirements given hereinafter.
- **Retention Period** Chlorination water shall be retained in the pipeline for a period of at least 24 hours. After the chlorine treated water has been retained for the required time, the chlorine residual at the pipe extremities and at such other representative points shall be at least 10 parts per million. This procedure shall be repeated until the required residual chlorine concentration is obtained.
- **Chlorination of Valves** During the process of chlorination the pipeline, all valves or other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water.

#### 5.4.11 Final Flushing

Following complete disinfection of the pipeline, all treated water shall be thoroughly flushed from the pipeline at its extremities. Treated water and water used for flushing the pipelines shall be disposed of in a manner instructed by the Engineer. Fresh treated water shall be filled in the line and water tested from presence of coliform. The test result should indicate negative coliform presence. If the test indicates any positive coliform, the entire process of disinfection shall be repeated or improved upon until coliform free samples are obtained.

#### 5.4.12 Sampling And Testing

Disinfection of the pipeline and appurtenances shall be the responsibility of the Contractor. The first set of samples will be collected for analysis by the Engineer. Should the samples reveal presence of coliform the Contractor shall again disinfect the pipeline and appurtenances at no extra cost to the Employer for sampling and testing for subsequent retests until coliform free samples are obtained? The charges for re-sampling and retesting shall be recovered from the Contractor.



#### 5.4.13 Clean-Up

Upon completion of the installation of the water supply lines, distribution system and appurtenances, all debris and surplus materials resulting from the work will be removed and disposed off in a manner satisfactory to the Engineer

#### 5.5 SOIL, WASTE, VENT & RAIN WATER DRAINAGE PIPES & PIPE FITTINGS (C. I. & uPVC)

All cast iron soil pipes and fittings shall be installed to the lines and grades shown on the drawings or as directed by the Engineer. When required to be installed above ground floor level, suitable and substantial number of hangers and supports of approved type and make shall be provided. No piping shall be hung from the piping of other systems. Clamps shall be provided on not more than 1.5 meter centres or a minimum of one hanger per each length of pipe whichever is smaller. Where excessive numbers of fittings are installed, additional clamps will be provided.

All steel clamps, hangers and support etc. shall be given one coat of red oxide primer and two coats of synthetic enamel paint. All exposed C.I. soil/vent pipes shall be given two coats of synthetic enamel paint. Materials for painting shall be high quality product of well-known manufacturer and will be approved by the Engineer before using. The instructions of the manufacturer regarding all painting work shall strictly be adhered to Pipes passing through walls, floors, etc. shall be provided with sleeves of approved design. All vent pipes to be installed in the system shall be provided with approved cowl and will rise at least 0.70 meter above the roof.

Caulked joints for cast iron bell-and-spigot soil pipe shall be firmly packed with oakum or kemp and filled with molten lead not less than 22 mm deep and not to extend more than 3 mm below the rim of the hub. Rubber ring joints shall also be allowed. No paint, varnish, or other coatings shall be permitted on the jointing material unit after the joint has been tested and approved

Pipes passing through walls, floors, etc. shall be provided with sleeves of approved design. All vent pipe to be installed in the system shall be provided with approved cowl and will rise at least 0.70 meter above the roof.

Special requirements for *uPVC pipes and fittings* are as under:

Maximum Interval between Supports (m)  
(Support centers for uPVC pipe work systems)\*

Nominal Diameter, $d_e$ (mm)	Pipe Works	
	Horizontal ( $10x d_e$ ) (m)	Vertical (m)
40	0.40	1.2
50	0.50	1.5
75	0.75	2.0
110	1.10	2.0





\* The values shown are for general installations only. Attention is drawn to special requirements that may be needed in more demanding applications.

All steel clamps, hangers, supports etc. shall be given one coat of red oxide primer and two coats of synthetic enamel paint.

All exposed uPVC pipes shall be given two coats of approved colour water based emulsion paint (note that oil based paints must be avoided).

#### PRECAUTIONS

Following points describe how an uPVC must be cared of:

- a. The depth of concrete cover above uPVC pipe depends on the pipe gradient. However, a minimum of 1 (one) inch concrete cover must be provided.
- b. When using cemented joints, the adhesive should be given sufficient opportunity to harden before the pipe is concreted in.
- c. Horizontal lines that are concreted-in should be anchored against upward movement and should be adequately secured while the concrete is being poured.
- d. During the pouring and setting of concrete, necessary care shall be taken to prevent physical damage to the pipes.
- e. When using heated concrete or when steaming the concrete, the sensitivity of uPVC material to temperature changes should be borne in mind.
- f. Concrete mortar that is used before concreting-in shall include no sharp-edged material.
- g. Avoid excessive misalignment of the pipes.
- h. Avoid excessive tightness of joints.
- i. Provide sufficient expansion joints to allow thermal movement or regression.
- j. Use only allowed cleaning & descaling techniques for different situations & locations (as described in ISO/TR 7024-1985E) when a pipeline gets choked or blocked.

#### DELIVERY CONDITIONS

The internal and external surfaces of pipes and fittings shall be smooth and free from grooving, blistering and any other surface defect. The materials shall not contain visible impurities or pores. Pipe ends shall be cleanly cut, and the ends of pipes and fittings shall be square with the axis of the pipe.

#### MARKINGS

Pipes, fittings and sealing rings shall be marked clearly and indelibly so that legibility is maintained for the life of products under normal conditions of storage, weather and use.

The markings may be integral with the product or on a label. The markings shall not damage the product.



## PIPES

Pipes shall be marked with at least the following information:

- a. Manufacturer's name or trade mark;
- b. Pipe material;
- c. Nominal diameter of pipe;
- d. Nominal wall thickness of pipe
- e. Manufacturing information, in plain text or in code, providing traceability of the production period to within the year and month and the production site if the manufacturer is producing at several national or international sites.
- f. The number of this International Standard.

Pipes with a nominal laying length up to and including  $z_2$  meters shall be marked with at least once. Pipes with a nominal laying length greater than  $z_2$  meters shall be marked at intervals of  $z_3$  meters at the most. The values of  $z_2$  and  $z_3$  shall be as specified by the authorities in each country.

## FITTINGS

Fittings shall be marked with at least the following information:

- a. Manufacturer's name or trade mark;
- b. Fitting material (may be given on packing only in the case of PVC, provided this information is not required on each article by national authorities);
- c. Nominal diameter of fitting;
- d. Classification (where applicable)
- e. Values of angles, if any;
- f. Manufacturing information, in plain text or in code, providing traceability of the production period to within the year and month and the production site if the manufacturer is producing at several national or international sites (may be given on packing only, provided this information is not required on each article by national authorities);
- g. The number of this International Standard (may be given on packing only, provided this information is not required on each article by national authorities).

## SEALING RINGS

Sealing rings shall be marked with at least the following information:

- a. Manufacturer's name or trade mark;
- b. Nominal diameter of ring;
- c. Manufacturing information, in plain text or in code, providing traceability of the production period to within the year and month and the production site if the manufacturer is producing at several national or international sites.





## 6.0 TESTING AND COMMISSIONING

### 6.1 G.I. & PPR COLD AND HOT WATER PIPES

All water distribution system shall be tested whole or in part to 2 times the working pressure with a minimum test pressure of 100psi. The contractor shall pay for all device, materials, supplies, labor and power required for the test. The test will be run for two hours at the specified pressure and there should be no leakage in the system. Defects revealed by the test shall be repaired and the whole test rerun until the system proves to be satisfactory.

After all the pipes and fixtures have been properly laid and tested, they shall be flushed clean with water and then disinfected with water solution of chlorine of at least 50 ppm strength for a contact period of 6 hours. The system will be finally flushed with clean water.

### 6.2 SOIL, WASTE, VENT & RAIN WATER DRAINAGE PIPES & PIPE FITTINGS (C. I. & uPVC)

The entire system of drains, waste, and vent piping inside the building shall be tested by this Contractor under a water test. Every portion of the system shall be tested to a hydrostatic pressure equivalent to at least 3-meter head of water. After filling this Contractor shall shut off water supply and shall allow it to stand two hours, under test during which time there shall be no loss or leakage.

The Contractor shall furnish and pay for all devices, materials, supplies, labor and power required in connection with all tests. All tests shall be made in the presence of and to the satisfaction of the Engineer. The Contractor shall also be responsible for the repair of this work & other trades work that may be damaged or disturbed by the tests. Defects disclosed by the tests repaired. Work shall be replaced with new work without extra cost to the Employer. Tests shall be repeated as directed, until all work is proven satisfactory.

All fixtures shall be tested for soundness, stability, support and satisfactory operation.

## 7.0 MEASUREMENT AND PAYMENT

### 7.1 COLD & HOT WATER PIPE

#### 7.1.1 Measurement

Measurement for acceptably completed works of supply and installation of cold and hot water pipes shall be in running meter length.

- a. In building works, no measurement shall be made for earthworks, pipe fittings, jointing, hangers, clamps, brackets, sleeves, insulation, cutting and breaking concrete and then making it good, applying protective painting, coating, cleaning, testing and disinfecting etc. and the measurement will be for the full work specified herein.



- b. In external works, no measurement shall be made for pipe fittings, jointing, insulation, cutting and breaking concrete and then making it good, applying protective painting, coating, cleaning, flushing, testing and disinfecting etc. and the measurement will be for the full work specified herein. However, earthworks (excavation, backfilling, sand bedding), and thrust blocks shall be paid separately as specified in Bill of Quantities.

#### 7.1.2 Payment

Payment for acceptable measured quantity will be made at the unit rate per running Foot length of cold and hot water pipes quoted in the Bill of Quantities. The amount bid shall be the full payment for completion of the work in all respects as specified herein.

### 7.2 uPVC and C.I. SOIL, WASTE & VENT PIPES

#### 7.2.1 Measurement

Measurement for acceptably completed works of supply and installation of uPVC & C.I. pipes, will be in running Feet length and the work to be done shall include all pipe fittings, jointing, hangers, clamps, brackets, sleeves, cutting and breaking concrete and then making it good, applying protective painting, coating, cleaning and testing.

#### 7.2.2 Payment

Payment will be made at the unit rate of bid per running Feet length of pipe acceptably supplied and installed. The amount bid shall be full payment for the work specified herein.

### 7.3 PLUMBING FIXTURES

#### 7.3.1 Measurement

Measurement for plumbing fixtures will be made as per actual number acceptably installed. The Contractor's bid against these items shall include installation of complete unit as specified herein, inclusive of all work from inlet connection of water supply to outlet connection with the sanitary system, complete as per Contract Documents and/or as directed by the Engineer.

#### 7.3.2 Payment

Payment for plumbing fixtures shall be made at the applicable unit price per number bid for the respective item in the Bill of Quantities. The amount bid shall be full payment for the work specified herein.

### 7.4 MISCELLANEOUS ITEMS

#### 7.4.1 Measurement

Measurement for acceptably completed works of floor drains, roof drains, cleanouts, glass mirror, towel rail, toilet paper holder, soap





trays, mirror trays, water coolers, water heaters, etc. shall be made on the basis of actual number acceptably installed in position. The Contractor's bid against these items shall include installation complete as specified herein and/or as shown on the Drawings.

#### 7.4.2 Payment

Payment for acceptably measured quantity of floor drains, roof drains, cleanouts, glass mirrors, towel rails, toilet paper holders, soap trays, mirror trays electric water coolers, water heaters, etc. shall be made at the applicable unit rate per number quoted in the Bill of Quantities. The bid amount shall be full payment for the works specified herein and as shown on the Drawings.

\*\*\* End of Section 5100 \*\*\*



**SECTION - 5150**  
**FIRE PROTECTION**

- 1.0 SCOPE OF WORK
- 2.0 APPLICABLE STANDARDS
- 3.0 SUBMITTALS
- 4.0 FIRE PROTECTION EQUIPMENTS
- 5.0 CLEAN AGENT FIRE EXTINGUISHING SYSTEM
- 6.0 PORTABLE FIRE EXTINGUISHERS
- 7.0 INSTALLATION AND TESTING OF PIPES
- 8.0 MEASUREMENT AND PAYMENT





**SECTION - 5150**  
**FIRE PROTECTION**

**1. SCOPE OF WORK**

The work to be done under this section of the Specifications includes furnishing all plant, labour, equipment, appliances and materials and in performing all operations required in connection with the supply and installation of pipes and fittings for firefighting systems, portable fire extinguishers, fire hose rack cabinets and fire hydrants as shown on the Drawings, as specified herein and/or as directed by the Engineer.

**2. APPLICABLE STANDARDS**

Fire Fighting System shall conform to NFPA (National Fire Protection Association) of USA and/or Fire Safety provision-2016 Building Code of Pakistan.

**3. SUBMITTALS**

The contractor shall submit technical brochures and samples of all the items mentioned in the Specifications from approved manufactures or as directed by the Engineer

**4. FIRE PROTECTION EQUIPMENTS**

**4.1 PIPES AND FITTINGS**

Fire fighting pipes & fittings shall conform to ASTM A53/A53M steel line pipe "Steel Black and Hot dipped, Zinc Coated, Welded and Seamless Welded and Seamless Wrought Steel Pipe". Joints shall be welded as specified in the applicable standards. Factory-Made Wrought Steel Butt-welding fittings shall conform to ANSI/ASME B16.9 and Butt-welding End shall be ASME B16.25 or any other standard specified in NFPA. Where the pipe flanges and flanged fittings are used, the applicable standard shall be ASME B16.5 or any other standard specified in NFPA.

**4.2 FIRE HOSE CABINET**

Closets and cabinets used to contain fire hose shall be of a size to allow the installation of necessary equipment at hose stations and designed so they do not interfere with prompt use of hose connection, the hose and other equipment at the time of fire. Fire Hose Cabinet shall consist of rubber hose/reel of specified diameter and length as shown on the applicable drawings and as directed. The hose shall have polished brass valve nozzle at one end. The reel shall turn full 180 degrees. Hose and reel shall be placed in a steel fire box with glazed steel door. The door shall open full 180 degrees and shall be provided with locking arrangement. The locking arrangement will be such that the cabinet can be opened either by breaking the front glass and turning the handle from inside or with key from outside without breaking the front glass. Where "break glass" type protective cover for latching device is provided, the device provided to break the glass panel shall be attached in the immediate area of the break glass panel and shall be arranged so that device cannot be used to break the other glass panels in the



cabinet door. The glass shall be 5 mm thick and cabinet shall be made of at least 18 gauge sheet.

The exposed front face of fire hose cabinet shall be painted with signal red enamel paint over a prime coat of anti-corrosive paint. Instructions for opening of fire hose cabinets and operation of hose reel shall be inscribed in signal red on the inside face of the glass such that the instructions can be read from outside. The hose shall be rated for a working pressure of 16 kg/cm<sup>2</sup> and test pressure of 25 kg/cm<sup>2</sup>.

#### **4.3 EXTERNAL FIRE HYDRANTS/PILLAR HYDRANTS WITH HYDRANT CABINETS**

Above grade wet barrel fire hydrant shall be of Seamless ASTM Schedule 40 steel and shall conform to BS EN 671. It shall have 2 Nos. dia 2-1/2" (65mm) outlets suitable for connection of instantaneous coupling hose. It shall have one suitable inlet connection of diameter 100mm for fire department pumper if specified in BOQ item. It shall be suitable for working pressure of 1.5 times the system working pressure.

The outlets shall be provided with protective standard caps of galvanized steel and attached to the standpipe by chains. The hydrants shall be coated internally and externally with black bituminous coating.

Each hydrant shall be provided with two 100 feet (30 meter) of 2-1/2" (65mm) diameter rubber lined hose instantaneous coupling and nozzles, all housed within a steel cabinet beside the hydrant.

Valve pits shall be of adequate size and readily/easily accessible for inspection, operation, testing, maintenance and removal of equipment contained therein. They shall be constructed and arranged so as to properly protect the installed equipment from any ground movement and accumulation of water. The valve pits shall be precast concrete with reinforcement. Crushed stone or gravel shall be used for the floor of the pit. The pit covers shall be able to withstand the heaviest vehicle, which are using the roadside to be specified.

#### **4.4 FIRE SPRINKLERS**

The fire sprinklers have K-factor of 5.6. Sprinklers shall be located, spaced and positioned in accordance with the requirements of NFPA-13, as per drawing and/or as per manufacturer's recommendation. Sprinklers shall be positioned to provide protection of the area consistent with the overall objectives of NFPA-13 by controlling the positioning and allowable area of coverage for each sprinkler. The sprinkler shall be FM/UL listed having maximum working pressure 175 psi (12.1 bars) and hydrostatic test pressure of 350psi (25 bars).

#### **4.5 TEMPERATURE RATING, CLASSIFICATIONS, COLOR CODING & PAINTING OF FIRE SPRINKLERS**

Sprinklers shall only be painted as per manufacturer's recommendation or as per NFPA Standard.





Maximum Ceiling Temp		Temperature Rating		Temperature Classification	Color Code	Glass Bulb Color
°F	°C	°F	°C			
100	38	135-170	57-77	Ordinary	Uncolored or Black	Orange or Red
150	66	175-225	79-107	Intermediate	White	Yellow or Green
225	107	250-300	121-149	High	Blue	Blue
300	149	325-375	163-191	Extra High	Red	Purple
375	191	400-475	204-246	Very Extra High	Green	Black
475	246	500-575	260-302	Ultra High	Orange	Black
625	329	650	343	Ultra High	Orange	Black

#### 4.6 STOCK OF SPARE SPRINKLERS

A supply of spare sprinklers shall be maintained on the premises so that any sprinkler that have operated or been damaged in any way can be promptly replaced. The stock of spare sprinklers shall include all types and ratings installed as per NFPA standard and shall be as follows:

- 1) Not less than 06 sprinklers for protected facilities having under 300 sprinklers.
- 2) Not less than 12 sprinklers for protected facilities having 300 -1000 sprinklers.
- 3) Not less than 24 sprinklers for protected facilities having over 1000 sprinklers.

One sprinkler wrench as specified by sprinkler manufacturer shall be provided in the cabinet for each type of sprinkler installed to be used for the removal and installation of sprinklers in the system. A list of sprinklers installed in the property shall be posted in the sprinkler cabinet. The list includes the following:

- Sprinkler identification Number (SIN) if equipped or the manufacturer, model, K-factor, deflector type, thermal sensitivity and pressure rating.
- General description
- Quantity of each type, to be contained in the cabinet
- Issue or revision date of the list.

#### 4.7 FLOOR CONTROL VALVE ASSEMBLY (FCVA)

The FCVA is provided at every zone of sprinkler network as shown on drawing. This assembly consists of butterfly valve with supervisory switch, pressure reducing valve, pressure gauge, check valve, flow switch with clamping accessories and drain valve. The drain valve is utilized for the flow control, inspection, testing and draining of sections of wet pipe automatic sprinkler system. This system with an integral sight glass



assembly provides a simplified means for water flow alarm and draining of feed drains. This drain is provided with shut off valve, dual orifice valve and sight glass assembly. All sprinkler pipe and fittings shall be installed so that the system can be drained.

#### 4.8 ALARM CHECK VALVES

Alarm check valves shall be equipped to give clear positive audible alarm at any water flow through the sprinkler system equal to or greater than that from a single automatic sprinkler. It shall be suitable for vertical/horizontal installations as per system requirement or as directed by the Engineer and for the variable pressure of water supply.

Alarm check valves shall be of flanged type designed to withstand up to working pressure of 250 psi. It shall have cast iron body and clapper hinge, bronze clapper assembly, pilot valve assembly and other moving parts.

The alarm check valve assembly shall consist of the following:

- Alarm checks Valve, with trimmings for variable pressure, open drain, Vertical installation.
- Ø 2 inches main drain valve.
- System pressure guage.
- Supply pressure guage.
- Bypass check valve.
- Alarm control and test valve.
- Retainer chamber.
- Water motor alarm gong.
- Pressure operated alarm switch to actuate a bell

Alarm check valve shall be connected to the main control panel. The control panel shall have auto, manual and off selector switch. If the selector switch is in either off or manual position, an alarm signal should be sent to the main Fire Control and fire alarm panel.

#### 4.9 VALVES

All valves of Fire-fighting systems shall be as per standards and of specified pressure ratings.

#### 4.10 PRESSURE REGULATING VALVE

Pressure regulating valve shall be as per standards and of specified pressure ratings. Approved pressure gauge shall be installed on both upstream and downstream sides of every pressure regulating valve device.

#### 4.11 AIR RELEASE VALVES

These shall be designed to meet the following conditions:

- Expulsion of air during charging of the pipeline,
- Admit air during emptying of the pipeline to avoid the occurrence of negative pressure,





- Expulsion of air accumulated at summit points along the pipeline under normal operating conditions.

Air release valves shall be air cum vacuum release type to meet all the three conditions stated above and it shall be suitable for the liquid for which it is used. Valves body and cover shall be of Cast iron / malleable iron. Float and valve seat shall be of stainless steel. Valve ends shall be screwed or flanged as shown on the drawings. Threads shall be to B.S. 21 and flanges shall be drilled to B.S. 4504 Part 1. Air release valve shall be provided at all high points to ensure adequate venting of the piping system.

## **5. CLEAN AGENT FIRE EXTINGUISHING SYSTEM**

### **5.1 DISCHARGE NOZZLE**

Discharge nozzle shall be listed for intended use. Listing criteria shall include flow characteristics, area coverage, height limits and minimum pressure, as per NFPA standards or as per manufacturer's recommendation. Discharge nozzle shall be permanently marked to identify the manufacturer as well as the type and size of orifice. Nozzles shall be installed so as to free of any obstruction that could interfere with proper distribution of discharge agent.

### **5.2 DETECTION, ACTUATION, ALARM AND CONTROL SYSTEM**

The clean agent shall be controlled by listed clean agent releasing control panel. That is listed for monitoring the associated initiating device, meet the listed compatibility requirement for actuation of the system releasing device and controls the system notification appliances. Alarm system shall also be connected with the control panel of the system. The clean agent suppression system releasing control panel shall not be dependent upon or affected by the operation or failure of protected premises building fire alarm panel. Automatic detection, automatic actuation, alarm and control system shall be installed as per NFPA standards or as per manufacturer's recommendation.

### **5.3 OPERATING DEVICES**

All devices shall be located, installed or suitably protected so that they are not subject to mechanical, chemical or any other damage that would render them inoperative. A means of manual release of the system shall be accomplished by mechanical manual release or by electrical manual release when control system monitors the low-battery signal.

### **5.4 STORAGE CONTAINER ARRANGEMENT**

Storage containers and accessories shall be located and arranged so that inspection, testing, recharging and other maintenance activities are facilitated and interruption of protection is held to minimum. Storage containers shall be installed and secured according to manufacturer's recommendation or as per NFPA standards or listed installation manual.



## 6. PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers shall be maintained in fully charged and operable condition and shall be kept in their designed places at all times when they are not been used. Fire extinguishers having gross weight not exceeding 40lbs (18.14 kg) shall be installed so that the top of extinguisher is not more than 5feet (1.53m) above the floor. Fire extinguishers having the gross weight greater than 40lbs (except wheeled types) shall be installed so that the top of extinguisher is not more than 3.5 feet (1.07m) above the floor. In no case shall the clearance between the hand portable fire extinguisher and floor be less than 4inch (102mm).

### 6.1 MATERIALS AND EQUIPMENT

Portable fire extinguishers shall contain specified quantities and types of extinguishing agents. Extinguishers shall be classified according to type of extinguishing agents and the Class of fire types for which it is intended to be used. The extinguisher container/vessel shall be of anticorrosive material or otherwise lined internally with corrosion-resistant material. The outside surfaces of the container/ vessel shall be painted with at least two coats of anti-corrosive paint.

The extinguisher container shall be designed as pressure vessel and shall conform to all the applicable standards of ASME pressure vessel codes.

The container shall be fitted with spring-loaded pressure safety valve. The valve shall be set to blow off at 90% of container test pressure.

### 6.2 CODES AND STANDARDS

Portable fire extinguishers shall conform to NFPA-10 (National Fire Protection Association) of U.S.A. or F.O.C. (Fire Offices Committee) of U.K. and B.S. 5423 or Fire Safety Provision 2016, Building Code of Pakistan.

### 6.3 LABEL VISIBILITY

Fire extinguishers shall be installed so that the fire extinguishers operating instructions faced outward. Portable Fire extinguishers shall be painted with colour code according to NFPA Standard specifications. On the body of the extinguishers shall be marked/imprinted the following information.

- (a) Instructions on how to use the extinguisher.
- (b) Name of the extinguishing agent.
- (c) Weight/volume of the extinguishing agent.
- (d) Gross weight of the extinguisher.
- (e) Filling pressure of the extinguishing agent.
- (f) Classes of fires for which the extinguishing agents may be effectively used.
- (g) Name of the manufacturer and the year of manufacture.





## 6.4 INSPECTION FREQUENCY

Fire extinguishers shall be inspected at least once per calendar month. Fire extinguisher shall be inspected daily or weekly when conditions exist that indicate the need for more frequent inspections.

## 6.5 EXTINGUISHERS MAINTENANCE

Maintenance shall be done by manufacturer's service manual and thorough examination of mechanical parts, extinguishing agents, expelling means and physical condition. The extinguishers shall be subjected to maintenance at interval not more than one year. However the maintenance of type of extinguishers shall be at an interval specified in the applicable standards.

## 6.6 TYPES OF EXTINGUISHERS

### 6.6.1 Dry Chemical Extinguisher

Dry chemical extinguisher shall contain specified quantities of dry powder chemical. The type of dry powder shall be suitable for the intended use. The extinguisher shall have knob or lever operated valve, a short length of hose and a nozzle at the end of the hose. A siphon/dip tube shall extend from the valve to the bottom of the container. The valve shall have safety pin to prevent accidental release of the extinguishing agent. The discharge pressure shall be obtained from pressurized carbon dioxide cartage attached to the body of the extinguisher. The operation of the knob or lever shall pierce the cartage to obtain the expellant pressures. When operated the discharge time of 6 kg dry powder extinguisher shall not be less than 14 seconds and max range of throw shall be not less than 5-8 meter.

### 6.6.2 Foam Extinguisher

Foam extinguisher shall contain specified quantities of premixed foam of 1 liter of water, the extinguisher shall be pressurized with nitrogen. The extinguisher shall have a short length of hose and a valved nozzle. The valve shall have safety pin to prevent accidental release of the extinguishing agent. The extinguishers shall be self-expellant. In no case antifreeze additive shall be used.

When operated, the throw for 9 liters foam extinguisher shall not be less than 6 meters. The discharge time shall not be less than 40 seconds.

### 6.6.3 Wet Chemical Fire Extinguisher

Wet chemical fire extinguishers are recommended to extinguish Class-K fires. The extinguishing agent can be comprised of, but is not limited to, solution of water and potassium acetate, potassium carbonate, potassium citrate or a combination of these chemicals. The liquid agent typically has a pH of 9.0 or less. On class K fire, the agent forms a foam blanket to prevent re-ignition.

The extinguisher shall have knob or lever operated valve, a short length of hose and a nozzle at the end of the hose. The valve shall have safety pin to prevent accidental release of the extinguishing agent.



## 6.7 INSTALLATION OF EXTINGUISHERS

Portable fire extinguishers shall be installed at one meter height above finished floor.

Where only extinguishers are installed they shall be fixed to wall or column with painted steel clamps or stored in steel or concrete fire extinguisher cabinets as shown on the applicable drawings or as directed by the Engineer. Where clamped to the wall/column the clamp shall be such that extinguisher can be conveniently fixed and removed without loss of time.

Where stored in cabinets, the cabinets shall be of steel or concrete with glazed steel door painted with at least two coats of anti-corrosive signal red enamel paint over a prime coat of red oxide paint. The locking arrangement will be such that the door can be opened from inside by breaking the glass and from outside with key.

System should be tested and commissioned as per NFPA requirement or any other applicable standard.

## 7. INSTALLATION AND TESTING OF PIPES

### 7.1 GENERAL REQUIREMENTS

The Contractor shall submit to the Engineer for approval of the following information regarding the specified/proposed items of pipes and fittings.

- i. Name and address of the manufacturers
- ii. Country of origin, make and model
- iii. Dimensions and wall thicknesses of pipes and fittings
- iv. Material and thicknesses of coating and lining
- v. Factory test certificate from the manufacturers (MTC)
- vi. Warranty if so provided by the manufacturers
- vii. Method of jointing, testing and commissioning

Every pipe shall be tested at the manufacturer's works to specified hydraulic test pressure. The test pressure shall be maintained for sufficiently long time for proof and inspection. Each pipe and fitting shall be permanently marked or engraved giving the following information:

- (i) Make and Nominal diameter
- (ii) Class, Duty or Service (Pressure) Rating
- (iii) Standards according to which the pipes and fittings have been manufactured.

Unless otherwise specified diameters of pipes and fittings shall be nominal. Actual inside and outside diameters and tolerances in diameters of pipes and fittings shall be according to the specified standards. Unless otherwise specified, service ratings of pipes and fittings shall not be less than the maximum pressure to which they will be subjected to.

Unless otherwise specified, wall thicknesses of the pipes shall be according to the class, schedule or duty of the pipes. The wall thicknesses shall be measured at locations excluding the jointing ends. The tolerances in wall thicknesses shall be according to the specified standards. Wall thicknesses of fittings shall not be less than those of corresponding pipes to which they are joined together. Unless otherwise approved by





the Engineer, pipes and fittings, jointing materials such as rubber rings, gaskets, nuts & bolts and jointing compound etc. shall be of the same manufacturers as those of the pipes and fittings.

## 7.2 TRANSPORTATION, HANDLING AND STORAGE

The Contractor shall be responsible for proper transportation, handling (loading and unloading) and storage of pipes and fittings as per the manufacturer's recommendations and direction of the Engineer.

Crane, rope or nylon slings, lifting beams with flattened hook scissor-dog shall be used for loading and unloading of pipes fittings. Hooks and dogs shaft be well padded to prevent the pipe being damaged and shall be fitted-with locking device. Steadying ropes essential.

Pipes and fittings damaged during transportation, handling or storage of lowering shall be rejected and replaced at the Contractor's expense storage of gaskets and jointing compound shall be under shade to prevent damage by sunlight and extreme heat.

## 7.3 INSPECTION

Pipes and fittings shall be visually inspected for any evidence damage or hair cracks. The turned ends of pipes and fittings shall be inspected for any local irregularities, which could affect the water tightness of the joint. Damaged pipes and fittings shall be rejected and replaced at the Contractor's expense.

## 7.4 LAYING OF PIPES

### 7.4.1 Above Ground (Unburied)

Before installation, the interior of pipes and fittings shall be thoroughly cleaned of all rust, dirt and foreign materials. Pipe and fittings shall be installed to lines and grades as shown on the drawings and/or as directed by the Engineer.

Pipe joints shall be welded unless otherwise specified and/or directed by the Engineer except for jointing valves and appurtenances and where welding is not possible. Welding shall be done by qualified and licensed welders using electric arc welding process. The welding shall develop full strength of the adjoining steel. Defective joints and joints not developing full strength shall be rejected at the risk and cost of the Contractor.

Pipes and fittings shall be properly supported by galvanized steel clamps, brackets and hangers, etc. Supports shall permit unrestrained expansion and contraction. Clamps, brackets and hangers etc. shall be designed to take the weight of pipe, weight of water, seismic and wind loads.

Thrust anchors shall be provided at all changes in the pipe diameters and directions and at all branches and dead ends. Thrust anchors shall be designed to resist maximum thrust forces resulting from the worst possible combination of working/static/test pressures, transient/water hammer pressure, and thermal expansion/contraction, seismic and wind loads.

The Contractor shall submit to the Engineer for approval shop drawings of the pipes supports and thrust anchors. The supports and anchors shall be used only after approval by the Engineer. Approval by the Engineer shall however, not





relieve the Contractor from any of his contractual responsibility regarding safety requirements of the supports and anchors.

Pipes passing through floors, ceilings, roof, walls and columns in non-water retaining structures above ground or water table shall be encased in black steel pipe sleeve. The annular space between the pipes and the pipe sleeves shall not be less than one inch. The annular space shall be filled with approved packing material and sealed at both ends with approved fire rated sealant.

Pipes passing through water retaining structures above or below ground and non-water retaining structures below water table shall be provided with leak proof puddle flange. The flange diameter shall be larger than the outside diameter of the pipe by at least 4" for pipe diameters 6" and smaller and by at least 6" for pipe diameters larger than 6".

After installation, pipes, fittings, pipe supports and thrust anchors shall be painted with two coats of red oxide or zinc chromate primer and two coat of synthetic enamel paint of approved quality.

#### 7.4.2 Below Ground (Buried)

Before installation, the interior of pipes and fittings shall be thoroughly cleaned of all rust, dirt and foreign materials. Pipes and fittings shall be laid to alignments and grades as shown on the drawings and/or as directed by the Engineer. Pipes and fittings shall be lowered into the trench in a manner approved by the Engineer. All care shall be taken to avoid abrasion of the pipes and fittings.

The pipes shall be laid on specified bedding material. Before laying bedding material shall be approved by the Engineer. Recesses shall be excavated in the bottom and sides of the trench to accommodate joints, fittings and specials. After laying of pipe and fittings, the recesses shall be filled with specified bedding material and thoroughly compacted manually. Pipes and fittings alignments, that have the grades or joint disturbed or dislocated after laying shall be removed and re-laid to the entire satisfaction of the Engineer.

Backfilling shall be carried out with the specified materials and in the specified sequence. Backfill shall be laid in layers and compacted to 95% of AASHTO modified density. The thickness of each compacted layer shall not exceed 6". Hand tools shall be used for compaction of backfill/bedding material around the pipe and fittings. Mechanical methods may be used for compaction of backfill 12" over/above crown the pipeline.

When laying is not in progress, the open ends of the pipeline shall be closed with a temporary plug as approved by Engineer. Small changes in direction may be made by deflecting the last laid pipe after the joint has been made. If the alignment requires deflection in excess of the manufacturer's recommended limits, bends shall be used. Concrete thrust blocks shall be provided at all changes in the pipe diameters and directions and at all branches and dead ends.

After installation, pipe and fittings shall be applied with two coats of bituminous paint and wrapped with soaked bitumen hessian cloth. Alternatively pipe and fittings shall be double wrapped with bituminized tape.





## 7.5 JOINTING OF PIPES & FITTINGS

Welding shall be permitted as a mean of jointing pipes and fittings. The welding process shall be performed in accordance to NFPA-51B. Welding shall not be performed where there is impingement of rain, snow, sleet or high wind on the welded area of pipe product. Torch cutting and welding shall not be permitted as a means of modifying or repairing Fire-fighting system.

Weld between pipes and welded outlet fitting shall be permitted to be attached by full penetration welds, partial penetration groove welds or fillet welds. The minimum throat thickness shall not be less than the thickness of pipe, thickness of welded fitting or 3/16 inch (4.5mm) whichever is least. Circumferential butt joints shall be cut, beveled and fit so that full penetration shall be achieved. Face welds on the internal face of flange shall be permitted as a water seal in addition to hub weld.

When welding is performed, the following shall be applied: Holes in piping for outlets shall be cut to the full inside diameter of fittings prior to welding. Discs shall be retrieved. Openings cut into piping shall be smooth bore and all internal slag and welding residue shall be removed. The fittings shall not penetrate the internal diameter of piping. Steel plated shall not be welded to the ends of piping or fittings. Fittings shall not be modified. Nuts, clips, eye rods, angle brackets or other fasteners shall not be welded to pipe or fittings. Completed welds shall be free from cracks, incomplete fusion, surface porosity. Completed Circumferential butt weld reinforcement shall not exceed 3/32in (2mm).

## 7.6 TESTING

After laying each section of pipeline as convenient to the contractor or as necessary in the Engineer's opinion, shall be tested for hydrostatic pressure. Field hydrostatic test pressure shall not be less than 1-1/2 times the maximum pressure to which the system will be subjected to.

Before testing, pipe section shall be cleaned and their ends shall be closed with blank flanges, plugs or caps. The closed ends shall be anchored against thrust forces. Valve air vent outlet shall be installed at the upper end of the pipe section and valve water inlet fitting shall be installed at the lower end of the section. Pressure gauge certified from any approved laboratory shall be installed at both lower and upper ends of the pipe section. An isolating ball valve shall be fitted between the pipe section and the gauges.

Sufficient backfill material shall be placed over the center section of each pipe (leaving the joints exposed) to allow inspection of the pipe joints under the test pressure. All permanent anchors shall be in positions and shall have developed adequate strength before the testing begins. The pipe section under test shall be filled with water from the inlet fitting, taking care that all air is displaced through the vent outlet.

After filling, the pipeline shall be left under small pressure for 24 hours as directed by the Engineer in order to wet the pipe and the pipe joints. After the wetting period, additional water shall be introduced into the pipe section until the test pressure is achieved when the pipe section shall be closed.

The test pressure shall be maintained for at least two hours or for a period as directed by the Engineer. Pressure gauges shall be read at maximum intervals of 15 minutes during the test period.





If the pressure measurements are not made at the lowest point of the section, an allowance shall be made for the static head between the lowest point and the point of measurement to ensure that the specified works test pressure is not exceeded at the lowest point.

If a drop in pressure occurs, additional quantity of water shall be introduced into the pipe section in order to re-establish the test pressure. The additional quantity of water introduced into the pipe section shall be accurately measured.

During the test period all joints shall be inspected. If any abnormal movement, distortion, squirm or leakage is detected, the test pressure shall be relieved immediately and the defects shall be rectified in consultation and with the approval of the Engineer. After rectification of the defects, the pipe section shall be re-tested.

The test will be considered to have passed, if the quantity of water required to be added the test pressure does not exceed 100 liters per day, per meter of diameter and per kilometer of pipeline for each 30 meters head of test pressure.

### 7.7 FLUSHING AND COMMISSIONING

After installation and testing pipelines shall be flushed with water until all dust, dirt, scales and extraneous matters are removed from the inside of the pipeline. During flushing all valves and appurtenances shall be closed and open several times.

After successful completion of testing and flushing duly approved by the Engineer, pipelines shall be commissioned. All valves and appurtenances shall be set at proper openings and all parameters shall be set at specified or manufacturers' recommended values.

### 7.8 PIPEWORK SUPPORTS

All pipe work supports shall be of mild steel rolled sections and shall be painted with two coats of approved rich metallic zinc primer. Straps, rods and hangers shall be of mild steel when used for galvanized steel pipes.

Straps shall be provided on all pipe supports. Straps shall have a pair of nut and washers on each leg with the supporting steel flange clamped tight between the pair of nuts to form a rigid guide allowing the pipe to slide axially.

Horizontal pipe work along walls shall be supported on channel frames securely fixed to the column. All pipes shall be arranged to slide on the pipe supports and straps shall be provided to form a rigid guide.

Vertical pipe work shall be supported at the base or at anchor point to withstand the total weight of the riser. Brackets from risers shall not be used as a means of support for the riser.

Pipe work supports shall be so designed and installed as to allow free movement due to expansion and contraction. Supports shall be anchor to steel or reinforced concrete column, wall, beam or slab.

Each support shall be able to carry independently its all the operational loads of pipe work and water.

All pipes shall be individually supported. Pipes shall not hang from other pipes. Points at





which pipes pass through walls, floors, connections to plant equipment and heat emitters, etc. do not constitute points of supports for the pipes.

Provide suitable and substantial hangers and supports for all piping. As a minimum for metallic pressure piping, support schedule shall be as follows:

Pipe Size	Maximum hanger spacing (feet)	Rod Sizes (inches)
1 inch and smaller	6	3/8
1-1/4 inch to 2 inch	8	3/8
2-1/2 inch to 4 inch	10	3/8
5 inch and larger	12	1/2

## 8. MEASUREMENT AND PAYMENT

### 8.1 MEASUREMENT

Measurement of acceptable completed works of every component of fire-fighting system will be made on the basis of material/equipment provided and installed in accordance with the above specifications and applicable drawings.

### 8.2 PAYMENT

Payment for acceptable measured quantities of every component of fire-fighting system will be made on the basis of unit rate of material/equipment quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 5150 \*\*\*



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**SECTION 5220**  
**VALVES AND APPURTENANCES**

- 1.0 SCOPE
- 2.0 APPLICABLE STANDARDS
- 3.0 SUBMITTALS
- 4.0 MATERIAL AND EQUIPMENT
- 5.0 DELIVERY, STORAGE AND HANDLING
- 6.0 MEASUREMENT AND PAYMENT





## 1.0 SCOPE

The work under this section of the specification consists of furnishing all plant, labour, equipment, appliances, materials and performing all operations required as specified herein, as shown on the drawings, or as directed by the Engineer, in connection with installation of valves.

## 2.0 APPLICABLE STANDARDS

Cast Iron gate valves	BS-5163
Cast iron check valves	BS- 5153
Bronze gate valves	BS- 5154
Bronze check valves	BS- 5152
Flexible rubber joint	BS- 5155
Float valves	BS- 1212

## 3.0 SUBMITTALS

The contractor shall submit technical brochures and samples of all the items mentioned in the Specifications from approved manufactures or as directed by the Engineer

## 4.0 MATERIAL & EQUIPMENT

### 4.1 DESCRIPTION

All valves shall be of renowned manufacturer as specified. Valve material shall be suitable for installation on potable water lines, sewage line or sludge piping. Service rating of the valves shall be at least 7 bars to 16 bars. The interior of all valves shall be cleaned of all foreign material before installation.

Valves shall be installed at the position indicated in the Contract Documents or as directed by the Engineer. Valves shall be adequately supported. Installed valves shall be subjected to pressure and leakage tests and no leakage shall be observed under these tests. End joints, flanges, etc., shall be of the appropriate class and material.

Valves shall be installed either in chambers or above grade on line as shown in the Contract documents and/or as specified herein. Valves shall be securely anchored.

Open and closed position indicator shall be provided for all valves. If installed in valve chambers, the indicator shall not extend above ground and shall not interfere with opening or closing of the valve. The indicator design shall be approved by the Engineer before installation.

### 4.2 CAST IRON GATE VALVES

Cast iron gate valves shall have flanged ends and wheel handle and shall conform to B.S.5163 "Specifications for Double Flanged Cast Iron Wedge Gate Valves for Waterworks purposes". Flanges shall be drilled to B.S. 4504 Part 1. Valves shall be rated for a working/service pressure of 16 bars for water supply system and 25 bars for firefighting system. Valves shall close in clockwise direction.



The valve parts shall be of the following materials.

- Valve body shall be of cast iron.
- Flanges shall be of cast iron.
- Shaft shall be of stainless steel.
- Disc shall be of stainless steel with bronze trim.
- Seat shall be of cast iron with bronze trim.

#### 4.3 CAST IRON CHECK VALVES

Cast iron check valves shall be of non-slam, swing type with flanged ends and shall conform to B.S. 5153, "Specifications for Cast Iron Check Valves for General Purposes". Flanges shall be drilled to B.S. 4504 Part 1. Valves shall be rated for a working/service pressure of 16 bars. The direction of flow shall be permanently marked on the body of the valve.

The valve parts shall be of the following materials.

- Valve body shall be of cast iron.
- Flanges shall be of cast iron.
- Shaft and spring shall be of stainless steel.
- Disc and seat shall be of stainless steel with bronze trim.
- Disc and shaft seal shall be of rubber (O-ring type).
- Wheel handle shall be of cast iron.

Valve parts in contact with water shall be of corrosion resistant material, free from toxic substances and shall not foster microbiological growth or impart taste, odor, turbidity or color to the water.

Inside surfaces of valves shall be enameled and outside surfaces shall be epoxy coated.

#### 4.4 BRONZE GATE VALVE

Bronze gate valves shall conform to B.S. 5154, "Specifications for Copper Alloy, Globe, Globe Stop, Check and Gate Valves for General Purposes". Valves shall be rated for a working/service pressure of 16 bars. Valve ends shall be screwed or flanged as shown on the drawings. Threads shall be to B.S. 21 and flanges shall be drilled to B.S. 4504 Part 1. Valves shall close in clockwise direction. Open and shut indicators shall be marked on the wheel handle.

#### 4.5 BRONZE CHECK VALVES

Check valves shall conform to B.S. 5152 "Specifications for bronze check valves for general purposes". The service rating shall be 16 bars. The direction of flow shall be permanently marked on the body of the valve. Body of valve shall be tested to 1-1/2 times the service rating and seat shall be tested to service rating. No leakage shall be permitted under the above tests check valves shall be of swing type.

End of the valves shall be flanged to joint with the standard fittings. Flanges shall be of appropriate class and material. Valves shall be installed at positions shown on the drawings the interior shall be cleaned





of all foreign matter before installation. They shall be inspected to ensure that all components are sound and in working condition.

#### 4.6 AUTOMATIC AIR VENT VALVE

Automatic Air Vent valve shall be of PN-16 Brass or bronze body (made in Italy), of specified size for automatic discharge of air and for automatic breaking of vacuum in a pressure main. The material used shall be corrosion resisting, growth. Each valve shall be installed with an isolating gate valve, stand pipe, clamp and connection with the line.

#### 4.7 FLEXIBLE RUBBER JOINT

Flexible rubber joint shall be threaded union type of PN-16 conforming to BS 5155, of specified size for installation in water supply line crossing building expansion joint or at the locations as marked on drawings or as directed by the Engineer. The material used shall be corrosion resisting.

#### 4.8 FLOAT VALVE

Float valve shall be of copper alloy, piston type and shall conform to B.S. 1212. Float shall be of copper and shall conform to B.S. 1968.

#### 4.9 SINGLE ACTING AIR VALVE

Air release valves shall be single acting (air cum vacuum release) type suitable for the liquid for which it is used. Valves body and cover shall be of malleable iron. Float and valve seat shall be of stainless steel. Valve head shall be of Viton (Synthetic Rubber). Valve ends shall be screwed or flanged as shown on the drawings. Threads shall be to B.S. 21 and flanges shall be drilled to B.S. 4504 Part 1.

Air release valve shall be provided at all high points to ensure adequate venting of the piping system.

#### 4.10 WATER METER

Water meter shall be of turbine/ vane type .the body shall be of fine grained cast iron with black enamel coating. Ends shall be flange shall be rated for 16 bars working pressure. The normal flow rate shall range from 50 cu.m/hr. to 300 cu.m/hr.

#### 4.11 INSTALLATION OF VALVES, TESTING & COMMISSIONING

Valves shall be installed either in chambers or above grade on line as shown on the drawings and as directed by the Engineer. Before installation, the interior surfaces of valves shall be cleaned of all foreign matters, inspected to ensure that all components are sound and in working condition and tested to 1-1/2 times the working pressure or the service pressure whichever is greater. After installation, valves shall be securely anchored; tested, retouched where paints have been damaged and labeled.



## 5.0 DELIVERY, STORAGE & HANDLING

Valves should be handled and stored properly to avoid any damage and slippage of threads especially during installation.

## 6.0 MEASUREMENT AND PAYMENT

### 6.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost therefore shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

- a. Jointing arrangement of pipe on both ends of valves, including gaskets, nuts, bolts etc.
- b. Valves and appurtenances supports and anchors
- c. Keys for operation of valves
- d. Steel embedded parts and label plates
- e. Manufacturer's literature and operation manual for valves and appurtenances
- f. Painting of valves, water meter and appurtenances
- g. Stand pipe and coupling for underground fire hydrants

### 6.2 Measurement:

Measurement of acceptable completed works of all types of valves, water meter and above ground fire hydrants will be made on the basis of actual number of valves and above ground fire hydrants provided and installed in position as shown on the drawings, and as directed by the Engineer.

### 6.3 Payment:

Payment for the acceptable measured quantity of all types of valves, water meter and above ground fire hydrants will be made on the basis of unit rate per number quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 5220\*\*\*





**SECTION - 5240****PUMPING MACHINERY**

- 1.0 SCOPE
- 2.0 MATERIALS AND PRODUCTS
- 3.0 SPECIAL REQUIREMENTS OF PUMPS
- 4.0 POTABLE WATER BOOSTER PUMP SET
- 5.0 POTABLE WATER PUMP & MOTOR
- 6.0 SUBMERSIBLE DRAINAGE PUMP AND MOTOR
- 7.0 MAINTENANCE MANUALS AND TOOLS
- 8.0 MEASUREMENT AND PAYMENT



## 1.0 SCOPE

The work to be done under this section of the specifications includes furnishing all plant, labour, equipment, appliances and materials and in performing all operations required in connection with the installation of pumping machinery including all accessories as specified herein or shown on the Drawings or as directed by the Engineer.

## 2.0 MATERIALS AND PRODUCTS

Materials and machinery shall conform to the latest referenced specifications and other provisions specified herein and shall be new and unused. In case where manufacturers are specified, materials and equipment will be of the same manufacturers. In all other cases the Contractor shall submit the names and addresses of the Manufacturers and trade names of the materials and equipment that he intends to buy. Other information such as diagram, drawing and descriptive data will be supplied if so desired by the Engineer. Approval of materials and all the machinery under this provision shall not be construed as authorising any deviations from the specifications. The approval of machinery of manufacturer other than that specified will be purely on the discretion of the Engineer. The Engineer will fully ascertain the facts and satisfy himself as to the performance of the machinery offered by the Contractor.

## 3.0 SPECIAL REQUIREMENTS OF PUMPS

The Contractor shall furnish with each pump properly identified characteristic curves prepared and certified by the manufacturer showing capacity, head, efficiency and brake horsepower throughout the entire range of the pump.

The pumps shall have stable throttling curves and be suitable for unrestricted parallel operation.

All pumps shall be electric driven.

The pumps and their drives shall not overload or trip when operating against zero pressure.

The design, construction and materials shall be such that damage as a result of cavitation is completely eliminated.

Pumps shall have bearings and be suitable for continuous as well as intermittent operation without external sealing or cooling water. The pumps shall be such that they shall come into operation at once after a prolonged shutdown period without having to take special measures. Pumps shall be capable of delivering specified quantity of water at the specified pressure.

Pumps shall be tested at site before their final acceptance.

Pumps shall be installed at positions shown on the Drawings and/or as directed by the Engineer.

Pumps and their drives shall be in perfect alignment when installed in position.





Pump set shall be provided with reducer/enlarger if necessary on pump discharge pipe and suction pipe.

#### 4.0 POTABLE WATER BOOSTER PUMP SET

Skid mounted potable water booster pump set shall comprise centrifugal pump and a pressure tank provided with the following accessories:

One number PVC/polypropylene/rubber/epoxy lined steel hydro-pneumatic pressure tank of specified capacity with neoprene rubber diaphragm between the water and air sections. The tank shall be complete skid mounted boosting system with automatic motor control unit for dry run protection and auto operation system shall be provided with stainless steel piping. The unit shall be furnished ready for installation L/C flexible pipe gate valve, non return valve, pressure switch & pressure gauge and shall be ready for operation when connected to the piping & electricity supply. The tank shall be rated for a working pressure of 16 kg/cm<sup>2</sup> and test pressure of 25kg/cm<sup>2</sup> and shall comply with all the relevant clauses of "ASME Code for Pressure Vessel".

Pump sleeve, intermediate chamber/guide vanes, impeller, suction inter-connector spline shaft cover plates etc. shall be of stainless steel with mechanical seal of approved material. Base plate shall be painted steel.

Pressure gauge, pressure switch gate and check valve on pump discharge pipe. Pressure switch will be adjustable between specified maximum and minimum pressure levels and shall be wired to motor control panel.

- Gate valve and check valve on pump discharge pipe.
- Gate valve, on pump suction pipe.
- Minimum run timer adjustable from 0-6 minutes.
- Low water level cut-off switch.
- Reducer/enlarger, if necessary on pump discharge and suction pipe.
- Alternator with manual over-ride.
- Alarm shall sound at low water level.

Duty of the pump shall automatically alternate between the two pumps (if available) with manual override. In failure of any of the duty pump the standby pump will automatically come into operations within 30 second.

#### 5.0 POTABLE WATER PUMP & MOTOR

The pump will be vertical centrifugal pump of specified capacity, head and duty, totally enclosed, fan cooled, squirrel cage induction motors of specified power.

Pump material shall be as under:

Body:	Fine grained grey cast iron
Impeller:	Bronze
Shaft:	Bronze or stainless steel

Pumps shall have mechanical seal. The suction and discharge flanges shall be rated for a working pressure of 10 kg/cm<sup>2</sup> for potable water pumps. The flanges shall be drilled to BS 19 (Table 'D' or 'E') or BS 4504.

Motors shall run on 3-phase, 400 volts + 10%, 50 c/s A/C power motors shall be



protected from low voltage, overload, overheating and phase failure.

Potable water pumps and motors shall be installed on concrete foundation with anchor bolts.

Potable water pumps will be automatically operated at pre-set levels in overhead tanks with help of level switches installed in respective overhead water tanks.

In case a pump fails to start automatically, an alarm will be automatically sounded at preset minimum water level in overhead water tank.

## 6.0 SUBMERSIBLE DRAINAGE PUMP & MOTOR

The pump shall consist of submersible drainage pump and motor with duckfoot bend/auto coupling, guide rails and chain etc of the specified capacity and head and shall be integral sealed unit with strainer.

Pump material shall be as under:

Casting:	Cast Iron
Impeller / Bowl:	Cast Iron
Shaft:	Stainless steel
Bearing:	Pre-lubricated bearing
Motor:	Air filled water tight

The pumps shall be installed inside the pit as shown on drawing. The discharge flange shall be threaded to BS 21 and shall be rated for working pressure of 10 kg/cm<sup>2</sup>.

### 6.1 INSTALLATION

The submersible drainage/ sewage pumps shall be installed in the sump pits at the locations shown on the drawings.

### 6.2 PUMP ACCESSORIES

Pumps shall be provided inclusive of the following accessories:

- i. Duck foot Bend, Guide rails and pulling chain etc.
- ii. Pressure gauge, level switches, flow switches etc.
- iii. Reducer/enlarger is necessary if the pump discharge size is different from discharge piping.

### 6.3 MOTOR PROTECTION

Motors of 3kw or less power shall be started direct on line. Larger motors shall be started by star-delta starter.

Motor shall be protected against under voltage over voltage, overload, over-heating and phase failure.

Motor shall be rated for normal operation against a voltage fluctuation of + 10% and frequency fluctuation of + 2Hz.





## 6.4 CONTROL

### Submersible Drainage Pump

Operation of pumps shall be controlled by level switches installed inside the sump pit.

- i. One pump shall be duty and one shall be standby.
- ii. Pumps shall start and stop at the designated water levels inside the sump.
- iii. If duty pump fail to start, the standby pump shall automatically come into operation.
- iv. If standby pump fails to start, an alarm shall be sounded at high water level.

## 6.5 LEVEL SWITCH

Level switches shall be electric actuating device, which will close/open the circuit at preset lower/higher pressures. The device shall be housed in diecast aluminium casing with enamel finish. The switch shall be adjustable. The pressure switch shall be rated for a working pressure of 16 Bar. The switch shall be wired to control panel.

## 6.6 WATER LEVEL INDICATOR

The water level indicator for high and low water level cut off shall operate on 230 Volt AC, 50 Hz and supplied complete with float, float chains, counter-weights, chain clamps, steel mounting brackets, chain guide roller and any other equipment and material necessary for installation and satisfactory operation.

The level indicator shall have at least 5 switch-contacts or as required for sensing the required water levels within the specified range. The level indicator shall be suitable to match with the specific gravity of the fluid in which it is intended to be installed. All operational, constructional and installation details shall be furnished by Contractor for approval.

The Contractor may quote for non-mechanical type of water level indicator to give equivalent performance. Technical literature and data of the indicator is to be furnished along with the bid documents.

## 7.0 MAINTENANCE MANUALS AND TOOLS

- 7.1 A book or books containing the complete information in connection with the assembly, operation, lubrication, adjustment and repair of the pumping equipment, electric motor, together with detailed parts list with drawings or photographs shall be furnished in duplicate.
- 7.2 For the pump room, special tools necessary for maintenance and repair of the pumps and electric motors including tools kits, grease guns etc. with accessories shall be furnished.



- 7.3 The manufacturer's recommended list of spare parts to be stocked by the CLIENT shall be submitted by the Contractor to the Engineer for approval. Such spare parts will also be furnished by the Contractor.
- 7.4 All the maintenance manuals, tools, spare parts etc., shall be supplied by the Contractor at no cost of the CLIENT and all cost shall be deemed to be included by the Contractor in his bid against item of pumping set.

## 8.0 MEASUREMENT AND PAYMENT

### 8.1 Pumping Machinery

#### 6.1.1 Measurement

Measurement for payment of pumping machinery pressure gauge, brass strainer, pressure switch and water level indicator shall be the actual number acceptably provided and installed in position; the Contractor's bid against these item shall include cost of providing and installing the pumping machinery including the pumps, electric motors, all accessories, manuals, tools, spare parts, etc., as shown on the Drawings, as specified herein or as directed by the Engineer.

#### 6.1.2 Payment

Payment will be made for acceptable measured quantity of pumping machinery pressure gauge, brass strainer, pressure switch and water level indicator on the basis of unit rate per number quoted in the Bill of Quantities. The amount bid shall be full payment for the work specified.

\*\*\* End of Section 5240 \*\*\*





**SECTION - 8001****GENERAL SPECIFICATIONS FOR ELECTRICAL WORKS**

- 1.0 SCOPE OF WORK**
- 2.0 RULES & REGULATIONS**
- 3.0 AMBIENT CONDITIONS**
- 4.0 STANDARDS**
- 5.0 SYSTEM DATA**
- 6.0 EQUIPMENT**
- 7.0 DRAWINGS AND DATA TO BE FURNISHED BY THE CONTRACTOR**
- 8.0 MANUFACTURER'S INSTRUCTIONS**
- 9.0 GUARANTEE**
- 10.0 DANGER BOARDS WITH SIGNS, DESIGNATION AND SHOCK / FIRST AID CHARTS AND FIRE FIGHTING EQUIPMENT**
- 11.0 ASSOCIATED CIVIL WORKS**
- 12.0 INSTALLATION INSTRUCTIONS - GENERAL**
- 13.0 FACTORY TESTS**
- 14.0 TESTING - GENERAL**
- 15.0 APPENDICES TO BE FILLED IN BY THE BIDDER**
- 16.0 PAYMENT**



## 1.0 SCOPE OF WORK

The works related to the electrical system which is included in the Scope of this Contract as shown on the Drawings, stated in the Specifications and Bill of Quantities and explained in these Specifications. The works shall broadly include but not limited to the following:

- General Specifications for Electrical Works
- Low Voltage D.G. Set
- Indoor power Transformer
- H.T. Switchboards
- L.T Switchboards
- LT Distribution Boards
- Motor Control Centre
- Light Fixtures
- Low Tension Cables
- Wiring Accessories
- Conduits and Pipes
- Earthing
- Lightning Protection System
- Miscellaneous Items
- Structured Cabling Network
- Fire Alarm System
- Closed Circuit Television System
- Public Address System
- Cable Antenna TV System

The Contractor shall also be responsible to supply any other equipment not specifically mentioned in these Documents but which is necessary for proper operation of the works/system included in the scope of this Contract. The Contractor shall solely be responsible for ensuring proper functional requirements of different equipment. He shall also be responsible for furnishing any additional piece of equipment and for making modification in the equipment as desired and/or approved by the Engineer to achieve proper co-ordination with various equipment offered in the bid and also with those installed by others.

## 2.0 RULES & REGULATIONS

The entire electrical installation/work shall be carried out by licensed Contractor, authorised to undertake such work under the provisions of the Electricity Act 1910 and The Electricity Rules 1937 as adopted and modified upto date by the Government of Pakistan.

All works shall be carried out in accordance with the latest edition of the Regulations of the Electrical Equipment of Buildings issued by the Institute of Electrical Engineers-London, the Contract Documents, The Electricity Rules 1937 and bye-laws that are in force from time to time. Any discrepancy between these Specifications and any other rules and regulations shall be brought to the





notice of Engineer for his instructions and the discussion of the accepting/controlling shall be final and conclusive.

The Contractor shall be responsible for completing all formalities and submitting the test certificates as per prevailing rules and regulations, and shall have the installation passed by the Government Electric Inspector of that region. All requirements of the Electric Inspector and the WAPDA / MEPCO shall be complied with.

### 3.0 AMBIENT CONDITIONS

All material and equipment supplied and installed shall be designed, manufactured and tested to meet the following ambient conditions unless specifically stated otherwise for any material/ equipment.

Maximum indoors ambient temperature	:	45-Degree Celsius
Minimum indoors ambient temperature	:	Zero Degrees Celsius
Maximum outdoors-ambient temperature	:	50-Degree Celsius
Minimum outdoors-ambient temperature	:	Zero Degrees Celsius
Maximum Relative humidity	:	100 Percent
Maximum Altitude of project	:	220 meters above the mean sea level.

The atmospheric conditions are tropical and highly humid.

### 4.0 STANDARDS

The latest standards and codes of reputable organisations shall be applicable for the material and equipment specified herein and for installation work. Such organisations to be BSS, VDE, NFPA 99, NEC Article 517 etc. In case the Specifications laid down herein differ from those given in the standards, then the equivalent or better specifications shall govern. Wherever applicable the equipment shall also conform to the requirements of Pakistan Standard Institution (PSI).

Contractor shall maintain at the site office one copy of the standards / codes applicable to the works.

### 5.0 SYSTEM DATA

Unless otherwise specified elsewhere, all equipment and material shall be designed to operate satisfactorily with the following minimum requirements without any de-rating.

- a) Voltage rating of equipment :
- |      |                         |
|------|-------------------------|
| HT : | 11 kV, 3 phase, +/- 10% |
| LT : | 400 V, 3 phase, +/- 10% |
|      | 230 V, 1 phase, +/- 10% |



b) Frequency : 50Hz  $\pm$  2Hz

In general, the electrical colour coding of switchgear cubicles, control panels, desks etc., shall be in accordance with the respective IEC Recommendations,

Live parts of electrical connections shall be colour coded according to IEC 446 as follows:

	<b>Conductor Designation</b>	<b>Coding Alphanumeric</b>	<b>Colour</b>
A.C. Network	Phase 1	L 1	red
	Phase 2	L 2	yellow
	Phase 3	L 3	blue
	Neutral	N	black
D.C. Network	Positive	L+	white
	Negative	L-	black
Earthing	Protective Earth	PE	green/yellow
	Earth	E	green/yellow

The colour coding for the secondary circuits of isolated power panel board is as follows:

Orange-Isolated Phase Conductor  
Brown- Isolated Neutral Conductor  
Green-Isolated Ground Conductor

Conductor insulation of secondary circuits of isolated power panel board shall be XLPE and PVC sheathed.

#### Control Cables

The Control Cables shall be manufactured according to specifications for L.T. Cables. The Control Cables shall be of multi-core, PVC insulated type withstanding without deterioration the conditions prevailing at the place of installation. The cross section of cable shall be as per the requirement of the system.

All the cores should be numbered and/or colour coded or otherwise properly identified. At-least 20% spare cores shall be provided in all Control Cables.



No separate payment is admissible for supplying, installing, testing and commissioning of control cables and is deemed to have been included in the BOQ rates of the respective equipment.

Distance in between power, communication and control cables shall be kept as per requirements laid down by NEC800, NFPA 70 and EN50174-2.

## 6.0 EQUIPMENT

### 6.1 IP Degree of Protection

The equipment shall have IP degree of protection as follows, unless mentioned other wise:

- IP 42 for indoor areas
- IP 54 for indoor damp areas
- IP 65 for outdoor areas

If properly rated equipment is not available, the Contractor shall provide field enclosures to attain the required IP degree of protection. If necessary cooling/exhaust fans and / or anti condensate heaters shall also be provided. No separate payment shall be made to attain the required IP degree of protection.

### 6.2 Identification & Labelling

All devices, meters, cabling, wiring and auxiliaries shall be properly labeled for identification. Labeling of equipment shall be done by means of flameproof material using indelible ink/markings. The labeling shall be such as to ensure uniformity and shall facilitate study of control diagrams/drawings during operation and maintenance.

All labeling shall be of suitable size to be visible from the operating conditions/positions at site.

### 6.3 Lamp Test Facility

All equipment / switchboards, etc. shall be provided with common lamp test facility.

## 7.0 DRAWINGS AND DATA TO BE FURNISHED BY THE CONTRACTOR

The shop drawings, as-built drawings and/or technical data to be furnished by the Contractor for each electrical equipment, LT cable distribution layout & shall include, but not limited to the following:

- (a) Structural drawings showing foundations, RCC details dimensional plans,



elevation and sections on a suitable scale.

- (b) Electrical drawings showing:
- Line diagrams of Switchboards, Motor Control Centres, distribution boards and isolated power panels with detailed wiring diagrams, elevations/internal component layout and other standard details.
  - LT Cabling, Grounding/Earthing including all cable routing and support details.
  - Necessary execution details such as no. of cable/wires, size of conduits, cable routes, cable trays and cable trenches, etc.
  - Substation and Generator Room Equipment installation detail.
  - Manhole/Duct works.
- (c) Layouts of all LT cable routes with coordinates and levels.
- (d) Technical literature and manufacturer's characteristic data with the description of materials and weights of all equipment as instructed by the Engineer.

At least three (3) copies of the shop drawings and/or technical data of the equipment shall be submitted to the Engineer for checking and approval.

## 8.0 MANUFACTURER'S INSTRUCTIONS

The Contractor shall supply to the Engineer in properly bound form six (6) copies of manufacturer's instruction manuals for installation, testing, commissioning, operation and maintenance of the specified equipment including manuals of spare parts and tools of the equipment. At least two copies of the documents shall be submitted in original. The installation instructions shall be submitted 2 weeks prior to commencement of installation of each equipment, and operation and maintenance instruction at the time of commissioning. If the Contractor fails to provide the documents the Engineer shall withhold issuance of requisite certificates and deduct suitable amount from the payments to the Contractor.

## 9.0 GUARANTEE

The Contractor shall furnish written guarantee of the manufacturer or supplier with respect to satisfactory performance of each equipment. Guarantee shall be given for replacement and repair of part or whole of the equipment, which may be found defective in material or workmanship. The guarantee shall cover the duration of Maintenance Period as defined in the Conditions of Contract. This guarantee shall not relieve the Contractor of his obligations and he will be fully





responsible for the repair or replacement of any defective material in time, so as not to cause any undue delay in carrying out the repairs and/or replacements.

#### **10.0 DANGER BOARDS WITH SIGNS, DESIGNATION AND SHOCK / FIRST AID CHARTS AND FIRE FIGHTING EQUIPMENT**

Danger Boards having signs and designation of the room shall be installed on the external door of HT, LT, Power transformer, Low Voltage DG Set Rooms. Shock/First Aid Charts shall be installed in H.T, L.T and Low Voltage DG Set Rooms.

Potable fire fighting extinguisher suitable to control electrical fire shall be provided in H.T, L.T, Power Transformer and Low Voltage DG Set Rooms.

All the above items shall also be provided, wherever required to comply the requirements of the Pakistan Electricity Rules/Electric Inspector.

Laminated single line and adequate detail drawings on proper boards highlighting the main system features shall be displayed/ fixed in respective electrical and communication rooms.

#### **11.0 ASSOCIATED CIVIL WORKS**

Except where separately stated in the Bill of Quantities the cost of all civil works associated with any BOQ item of electrical works, such as excavation and back filling of earth, compaction of the earth, foundation pads, chiselling, making openings, etc. shall be included in the price quoted against respective items. No separate payment for such works will be made. Such works will also include repair of any damage to civil works caused by the Contractor during electrical installation.

#### **12.0 INSTALLATION INSTRUCTIONS - GENERAL**

The Contractor shall furnish all labour, materials, tools and equipment required to install, connect, test and commission all electrical equipment specified herein, whether or not such equipment is furnished by him or by others.

For all equipment to be installed by the Contractor, the Contractor shall supply and install all erection materials such as foundation bolts, washers, nuts, etc. as required and without any additional costs.

The Contractor shall set out the works himself as per Specifications and Drawings and shall properly position the equipment on specified foundation/location. In general, the manufacturer's instructions for installation shall be followed. Any defect or faulty operation of equipment due to the Contractor not following the manufacturer's instructions shall be corrected and repaired by the Contractor at his own cost.





For any deviation from the working drawings or specification that are deemed necessary by the Contractor due to site conditions, he shall submit the details and obtain the Engineer approval before starting such works.

### 13.0 FACTORY TESTS

All type and routine tests on Low Voltage D.G Set, Power Transformer, H.T Switchboards, LT Switchboards, Motor Control Centre, H.T Cables, LT Cables, and all other equipment shall be performed at the manufacturer's works in the presence of the Engineer or his Representative. Type tests may be waived off in case test certificates are submitted as certified by an Engineer approved standard laboratory of international repute; but merely producing the test type certificates will not relieve the manufacturer to carry out the required standard/routine tests.

The Contractor shall inform the Engineer about the date and time of test of each equipment at least two weeks in advance. This shall, however, be done after the Contractor has got the test procedures duly approved by the Engineer. The witnessing of test by the Engineer and the Employer shall not absolve the Contractor from his responsibility for the proper functioning of the equipment, and for furnishing the guarantees referred to in clause 9.0. All test results shall be supplied in quadruplicate. All expenses for carrying out the tests as incurred by the Engineer and the Employer to witness it shall be borne by the Contractor and deemed to have been included in the bid. Provision for at least two person's visit for Factory Acceptance Tests shall be made to include one representative each from the Employer and the Consultant/Engineer. The contractor shall undertake all formalities as may be required for the Engineer or his representative to enable him make the visit.

### 14.0 TESTING - GENERAL

#### 14.1 Scope

Upon completion of the installation, the Contractor shall perform field tests on all equipment, materials and systems. All tests shall be conducted in the presence of the Engineer for the purpose of demonstrating equipment or system compliance with Specifications. The Contractor shall submit for Engineer's approval complete details of tests to be performed describing the procedure, test observations and expected results.

The Contractor shall furnish all tools, instruments, test equipment, materials, etc., and all qualified personnel required for the testing, setting and adjustment of all electrical equipment and material including putting the same into operation.

All tests shall be made with proper regard for the protection of the personnel and equipment, and the Contractor shall be responsible for





adequate protection of all personnel and equipment during such tests. The cost of any damages or rectification work due to any accident during the tests shall be the sole responsibility of Contractor.

The Contractor shall record all test values of the tests made by him on all equipment. Four (4) copies of all test data and results certified by the Engineer shall be given to the Engineer for record purposes. These shall also include details of testing method, testing equipment, diagrams, etc.

The witnessing of any tests by the Engineer does not relieve the Contractor of his guarantees for materials, equipment and workmanship, or as any other obligations of Contract.

#### 14.2 Low Voltage D.G. Set

Prior to the tests, the contractor shall submit manufacturer's recommended detailed description of the test procedures to be conducted for Engineer's approval.

The Contractor shall carry out full site load and no load tests in accordance with IEC, ISO or BS Specifications for site commissioning. The inspection and tests shall include but not be limited to:

Basic Tests:	Insulation Resistance Earth Continuity Earth Loop Impedance Polarity Phase Rotation Voltage and Frequency Starting System Protection Equipment
Battery:	Nominal Voltage Discharge Voltage Specific Gravity of Electrolyte Level of Electrolyte Charging System
Lubrication:	Check as required by manufacturer
Operational Check at Start-up	Oil Pressure Fuel Oil Leaks Operation of Safety Devices Operational Speed Automatic Control Instrument Check Exhaust Check Undue Vibration



Operational Check After one hour's run:	Oil Pressure	
	Oil Leaks	
	Cooling System	
	Oil Temperature	
Commissioning Test:	25% of full load	2 hrs.
	50% of full load	5 hrs.
	75% of full load	8 hrs.
	100% of full load	8 hrs.
	110% of full load	1 hr.

All commissioning and test results shall be recorded and compared with design data. A retest/commissioning shall take place if results are not satisfactory. All the tools, labour, POL, required for the testing and commissioning shall be provided by the Contractor at no extra cost. If required load is not available at site for testing the generators, the Contractor shall provide dummy load at site at no extra cost to the Employer. The correct functioning of the control equipment shall also be proved.

#### Battery Charger

Battery charger shall be static type and shall provide for both trickle and boost charging of the batteries when the engine is not in operation. The charger shall be of suitable capacity to fully recharge the completely discharged batteries within four hours at boost charge.

#### Control Panel

The Control Panel shall provide all the necessary control and monitoring devices of the Diesel Generating Sets. All the control and monitoring of the safety devices, alarms, protections, meters, lamps, etc. as mentioned in this Specifications and required as per good engineering practices for such an installation shall be provided in the Control Panel.

### 14.3 Transformer Tests

In addition to the insulation resistance test of the transformer, a polarity and phase rotation test shall also be made. Buchholz relay shall be tested for proper operation. Di-electric test shall be carried out on transformer oil prior to putting the same in operation.

### 14.4 HT / LT Switchboards

Each circuit breaker shall be operated electrically and mechanically. All interlocks and control circuits shall be checked for proper connections in accordance with the wiring diagrams given by the manufacturer.



The Contractor shall properly identify the phases of all switchgear and cables for connections to give proper phase sequence.

Trip circuits shall be checked for correct operation and rating of equipment served. The correct size and function of fuses, disconnect switches, number of interlocks, indicating lights, alarms and remote control devices shall be in accordance with approved manufacturer drawings. Nameplates shall be checked for proper designation of equipment served. Protective relays shall be tested and set at site prior to commissioning of the equipment.

#### 14.5 Insulation Resistance Test

Insulation resistance test shall be made on all electrical equipment by using a meggar of 500 volts for circuits upto 250 volts and 1000 volt for circuits between 250 and 500 volts. For testing of 11 kV circuits, upto 5 kV meggar shall be used; the exact voltage shall be as advised by the equipment manufacturer unless otherwise advised by the Engineer.

The insulation resistance values of cables, transformer, switchgears, etc., shall be as per BSS, IEEE, NEC, ICEA and Pakistan Electricity Rules.

Before making connections at the ends of each cable run or joint between cables, the insulation resistance test of each cable section shall be made. H.T. cables shall be subjected to high voltage test as per recommendations of standard to which the cable is manufactured. Each conductor of a multi-core cable shall be tested individually with each of the other conductor of the group and also with earth. If insulation resistance test readings are found to be less than the specified minimum in any conductor, the entire cable shall be replaced and tests repeated on new cable. If cable joint is provided, then each cable section shall be tested, and joint made only after the tests have been made satisfactorily. Finally the completed cable length including the joints shall be tested.

The transformer and switchgears shall be given an insulation resistance measurement test after installation, but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches and between each phase and earth.

If the insulation resistance of the circuit under test is less than the specified value, the cause of the low reading shall be determined and removed. Corrective measures shall include dry-out procedure by means of heaters, if equipment is found to contain moisture. Where corrective measures are carried out, the insulation resistance readings shall be taken after the correction has been made and repeated twice at 12 hours interval. The maximum range for each reading in the three successive tests shall not exceed 20% of the average value. After all tests have been



made, the equipment shall be reconnected as required. Polarity test shall be made on single pole switching devices.

#### 14.6 Earth Resistance Test

The Contractor shall make Earth resistance tests on the Earthing system, separating and reconnecting each earth connection.

If it is indicated that soil treatment or other corrective measures are required to lower the ground resistance values, the Engineer will determine the extent of such corrective measures.

The electrical resistance of the ECC together with the resistance of the Earthing leads measured from the connection with earth electrode to any other position in the complete installation shall not exceed one ohm.

Earth resistance test shall be performed as per Electrical Inspector's requirements. Where more than one earth electrodes are installed, the earth resistance test of each electrode shall be measured by means of resistance bridge instrument.

The complete lightning protection system shall be tested for continuity and earth resistance. The combined earth resistance at any point in the lightning protection system shall not exceed 10 ohms.

#### 14.7 Completed Tests

After any equipment has been tested, checked for operation, etc., and is accepted by the Engineer the Contractor shall be responsible for the proper protection of that equipment so that subsequent testing of other equipment do not cause any damage to the already tested equipment.

#### 14.8 Expenses

All expenses, i.e., travelling, boarding and lodging for carrying out the tests and witnessing by the Engineer shall be borne by the Contractor and are deemed to have been included in the BOQ rates of the respective equipment(s) by the Contractor.

#### 14.9 Spare Parts

Contractor shall provide spare parts as identified in relevant appendix. The cost of each spare parts shall be carried over to relevant BOQ item and no extra payment shall be admissible in this regard.





#### 14.10 Special Tools

Contractor shall provide special tools as indicated in Appendix-IV and as may be deemed essential for assembly, adjustment, dismantling, installation and maintenance reasons.

No separate payment shall be made for any special tools and cost shall be deemed to be included in the cost of the Contract.

#### 15.0 APPENDICES TO BE FILLED IN BY THE BIDDER

The details regarding equipment manufacturers, deviations, etc., are to be furnished in the appendices attached with form of Bids, in accordance with the provisions of the clause "Requirements of Electrical Works" given in the instructions to Bidder, Volume - I.

#### 16.0 PAYMENT

No separate payment shall be made for work involved within the scope of this section unless specifically stated in the Bill of Quantities or herein.

\*\*\* End of Section 8001 \*\*\*



**SECTION - 8133**

**LT DISTRIBUTION BOARDS**

- 1.0 SCOPE OF WORK**
- 2.0 GENERAL**
- 3.0 APPLICABLE STANDARDS/CODES**
- 4.0 MATERIAL**
- 5.0 INSTALLATIONS**
- 6.0 MEASUREMENT AND PAYMENT**





## 1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing, and commissioning of all material and services of the complete Low Tension (LT) Distribution Boards as specified herein and/or shown on the Bidding Drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at site with other services for exact location and position of the each L.T. Distribution Board.

The Low Tension Distribution Board with accessories shall also comply with the General Specifications for Electrical Works, Section - 8001 and with other relevant provisions of the Bidding Document.

## 2.0 GENERAL

The Low Tension Distribution Board (DB) shall be sheet steel fabricated suitable for surface/recessed mounting on wall or floor standing totally enclosed, dust tight and vermin proof. It shall be complete in all respect with material and accessories, finished according to the Specifications and to the normal requirements. The LT Distribution Board shall have protection class IP-42 for indoor installation, class IP-54 for indoor damp areas and class IP-65 for outdoor area.

The Low Tension Distribution Board shall be front operation type and shall:

- have a rated service short circuit breaking capacity (Ics), conforming to IEC 60947-2 and as shown on the drawings.
- be provided with adequate clearance from live parts so that the flashovers can not be caused by switching, vermin, pests etc.
- be suitable for 400 Volts, 3 phase 4 wire, 50 Hz system.
- be designed for flush mounting of all instruments on the front side.
- have incoming and outgoing cable termination arrangement, terminal block/line up terminals.
- be provided with stainless steel name plate on the front side of door.
- have all incoming and outgoing connections from top or bottom as per requirement of site conditions.
- have door grounded by flexible copper strip/cable.
- have wiring diagram in the pocket inside the door of Distribution Board



### 3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope for this section:

IEC 60051	-	Direct setting electrical measuring instruments
IEC 60073	-	Colours for indicator lights and push buttons
IEC 60947-2	-	Low voltage switchgear and control gear
IEC 60439	-	Low Voltage Switchgear and Control gear Assemblies.
BS 4752	-	Circuit Breaker
BS 3871	-	Miniature & Moulded Case Circuit Breakers
BS 88	-	HRC fuses
BS 89/90	-	Ammeters and Voltmeters
BS 3938	-	Low voltage current transformers
BS 1432	-	Bus Bars



### 4.0 MATERIAL

#### 4.1 Sheet Metal Work

The Low Tension Distribution Board (DB) shall be fabricated with 16 SWG/14SWG sheet steel recess / surface mounting as approved by the Engineer. All the components shall be installed on a common component mounting plate inside the enclosure and protected from the front with screwed sheet steel front plate. The enclosure shall be provided with rubber gasketing and a lockable hinged door with cam fastener.

The distribution board shall be supplied complete with all installation materials as recommended by the manufacturer. The incoming and outgoing cable connections shall be according to the wiring requirements. If required, an adapter box for accommodating the cables and conduits may be provided. The box shall be of the same material and finish as the DB. All holes, cutout etc. shall be tool and free from burrs and rough edges.

The cabling inside the DB shall be suitably harnessed by means of straps



or cords. Colour sleeves shall be provided on each cable lugs connected to the bus bars, circuit breakers or terminals for phase identification. An earth bar shall be provided for connection of incoming and outgoing earth conductors. The earth bar shall be permanently connected to the body of DB at two points. Flexible copper strip shall be provided for earthing of the door of DB.

Circuit numbers/ designation on all circuits shall be conspicuously marked to facilitate connection and maintenance.

All metal work of the DB shall be cleaned down to bare shining metal phosphated and the surfaces chemically prepared for powder coating. Then these shall be coated with powder of colour RAL 7032 and then baked in oven. The thickness of powder coating shall not be less than 120 microns.

## 4.2 Components

The Low Tension Distribution Boards (DB) shall be provided with components as specified, as shown on the Bidding Drawings and required for the satisfactory operation of the distribution board and of the electrical system.

Typical component specifications are given below:

### 4.2.1 Bus Bars

The Bus bars shall be made of 99.99% pure high conductivity electrolytic tinned copper and shall be completely isolated and mechanically braced for the specified fault level. The identification of bus bars shall be by providing colours sleeves on bus bar ends and these shall be red, yellow and blue for phases and black for neutral. The earth bus bar shall be green.

The bus bars shall be for three phase, neutral and earth and shall be of appropriate size to meet the electrical and mechanical requirements of the system. The temperature rise shall not exceed 30°C at rated current.

### 4.2.2 Moulded Case Circuit Breaker (MCCB)

The MCCBs shall be moulded case triple pole 440 Volts or single/double pole 250 Volts of current ratings as shown on the drawings. These shall have fixed magnetic short circuit and adjustable/fixed thermal overload protection.

Under voltage and shunt trip etc. shall also be provided when so required for safe operation and interlock.

The MCCBs shall be installed such that their switching levers are accessible through the front plate for operation.

The single and triple pole MCCBs shall have short circuit rupturing capacity suitable for the distribution system as approved by the Engineer or as shown on the drawings. The MCCBs shall be suitable for working on lighting and power circuits.

#### 4.2.3 Ammeters and Voltmeters

All meters shall be flush mounting, moving iron, spring controlled. The front dimensions shall be 96 x 96 mm for meters.

The meters shall be of accuracy class 1.5 according to BS-89 and 90. The ammeter shall be suitable for connection to 5 Amps secondary of current transformers or directly through shunt as shown on drawings. The ammeters and voltmeters shall have measuring range as indicated on the drawings.

#### 4.2.4 Current Transformers

Air cooled, ring type current transformers shall be provided having transformation ratio as indicated on the drawings. The current transformers shall be of suitable burden having accuracy class 1.0 according to BS 3938. The current transformers shall have 5 amps secondary.

#### 4.2.5 Selector Switches

The ammeter and voltmeter selector switches shall be complete with front plate, grip handle, R-Y-B and OFF position for ammeters, and RY-YB-BR-RN-YN-BN and OFF position for voltmeters shall be marked on the respective selector switches.

#### 4.2.6 Air Break Contactors

The contactors shall be air break, triple pole 400 VAC type and suitable for the type of duty (at least utilization Category AC3) to be performed. The main contacts shall be silver tipped, butt type with double break per pole. Each contactor shall be provided with single phase 230 VAC operating coil and minimum one spare normally open and one normally closed auxiliary contact. The number of working auxiliary contacts shall be provided according to the system requirements.

#### 4.2.7 Push Buttons





The push buttons shall be illuminated, momentary make/break contact type or latch type (push-on/push-off) as required and approved by the Engineer and suitable for flush mounting. The push button for ON and OFF switching shall be red and green respectively. They shall be provided as shown on the drawing.

#### 4.2.8 Indicating Lamps

Indicating lamps shall be LED type suitable for flush mounting, complete with base. They shall be suitable for operation on 230 V AC and it shall have rosettes of suitable colours as approved by the Engineer. These shall be provided for R, Y, B phases on each distribution board.

#### 4.2.9 Impulse Relay

Impulse Relay shall be 1 or 2 pole, 250 V rated and be provided with latching mechanism.

#### 4.2.10 Line up Terminals

Line up terminals wherever provided for control or power circuits shall be suitable for voltage and size of conductors as indicated on drawing.

The line-up terminals for controls shall be suitable for channel mounting. All necessary accessories such as end plates, fixing clips, transparent label holder caps and label sheets with marking shall be provided.

## 5.0 INSTALLATION

The location of low tension distribution boards (DB) are shown diagrammatically on the drawings. The actual location shall be determined at site, keeping in view the site conditions and in co-ordination with other equipment, as approved by the Engineer.

Low tension distribution board for recessed mounting in wall shall be installed such that the door shall finish flush with the surface of wall. The recess mounted distribution board shall be installed before the plastering of walls. The DB shall be protected to avoid any damage due to the civil work. Any cuttings, dismantling of the existing wall required for fixing the DB shall be coordinated at site with the approval of Engineer. Any damage done to civil structure shall be made good by



the Contractor.

All loose parts dispatched separately with the DB shall be installed as per manufacturer instructions and all adjustments or setting shall be made as required. All screws, nuts and bolts used for fixing the distribution board shall be galvanized.

The distribution boards installation shall include connecting all incoming and outgoing cables. The cable entry in the boards shall be provided from top or bottom as required and/or as approved by the Engineer.

The distribution boards shall be tested as per instructions contained in article "Testing" of General Specifications for Electrical Works, Section-8001 of these Specifications.

## 6.0 MEASUREMENT AND PAYMENT

### 6.1 General

The Contractor's bid amount against each item of Bill of Quantities as given below shall include design, fabrication, supply, installation, testing, commissioning and completion for all works specified herein and/or as shown on the Bidding Drawings related to the item.

### 6.2 LT Distribution Boards (DBs)

#### 6.2.1 Measurement:

Measurement shall be made for the number of each LT Distribution Board acceptably supplied and installed by the Contractor as a complete job.

#### 6.2.2 Payment:

Payment shall be made for the number of jobs measured, as provided above, at the Contract unit price each and shall constitute full compensation for design, fabricating, supplying, installing, connecting, testing and commissioning of the LT Distribution Boards, including fixing arrangement, adapter box and other components/accessories for complete installation.

\*\*\* End of Section 8133 \*\*\*





**SECTION - 8150**

**LIGHT FIXTURES**

- 1.0 SCOPE OF WORK**
- 2.0 GENERAL**
- 3.0 APPLICABLE STANDARDS/CODES**
- 4.0 MATERIAL**
- 5.0 INSTALLATIONS**
- 6.0 MEASUREMENT AND PAYMENT**



## 1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing and commissioning of all material and accessories of the complete Light fixtures as specified herein and/or shown on the Tender drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact locations and positions of the light fixtures.

The lighting fixtures with accessories shall also comply with the General Specifications for Electrical Works, Section-8001 and with other relevant provisions of the Tender Document.

## 2.0 GENERAL

The description of light fixtures is given in the bill of quantities, and stated on the drawings, and all relevant material is described in this Section. The determination of quality is based on certified photo-metric data covering the coefficient of utilisation, light distribution curves, construction material, shape, finish, operation, etc.

The Contractor shall submit at least two samples of each and every light fixture specified and obtain approval of the Engineer before purchasing. The quality and finishes of the local make light fixtures (if mentioned in BOQ) shall be same as that of standard manufacturer. The accessories such as ballast, LED drivers, lamps, ignitors, etc., for all type of light fixtures shall be of make as stated in list of approved manufacturers. Approved equivalent against those specified will be accepted if the specified one is/will not be available. For any substitution the Engineer's approval is necessary.

All fixtures shall be finished in standard colour schemes as mentioned in the manufacturer's catalogue for respective fixtures, unless specifically stated in the Specifications, Drawings or Bill of Quantities or directed by the Engineer.

## 3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards/codes shall be applicable to the material specified within the scope of this section:

IEC 60598-2-1-	Particular requirement- Fixed general purpose luminaire
IEC 60598-2-2-	Electrical Insulation Class I
IEC 62471 -	Photo biological Safety of lamps and lamps system
IEC 62031 -	LED modules for general lighting – Safety specifications





IESNA LM80	-	Testing report for LED Chips with TM21 extrapolation graph
IEC61347-1 - IEC61347-2-13	-	General and safety requirements. Particular requirements for DC or AC supplied electronic control gear for LED modules.
IEC62384	-	DC or AC supplied electronic control gear for LED modules.
ISO 7010	-	Signs for the purposes of accident prevention, Fire protection, health hazard information and Emergency evacuation.

## 4.0 MATERIAL

### 4.1 LED Flood Light Fixture

The Contractor shall furnish and install the complete Boundary Wall luminaires maintaining avg. 30 lux for existing outdoor mixed traffic area, fully IP 66 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaires shall be fully flexible for future upgrades and easy replacements for maintenance purposes.

The luminaire shall have such distribution to achieve flood lighting application parameters. The luminaire shall offer a composite system efficiency of at least 100 Lumen/Watt and a lumen package of up to 13,000 for 120W+/-5W. The light fixture have three different optical beam angles Symmetric Wide Beam & Asymmetric Medium Beam & Narrow Beam optics according to application.

The LED light fixture should be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 45 °C and shall be capable to operate efficiently within the temperature limit of -40 °C to 50 °C. The complete light fixture should have useful life of 50,000 burning hours.

### 4.2 LED Street Light Fixture

The road light fixture shall be an attractive modern appearance, high performance lantern suitable for 150W LED lamp as given in the BOQ/drawing.

Light fixture shall be provided with solid die cast aluminium housing, heat resistant silicon rubber gasket in optical LED compartment, DME type optic, tampered glass cover and shall be coated with powder of colour RAL 7040 ensuring no discoloration when exposed to UV light.

The light fixture shall be designed to receive power either from the battery or from the AC source. The light fixture shall have the following characteristics:

Voltage	=	85-265 VAC
Surge Protector	=	10 kV
Power Factor	>	0.9 (nominal power)

The light fixture shall have IP 66 protection to ensure long reliable performance and minimize maintenance requirement and an Impact resistance of IK 08 with insulation Class I. Use of chemical glue shall NOT be allowed to avoid probable breakdown of water-proof and dust-proof seal.

The light fixture should have a minimum color rendering index (Ra) of 70 + 5 and a color temperature of 4000K for maximum efficacy with an average output of at least 10,000 lumens for 90 Watt and 22,000 lumens for 200 Watt LED Fixture. The LED should have a color consistency within 5 SDCM (Standard Deviation of Color Matching). The color temperature variation of the LEDs should be restricted as per ANSI C78.377A with CCT variation limiting within 500K for nominal CCT of 4000K.

The LED light fixture should be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 45 °C and shall be capable to operate efficiently within the temperature limit of -40 °C to 55 °C. The complete light fixture should have useful life of 50,000 burning hours.

The light fixture shall be fully compatible with future LED upgrades when they become available. It shall have a modular design to upgrade / replace with new LED modules or LED drivers at site conveniently with minimum effort. All electronic components/drivers shall be mounted on a separate removable gear tray. Light fixture housing shall have a tool less access by opening the cover.

The proposed LED road lighting light fixture shall be provided with in-built surge protection system to protect the electronic driver and LED system. Minimum surge protection rating is 10kV.

The housing shell, under the circuit board, shall be specially designed to ensure perfect contact between the circuit board and the light fixture housing for efficient heat dissipation. Only Metal Core PCBs shall be used to maximize heat transfer process and to offer reinforced electrical insulation via di-electric layer. The Metal Core PCB should be mounted on the housing using a highly efficient thermal interface material.





The optical LED compartment shall have a thermally hardened glass cover and high quality silicon gasket. The Glass cover will be tightly secured with the housing. The light fixture should have flexible optical system to achieve lighting parameters for required class of roads. The light fixture should offer a composite system efficiency of at least 100 lumen/Watt.

Specially designed lens system with unique inner and outer profile for high efficiency LED shall be provided to ensure maximum spacing between the poles and cover higher road widths. Multi layer optics design to ensure adequate luminance and luminance uniformity in the unlikely event of individual LED failure. The light fixture should offer choice of narrow, medium and wide beam light distribution.

The lamp position shall be adjustable to at least three positions to facilitate the changing of photometric distributions.. The photometric data of the lantern shall be authenticated by an Internationally Accredited Lighting Organisation.

Luminance level calculation with average luminance of the road surface, overall uniformity of road luminance, threshold increment, longitudinal uniformity of road surface luminance and surround ratio achieved shall be submitted by the Contractor / manufacturer for verifying conformance to international lighting standards and approval of the Engineer.

#### 4.3 LED Chips and Driver

The LED chip shall be from Cree / Nichia / Lumileds make or approved equivalent. The LED driver shall be designed to operate large array of high power LED's through current controlled output. The driver shall be suitable for operate up to 250VAC 50/60Hz mains supply. The LED driver shall have an efficiency of at least 90%. Fixed Output LED Driver (PSU) shall be integrated within each LED luminaire. The Driver compartment cavity and gear tray shall be designed with tool-less access for maintenance and replacement.

The light fixtures including the driver will include a warranty of at least 3 years against manufacturing defects. The cost of such provision will deemed to have been respective BOQ item of light fixture and no separate payment shall be admissible in this regard.

The LED driver shall fully conform to following specifications:-

- 1) BS-EN 61347-1 - General and safety requirements.
- 2) BS-EN 61347-2-13 - Particular requirements for DC or AC supplied electronic control gear for LED modules.
- 3) BS EN 55015: 2013 – Emission – Electrical lighting and similar equipment



- 4) BS EN 61547: 2009 – Immunity – Equipment for general lighting purpose
- 5) BS EN 61000-3-2: 2009 – Limits for harmonic currents emissions.
- 6) BS EN 61000-3-3: 2008 – Limits for voltage fluctuation and flicker.
- 7) BS EN 62493 – Assessment of lighting equipment related to human exposure to electromagnetic fields

## 5.0 INSTALLATION

### 5.1 General

The mounting heights of light fixtures are indicated on the drawings, and positions of fixtures are according to the mentioned scale.

The Contractor must ensure that the light fixtures are installed uniformly with respect to the dimensions of the area. Any modifications due to site conditions may be made with the approval of Engineer. All fixtures shall be carefully aligned before fixing in position.

The wiring between ceiling rose or terminal box and the fixture shall be carried out with 3-core 1.0 sq.mm and 1.5-sq.mm flexible copper conductor PVC/PVC cable respectively for circuits protected by 10 amps and 15/20 amps MCBs. The wiring inside light fixture body shall be done with heat resistant cables or PVC insulated cable in heat resistant sleeves as approved by the Engineer.

Glasses, shades, reflectors, diffusers, etc., must be in a clear condition after installation. All light fixtures shall be earthed by an earth wire connected to the earth terminal in the fixture.

### 5.2 Street Light / Flood Light Fixture

The proposed street light fixture / flood light fixture shall be installed on the light pole/mast as per manufacturer's installation instructions. The road light fixture shall be properly levelled and the lamp adjusted to the appropriate position and all screws, bolts checked for tightness, etc. The light fixture shall be connected to the supply and earth at the proper terminals in the fixture.

### 5.3 Flood Light Lanterns

The flood light lanterns shall be installed on truss/G.I. bracket as per details shown on the drawing. Manufacturer's installation instructions shall be followed. The G.I. bracket shall be installed on column as shown on drawing. The exact location, rating and tilt/pan angles of light fixtures shall be finalized at site to suit the flood lighting requirements. Engineer's decision will be binding and final.





#### 5.4 LED Batten / Panel Light Fixture:

LED Batten or Panel light fixtures on the surface of ceiling shall be installed with the back of the body flush with the ceiling surface, and in a manner so as to facilitate wiring. Nylon plugs and galvanized steel bolts or screws shall be used for fixing the light fixture to the ceiling. For light fixtures installation on false ceiling the installation method/detail shall be coordinated with ceiling design and submitted for approval of Engineer. Care shall be taken to prevent the weight of the fixture from being transferred to the false ceiling.

Pendant light fixtures shall have two holes in the top of each casing for supporting to the ceiling by a 3/4" dia. galvanized pipe or any other standard method as approved by the Engineer. Wiring from ceiling rose to the fixture shall be done through the pipe. Proper arrangements such as long threads with check nuts, etc. for minor adjustment in the mounting heights of the fixtures shall also be provided.

#### 5.5 LED Down Light Fixture

LED downlight fixtures shall be installed on the surface of ceiling or wall by means of nylon plugs and galvanized steel screws, such that their back finish flush with the surface for exposed conduits and flush with outlet box for concealed conduit system. Wherever convenient, screws for fixing light fixtures shall be screwed into the holes of the outlet box. The lights on false ceiling shall be installed in a manner as described for LED Panel light fixture.

### 6.0 MEASUREMENT AND PAYMENT

#### 6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or shown on the Bidding Drawings related to the item.

#### 6.2 LED Batten / LED Smart Panel / LED Downlight / LED Exit Light / CFL Bulkhead / LED or Conventional Flood Light/ LED Street Light Fixture

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or shown on the Bidding Drawings related to the item.

##### 6.2.1 Measurement

Measurement shall be made for each type of light fixture including



all accessories acceptably supplied and installed by the Contractor as complete unit.

#### 6.2.2 Payment

Payment shall be made for the number of units measured as provided above at the contract unit price each and constitute full compensation for supplying, installing, connecting, testing and completion of LED Battens / LED Smart Panel / LED Downlight / LED Exit Sign / compact fluorescent Bulkhead including all accessories such as capacitors , LED drivers, LED Chips, LED optics, connecting cables & connectors, suspension rods and pendent arrangement, GI pipe bracket, ceiling supports, internal wiring, nuts, bolts, screws, etc., as required and complete in all respects.

### 6.3 **LED Street Light Fixture**

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or shown on the Bidding Drawings related to the item.

#### 6.3.1 Measurement

Measurement shall be made for each type of light fixture including all accessories acceptably supplied and installed by the Contractor as complete unit.

#### 6.3.2 Payment

Payment shall be made for the number of units measured as provided above at the contract unit price each and constitute full compensation for supplying, installing, connecting, testing and completion of High Pressure Sodium Flood Light / LED Flood Light Fixtures/ LED Street lights including all accessories such as ballasts, capacitors, igniters, LED drivers, nuts, bolts, screws, etc., including PVC pipe, foundation etc., as required and complete in all respects.

\*\*\* End of Section 8150\*\*\*





**SECTION - 8220****WIRING ACCESSORIES**

- 1.0 SCOPE OF WORK
- 2.0 GENERAL
- 3.0 APPLICABLE STANDARDS/CODES
- 4.0 MATERIAL
- 5.0 INSTALLATIONS
- 6.0 MEASUREMENT AND PAYMENT



## 1.0 SCOPE OF WORK

The work under this Section consists of supplying, installing, and commissioning of all material and services of the complete Wiring Accessories including switches, switch sockets, etc., as specified herein and/or shown on the Bidding drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at Site with other services for exact location and position of all wiring accessories.

The wiring accessories such as switches, switch socket outlets, socket outlets and ceiling roses, etc. shall also comply with the General Specifications for Electrical Works Section 8001 and with other relevant provisions of the Bidding Documents.

## 2.0 GENERAL

The locations of the wiring accessories such as switches, sockets, etc. are tentatively shown on the drawings. The Contractor shall ensure the exact positions and locations of wiring accessories in coordination with other services drawings, as per site requirements and as directed by the Engineer. The Contractor shall be responsible for proper functioning of wiring accessories after installation and commissioning.

The description of switches, switch sockets, socket outlets etc. are given in the Bill of Quantities, stated as drawings and in this section. The Contractor shall submit sample of each and every item of wiring accessories for the approval of the Engineer.

## 3.0 APPLICABLE STANDARDS/CODES

The latest edition of following standards & codes shall be applicable for the materials specified within the scope of this section :

BS 3676	-	Switches for domestic and similar purposes.
BS 4343	-	Industrial plugs, socket outlets and couplers for AC and DC supplies.
BS 2135	-	Capacitors for radio interference suppression.
BS 67	-	Ceiling roses.
BS 546	-	2-pole and earthing pin plugs, socket outlets and socket outlet adaptors.
BS 1362	-	Specification for general purpose fuse links for domestic and similar purposes.





BS 1363 (Part 4-1995) -	Specification for 13A fused connection units: switched and unswitched.
BS 5733 (1995) -	Specification for general requirements for electrical accessories.
DIN EN 60669-1 -	Switches for household and similar fixed electrical installations.

#### 4.0 MATERIAL

##### 4.1 Switches/Blank Face Plates

Switches for controlling light and fan points shall be single pole, rated for 10 Amps, 250 volts AC. The body of the switches shall be of thermoplastic with faceplate suitable for flush mounting and colour as approved by the Engineer. The switches shall be gang type having silver tipped contacts and shall operate with snap action.

Unless otherwise specified wherever switches control only the light points, these shall be plate type gang switches installed on common outlet boxes. Where only sheet steel back box is indicated on drawings, blank face plates shall be provided of same make and model as that of switches.

Where specified weather proof or metal front plates shall be used with single grid type switches. The plate shall be finished in specified colour or as otherwise directed by the Engineer.

The bell push switches shall be spring loaded type with the identification symbol embossed on it.

Two-way and intermediate switches shall be used to control lights from two or more different locations particularly in staircase as shown on the drawings.

##### 4.2 13A Switch-Socket/Socket Outlets

Switch socket/Socket units shall be 3 pin, 13 A 250V, AC with faceplate of colour as approved by Engineer. The outlets shall be heavy-duty type suitable for mounting on sheet steel outlet box. The 13 Amps Switch socket/Socket outlets shall have sheltered live contacts and designed such that the earth pin of plug is engaged to socket earth before making of live contacts.



Where metal plate switches are installed, the switch socket units shall also be provided with front plate of similar design.

#### 4.3 15A Socket Outlets

15 Amps Socket Outlets shall be 2 pin + earth, 250V AC socket outlets with faceplate of colour as approved by the Engineer by the Engineer.

The outlets shall be heavy-duty type suitable for mounting on sheet steel outlet box. The 15 Amps Socket Outlets shall be designed such that the earth pin of plug is engaged to socket earth prior to making contact to the live contacts.

#### 4.4 32A Industrial Socket Outlet

The 32A, industrial socket outlet shall be weather proof conforming to the standard and requirements of relevant IEC codes.

The socket outlets shall be of heavy-duty type suitable for outdoor installation. The socket outlet shall be mounted on polycarbonate enclosure and have gasketed cover and window, captive cover screw type. All socket outlets shall be supplied with matching plugs.

#### 4.5 64A Industrial Socket Outlet

The 16A, industrial socket outlet shall be weather proof conforming to the standard and requirements of relevant IEC codes.

The socket outlets shall be of heavy-duty type suitable for outdoor installation. The socket outlet shall be mounted on polycarbonate enclosure and have gasketed cover and window, captive cover screw type. All socket outlets shall be supplied with matching plugs.

#### 4.6 Connection Unit

Connection Unit shall be used to supply to appliances where so specified or shown on drawings. (Air conditioner/Hand drier / Water heaters etc.).

It shall be rated for 20A, 250V AC or as shown on drawings/BOQ. The body shall be of thermoplastic material. Installation shall be surface/ concealed as required.

Face plate and colour to be as per approval of Engineer.

Connectors shall be of best quality (for Phase, Neutral and Earth) and suitable for the size of wiring.





The connection unit shall have the following features as per requirement in B.O.Q or as shown on drawing.

- 20 A Double Pole Switch
- Fuse – Rating as per requirement of appliance
- Neon Indication light
- Grommetted outlet on face plate suitable for flexible wiring connection to appliance

#### 4.7 Ground Jack Module

Ground jack modules are used to make convenient ground connections for medical equipment of operation theaters. These unit contain ground jack receptacles and a ground bus. These modules shall be furnished with type #304 brushed stainless trim. These modules shall be provided with 30A twist-to-lock ground jacks, 1 No. copper ground bus bar 1/8" thick x 3/4" wide and lug suitable for 2.5 sq. mm. earth cable connection.

#### 4.8 Fan Dimmers

The fan regulator/dimmer shall be made of low voltage electronic components with essential radio frequency compressor and shall be designed for smooth speed control/variation of fans. The regulators/dimmer and fan control switches shall be of same make and colour as that of the approved wiring accessories. The regulator/dimmer and fan-controlling switch shall preferably be mounted on same face plate. They shall be suitable for flush mounting on a sheet steel outlet back box.

#### 4.9 Sheet Steel Back Boxes

The sheet steel boxes for installation of switches, fan dimmers, socket, outlets and blank face plates shall be made of 16 SWG sheet steel having appropriate dimensions. The box shall have suitable arrangement for receiving the conduit(s). An earth terminal shall be provided for connecting at least three earth wires of 4-sq.mm size. The outlet box shall be finished in powder-coated paint. The sheet steel back box shall be as approved by the Engineer.

#### 4.10 Ceiling Roses

The ceiling roses shall be suitable for 5 amps 250 volts single-phase ac. It shall have white plastic moulded base plate and copper or brass terminals suitable for connecting at least two wires of 2.5 sq. mm size. The ceiling rose shall have a cover with cable inlet hole suitable for multicore PVC insulated and PVC sheathed cable.



## 5.0 INSTALLATION

### 5.1 General

The mounting heights of all wiring accessories are stated on the drawings. In case the mounting height is not mentioned, the instructions of the Engineer shall be obtained before fixing.

### 5.2 Wiring Accessories Installation

All wiring accessories such as Switches, Blank Face Plates, 13/15A Switch Socket, 32/64/125A Industrial Socket Outlet, Connection Units & ground jack modules shall be installed on 1.63 mm (16 SWG) thick sheet steel box recessed in wall/column/floor. The faceplate shall be fixed on sheet steel box by means of flat head galvanized or brass screws sunk in the faceplate so as to finish flush with the surface. Matching screw caps shall be installed on the opening for screw in faceplates.

The units installed in integrated bed head units shall be fitted with the parallel power tracks provided with the unit.

## 6.0 MEASUREMENT AND PAYMENT

### 6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supply, installation, testing, commissioning and completion for all work specified herein and/or as shown on the Bidding Drawing related to the item.

### 6.2 13A Switch Socket/Socket Outlets, 15 Amps Switch Socket/Socket Outlets, 32/64/125A Industrial Socket Outlet Connection Units & Ground Jack Module

#### 6.2.1 Measurement:

Measurement shall be made for the total number of each type of socket outlet complete with sheet steel back boxes, polycarbonate enclosure and all accessories acceptably supplied and installed by the Contractor as a complete unit.

#### 6.2.2 Payment:

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each and shall constitute full compensation for supplying, installing, connecting,





testing and completion of each type and rating of outlet including screws, screw caps, sheet steel box, polycarbonate enclosure, nuts, bolts and other accessories as required.

\*\*\* End of Section 8220\*\*\*



**SECTION - 8240**

**EARTHING**

- 1.0 SCOPE OF WORK**
- 2.0 GENERAL**
- 3.0 APPLICABLE STANDARDS/CODES**
- 4.0 MATERIAL**
- 5.0 INSTALLATIONS**
- 6.0 MEASUREMENT AND PAYMENT**





## 1.0 SCOPE OF WORK

The work under this section consists of supplying, installing, testing and commissioning of all material and services of the complete Earthing system as specified herein, as shown on the Tender Drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact route, location and position of the earth electrode and ECC etc.

The Earthing system shall also comply with the General Specifications for Electrical Works Section - 8001 and with other relevant provisions of the Tender Documents.

## 2.0 GENERAL

The earthing system consists of earth electrodes, earthing leads, earth connecting points, earth continuity conductors and all accessories necessary for the satisfactory operation of the associated electrical system.

## 3.0 APPLICABLE STANDARDS/CODES

The latest editions of following standards / codes shall be applicable for the materials specified within the scope of this section:

BS 951	-	Earthing clamps
BS 7430	-	Earthing
BS 2874	-	Nuts, bolts, washers, screws and rivets fixing for use on copper
BS 6346	-	PVC insulated cables

## 4.0 MATERIAL

### 4.1 Earth Electrode

#### 4.1.1 Plate Type

Earth Electrode for earthing shall comprise of 75 mm x 4877 mm x 6 mm thick copper plate with 4 Nos. 6 mm dia brass nuts, bolts and washers 70 sqmm HDHC Copper wire as earthing leads. A 100 mm dia Medium Duty GI pipe shall be used with 10 mm dia holes @500 mm c-c. The total length of this GI pipe should be 45 ft.



A 150 mm dia 60 ft long hole should be drilled in ground by percussion method and above mentioned 100 mm dia medium duty GI pipe should be fixed in this hole simultaneously up to the depth of 45 ft from NSL.

When the drilling up to 60 ft depth is complete, The above mentioned earth electrode shall be drop down to the bottom of the hole with the help of 2 Nos 70 sqmm earth leads. Once the plate is in place fill in the hole with moisture retaining bentonite slurry with tremie method up to the top. When the bentonite settle down cast a (1:4:8) concrete manhole 700 mm x 700 mm & 500 mm deep as shown in the drawing. Place a medium duty CI cover as shown in the drawing.

#### 4.1.2 Copper Clad Steel Rod Type

This type of earth electrode shall comprise a 3 metre long, 20 mm dia. copper clad steel rod having flat head at drive end and pointed conical tip at the driven end. The tip shall be hardened to facilitate driving. At the top of the rod, a brass clamp for bolted connections shall be provided suitable for connection to the down conductor or earthing lead as required. The thickness of Cu coating on the Galvanized Steel Rod should be 250 micron.

The inspection chamber with C.I. cover shall be provided as instructed by the Engineer.

#### 4.2 Earthing Lead

The earthing lead shall connect the earth electrode to earth connecting point or equipment in the building. It shall be of stranded bare electrolytic copper of size shown on the drawings. The cost of earthing leads deemed to have been included in the price of earth electrode and no separate payment shall be made for it.

#### 4.3 Earth Continuity Conductor

Earth continuity conductor (ECC) shall be stranded bare copper wire or single core PVC insulated copper conductor cable of sizes indicated on the drawings. All thimbles, lugs, sockets, nuts, washers & other accessories necessary for the complete installation of ECC shall be provided by the Contractor without any extra cost.

The specifications for single core PVC insulated cables used as ECC shall be same as those given in section "LT Cables" of the technical specifications. PVC insulated cables when used as ECC shall be green or green/yellow.





#### 4.4 Earth Connecting Point

Earth connecting points shall comprise tinned copper bar, rectangular in shape, having dimensions of 300 x 50 x 6 mm. At least six terminals for connection shall be arranged on the bar, which can be increased or decreased as required by the Engineer.

The terminals shall have brass or tinned copper bolts, nuts and washers for protection against corrosion. Two holes shall be provided off centre of the copper bar for fixing to the wall by means of 10 mm dia. nut and bolt and shall be insulated by means of rubber gaskets/washers.

### 5.0 INSTALLATION

#### 5.1 General

Complete earthing systems as shown on the drawing shall be installed by the Contractor. The earthing system shall give earth resistance, including the resistance of soil, earth leads and ECC equal to or less than one ohm.

At all connections of earth continuity conductor to Generator, Transformer, LT Switch Board, LT Distribution Board, or any other metallic body, proper size copper or brass sockets, thimbles or lugs shall be used to which the copper wire shall be connected by copper brazing. The soldering of copper wire at joints or terminations shall not be allowed. All tee-off connections shall be by copper brazing using suitable socket and clamps. After brazing, the jointed surface shall be protected by oxide inhibiting compound of low electrical resistance. For connections to metallic body, the surface shall be thoroughly cleaned before bolting the lug or socket.

The earth continuity conductor shall in general run in cable trench or in conduits/pipes as shown on the drawings. For under floor runs, these shall be installed in pipe/conduit of appropriate sizes. Where laid along underground cables, these shall be laid directly underground in unpaved areas and in pipes under paved areas.

The earthing system shall be tested after complete installation of earth electrodes.

#### 5.2 Earth Electrode

##### 5.2.1 Plate Type

The electrode plate shall be installed at a minimum depth of 5 metres from finished ground level or 1 metre below permanent water level whichever is less. The minimum horizontal distance between earth electrodes shall be 3 metres. Bentonite slurry with tremie method shall be made and buried alongwith the copper



plate in the ground to increase the soil conductivity. The electrode shall be installed as per details shown on the drawings. The inspection chambers shall be constructed at locations approved by the Engineer.

#### 5.2.2 Copper Clad Steel Rod Type

In case the soil conditions at site permit and approved by the Engineer this type of earth electrode may be installed by hammering the electrode in soil, until the top of the rod is about 300 mm below the proposed finished ground level. If hammering down of rod is not possible due to site conditions, a pit shall be first excavated in bare ground upto the required depth and electrode shall be installed upright in the pit. The excavated pit shall be backfilled in layers of 500 mm, each layer tamped and compacted.

### 5.3 **Earth Continuity Conductor**

The earth continuity conductor of sizes shown on the drawing shall be installed all along the cable runs and connected to the earthing bar/terminals provided in equipment. The body of generator, transformer and all switchboards shall also be connected to earth by specified size of ECC. All other metal work shall also be connected to earth by specified size of ECC.

At any joint or terminations, the ECC shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

### 5.4 **Earth Connecting Point**

The earth connecting point shall be installed at locations shown on the drawings. It shall be fixed on wall surface by means of brass screws with nuts, washers and other insulating material as instructed by the Engineer.

## 6.0 **MEASUREMENT AND PAYMENT**

### 6.1 **General**

The Contractor's bid amount against each Bill of Quantities item as given below shall include supplying, installation, testing, and commissioning of all work specified herein, as shown on the Tender drawing related to the item.





## 6.2 Earth Electrode

### 6.2.1 Measurement:

Measurement shall be made for the total no. of each type of earth electrode acceptably supplied and installed by the Contractor as a complete unit.

### 6.2.2 Payment:

Payment shall be made for the number of units measured, as provided above, at the Contract unit price each, and shall constitute full compensation for supplying, installing, testing, commissioning and completion of earth electrodes including copper plate or copper clad steel rod, earthing leads, excavation, backfilling, lime and charcoal, inspection chamber with cover, GI pipes for earthing leads/watering, nuts, bolts, washers, lugs, brazing and all related civil works.

## 6.3 Earth Continuity Conductor (ECC)

### 6.3.1 Measurement:

Measurement shall be made for the total running feet of each size and type of earth continuity conductor (ECC) acceptably supplied and installed by the Contractor.

### 6.3.2 Payment:

Payment shall be made for the total running feet of each size and type of ECC measured, as provided above, at the Contract unit price and shall constitute full compensation for supplying, installing, connecting, testing and completing of ECC including all accessories such as sockets, thimbles, lugs, bolts, nuts, washers, brazing, etc.

## 6.4 Earth Connecting Point

### 6.4.1 Measurement:

Measurement shall be made for the total no. of earth connecting points acceptably supplied and installed by the Contractor as a complete unit.

### 6.4.2 Payment:

Payment shall be made for the total number of units measured, as provided above, at the Contract unit price each and shall



constitute full compensation for supplying, installing and completion of earth connecting point and all other associated accessories such as nuts, bolts, washers, lugs, etc.

\*\*\* End of Section 8240 \*\*\*





**SECTION - 8250**  
**LIGHTNING PROTECTION SYSTEM**

**1.0 SCOPE OF WORK**

The work under this section consists of supplying, installing, testing and commissioning of all materials and accessories of the complete Lightning Protection System as specified herein, as shown on the Tender Drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact route, location and position of the lightning protection system.

The lightning protection system with accessories shall also comply with the General Specifications for Electrical Works Section - 8001 and with other relevant provisions of the Tender Documents.

**2.0 GENERAL**

The Contractor shall install the system as specified herein and in accordance with the referred standard. The extent of work specified or shown on the drawings is schematic and does not indicate the exact position of testing terminals, conductor connections, etc. However, the Contractor shall ensure that the system is complete in all respect as intended by the specifications. The earthing resistance of lightning protection system at any point in the system shall not exceed THREE OHMS.

**3.0 APPLICABLE STANDARDS/CODES**

The latest editions of following standards / codes shall be applicable for the materials specified within the scope of this section:

BS 6651	-	Protection of structures against lightning.
CP 326	-	Protection of structures against lightning (code of practice)
BS 2873	-	Copper and copper alloys
BS 2874	-	Copper and copper alloys - Rods and section (other than forging stock)
BS 1433	-	Hard drawn bare copper conductor for earthing



#### 4.0 MATERIAL

The installation of lightning protection system shall comprise;

- Air terminal
- Down/Roof conductors.
- Testing terminals.
- Earth electrode (Copper Clad Steel Rod Type)
- Concrete Inspection pit with cover

##### 4.1 Air Terminal

The air terminal for lightning protection system shall be of solid copper 1000 mm long, 15 mm dia with appropriate base suitable for connection of required number of roof/down conductors.

The structural design shall be submitted by the contractor for review in accordance with wind & seismic loads given in the relevant sections.

##### 4.2 Down/Roof Conductors

The down/roof conductors for lightning protection system shall be 70 sqmm bare solid soft drawn tinned copper conductor or 25mm x 3mm Cu Strip. All connections between metal work on the roof shall be with the same conductor sizes and material as for roof conductor. All accessories for fixing of copper conductor to concrete surface shall be of copper or brass as approved by the Engineer.

Alternatively, the down conductors shall be cad welded at the top & bottom with reinforcing bars of the column; Steel Structures etc. to be used as all or part of the down conductor system provided they are appropriately connected to the air and earth termination network and test shall be carried out at each step/levels to ensure good electrical conductivity.

##### 4.3 Testing Terminals

For each down conductor, a testing terminal shall be provided. It shall be installed 1.5 meters above the finished floor level or as convenient for testing purposes and as directed by the Engineer. The testing terminals shall have removable connections.

##### 4.4 Earth Electrode (Copper Clad Steel Rod Type)

This type of earth electrode shall comprise a 3.00 meter long, 20 mm dia. copper clad steel rod in section of 1.5 m with copper coupling having flat head at drive end and pointed conical tip at the driven end. The tip shall be hardened to facilitate driving. At the top of the rod, a brass clamp for bolted connections shall be provided suitable for connection to the down conductor or earthing lead as required.

The inspection chamber with C.I. cover shall be provided as specified for plate type earth electrode.





## 5.0 INSTALLATION

### 5.1 Air Terminal

The base of the air terminal shall be properly fixed to roof of the building and all roof/down conductors properly bolted. The threaded air terminal shall than be placed. The entire assembly shall be installed in compliance to wind loading / structural calculations.

### 5.2 Roof Conductor

The horizontal air terminations or roof conductors shall be installed on the roof in the form of network mesh of 20 m x 20 m as shown on the drawings. the copper strip 25x3 mm shall be firmly secured to the concrete surface by means of copper or brass clamps of approved design at a maximum interval of 500 mm.

The roof conductor in the form of copper strip 25x3 mm shall be connected to the copper rod by means of copper clamps. The clamp to be tightly fixed to the rod and brazed to ensure low resistance path to earth. The contact surface between copper clamp and conductor shall be cleaned, silver painted, brazed after bolting and provided with a coat of anti corrosive paint after installation.

### 5.3 Down Conductor

The down conductor shall be installed along the shortest possible route from roof to earth electrode. It shall be secured on the surface of wall by means of clamps at a maximum interval of 300 mm. Alternatively the down conductors shall be cad welded at the top and bottom of the column reinforcing bars, steel structures to be used as all or part of the down conductors system.

In general, bends shall be avoided along the routes of down conductor and maximum possible bending radius will be provided at turns. All joints between conductors shall be electrically and mechanically strong and effective. Straight joints in the down conductor shall be bolted. The joint shall be given a coat of anti corrosive paint after connection. All accessories such as nuts, bolts, washers, solder, paint etc. shall be furnished by the Contractor.

For each down conductor a removable terminal shall be provided for testing purpose at approximately 1.5 meter height. The location of testing terminals is not shown on the drawings. The Contractor must ensure that testing terminals are installed so as to facilitate testing. The testing terminals shall be bolted type and made in accordance with the specifications for straight bolted joints. The connecting earth lead from testing terminals to earth electrodes shall be continuous without any joint. All metal work, pipes etc., at the roof and within 2 meters along the route of Down conductor shall be bonded to the lightning protection system. The bonding shall be effective and approval of the Engineer shall be obtained for the bonding method.

### 5.4 Earth Electrode (Copper Clad Steel Rod Type)

In case the soil conditions at site permit, this type of earth electrode may be installed by hammering the electrode in soil, using driving stud until the top of the rod is about 300 mm below the proposed finished ground level. If hammering down of rod is not possible due to site conditions, a pit shall be first excavated in bare ground upto the required depth and electrode shall be installed upright in the pit. The excavated pit shall be backfilled in layers of 500 mm, each layer tamped and compacted to ensure a good and firm contact between electrode and earth.



## 6.0 MEASUREMENT AND PAYMENT

### 6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supplying, installation, testing, and commissioning and completion of all work specified herein, as shown on the Tender drawing related to the item.

### 6.2 Air Terminal

6.2.1 **Measurement:** Measurement shall be made for the total number of air terminal acceptably supplied and installed by the Contractor.

6.2.2 **Payment:** Payment shall be made for the total number of air terminal measured, as provided above, at the Contract unit price each, and shall constitute full compensation for supplying, installing, testing, commissioning and completion of the air terminal including all accessories, such as sockets, thimbles, lugs, bolts nuts, brazing, etc.

### 6.3 Down/Roof Conductors

6.3.1 **Measurement:** Measurement shall be made for the total running meter of down/roof conductors acceptably supplied and installed by the Contractor.

6.3.2 **Payment:** Payment shall be made for the total running meter of down/roof conductors measured, as provided above, at the Contract unit price each, and shall constitute full compensation for supplying, installing, testing, commissioning and completion of the down/roof conductors including all accessories, such as sockets, thimbles, saddles, lugs, bolts nuts, brazing / cad welding etc.

### 6.4 Earth Electrode (Copper Clad Steel Rod Type)

6.4.1 **Measurement:** Measurement shall be made for the total number of copper clad steel rod type earth electrode acceptably supplied, installed and tested by the Contractor as a complete unit.

6.4.2 **Payment:** Payment shall be made for the number of units measured, as provided above at the Contract Unit Price each, and shall constitute full compensation for supplying, installing, testing, commissioning and completion of the copper clad steel rod type earth electrode including testing terminal, earthing lead from testing terminals to earth electrodes, excavation, backfilling, compaction, civil works for inspection chamber, cast iron cover, G.I. pipe for earthing lead etc. and all accessories, such as sockets, thimbles, lugs, saddles, bolts nuts, brazing, etc.





## 6.5 Cad Welding

- 6.5.1 **Measurement:** Measurement of cad welding of down conductors with the reinforcing bar of the column and welding of bar to bar shall be made for the total number of points acceptably done and completed by the Contractor.
- 6.5.2 **Payment:** Payment shall be made for the number of cad welding points completed as provided above at the contract unit price each, and shall constitute full compensation for execution and completion of the cad welding including testing at each step/level for good electrical conductivity.



# COMPLETION OF LEFTOVER WORK OF CHOTTAGALA CAMPUS, UNIVERSITY OF POONCH, RAWALAKOT, AJK

(PACKAGE B-1)

## BIDDING DOCUMENTS

### VOLUME-III

SEPTEMBER, 2024

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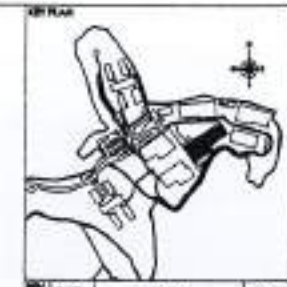


**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD.**  
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ARCHITECTURAL DRAWINGS

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58	FIRST FLOOR FLOORING PLAN ( BLOWN UP)	A11-005
59	FIRST FLOOR FLOORING PLAN ( BLOWN UP)	A11-006

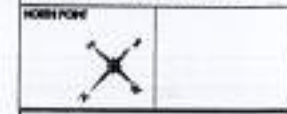


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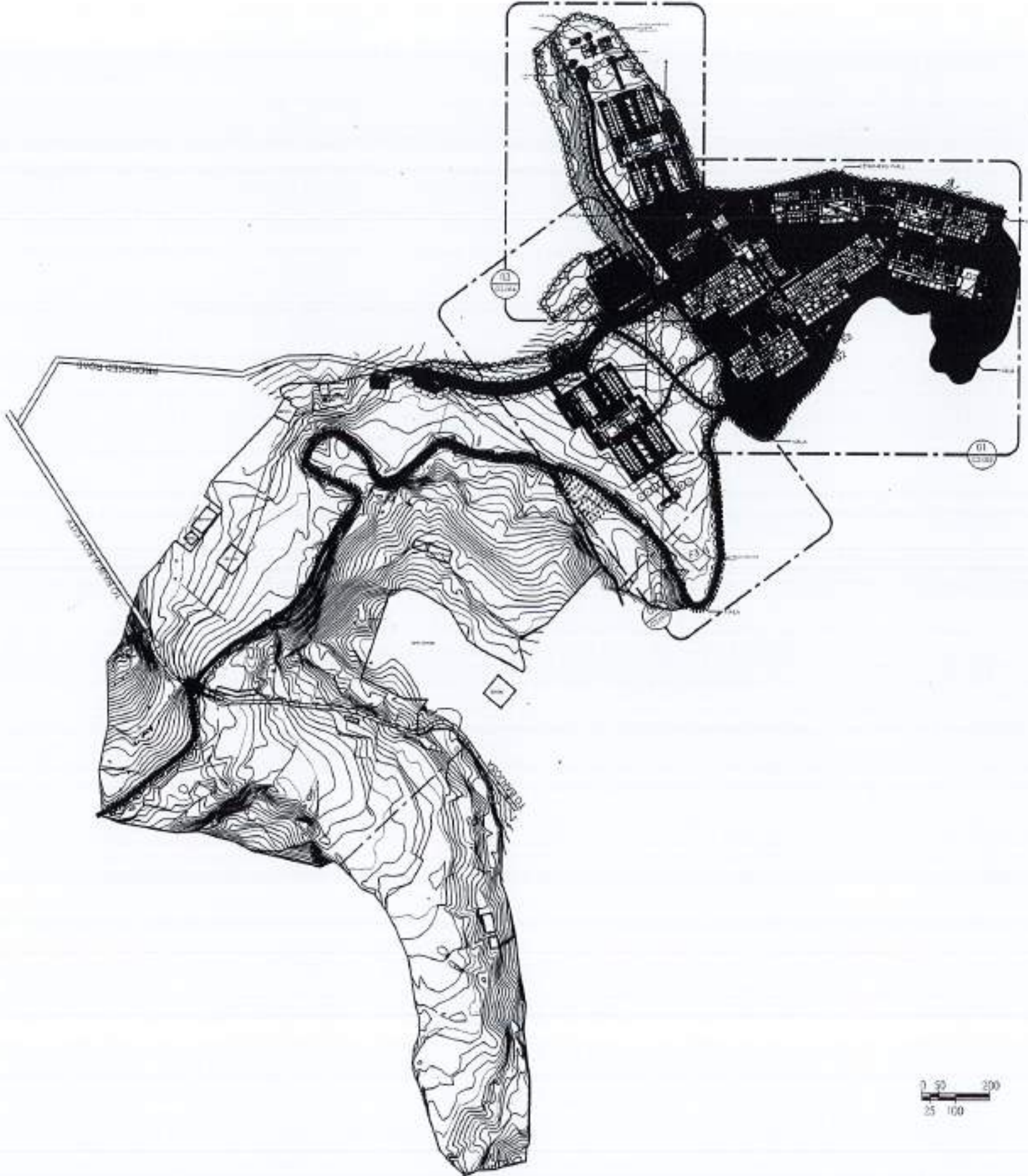
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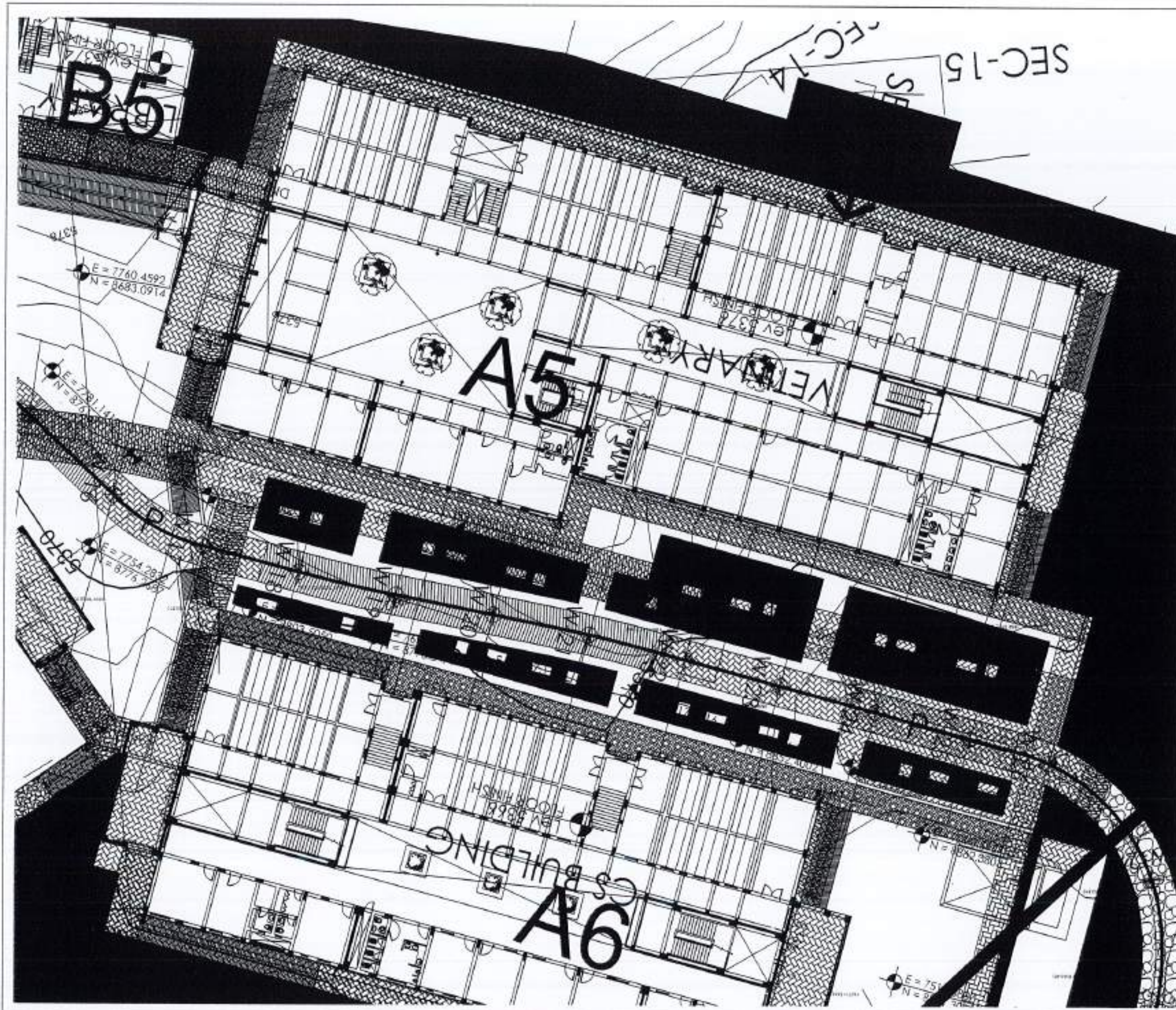
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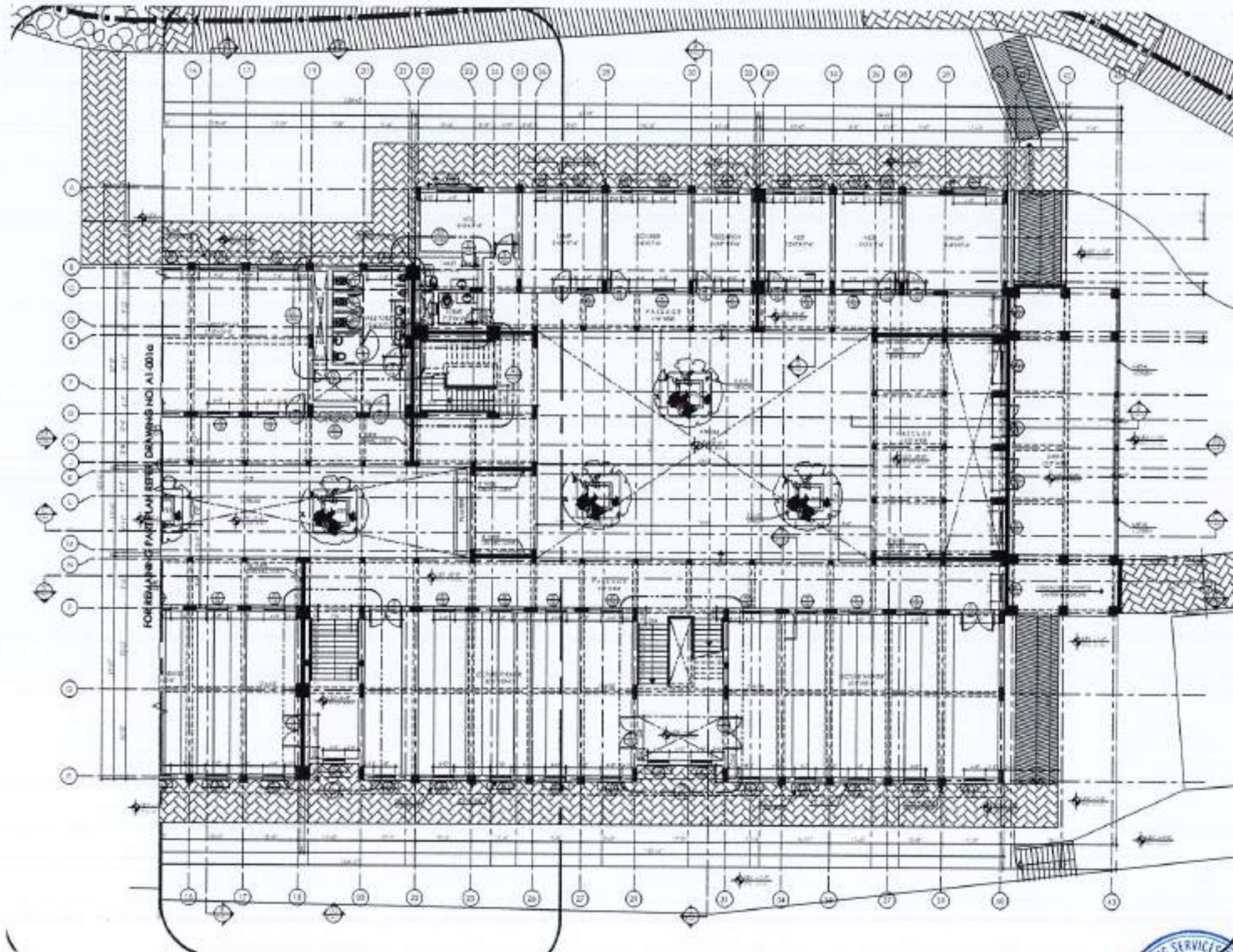
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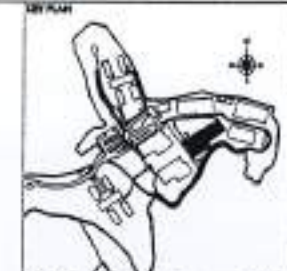
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1 GROUND FLOOR PLAN PART - 02



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 U.S. Associates  
 ENVIRONMENTAL & MANAGEMENT CONSULTANT:  
 U.S. Associates  
 U.S. Associates  
 U.S. Associates

JOB NO. 502  
 DRAWING NO. A1-001b

REVIEW & APPROVAL CONSULTANT:  
**NESPAK (PVT.) LIMITED**

SUBJECT MATTER:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 GROUND FLOOR PLAN  
 PART - 01  
 WORKING DRAWING

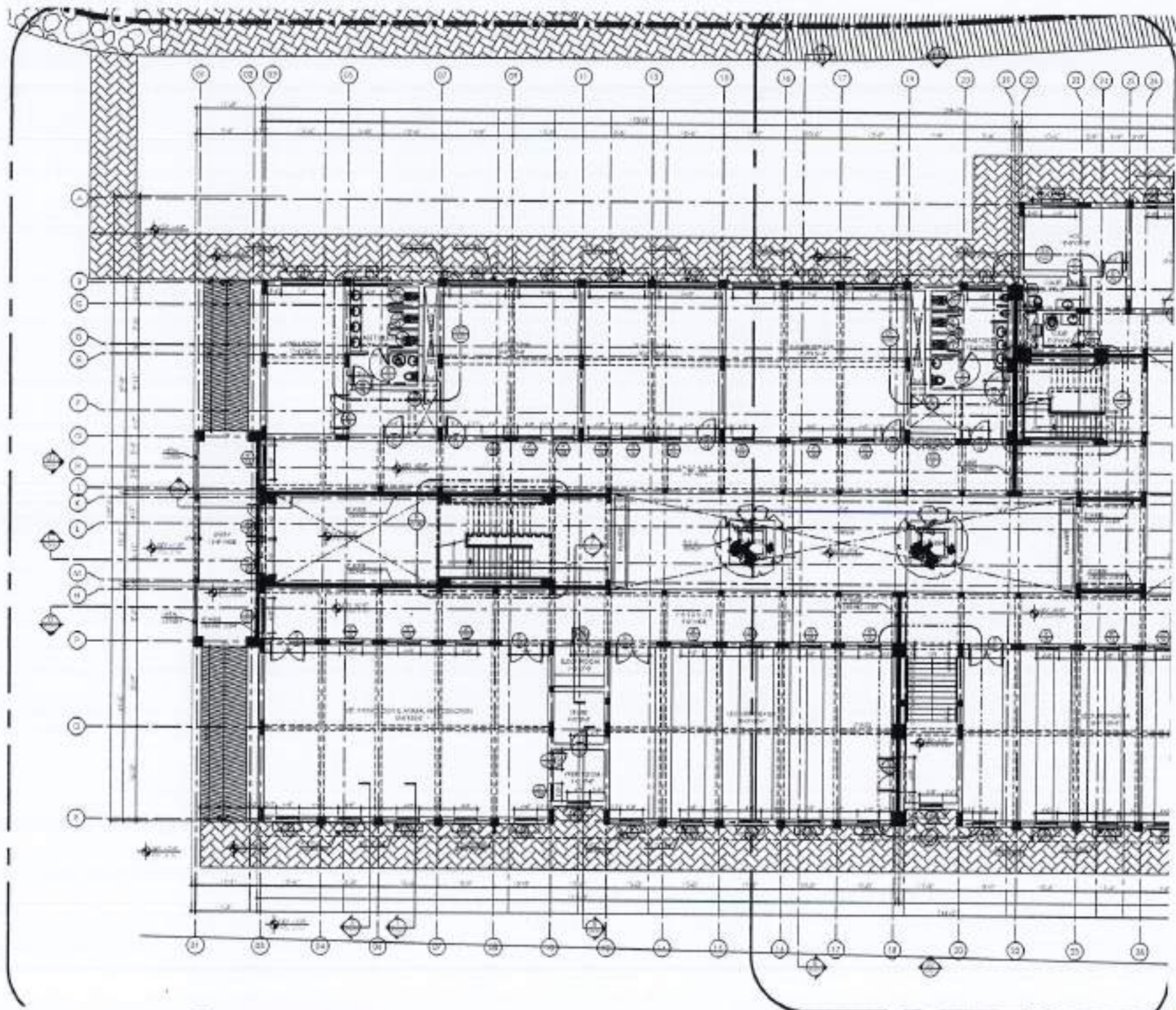
DATE:  
 17th APRIL 2024

DESIGNED BY:  
 APPROVED BY:

SCALE: 1/8" = 1'-0"  
 DATE: 17th APRIL 2024  
 PROJECT NO: 4753/322/BD/04802b







1 GROUND FLOOR PLAN PART - 01



REV.	DATE	ISSUED	REMARKS

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAWALAKOT.  
 CLIENT:  
 UNIVERSITY OF POKHRA, RAWALAKOT  
 HOBBYPOINT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECTS  
 The Architects  
 Mushtaq and Bial  
 CONSULTING ENGINEERS  
 144 B-1/2, GHAZIABAD ROAD, GHAZIABAD  
 TEL: 37311111, 37311112, 37311113, 37311114, 37311115, 37311116, 37311117, 37311118, 37311119, 37311120, 37311121, 37311122, 37311123, 37311124, 37311125, 37311126, 37311127, 37311128, 37311129, 37311130, 37311131, 37311132, 37311133, 37311134, 37311135, 37311136, 37311137, 37311138, 37311139, 37311140, 37311141, 37311142, 37311143, 37311144, 37311145, 37311146, 37311147, 37311148, 37311149, 37311150, 37311151, 37311152, 37311153, 37311154, 37311155, 37311156, 37311157, 37311158, 37311159, 37311160, 37311161, 37311162, 37311163, 37311164, 37311165, 37311166, 37311167, 37311168, 37311169, 37311170, 37311171, 37311172, 37311173, 37311174, 37311175, 37311176, 37311177, 37311178, 37311179, 37311180, 37311181, 37311182, 37311183, 37311184, 37311185, 37311186, 37311187, 37311188, 37311189, 37311190, 37311191, 37311192, 37311193, 37311194, 37311195, 37311196, 37311197, 37311198, 37311199, 37311200

ELECTRICAL CONSULTANT  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 144 B-1/2, GHAZIABAD ROAD, GHAZIABAD

MECHANICAL CONSULTANT  
 M. A. KHAN  
 MECHANICAL ENGINEER  
 144 B-1/2, GHAZIABAD ROAD, GHAZIABAD

CLIENT'S REF. NO. 502  
 DRAWING NO. A1-001a

REVIEW & SUPERVISION CONSULTANT  
 NESPAK (PVT.) LIMITED  
 144 B-1/2, GHAZIABAD ROAD, GHAZIABAD

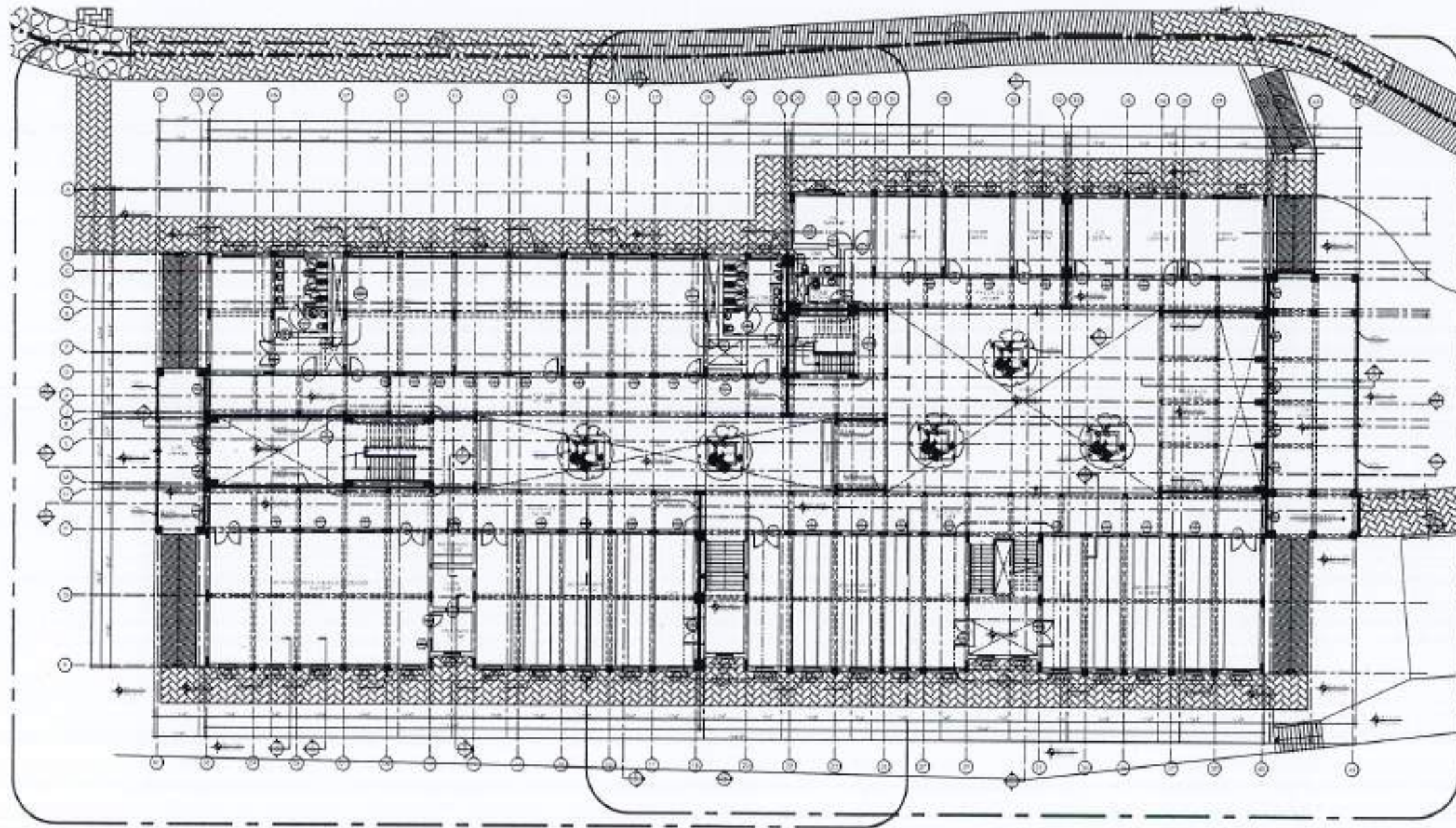
PROJECT TITLE  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE  
 GROUND FLOOR PLAN  
 PART - 01  
 WORKING DRAWING

DATE: 17th APRIL 2024  
 SCALE: 1/8" = 1'-0"  
 NEW DRAWING NO. 4753/322/80/04802a







1 GROUND FLOOR PLAN



REV. NO.	DATE	BY	CHKD.

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POONCH, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 (Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, Assam, Jharkhand, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Maharashtra, Goa, Mizoram, Tripura, Meghalaya, Manipal, Nagaland, Arunachal Pradesh, Assam, Jharkhand, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Maharashtra, Goa, Mizoram, Tripura, Meghalaya, Manipal, Nagaland, Arunachal Pradesh)

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 204, MOON BEGUM, SHANU PUNJ, GATEWAY-1980  
 RAJOURI, JAMMU & KASHMIR - 190001  
 PHONE: 9890000000, 9890000001

ELECTRICAL CONSULTANT:  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 144 B-Block, G.D. Chowdhury Colony - 1001

PLUMBING CONSULTANT:  
 C.C. Javedani  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 11/12, G.D. Chowdhury Colony, G.D. Chowdhury Colony - 1001

NO. DRAWING NO.  
 502 A1-001

REVIEW & SUPERVISION CONSULTANT:  
 NESPAC (PVT.) LIMITED

PREPARED BY:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 GROUND FLOOR PLAN  
 OVERALL PLAN  
 WORKING DRAWING

DRAWN BY:  
 JAVED KHALIL

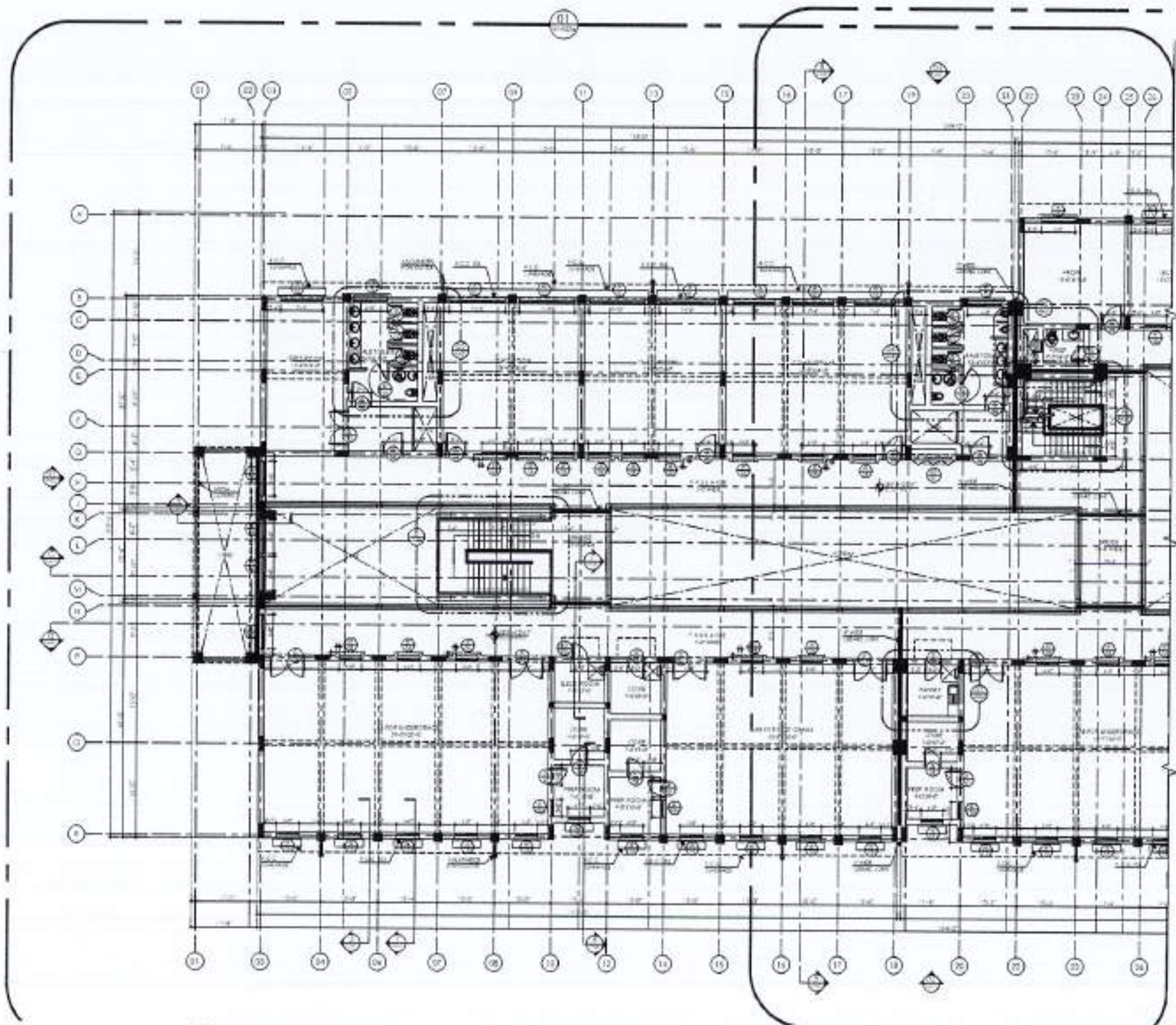
CHECKED BY:

APPROVED BY:

SCALE: 1/20th OF DATE: 17th APRIL 2024

REV. DRAWING NO.: 4753/322/BD/04802





1 FIRST FLOOR PLAN PART - 01

FOR REMAINING PART PLAN REFER DRAWING NO. A1-002b



REV.	DATE	BY	REMARKS

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- ANY DISCREPANCY IS TO BE REPORTED TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPIND.

**CLIENT:**  
UNIVERSITY OF PUNJAB, RAWALPIND.



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECT:**  
The Architects  
Architects, Planning, Interior Design, Landscape Architecture, Surveying, Environmental Engineering, etc.  
100-A, G-Block, Sector 10, F-7/2, Islamabad.

**STRUCTURAL CONSULTANT:**  
mushtaq and bial consulting engineers  
2nd floor, Block B, University of Punjab, Rawalpindi.  
Mobile: 9991-484848, 9991-484848, 9991-484848  
Email: mushtaq@mushtaqandbial.com

**ELECTRICAL CONSULTANT:**  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
1-4-B, Dufferin Road, D-11/1, Islamabad.

**PLUMBING CONSULTANT:**  
P.L. Associates  
ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
2nd Floor, Block B, University of Punjab, Rawalpindi.

**DATE:** 502  
**REVISION NO.:** A1-002a

**OWNER & APPROVED CONSULTANT:**  
NESPAC (PVT.) LIMITED

**SUB-PROJECT NO.:**  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

**DRAWING NO.:**  
FIRST FLOOR PLAN  
PART - 01  
WORKING DRAWING

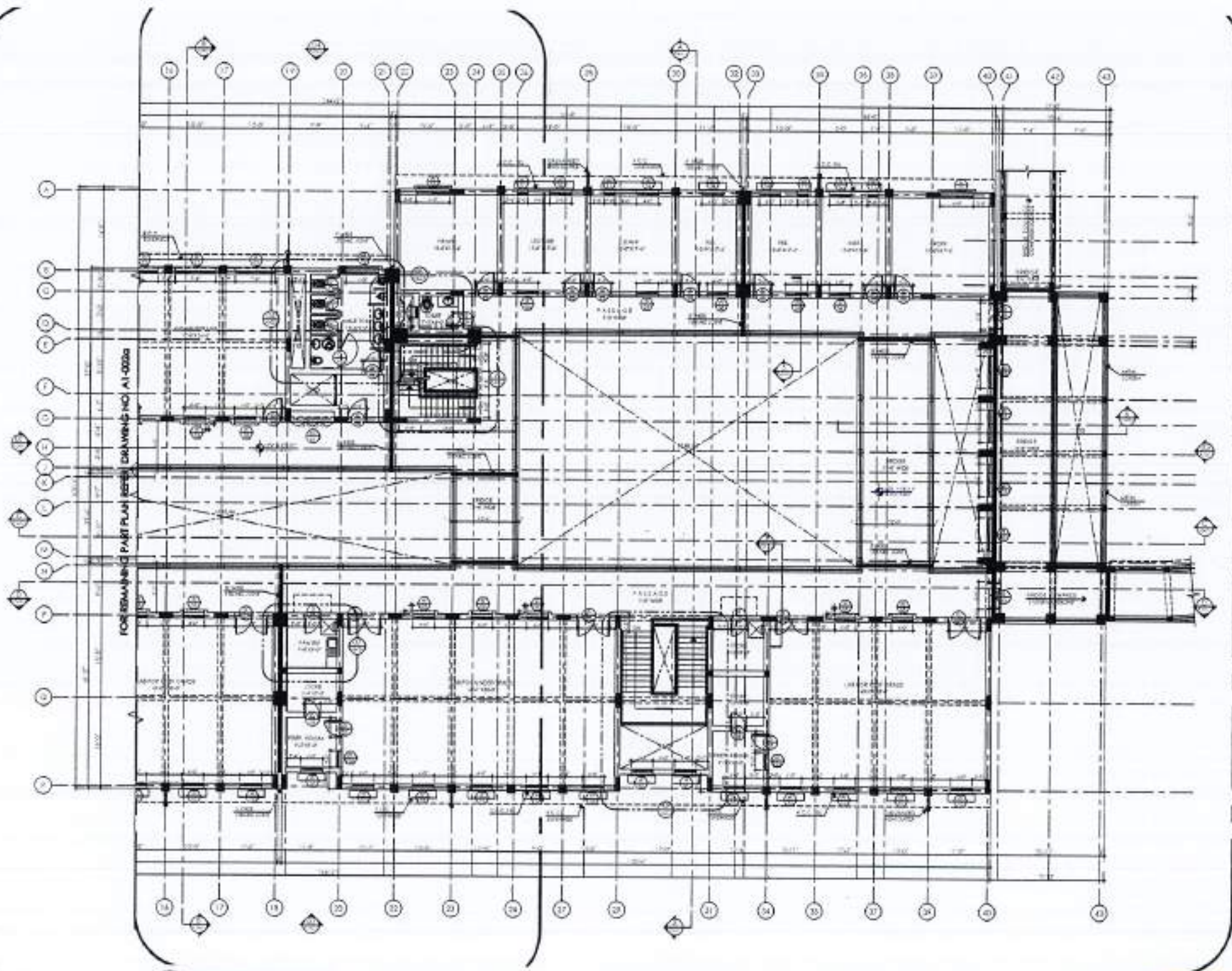
**CREATED BY:** JAVED KHALIL  
**DRAWN BY:**

**CHECKED BY:**  
**APPROVED BY:**

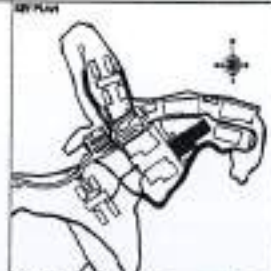
**SCALE:** 1/8" = 1'-0"  
**DATE:** 17th APRIL 2024  
**REVISED BY:** 4753/322/BD/C4803a







1 FIRST FLOOR PLAN PART - 02



REV. NO.	DATE	ISSUED	REVISION

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAJWALAKOT.


CLIENT:  
 UNIVERSITY OF PUNJAB, RAJWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECT  
 CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAJWALAKOT

STRUCTURAL CONSULTANT:  
  
**mustaq and bilal**  
 consulting engineers  
 54, HOOR ROAD, BHAKTAPAL, LAHORE-7500  
 (PUNJAB) PAKISTAN

ELECTRICAL CONSULTANT:  
 E F & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 544 Street, DUBLIN-2, IRELAND

PLUMBING CONSULTANT:  
  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 22-A, BANGALORE ROAD, KARACHI-75000  
 (PUNJAB) PAKISTAN

NO.:	502	REVISION NO.:	A1-002b
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DESIGN & SUPERVISION CONSULTANT:  
**NESPAK (PVT.) LIMITED**

EMPLOYER:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING NO. & TITLE:  
 FIRST FLOOR PLAN PART - 02  
 WORKING DRAWING

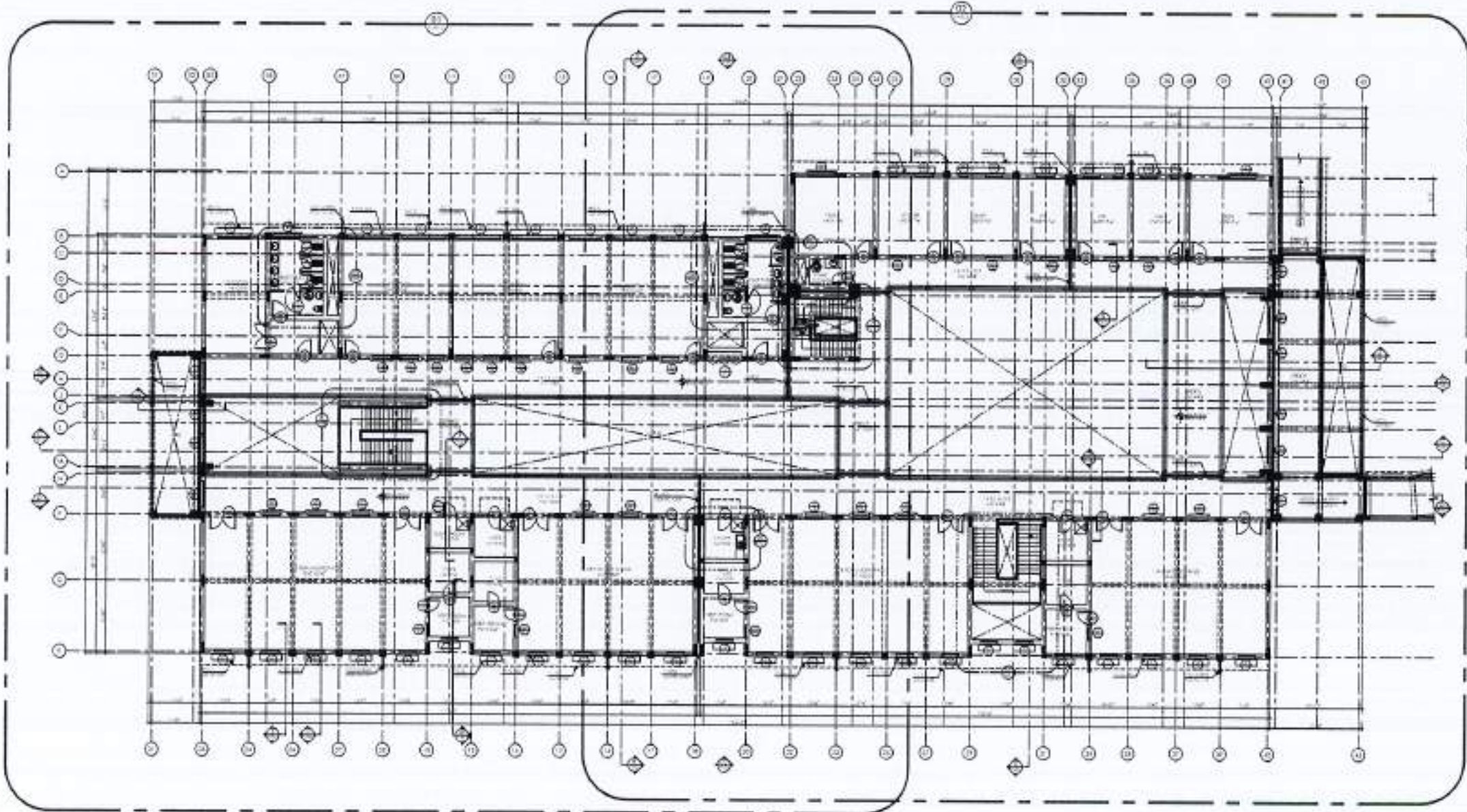
DATE:  
 17th APRIL 2024

DESIGNED BY:  
 APPROVED BY:

SCALE:  
 1/8" = 1'-0"  
 DATE:  
 17th APRIL 2024  
 INFORMATION NO. 4753/322/BD/04803b







REV. NO.	DATE	REVISION

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.


CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 **THE ARCHITECTS**  
 ARCHITECTS & ENGINEERS  
 100, B-1/1, CHANAYANA, ISLAMABAD

STRUCTURAL CONSULTANT:  
 **mushtaq and bilal**  
 consulting engineers  
 100, B-1/1, CHANAYANA, ISLAMABAD

ELECTRICAL CONSULTANT:  
**E T & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 100, B-1/1, CHANAYANA, ISLAMABAD

PURBING CONSULTANT:  
 **PURBING CONSULTANTS**  
 100, B-1/1, CHANAYANA, ISLAMABAD

MECHANICAL & MANAGEMENT CONSULTANT:  
 **MECHANICAL & MANAGEMENT CONSULTANTS**  
 100, B-1/1, CHANAYANA, ISLAMABAD

OLD DRAWING NO:  
 502

NEW DRAWING NO:  
 A1-002

REVIEW & SUPERVISION CONSULTANT:  
**NESPAC (PVT.) LIMITED**

PROJECT FILE:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING FILE:  
 GROUND FLOOR PLAN  
 OVERALL PLAN  
 WORKING DRAWING

DESIGNER:  
 JAVED HAMEED

SCALE:  
 1/8" = 1'-0"

DATE:  
 17th APRIL 2024

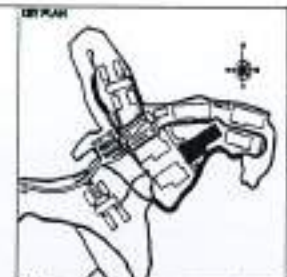
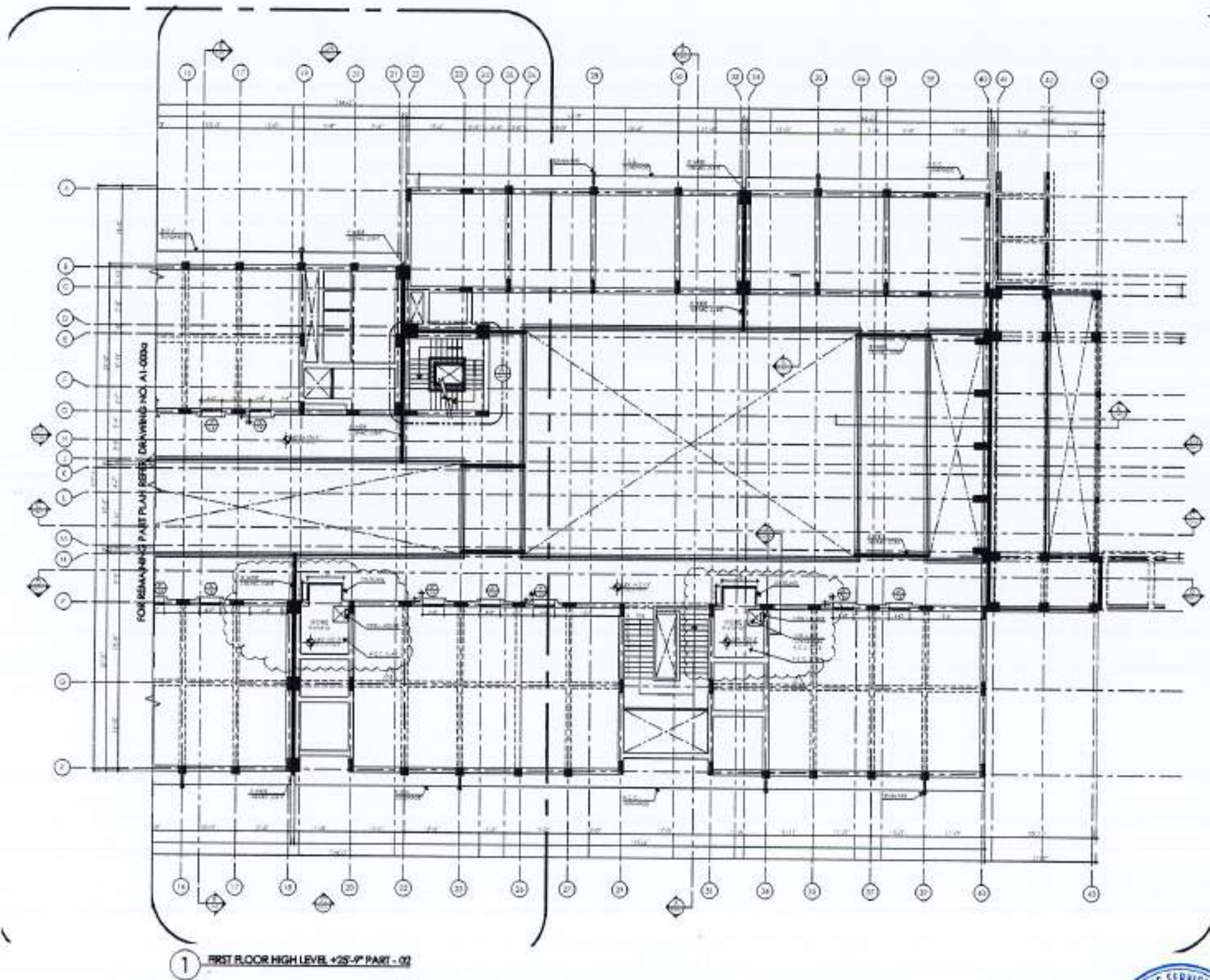
PROJECT NO:  
 4753/322/80/04803









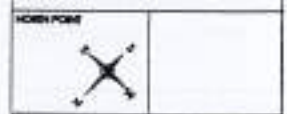


REV	DATE	REASON	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPIND.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALPIND.



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 Mushtaq and Bilal Consulting Engineers

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 100 H-8 ROAD, PHASE-8, GATE NO. 100, F-7/1, ISLAMABAD.

ELECTRICAL CONSULTANT:  
 E.P.A. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1-A/10, BAHADURZADE GANJ, ISLAMABAD.

PLUMBING CONSULTANT:  
 P.S. Associates  
 1-A/10, BAHADURZADE GANJ, ISLAMABAD.

MECHANICAL & HEATING CONSULTANT:  
 M.H. Associates  
 1-A/10, BAHADURZADE GANJ, ISLAMABAD.

DESIGNED BY:  
 ZOE NO. 502  
 DRAWING NO. A1-003b

OWNER & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUB-PROJECT TITLE:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 FIRST FLOOR HIGH LEVEL PART - 02 WORKING DRAWING

CHECKED BY:  
 ARCHITECT

DESIGNED BY:

APPROVED BY:

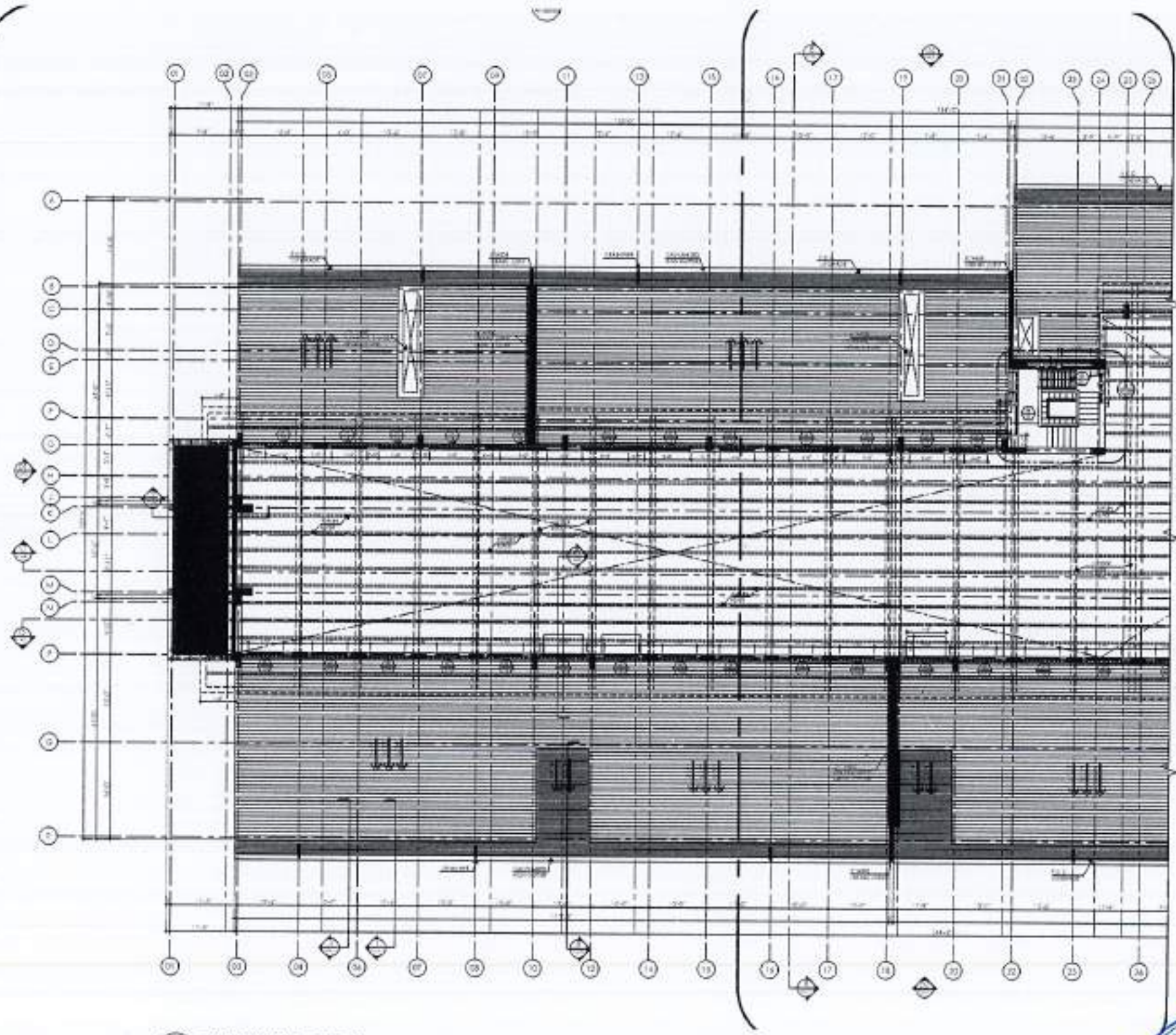
SCALE: 1/8" = 1'-0" DATE: 17th APRIL 2024  
 PROJECT NO: 4753/322/BD/04804b











1 CLEARSTOREY LEVEL, PART - 01

FOR REMAINING PART PLAN REFER DRAWING NO. A1-004b



REV.	DATE	BY	CHKD.	REVISION

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**PROJECT**  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAWALAKOT.


**CLIENT**  
UNIVERSITY OF POKHRA, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECT**  
THE ARCHITECTS  
ARCHITECTS, PLANNERS, ENGINEERS  
AND INTERIORS DESIGNERS  
PVT. LTD. (PUNJAB)

**ELECTRICAL CONSULTANT**  
  
**mushtaq and bilal**  
consulting engineers  
15/1000 DEBBI, BHAKTANAL, CHAKRI-1800  
PUNJAB, PAKISTAN

**ELECTRICAL CONSULTANT**  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
144 BANI, GARDHANI, KARACHI-7500

**PLUMBING CONSULTANT**  
P.C. CONSULTANTS  
MECHANICAL & SANITARY CONSULTANTS  
20-A, SECTOR-11, CHAKRI-1800  
PUNJAB, PAKISTAN

**DESIGNED BY**

**NO.** 502      **DESCRIPTION** A1-004a

**DESIGN & SUPERVISION CONSULTANT**  
NESPAC (PVT.) LIMITED

**PROJECT SITE**  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

**DRAWING TITLE**  
CLEARSTOREY LEVEL  
PART - 01  
WORKING DRAWING

**DATE**

**DESIGNED BY**

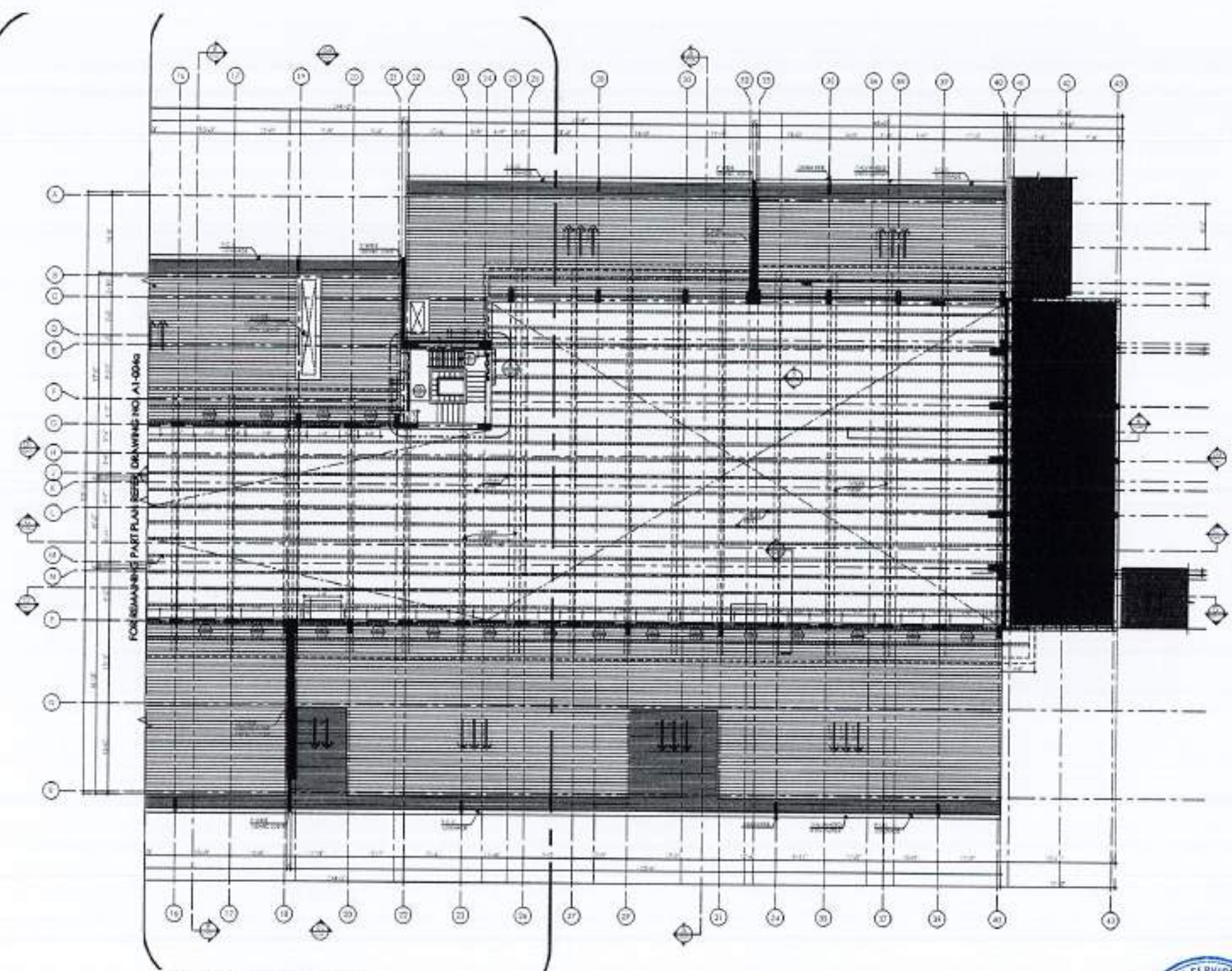
**CHECKED BY**

**APPROVED BY**

**SCALE** 1/8" = 1'-0"      **DATE** 07th APRIL 2004

**PROJECT NO.** 4753/322/8D/04805a





1 CLEARSTOREY LEVEL PART -02



REV. PLAN

REV.	DATE	BY	REASON

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 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT

WORKING DRAWING

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 10/100, G-7/1, Sector 7, F-7/2, Islamabad.

STRUCTURAL CONSULTANT:  
 AAB  
 mushtaq and bial consulting engineers  
 10/100, G-7/1, Sector 7, F-7/2, Islamabad.

ELECTRICAL CONSULTANT:  
 K.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 10/100, G-7/1, Sector 7, F-7/2, Islamabad.

PLUMBING CONSULTANT:  
 U.S. CONSULTANTS  
 10/100, G-7/1, Sector 7, F-7/2, Islamabad.

ENVIRONMENTAL & SANITATION CONSULTANT:  
 U.S. CONSULTANTS  
 10/100, G-7/1, Sector 7, F-7/2, Islamabad.

JOB NO. 502 DRAWING NO. A1-004b

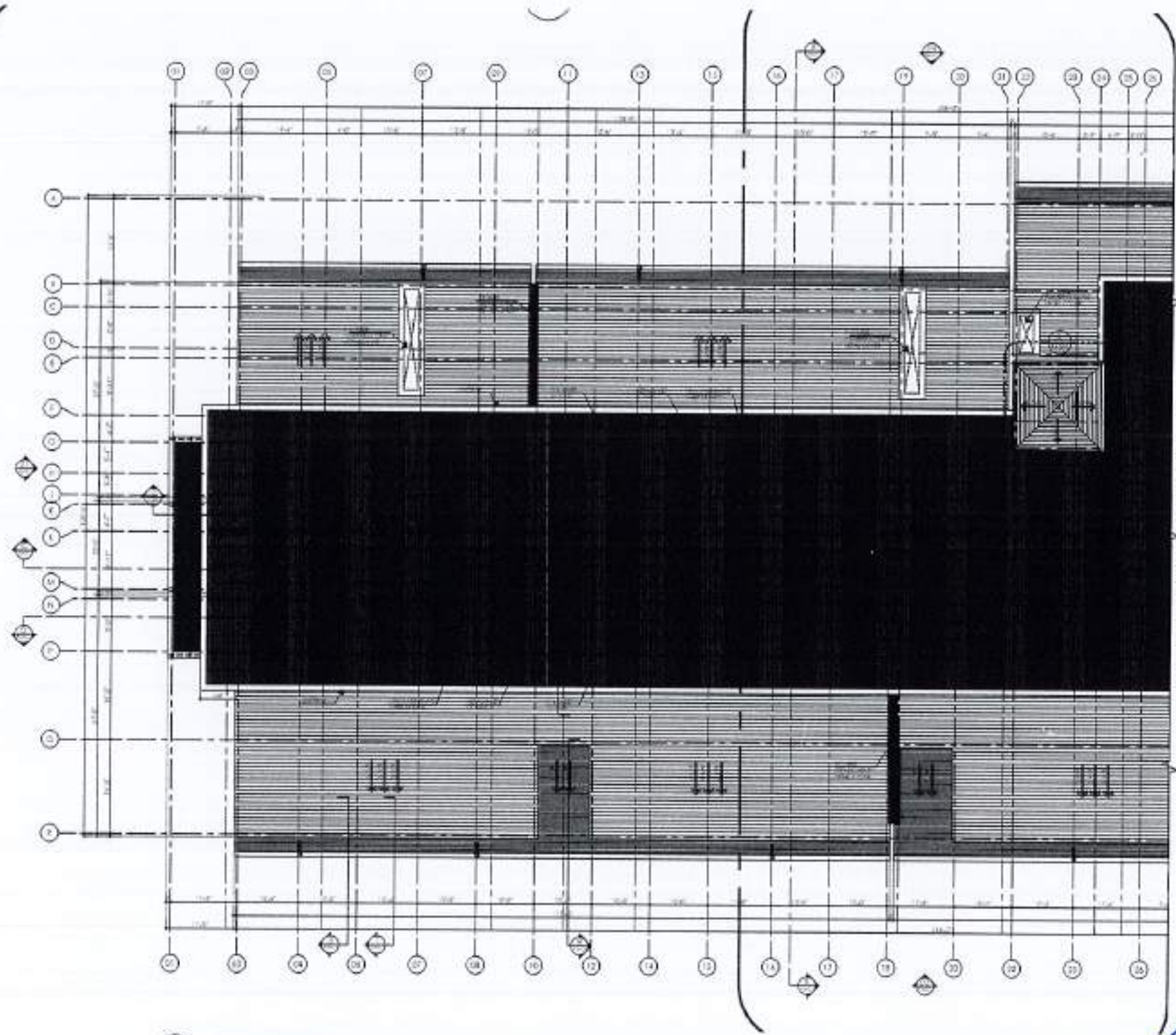
DESIGNED BY: JAVED KHAN  
 CHECKED BY:  
 APPROVED BY:

SCALE: 1/8" = 1'-0" DATE: 17th APRIL 2024  
 REV. DRAWING NO: 4753/322/BD/04805b









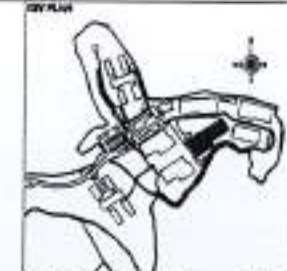
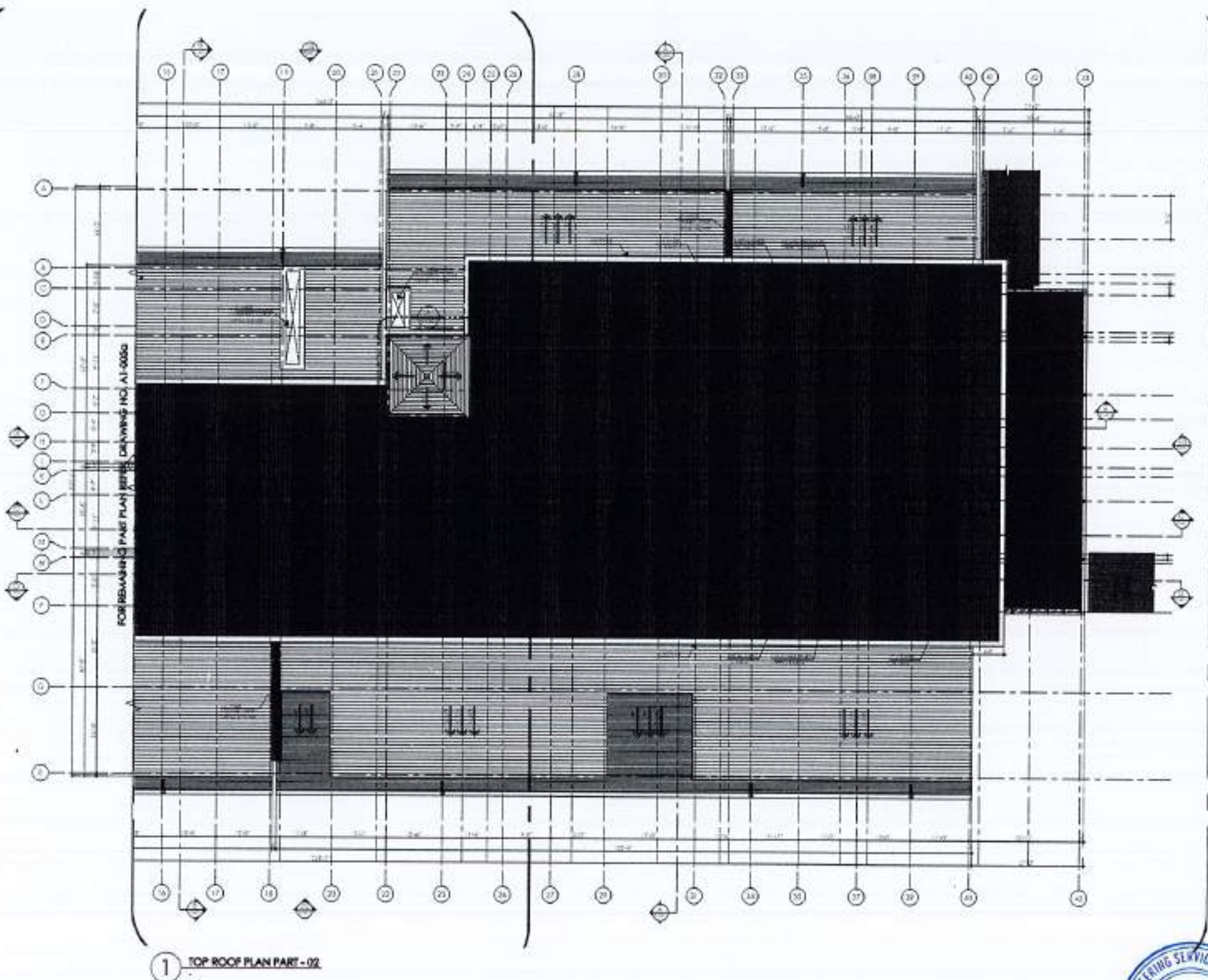
1 TOP ROOF PLAN PART - 01

FOR REMAINING PART PLAN REFER DRAWING NO. A1-005B



REV. NO.	DATE	REVISION
<p>NOTE:</p> <ul style="list-style-type: none"> <li>1. THIS DRAWING IS THE SOLE PROPERTY OF THE ARCHITECT. NO PORTION THEREOF OR THE WHOLE THEREOF MAY BE REPRODUCED, COPIED, SCANNED, REPRODUCED OR USED IN PART TECHNICAL OR COMMERCIAL PURPOSE WITHOUT PRIOR WRITTEN PERMISSION FROM THE ARCHITECT.</li> <li>2. THIS DRAWING IS NOT TO BE SEALED OR USED WITHOUT PERMISSION TO BE USED.</li> <li>3. ALL DIMENSIONS ARE TO BE CHECKED AND VERIFIED ON SITE.</li> <li>4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.</li> </ul>		
<p>PROJECT:</p> <p>COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POKHRA, RAJWALAKOT.</p>		
<p>CLIENT:</p> <p>UNIVERSITY OF POKHRA, RAJWALAKOT</p>		
<p>SCALE:</p>		
<p>THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.</p>		
<p>ORIGINAL DESIGN CONSULTANT</p>		
<p>ARCHITECTS:</p> <p>The Architects  <small>Architects, Engineers, Planners, Surveyors, Estimators, Quantity Surveyors, Valuers, Cost Estimators, Environmental Engineers, and Project Managers.</small></p>		
<p>STRUCTURAL CONSULTANT:</p> <p>mustaq and bial          consulting engineers  <small>ALL WORKS ARE SUBJECT TO APPROVAL BY THE CONCERNED AUTHORITIES.</small></p>		
<p>ELECTRICAL CONSULTANT:</p> <p>K.P. &amp; ASSOCIATES          ELECTRICAL ENGINEERS  <small>14-B, BLOCK-1, GATEWAY ROAD, KARACHI-75200</small></p>		
<p>PLUMBING CONSULTANT:</p> <p>K.P. &amp; ASSOCIATES  <small>14-B, BLOCK-1, GATEWAY ROAD, KARACHI-75200</small></p>		
<p>MECHANICAL &amp; MECHANICAL CONSULTANT:</p> <p>K.P. &amp; ASSOCIATES  <small>14-B, BLOCK-1, GATEWAY ROAD, KARACHI-75200</small></p>		
<p>DESIGNING UNIT:</p>		
JOB NO.	DRAWING NO.	
502	A1-005a	
<p>OWNER &amp; EMPLOYER ORGANIZATION:</p> <p>NESPAK (PVT.) LIMITED</p>		
<p>DEPARTMENT OF VETERINARY &amp; ANIMAL SCIENCE</p>		
<p>DRAWING TITLE:</p> <p>CLEARSTOREY LEVEL, PART - 01, WORKING DRAWING</p>		
<p>DATE:</p> <p>17th APRIL 2024</p>		
<p>PROJECT NO.:</p> <p>4753/322/BD/04806a</p>		





REV. NO.	DATE	ISSUED	ISSUED BY

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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA, BAWALAKOT.

**CLIENT:**  
UNIVERSITY OF POKHARA, BAWALAKOT



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT:**

**ARCHITECT:**  
The Architects  
Architects, Engineers, Planners  
and Surveyors (P) Private Limited  
Plot No. 10, Sector 10, Gurgaon, Haryana

**STRUCTURAL CONSULTANT:**  
A.A.E.  
**mushtaq and bilal**  
consulting engineers  
101, WOOD ROAD, BHAYINDRA, CHANDIGARH  
(INDIA) PH: 9814382071 FAX: 9814382072

**ELECTRICAL CONSULTANT:**  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
1-41, Block, D-10, Sector-10, Gurgaon - 122001

**PLUMBING CONSULTANT:**  
P.P. (SANGHVI)

**ENVIRONMENTAL & MANAGEMENT CONSULTANT:**  
M/S. ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
PLOT NO. 10, SECTOR 10, GURGAON, HARYANA

**OLD DRAWING NO.:** 502  
**NEW DRAWING NO.:** A1-005b

**REVIEW & SUPERVISION CONSULTANT:**  
Nespak (Pvt.) Limited

**PROJECTING:**  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

**DRAWING TITLE:**  
CLEARSTOREY LEVEL  
PART - 02  
WORKING DRAWING

**DATE:** 14/06/2024

**DESIGNED BY:**

**APPROVED BY:**

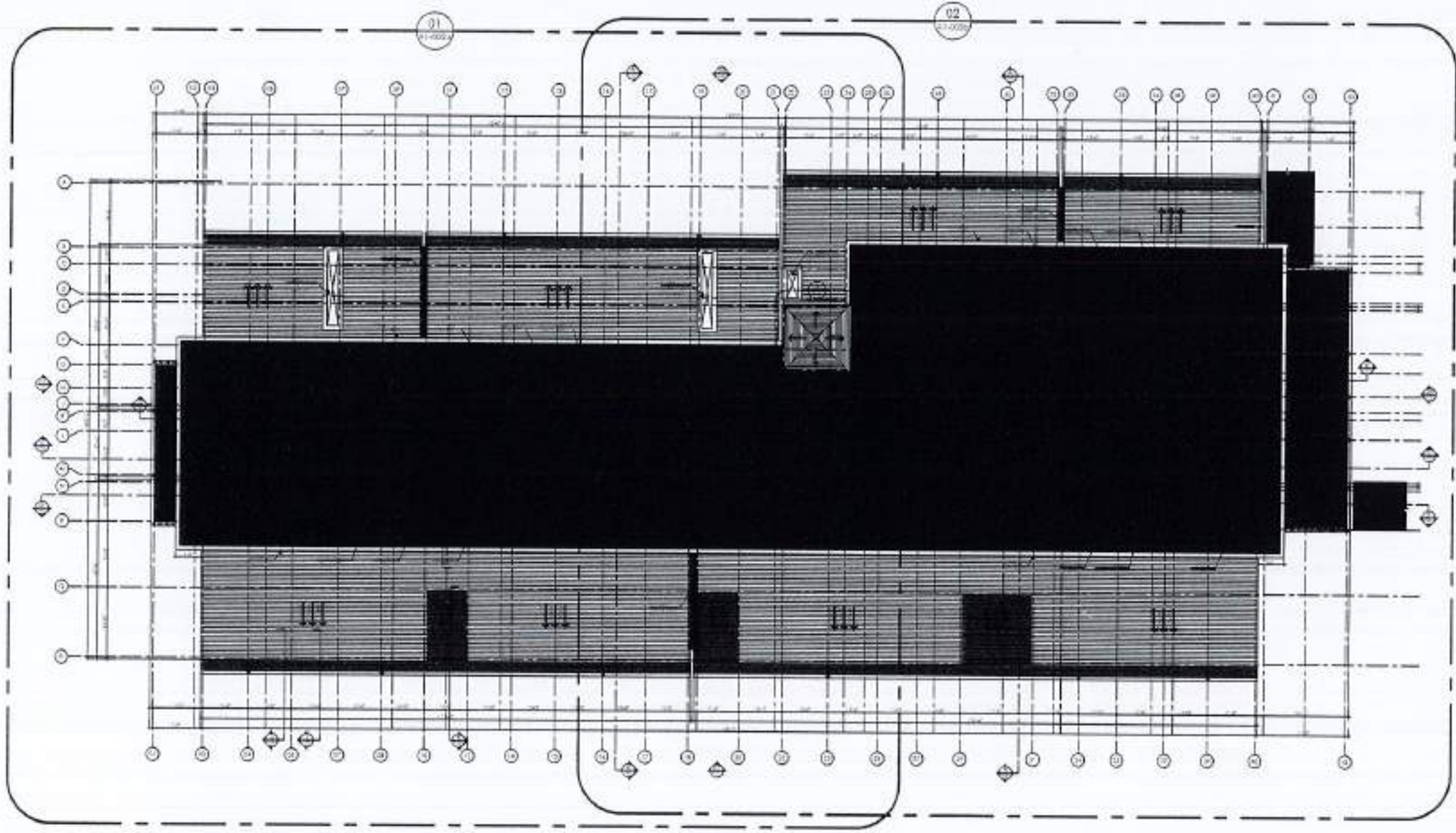
**SCALE:** 1/8" = 1'-0"

**DATE:** 17/06/2024

**PROJECT NO.:** 4753/322/BD/0-4804b







1 TOP ROOF PLAN



REV.	DATE	ISSUED	REMARKS

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPIND.


CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALPIND.



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects Association, Punjab, Pakistan  
 24-A, Block-1, G.D. Road, Lahore Cantt., Pakistan  
 Tel: 37322222, 37322223, 37322224, 37322225, 37322226, 37322227, 37322228, 37322229, 37322230, 37322231, 37322232, 37322233, 37322234, 37322235, 37322236, 37322237, 37322238, 37322239, 37322240, 37322241, 37322242, 37322243, 37322244, 37322245, 37322246, 37322247, 37322248, 37322249, 37322250, 37322251, 37322252, 37322253, 37322254, 37322255, 37322256, 37322257, 37322258, 37322259, 37322260, 37322261, 37322262, 37322263, 37322264, 37322265, 37322266, 37322267, 37322268, 37322269, 37322270, 37322271, 37322272, 37322273, 37322274, 37322275, 37322276, 37322277, 37322278, 37322279, 37322280, 37322281, 37322282, 37322283, 37322284, 37322285, 37322286, 37322287, 37322288, 37322289, 37322290, 37322291, 37322292, 37322293, 37322294, 37322295, 37322296, 37322297, 37322298, 37322299, 37322300

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 24-A, Block-1, G.D. Road, Lahore Cantt., Pakistan  
 Tel: 37322222, 37322223, 37322224, 37322225, 37322226, 37322227, 37322228, 37322229, 37322230, 37322231, 37322232, 37322233, 37322234, 37322235, 37322236, 37322237, 37322238, 37322239, 37322240, 37322241, 37322242, 37322243, 37322244, 37322245, 37322246, 37322247, 37322248, 37322249, 37322250, 37322251, 37322252, 37322253, 37322254, 37322255, 37322256, 37322257, 37322258, 37322259, 37322260, 37322261, 37322262, 37322263, 37322264, 37322265, 37322266, 37322267, 37322268, 37322269, 37322270, 37322271, 37322272, 37322273, 37322274, 37322275, 37322276, 37322277, 37322278, 37322279, 37322280, 37322281, 37322282, 37322283, 37322284, 37322285, 37322286, 37322287, 37322288, 37322289, 37322290, 37322291, 37322292, 37322293, 37322294, 37322295, 37322296, 37322297, 37322298, 37322299, 37322300

ELECTRICAL CONSULTANT:  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1-A4 Block, G.D. Road, Lahore Cantt., Pakistan

PLUMBING CONSULTANT:  
 E.P. & ASSOCIATES  
 1-A4 Block, G.D. Road, Lahore Cantt., Pakistan

ENVIRONMENTAL & MANAGEMENT CONSULTANT:  
 24-A, Block-1, G.D. Road, Lahore Cantt., Pakistan  
 Tel: 37322222, 37322223, 37322224, 37322225, 37322226, 37322227, 37322228, 37322229, 37322230, 37322231, 37322232, 37322233, 37322234, 37322235, 37322236, 37322237, 37322238, 37322239, 37322240, 37322241, 37322242, 37322243, 37322244, 37322245, 37322246, 37322247, 37322248, 37322249, 37322250, 37322251, 37322252, 37322253, 37322254, 37322255, 37322256, 37322257, 37322258, 37322259, 37322260, 37322261, 37322262, 37322263, 37322264, 37322265, 37322266, 37322267, 37322268, 37322269, 37322270, 37322271, 37322272, 37322273, 37322274, 37322275, 37322276, 37322277, 37322278, 37322279, 37322280, 37322281, 37322282, 37322283, 37322284, 37322285, 37322286, 37322287, 37322288, 37322289, 37322290, 37322291, 37322292, 37322293, 37322294, 37322295, 37322296, 37322297, 37322298, 37322299, 37322300

REVIEW & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

PROJECT TITLE:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 TOP ROOF PLAN  
 OVERALL PLAN  
 WORKING DRAWING

SHEET NO.:  
 502

DRAWING NO.:  
 A1-005

SCALE:  
 1/8" = 1'-0"

DATE:  
 17th APRIL 2024

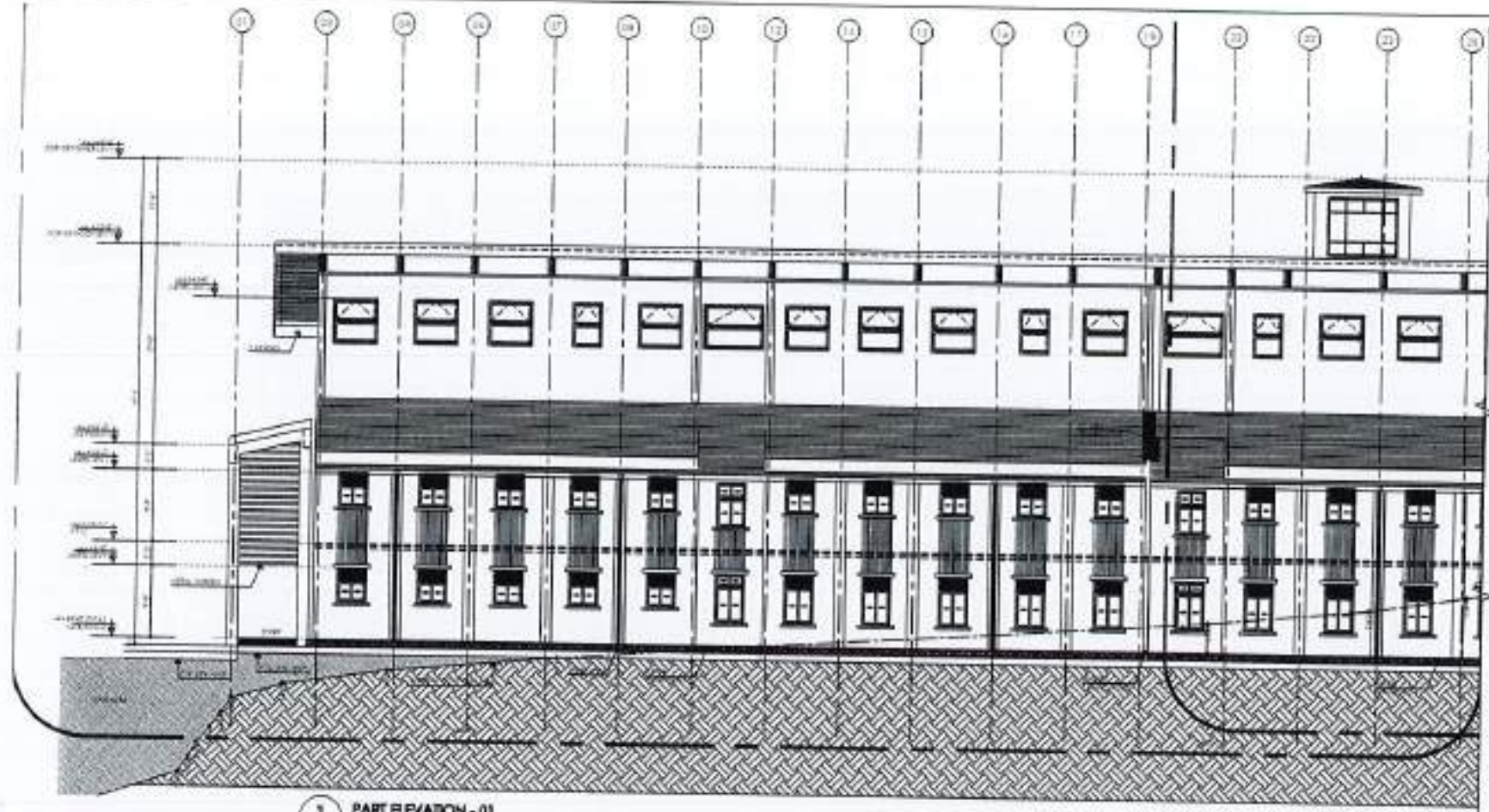
NEW DRAWING NO.:  
 4753/322/BD/04806



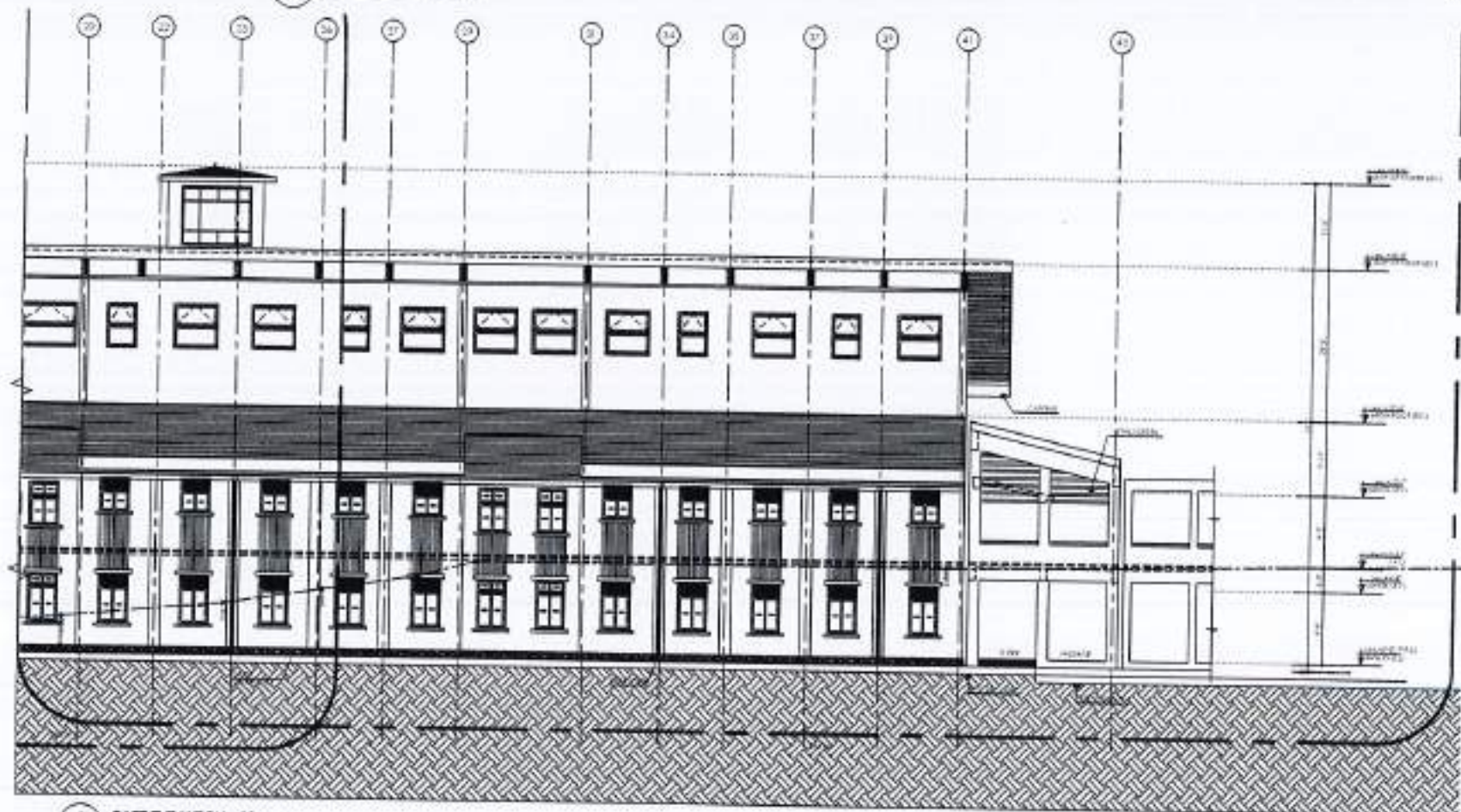








1 PART ELEVATION - 01



2 PART ELEVATION - 02



REV. NO.	DATE	BY	REVISION

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POKHARA, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 (Architects, Planning, Interior Design, Landscape Architecture, etc.)  
 100-A, Block-1, G-Block, Sector-10, Gurgaon, Haryana, India

STRUCTURAL CONSULTANT:  
  
**mushtaq and bilal**  
 consulting engineers  
 204, H-8, D-8, Block-8, Sector-8, Gurgaon, Haryana, India

ELECTRICAL CONSULTANT:  
 C. P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 844 Block, Gurgaon - Sector-10, Gurgaon

MECHANICAL CONSULTANT:  
 P. S. Associates  
 MECHANICAL & SANITARY CONSULTANTS  
 100-A, Block-1, G-Block, Sector-10, Gurgaon, Haryana, India

JOB NO. 502 DRAWING NO. A2-002a

REVIEW & SUPERVISION CONSULTANT:  
**NESPAK (PVT.) LIMITED**  
 SUB-PROJECT HEAD:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 ELEVATION - 02  
 PART ELEVATION - 01 & 02  
 WORKING DRAWING

DATE BY: JAVED HAMEED

DESIGN BY:

CHECKED BY:

APPROVED BY:

SCALE: 1/8" = 1'-0" DATE: 07th APRIL 2024

REV. DRAWING NO.: 4753/322/BD/04808a











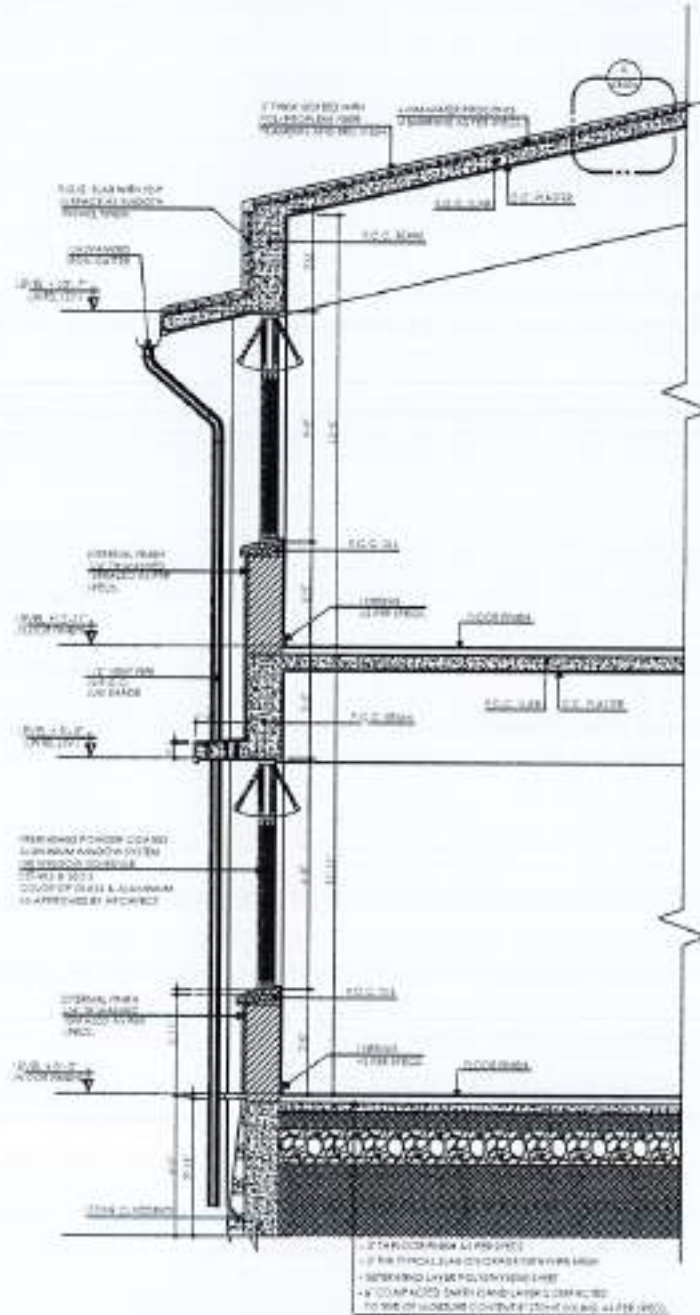




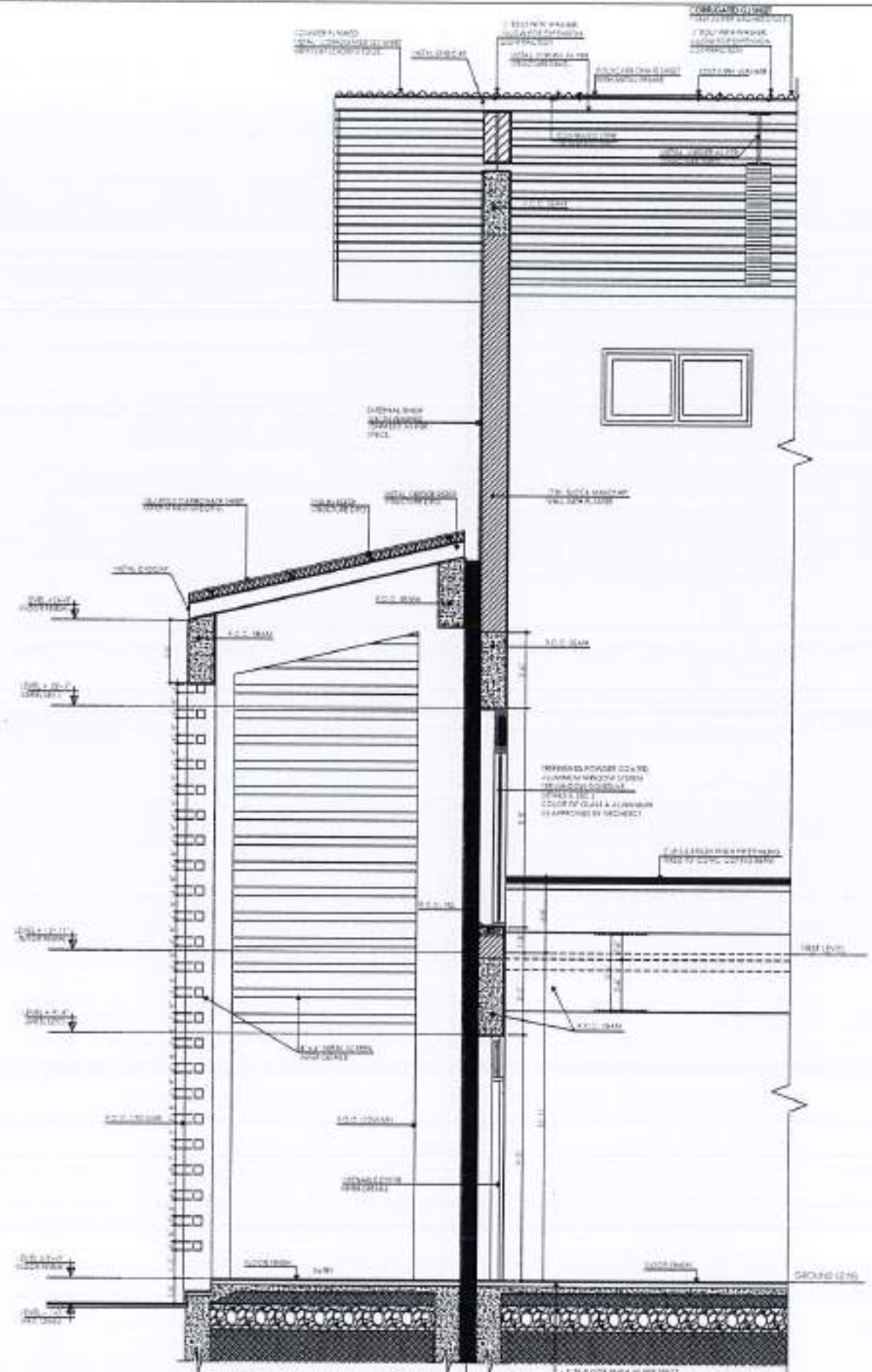




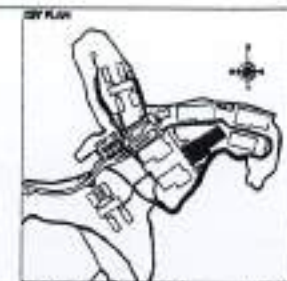




01 TYPICAL WALL SECTION - 1-1  
WINDOW SECTION



02 TYPICAL WALL SECTION - 2-2  
ENTRANCE



REV. NO.	DATE	ISSUED	REVISION

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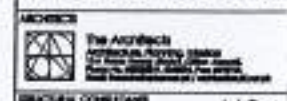
PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAWALAKOT.

CLIENT:  
UNIVERSITY OF POKHRA, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT



ARCHITECTURAL CONSULTANT:  
mushtaq and bilal consulting engineers  
101, HONORABLE AVENUE, PAKISTAN  
TEL: 0351-4001111-112 FAX: 0351-4001111-113  
WWW.MUSHTAQANDBILAL.COM

ELECTRICAL CONSULTANT:  
K.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
144, B-1/2, SUBHAN-UL-JAMANA, JAMINA-1

PLUMBING CONSULTANT:  
T.S. Associates  
ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

DATE: 17/04/2024

502 A3-003

REVIEW & SUPERVISION CONSULTANT:  
NESPAC (PVT.) LIMITED

SUBJECT SITE:  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
WALL SECTIONS  
1-1 & 2-2  
WORKING DRAWING

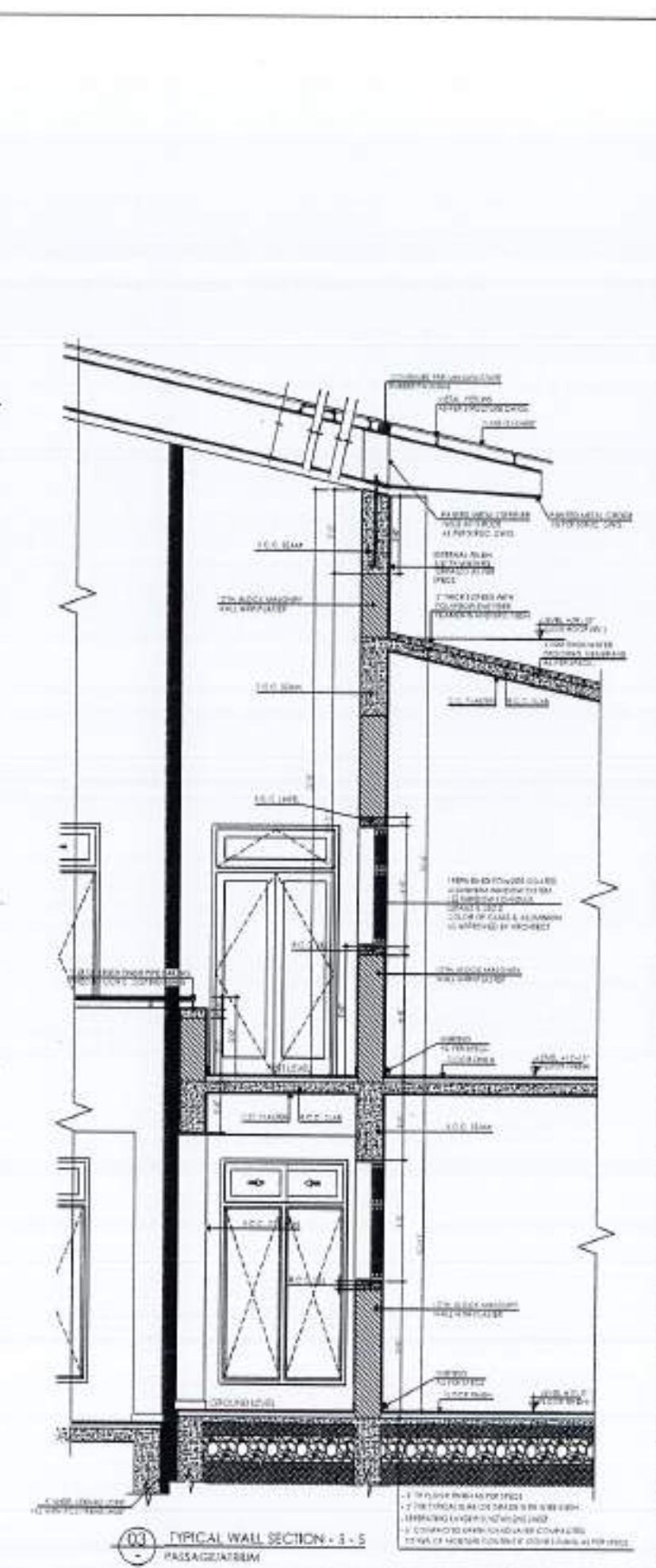
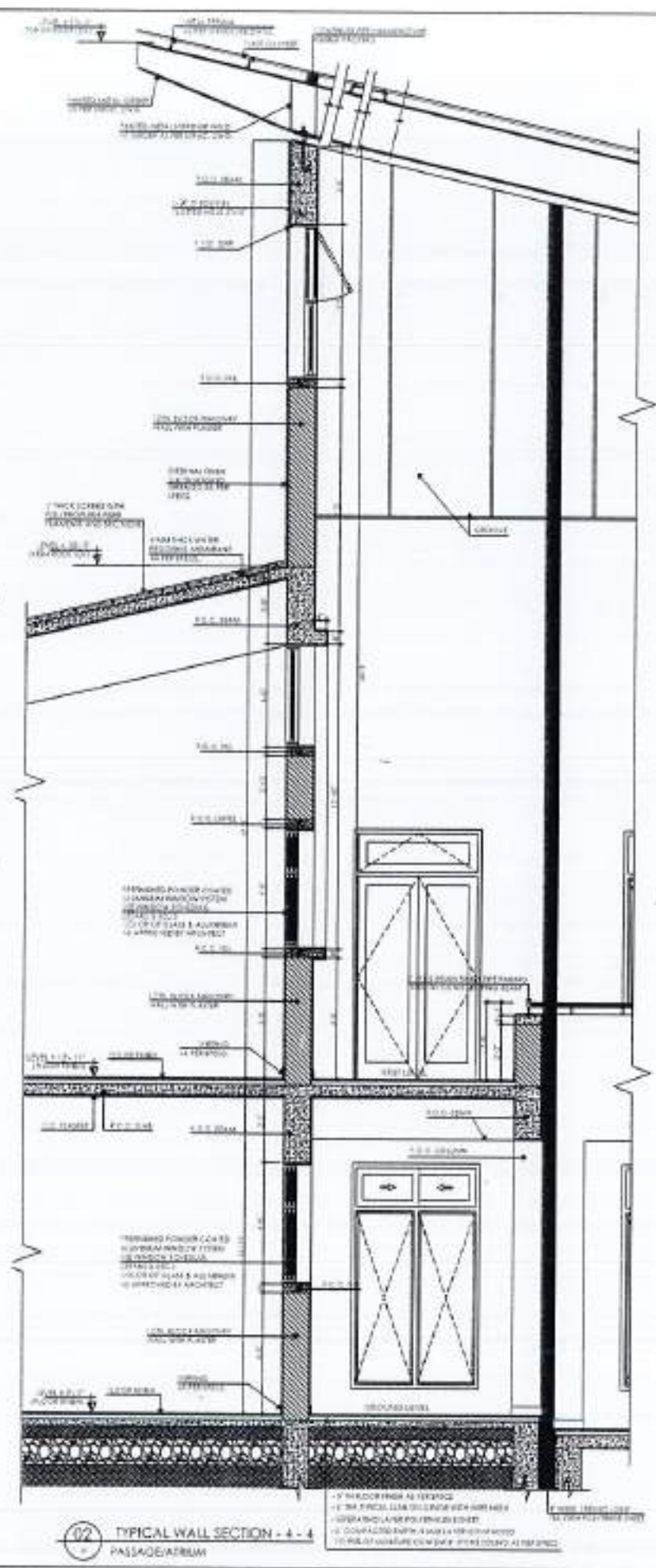
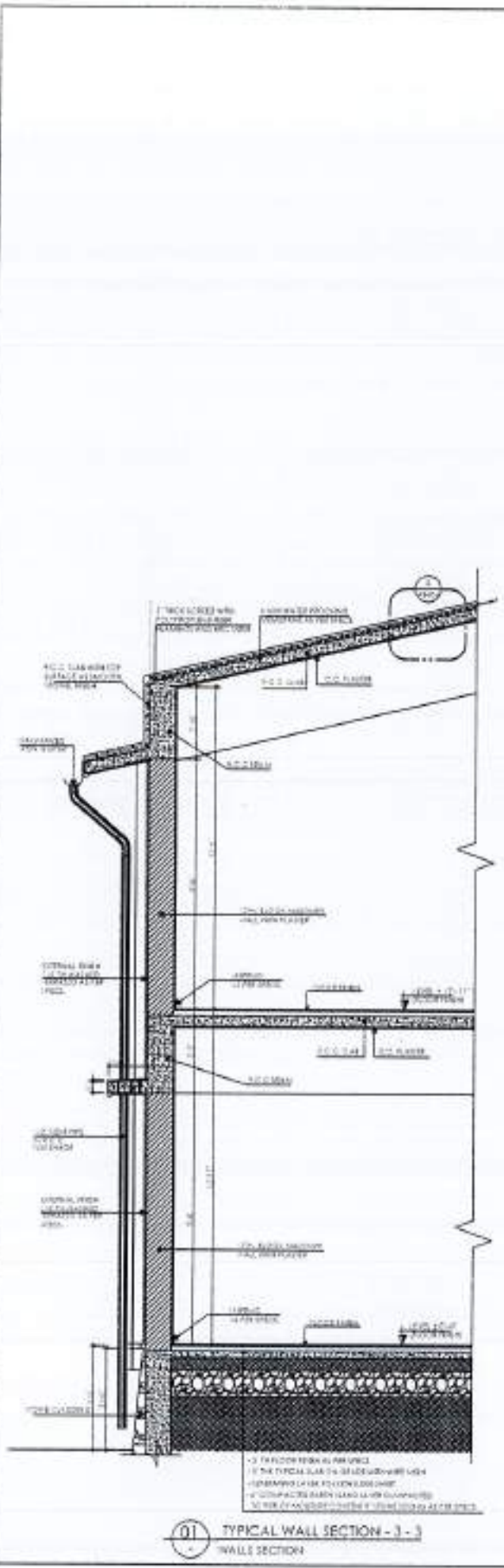
SCALE:  
AS SHOWN

APPROVED BY:  
DATE: 17/04/2024

PROJECT NO.:  
4753/322/BD/04B11







REV. NO.	DATE	ISSUED	REASON

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAHWALACOT.

CLIENT:  
UNIVERSITY OF POKHRA, RAHWALACOT

WORKFORM:  
[Symbol]

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT:  
[Symbol]

ARCHITECT:  
The Architects  
[Symbol]

STRUCTURAL CONSULTANT:  
[Symbol]  
mushtaq and bial  
consulting engineers  
101, KUCH BAZAR, BHAKHRA PIND, CHANDIGARH  
MOB: 98148-82071, 98148-82072, 98148-82073  
WWW.MUSHTAQANDBIAL.COM

ELECTRICAL CONSULTANT:  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
144, BANGA, DUBLIN-4, IRELAND  
TEL: 00353-1-4522222

MECHANICAL CONSULTANT:  
[Symbol]

ENVIRONMENTAL & MANAGEMENT CONSULTANT:  
[Symbol]

OLD DRAWING NO:  
502 A3-004

OWNER & APPROVER CONSULTANT:  
NESPAC (PVT.) LIMITED

SUB-PRIJECT NO:  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING NO:  
WALL SECTIONS  
3-3, 4-4 & 5-5  
WORKING DRAWING

DATE:  
17th APR 2024

SCALE:  
1/20th = 1/10"

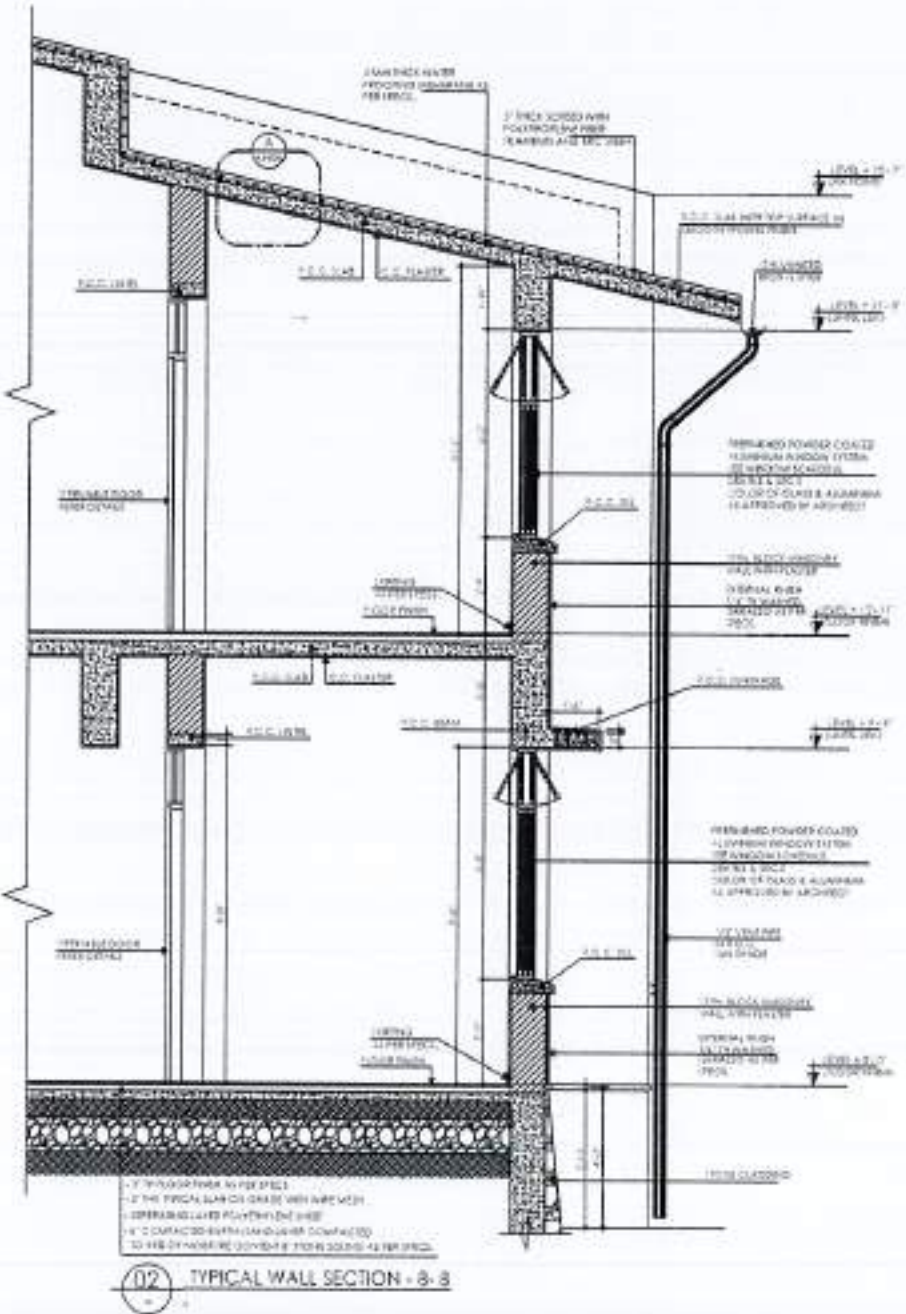
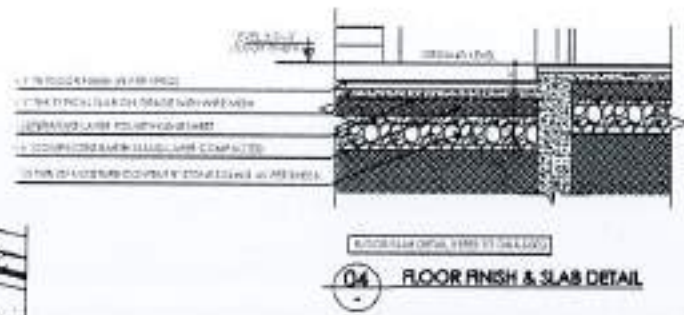
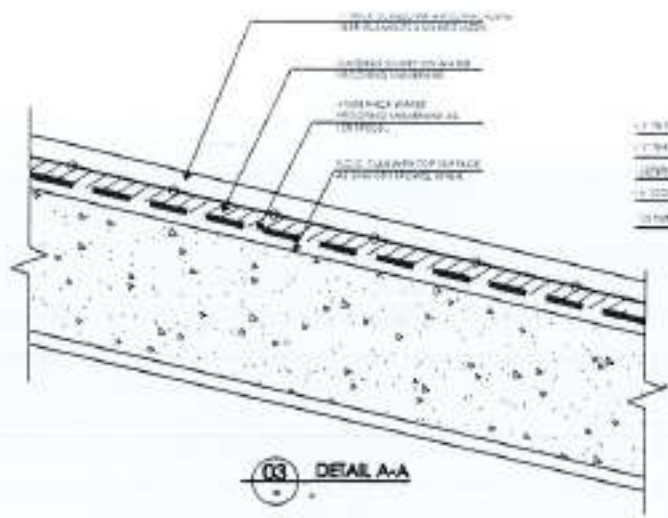
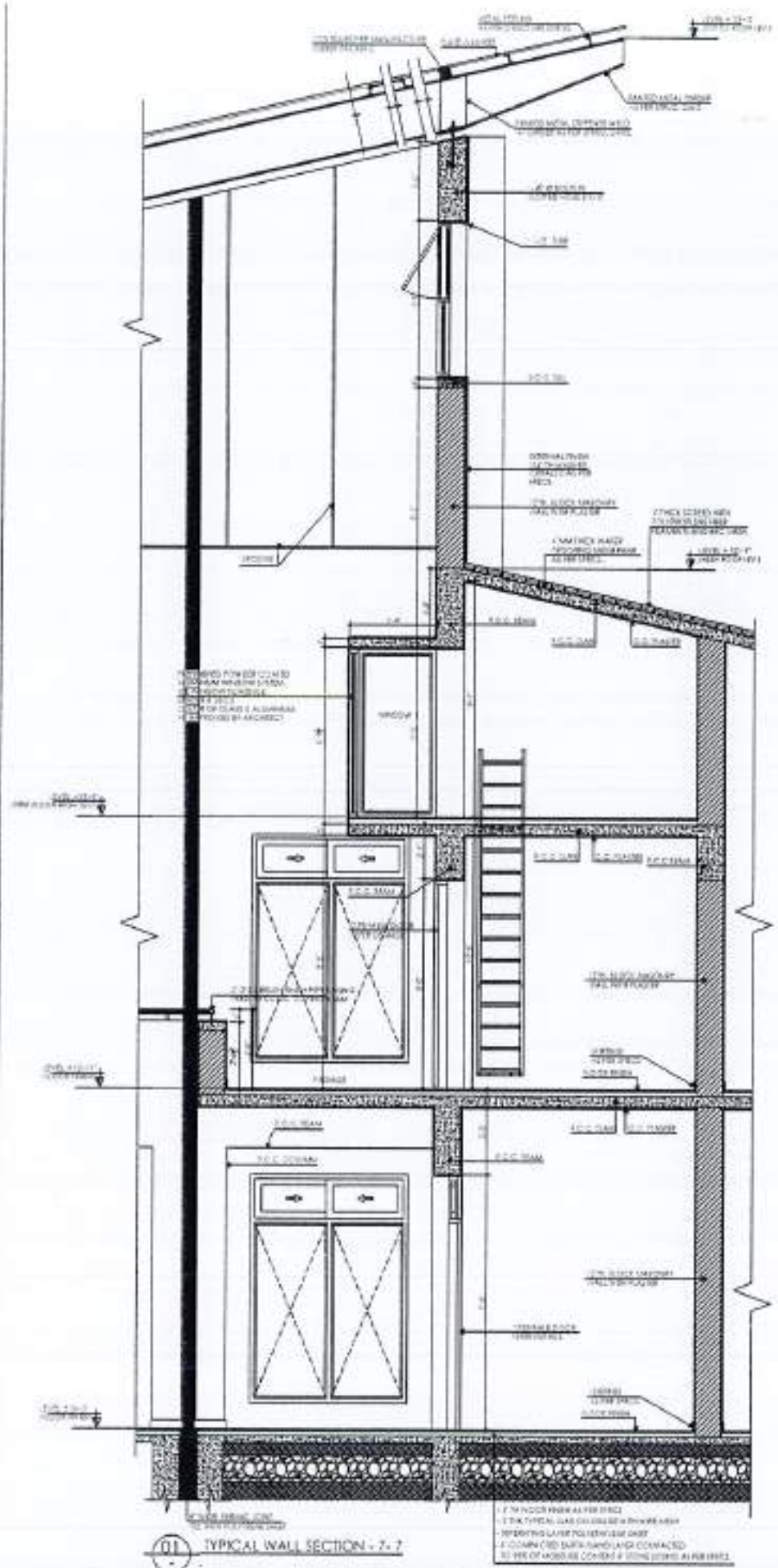
REV. NO. 4753/322/BD/04812











NO.	DATE	ISSUED	ISSUED BY
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<p><b>PROJECT:</b></p> <p>COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAJWALAKOT.</p>			
<p><b>CLIENT:</b></p> <p>UNIVERSITY OF PUNJAB, RAJWALAKOT</p>			
<p><b>WORK POSITION:</b></p> <p style="text-align: center;"> </p>			
<p><b>THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.</b></p>			
<p><b>ORIGINAL DESIGN CONSULTANT:</b></p> <p><b>ARCHITECT:</b></p> <p>The Architects          International Planning Institute          100-A, Block-1, G.D. Chowk, Lahore, Pakistan          Tel: 042-35231111, Fax: 042-35231112, Email: info@iipia.com</p> <p><b>STRUCTURAL CONSULTANT:</b></p> <p><b>mushtaq and bilal consulting engineers</b>          100-A, Block-1, G.D. Chowk, Lahore, Pakistan          Tel: 042-35231111, Fax: 042-35231112, Email: info@mushtaqbilal.com</p> <p><b>ELECTRICAL CONSULTANT:</b></p> <p><b>K.P. &amp; ASSOCIATES ELECTRICAL ENGINEERS</b>          6-A Block - G.D. Chowk - Lahore - Pakistan - 75200</p> <p><b>PLUMBING CONSULTANT:</b></p> <p><b>M. J. Anwar</b></p> <p><b>MECHANICAL &amp; MANAGEMENT CONSULTANT:</b></p> <p><b>MECHANICAL &amp; MANAGEMENT CONSULTANT</b>          100-A, Block-1, G.D. Chowk, Lahore, Pakistan          Tel: 042-35231111, Fax: 042-35231112, Email: info@iipia.com</p>			
<p><b>JOB NO.:</b></p> <p>502</p>	<p><b>DRAWINGS:</b></p> <p>A3-006</p>		
<p><b>REVIEW &amp; SUPERVISION CONSULTANT:</b></p> <p><b>NESPAK (PVT.) LIMITED</b></p> <p><b>SUB-PROJECT TITLE:</b></p> <p>DEPARTMENT OF VETERINARY &amp; ANIMAL SCIENCE</p>			
<p><b>DRAWING TITLE:</b></p> <p>WALL SECTIONS 7-7 &amp; 8-8</p> <p><b>WORKING DRAWING</b></p>			
<p><b>CAD BY:</b></p> <p>AJIB IQBAL</p>			
<p><b>DESIGN BY:</b></p> <p> </p>			
<p><b>APPROVED BY:</b></p> <p> </p>			
<p><b>SCALE:</b></p> <p>1/2" = 1'-0"</p>	<p><b>DATE:</b></p> <p>17th APRIL 2024</p>		
<p><b>PROJECT NO.:</b></p> <p>4753/322/80/04814</p>			

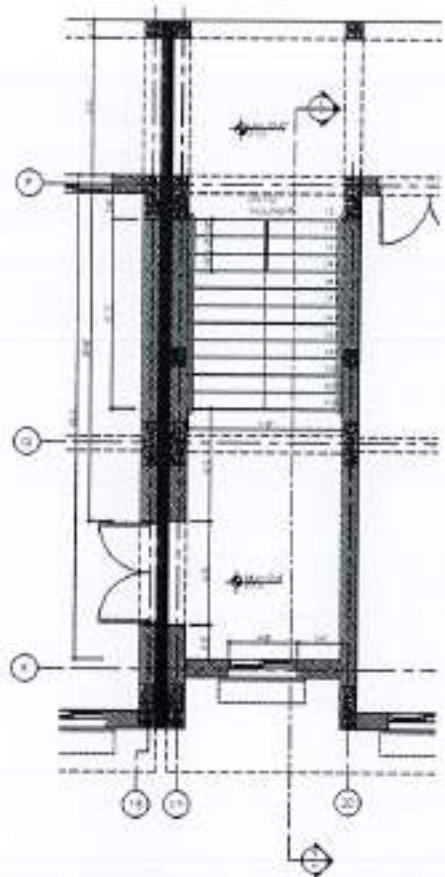








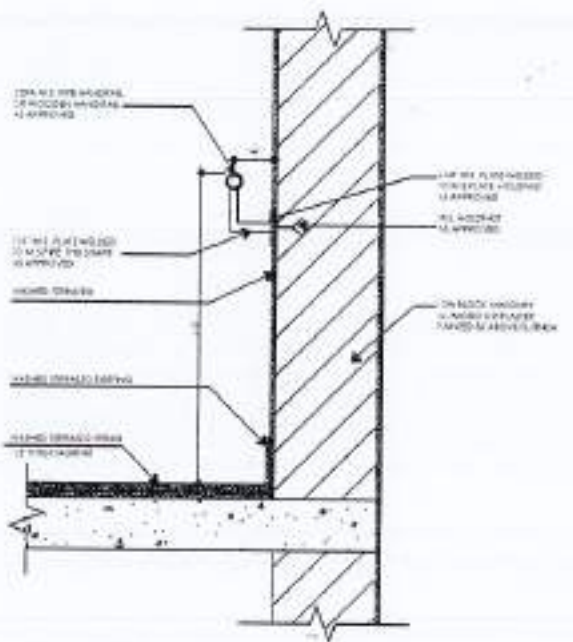




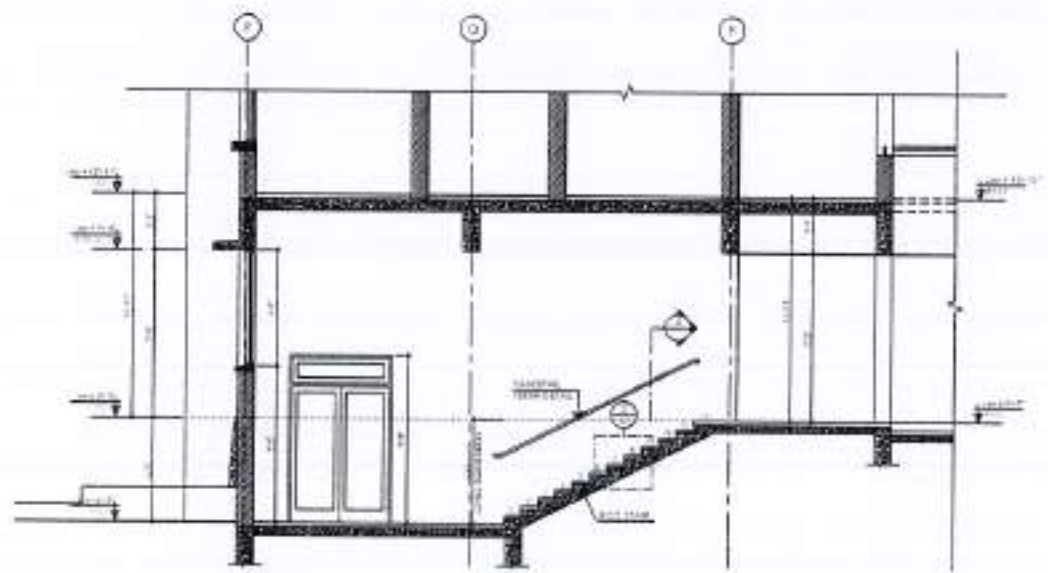
① GROUND FLOOR LEVEL

Stair For Ground Floor to Landing  
 12 Nos. Eq. Riser in 6'-0" Height  
 From Lev. 0'-0" To Lev. 6'-0"  
 (Each Riser 6")

③ NOTES



④ HANDRAIL DETAIL  
 SCALE: 1/2" = 1'-0"



② SECTION X-X



⑤ STEP DETAIL  
 SCALE: 1/2" = 1'-0"



REV.	DATE	ISSUED	REMARKS

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 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FROM THE COMMENCEMENT OF WORK ON SITE.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 MUSTAQ & BILAL  
 CONSULTING ENGINEERS

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 244, MOON BEHAR, RAHATWALA, GHAZIABAD  
 PUNJAB, INDIA

ELECTRICAL CONSULTANT:  
 S.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 144, BOKI, GHAZIABAD, PUNJAB, INDIA

MECHANICAL CONSULTANT:  
 S.P. & ASSOCIATES  
 MECHANICAL ENGINEERS  
 144, BOKI, GHAZIABAD, PUNJAB, INDIA

SCALE: 1/2" = 1'-0"  
 DATE: 17th APRIL 2024

REVIEW & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

PROJECT TITLE:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 STAIR - C  
 PLAN, SECTION & DETAILS  
 WORKING DRAWING

CAD BY:  
 JAVED KHALIL

CHECKED BY:

APPROVED BY:

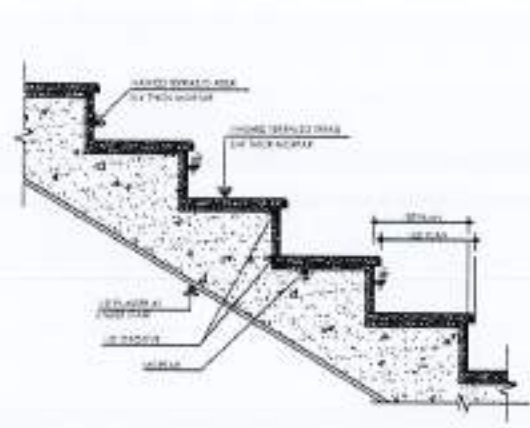
SCALE: 1/2" = 1'-0"  
 DATE: 17th APRIL 2024  
 PUNJAB UNIVERSITY NO: 4753/322/80/04817



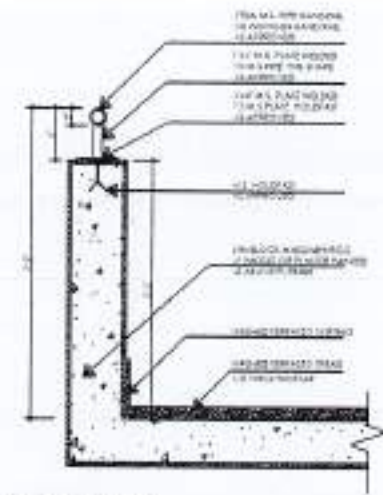




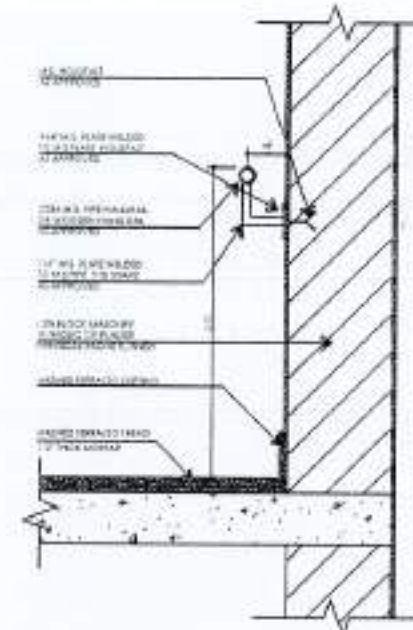
1 PART ELEVATION (TYP.)  
SCALE: 1/8" = 1'-0"



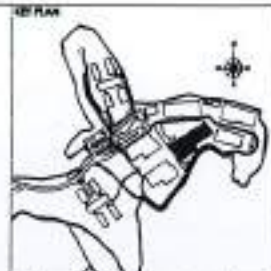
2 STEP DETAIL  
SCALE: 1/2" = 1'-0"



3 HANDRAIL DETAIL  
SCALE: 1/2" = 1'-0"



4 HANDRAIL DETAIL  
SCALE: 1/2" = 1'-0"



REV.	DATE	BY	CHKD.	REMARKS

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ANY DISCREPANCY IS TO BE REPORTED TO THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT: COMPLETION OF LEFTOVER WORK OF CHOIAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

CLIENT: UNIVERSITY OF PUNJAB, RAWALAKOT.

FORM NO:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:

MUSHTAQ AND BILAL CONSULTING ENGINEERS  
ALL WORKS UNDER SUPERVISION OF REGISTERED ENGINEERS  
REGISTERED NO. 1000/2000/1000/1000

ELECTRICAL CONSULTANT: E.P. & ASSOCIATES ELECTRICAL ENGINEERS  
1-44 BLOC, SUITE 1000, JALALI TOWER, 1000

PLUMBING CONSULTANT:

ENVIRONMENTAL & SANITATION CONSULTANT:

REVIEW & SUPERVISION CONSULTANT: NESPAK (PVT.) LIMITED

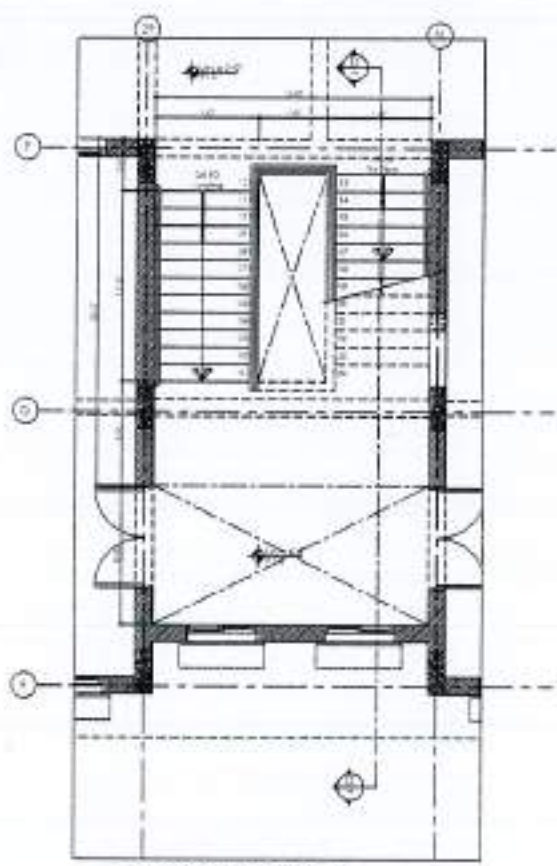
PROJECT: DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING NO: STAIR - D  
PLAN, SECTION & DETAILS  
WORKING DRAWING

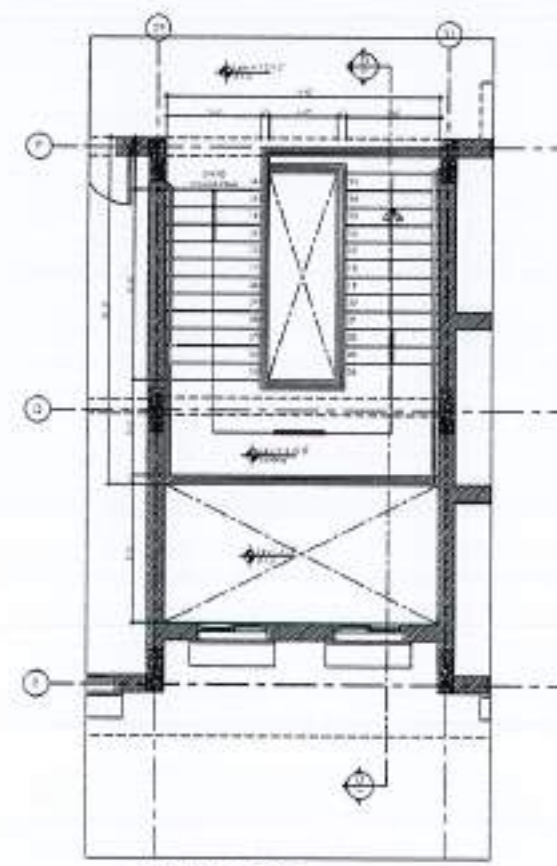
DRAWN BY: JAVED KHALIL  
CHECK BY:

APPROVED BY:

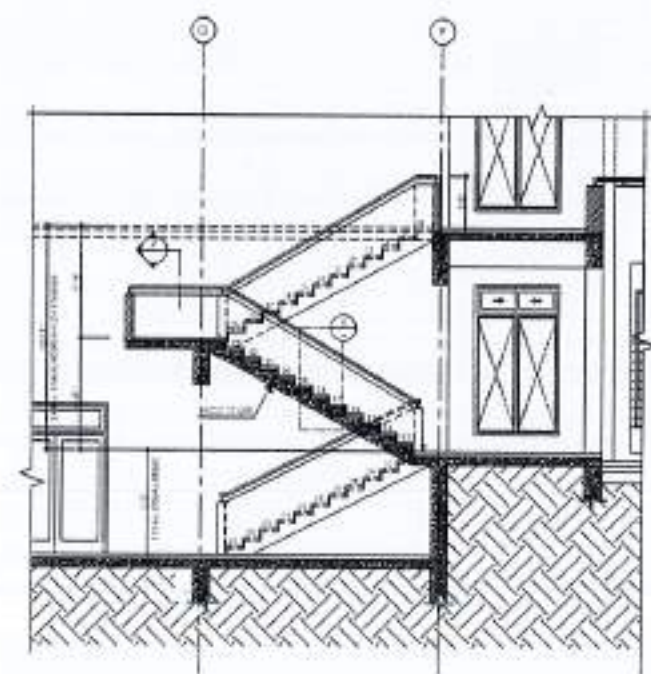
SCALE: 1/8" = 1'-0" DATE: 17th APRIL 2024  
NEW DRAWING NO: 4753/322/BD/04818



1 GROUND FLOOR LEVEL



2 FIRST FLOOR LEVEL



3 SECTION D-D



Stair For Ground Floor, 1st Floor  
24 Nos. St. Riser In 12'-11" Height  
From Lev. ± 0'-0" To + 12'-11" Lev.  
(Each Riser & 45°)

NOTES





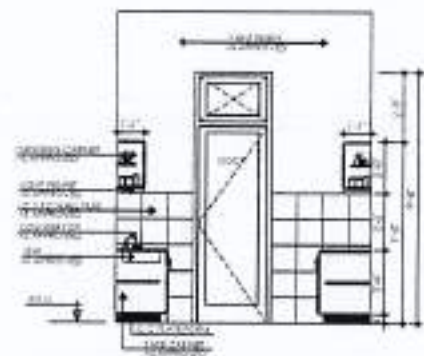




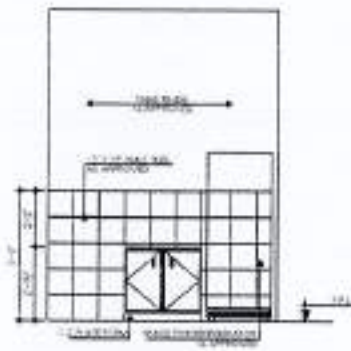




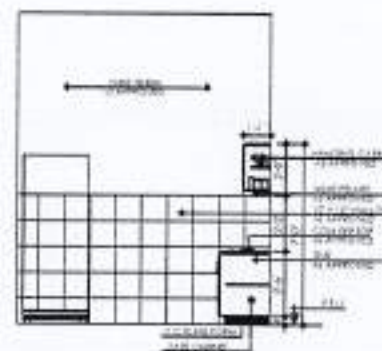




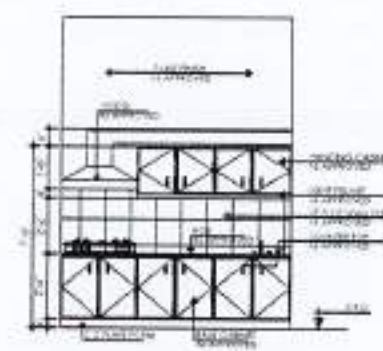
01 BEYAZON



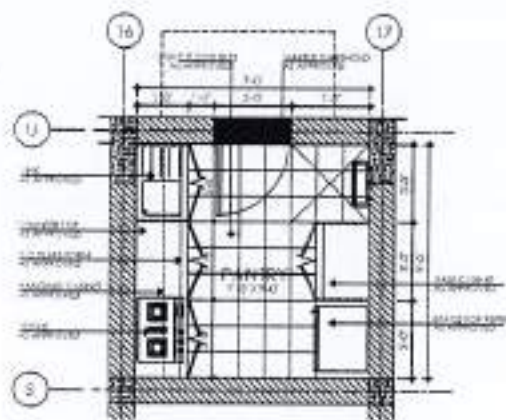
02 BEYAZON



03 BEYAZON



04 BEYAZON



05 PANTRY



REV.	DATE	BY	CHKD.

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOAGALA CAMPUS UNIVERSITY OF PUNJAB, RAJWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAJWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 (Punjab, Planning, Urban Design, Interior Design, Landscape Architecture, Environmental Architecture, etc.)

MECHANICAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 154, HIKO ROAD, SHANWAL, DISTRICT RAJWALAKOT, PUNJAB, INDIA

ELECTRICAL CONSULTANT:  
 K P & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1-41, BANGLA, GILANWALA, DISTRICT RAJWALAKOT, PUNJAB, INDIA

PLUMBING CONSULTANT:  
 (Punjab, Planning, Urban Design, Interior Design, Landscape Architecture, Environmental Architecture, etc.)

ENVIRONMENTAL AND SANITARY CONSULTANT:  
 (Punjab, Planning, Urban Design, Interior Design, Landscape Architecture, Environmental Architecture, etc.)

JOB NO. 502  
 DRAWING NO. A5-004

OWNER & SUPERVISOR CONSULTANT:  
 NESPAK (PVT.) LIMITED

PROJECT TITLE:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 PANTRY LAYOUT DETAILS  
 WORKING DRAWING

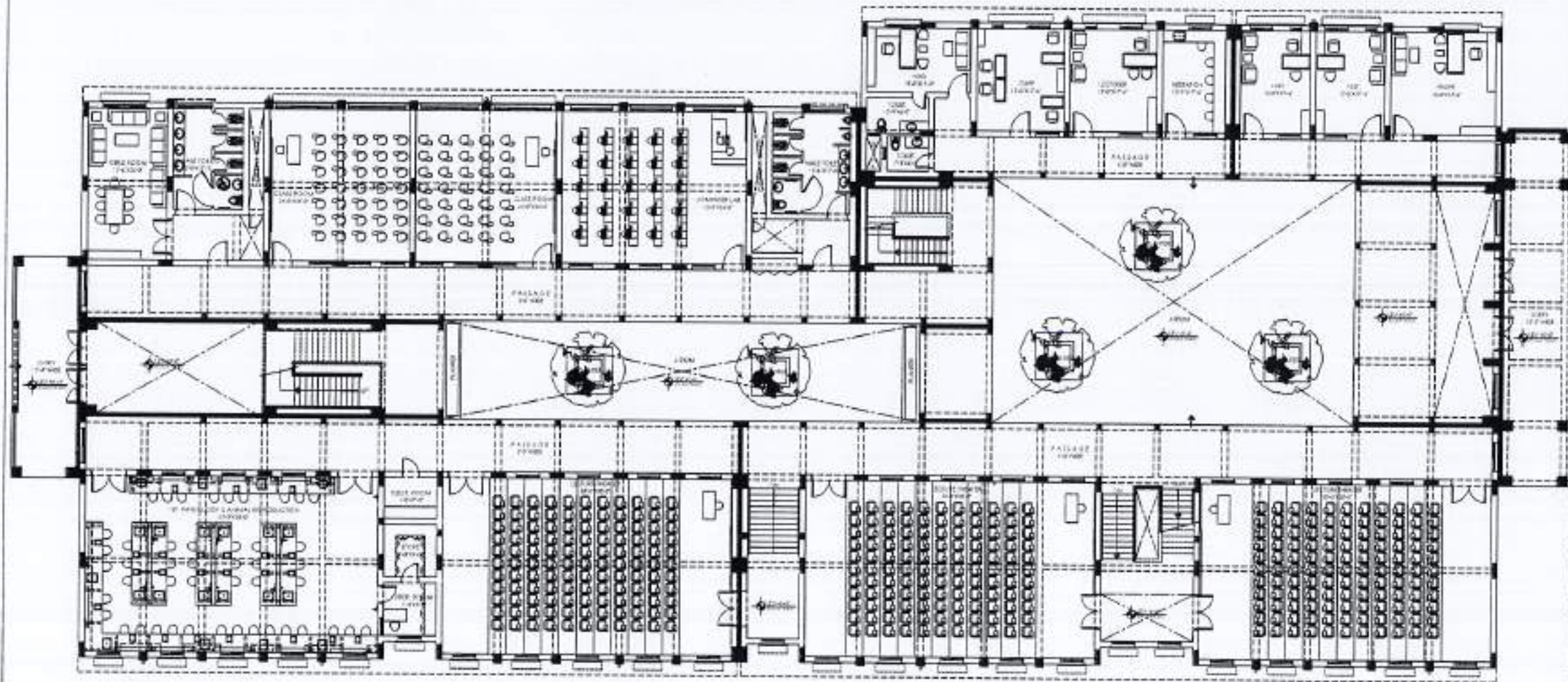
DATE:  
 APPROVED BY:

SCALE:  
 DATE:

PROJECT NO. 4753/322/BD/04822







1 GROUND FLOOR FURNITURE



REV.	DATE	ISSUED	REMARKS

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POKHRA, RAJALAKOT.

CLIENT: UNIVERSITY OF POKHRA, RAJALAKOT.

WORK POINT:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: The Architects  
 101, H-10, Sector-10, Gurgaon, Haryana, India. Phone: +91-122-4433333, Fax: +91-122-4433334, Email: info@thearchitects.com

MECHANICAL CONSULTANT: mushtaq and bilal consulting engineers  
 101, H-10, Sector-10, Gurgaon, Haryana, India. Phone: +91-122-4433333, Fax: +91-122-4433334, Email: info@mushtaqandbilal.com

ELECTRICAL CONSULTANT: K.P. & ASSOCIATES ELECTRICAL ENGINEERS  
 101, H-10, Sector-10, Gurgaon, Haryana, India

PLUMBING CONSULTANT: K.P. & ASSOCIATES PLUMBING ENGINEERS  
 101, H-10, Sector-10, Gurgaon, Haryana, India

ENVIRONMENTAL & INSTRUMENT CONSULTANT: ENVIRONMENTAL & INSTRUMENT CONSULTANTS  
 101, H-10, Sector-10, Gurgaon, Haryana, India

DESIGNED BY: FOR NO. 502 DRAWING NO. A6-001

REVIEW & SUPERVISION CONSULTANT: NESPAK (PVT.) LIMITED

SUBJECT: DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING FOR: GROUND FLOOR FURNITURE LAYOUT PLAN WORKING DRAWING

DATE: 17/04/2024

DESIGNER: AHMED KHALIL

CHECKER: [Blank]

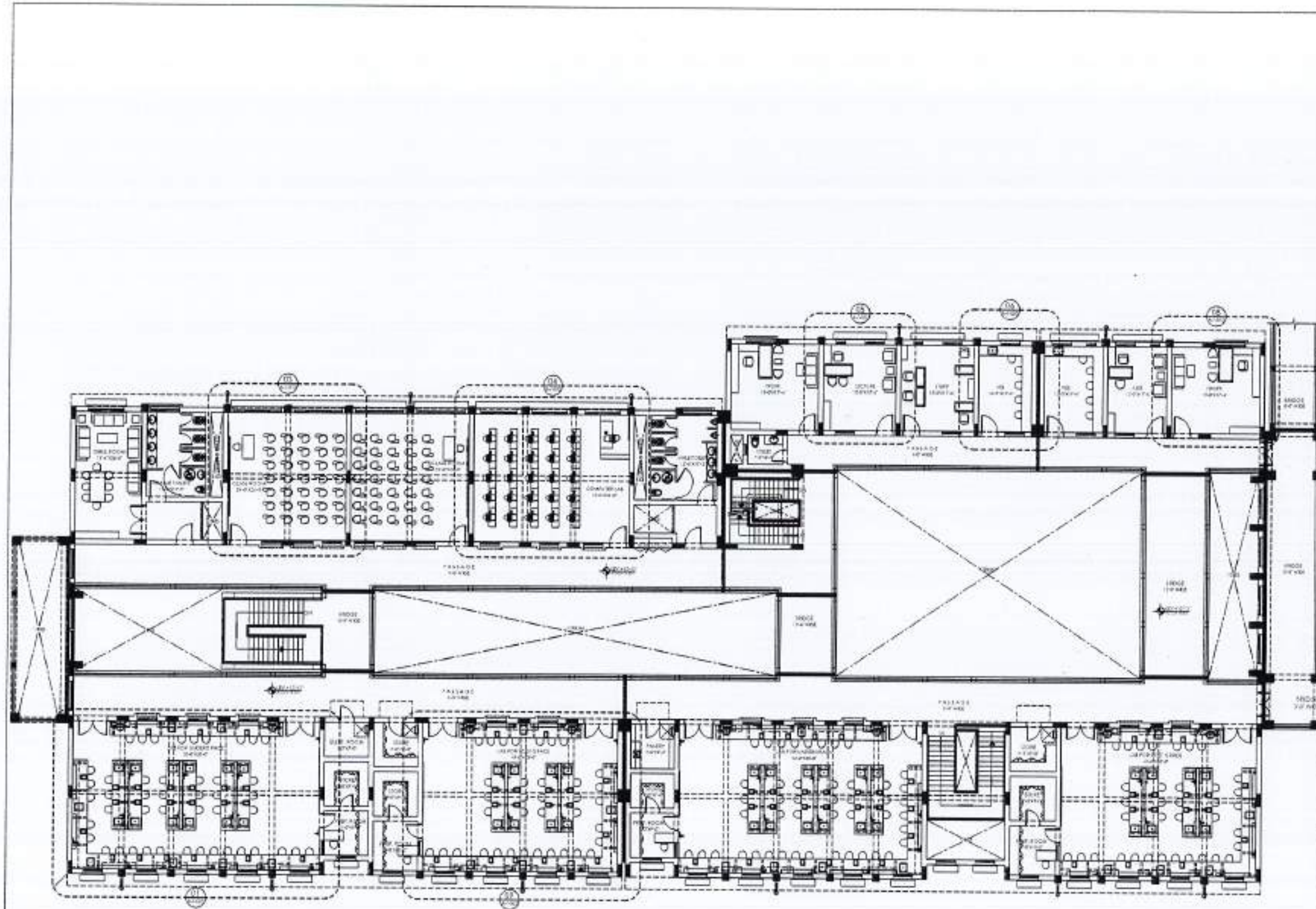
APPROVED BY: [Blank]

SCALE: 1/8" = 1'-0" DATE: 17/04/2024

NEW DRAWING NO: 4753/322/BD/04823







1 FIRST FLOOR FURNITURE



REV.	DATE	BY	CHKD.

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAJWALAKOT.

CITY: UNIVERSITY OF PUNJAB, RAJWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: THE ARCHITECTS (PUNJAB) PRIVATE LIMITED  
101, HOUSING SOCIETY, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAJWALAKOT.

MECHANICAL CONSULTANT: **mustafa and bilal consulting engineers**  
101, HOUSING SOCIETY, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAJWALAKOT.

ELECTRICAL CONSULTANT: **K.P. & ASSOCIATES ELECTRICAL ENGINEERS**  
101, HOUSING SOCIETY, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAJWALAKOT.

PLUMBING CONSULTANT: **K.P. & ASSOCIATES**  
101, HOUSING SOCIETY, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAJWALAKOT.

DESIGNING NO: 502

JOB NO: A6-002

OWNER & SUPERVISOR CONSULTANT: **NESPAK (PVT.) LIMITED**

DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING NO: **FIRST FLOOR FURNITURE LAYOUT PLAN WORKING DRAWING**

DATE: 17th APRIL 2024

DESIGNED BY: [Signature]

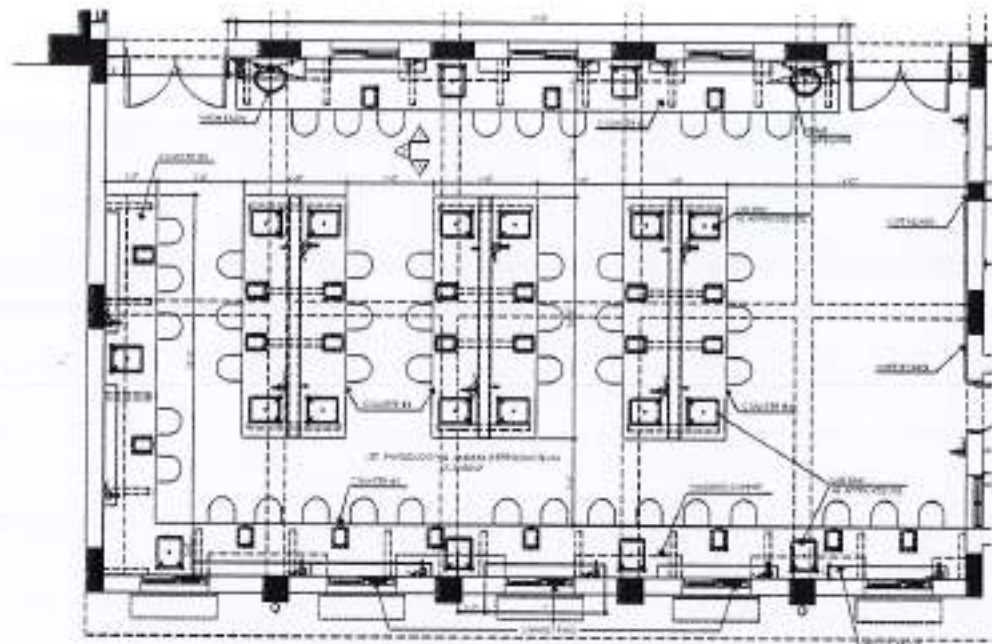
SCALE: 1/8" = 1'-0"

DATE: 17th APRIL 2024

PROJECT NO: 4753/322/BD/04824

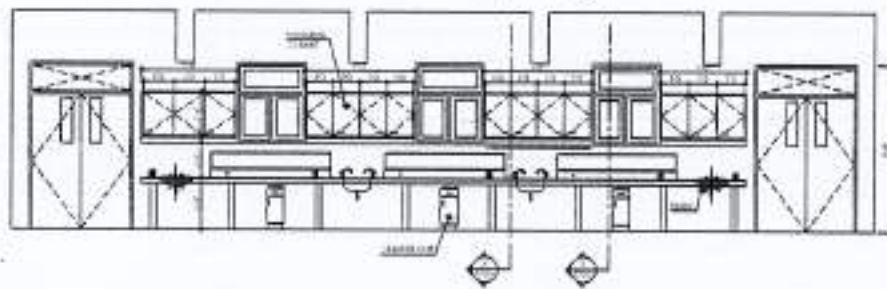




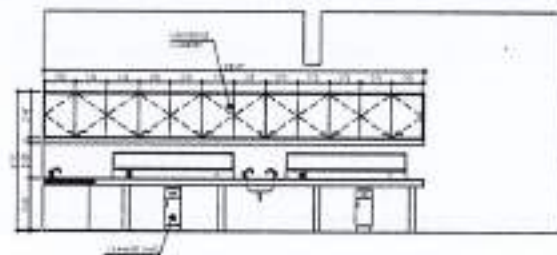


PART PLAN - 01

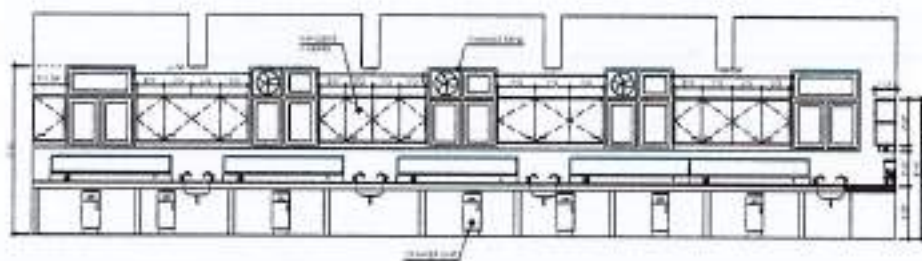
(TYPICAL LAYOUT)



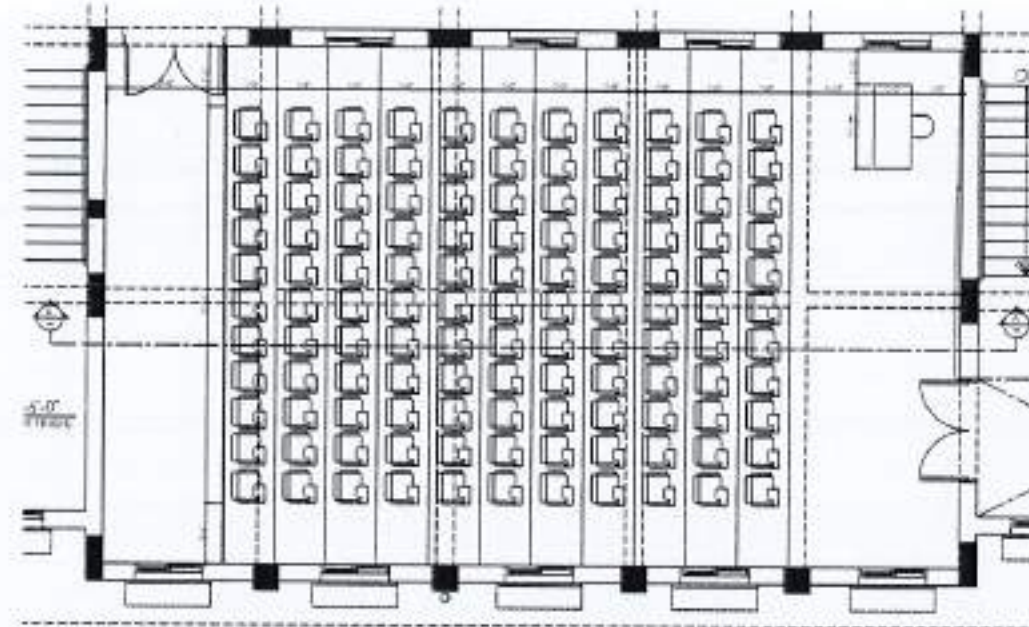
ELEVATION - 01



ELEVATION - 02

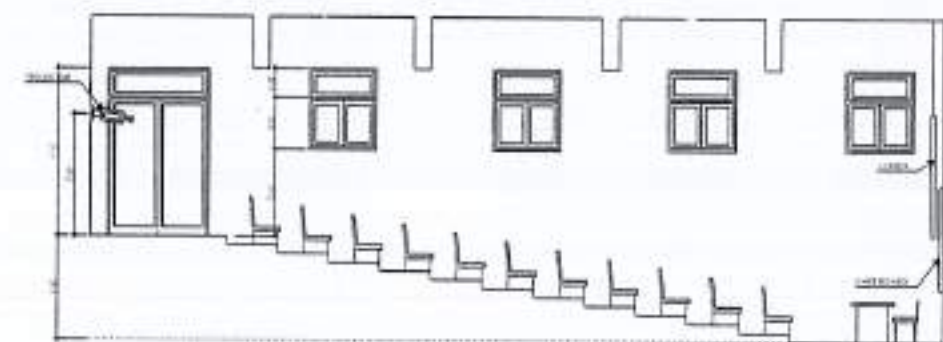


ELEVATION - 03



PART PLAN - 02

(TYPICAL LAYOUT)



SECTION A-A



REV.	DATE	ISSUED	REMARKS

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 4. ALL DIMENSIONS ARE TO BE IN METERS AND UNLESS OTHERWISE SPECIFIED.  
 5. ALL DIMENSIONS ARE TO BE IN METERS AND UNLESS OTHERWISE SPECIFIED.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAJVALAKOT.  
 CLIENT:  
 UNIVERSITY OF PUNJAB RAJVALAKOT  
 CONSULTANT:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
  
**mushtaq and bilal**  
 consulting engineers  
 ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PRACTICE OF ARCHITECTURE IN PUNJAB AND THE PRACTICE OF ARCHITECTURE ACT, 1972.

ELECTRICAL CONSULTANT:  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1-4/Block, Chhotagala-Campus, Rajvalakot-19001

PLUMBING CONSULTANT:  
  
 E.P. ASSOCIATES  
 MECHANICAL & PLUMBING CONSULTANTS  
 1-4/Block, Chhotagala-Campus, Rajvalakot-19001

OLD DRAWING NO:  
 502  
 DRAWING NO:  
 A7-001

REVIEW & APPROVAL CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUBJECT:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING FOR:  
 GROUND & FIRST FLOOR  
 FURNITURE DETAILS  
 WORKING DRAWING

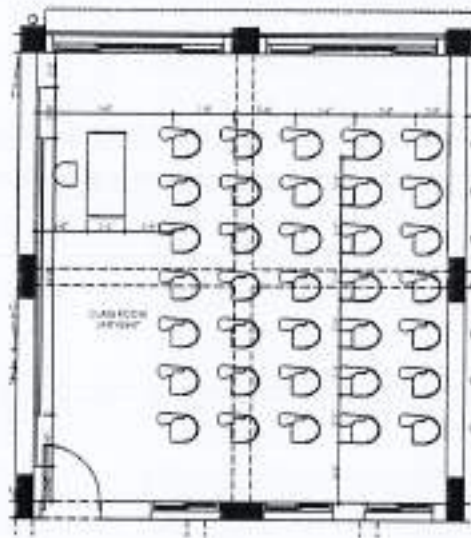
DESIGNED BY:  
 JAVED IQBAL  
 CHECKED BY:  
 APPROVED BY:

SCALE:  
 1/4" = 1'-0"  
 DATE:  
 07/11/2024

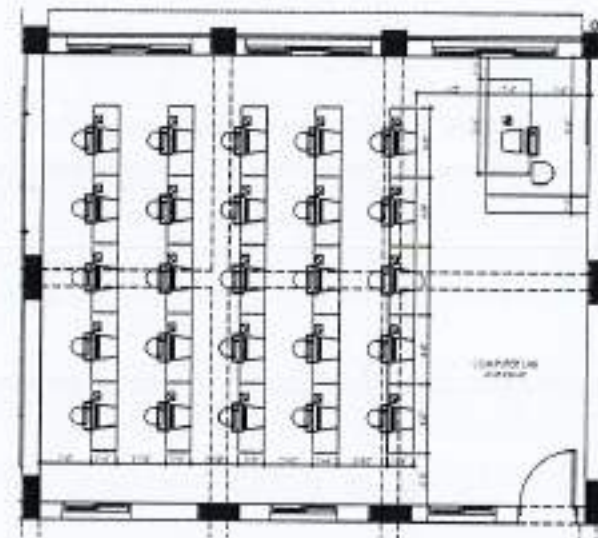
NEW DRAWING NO:  
 4753/322/BD/04825







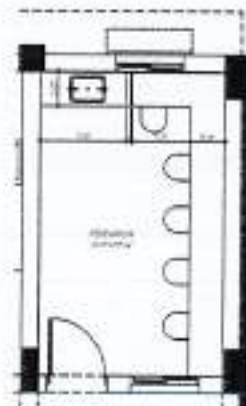
PART PLAN - 03



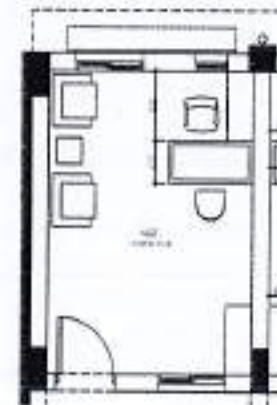
PART PLAN - 04



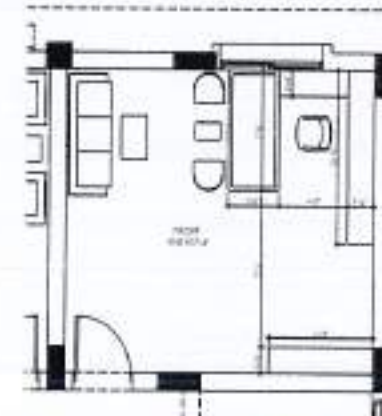
PART PLAN - 05



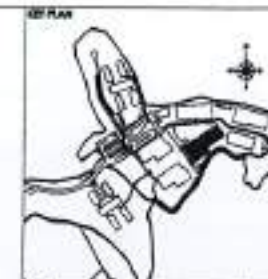
PART PLAN - 06



PART PLAN - 07



PART PLAN - 08



REV.	DATE	ISSUED	REMARKS

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 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

**PROJECT:**  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POKHARA, RAJALAKOT.


**CLIENT:**  
 UNIVERSITY OF POKHARA RAJALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

**ARCHITECT:**  
 The Architects  
 Chitragala, Pokhara, Nepal  
 P.O. Box 10, Chitragala, Pokhara  
 Phone: 977-031-4222222, 4222222  
 Email: info@the-architects.com.np

**MECHANICAL CONSULTANT:**  
  
**mushtaq and bilal**  
 consulting engineers  
 P.O. Box 10, Chitragala, Pokhara  
 Phone: 977-031-4222222, 4222222  
 Email: info@mushtaqandbilal.com.np

**ELECTRICAL CONSULTANT:**  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 144 Road, Chitragala, Pokhara - 76601

**PLUMBING CONSULTANT:**  
 GANESH  
 P.O. Box 10, Chitragala, Pokhara  
 Phone: 977-031-4222222, 4222222  
 Email: info@ganesh.com.np

**ENVIRONMENTAL & MANAGEMENT CONSULTANT:**  
 P.O. Box 10, Chitragala, Pokhara  
 Phone: 977-031-4222222, 4222222  
 Email: info@emc.com.np

**DESIGNED BY:**  
 CONTROL: 502  
 DRAWING NO: A7-002

**REVIEW & SUPERVISION CONSULTANT:**  
 NESPAK (PVT.) LIMITED

**PROJECT TITLE:**  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

**DRAWING TITLE:**  
 GROUND & FIRST FLOOR FURNITURE DETAILS WORKING DRAWING

**DRAWN BY:**  
 AYED GHAL

**DESIGN BY:**

**REVIEWED BY:**

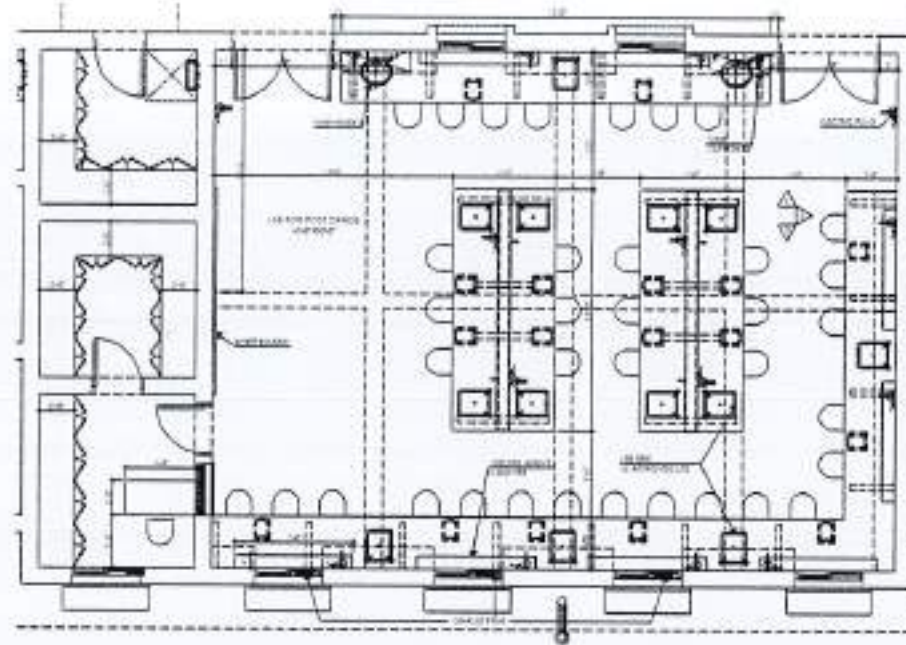
**APPROVED BY:**

**SCALE:** 1/4" = 1'-0" **DATE:** 17th APRIL 2024

**NEW DRAWING NO:** 4753/322/BD/04824



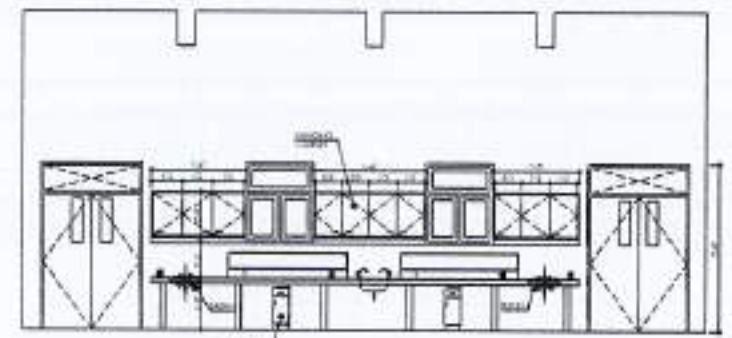




REV. NO.	DATE	ISSUED	REVISION

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 2. THE DRAWING IS NOT TO BE REPRODUCED OR USED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF HAS THE ARCHITECT.  
 3. ALL DIMENSIONS ARE TO BE RECORDED AND VERIFIED ON SITE.  
 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PART PLAN - 09



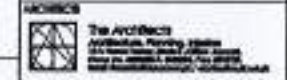
PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT



STRUCTURAL CONSULTANT:  
**mushtaq and bilal**  
 consulting engineers  
 104, KORE ROAD, BHAYINDARA, LAHORE-75000  
 TEL: 354-5555 / 354-5556 / 354-5557 / 354-5558 / 354-5559 / 354-5560 / 354-5561 / 354-5562 / 354-5563 / 354-5564 / 354-5565 / 354-5566 / 354-5567 / 354-5568 / 354-5569 / 354-5570 / 354-5571 / 354-5572 / 354-5573 / 354-5574 / 354-5575 / 354-5576 / 354-5577 / 354-5578 / 354-5579 / 354-5580 / 354-5581 / 354-5582 / 354-5583 / 354-5584 / 354-5585 / 354-5586 / 354-5587 / 354-5588 / 354-5589 / 354-5590 / 354-5591 / 354-5592 / 354-5593 / 354-5594 / 354-5595 / 354-5596 / 354-5597 / 354-5598 / 354-5599 / 354-5600

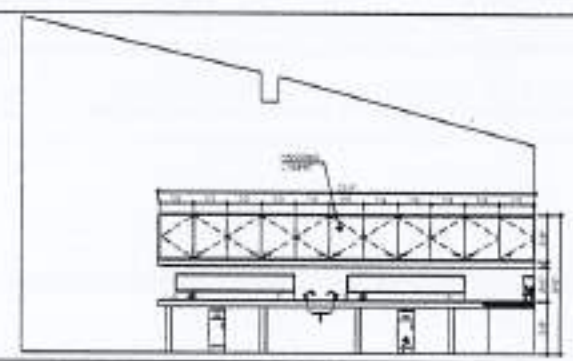
ELECTRICAL CONSULTANT:  
**E.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 144, B-1, DUBAI ROAD, LAHORE-75000

PLUMBING CONSULTANT:  
**P.C. Associates**

MECHANICAL & MANAGEMENT CONSULTANT:  
**M.M. Associates**

JOB NO. 502      DRAWING NO. A7-003

ELEVATION - 01



REVIEW & APPROVAL CONSULTANT:  
**NESPAK (PVT.) LIMITED**

APPROVED BY:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 FIRST FLOOR FURNITURE DETAILS WORKING DRAWING

DATE BY:      APPROVED BY:

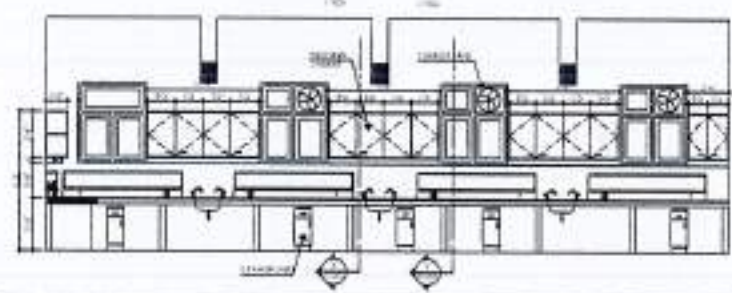
DATE BY:      APPROVED BY:

DATE BY:      APPROVED BY:

SCALE: 1/8" = 1'-0"      DATE: 07th APRIL 2024

REV. NO. 01      DATE: 07th APRIL 2024

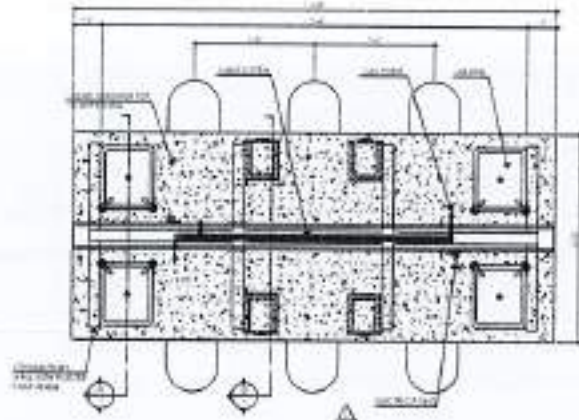
ELEVATION - 02



ELEVATION - 03

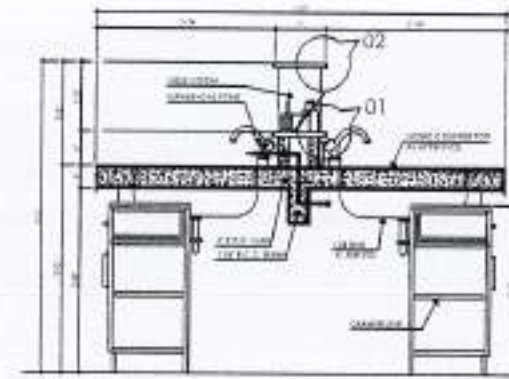
REV. NO. 01      DATE: 07th APRIL 2024





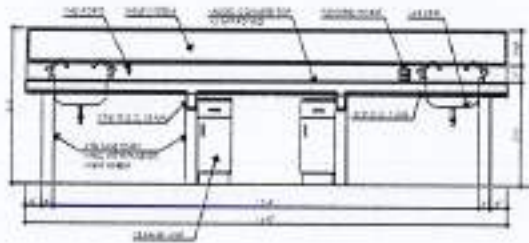
TYPICAL LAB COUNTER DETAIL

SCALE: 1/2"=1'-0"



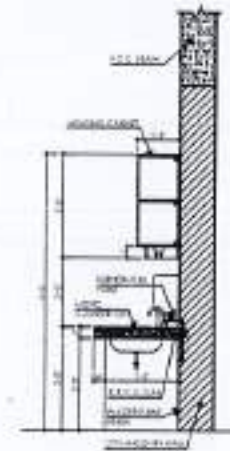
SECTION - B-B

SCALE: 1"=1'-0"



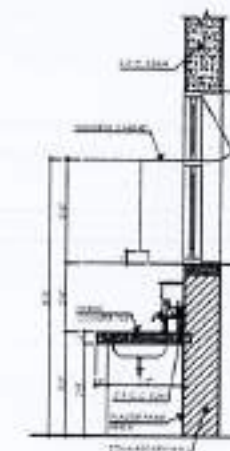
ELEVATION - 01

SCALE: 1/2"=1'-0"



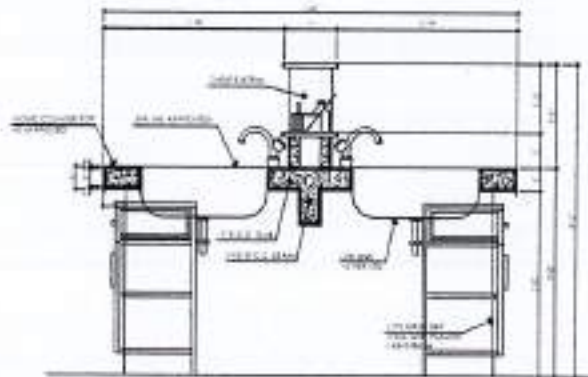
SECTION - X-X

SCALE: 1/2"=1'-0"



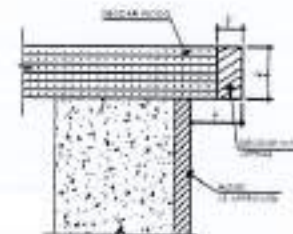
SECTION - Y-Y

SCALE: 1/2"=1'-0"



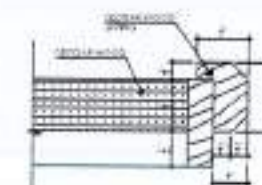
SECTION - A-A

SCALE: 1"=1'-0"



DETAIL - 01

SCALE: 1'-0"=1'-0"



DETAIL - 02

SCALE: 1'-0"=1'-0"



REV.	DATE	BY	CHKD

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOISAGALA CAMPUS UNIVERSITY OF POKHRAH RAWALAKOT.

CLIENT: UNIVERSITY OF POKHRAH RAWALAKOT

NO. OF SHEETS: 4

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: The Architects (Mus Tag and Bilal Consulting Engineers) Rawal Kot, Islamabad.

STRUCTURAL CONSULTANT: mus tag and bilal consulting engineers

ELECTRICAL CONSULTANT: K.P. & ASSOCIATES ELECTRICAL ENGINEERS

MECHANICAL CONSULTANT: M.S. CONSULTANTS

ENVIRONMENTAL & MANAGEMENT CONSULTANT: M.S. CONSULTANTS

NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4

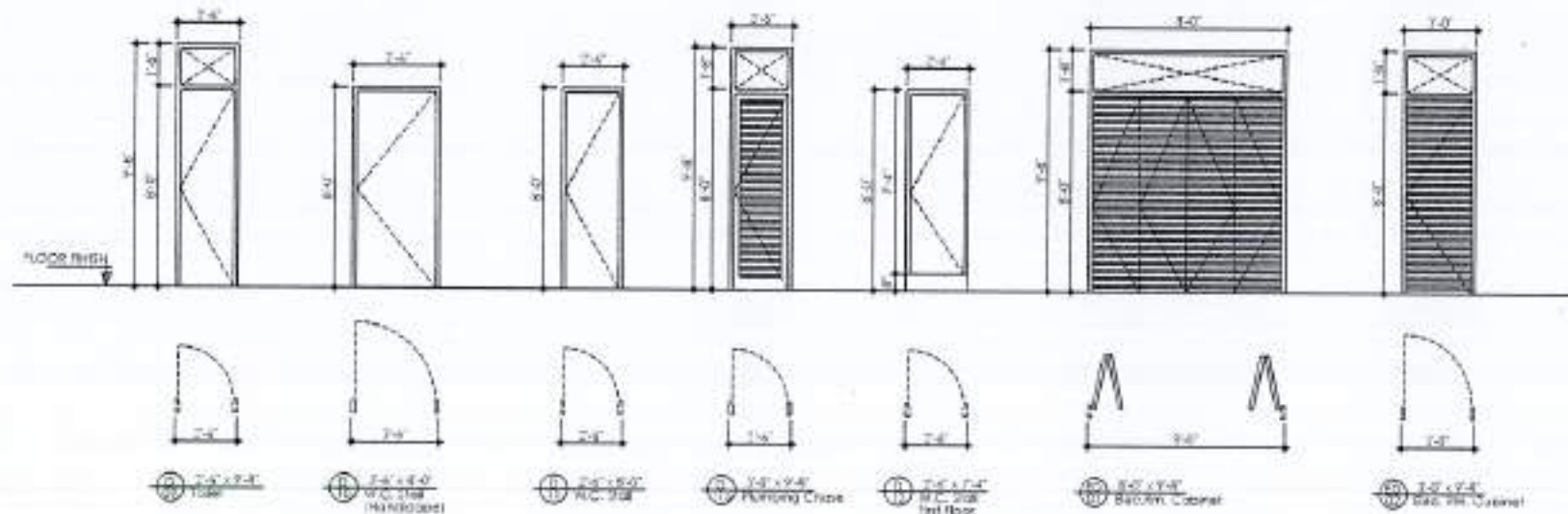
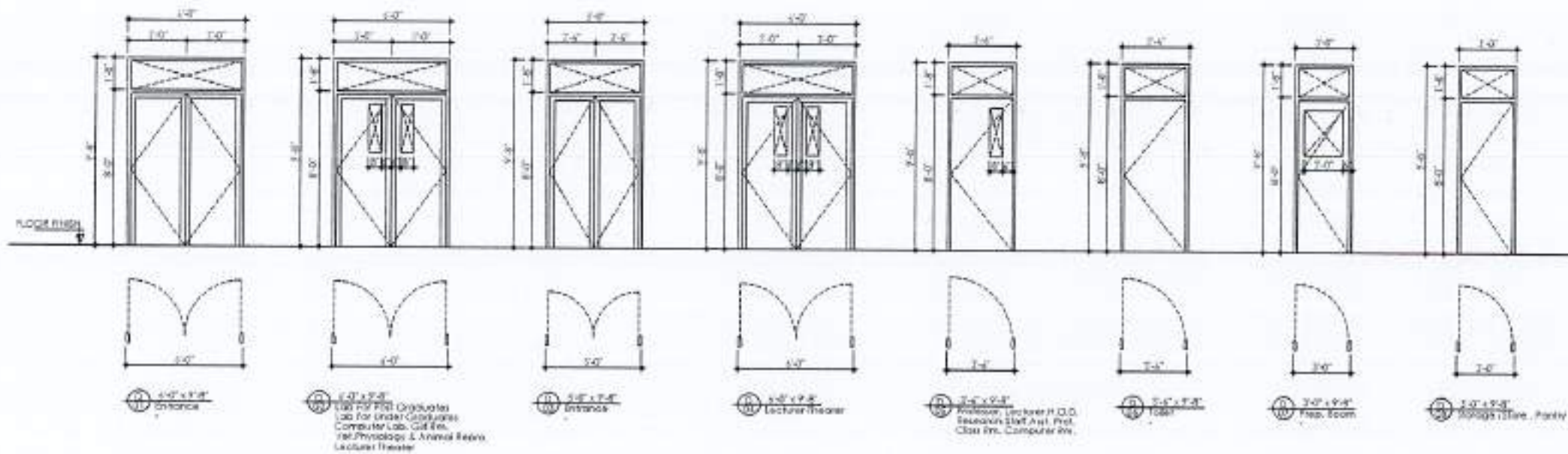
NO. OF SHEETS: 4

NO. OF SHEETS: 4

NO. OF SHEETS: 4







REV.	DATE	BY	REMARKS

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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

**CUSTOMER:**  
UNIVERSITY OF PUNJAB RAWALAKOT

**NO. OF FLOOR:**  
1st Floor

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

**ARCHITECT:**  
The Architects  
Architectural Planning, Interior Design, Building Services, etc.  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

**MUSHTAQ AND BILAL CONSULTING ENGINEERS**  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

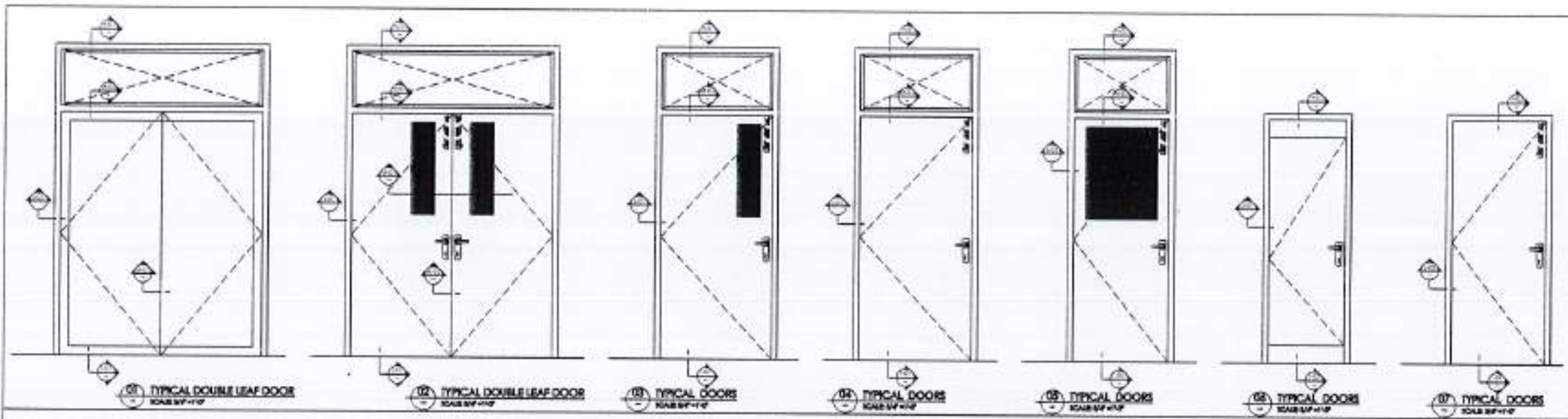
**ELECTRICAL CONSULTANTS:**  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
8-44 Mark, Dufferin Avenue, Karachi - 7500

**PLUMBING CONSULTANTS:**  
P.C. ENGINEERS  
PLUMBING, MECHANICAL & ELECTRICAL ENGINEERS  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458,







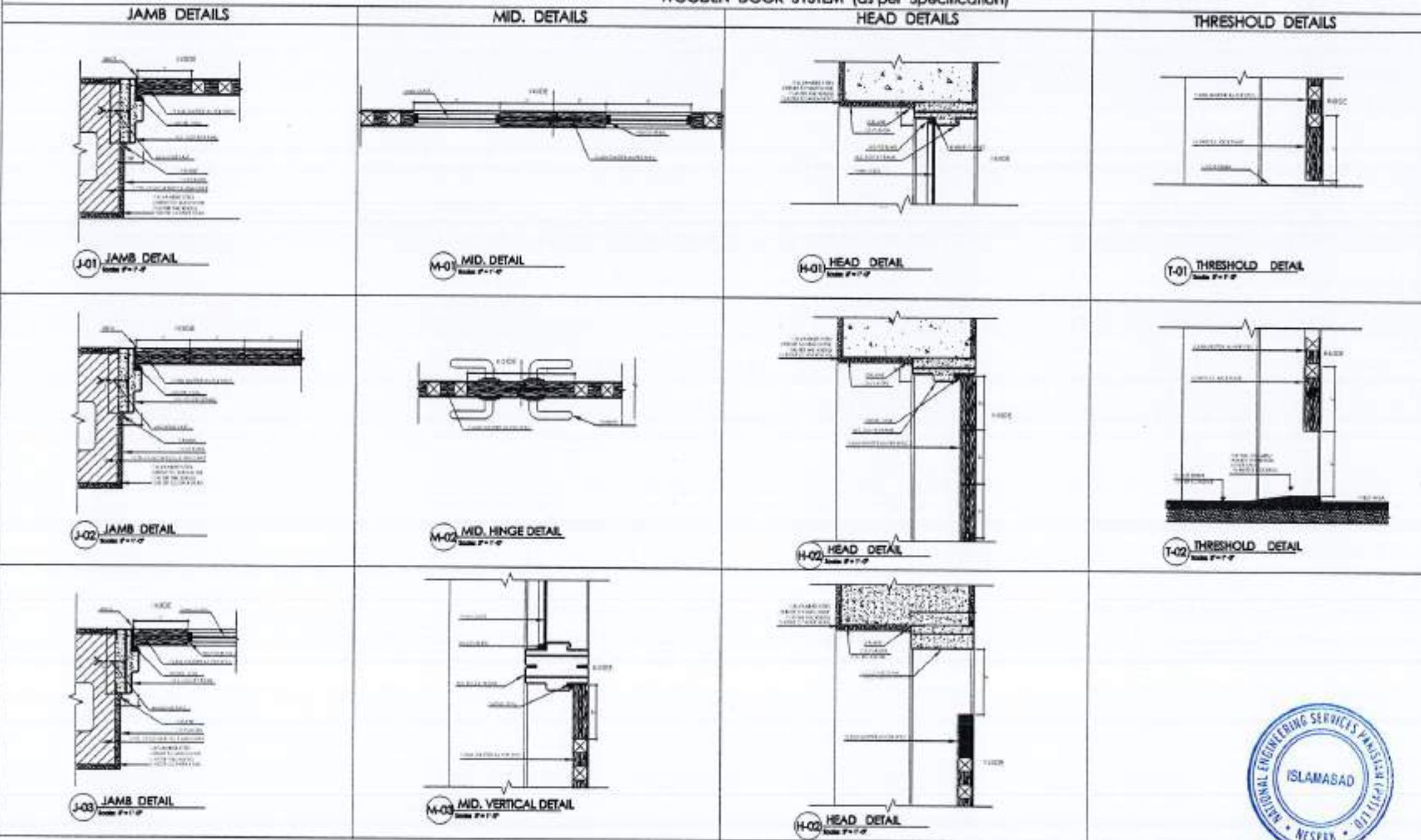


REV.	DATE	BY	CHKD.

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WOODEN DOOR SYSTEM (as per Specification)



PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOITAGALA CAMPUS UNIVERSITY OF POONCH, RAJWALAKOT.  
CLIENT:  
UNIVERSITY OF POONCH, RAJWALAKOT  
WORK NO:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECTS:  
 The Architects  
MUSHTAQ AND BIAL CONSULTING ENGINEERS  
154, HOOR ROAD, BHANWAL, DISTRICT PUNJAB  
TEL: 0351-2511111 FAX: 0351-2511111

ELECTRICAL CONSULTANT:  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
14-B, BLOCK-3, GATEWAY ROAD, COLONY-1, PUNJAB

PLUMBING CONSULTANT:  
 P. & S. ENGINEERS  
154, HOOR ROAD, BHANWAL, DISTRICT PUNJAB  
TEL: 0351-2511111 FAX: 0351-2511111

DATE: 502  
DRAWING NO: A8-003

OWNER & SUPERVISION CONSULTANT:  
NESPAC (PVT.) LIMITED

SUBJECT: DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

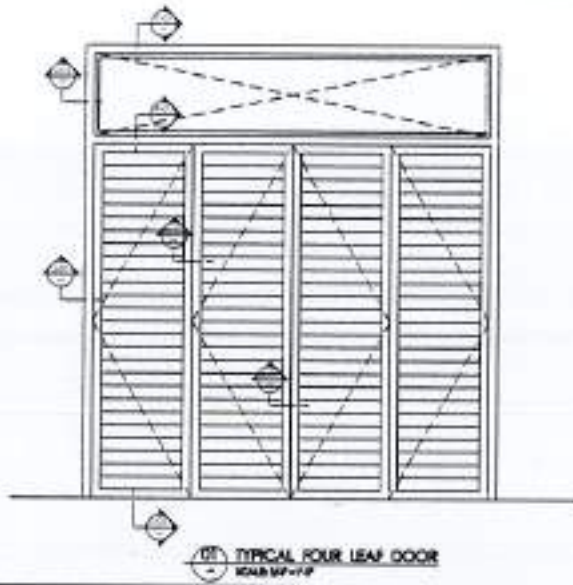
DRAWING TITLE: DOOR JOINERY DETAILS WORKING DRAWING

DESIGNED BY: JAVED KHAN  
CHECKED BY:  
APPROVED BY:

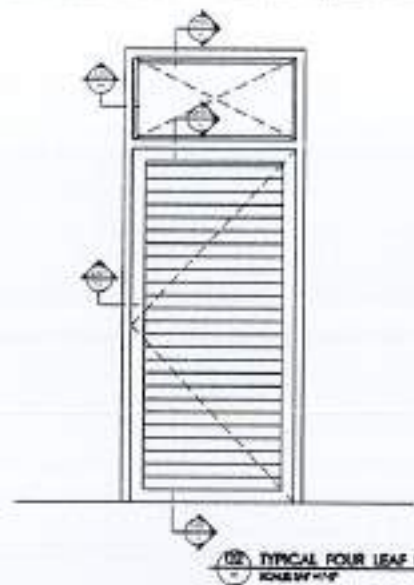
SCALE: AS SHOWN DATE: 17th APRIL 2024  
PROJECT NO: 4753/322/BD/04831





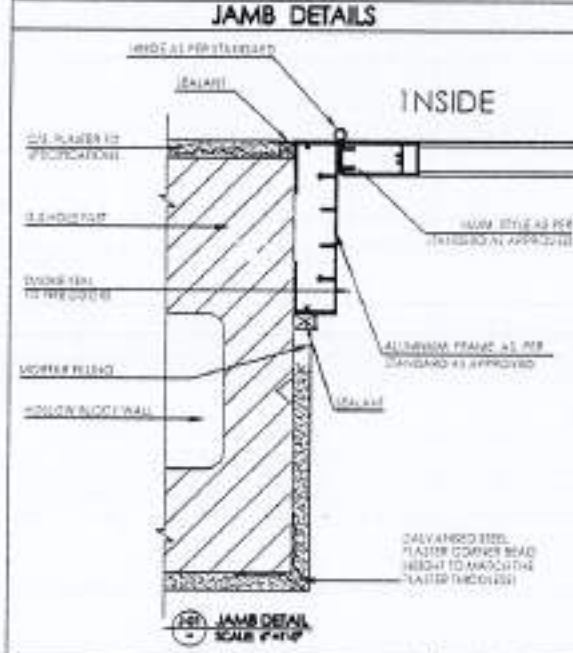


101 TYPICAL FOUR LEAF DOOR  
SCALE 1/4" = 1'-0"

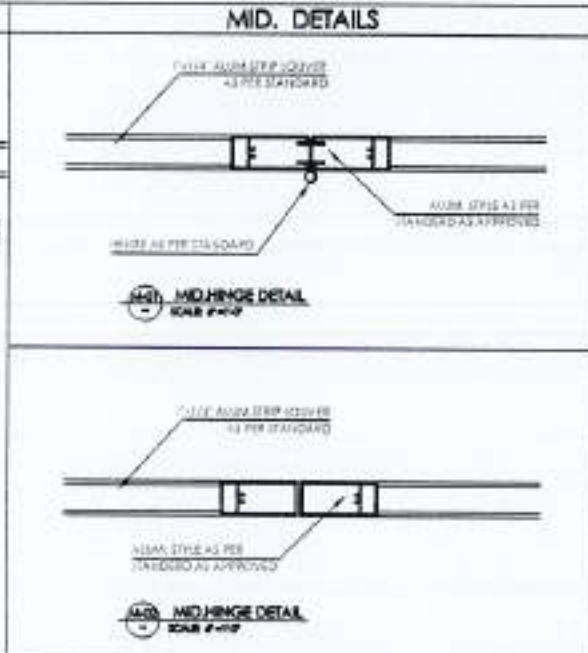


102 TYPICAL FOUR LEAF DOOR  
SCALE 1/4" = 1'-0"

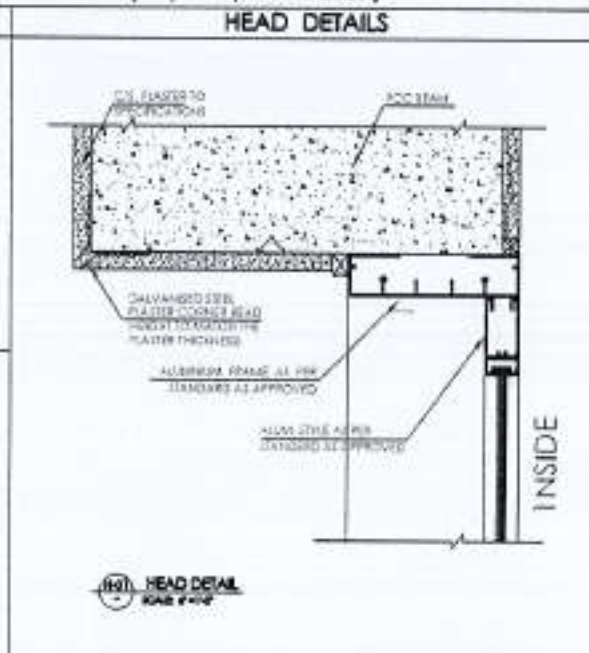
ALUMINIUM ELECTRICAL DOOR SYSTEM (as per Specification)



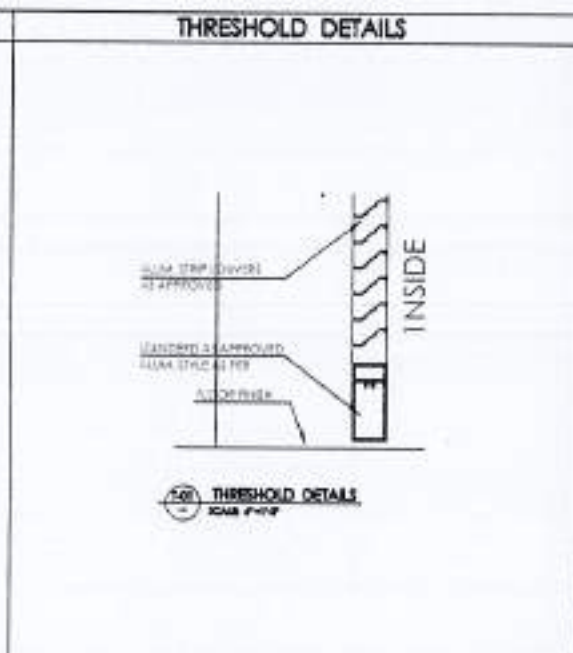
103 JAMB DETAIL  
SCALE 1/4" = 1'-0"



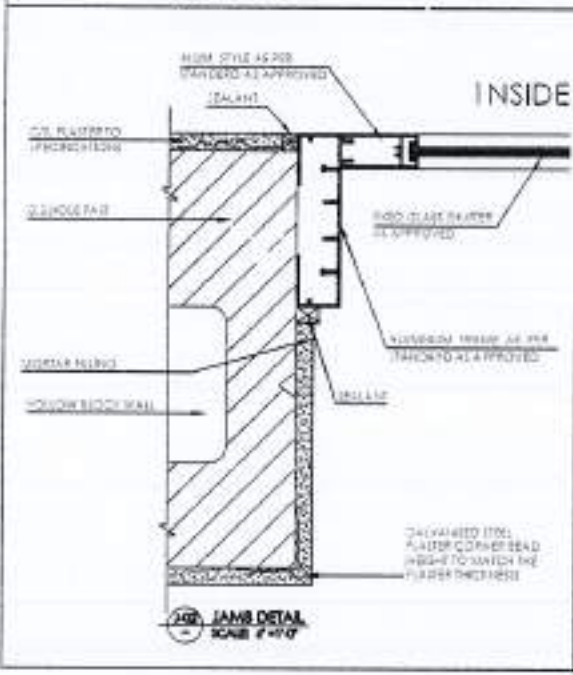
104 MID-HINGE DETAIL  
SCALE 1/4" = 1'-0"



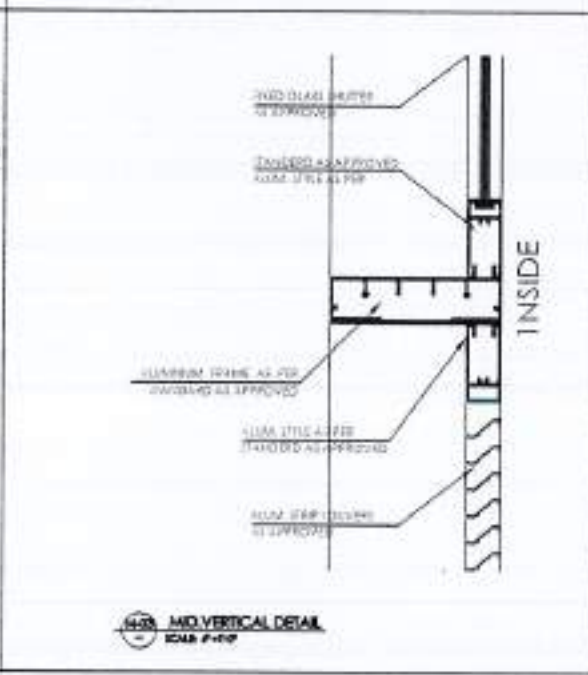
105 HEAD DETAIL  
SCALE 1/4" = 1'-0"



106 THRESHOLD DETAIL  
SCALE 1/4" = 1'-0"



107 JAMB DETAIL  
SCALE 1/4" = 1'-0"



108 MID VERTICAL DETAIL  
SCALE 1/4" = 1'-0"



REV. NO.	DATE	BY	REASON

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POKHARA RAWALAKOT.

CUSTOMER:  
UNIVERSITY OF POKHARA RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

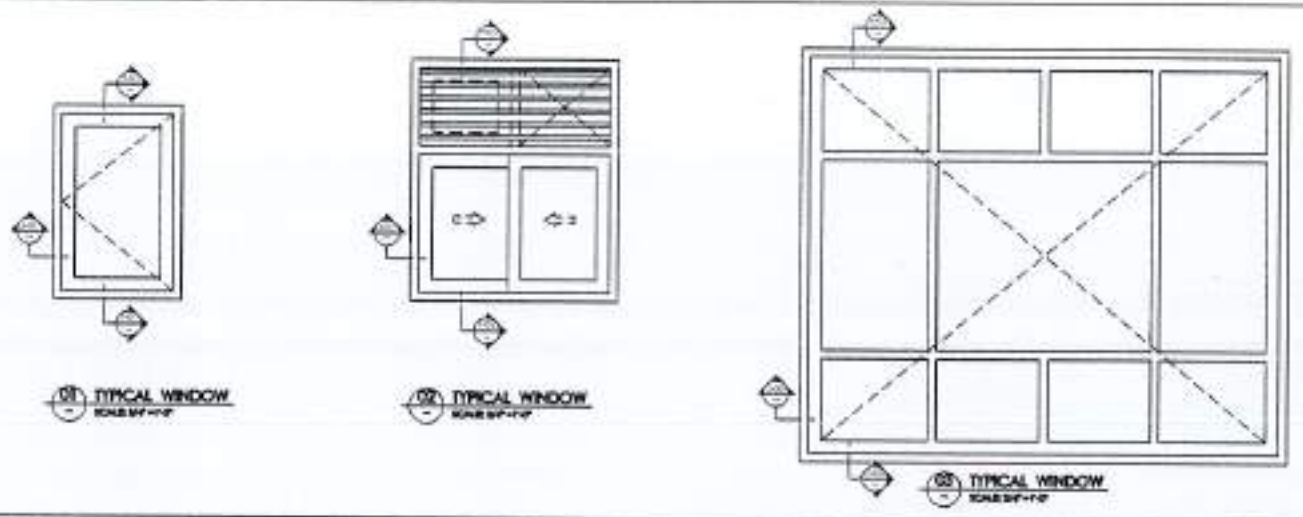
ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
Mushtaq and Bilal  
Consulting Engineers  
204, HOCK ROAD, BHAKTIPUR, CHITAGALA CAMPUS, POKHARA  
TEL: 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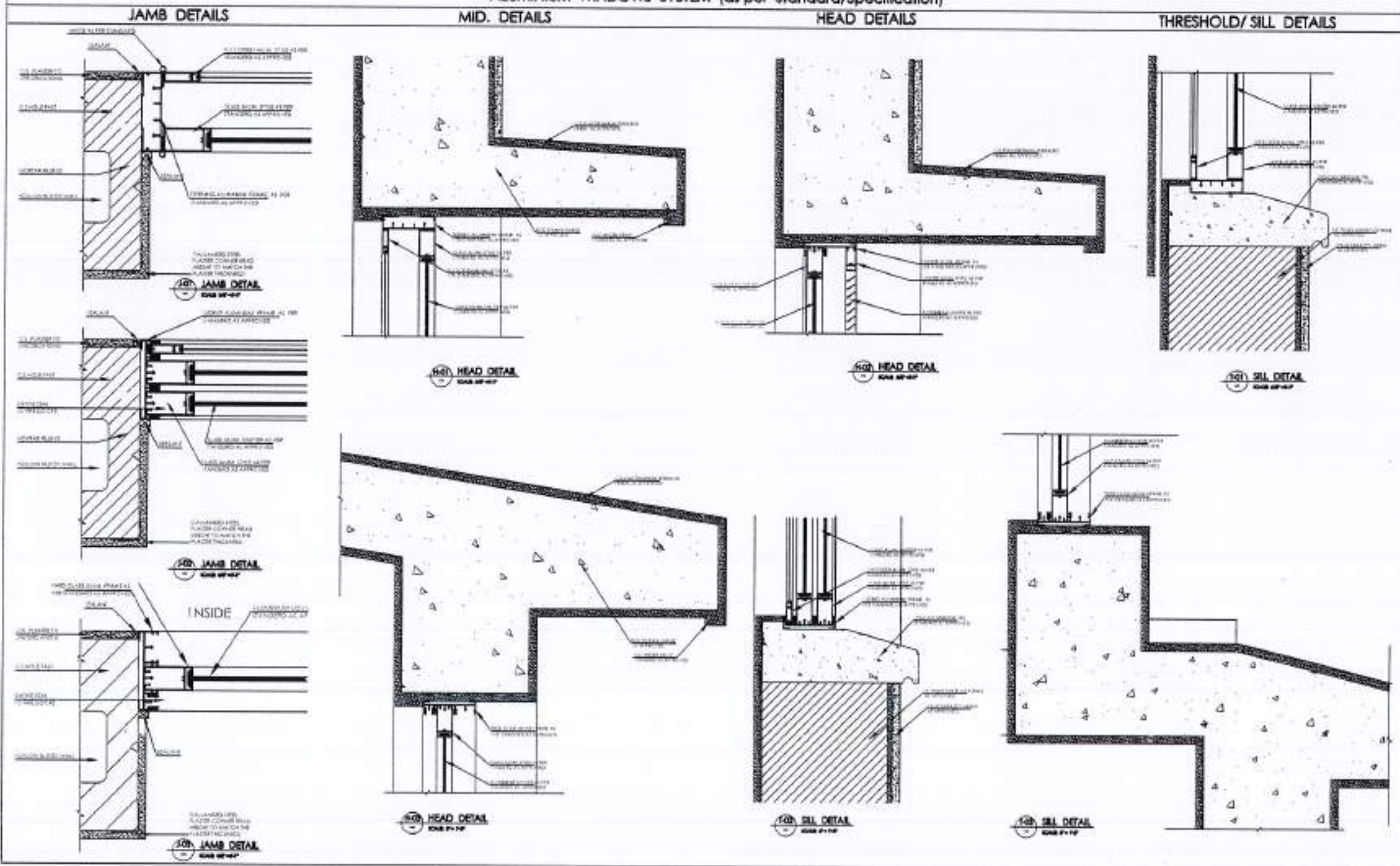








ALUMINIUM WINDOWS SYSTEM (as per Standard/Specification)



REV. NO.	DATE	ISSUED	ISSUED BY

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT: UNIVERSITY OF POONCH, RAWALAKOT.

WORK NO: [Symbol]

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

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ARCHITECT: THE ARCHITECTS (Punjab, Pakistan) Private Limited, 101, Main Road, Lahore, Pakistan.

ELECTRICAL CONSULTANT: AAE mustaq and bilal consulting engineers, 101, Main Road, Lahore, Pakistan.

Mechanical CONSULTANT: E.P. & ASSOCIATES ELECTRICAL ENGINEERS, 101, Main Road, Lahore, Pakistan.

PLUMBING CONSULTANT: [Symbol]

ENVIRONMENTAL & SANITATION CONSULTANT: [Symbol]

DESIGNING NO: 502

WORK NO: A8-006

REVIEW & APPROVAL CONSULTANT: NESPAK (PVT.) LIMITED

PROJECT: DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWN BY: ALUM, WIN, JOINERY DETAILS

WORKING DRAWING

SCALE: AS SHOWN DATE: 17th APRIL 2024

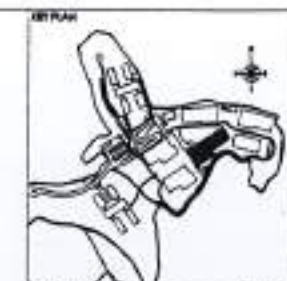
NEW DRAWING NO: 4753/322/BD/04834





SCHEDULE OF FINISHES DEPARTMENT OF VETERINARY & ANIMAL SCIENCE							
FLOOR	S.NO.	ROOM NAME	FLOOR	SKIRTING	WALL	CEILING	REMARK
GROUND FLOOR	1	ENTRANCE LOBBY	F-07	S-01	W-05	C-01	
	2	LOBBY	F-01	S-01	W-05	C-01	
	3	STAIR CASE	F-02	S-01	W-05	C-01	
	4	MALE & FEMALE TOILET	F-04	---	W-01&05	C-01&02	
	5	TOILET (FACULTY)	F-04	---	W-01&05	C-01&02	
	6	PASSAGE COURT	F-01	S-01	W-03&5	C-01	
	7	LECTURE THEATER	F-05	S-01	W-01	C-01	
	8	GIRLS ROOM	F-01	S-01	W-05	C-01	
	9	CLASS ROOM	F-01&03	S-01	W-05	C-01	
	10	PROFESSOR	F-01	S-01	W-05	C-01	
	11	ASSISTANT PROFESSOR	F-01	S-01	W-05	C-01	
	12	LECTURER	F-01	S-01	W-05	C-01	
	13	RESEARCH	F-01	S-01	W-05	C-01	
	14	H.O.D.	F-01	S-01	W-05	C-01	
	15	STAFF	F-01	S-01	W-05	C-01	
	16	ELECTRICAL	F-01	S-01	W-05	C-01	
	17	ATRIUM	F-08	S-01	W-01	C-04	
	18	LAB PREP FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	19	STORE	F-01	S-01	W-05	C-01	
FIRST FLOOR	1	STAIR CASE	F-02	S-01	W-05	C-01	
	2	MALE & FEMALE TOILET	F-04	---	W-01&05	C-01&02	
	3	TOILET (FACULTY)	F-04	---	W-01&05	C-01&02	
	4	PASSAGE COURT	F-01	S-01	W-03&5	C-01	
	5	ELECTRICAL	F-01	S-01	W-05	C-01	
	6	STORE	F-01	S-01	W-05	C-01	
	7	PROFESSOR	F-01	S-01	W-05	C-01	
	8	ASSISTANT PROFESSOR	F-01	S-01	W-05	C-01	
	9	LECTURER	F-01	S-01	W-05	C-01	
	10	RESEARCH	F-01	S-01	W-05	C-01	
	11	STAFF	F-01	S-01	W-05	C-01	
	12	LAB FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	13	LAB PREP FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	14	LAB STORE FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	15	LAB FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	16	LAB PREP FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	17	LAB STORE FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	18	CLASS ROOM	F-01	S-01	W-05	C-01	
	19	BRIDGE	F-01	S-01	W-03&05	C-01	
	20	GIRLS ROOM	F-01&03	S-01	W-05	C-01	
	21	PANTRY	F-01	S-01	W-01&05	C-01	
H.L.E V.	1	STORE	F-01	S-01	W-05	C-01	
ROOF	1	STAIR CASE	F-02	S-01	W-05	C-01	
		ATRIUM	---	---	---	C-04	

FINISHES AND MATERIAL LEGEND		
S.NO.	ABBREVIATION	FLOOR FINISHES:
1	F-01	12"X12"X1" TERRAZZO TILES IN WHITE CEMENT WITH APPROVED COLOUR & SHADE AS PER SPECS TO ARCHITECTS APPROVAL
2	F-02	3/4" THICK TERRAZZO (CAST IN SITU) POLISHED FINISH TREAD & RISER WITH ANTI SLIP GROOVES COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
3	F-03	1/2" THICK 12" WIDE TERRAZZO (CAST IN SITU) BORDER APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
4	F-04	8"X8" /12"X12" OR APPROVED SIZE LOCAL CERAMIC TILES MATT FINISH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
5	F-05	C.C. TILE FOR ROOF APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
6	F-06	C.C. TILE FOR COURT AREA, SIZE 12"X12" APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
7	F-07	3/4" THICK TERRAZZO (CAST IN SITU) POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
SKIRTING:		
8	S-01	4" HIGH TERRAZZO TILES SKIRTING POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
9	S-02	4" HIGH C.C. TILES SKIRTING
WALL FINISHES:		
10	W-01	8"X8" /12"X12" OR APPROVED SIZE LOCAL GLAZED CERAMIC TILES OF APPROVED COLOUR DADO APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL (SEE ELEVATION DWG. FOR DETAILS)
11	W-02	18" THICK STONE WALL BUILD WITH BEST LOCAL AVAILABLE STONE AS PER SPECS TO ARCHITECTS APPROVAL
12	W-03	3/4" THICK IN 1:2 RATIO WASH TERRAZZO OVER ROUGH PLASTER APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
13	W-04	36"X12" SIZE LOCAL MARBLE POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
14	W-05	3-COATS OF PLASTIC EMULSION PAINT TO INTERNAL PLASTER SURFACE APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
15	W-06	ACOUSTIC LINED WOOD PLY WALL PANELING SYSTEM AS PER DESIGN AND ARCHITECTS APPROVAL
CEILING FINISHES:		
16	C-01	SMOOTH CEMENT PLASTER WITH EMULSION PAINT FINISHES SYSTEM, COLOUR AS PER ARCHITECTS APPROVAL
17	C-02	3/4" THICK CEMENT BOARD FALSE CEILING WITH COMPLETE SUSPENSION SYSTEM WITH EMULSION PAINT FINISH SYSTEM COLOUR AS PER ARCHITECTS APPROVAL
18	C-03	ACOUSTIC LINED WOOD PLY FALSE CEILING AND COMPLETE SUSPENSION SYSTEM AS PER SPECS.
19	C-04	18 GAUGE PLAIN METAL G.I. SHEET, 10 GAGUGE CORRUGATED SHEET, 12 MM POLYCARBONATED SHEET



REV. NO.	DATE	REASON	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECTS:  
 The Architects  
 100, H-8, Phase-8, Islamabad  
 TEL: 37311111, 37311112, 37311113, 37311114, 37311115, 37311116, 37311117, 37311118, 37311119, 37311120, 37311121, 37311122, 37311123, 37311124, 37311125, 37311126, 37311127, 37311128, 37311129, 37311130, 37311131, 37311132, 37311133, 37311134, 37311135, 37311136, 37311137, 37311138, 37311139, 37311140, 37311141, 37311142, 37311143, 37311144, 37311145, 37311146, 37311147, 37311148, 37311149, 37311150, 37311151, 37311152, 37311153, 37311154, 37311155, 37311156, 37311157, 37311158, 37311159, 37311160, 37311161, 37311162, 37311163, 37311164, 37311165, 37311166, 37311167, 37311168, 37311169, 37311170, 37311171, 37311172, 37311173, 37311174, 37311175, 37311176, 37311177, 37311178, 37311179, 37311180, 37311181, 37311182, 37311183, 37311184, 37311185, 37311186, 37311187, 37311188, 37311189, 37311190, 37311191, 37311192, 37311193, 37311194, 37311195, 37311196, 37311197, 37311198, 37311199, 37311200

CONSULTANT CONSULTANT:  
 mushtaq and biall consulting engineers  
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ELECTRICAL CONSULTANT:  
 E.P.S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
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PLUMBING CONSULTANT:  
 E.P.S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
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ENVIRONMENTAL & MANAGEMENT CONSULTANT:  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 100, H-8, Phase-8, Islamabad, Pakistan

OLD DRAWING NO.:

CENTRAL DEPARTMENT:

502 A9-001

REVIEW & APPROVAL CONSULTANT:  
 NESPAK (PVT.) LIMITED

APPROVED FOR:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 FINISHES SCHEDULE WORKING DRAWING

SHEET NO.:  
 4753/322/8D/04835







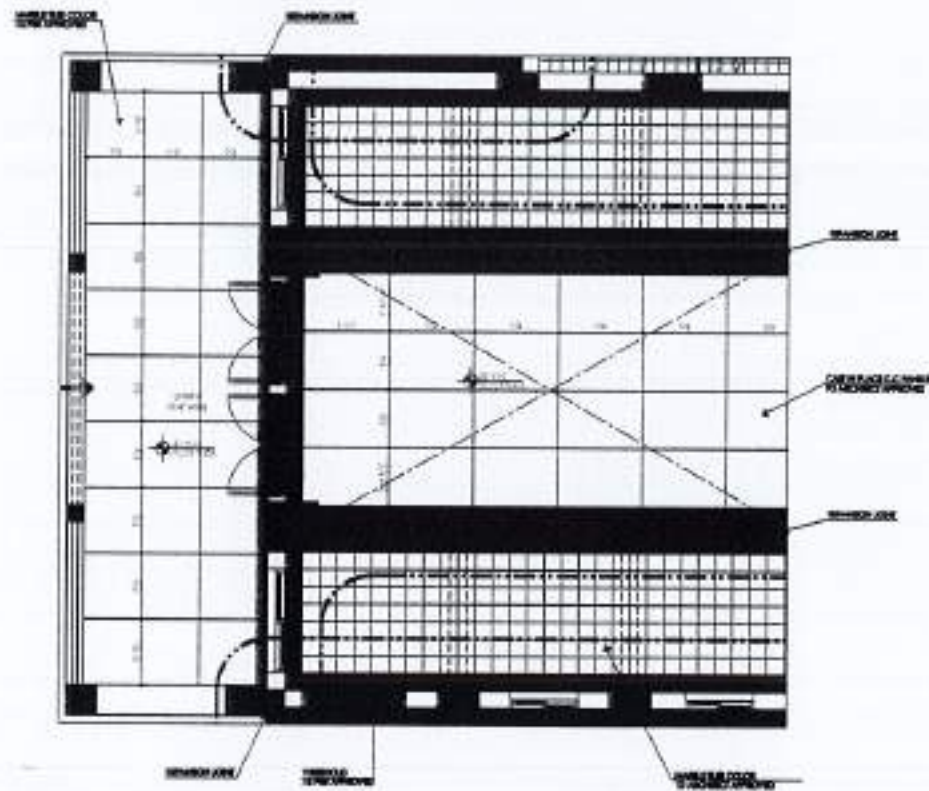




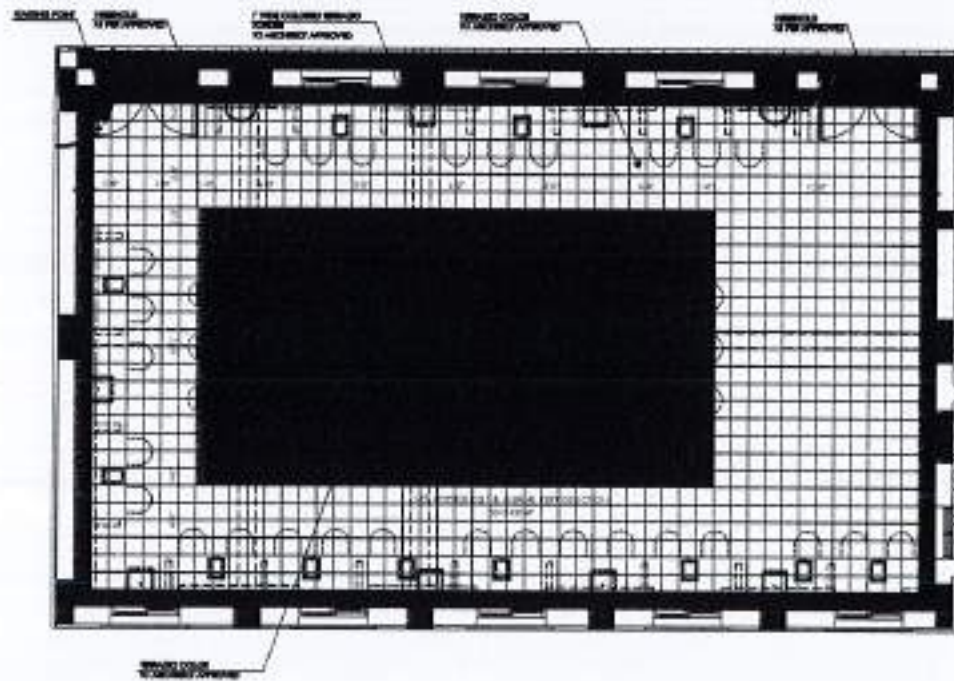




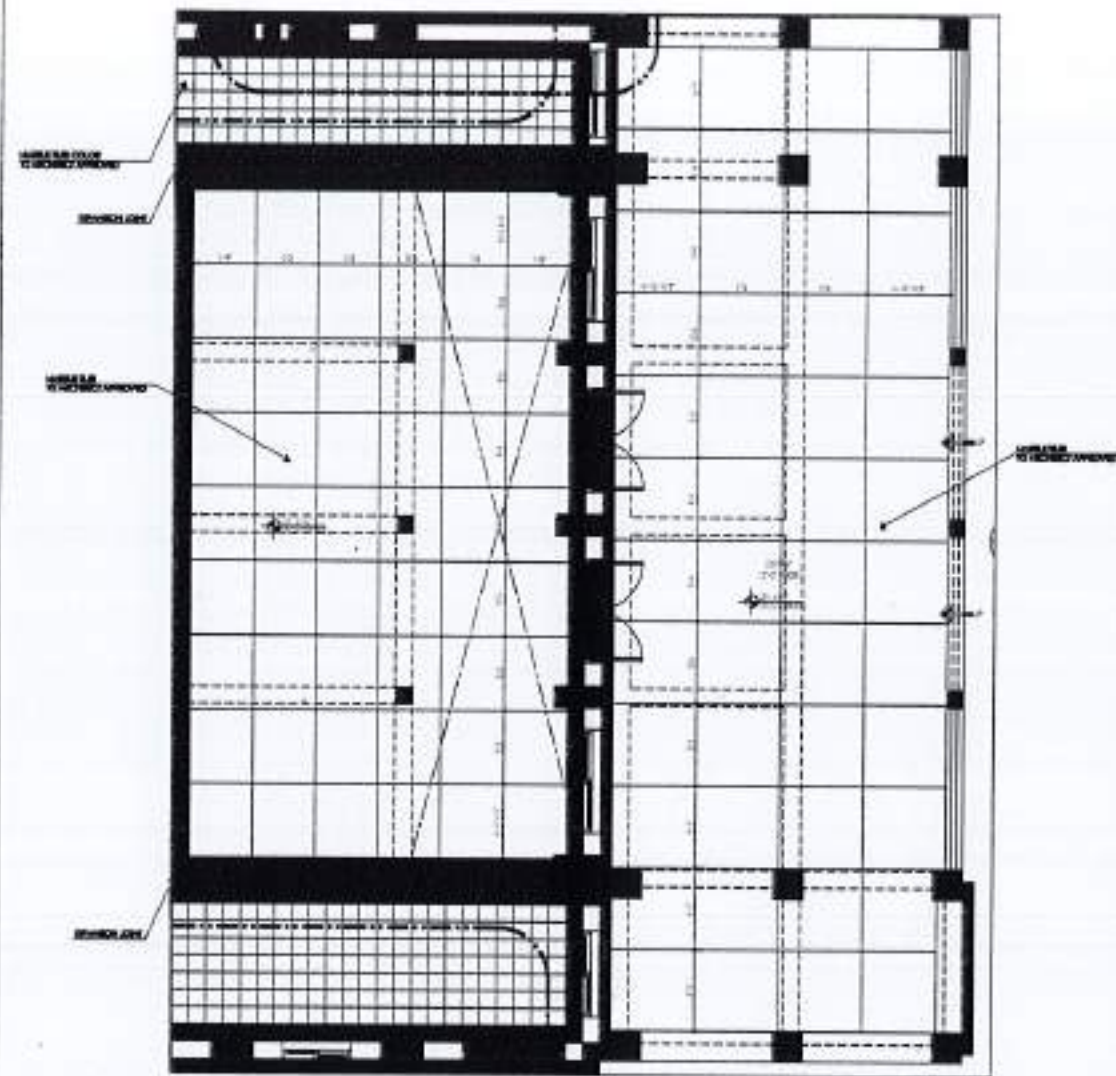




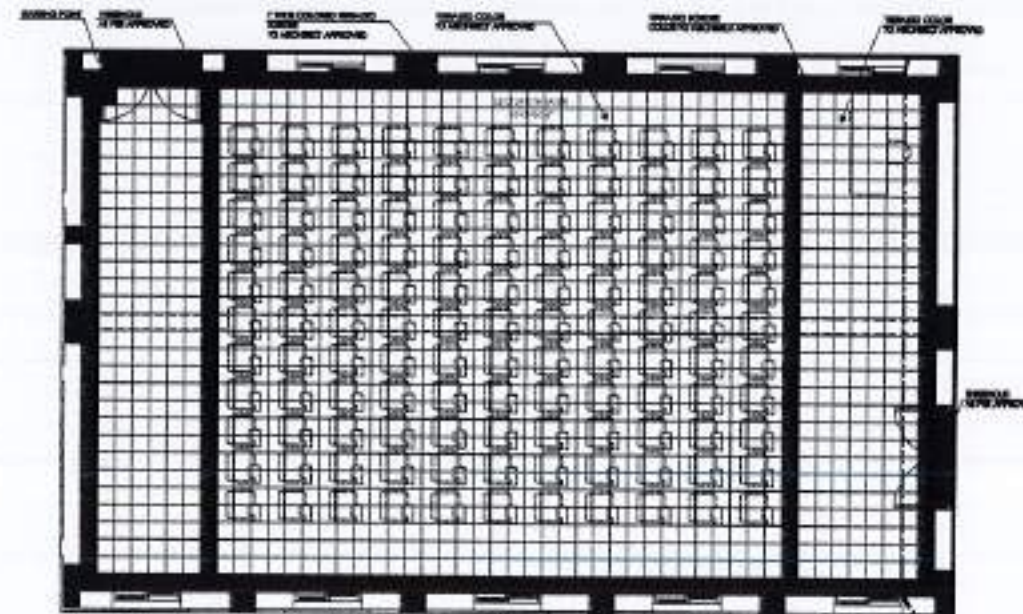
PART PLAN - 01



PART PLAN - 03



PART PLAN - 02



PART PLAN - 04



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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

**CLIENT:**  
UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

**ARCHITECT:**  
The Architects  
Mustafa Bilal Consulting Engineers  
144 Street, G-10/2, Islamabad, Pakistan

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**NO. OF SHEETS:** 502  
**DRAWING NO.:** A11-003

**REVIEW & SUPERVISION CONSULTANT:**  
NESPAC (PVT.) LIMITED

**SUBJECT:**  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

**DRAWING TITLE:**  
GROUND FLOOR FLOORING PLAN (BLOWN UP) WORKING DRAWING

**DATE:** JUNE 2011  
**DRAWN BY:**  
**CHECKED BY:**  
**APPROVED BY:**

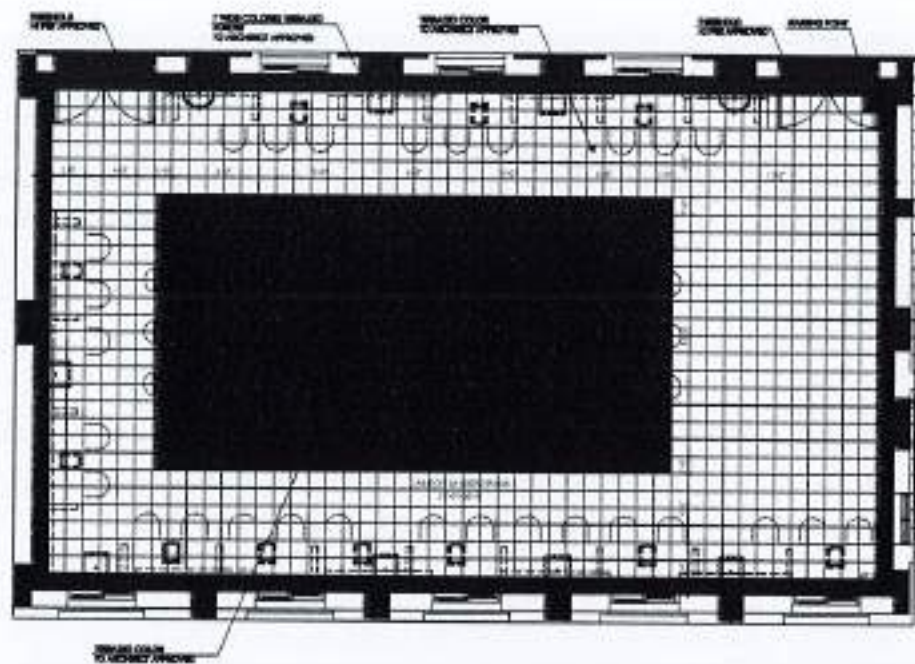
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**SHEET:** 17/14/001/004  
**REV. NO.:** 4753/322/80/04839



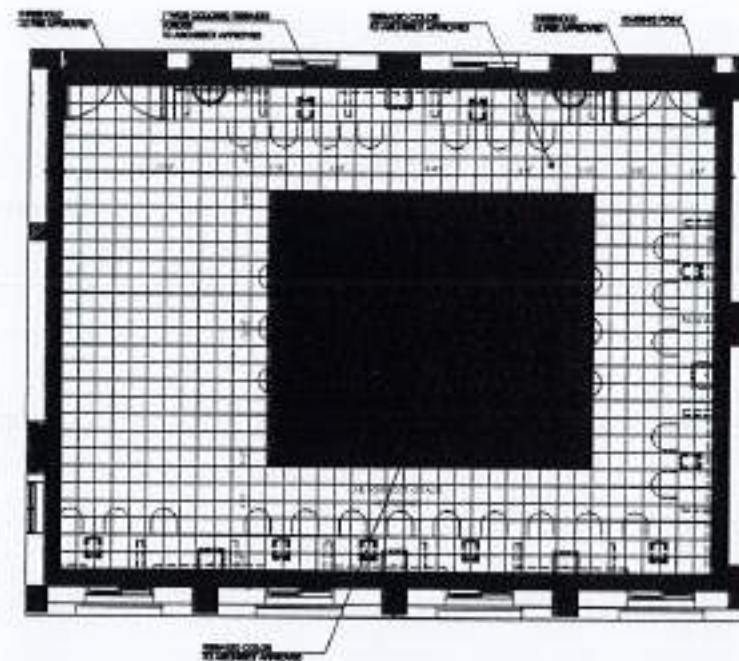




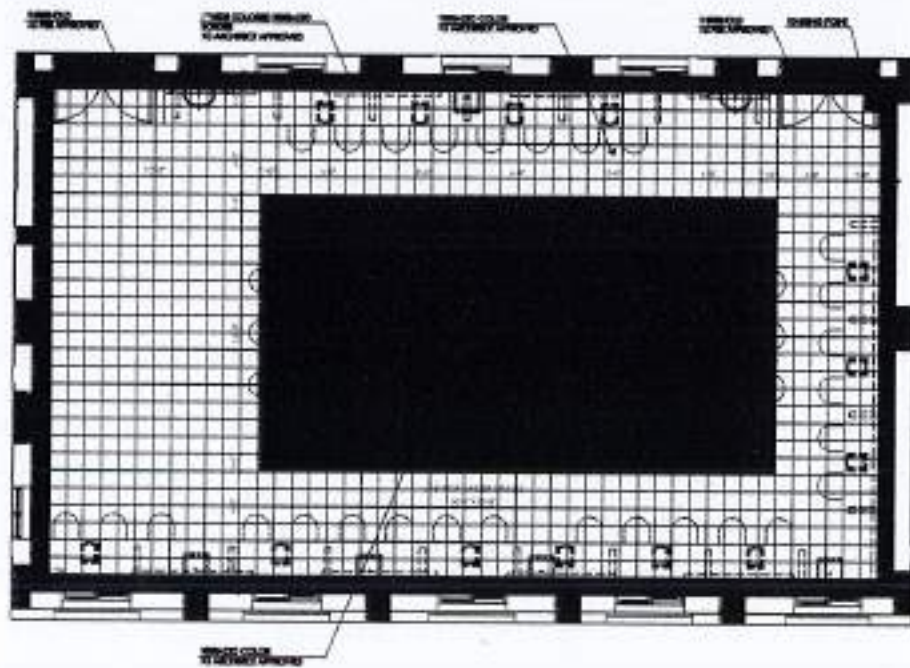




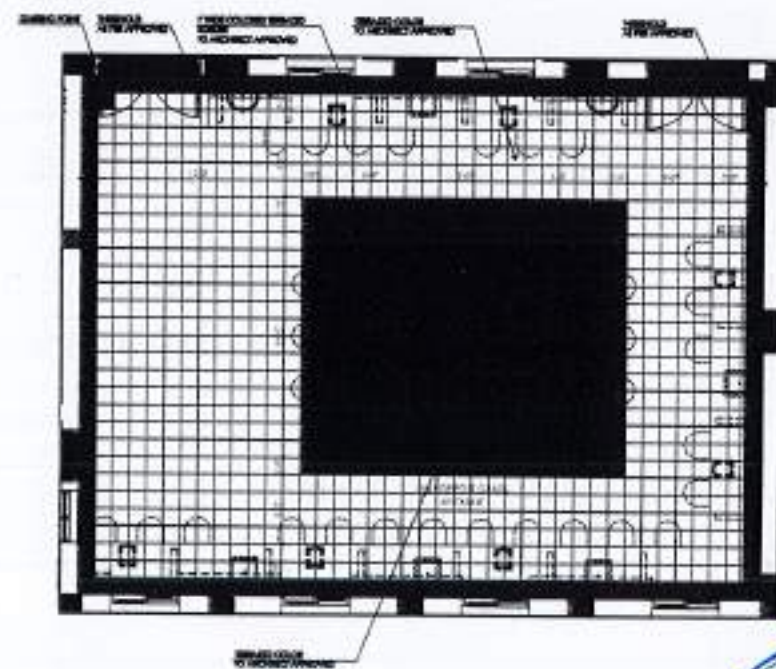
PART PLAN - 12



PART PLAN - 13



PART PLAN - 14



PART PLAN - 15



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**PROJECT**  
COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

**CLIENT**  
UNIVERSITY OF POONCH, RAWALAKOT



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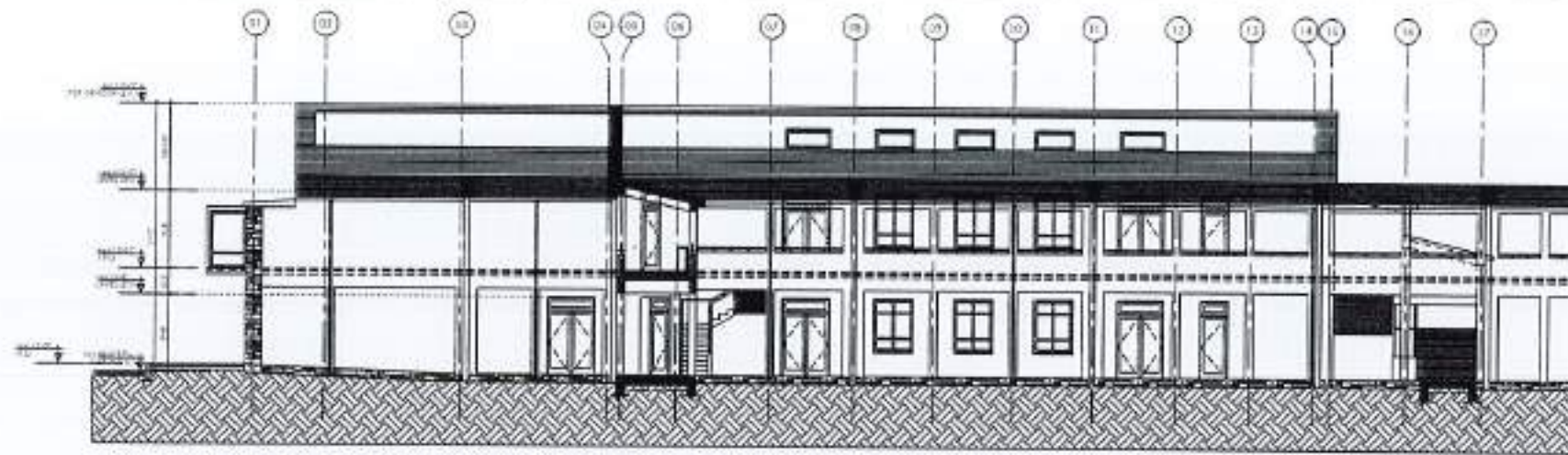
ORIGINAL DESIGN CONSULTANT

**ARCHITECT**  
The Architects  
Mustafa and Bial Consulting Engineers  
10-A, HOOR ROAD, SHAN PESHAWAR, PESHAWAR  
TEL: 0111-3221111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-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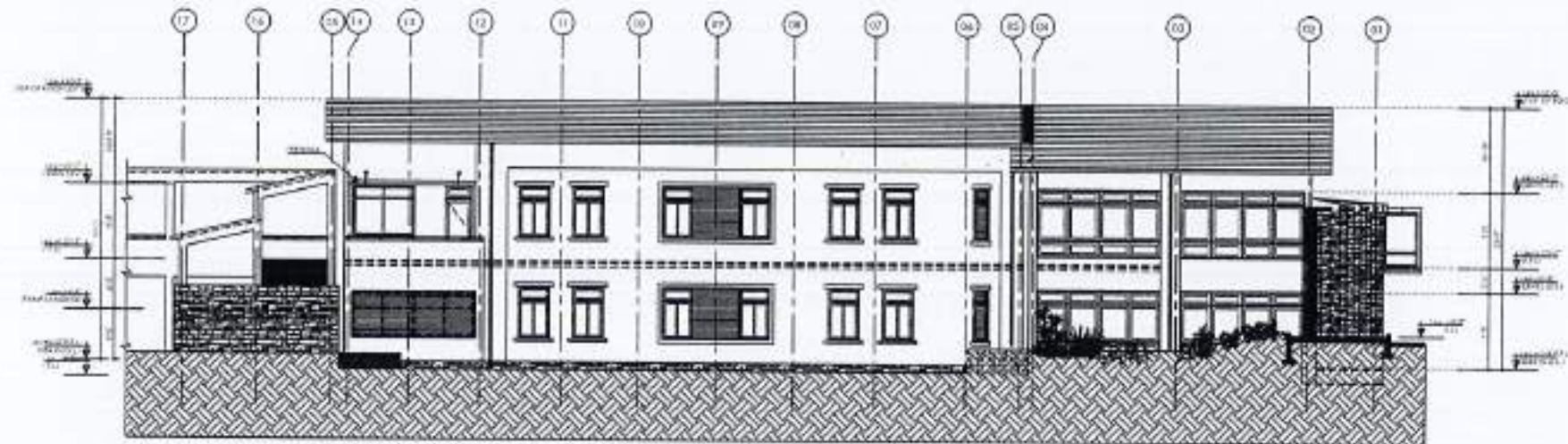




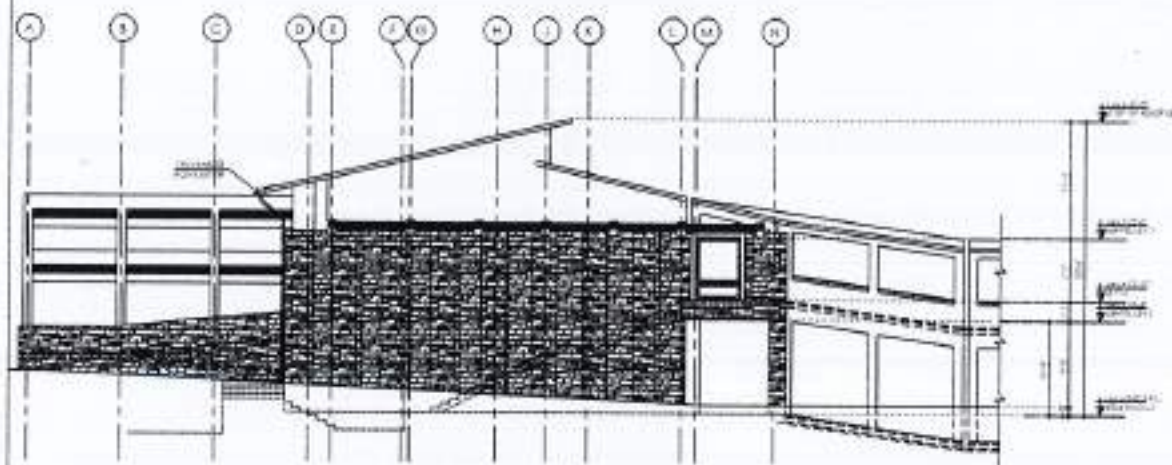




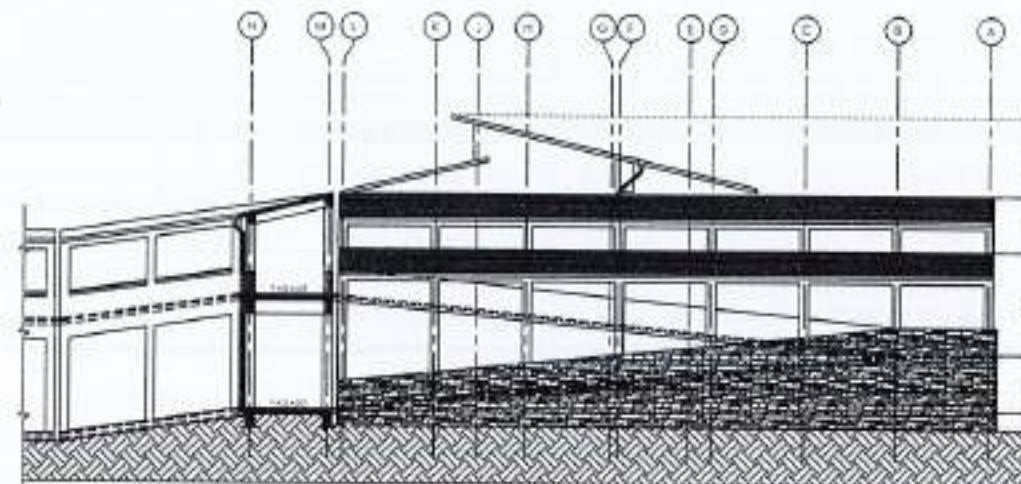
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02 ELEVATION - 03



03 ELEVATION - 02



04 ELEVATION - 04

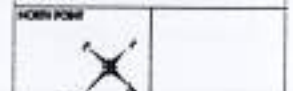


REV.	DATE	REASON

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPIND.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALPIND



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT:

ARCHITECT:  
 The Architects  
 Architecture, Planning, Interior Design, Engineering, Surveying, Environmental Impact Assessment, Urban Design, Landscape Architecture, Project Management, Construction Management, Real Estate Development, etc.

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OLD DRAWING NO:

JOB NO. DRAWING NO.  
 502 A2-001

OWNER & PREVIOUS CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUB-PROJECT FILE:  
 HI-TECH LIBRARY, AND GIRLS COMMON ROOM

DRAWING FILE:  
 ELEVATIONS 01,02,03 & 04

CHECKED BY:  
 DRAWN BY:

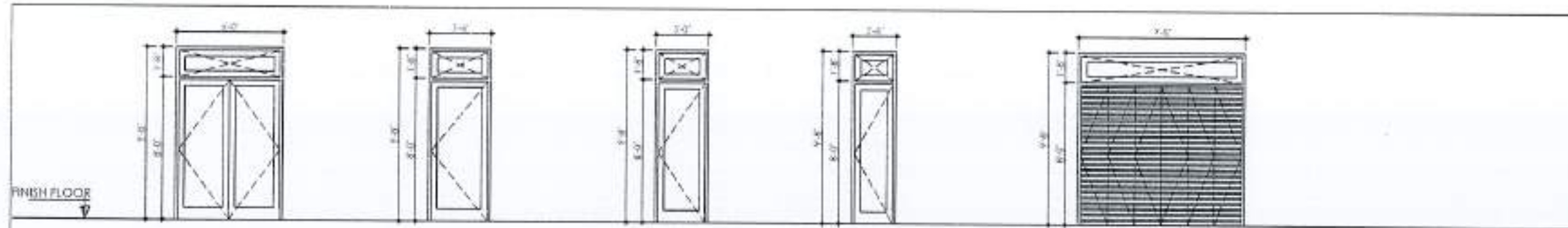
APPROVED BY:

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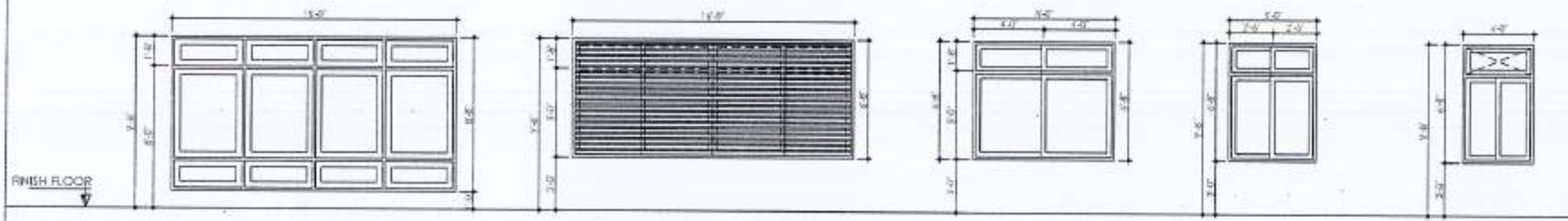
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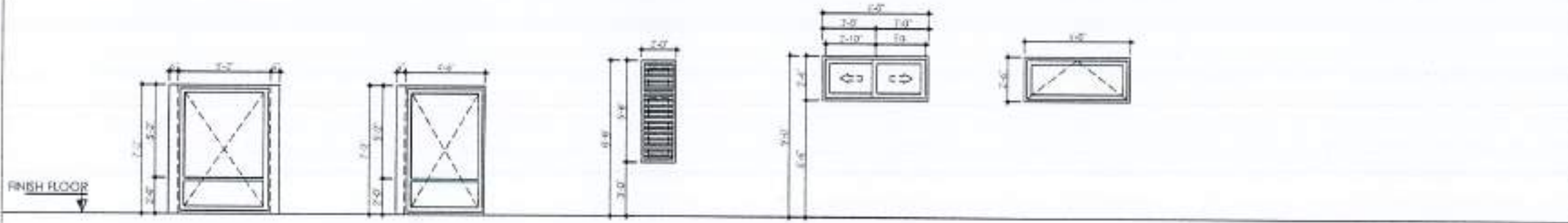




(W) 01 6'-0" X 9'-8" Hi-Tech Lab  
 (W) 02 3'-6" X 9'-8" Common Room  
 (W) 03 3'-0" X 9'-8" Prep. room  
 (W) 04 2'-6" X 9'-8" Toilet  
 (W) 05 9'-5" X 9'-8" Rec. Rm Cabinet



(W) 06 16'-0" X 8'-8" library  
 (W) 07 16'-0" X 6'-8" Comm. Room  
 (W) 08 8'-0" X 6'-8" Comm. Room  
 (W) 09 5'-0" X 6'-8" Hi-Tech Lab Prep. Rm.  
 (W) 10 4'-0" X 6'-8" Hi-Tech Lab



(W) 11 5'-2" X 7'-2" Passage  
 (W) 12 4'-6" X 7'-2" Passage  
 (W) 13 2'-0" X 5'-8" Toilet  
 (W) 14 6'-0" X 2'-6" Toilet  
 (W) 15 6'-0" X 2'-6" Roof



REV. NO.	DATE	ISSUE	REASON

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 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAJALAKOT.

CLIENT:  
 UNIVERSITY OF POKHRA, RAJALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT:

ARCHITECT:  
 The Architects  
 Mushtaq and Bilal Consulting Engineers  
 24, HOSE ROAD, TRADE MARK, CHAKRI, DISTRICT-14500, PAFKOT, ISLAMABAD.

ELECTRICAL CONSULTANT:  
 E.P.S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1-4-BLOCK, GULSHAN-2, JALALI APTS - 7500

PLUMBING CONSULTANT:  
 P.S. Associates  
 15, PAFKOT, ISLAMABAD.

DRAWING NO:  
 502 A8-001

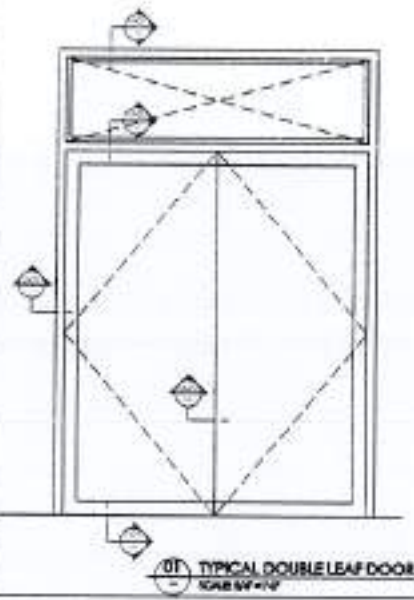
SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUB-PROJECT NAME:  
 HI-TECH, LIBRARY, AND GIRLS COMMON ROOM

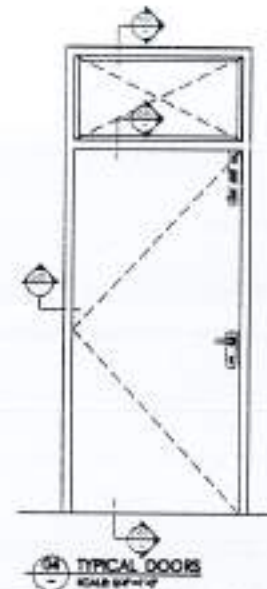
DRAWING TITLE:  
 DOOR & WINDOW SCHEDULE

DESIGNER:  
 JANE BISHNOI  
 CHECKED BY:  
 APPROVED BY:  
 SCALE: 1/8" = 1'-0"  
 DATE: 17/04/2024  
 REV. DRAWING NO.: 4753/322/BD/04817



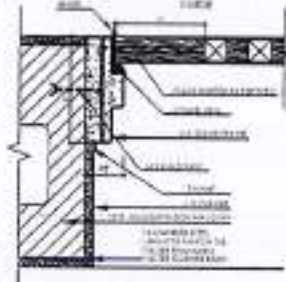

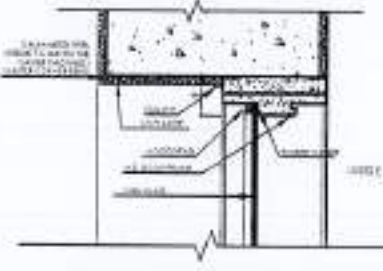

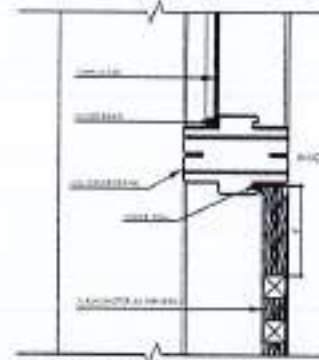


01 TYPICAL DOUBLE LEAF DOOR  
SCALE 1/4" = 1'-0"



02 TYPICAL DOORS  
SCALE 1/4" = 1'-0"

WOODEN DOOR SYSTEM (as per Specification)

JAMB DETAILS	MID. DETAILS	HEAD DETAILS	THRESHOLD DETAILS
 <p>J-01 JAMB DETAIL Scale 1/4" = 1'-0"</p>	 <p>M-02 MID. HINGE DETAIL Scale 1/4" = 1'-0"</p>	 <p>H-01 HEAD DETAIL Scale 1/4" = 1'-0"</p>	 <p>T-01 THRESHOLD DETAIL Scale 1/4" = 1'-0"</p>
	 <p>M-03 MID. VERTICAL DETAIL Scale 1/4" = 1'-0"</p>		



REV.	DATE	DESCRIPTION

NOTE:  
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 3. ALL DIMENSIONS ARE TO BE INDICATED AND TOLERANCES ON SITE.  
 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

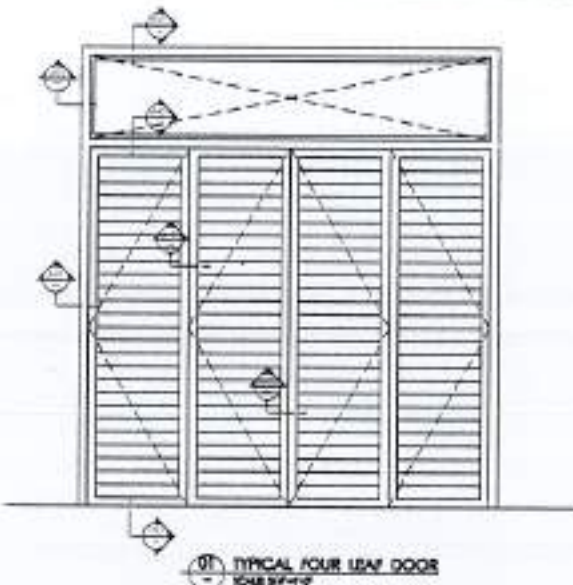
PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.  
 CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALAKOT  
 NORTH POINT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
  
 The Architect  
 Architect, Planning, Interior Design, etc.  
 STRUCTURAL CONSULTANT:  
  
 mushtaq and bilal consulting engineers  
 11A, HOOR ROAD, BHANSHALI, GANCHO TRUSS TOWER, 4TH FLOOR, G-1/1, G-1/2, G-1/3, G-1/4, G-1/5, G-1/6, G-1/7, G-1/8, G-1/9, G-1/10, G-1/11, G-1/12, G-1/13, G-1/14, G-1/15, G-1/16, G-1/17, G-1/18, G-1/19, G-1/20, G-1/21, G-1/22, G-1/23, G-1/24, G-1/25, G-1/26, G-1/27, G-1/28, G-1/29, G-1/30, G-1/31, G-1/32, G-1/33, G-1/34, G-1/35, G-1/36, G-1/37, G-1/38, G-1/39, G-1/40, G-1/41, G-1/42, G-1/43, G-1/44, G-1/45, G-1/46, G-1/47, G-1/48, G-1/49, G-1/50, G-1/51, G-1/52, G-1/53, G-1/54, G-1/55, G-1/56, G-1/57, G-1/58, G-1/59, G-1/60, G-1/61, G-1/62, G-1/63, G-1/64, G-1/65, G-1/66, G-1/67, G-1/68, G-1/69, G-1/70, G-1/71, G-1/72, G-1/73, G-1/74, G-1/75, G-1/76, G-1/77, G-1/78, G-1/79, G-1/80, G-1/81, G-1/82, G-1/83, G-1/84, G-1/85, G-1/86, G-1/87, G-1/88, G-1/89, G-1/90, G-1/91, G-1/92, G-1/93, G-1/94, G-1/95, G-1/96, G-1/97, G-1/98, G-1/99, G-1/100, G-1/101, G-1/102, G-1/103, G-1/104, G-1/105, G-1/106, G-1/107, G-1/108, G-1/109, G-1/110, G-1/111, G-1/112, G-1/113, G-1/114, G-1/115, G-1/116, 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G-1/1204, G-1/1205, G-1/1206, G-1/1207, G-1/1208, G-1/1209, G-1/1210, G-1/1211, G-1/1212, G-1/1213, G-1/1214, G-1/1215, G-1/1216, G-1/1217, G-1/1218, G-1/1219, G-1/1220, G-1/1221, G-1/1222, G-1/1223, G-1/1224, G-1/1225, G-1/1226, G-1/1227, G-1/1228, G-1/1229, G-1/1230, G-1/1231, G-1/1232, G-1/1233, G-1/1234, G-1/1235, G-1/1236, G-1/1237, G-1/1238, G-1/1239, G-1/1240, G-1/1241, G-1/1242, G-1/1243, G-1/1244, G-1/1245, G-1/1246, G-1/1247, G-1/1248, G-1/1249, G-1/1250, G-1/1251, G-1/1252, G-1/1253, G-1/1254, G-1/1255, G-1/1256, G-1/1257, G-1/1258, G-1/1259, G-1/1260, G-1/1261, G-1/1262, G-1/1263, G-1/1264, G-1/1265, G-1/1266, G-1/1267, G-1/1268, G-1/1269, G-1/1270, G-1/1271, G-1/1272, G-1/1273, G-1/1274, G-1/1275, G-1/1276, G-1/1277, G-1/1278, G-1/1279, G-1/1280, G-1/1281, G-1/1282, G-1/1283, G-1/1284, G-1/1285, G-1/1286, G-1/1287, G-1/1288, G-1/1289, G-1/1290, G-1/1291, G-1/1292, G-

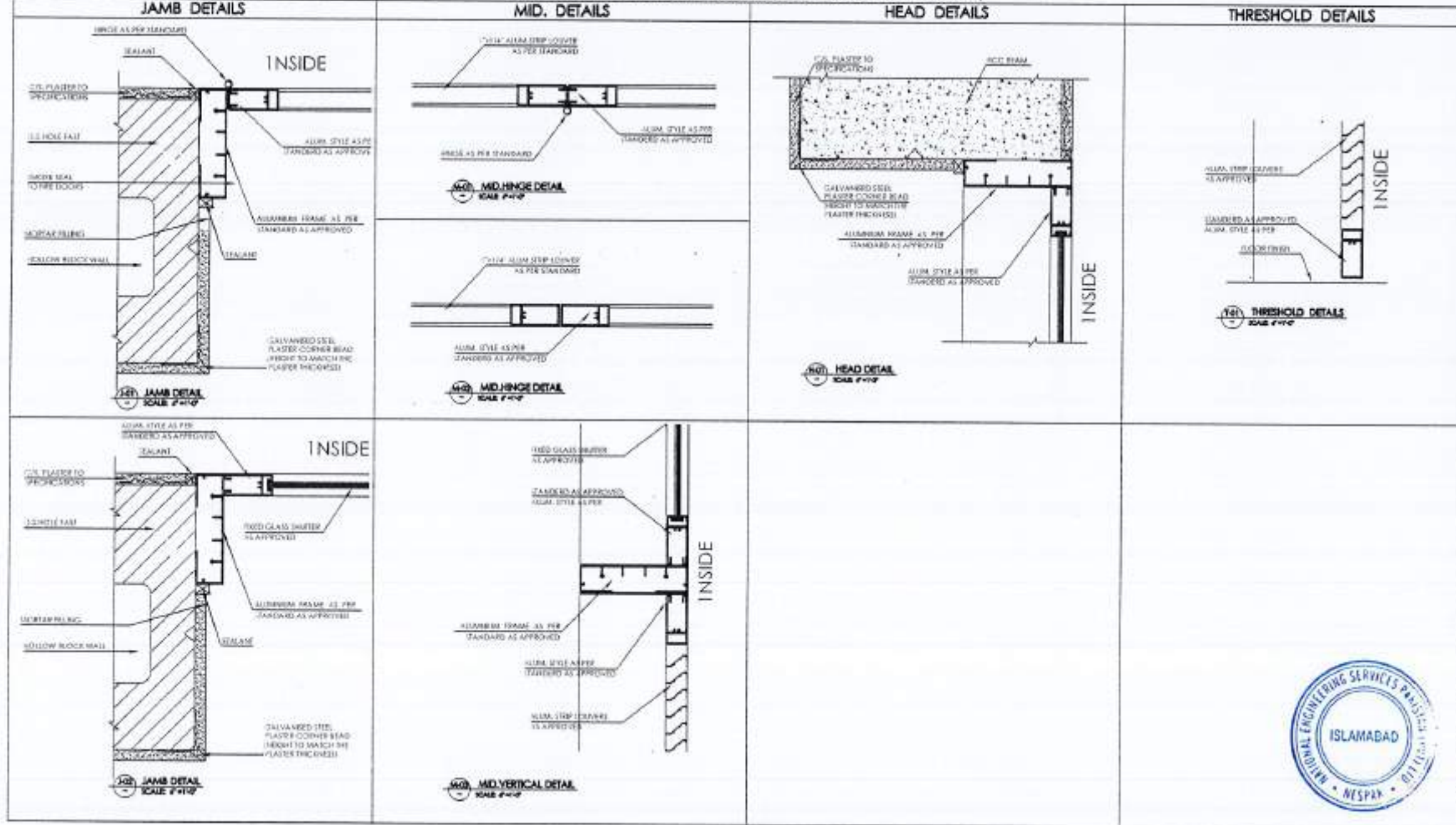




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ALUMINIUM ELECTRICAL DOOR SYSTEM (as per Specification)



PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POONCH, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 Has Be Architects, Planning, Design, Construction Management and Project Management Services  
 14-B, G-Block, Sector-10, Gurgaon, Haryana, India

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 24, NOOR ROAD, PHASE II, HAZRA CHAUNTRY, WAPDA OFFICE BUILDING, G-10/4, ISLAMABAD

ELECTRICAL CONSULTANT:  
 C.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 14-B, G-Block, Sector-10, Gurgaon, Haryana, India

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 C.P. & ASSOCIATES  
 PLUMBING ENGINEERS  
 14-B, G-Block, Sector-10, Gurgaon, Haryana, India

OLD DRAWING NO:  
 502 A8-003

DESIGN & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

PROJECT TITLE:  
 HI-TECH, LIBRARY, AND GIRLS COMMON ROOM

DRAWING TITLE:  
 DETAILS OF ELECTR. DOOR

DESIGNER:  
 SHAH SUHAIL

CHECKED BY:  
 (Signature)

APPROVED BY:  
 (Signature)

SCALE:  
 1/4" = 1'-0"

DATE:  
 17th APRIL 2024

REV. DRAWING NO:  
 4753/322/BO/04819



















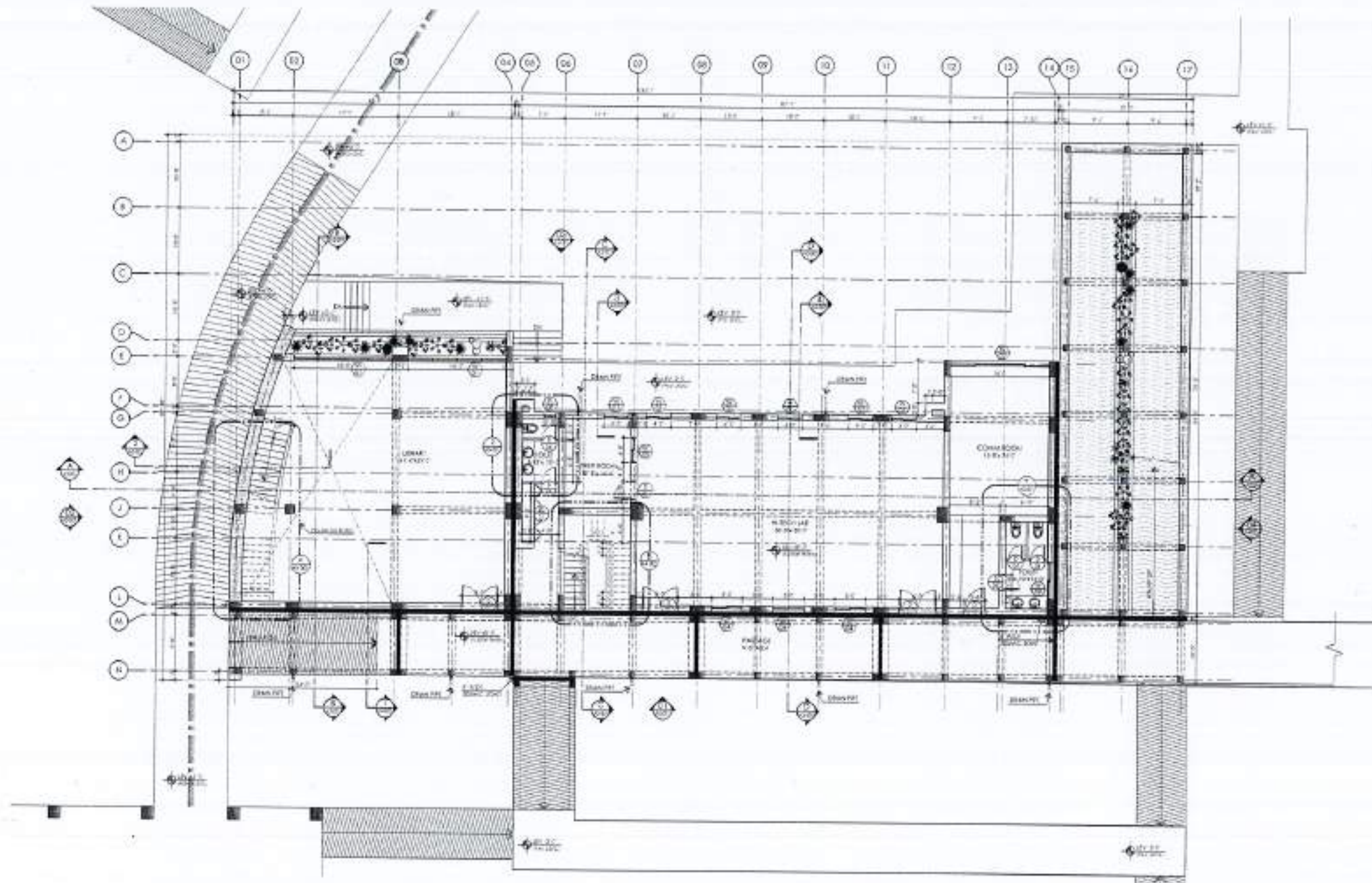












01 GROUND FLOOR PLAN



REV	DATE	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHORAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPOT.  
 CLIENT:  
 UNIVERSITY OF PUNJAB RAWALPOT.  
 ADDRESS:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

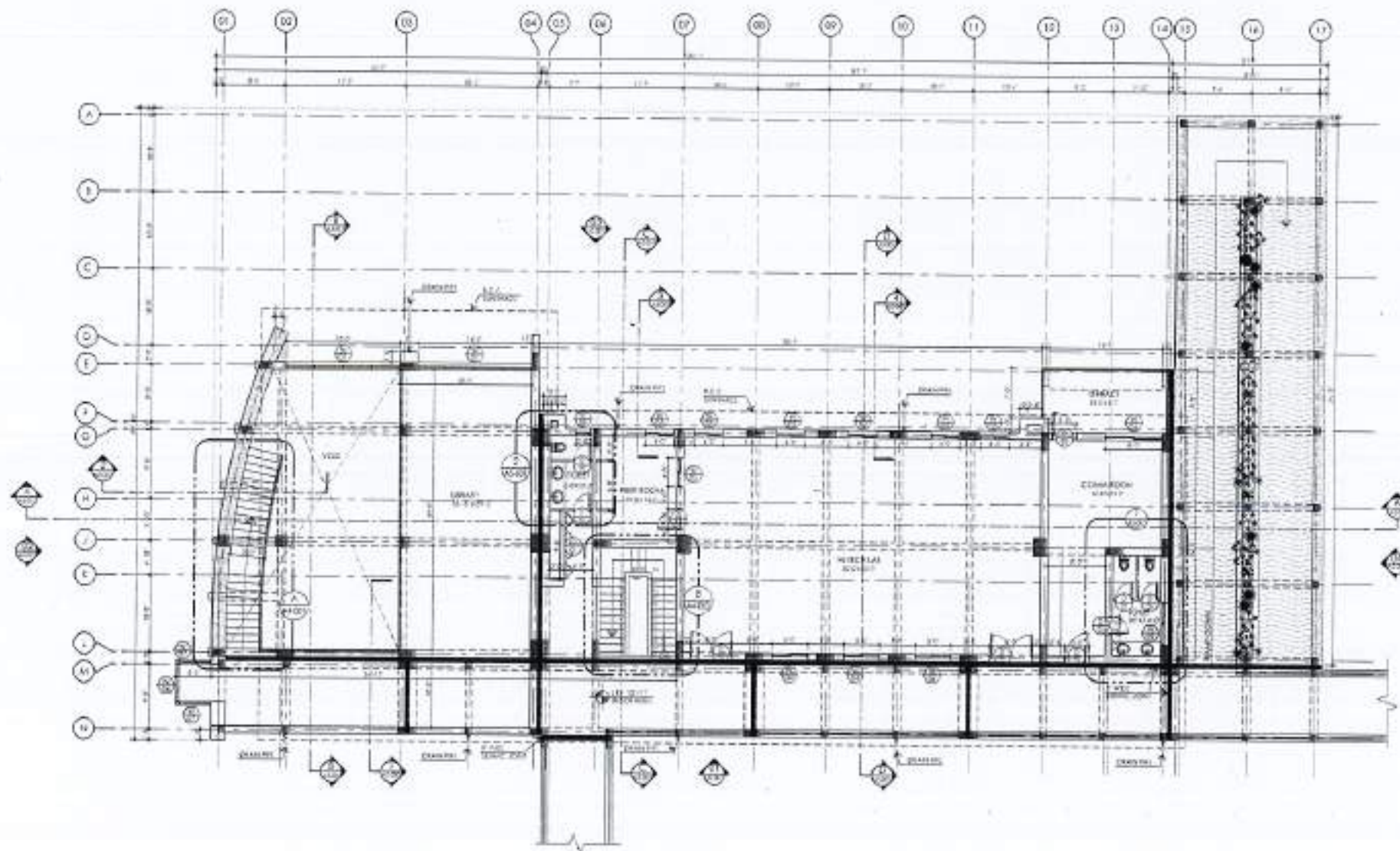
ARCHITECT:  
  
 THE ARCHITECTS  
 Rawal Kotli, Punjab, Pakistan  
 PUNJAB, PAKISTAN

STRUCTURAL CONSULTANT:  
  
**mushtaq and bilal**  
 consulting engineers  
 204, HODD ROAD, CHORAGALA, LAHORE-75200  
 TEL: 34874487-34874488 FAX: 34874489  
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2329, 2331, 2333, 2335, 2337, 2339, 2341, 2343, 2345, 2347, 2349, 2351, 2353, 2355, 2357, 2359, 2361, 2363, 2365, 2367, 2369, 2371, 2373, 2375, 2377, 2379, 2381, 2383, 2385, 2387, 2389, 2391, 2393, 2395, 2397, 2399, 2401, 2403, 2405, 2407, 2409, 2411, 2413, 2415, 2417, 2419, 2421, 2423, 2425, 2427, 2429, 2431, 2433, 2435, 2437, 2439, 2441, 2443, 2445, 2447, 2449, 2451, 2453, 2455, 2457, 2459, 2461, 2463, 2465, 2467, 2469, 2471, 2473, 2475, 2477, 2479, 2481, 2483, 2485, 2487, 2489, 2491, 2493, 2495, 2497, 2499, 2501, 2503, 2505, 2507, 2509, 2511, 2513, 2515, 2517, 2519, 2521, 2523, 2525, 2527, 2529, 2531, 2533, 2535, 2537, 2539, 2541, 2543, 2545, 2547, 2549, 2551, 2553, 2555, 2557, 2559, 2561, 2563, 2565, 2567, 2569, 2571, 2573, 2575, 2577, 2579, 2581, 2583, 2585, 2587, 2589, 2591, 2593, 2595, 2597, 2599, 2601, 2603, 2605, 2607, 2609, 2611, 2613, 2615, 2617, 2619, 2621, 2623, 2625, 2627, 2629, 2631, 2633, 2635, 2637, 2639, 2641, 2643, 2645, 2647, 2649, 2651, 2653, 2655, 2657, 2659, 2661, 2663, 2665, 2667, 2669, 2671, 2673, 2675, 2677, 2679, 2681, 2683, 2685, 2687, 2689, 2691, 2693, 2695, 2697, 2699, 2701, 2703, 2705, 2707, 2709, 2711, 2713, 2715, 2717, 2719, 2721, 2723, 2725, 2727, 2729, 2731, 2733, 2735, 2737, 2739, 2741, 2743, 2745, 2747, 2749, 2751, 2753, 2755, 2757, 2759, 2761, 2763, 2765, 2767, 2769, 2771, 2773, 2775, 2777, 2779, 2781, 2783, 2785, 2787, 2789, 2791, 2793, 2795, 2797, 2799, 2801, 2803, 2805, 2807, 2809, 2811, 2813, 2815, 2817, 2819, 2821, 2823, 2825, 2827, 2829, 2831, 2833, 2835, 2837, 2839, 2841, 2843, 2845, 2847, 2849, 2851, 2853, 2855, 2857, 2859, 2861, 2863, 2865, 2867, 2869, 2871, 2873, 2875, 2877, 2879, 2881, 2883, 2885, 2887, 2889, 2891, 2893, 2895, 2897, 2899, 2901, 2903, 2905, 2907, 2909, 2911, 2913, 2915, 2917, 2919, 2921, 2923, 2925, 2927, 2929, 2931, 2933, 2935, 2937, 2939, 2941, 2943, 2945, 2947, 2949, 2951, 2953, 2955, 2957, 2959, 2961, 2963, 2965, 2967, 2969, 2971, 2973, 2975, 2977, 2979, 2981, 2983, 2985, 2987, 2989, 2991, 2993, 2995, 2997, 2999, 3001, 3003, 3005, 3007, 3009, 3011, 3013, 3015, 3017, 3019, 3021, 3023, 3025, 3027, 3029, 3031, 3033, 3035, 3037, 3039, 3041, 3043, 3045, 3047, 3049, 3051, 3053, 3055, 3057, 3059, 3061, 3063, 3065, 3067, 3069, 3071, 3073, 3075, 3077, 3079, 3081, 3083, 3085, 3087, 3089, 3091, 3093, 3095, 3097, 3099, 3101, 3103, 3105, 3107, 3109, 3111, 3113, 3115, 3117, 3119, 3121, 3123, 3125, 3127, 3129, 3131, 3133, 3135, 3137, 3139, 3141, 3143, 3145, 3147, 3149, 3151, 3153, 3155, 3157, 3159, 3161, 3163, 3165, 3167, 3169, 3171, 3173, 3175, 3177, 3179, 3181, 3183, 3185, 3187, 3189, 3191, 3193, 3195, 3197, 3199, 3201, 3203, 3205, 3207, 3209, 3211, 3213, 3215, 3217, 3219, 3221, 3223, 3225, 3227, 3229, 3231, 3233, 3235, 3237, 3239, 3241, 3243, 3245, 3247, 3249, 3251, 3253, 3255, 3257, 3259, 3261, 3263, 3265, 3267, 3269, 3271, 3273, 3275, 3277, 3279, 3281, 3283, 3285, 3287, 3289, 3291, 3293, 3295, 3297, 3299, 3301, 3303, 3305, 3307, 3309, 3311, 3313, 3315, 3317, 3319, 3321, 3323, 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01 FIRST FLOOR PLAN



REV. NO.	DATE	REVISION

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOUDAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPINDI.

CLIENT:  
UNIVERSITY OF PUNJAB, RAWALPINDI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
Architects Planning Section  
Plot No. 10/10/1, Block No. 10/10/1, Phase I, F-7/3, Islamabad.

STRUCTURAL CONSULTANT:  
**mushtaq and bilal consulting engineers**  
B-14, 100th Street, Sharada Town, Karachi-75000  
Tel: 021-34511111, 34511112, 34511113, 34511114, 34511115, 34511116, 34511117, 34511118, 34511119, 34511120, 34511121, 34511122, 34511123, 34511124, 34511125, 34511126, 34511127, 34511128, 34511129, 34511130, 34511131, 34511132, 34511133, 34511134, 34511135, 34511136, 34511137, 34511138, 34511139, 34511140, 34511141, 34511142, 34511143, 34511144, 34511145, 34511146, 34511147, 34511148, 34511149, 34511150, 34511151, 34511152, 34511153, 34511154, 34511155, 34511156, 34511157, 34511158, 34511159, 34511160, 34511161, 34511162, 34511163, 34511164, 34511165, 34511166, 34511167, 34511168, 34511169, 34511170, 34511171, 34511172, 34511173, 34511174, 34511175, 34511176, 34511177, 34511178, 34511179, 34511180, 34511181, 34511182, 34511183, 34511184, 34511185, 34511186, 34511187, 34511188, 34511189, 34511190, 34511191, 34511192, 34511193, 34511194, 34511195, 34511196, 34511197, 34511198, 34511199, 34511200.

ELECTRICAL CONSULTANT:  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
144 BOD - Quetta Road, Karachi - 75000

PLUMBING CONSULTANT:  
M.A. Associates  
ENVIRONMENTAL & MANAGEMENT ENGINEERS  
Plot No. 10/10/1, Block No. 10/10/1, Phase I, F-7/3, Islamabad.

JOB NO.: 502  
JOB TITLE: A1-002

REVIEW & SUPERVISION CONSULTANT:  
NESPAK (PVT.) LIMITED

PROJECT TITLE:  
HITECH, LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
FIRST FLOOR PLAN

DESIGNER:  
DARR SHAMSAD

CHECKER:

APPROVED BY:

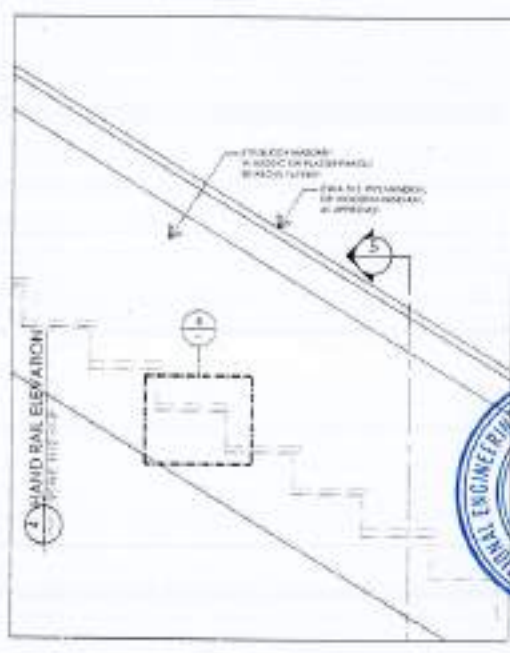
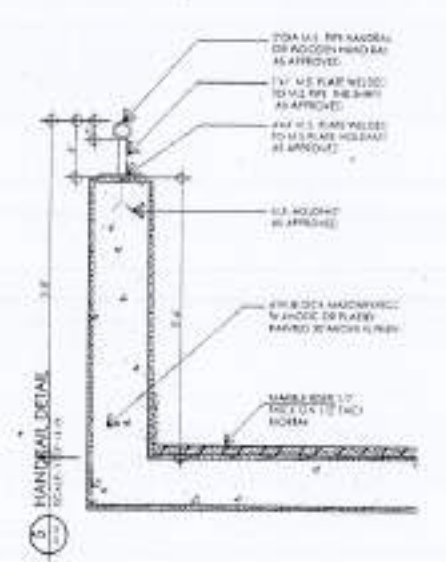
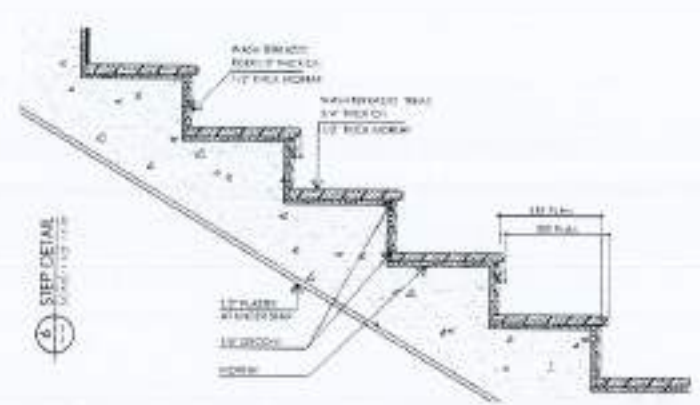
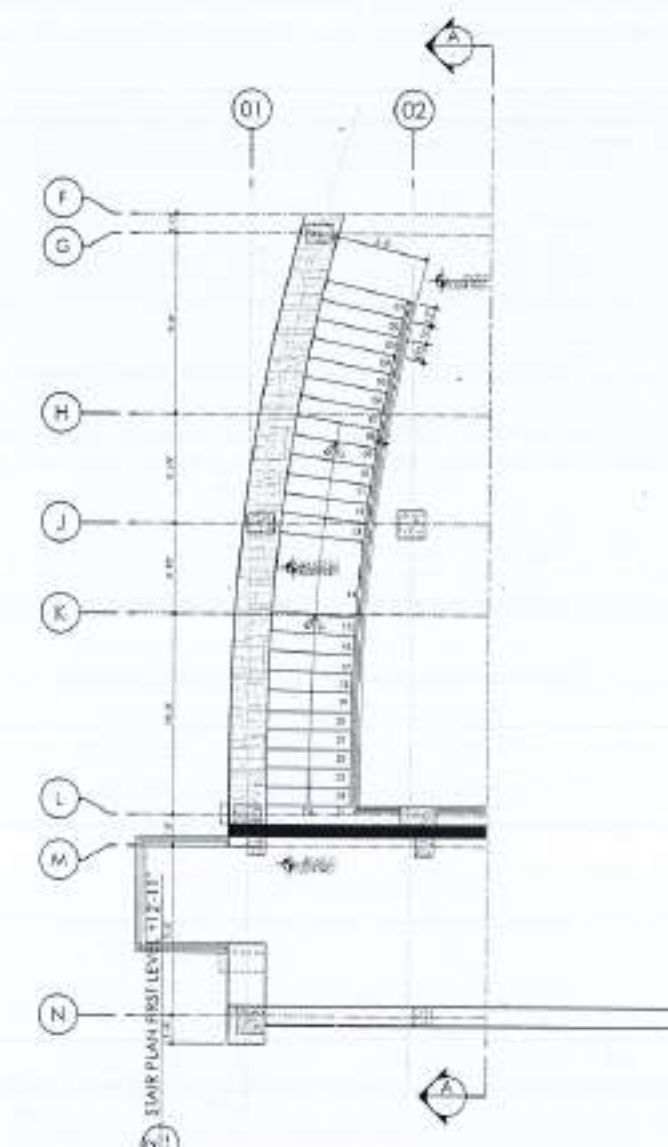
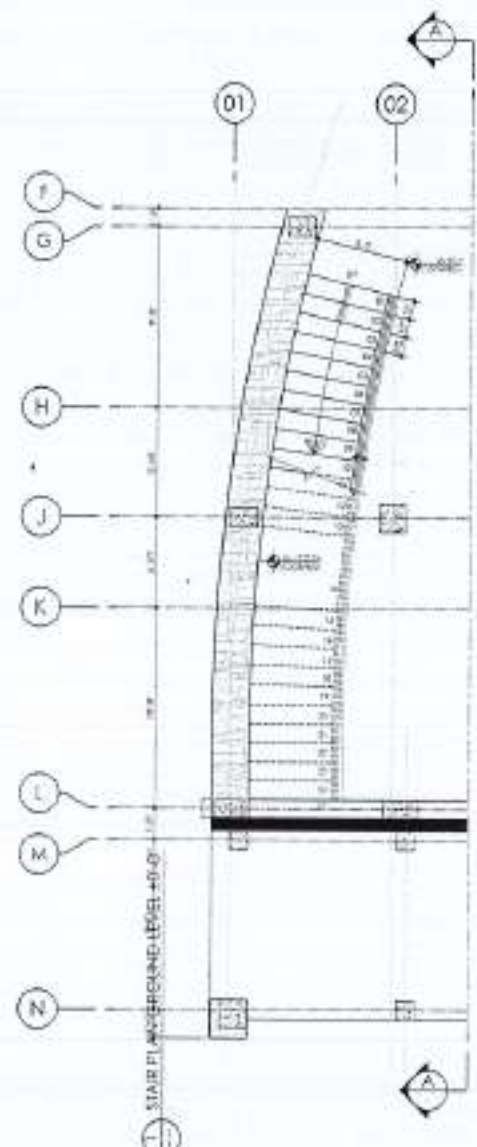
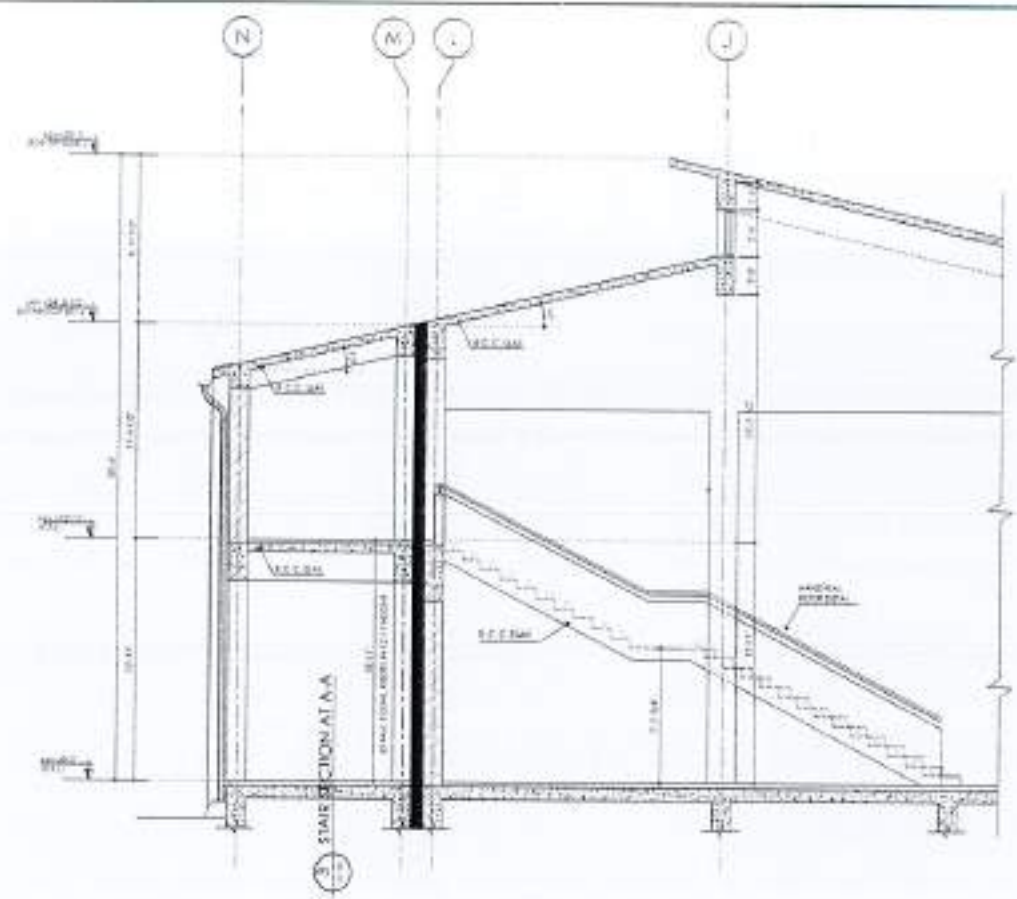
SCALE:  
1/8" = 1'-0"  
DATE:  
19th APRIL 2024  
DRAWING NO.:  
4753/322/BD/06805











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REV.	DATE	DESCRIPTION

PROJECT  
 COMPLETION OF LEFTOVER WORK OF CHORAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPIND

CLIENT  
 UNIVERSITY OF PUNJAB RAWALPIND

NO. OF FLOOR  
 1

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECTS  
 AAB ENGINEERS  
 204 HOOD ROAD, SHARAH MAJLIS, KARACHI-75300  
 TEL: 021-421-4211 (EXTENSION) 4211111 FAX: 4211111  
 WWW.AABENGINEERS.COM

ELECTRICAL CONSULTANT  
 E. F. S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 643/650, GURDWARA ROAD, KARACHI-75300

PLUMBING CONSULTANT  
 P. S. ENGINEERS  
 4/11, BANGLORE ROAD, KARACHI-75300  
 TEL: 4211111 (EXTENSION) 4211111 FAX: 4211111  
 WWW.PSENGINEERS.COM

502 A4-001

DESIGN & SUPERVISOR/CLIENT  
 NESPAK (PVT.) LIMITED

THE PROJECT TITLE  
 HI-TECH. LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE  
 STAIR DETAIL -A-

DATE  
 12th APRIL 2024

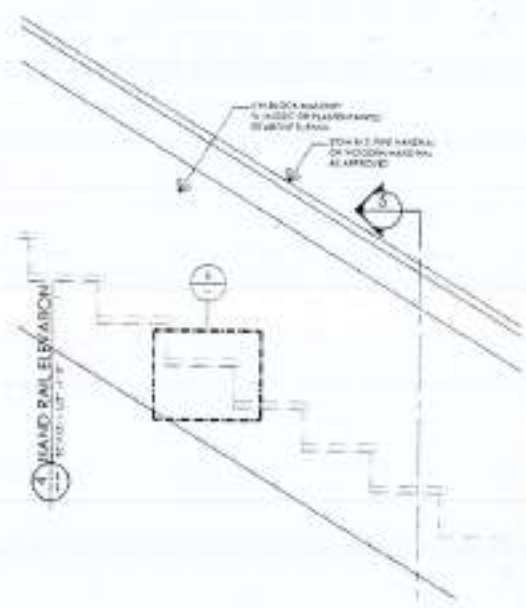
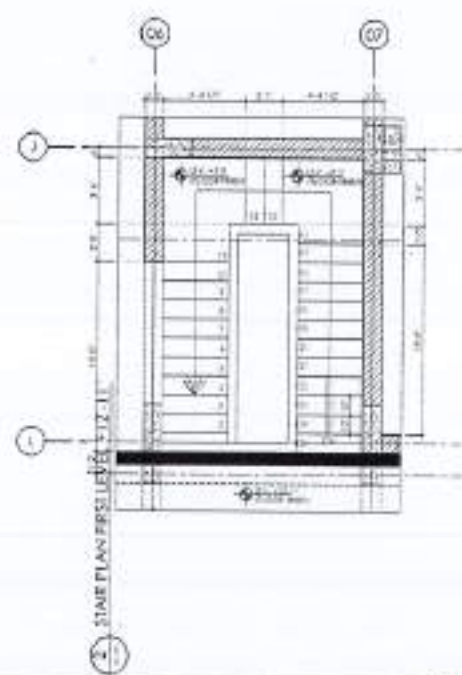
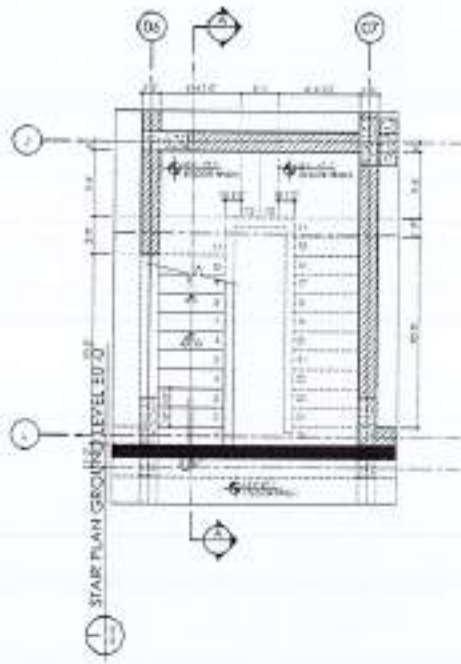
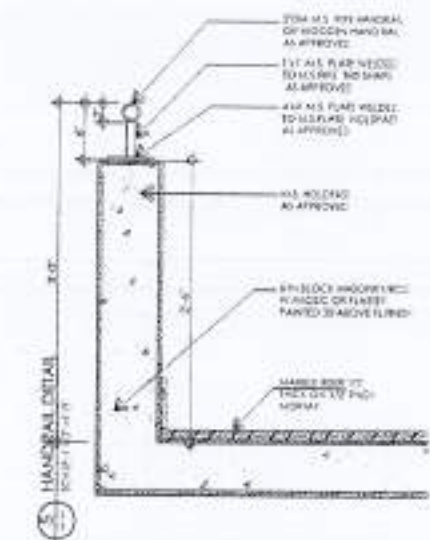
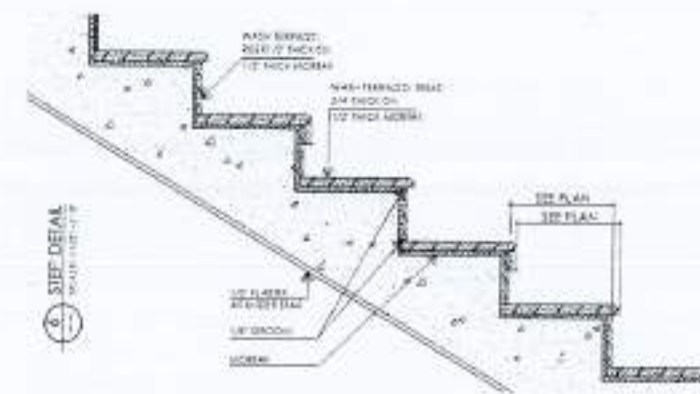
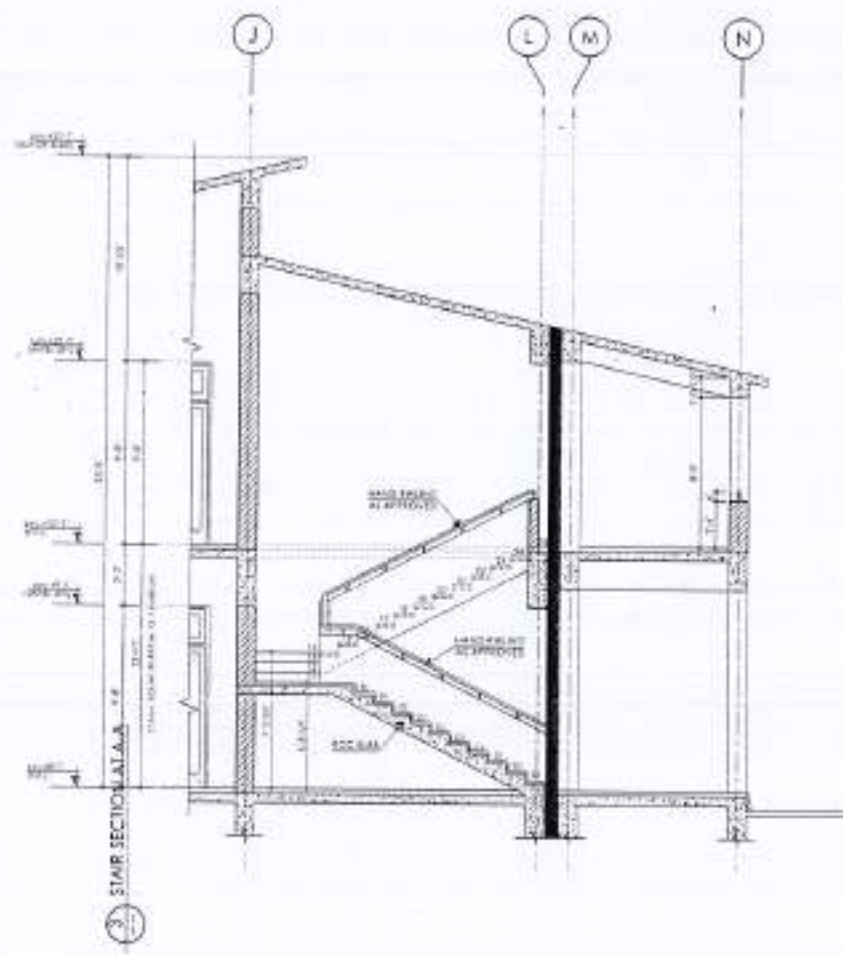
SCALE  
 1/2" = 1'-0"

PROJECT NO.  
 4753/322/BD/06B11





Scale for Ground to 1st Floor  
 25'0" Rise in 12'-11" Rise  
 From: 00'-0" To: 00'-12'-11"



REV	DATE	BY	REMARKS

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PROJECT:  
 COMPLETION OF LEFTOVER WORK  
 OF CHOTAGALA CAMPUS  
 UNIVERSITY OF PUNJAB  
 RAWALAKOTI

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOTI



THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT

ARCHITECTS:  
 THE ARCHITECTS  
 15-A, PAFKAR ROAD, PHASE II, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOTI

STRUCTURAL CONSULTANT:  
  
**mushtaq and bilal**  
 consulting engineers  
 204, HOOR ROAD, PHASE II, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOTI

ELECTRICAL CONSULTANT:  
 E. P. S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 5-A, BOKA, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOTI

PLUMBING CONSULTANT:  
 E. P. S. ASSOCIATES  
 PLUMBING ENGINEERS  
 5-A, BOKA, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOTI

SOIL DATA BY:  
 SOIL CONSULTANTS  
 502 A4-002

REVIEW & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUB-PROJECT TITLE:  
 HI-TECH LIBRARY  
 AND GIRLS COMMON ROOM

DRAWING TITLE:  
 STAIR DETAIL - B

DATE:  
 17th APRIL 2024

DESIGNER:  
 WAHID SHAHID

CHECKER:  
 WAHID SHAHID

APPROVER:  
 WAHID SHAHID

SCALE:  
 1/4" = 1'-0"

NO. OF SHEETS:  
 4753/322/BD/06812







REV. NO.	DATE	REASON	REMARKS

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPAKOT.

CLIENT:  
UNIVERSITY OF PUNJAB, RAWALPAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
ARCHITECTS PARTNERSHIP FIRM  
13-A New Road, Rawal, Islamabad  
Phone No. 35870773, 35870733, 35870732  
Fax: 35870733, 35870732, 35870731

STRUCTURAL CONSULTANT:  
**AAE**  
mushtaq and bilal  
consulting engineers  
8/A, ADD: QUAH, SHAKAR PAK, RAMBHA TOWN  
TEL: 0011-415-413300, 415-413301, 415-413302  
E-mail: mushtaqbilal@comcast.com

ELECTRICAL CONSULTANT:  
K. S. ASSOCIATES  
ELECTRICAL ENGINEERS  
8-A4 Road, Gulshan-e-Iqbal, Karachi - 75200

PLUMBING CONSULTANT:  
**ES ASSOCIATES**  
ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
10/2, 2nd Floor, National Highway No. 1, F-7/1, Islamabad  
Tel: 35870733, 35870732, 35870731

DATE DRAWN: 17/04/2024  
DSS NO.: 502  
TSS NO.: A5-001

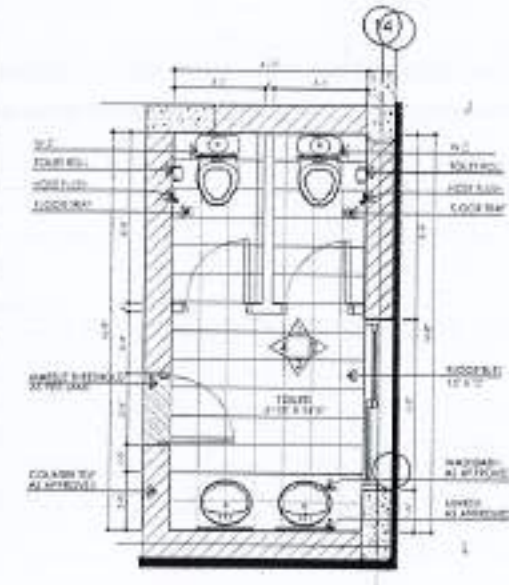
REVIEW & SUPERVISION CONSULTANT:  
**NESPAK (PVT.) LIMITED**

FOR PROJECT FILE:  
HI-TECH LIBRARY AND GIRLS COMMON ROOM

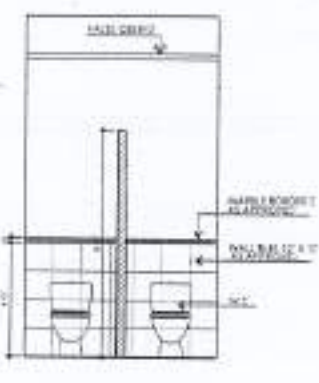
DRAWING TITLE:  
TOILET LAYOUT DETAILS

DESIGNER:  
DESIGNER:  
REVISOR:  
APPROVED BY:

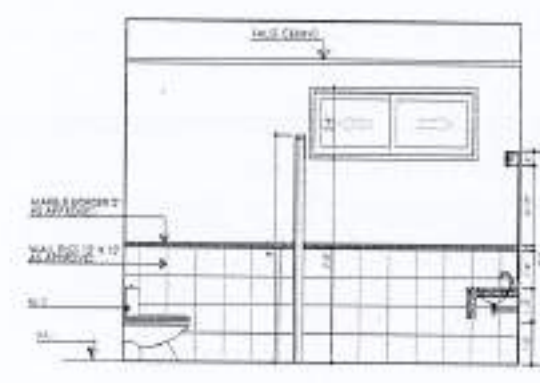
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DATE: 17th APRIL 2024  
DRAWING NO.: 4753/322/BO/04813



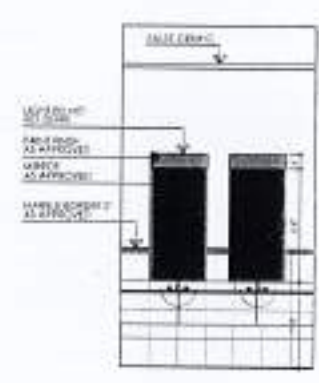
01 TOILETS (GROUND AND FIRST FLOOR)  
REV 1/24



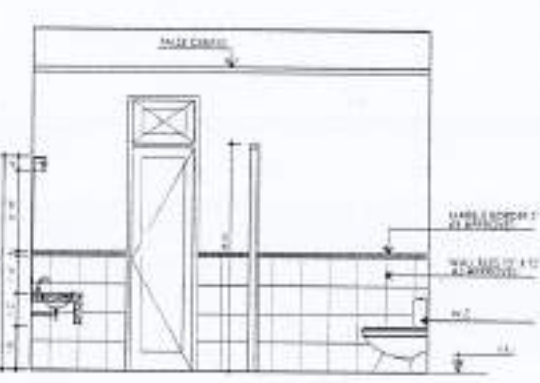
01 ELEVATION  
REV 1/24



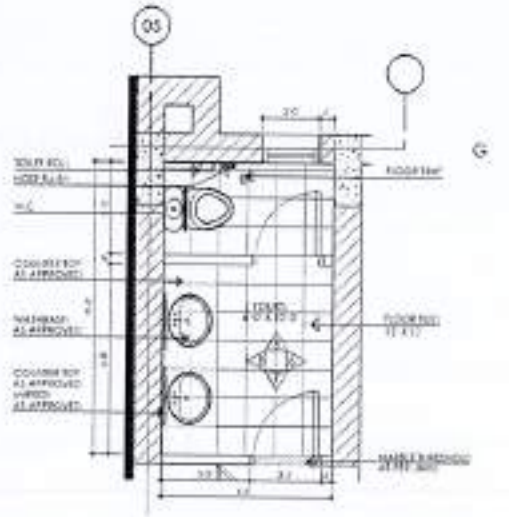
02 ELEVATION  
REV 1/24



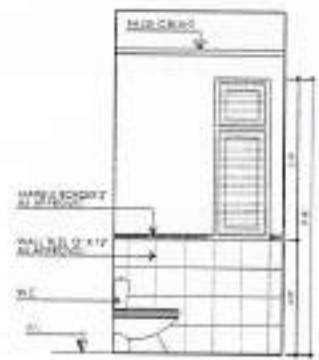
03 ELEVATION  
REV 1/24



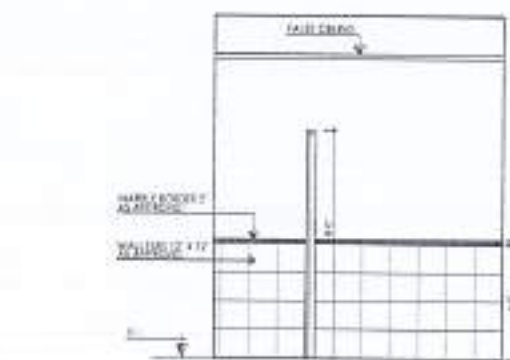
04 ELEVATION  
REV 1/24



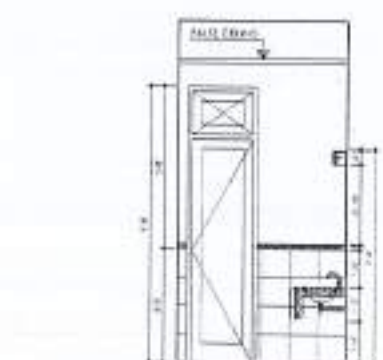
02 TOILETS (GROUND AND FIRST FLOOR)  
REV 1/24



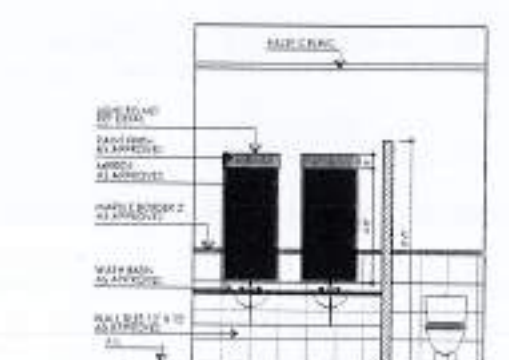
05 ELEVATION  
REV 1/24



06 ELEVATION  
REV 1/24



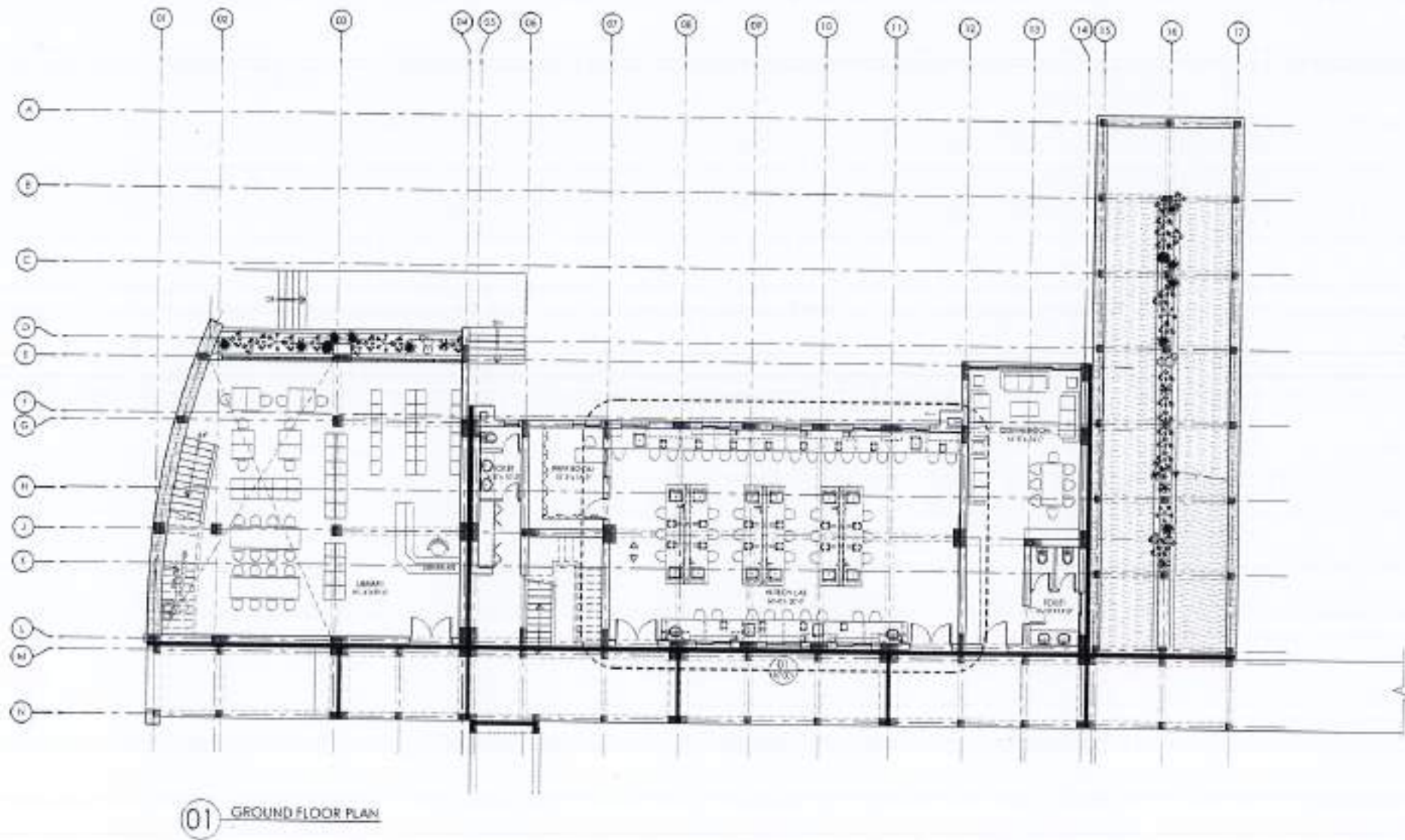
07 ELEVATION  
REV 1/24



08 ELEVATION  
REV 1/24







REV.	DATE	BY
01	04/15	001

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPINDI.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALPINDI.



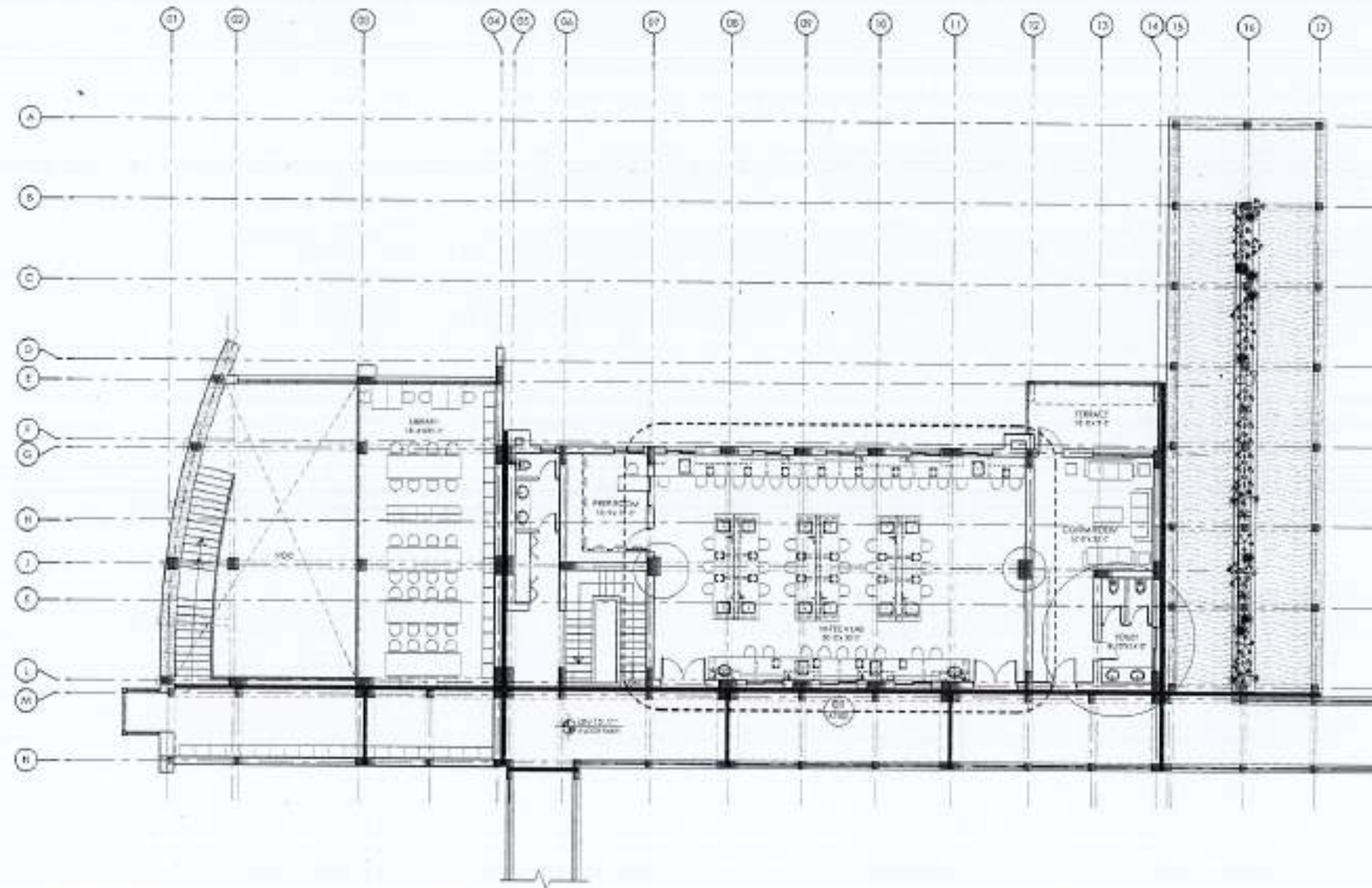
THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECT  
 ANWARUL HAQUE ENGINEERING & ARCHITECTURE  
 11-A, GROUND FLOOR, CHANDI MARKET, KARACHI-74200

STRUCTURAL CONSULTANT:  
  
**musthaq and bilal**  
 consulting engineers  
 8/A, 8/02/03, HANSA PAK, BRANCH 1500,  
 SUITE 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 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01 FIRST FLOOR PLAN



REV.	DATE	BY	REMARKS

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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

**CLIENT:**  
UNIVERSITY OF PUNJAB, RAWALAKOT.



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECT:**  
The Architect  
ARCHITECTURAL ENGINEERING  
PUNJAB UNIVERSITY OF ARCHITECTURE  
RAWALAKOT

**STRUCTURAL CONSULTANT:**  
**mushtaq and bilal**  
consulting engineers  
301, HOOR ROAD, SHARADAPUR, RAWALAKOT  
91-0301-4115-8115, 4115-8115, 4115-8115, 4115-8115  
Email: mushtaqbilal@msae.com

**ELECTRICAL CONSULTANT:**  
E.P.A. ASSOCIATES  
ELECTRICAL ENGINEERS  
144/101, GURDWARA ROAD, LAHORE - 75200

**PLUMBING CONSULTANT:**  
E.P.A. ASSOCIATES  
PLUMBING ENGINEERS  
144/101, GURDWARA ROAD, LAHORE - 75200

**SCALE:** 1/8" = 1'-0"  
**DRAWING NO.:** 502  
**REVISION NO.:** A6-002

**REVIEW & SUPERVISION CONSULTANT:**  
NESPAK (PVT.) LIMITED

**SUBJECT:**  
HI-TECH LIBRARY AND GIRLS COMMON ROOM

**DRAWING TITLE:**  
FIRST FLOOR FURNITURE LAYOUT

**DESIGNED BY:**  
EMIR SHAIKAC

**CHECKED BY:**

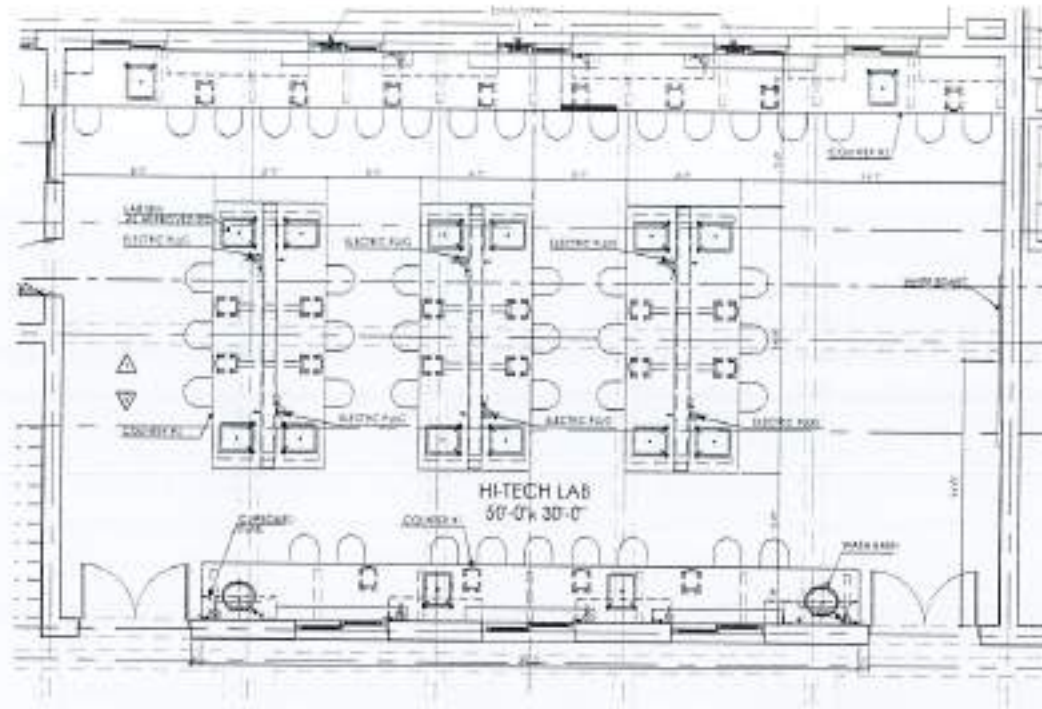
**APPROVED BY:**

**DATE:**

**SCALE:** 1/8" = 1'-0"  
**DATE:** 17/04/2024  
**REV. DRAWING NO.:** 4753/322/BD/06B15





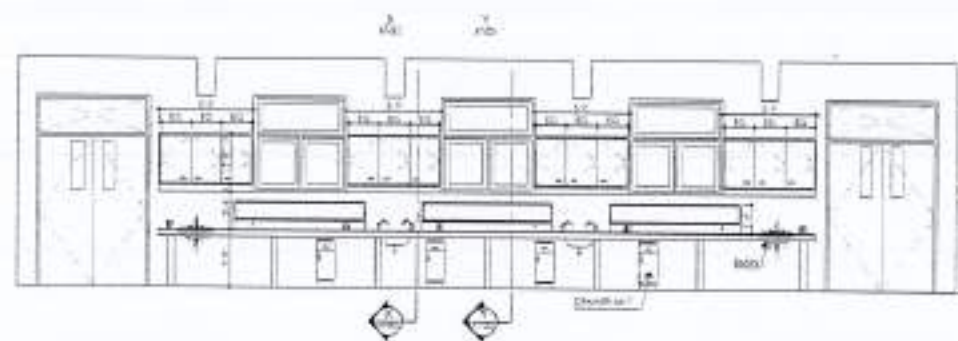


PART PLAN - 01

(TYPICAL LAYOUT)



ELEVATION - 01



ELEVATION - 02



REV. No.	DATE	BY	REMARKS

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**PROJECT**  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA RAJAWALAKOT

**CLIENT**  
 UNIVERSITY OF POKHARA RAJAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECTS**  
 THE ARCHITECTS:  
 MUSHTAQ AND BILAL CONSULTING ENGINEERS  
 30A HUDA ROAD, ISLAMABAD, PAKISTAN  
 TEL: 37314541-52, 37314542-53 FAX: 37314544-45  
 E-MAIL: mushtaqbilal@comcast.com.pk

**STRUCTURAL CONSULTANT**  
  
**mushtaq and bilal consulting engineers**  
 30A HUDA ROAD, ISLAMABAD, PAKISTAN  
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**OLD DRAWING NO:**  
 502 | A7-001

**REVIEW & SUPERVISION CONSULTANT**  
**NESPAC (PVT.) LIMITED**

**SUBJECT TITLE**  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM

**DRAWING TITLE**  
 GROUND & FIRST FLOOR FURNITURE DETAIL

**DRAWN BY**  
 UMAR SHANUQ

**DESIGNED BY**

**FOR JUDGE**

**APPROVED BY**

**SCALE**  
 1/8" = 1'-0" | DATE: 17th APRIL 2024

**PROJECT NO**  
 4753/322/BD/06816





SCHEDULE OF FINISHES DEPARTMENT OF HI-TECH, LIBRARY.							
FLOOR	S.NO.	ROOM NAME	FLOOR	SKIRTING	WALL	CEILING	REMARK
GROUND FLOOR	1	STAIR CASE	F-02	S-01	W-05	C-01	
	2	TOILET (FACULTY)	F-04	---	W-01&05	C-01&02	
	3	PASSAGE COURT	F-01	S-01	W-03&5	C-01	
	4	LIBRARY HALL	F-01	S-01	W-05	C-01	
	5	PREP ROOM	F-01	S-01	W-05	C-01	
	6	COMM ROOM	F-01	S-01	W-05	C-01	
	7	HI-TECH LAB	F-01	S-01	W-05	C-01	
	8	RAMP	F-02	S-01	W-05	---	
FLOOR	S.NO.	ROOM NAME	FLOOR	SKIRTING	WALL	CEILING	REMARK
FIRST FLOOR	1	STAIR CASE	F-02	S-01	W-05	C-01	
	2	TOILET (FACULTY)	F-04	---	W-01&05	C-01&02	
	3	PASSAGE COURT	F-01	S-01	W-03&5	C-01	
	4	LIBRARY HALL	F-01	S-01	W-05	C-01	
	5	PREP ROOM	F-01	S-01	W-05	C-01	
	6	COMM ROOM	F-01	S-01	W-05	C-01	
	7	HI-TECH LAB	F-01	S-01	W-05	C-01	
	8	ROOF TERRACE	F-05	S-02	---	---	

FINISHES AND MATERIAL LEGEND		
S.NO.	ABBREVIATION	FLOOR FINISHES:
1	F-01	12"X12"X1" TERRAZZO TILES IN WHITE CEMENT WITH APPROVED COLOUR & SHADE AS PER SPECS TO ARCHITECTS APPROVAL
2	F-02	3/4" THICK TERRAZZO (CAST IN SITU) POLISHED FINISH TREAD & RISER WITH ANTI SLIP GROOVES COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
3	F-03	1/2" THICK 12" WIDE TERRAZZO (CAST IN SITU) BORDER APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
4	F-04	8"X8" / 12"X12" OR APPROVED SIZE LOCAL CERAMIC TILES MATT FINISH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
5	F-05	C.C. TILE FOR ROOF APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
6	F-06	C.C. TILE FOR COURT AREA. SIZE 12"X12" APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
7	F-07	3/4" THICK TERRAZZO (CAST IN SITU) POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
SKIRTING:		
8	S-01	4" HIGH TERRAZZO TILES SKIRTING POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
9	S-02	4" HIGH C.C. TILES SKIRTING
WALL FINISHES:		
10	W-01	8"X8" / 12"X12" OR APPROVED SIZE LOCAL GLAZED CERAMIC TILES OF APPROVED COLOUR (ADO APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL (SEE ELEVATION DWG. FOR DETAILS)
11	W-02	18" THICK STONE WALL BUILD WITH BEST LOCAL AVAILABLE STONE AS PER SPECS TO ARCHITECTS APPROVAL
12	W-03	3/4" THICK IN 1:2 RATIO WASH TERRAZZO OVER ROUGH PLASTER APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
13	W-04	36"X12" SIZE LOCAL MARBLE POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
14	W-05	3-COATS OF PLASTIC EMULSION PAINT TO INTERNAL PLASTER SURFACE APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
15	W-06	ACOUSTIC LINED WOOD PLY WALL PANELING SYSTEM AS PER DESIGN AND ARCHITECTS APPROVAL
CEILING FINISHES:		
16	C-01	SMOOTH CEMENT PLASTER WITH EMULSION PAINT FINISHES SYSTEM, COLOUR AS PER ARCHITECTS APPROVAL
17	C-02	3/4" THICK CEMENT BOARD FALSE CEILING WITH COMPLETE SUSPENSION SYSTEM WITH EMULSION PAINT FINISH SYSTEM COLOUR AS PER ARCHITECTS APPROVAL
18	C-03	ACOUSTIC LINED WOOD PLY FALSE CEILING AND COMPLETE SUSPENSION SYSTEM AS PER SPECS
19	C-04	16 GAUGE PLAIN METAL G.I. SHEET, 10 GAGUGE CORRUGATED SHEET, 12 MM POLYCARBONATED SHEET



REV. NO. DATE BY: SD/ DATE: 15/04/2024

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOISAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPINDI.

CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALPINDI

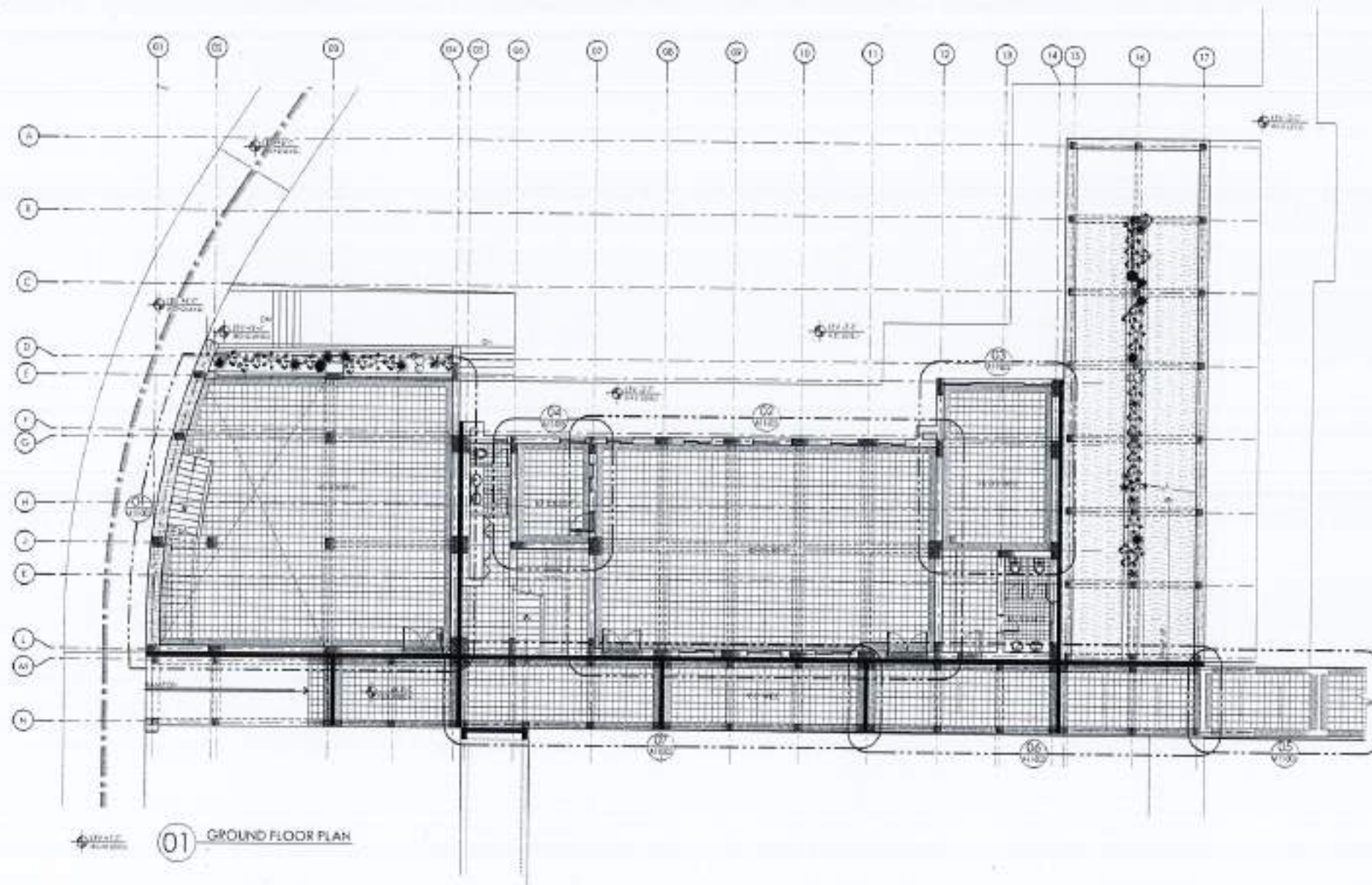


THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECTS  
 ARCHITECTURAL WORKS ENGINEERS  
 114, SOFIA ROAD, G-7/1, F-7/1, G-7/2, F-7/2, G-7/3, F-7/3, G-7/4, F-7/4, G-7/5, F-7/5, G-7/6, F-7/6, G-7/7, F-7/7, G-7/8, F-7/8, G-7/9, F-7/9, G-7/10, F-7/10, G-7/11, F-7/11, G-7/12, F-7/12, G-7/13, F-7/13, G-7/14, F-7/14, G-7/15, F-7/15, G-7/16, F-7/16, G-7/17, F-7/17, G-7/18, F-7/18, G-7/19, F-7/19, G-7/20, F-7/20, G-7/21, F-7/21, G-7/22, F-7/22, G-7/23, F-7/23, G-7/24, F-7/24, G-7/25, F-7/25, G-7/26, F-7/26, G-7/27, F-7/27, G-7/28, F-7/28, G-7/29, F-7/29, G-7/30, F-7/30, G-7/31, F-7/31, G-7/32, F-7/32, G-7/33, F-7/33, G-7/34, F-7/34, G-7/35, F-7/35, G-7/36, F-7/36, G-7/37, F-7/37, G-7/38, F-7/38, G-7/39, F-7/39, G-7/40, F-7/40, G-7/41, F-7/41, G-7/42, F-7/42, G-7/43, F-7/43, G-7/44, F-7/44, G-7/45, F-7/45, G-7/46, F-7/46, G-7/47, F-7/47, G-7/48, F-7/48, G-7/49, F-7/49, G-7/50, F-7/50, G-7/51, F-7/51, G-7/52, F-7/52, G-7/53, F-7/53, G-7/54, F-7/54, G-7/55, F-7/55, G-7/56, F-7/56, G-7/57, F-7/57, G-7/58, F-7/58, G-7/59, F-7/59, G-7/60, F-7/60, G-7/61, F-7/61, G-7/62, F-7/62, G-7/63, 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01 GROUND FLOOR PLAN



REV	DATE	REASON

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOITAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects ARCHITECTS PARTNERSHIP  
 ARCHITECTS PARTNERSHIP  
 PUNJAB UNIVERSITY CAMPUS  
 CHOITAGALA RAWALAKOT

STRUCTURAL CONSULTANT:  
  
**mushtaq and bilal**  
 consulting engineers  
 204 HODDERSON STREET PAKISTAN ISLAMABAD - 75200  
 TEL: 0321-4011307/4011308/4011309/4011310/4011311/4011312

ELECTRICAL CONSULTANT:  
 K P & ASSOCIATES  
 ELECTRICAL ENGINEER  
 8-BAR Road, Gulshan-e-Iqbal, Phase-1, F-7/2

MECHANICAL CONSULTANT:  
  
 M/S. JAMALI  
 MECHANICAL & PLUMBING CONSULTANTS  
 11-1/2 STREET OPP. GATE NO. 1000  
 PAFK CAMPUS CHOITAGALA RAWALAKOT

HYDRAULIC ENGINEER:  
 DRAWING NO:  
 502 A11-001

REVIEW & SUPERVISION ENGINEER:  
 NESPAK (PVT.) LIMITED

SUB-PROJECT TITLE:  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
 GROUND FLOOR FLOORING LAYOUT PLAN

CADIST:  
 USMAN HANIF

DESIGNER:  
 USMAN HANIF

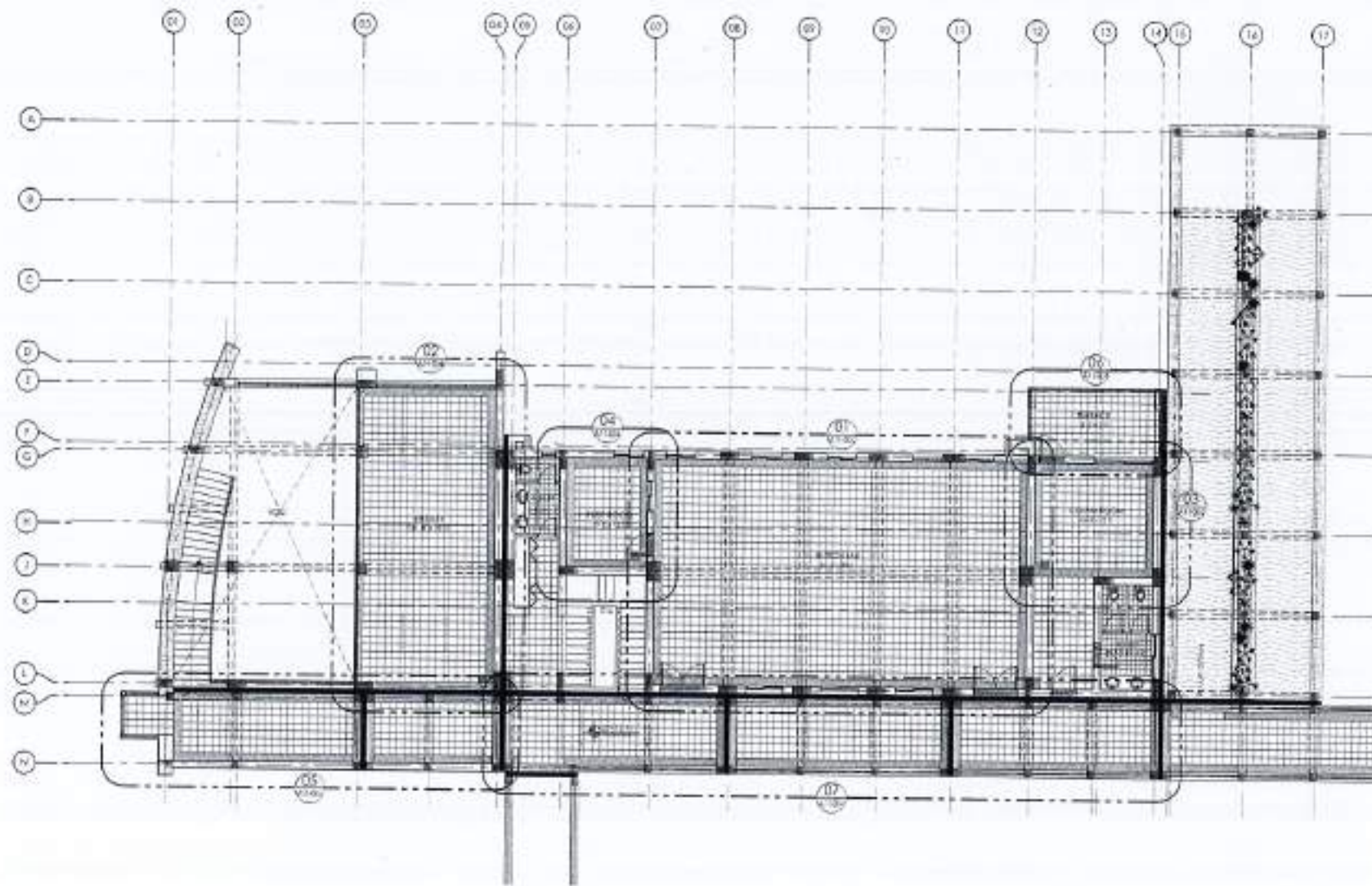
APPROVED BY:  
 USMAN HANIF

SCALE:  
 1/4" = 1'-0" DATE: 17th APRIL 2024

REV. DRAWING NO:  
 4753/322/BD/06823







REV.	DATE	ISSUED

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REASON:  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT

CUSTOMER:  
UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
Mushtaq Bilal  
11-Block, Phase 1, F-7/2, Islamabad  
11000

STRUCTURAL CONSULTANT:  
**MAB**  
mushtaq and bilal  
consulting engineers  
11-Block, Phase 1, F-7/2, Islamabad  
11000

ELECTRICAL CONSULTANT:  
E. F. & ASSOCIATES  
ELECTRICAL ENGINEERS  
11-Block, Phase 1, F-7/2, Islamabad  
11000

MECHANICAL CONSULTANT:  
MEC Associates  
MECHANICAL & SANITARY ENGINEERS  
11-Block, Phase 1, F-7/2, Islamabad  
11000

NO. OF SHEETS: 502  
DRAWING NO.: A11-002

OWNER & SUPERVISOR COMPANY:  
NESPAK (PVT.) LIMITED

PROJECT TITLE:  
HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
FIRST FLOOR FLOORING LAYOUT PLAN

DESIGNED BY:  
CHECKED BY:  
APPROVED BY:

SCALE: 1/8" = 1'-0" DATE: 17th APRIL 2014

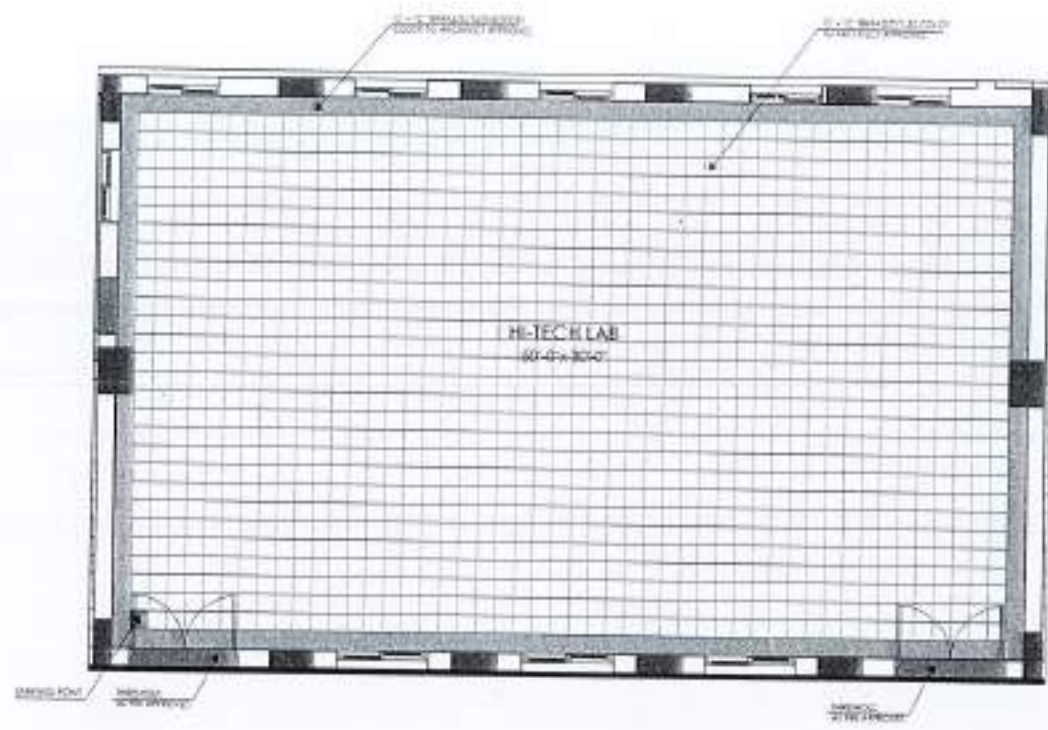
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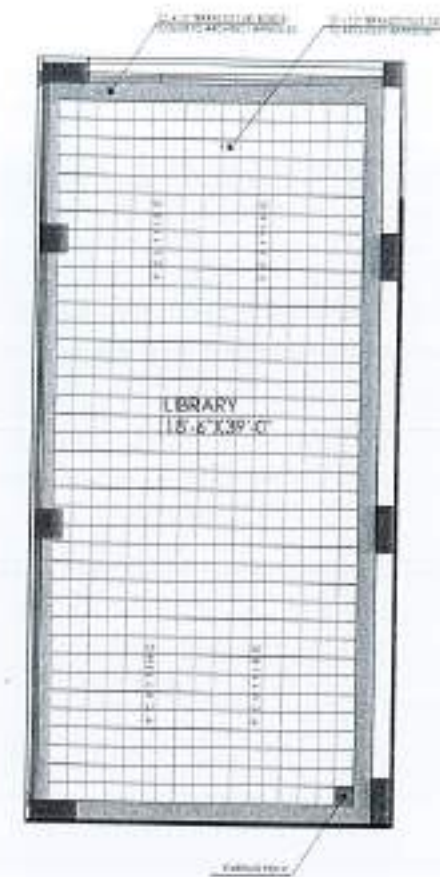






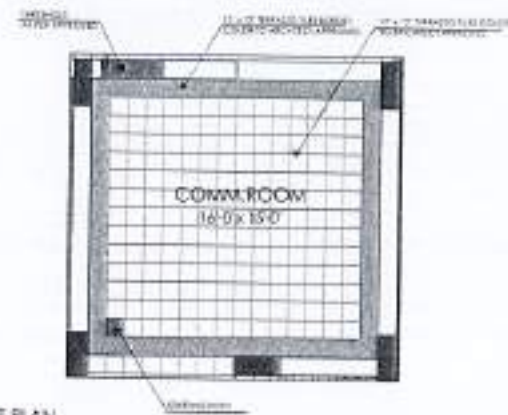
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PART PLAN - 01



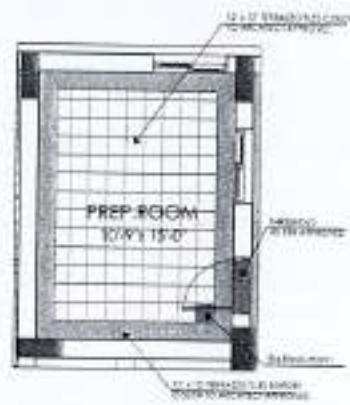
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PART PLAN - 02



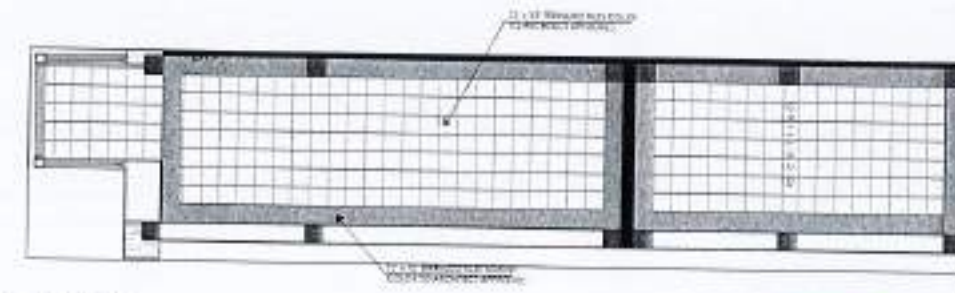
3 PART PLAN

PART PLAN - 03



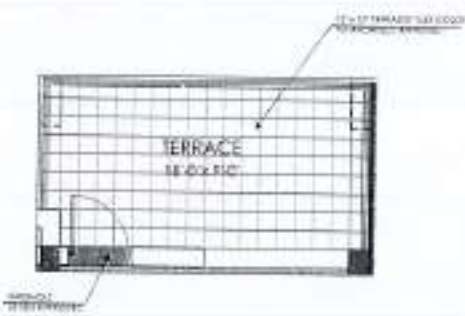
4 PART PLAN

PART PLAN - 04



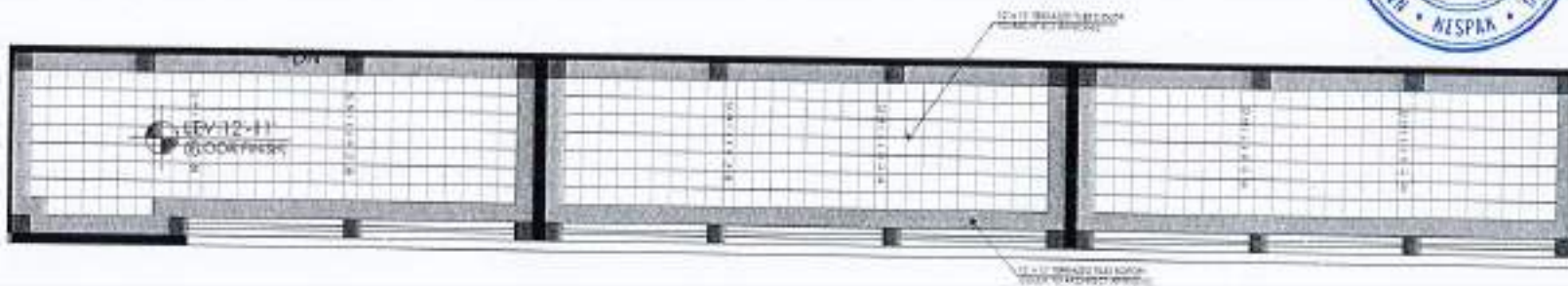
6 PART PLAN

PART PLAN - 05



5 PART PLAN

PART PLAN - 06



7 PART PLAN

PART PLAN - 07



REV.	DATE	BY	CHKD.

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT

CUSTOMER:  
 UNIVERSITY OF PUNJAB RAWALAKOT

DATE:  
 17th APRIL 2024

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 204 HOOD STREET, SHARHAT AREA, KARACHI-75200  
 TEL: 021-35041111 / 35041112 / 35041113 / 35041114 / 35041115

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers  
 204 HOOD STREET, SHARHAT AREA, KARACHI-75200  
 TEL: 021-35041111 / 35041112 / 35041113 / 35041114 / 35041115

ELECTRICAL CONSULTANT:  
 E.P.S. ASSOCIATES  
 ELECTRICAL ENGINEER  
 KARACHI, CALIFORNIA AVENUE MARKET, 1992

PLUMBING CONSULTANT:  
 Environmental & Management Consultants  
 204 HOOD STREET, SHARHAT AREA, KARACHI-75200  
 TEL: 021-35041111 / 35041112 / 35041113 / 35041114 / 35041115



PROJECT NO: 502  
 DRAWING NO: A11-004

REVIEW & APPROVAL CONSULTANT:  
 NESPAC (PVT.) LIMITED

OUR PROJECTS:  
 HI-TECH, LIBRARY, AND GIRLS COMMON ROOM

DRAWING TITLE:  
 GROUND FLOOR FLOORING PLAN (BLOWN UP)

CASE NO:  
 SHEET NO:

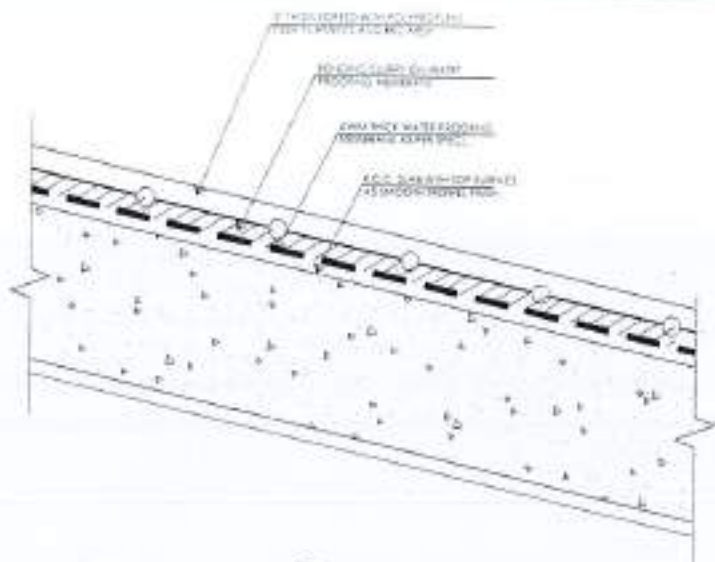
DATE:  
 17th APRIL 2024

PROJECT NO:  
 4753/322/BD/D6826

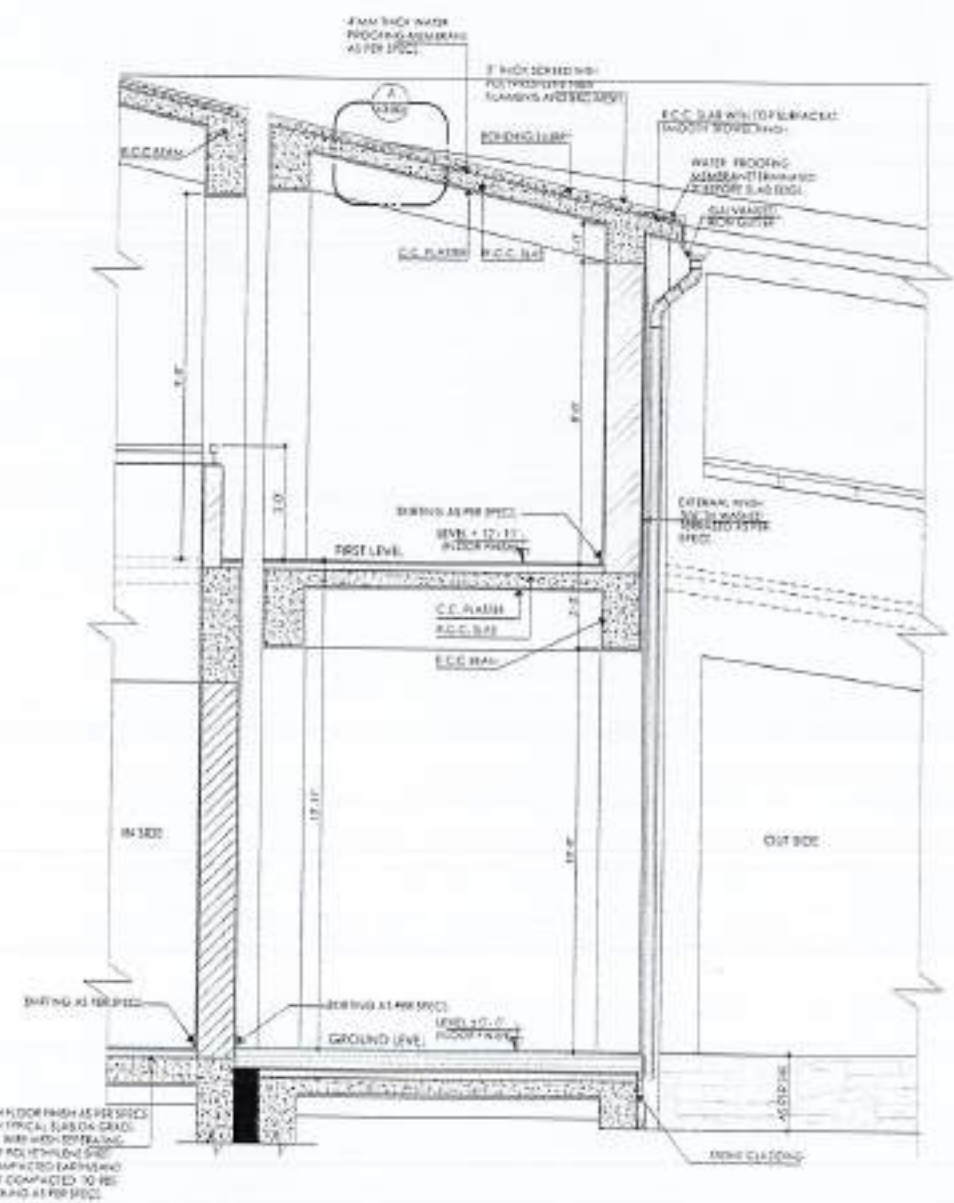




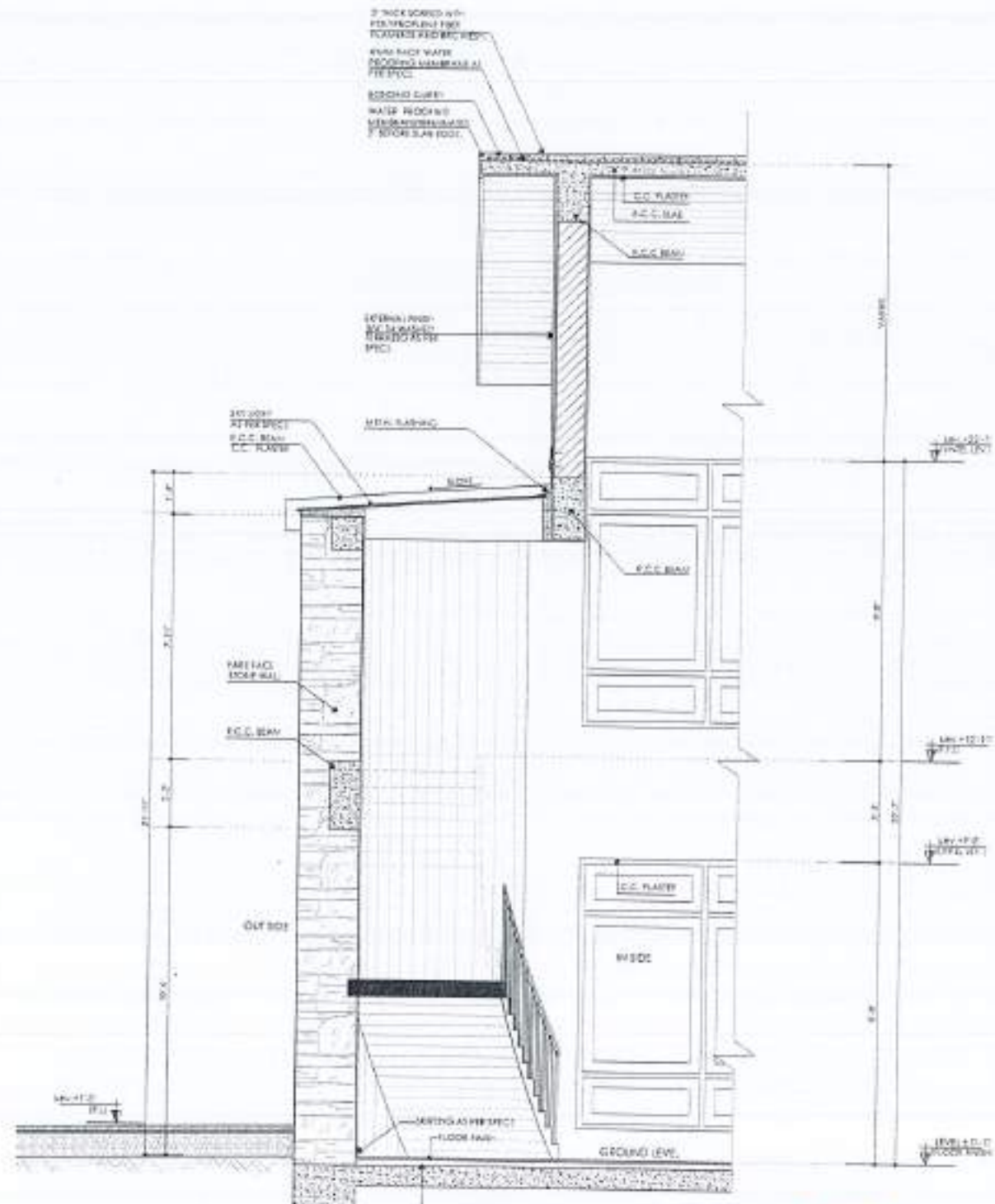




03 DETAIL A-A



01 TYPICAL WALL SECTION - 1 - 1 WALLS SECTION



02 TYPICAL WALL SECTION - 2 - 2 WALLS SECTION



REV	CHKD	DATE

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA, RAWALPINDI.

CLIENT:  
 UNIVERSITY OF POKHARA, RAWALPINDI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 ARCHITECTS ASSOCIATES  
 11-A, F-7/1, G-7/1, H-7/1, I-7/1, J-7/1, K-7/1, L-7/1, M-7/1, N-7/1, O-7/1, P-7/1, Q-7/1, R-7/1, S-7/1, T-7/1, U-7/1, V-7/1, W-7/1, X-7/1, Y-7/1, Z-7/1

REGULATORY CONSULTANT:  
 mushtaq and bilal consulting engineers  
 304 HIGHER ESTATE, DHA PHASE 1, KARACHI-75300  
 TEL: 3733 4841, 3733 4842, 3733 4843, 3733 4844, 3733 4845, 3733 4846, 3733 4847, 3733 4848, 3733 4849, 3733 4850, 3733 4851, 3733 4852, 3733 4853, 3733 4854, 3733 4855, 3733 4856, 3733 4857, 3733 4858, 3733 4859, 3733 4860, 3733 4861, 3733 4862, 3733 4863, 3733 4864, 3733 4865, 3733 4866, 3733 4867, 3733 4868, 3733 4869, 3733 4870, 3733 4871, 3733 4872, 3733 4873, 3733 4874, 3733 4875, 3733 4876, 3733 4877, 3733 4878, 3733 4879, 3733 4880, 3733 4881, 3733 4882, 3733 4883, 3733 4884, 3733 4885, 3733 4886, 3733 4887, 3733 4888, 3733 4889, 3733 4890, 3733 4891, 3733 4892, 3733 4893, 3733 4894, 3733 4895, 3733 4896, 3733 4897, 3733 4898, 3733 4899, 3733 4900

ELECTRICAL CONSULTANT:  
 K & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 8-B, B-1/1, D-1/1, E-1/1, F-1/1, G-1/1, H-1/1, I-1/1, J-1/1, K-1/1, L-1/1, M-1/1, N-1/1, O-1/1, P-1/1, Q-1/1, R-1/1, S-1/1, T-1/1, U-1/1, V-1/1, W-1/1, X-1/1, Y-1/1, Z-1/1

PLUMBING CONSULTANT:  
 M. J. JAMALI  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 11-A, F-7/1, G-7/1, H-7/1, I-7/1, J-7/1, K-7/1, L-7/1, M-7/1, N-7/1, O-7/1, P-7/1, Q-7/1, R-7/1, S-7/1, T-7/1, U-7/1, V-7/1, W-7/1, X-7/1, Y-7/1, Z-7/1

DRAWING NO:  
 502 A3-002

REVISION & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

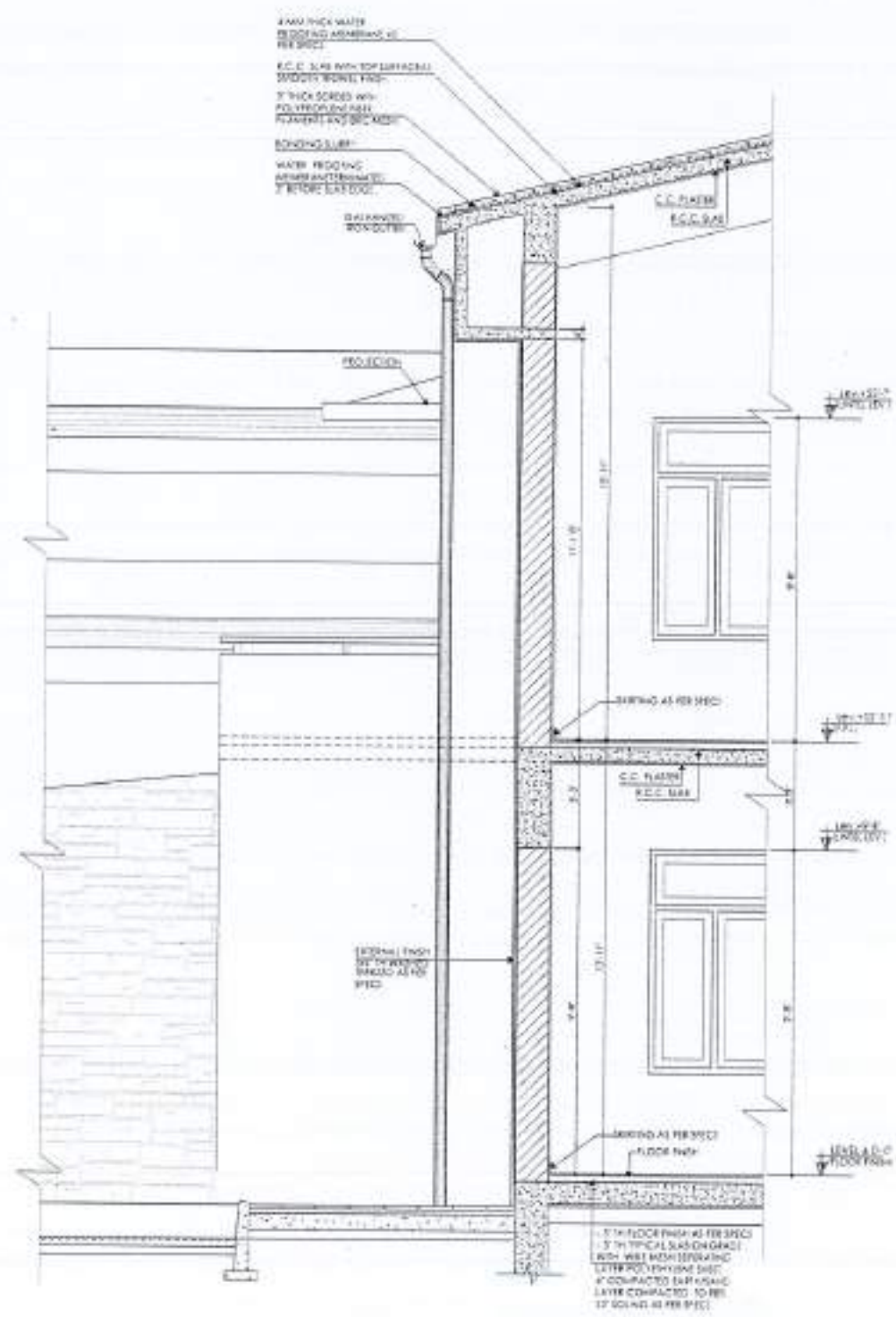
PROJECT TITLE:  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
 WALL SECTION - D1 & D2

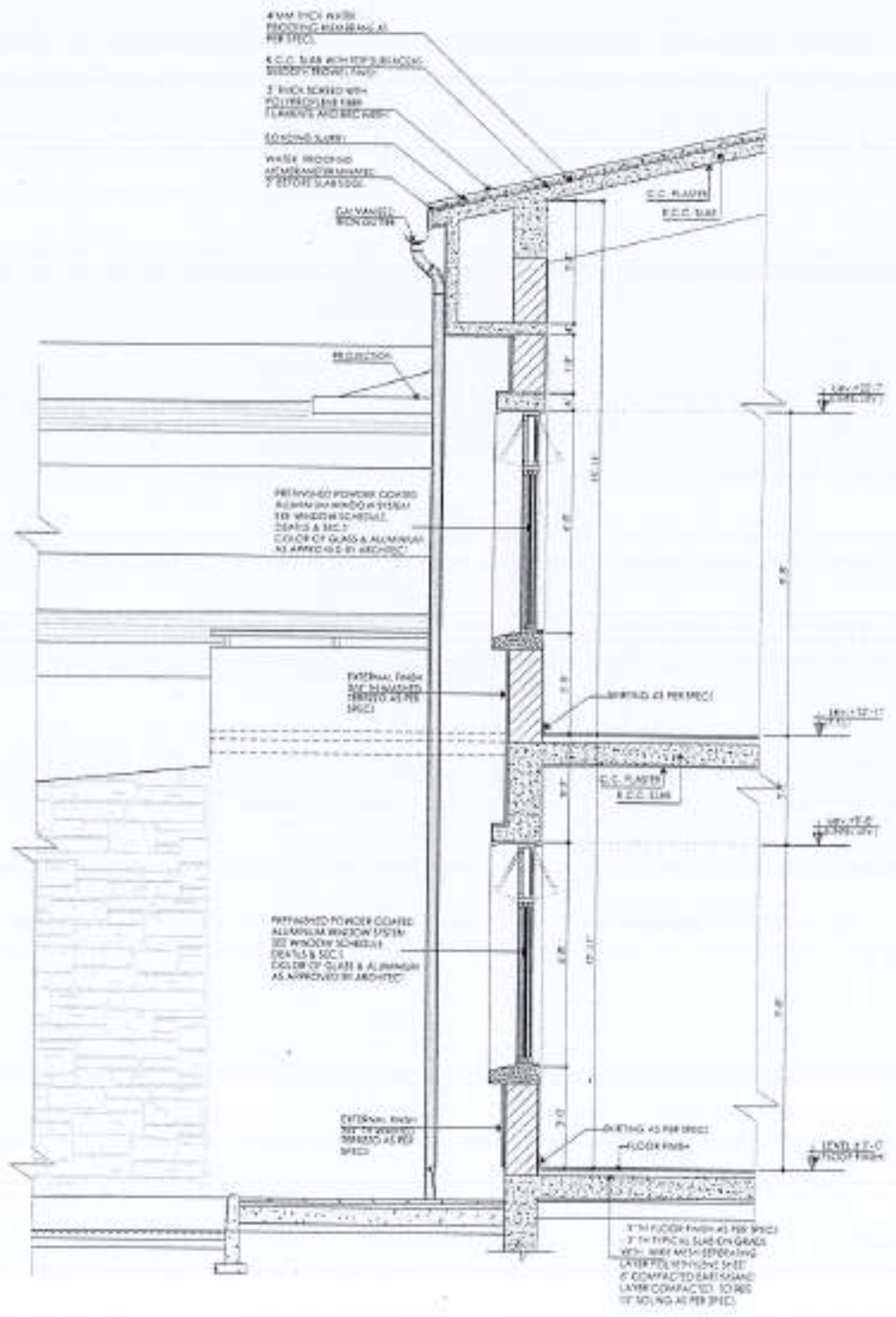
DATE:  
 17th APRIL 2024  
 DRAWN BY:  
 WAHAB KHAN  
 CHECKED BY:  
 NADIA KHAN  
 APPROVED BY:  
 WAHAB KHAN  
 SCALE:  
 1/4" = 1'-0"  
 DATE:  
 17th APRIL 2024  
 PROJECT NO:  
 4753/322/BD/06BD09







03 TYPICAL WALL SECTION - 3-3  
WALLS SECTION



04 TYPICAL WALL SECTION - 4-4  
WALLS SECTION

REV	DATE	BY	CHKD

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOITAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECT  
 Architectural Planning Office  
 25-A, F-7/2, Phase-7, Islamabad  
 TEL: 37311451-52, 37311453-54 FAX: 37311455  
 Email: info@the-architect.com

STRUCTURAL CONSULTANT:  
  
**mushiq and bilal**  
 consulting engineers  
 5th FLOOR, 5th PHASE, PAF, ISLAMABAD  
 TEL: 37311451-52, 37311453-54 FAX: 37311455  
 Email: info@bilal-mushiq.com

ELECTRICAL CONSULTANT:  
 K O & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 8th FLOOR - Green Park - Phase 7, Islamabad

PLUMBING CONSULTANT:  
  
 ENVIRONMENTAL & MANAGEMENT SERVICES  
 11th FLOOR, PHASE 7, ISLAMABAD

ELEVATIONS BY:  
 ITENE: 502  
 BRANING: A3-003

REVIEW & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

PROJECT TITLE:  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
 WALL SECTION - 03 & 04

DESIGNER:  
 SHAH FARIKH

REVISOR:

APPROVED BY:

SCALE:  
 1/8" = 1'-0" (0:8)  
 1/4" = 1'-0" (0:4)  
 NEW DRAWING NO:  
 4753/322/BD/06B10





## AGRONOMY & SOIL SCIENCE ARCHITECTURAL DRAWINGS

S#	Title	DWG.#
01	LIST OF DRAWING	
02	MASTER PLAN	A0-000
03	LOCATION PLAN	A0-001
04	LOCATION PLAN BLOW UP	A0-002
05	GROUND FLOOR PLAN	A0-003
06	FIRST FLOOR PLAN	A1-001
07	FIRST FLOOR HIGH LEVEL PLAN	A1-002
08	CLEARSTOREY LEVEL PLAN	A1-003
09	TOP ROOF PLAN	A1-004
10	ELEVATIONS - 01 & 02	A1-005
11	ELEVATIONS - 03 & 04	A2-001
12	SECTIONS - A-A & B-B	A2-002
13	SECTION - C-C & D-D	A3-001
14	SECTION - E-E	A3-002
15	WALL SECTIONS - 01, 02 & 03	A3-003
16	WALL SECTIONS - 04 & 05	A3-004
17	WALL SECTION - 06	A3-005
18	WALL SECTIONS - 07 & 08	A3-006
19	STAIL DETAIL - A	A3-007
20	STAIL DETAIL - B	A4-001
21	TOILETS LAYOUT DETAILS	A4-002
22	TOILETS LAYOUT DETAILS	A5-001
23	TOILETS LAYOUT DETAILS	A5-002
24	PANTRY LAYOUT DETAIL	A5-003
25	GROUND FLOOR FURNITURE LAYOUT	A5-004
26	FIRST FLOOR FURNITURE LAYOUT	A6-001
27	GROUND & FIRST FLOOR FURNITURE DETAIL	A6-002
28	GROUND & FIRST FLOOR FURNITURE DETAIL	A7-001
29	GROUND & FIRST FLOOR FURNITURE DETAIL	A7-002
30	GROUND & FIRST FLOOR TYPICAL FURNITURE DETAIL	A7-003
31	DOORS & WINDOWS SCHEDULE	A7-004
32	WINDOWS SCHEDULE	A8-001
33	DOORS JOINERY DETAILS	A8-002
34	DETAILS OF ELECTR. DOOR	A8-003
35	ALUM. WIN. JOINERY DETAIL	A8-004
36	ALUM. WIN. JOINERY DETAIL	A8-005
37	FINISHES SCHEDULE	A8-006
38	ROOF DETAILING	A9-001
39	GROUND FLOOR FLOORING LAYOUT PLAN	A10-001
40	FIRST FLOOR FLOORING LAYOUT PLAN	A11-001
41	GROUND FLOOR FLOORING PLAN ( BLOWN UP)	A11-002
42	GROUND FLOOR FLOORING PLAN ( BLOWN UP)	A11-003
43	FIRST FLOOR FLOORING PLAN ( BLOWN UP)	A11-004
44	FIRST FLOOR FLOORING PLAN ( BLOWN UP)	A11-005
		A11-006



REV PLAN



REV.	DATE	REASON	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA, RAJAWALAKOT.

CLIENT:  
 UNIVERSITY OF POKHARA, RAJAWALAKOT.

ARCHITECT:  


THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 10/10, P.O. Box 10, Kathmandu, Nepal  
 TEL: 977-1-4255111, 4255112, 4255113, 4255114, 4255115, 4255116, 4255117, 4255118, 4255119, 4255120, 4255121, 4255122, 4255123, 4255124, 4255125, 4255126, 4255127, 4255128, 4255129, 4255130, 4255131, 4255132, 4255133, 4255134, 4255135, 4255136, 4255137, 4255138, 4255139, 4255140, 4255141, 4255142, 4255143, 4255144, 4255145, 4255146, 4255147, 4255148, 4255149, 4255150, 4255151, 4255152, 4255153, 4255154, 4255155, 4255156, 4255157, 4255158, 4255159, 4255160, 4255161, 4255162, 4255163, 4255164, 4255165, 4255166, 4255167, 4255168, 4255169, 4255170, 4255171, 4255172, 4255173, 4255174, 4255175, 4255176, 4255177, 4255178, 4255179, 4255180, 4255181, 4255182, 4255183, 4255184, 4255185, 4255186, 4255187, 4255188, 4255189, 4255190, 4255191, 4255192, 4255193, 4255194, 4255195, 4255196, 4255197, 4255198, 4255199, 4255200

STRUCTURAL CONSULTANT:  
 M&B  
**mustaq and bilal**  
 consulting engineers  
 10/10, P.O. Box 10, Kathmandu, Nepal  
 TEL: 977-1-4255111, 4255112, 4255113, 4255114, 4255115, 4255116, 4255117, 4255118, 4255119, 4255120, 4255121, 4255122, 4255123, 4255124, 4255125, 4255126, 4255127, 4255128, 4255129, 4255130, 4255131, 4255132, 4255133, 4255134, 4255135, 4255136, 4255137, 4255138, 4255139, 4255140, 4255141, 4255142, 4255143, 4255144, 4255145, 4255146, 4255147, 4255148, 4255149, 4255150, 4255151, 4255152, 4255153, 4255154, 4255155, 4255156, 4255157, 4255158, 4255159, 4255160, 4255161, 4255162, 4255163, 4255164, 4255165, 4255166, 4255167, 4255168, 4255169, 4255170, 4255171, 4255172, 4255173, 4255174, 4255175, 4255176, 4255177, 4255178, 4255179, 4255180, 4255181, 4255182, 4255183, 4255184, 4255185, 4255186, 4255187, 4255188, 4255189, 4255190, 4255191, 4255192, 4255193, 4255194, 4255195, 4255196, 4255197, 4255198, 4255199, 4255200

ELECTRICAL CONSULTANT:  
 C.P.A. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 10/10, P.O. Box 10, Kathmandu, Nepal

PLUMBING CONSULTANT:  
 C.P.A. ASSOCIATES  
 10/10, P.O. Box 10, Kathmandu, Nepal

ENVIRONMENTAL & MANAGEMENT CONSULTANT:  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 10/10, P.O. Box 10, Kathmandu, Nepal

JOB NO: 502      DRAWING NO: A0-000

DESIGN & APPROVAL CONSULTANT:  
**NESPAC (PVT.) LIMITED**

PROJECT TITLE:  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 LIST OF DRAWINGS  
 WORKING DRAWING

DRAWN BY:  
 \_\_\_\_\_

CHECKED BY:  
 \_\_\_\_\_

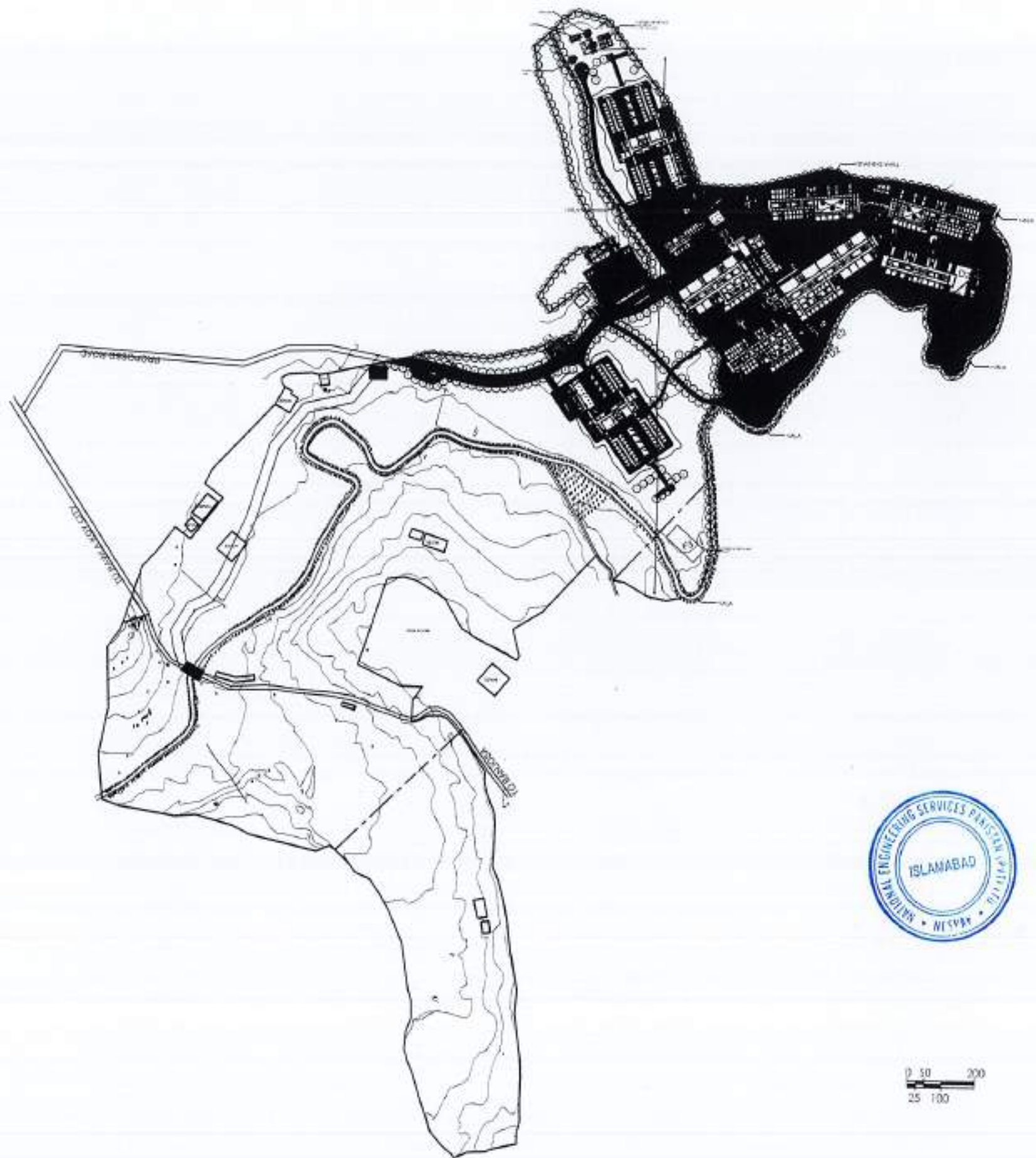
APPROVED BY:  
 \_\_\_\_\_

SCALE: 1:25      DATE: APR. 2024

REVISED BY:  
 \_\_\_\_\_

JOB NO: 4753/322/BD/03800





REV.	DATE	ISSUED	BY

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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

**CLIENT:**  
UNIVERSITY OF POONCH RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

**ARCHITECT:**  
The Architects  
M. A. H. Khan, M. A. H. Khan, M. A. H. Khan  
14-B, Block, Chakara, Rawalakot, Poonch, Jammu & Kashmir

**STRUCTURAL CONSULTANT:**  
mushtaq and bilal  
consulting engineers  
SILK ROAD BANGOR, BANGOR TOWN, RAWALAKOT  
TEL: 011-26111111 FAX: 011-26111111

**ELECTRICAL CONSULTANT:**  
K.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
14-B, Block, Chakara, Rawalakot, Poonch, Jammu & Kashmir

**PLUMBING CONSULTANT:**  
K.P. & ASSOCIATES  
PLUMBING ENGINEERS  
14-B, Block, Chakara, Rawalakot, Poonch, Jammu & Kashmir

**OLD DRAWING NO:**

**NEW DRAWING NO:**  
502 A0-001

**OWNER & SUPERVISOR:**  
NESPAC (PVT.) LIMITED

**ESTABLISHMENT:**  
DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

**DRAWING TITLE:**  
MASTER PLAN  
WORKING DRAWING

**DRAWN BY:**  
MHAH

**CHECKED BY:**

**APPROVED BY:**

**SCALE:**  
1/4" = 1'-0"

**DATE:**  
APRIL 2004

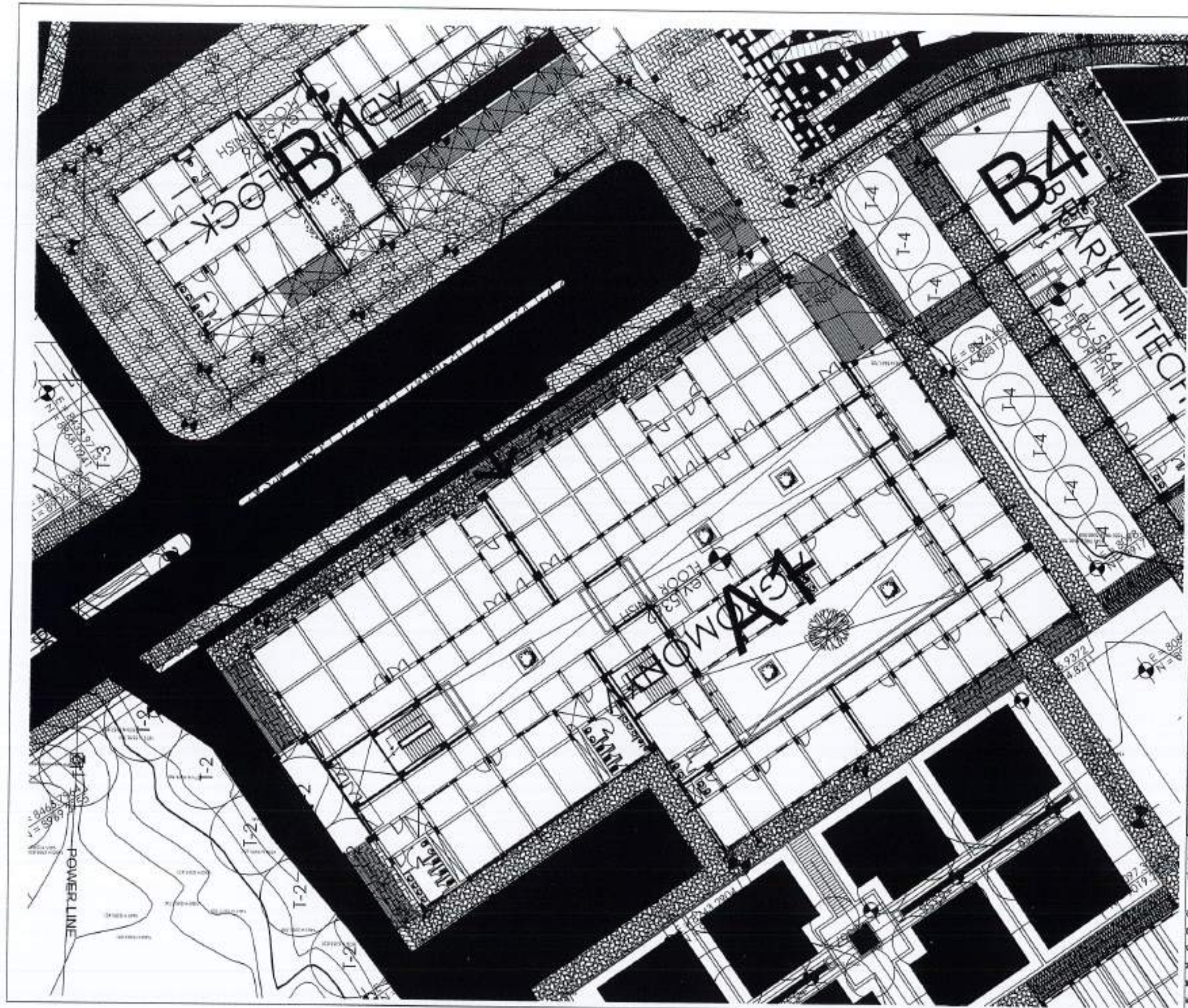
**NEW DRAWING NO:**  
4753/322/BD/03801











**KEY PLAN**

NO.	DATE	REVISION

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**ALL DIMENSIONS ARE TO BE INDICATED AND VERIFIED ON SITE.**

**ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.**

**PROJECT:**  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRAH, RAJLAHORE.

**CLIENT:**  
 UNIVERSITY OF POKHRAH, RAJLAHORE.

**POSITION:**

**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT**

**MUSHTAG ARCHITECTS AND ENGINEERS**  
 The Architects  
 Civil/Structural/Planning/Interior/Environmental/MEPE/Quantity Surveying/Estimation/Construction Management

**PROFESSIONAL CONSULTANT**  
  
**mushtag and bilal consulting engineers**  
 501, H-8, B-1, CHANDAN, ISLAMABAD, PAKISTAN  
 TEL: 37311111, 37311112, 37311113, 37311114, 37311115, 37311116, 37311117, 37311118, 37311119, 37311120, 37311121, 37311122, 37311123, 37311124, 37311125, 37311126, 37311127, 37311128, 37311129, 37311130, 37311131, 37311132, 37311133, 37311134, 37311135, 37311136, 37311137, 37311138, 37311139, 37311140, 37311141, 37311142, 37311143, 37311144, 37311145, 37311146, 37311147, 37311148, 37311149, 37311150, 37311151, 37311152, 37311153, 37311154, 37311155, 37311156, 37311157, 37311158, 37311159, 37311160, 37311161, 37311162, 37311163, 37311164, 37311165, 37311166, 37311167, 37311168, 37311169, 37311170, 37311171, 37311172, 37311173, 37311174, 37311175, 37311176, 37311177, 37311178, 37311179, 37311180, 37311181, 37311182, 37311183, 37311184, 37311185, 37311186, 37311187, 37311188, 37311189, 37311190, 37311191, 37311192, 37311193, 37311194, 37311195, 37311196, 37311197, 37311198, 37311199, 37311200

**ELECTRICAL CONSULTANT**  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1-A-10, D-11, Islamabad, Pakistan - 75200

**PLANNING CONSULTANT**  
 P.L. CONSULTANTS  
 CIVIL/ARCHITECTURAL/PLANNING/INTERIOR/ENVIRONMENTAL/MEPE/ESTIMATION/CONSTRUCTION MANAGEMENT

**OLD DRAWING NO:**  
 502 A0-003

**NEW & SUPERVISOR CONSULTANT**  
**NESPAK (PVT.) LIMITED**  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

**DRAWING TITLE**  
 LOCATION PLAN BLOW UP  
 WORKING DRAWING

**DATE:**  
 04/04/2024

**SCALE:**  
 1/4" = 1'-0"

**DATE:**  
 APRIL 2024

**NEW DRAWING NO:**  
 4753/322/BO/05803



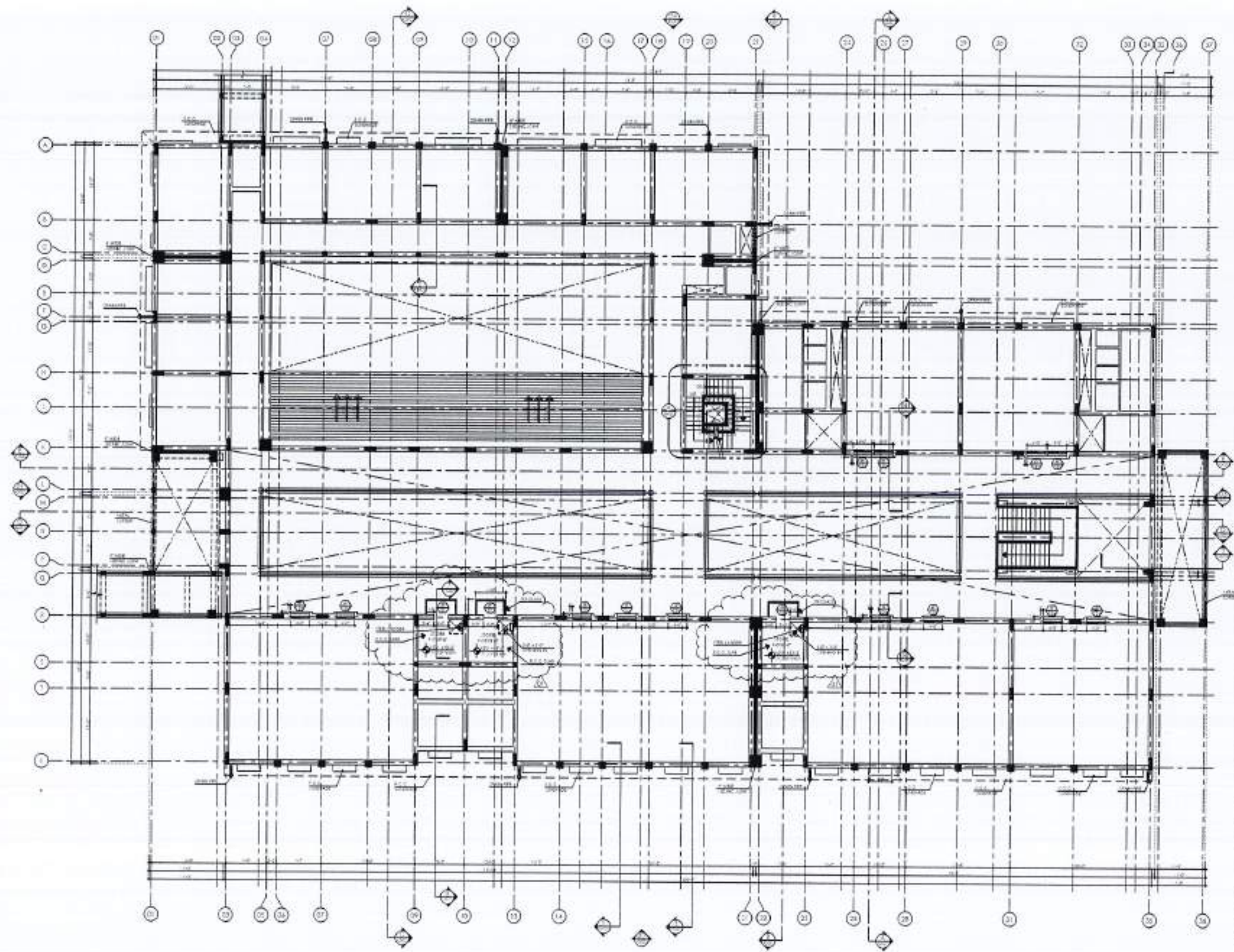












REV.	DATE	REASON	BY

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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

**CLIENT:**  
UNIVERSITY OF POONCH, RAWALAKOT



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT:**

**ARCHITECT:**  
The Architects  
Mushtag and Bilal Consulting Engineers  
11-B, Block, G.D. Chowk, Rawalakot, Poonch, Pakistan.  
Tel: 091-999-999-999, Fax: 091-999-999-999, Email: mushtag@mshtag.com

**STRUCTURAL CONSULTANT:**  
mushtag and bilal consulting engineers  
ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING REGULATIONS, 1979 AND THE NATIONAL ELECTRICAL REGULATIONS, 1979.

**MECHANICAL CONSULTANT:**  
E.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
11-B, Block, G.D. Chowk, Rawalakot, Poonch, Pakistan.

**PLUMBING CONSULTANT:**  
E.P. & ASSOCIATES  
MECHANICAL & PLUMBING CONSULTANTS  
11-B, Block, G.D. Chowk, Rawalakot, Poonch, Pakistan.

**DATE:** 05/04/2024  
**DRAWING NO.:** 502 A1-003

**DESIGN & SUPERVISION CONSULTANT:**  
NESPAK (PVT.) LIMITED  
SUBJECT: DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

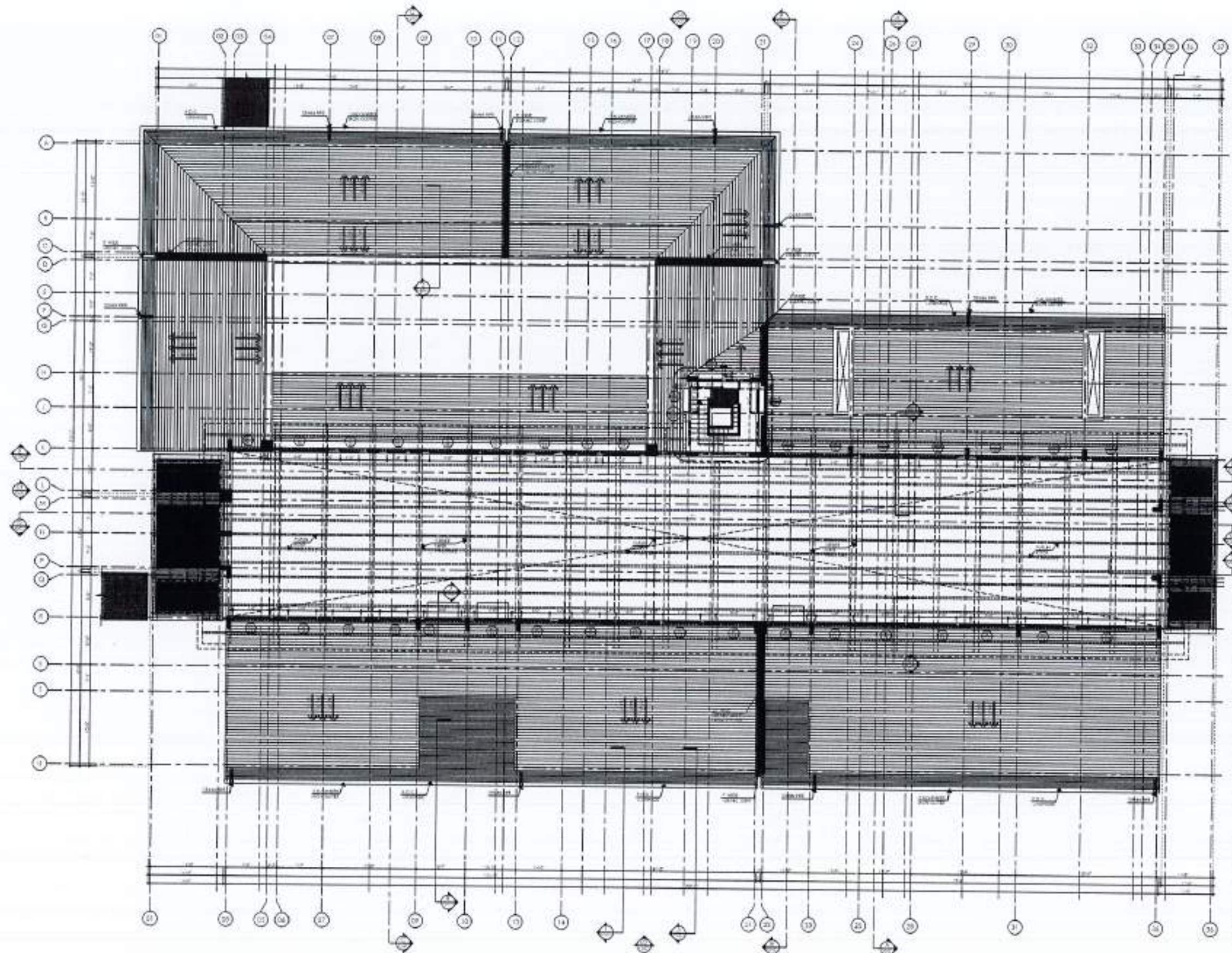
**DRAWING TITLE:**  
FIRST FLOOR HIGH LEVEL WORKING DRAWING

**DATE BY:** MM/YY  
**CHECK BY:** MM/YY  
**SCALE BY:** MM/YY  
**APPROVED BY:** MM/YY

**SCALE:** 1/8" = 1'-0"  
**DATE:** APRIL 2024  
**REVISED BY:** 4753/322/BD/03806







REV. NO.	DATE	ISSUED	REVISION

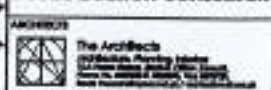
NOTE:  
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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA, BAKWALADOT.  
 CLIENT:  
 UNIVERSITY OF POKHARA, BAKWALADOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT:



ORIGINAL CONSULTANT:  
**mushtaq and bilal**  
 consulting engineers  
 104, HOOR ROAD, BHAKTAPAL, DHAKA-1000  
 TEL: 8801 / 8801-1001. FAX: 8801-1001. E-mail: mushtaqbilal.com.bd

ELECTRICAL CONSULTANT:  
**E.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 1-A-10/11, DUBAIBANUATRA COMPOUND-1000

PLUMBING CONSULTANT:  
**PLUMBING CONSULTANTS**  
 10/10, BAKHUBANUATRA COMPOUND-1000

OLD DRAWING NO. 502  
 NEW DRAWING NO. A1-004

OWNER & SUPERVISOR CONSULTANT:  
**NESPAK (PVT.) LIMITED**

FOR PROJECTS:  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 CLEARSTOREY LEVEL PLAN  
 WORKING DRAWING

DATE BY: SAH  
 DESIGN BY:  
 CHECKED BY:  
 APPROVED BY:

SCALE: 1/8" = 1'-0"  
 DATE: APRIL 2004

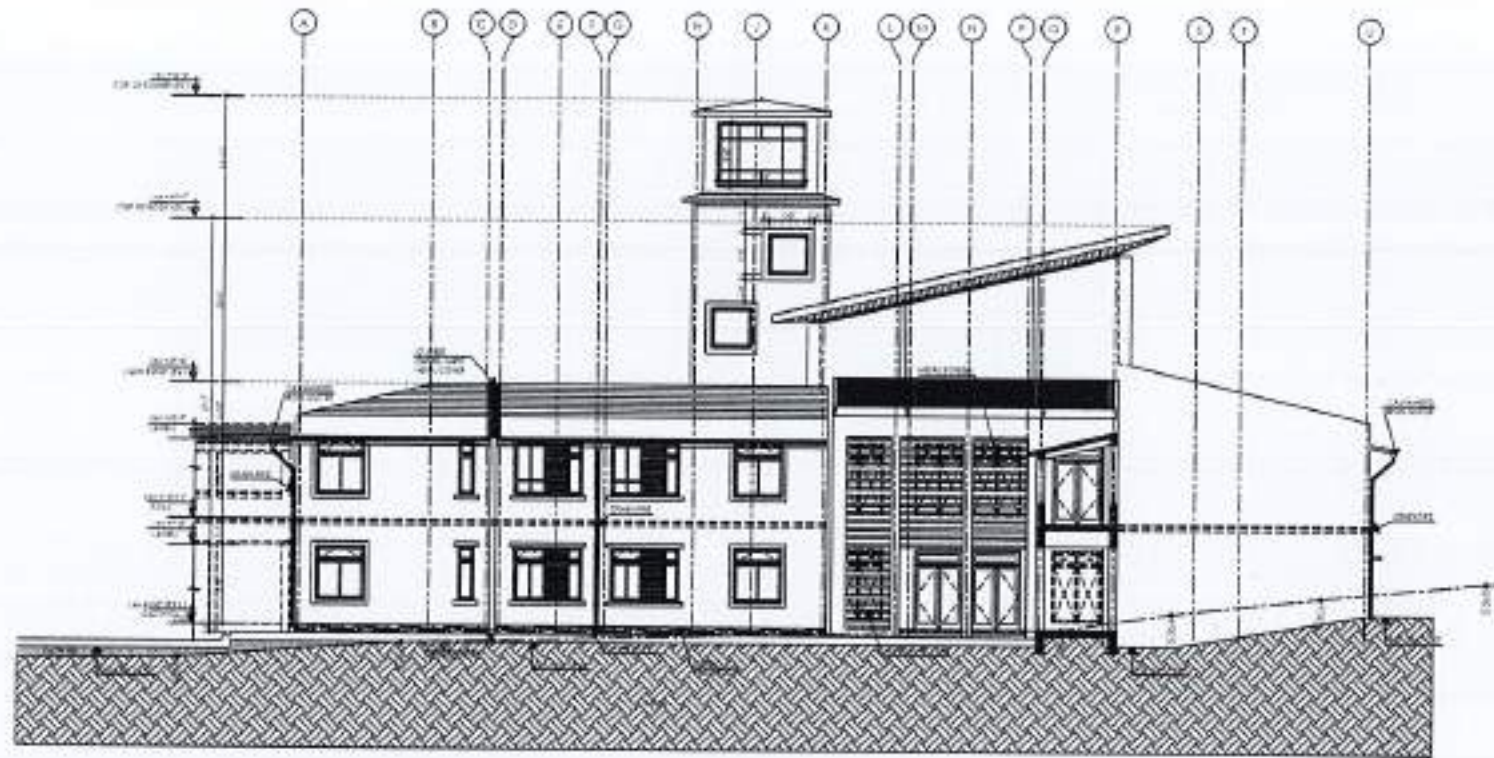
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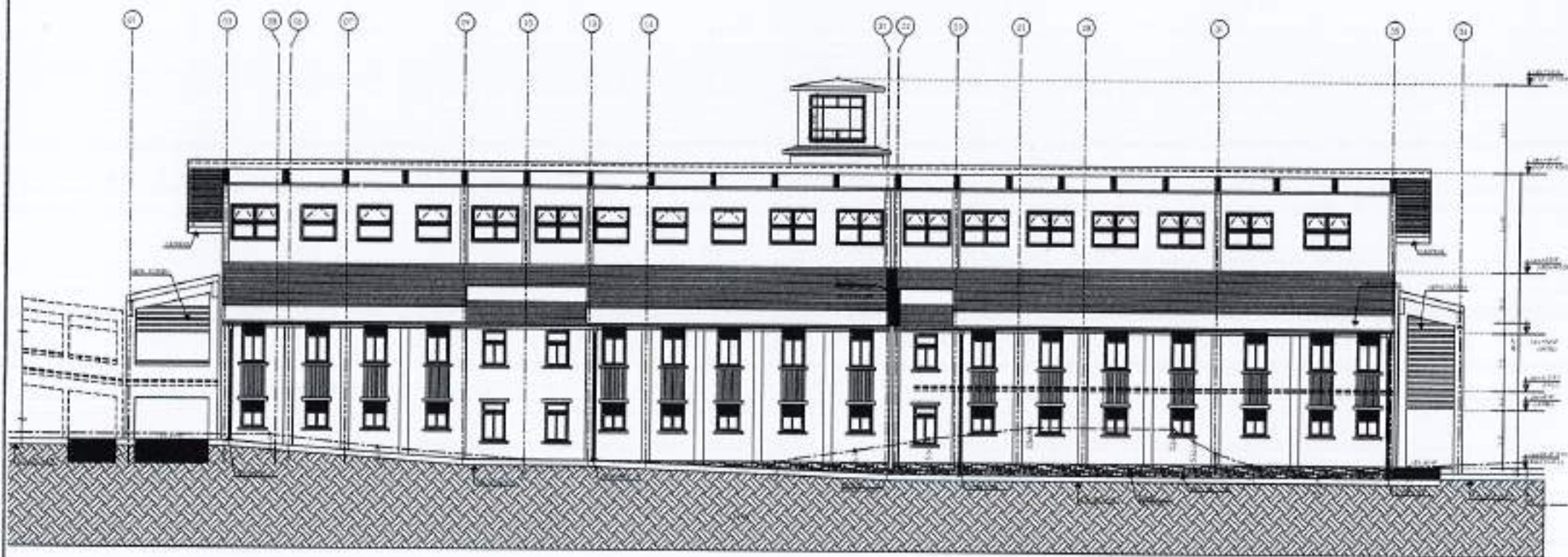








1 ELEVATION-01



2 ELEVATION-02



NO.	DATE	REVISION	BY

NOTES:  
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 \* ALL DIMENSIONS ARE TO BE INDICATED AND NOTED ON THE DRAWING.  
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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA BAWALAKOT.

CLIENT:  
 UNIVERSITY OF POKHRA BAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 A.S. THE ARCHITECTS  
 443 Main, 4th Floor, 4th Street, 4th Block, 4th Phase, 4th Stage, 4th Sector, 4th Zone, 4th City, 4th District, 4th Division, 4th Province, 4th Country.

ORIGINAL CONSULTANT:  
  
**mushtaq and bilal**  
 consulting engineers  
 24, H-8, Block-8, Phase-8, Street-8, Sector-8, Zone-8, City-8, District-8, Division-8, Province-8, Country-8.

TECHNICAL CONSULTANT:  
 K.P. & ASSOCIATES  
 TECHNICAL DRAWING  
 443 Main, 4th Floor, 4th Street, 4th Block, 4th Phase, 4th Stage, 4th Sector, 4th Zone, 4th City, 4th District, 4th Division, 4th Province, 4th Country.

PLANNING CONSULTANT:  
 U.S. CONSULTANTS  
 ENVIRONMENTAL AND URBAN PLANNING CONSULTANTS  
 443 Main, 4th Floor, 4th Street, 4th Block, 4th Phase, 4th Stage, 4th Sector, 4th Zone, 4th City, 4th District, 4th Division, 4th Province, 4th Country.

OLD DRAWING NO:  
 502 A2-001

DESIGN & EXECUTION CONSULTANT:  
**NESPAK (PVT.) LIMITED**

PROJECT TITLE:  
 DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 ELEVATIONS - 01 & 02  
 WORKING DRAWING

DATE BY:  
 \_\_\_\_\_

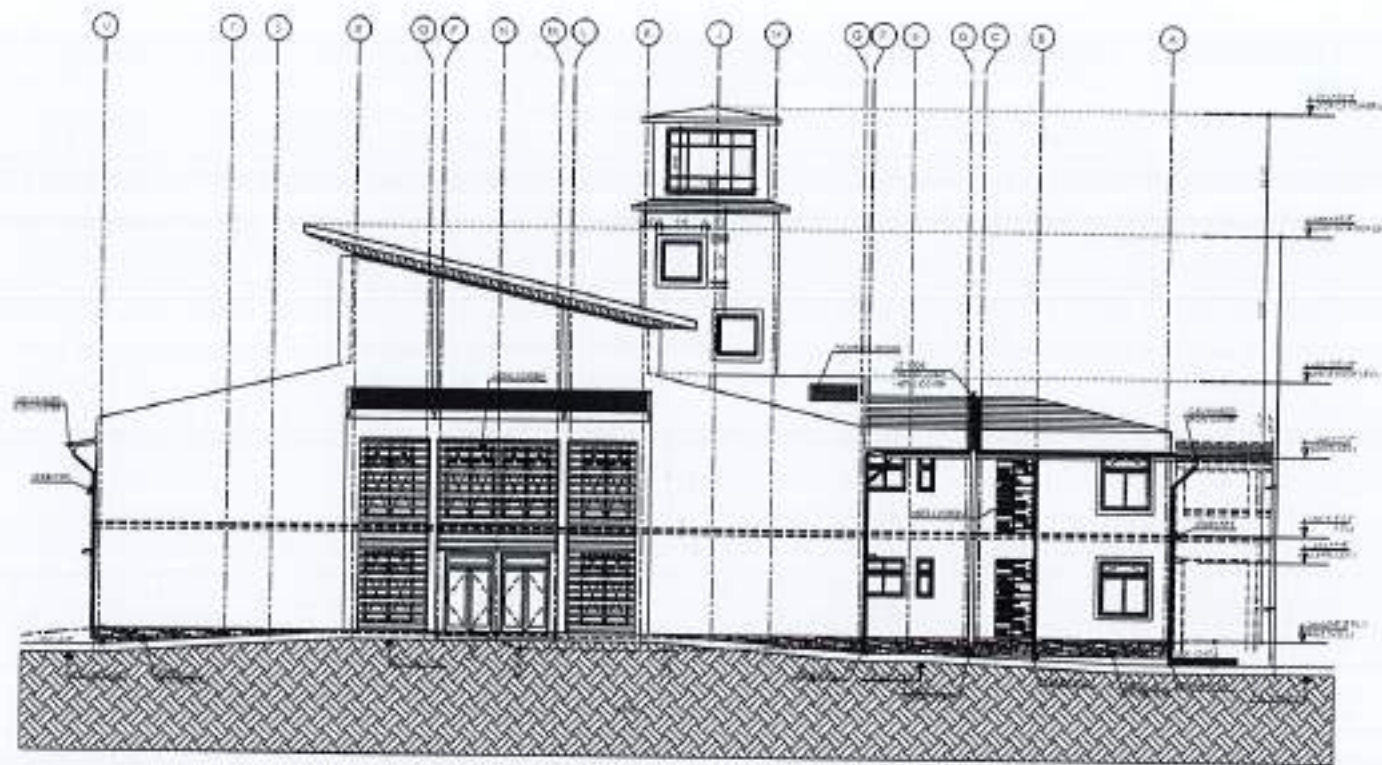
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SCALE:  
 1/4" = 1'-0"

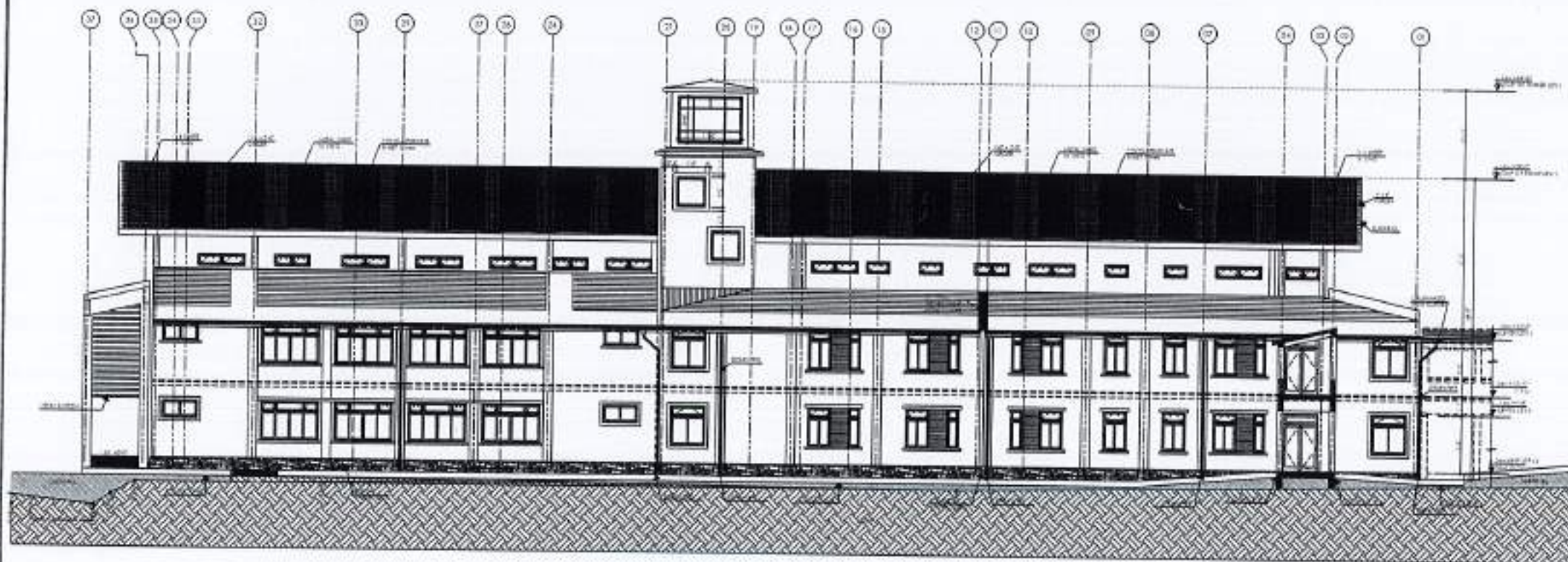
REVISION NO:  
 4753/322/80/03809







1 ELEVATION -03



2 ELEVATION -04



NO.	DATE	REVISION

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- ALL DIMENSIONS ARE TO BE INDICATED AND NOTED ON-SET.
- ANY OCCUPANCY IS TO BE SUBJECT TO BE APPROVED BY THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON-SET.

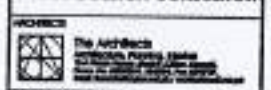
**PROJECT**  
COMPLETION OF LEFTOVER WORK OF CHOFAGALA CAMPUS UNIVERSITY OF PUNJAB, BAWALAKOT.

**CLIENT**  
UNIVERSITY OF PUNJAB BAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**



**ARCHITECTURAL CONSULTANT**  
mushtaq and bilal consulting engineers  
ALL WORK SHALL BE IN ACCORDANCE WITH THE PRACTICE AND STANDARDS OF THE PROFESSION.

**MECHANICAL CONSULTANT**  
K P & ASSOCIATES  
MECHANICAL ENGINEERS  
144 NEW JAMINA ROAD JAMINA - 1000

**PLUMBING CONSULTANT**  
K P & ASSOCIATES  
PLUMBING ENGINEERS  
144 NEW JAMINA ROAD JAMINA - 1000

**ESTIMATION & MANAGEMENT CONSULTANT**  
K P & ASSOCIATES  
ESTIMATION & MANAGEMENT CONSULTANTS  
144 NEW JAMINA ROAD JAMINA - 1000

**DESIGNED BY** 502 **DRAWING NO.** A2-002

**REVIEW & APPROVAL BY**  
NESPAK (PVT.) LIMITED

**FOR PROJECTOR**  
DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

**DRAWING TITLE**  
ELEVATIONS - 03 & 04  
WORKING DRAWING

**DATE:**

**DESIGNER:**

**CHECKED BY:**

**APPROVED BY:**

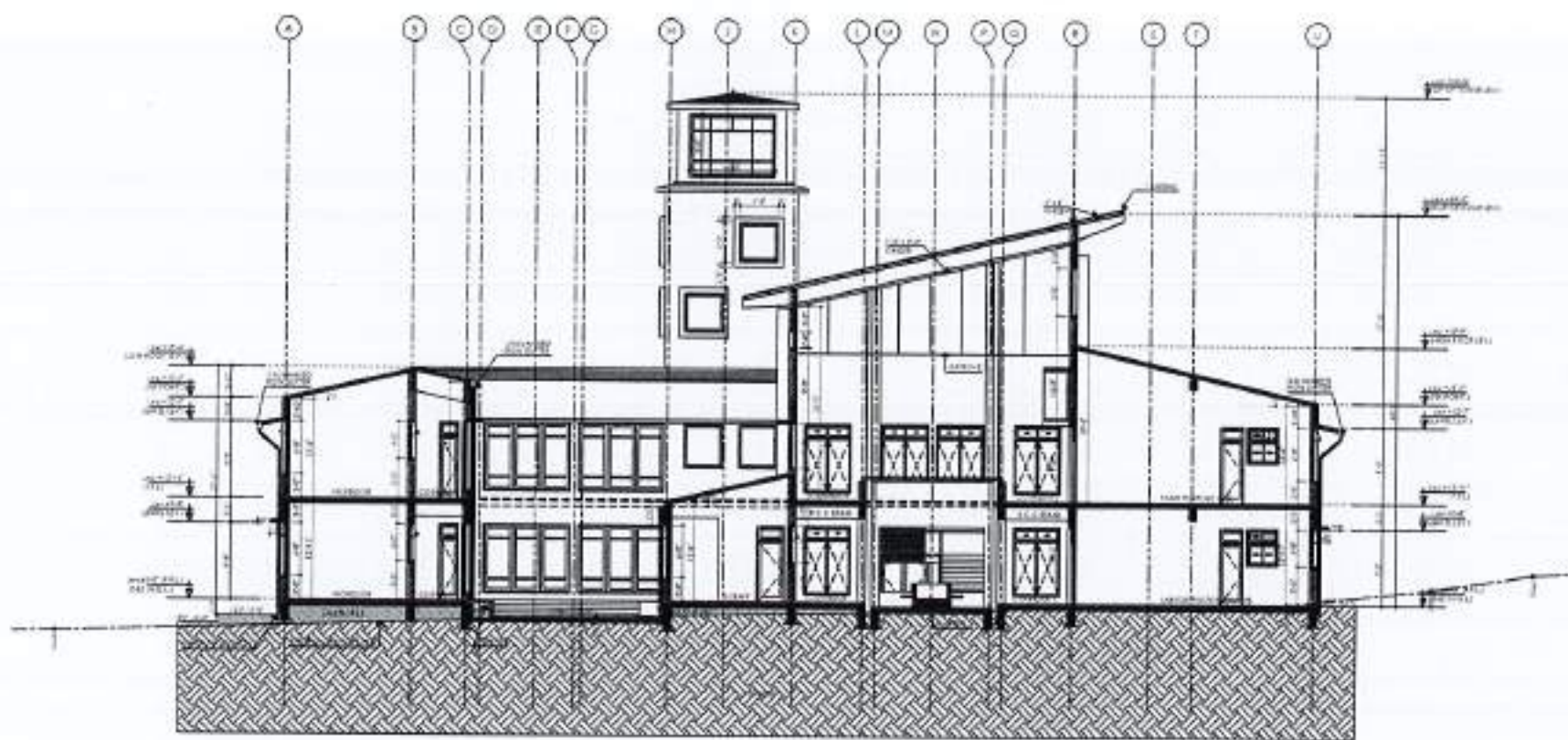
**SCALE** 1/4" = 1'-0" **DATE** APRIL 2024  
**REVISIONS** 4753/322/80/00810



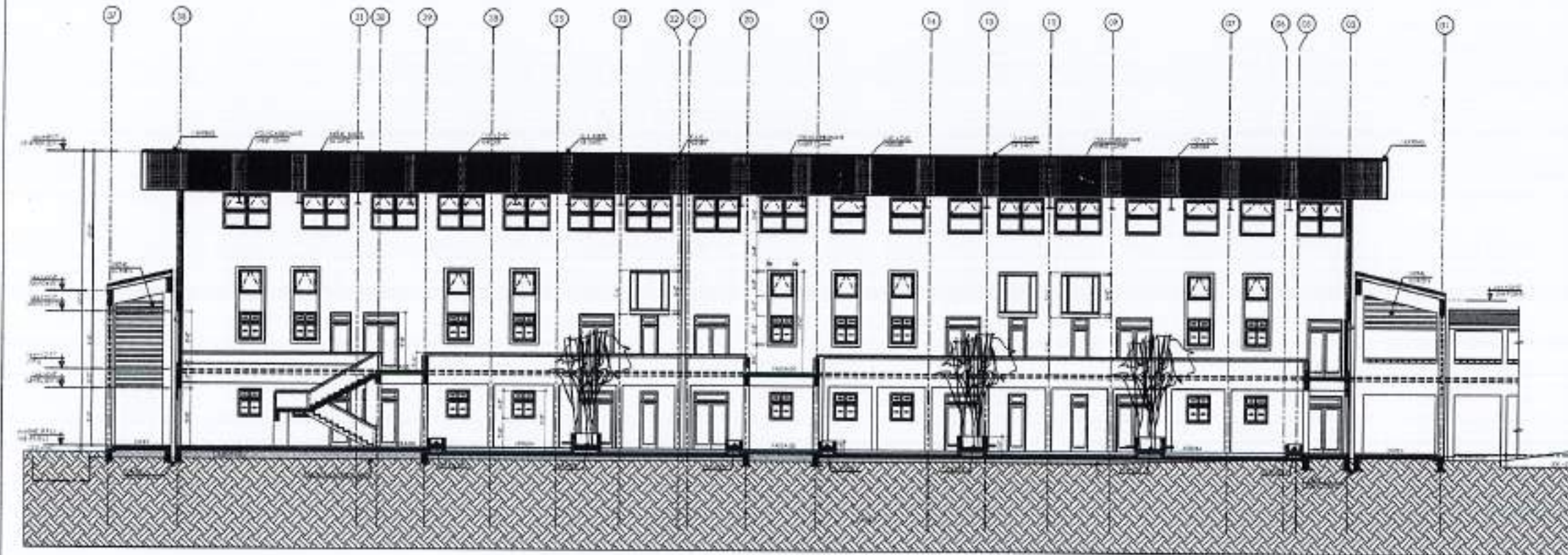








1 SECTION C-C



2 SECTION D-D

SET PLAN

NO.	DATE	REVISION

NOTE:  
 1. THIS DRAWING IS THE SOLE PROPERTY OF THE ARCHITECT. NO PART OR SUBSTANTIAL PORTION OF THIS DRAWING MAY BE REPRODUCED, COPIED, REPRODUCED OR USED IN ANY TECHNICAL OR COMMERCIAL PUBLICATION WITHOUT THE WRITTEN PERMISSION FROM THE ARCHITECT.  
 2. THE DRAWING IS NOT TO BE SCALE ONLY WHEN DIMENSIONS TO BE USED.  
 3. ALL DIMENSIONS ARE TO BE REDUCED AND VERIFIED ON SITE.  
 4. ANY DISCREPANCY IS TO BE REPORTED TO THE ARCHITECT OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POKHRA, RAWALAKOT

NO. OF FLOOR:

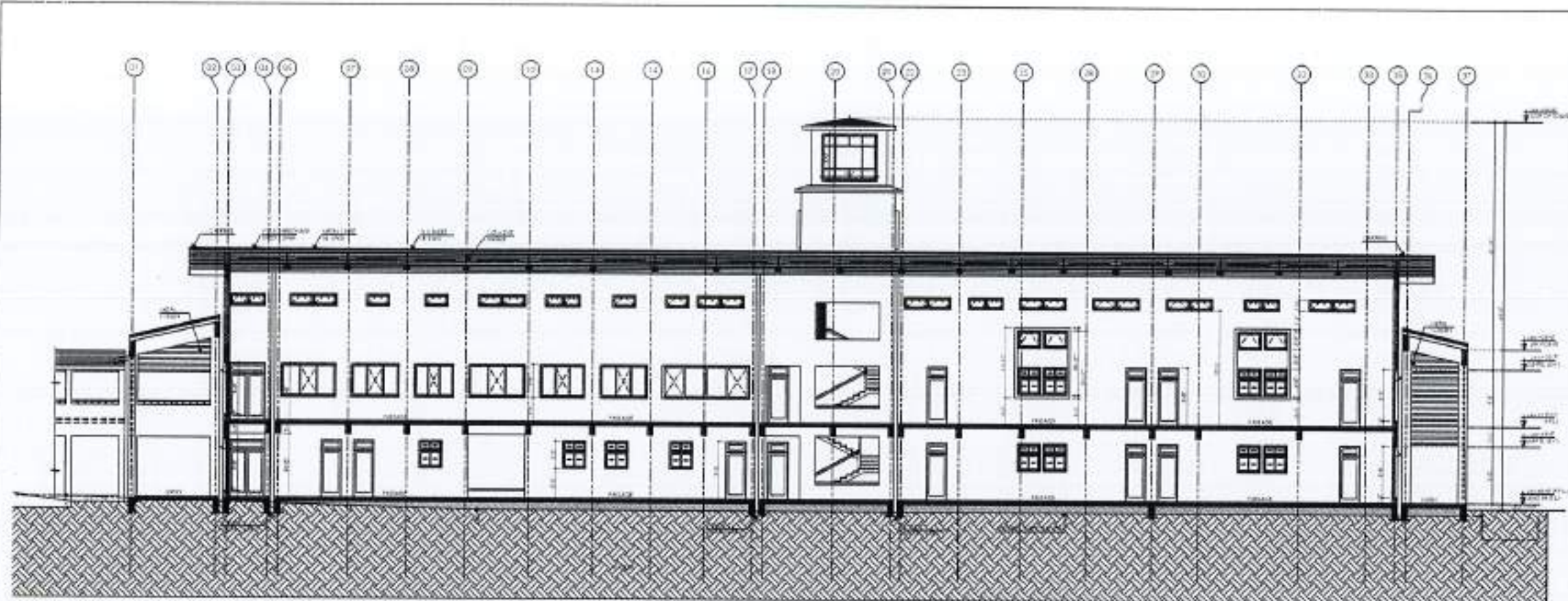
THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 1000-A/1000-B/1000-C/1000-D/1000-E/1000-F/1000-G/1000-H/1000-I/1000-J/1000-K/1000-L/1000-M/1000-N/1000-O/1000-P/1000-Q/1000-R/1000-S/1000-T/1000-U/1000-V/1000-W/1000-X/1000-Y/1000-Z/1000-AA/1000-AB/1000-AC/1000-AD/1000-AE/1000-AF/1000-AG/1000-AH/1000-AI/1000-AJ/1000-AK/1000-AL/1000-AM/1000-AN/1000-AO/1000-AP/1000-AQ/1000-AR/1000-AS/1000-AT/1000-AU/1000-AV/1000-AW/1000-AX/1000-AY/1000-AZ/1000-BA/1000-BB/1000-BC/1000-BD/1000-BE/1000-BF/1000-BG/1000-BH/1000-BI/1000-BJ/1000-BK/1000-BL/1000-BM/1000-BN/1000-BO/1000-BP/1000-BQ/1000-BR/1000-BS/1000-BT/1000-BU/1000-BV/1000-BW/1000-BX/1000-BY/1000-BZ/1000-CA/1000-CB/1000-CC/1000-CD/1000-CE/1000-CF/1000-CG/1000-CH/1000-CI/1000-CJ/1000-CK/1000-CL/1000-CM/1000-CN/1000-CO/1000-CP/1000-CQ/1000-CR/1000-CS/1000-CT/1000-CU/1000-CV/1000-CW/1000-CX/1000-CY/1000-CZ/1000-DA/1000-DB/1000-DC/1000-DD/1000-DE/1000-DF/1000-DG/1000-DH/1000-DI/1000-DJ/1000-DK/1000-DM/1000-DN/1000-DO/1000-DP/1000-DQ/1000-DR/1000-DS/1000-DT/1000-DU/1000-DV/1000-DW/1000-DX/1000-DY/1000-DZ/1000-EA/1000-EB/1000-EC/1000-ED/1000-EE/1000-EF/1000-EG/1000-EH/1000-EI/1000-EJ/1000-EK/1000-EL/1000-EM/1000-EN/1000-EO/1000-EP/1000-EQ/1000-ER/1000-ES/1000-ET/1000-EU/1000-EV/1000-EW/1000-EX/1000-EY/1000-EZ/1000-FA/1000-FB/1000-FC/1000-FD/1000-FE/1000-FG/1000-FH/1000-FI/1000-FJ/1000-FK/1000-FL/1000-FM/1000-FN/1000-FO/1000-FP/1000-FQ/1000-FR/1000-FS/1000-FT/1000-FU/1000-FV/1000-FW/1000-FX/1000-FY/1000-FZ/1000-GA/1000-GB/1000-GC/1000-GD/1000-GE/1000-GF/1000-GG/1000-GH/1000-GI/1000-GJ/1000-GK/1000-GL/1000-GM/1000-GN/1000-GO/1000-GP/1000-GQ/1000-GR/1000-GS/1000-GT/1000-GU/1000-GV/1000-GW/1000-GX/1000-GY/1000-GZ/1000-HA/1000-HB/1000-HC/1000-HD/1000-HE/1000-HF/1000-HG/1000-HH/1000-HI/1000-HJ/1000-HK/1000-HL/1000-HM/1000-HN/1000-HO/1000-HP/1000-HQ/1000-HR/1000-HS/1000-HT/1000-HU/1000-HV/1000-HW/1000-HX/1000-HY/1000-HZ/1000-IA/1000-IB/1000-IC/1000-ID/1000-IE/1000-IF/1000-IG/1000-IH/1000-II/1000-IJ/1000-IK/1000-IL/1000-IM/1000-IN/1000-IO/1000-IP/1000-IQ/1000-IR/1000-IS/1000-IT/1000-IU/1000-IV/1000-IW/1000-IX/1000-IY/1000-IZ/1000-JA/1000-JB/1000-JC/1000-JD/1000-JE/1000-JF/1000-JG/1000-JH/1000-JI/1000-JJ/1000-JK/1000-JL/1000-JM/1000-JN/1000-JO/1000-JP/1000-JQ/1000-JR/1000-JS/1000-JT/1000-JU/1000-JV/1000-JW/1000-JX/1000-JY/1000-JZ/1000-KA/1000-KB/1000-KC/1000-KD/1000-KE/1000-KF/1000-KG/1000-KH/1000-KI/1000-KJ/1000-KK/1000-KL/1000-KM/1000-KN/1000-KO/1000-KP/1000-KQ/1000-KR/1000-KS/1000-KT/1000-KU/1000-KV/1000-KW/1000-KX/1000-KY/1000-KZ/1000-LA/1000-LB/1000-LC/1000-LD/1000-LE/1000-LF/1000-LG/1000-LH/1000-LI/1000-LJ/1000-LK/1000-LL/1000-LM/1000-LN/1000-LO/1000-LP/1000-LQ/1000-LR/1000-LS/1000-LT/1000-LU/1000-LV/1000-LW/1000-LX/1000-LY/1000-LZ/1000-MA/1000-MB/1000-MC/1000-MD/1000-ME/1000-MF/1000-MG/1000-MH/1000-MI/1000-MJ/1000-MK/1000-ML/1000-MN/1000-MO/1000-MP/1000-MQ/1000-MR/1000-MS/1000-MT/1000-MU/1000-MV/1000-MW/1000-MX/1000-MY/1000-MZ/1000-NA/1000-NB/1000-NC/1000-ND/1000-NE/1000-NF/1000-NG/1000-NH/1000-NI/1000-NJ/1000-NK/1000-NL/1000-NM/1000-NO/1000-NP/1000-NQ/1000-NR/1000-NS/1000-NT/1000-NU/1000-NV/1000-NW/1000-NX/1000-NY/1000-NZ/1000-OA/1000-OB/1000-OC/1000-OD/1000-OE/1000-OF/1000-OG/1000-OH/1000-OI/1000-OJ/1000-OK/1000-OL/1000-OM/1000-ON/1000-OO/1000-OP/1000-OQ/1000-OR/1000-OS/1000-OT/1000-OU/1000-OV/1000-OW/1000-OX/1000-OY/1000-OZ/1000-PA/1000-PB/1000-PC/1000-PD/1000-PE/1000-PF/1000-PG/1000-PH/1000-PI/1000-PJ/1000-PK/1000-PL/1000-PM/1000-PN/1000-PO/1000-PP/1000-PQ/1000-PR/1000-PS/1000-PT/1000-PU/1000-PV/1000-PW/1000-PX/1000-PY/1000-PZ/1000-QA/1000-QB/1000-QC/1000-QD/1000-QE/1000-QF/1000-QG/1000-QH/1000-QI/1000-QJ/1000-QK/1000-QL/1000-QM/1000-QN/1000-QO/1000-QP/1000-QL/1000-QM/1000-QN/1000-QO/1000-QP/1000-QR/1000-QS/1000-QU/1000-QV/1000-QW/1000-QX/1000-QY/1000-QZ/1000-RA/1000-RB/1000-RC/1000-RD/1000-RE/1000-RF/1000-RG/1000-RH/1000-RI/1000-RJ/1000-RK/1000-RL/1000-RM/1000-RN/1000-RO/1000-RP/1000-RQ/1000-RR/1000-RS/1000-RT/1000-RU/1000-RV/1000-RW/1000-RX/1000-RY/1000-RZ/1000-SA/1000-SB/1000-SC/1000-SD/1000-SE/1000-SF/1000-SG/1000-SH/1000-SI/1000-SJ/1000-SK/1000-SL/1000-SM/1000-SN/1000-SO/1000-SP/1000-SQ/1000-SR/1000-SS/1000-ST/1000-SU/1000-SV/1000-SW/1000-SX/1000-SY/1000-SZ/1000-TA/1000-TB/1000-TC/1000-TD/1000-TE/1000-TF/1000-TG/1000-TH/1000-TI/1000-TJ/1000-TK/1000-TL/1000-TM/1000-TN/1000-TO/1000-TP/1000-TQ/1000-TR/1000-TS/1000-TU/1000-TV/1000-TW/1000-TX/1000-TY/1000-TZ/1000-UA/1000-UB/1000-UC/1000-UD/1000-UE/1000-UF/1000-UG/1000-UH/1000-UI/1000-UJ/1000-UK/1000-UL/1000-UM/1000-UN/1000-UO/1000-UP/1000-UQ/1000-UR/1000-US/1000-UT/1000-UV/1000-UW/1000-UX/1000-UY/1000-UZ/1000-VA/1000-VB/1000-VC/1000-VD/1000-VE/1000-VF/1000-VG/1000-VH/1000-VI/1000-VJ/1000-VK/1000-VL/1000-VM/1000-VN/1000-VO/1000-VP/1000-VQ/1000-VR/1000-VS/1000-VT/1000-VU/1000-VV/1000-VW/1000-VX/1000-VY/1000-VZ/1000-WA/1000-WB/1000-WC/1000-WD/1000-WE/1000-WF/1000-WG/1000-WH/1000-WI/1000-WJ/1000-WK/1000-WL/1000-WM/1000-WN/1000-WO/1000-WP/1000-WQ/1000-WR/1000-WS/1000-WT/1000-WU/1000-WV/1000-WW/1000-WX/1000-WY/1000-WZ/1000-XA/1000-XB/1000-XC/1000-XD/1000-XE/1000-XF/1000-XG/1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1 SECTION E-E



REV.	DATE	REASON	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECTS  
 The Architects  
 MUSHTAQ AND BILAL CONSULTING ENGINEERS  
 241 HODDER HOUSE, BANGALORE ROAD, COMMERCE TOWER, 100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000

mushtaq and bilal consulting engineers  
 241 HODDER HOUSE, BANGALORE ROAD, COMMERCE TOWER, 100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000

ELECTRICAL CONSULTANTS  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 3-48 Block, Chakera Industrial Estate, F-7/2

PLANNING CONSULTANTS  
 P.A. Associates  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 P.A. Associates

OLD DRAWING NO:  
 502

DRAWING NO:  
 A3-003

REVIEW & SUPERVISION CONSULTANT  
 NESPAK (PVT.) LIMITED

SUBJECT TITLE  
 DEPARTMENT OF AGRICULTURE  
 AGROHONY & SOIL SCIENCES

DRAWING TITLE  
 SECTION E-E  
 WORKING DRAWING

DATE:  
 28/04/2024

DESIGN BY:  
 \_\_\_\_\_

CHECKED BY:  
 \_\_\_\_\_

SCALE:  
 1/8" = 1'-0"



REVISED BY:  
 \_\_\_\_\_

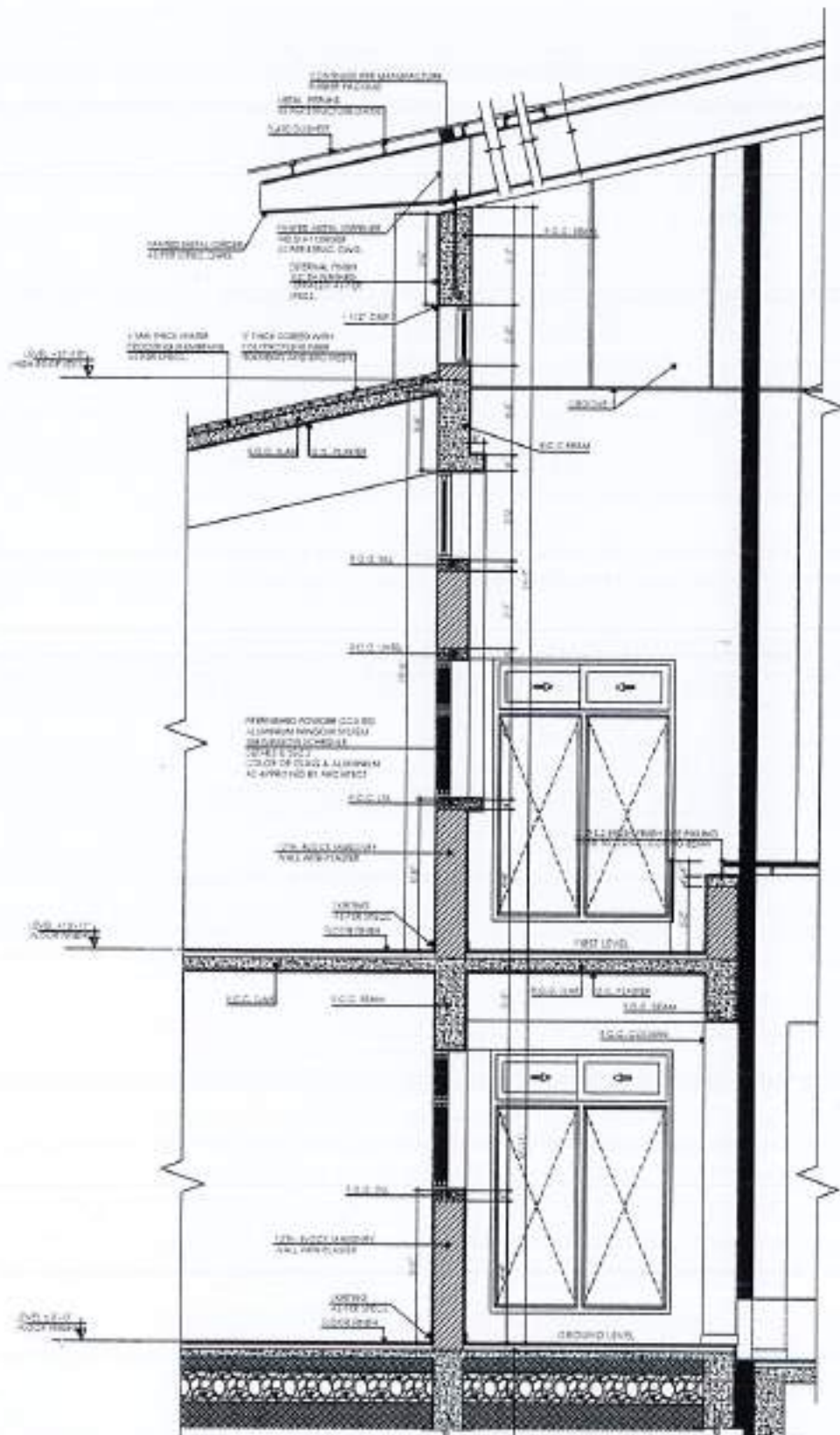
DATE:  
 APR 2024

4753/322/BO/03813



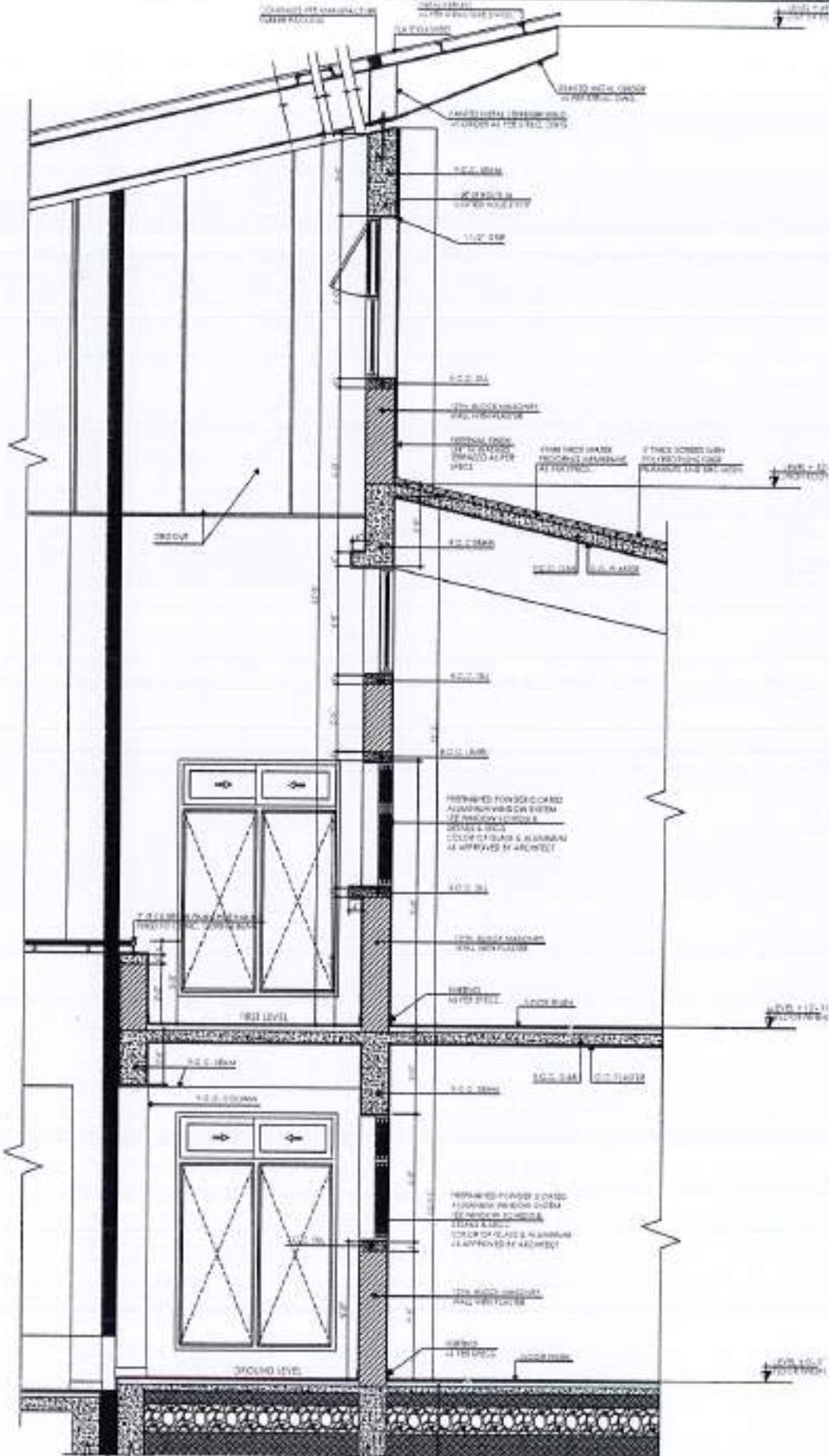






01 TYPICAL WALL SECTION - 4 - 4  
PASSAGE/ATRIUM

1. 4" IN PLACE CONCRETE PER SPACE  
2. 2" IN PLACE CONCRETE PER SPACE  
3. 4" IN PLACE CONCRETE PER SPACE  
4. 2" IN PLACE CONCRETE PER SPACE  
5. 4" IN PLACE CONCRETE PER SPACE  
6. 2" IN PLACE CONCRETE PER SPACE  
7. 4" IN PLACE CONCRETE PER SPACE  
8. 2" IN PLACE CONCRETE PER SPACE  
9. 4" IN PLACE CONCRETE PER SPACE  
10. 2" IN PLACE CONCRETE PER SPACE



02 TYPICAL WALL SECTION - 5 - 5  
PASSAGE/ATRIUM

1. 4" IN PLACE CONCRETE PER SPACE  
2. 2" IN PLACE CONCRETE PER SPACE  
3. 4" IN PLACE CONCRETE PER SPACE  
4. 2" IN PLACE CONCRETE PER SPACE  
5. 4" IN PLACE CONCRETE PER SPACE  
6. 2" IN PLACE CONCRETE PER SPACE  
7. 4" IN PLACE CONCRETE PER SPACE  
8. 2" IN PLACE CONCRETE PER SPACE  
9. 4" IN PLACE CONCRETE PER SPACE  
10. 2" IN PLACE CONCRETE PER SPACE



NO.	DATE	REVISION	REASON

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PROJECT  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAWALAKOT.

CLIENT  
UNIVERSITY OF POKHRA, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT  
The Architects  
Mushtaq and Bilal  
Consulting Engineers  
14-B, Block 8, G-8/2, Islamabad

STRUCTURAL CONSULTANT  
mushtaq and bilal consulting engineers  
204, H-8, Block 8, G-8/2, Islamabad

ELECTRICAL CONSULTANT  
K.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
14-B, Block 8, G-8/2, Islamabad

MECHANICAL CONSULTANT  
K.P. & ASSOCIATES  
MECHANICAL ENGINEERS  
14-B, Block 8, G-8/2, Islamabad

JOB NO. 502  
DESIGNATION A3-005

CLIENT & APPROVED CONSULTANT  
NESPAC (PVT.) LIMITED

PROJECT TITLE  
DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING TITLE  
WALL SECTIONS 4-4 & 5-5 WORKING DRAWING

SCALE  
1/4" = 1'-0"

DATE  
APRIL 2004

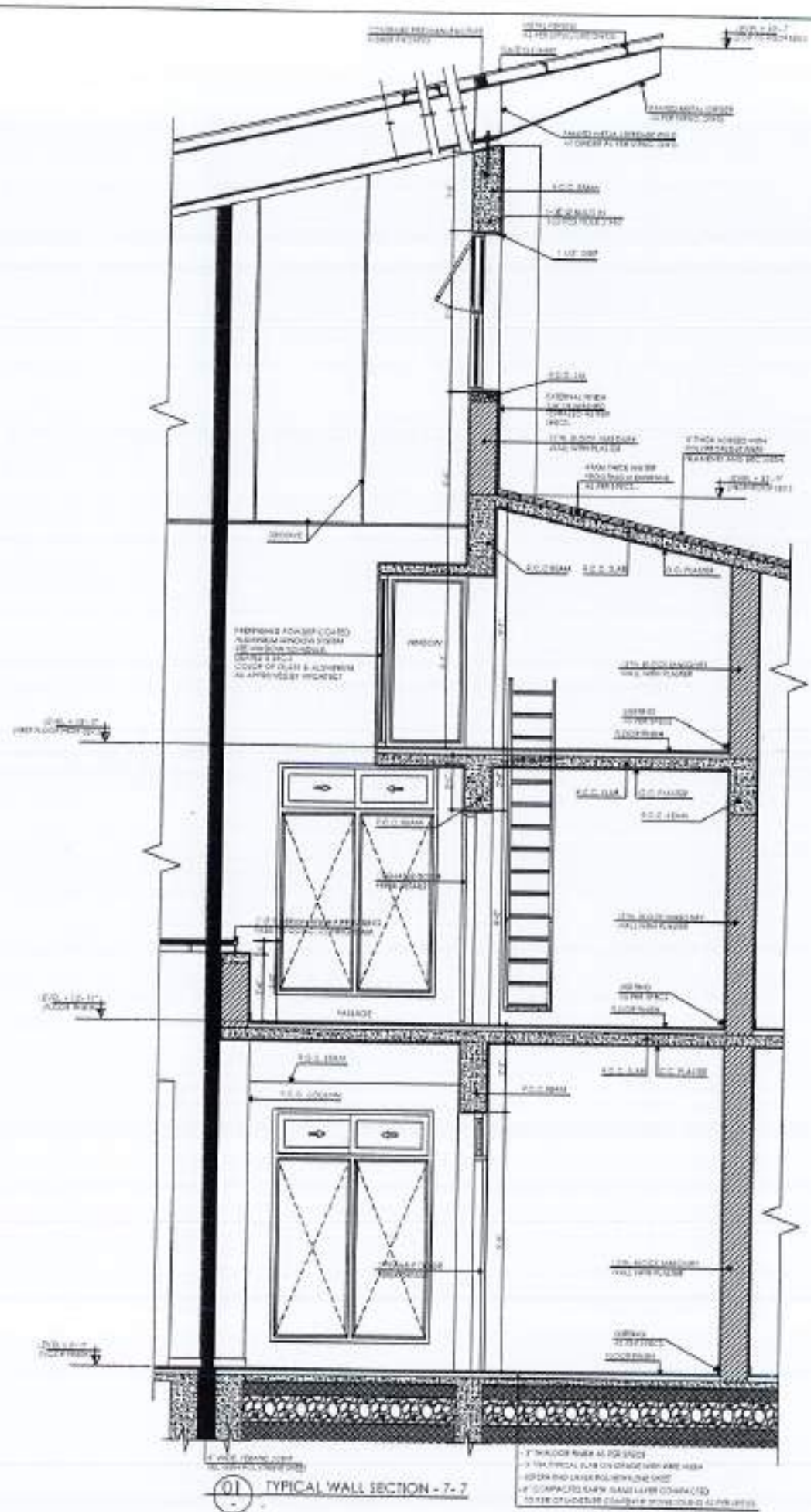
DESIGNED BY  
4753/322/80/03815





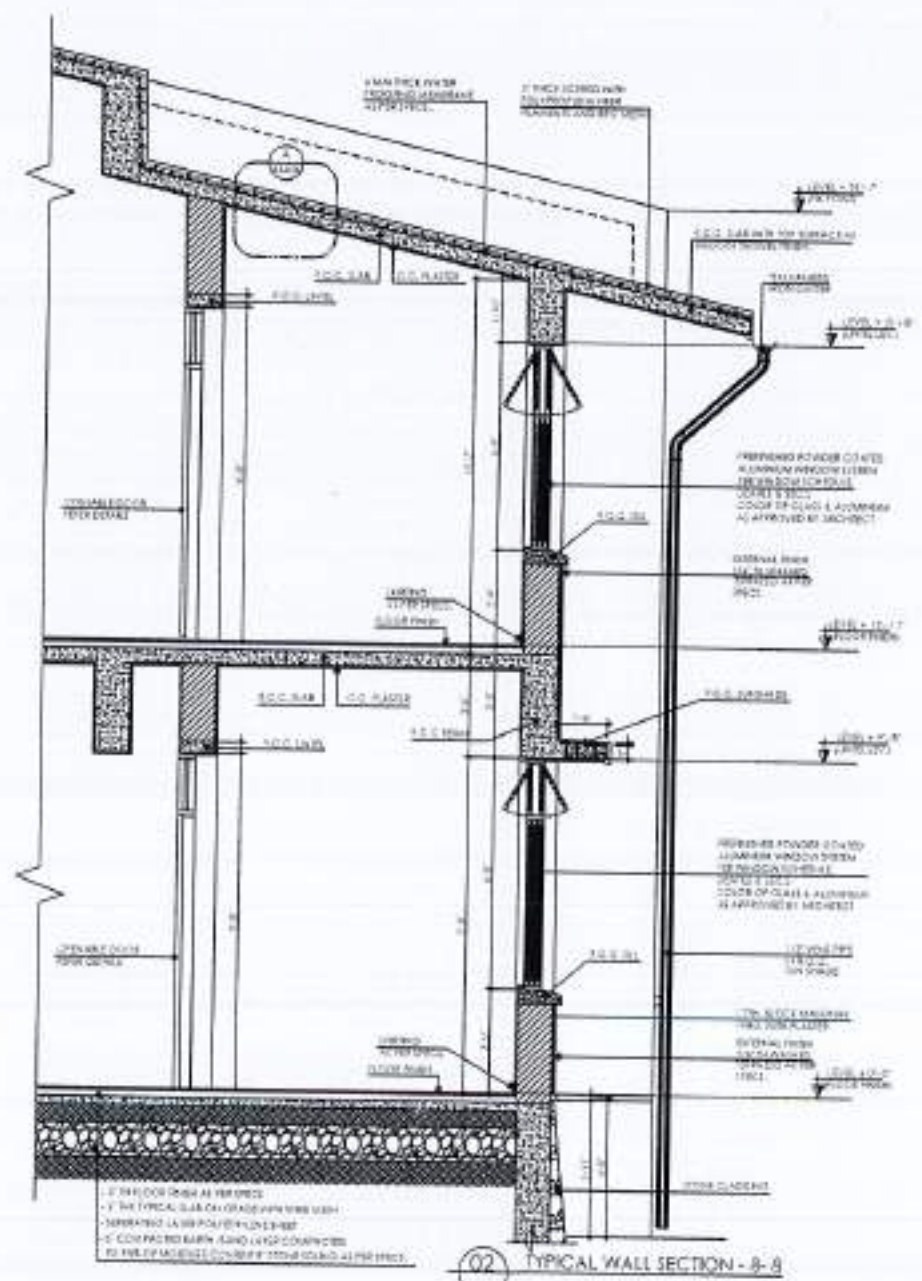






01 TYPICAL WALL SECTION - 7-7

1. 1.5" THICK BRICK AT PER SPEC.  
 2. 1.5" TYPICAL SLAB ON GRADE WITH 4% SLOPE  
 3. 1.5" TYPICAL SLAB ON GRADE WITH 4% SLOPE  
 4. 1.5" COMPACTED SAND SAND LAYER CONNECTED  
 TO THE EXISTING CONCRETE FOUNDATION AT PER SPEC.



02 TYPICAL WALL SECTION - 8-8

1. 1.5" THICK BRICK AT PER SPEC.  
 2. 1.5" TYPICAL SLAB ON GRADE WITH 4% SLOPE  
 3. 1.5" TYPICAL SLAB ON GRADE WITH 4% SLOPE  
 4. 1.5" COMPACTED SAND SAND LAYER CONNECTED  
 TO THE EXISTING CONCRETE FOUNDATION AT PER SPEC.



NO.	DATE	REVISION	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAJWALAKOT.

CLIENT:  
 UNIVERSITY OF POONCH, RAJWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architect: **MUSHTAG AND BILAL CONSULTING ENGINEERS**  
 10-A, HOSEA ROAD, KARACHI-75200, PAKISTAN

STRUCTURAL CONSULTANT:  
**MUSHTAG AND BILAL CONSULTING ENGINEERS**  
 10-A, HOSEA ROAD, KARACHI-75200, PAKISTAN

ELECTRICAL CONSULTANT:  
**K.P. & ASSOCIATES ELECTRICAL ENGINEERS**  
 14-B, QURAN ROAD, KARACHI-75200, PAKISTAN

MECHANICAL CONSULTANT:  
**MUSHTAG AND BILAL CONSULTING ENGINEERS**  
 10-A, HOSEA ROAD, KARACHI-75200, PAKISTAN

DATE: 5/2/2017  
 DRAWING NO: 502 A3-007

DESIGN & SUPERVISION CONSULTANT:  
**NESPAK (PVT.) LIMITED**

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 WALL SECTIONS 7-7 & 8-8 WORKING DRAWING

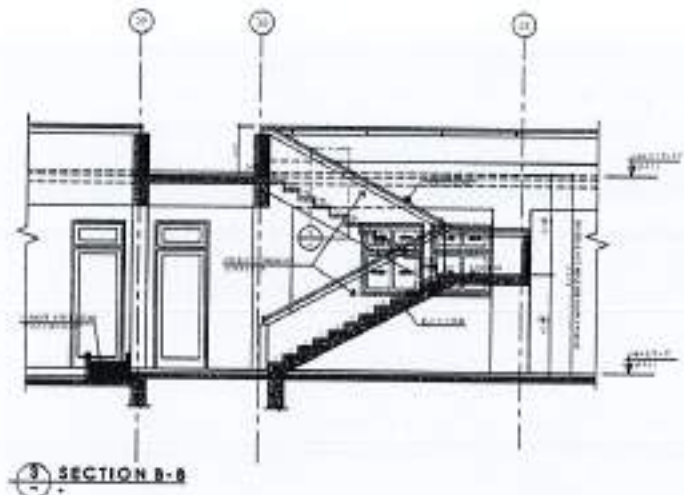
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 DATE: APRIL 2017  
 SHEET NO: 4753/322/80/03817



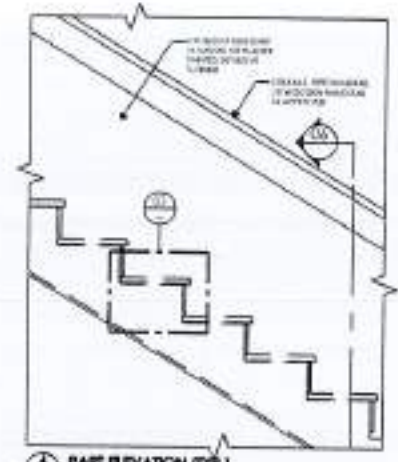








SECTION B-B



PART ELEVATION (TYP.)  
SCALE 1/4" = 1'-0"

Stair For Ground Floor, to 1st Floor  
24 Nos. of Riser in 12'-11" Height  
From Lev. ± 0'-0" To Lev. + 12'-11"  
(Each Riser 4.45")

NOTES



NO.	DATE	REVISION	BY

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PROJECT  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA, BAKHALKOT.

CLIENT  
UNIVERSITY OF POKHARA, BAKHALKOT

WORK POINT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT  
The Architects  
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Services Pvt. Ltd. (Punjab)  
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consulting engineers  
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ELECTRICAL CONSULTANT  
C.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
4-A, Road, Durrani Market, Lahore - 54000

PLUMBING CONSULTANT  
S.P. Associates  
10, Bahawalpur Road, Lahore - 54000

CONTRACT NO.  
502

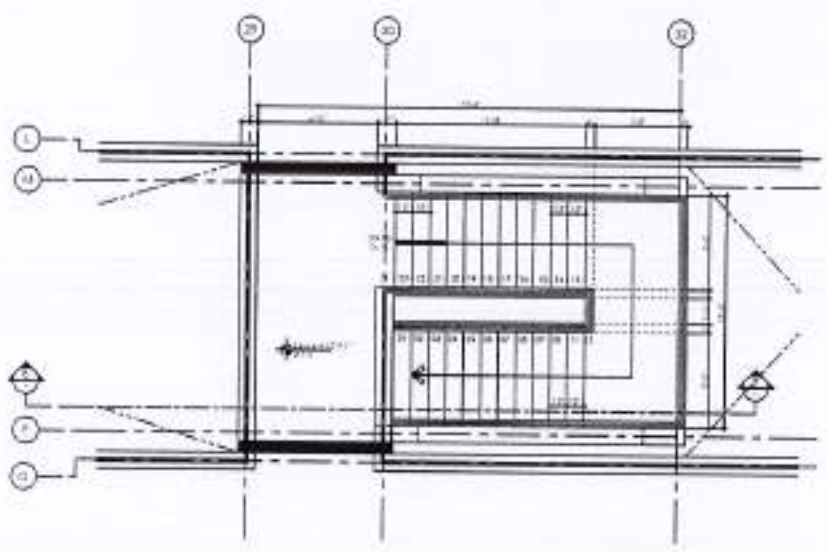
DRAWING NO.  
A4-002

DESIGN & SUPERVISION CONSULTANT  
NESPAK (PVT.) LIMITED  
DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

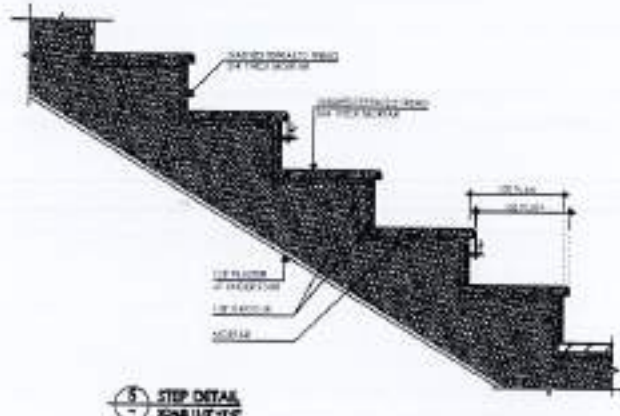
DRAWING TITLE  
STAIR - B  
PLAN, SECTION & DETAILS  
WORKING DRAWING

DATE: \_\_\_\_\_  
DESIGNED BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_

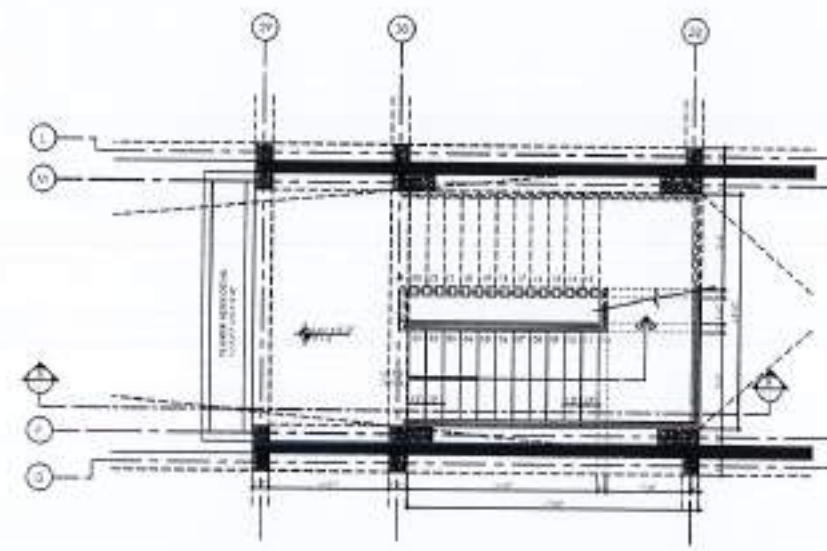
SCALE: 1/4" = 1'-0" DATE: APR 2024  
PROJECT NO.: 4753/322/80/03819



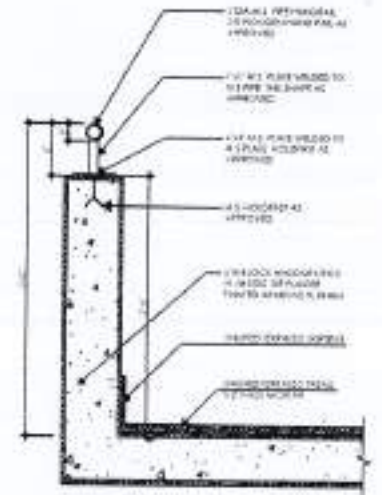
FIRST FLOOR LEVEL



STEP DETAIL  
SCALE 1/4" = 1'-0"



GROUND FLOOR LEVEL



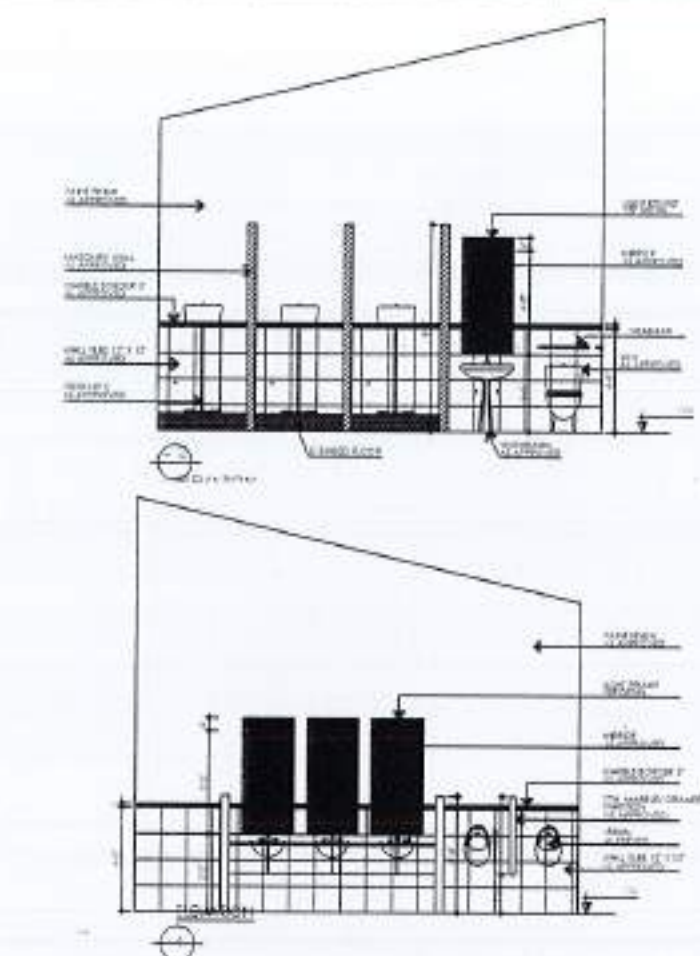
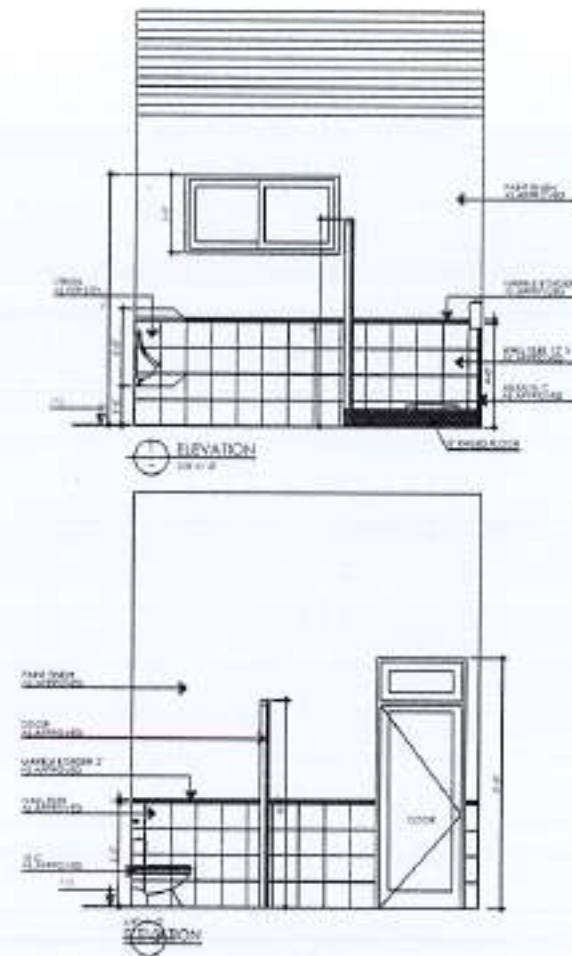
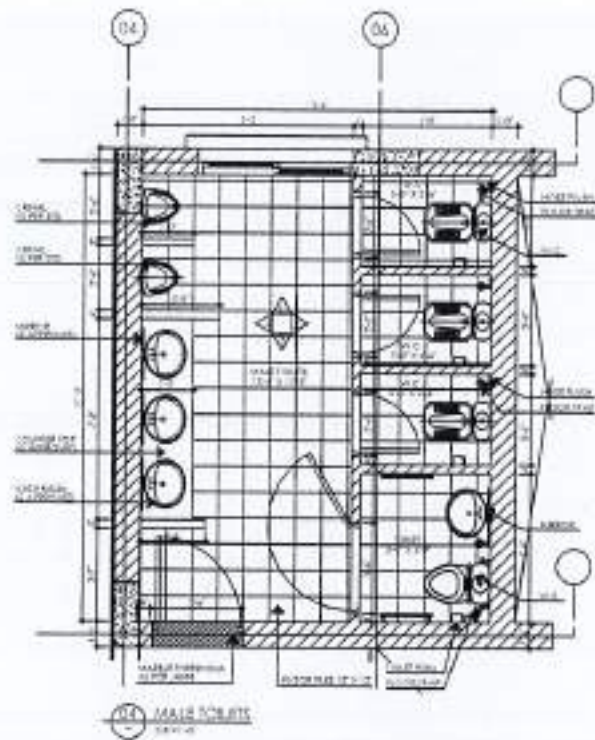
HANDRAIL DETAIL  
SCALE 1/4" = 1'-0"











04 PLAN

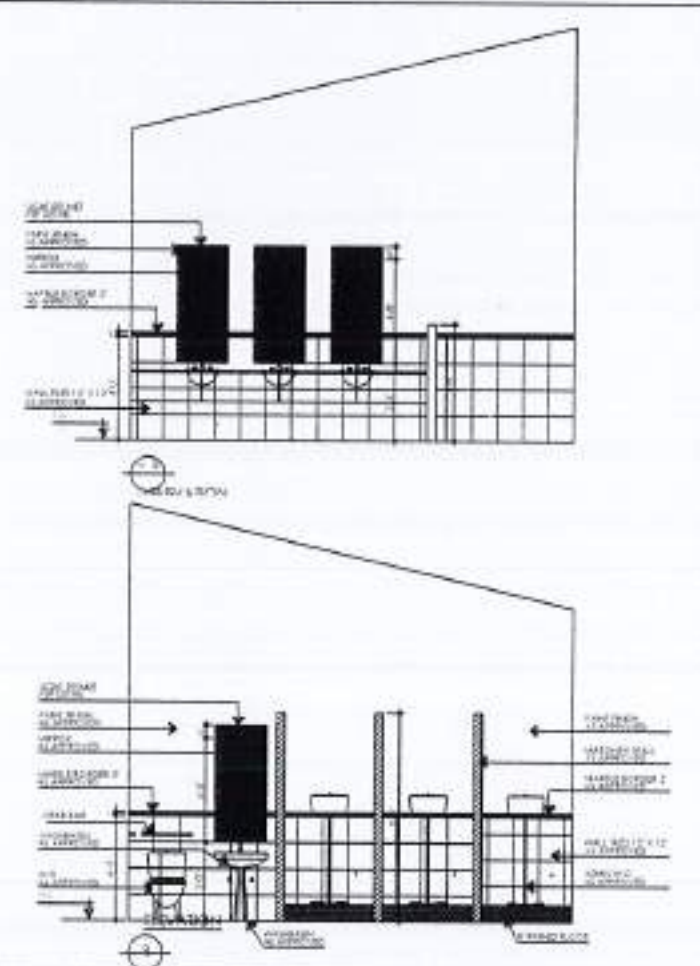
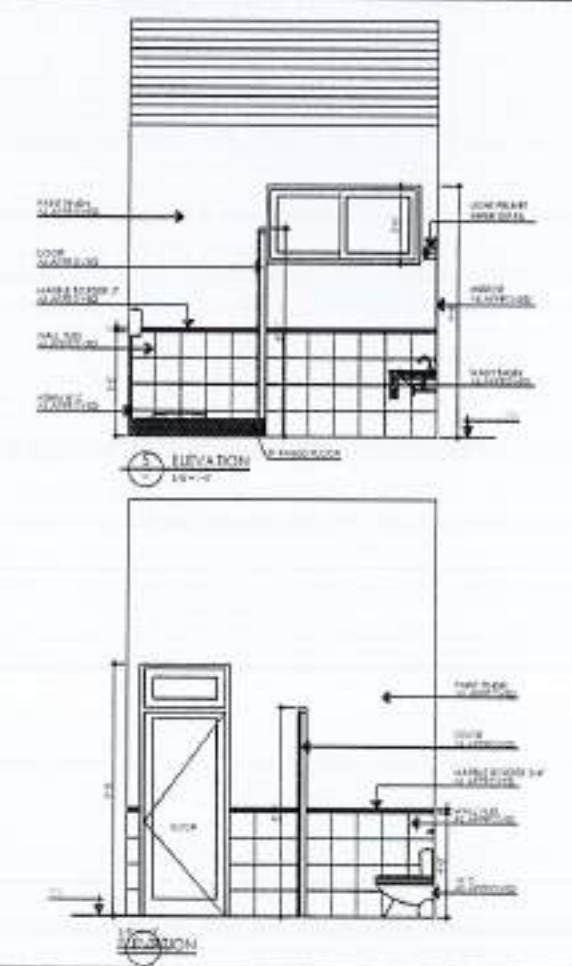
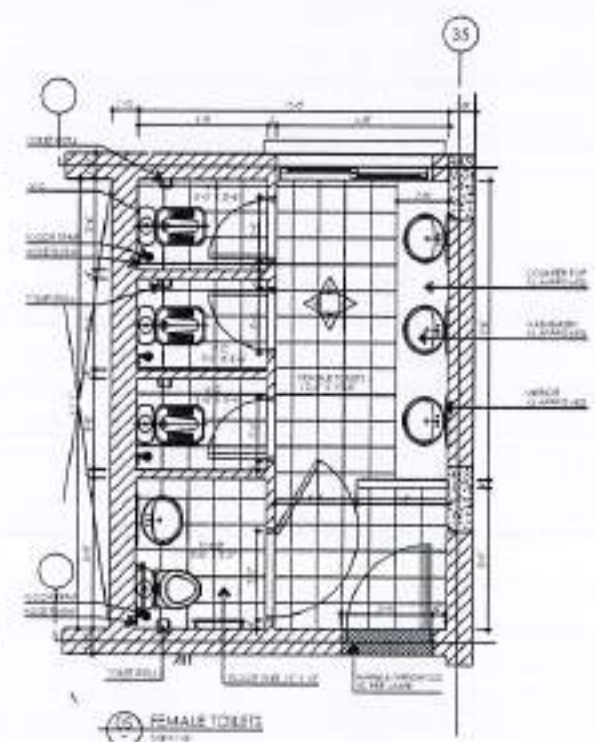
REV	DATE	BY	CHKD

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POONCH, RAWALAKOT

WORK POINT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT

STRUCTURAL CONSULTANT

**mushtaq and bilal**  
 consulting engineers

204, HUDA ROAD, BANGALORE, KARNATAKA, INDIA  
 TEL: 080-4561 4561, 080-4561 4562, 080-4561 4563, 080-4561 4564, 080-4561 4565, 080-4561 4566, 080-4561 4567, 080-4561 4568, 080-4561 4569, 080-4561 4570, 080-4561 4571, 080-4561 4572, 080-4561 4573, 080-4561 4574, 080-4561 4575, 080-4561 4576, 080-4561 4577, 080-4561 4578, 080-4561 4579, 080-4561 4580, 080-4561 4581, 080-4561 4582, 080-4561 4583, 080-4561 4584, 080-4561 4585, 080-4561 4586, 080-4561 4587, 080-4561 4588, 080-4561 4589, 080-4561 4590, 080-4561 4591, 080-4561 4592, 080-4561 4593, 080-4561 4594, 080-4561 4595, 080-4561 4596, 080-4561 4597, 080-4561 4598, 080-4561 4599, 080-4561 4600

ELECTRICAL CONSULTANT

**K.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS

14-B, ROSE, GARDEN, HOUSING SOCIETY, 1000

PLUMBING CONSULTANT

ENVIRONMENTAL & MECHANICAL CONSULTANTS

ENVIRONMENTAL & MECHANICAL CONSULTANTS

DATE DRAWING SET

JOB NO. 502

DESIGN NO. A5-002

OWNER & SUPERVISOR CONSULTANT

**NESPAK (PVT.) LIMITED**

SUB-PROJECT FILE

DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING FILE

TOILET LAYOUTS & ELEVATIONS  
 FIRST FLOOR  
 WORKING DRAWING

DATE: 08/24/2024

DRAWN BY: [Name]

CHECKED BY: [Name]

APPROVED BY: [Name]

SCALE: 1/4" = 1'-0"

DATE: 08/24/2024

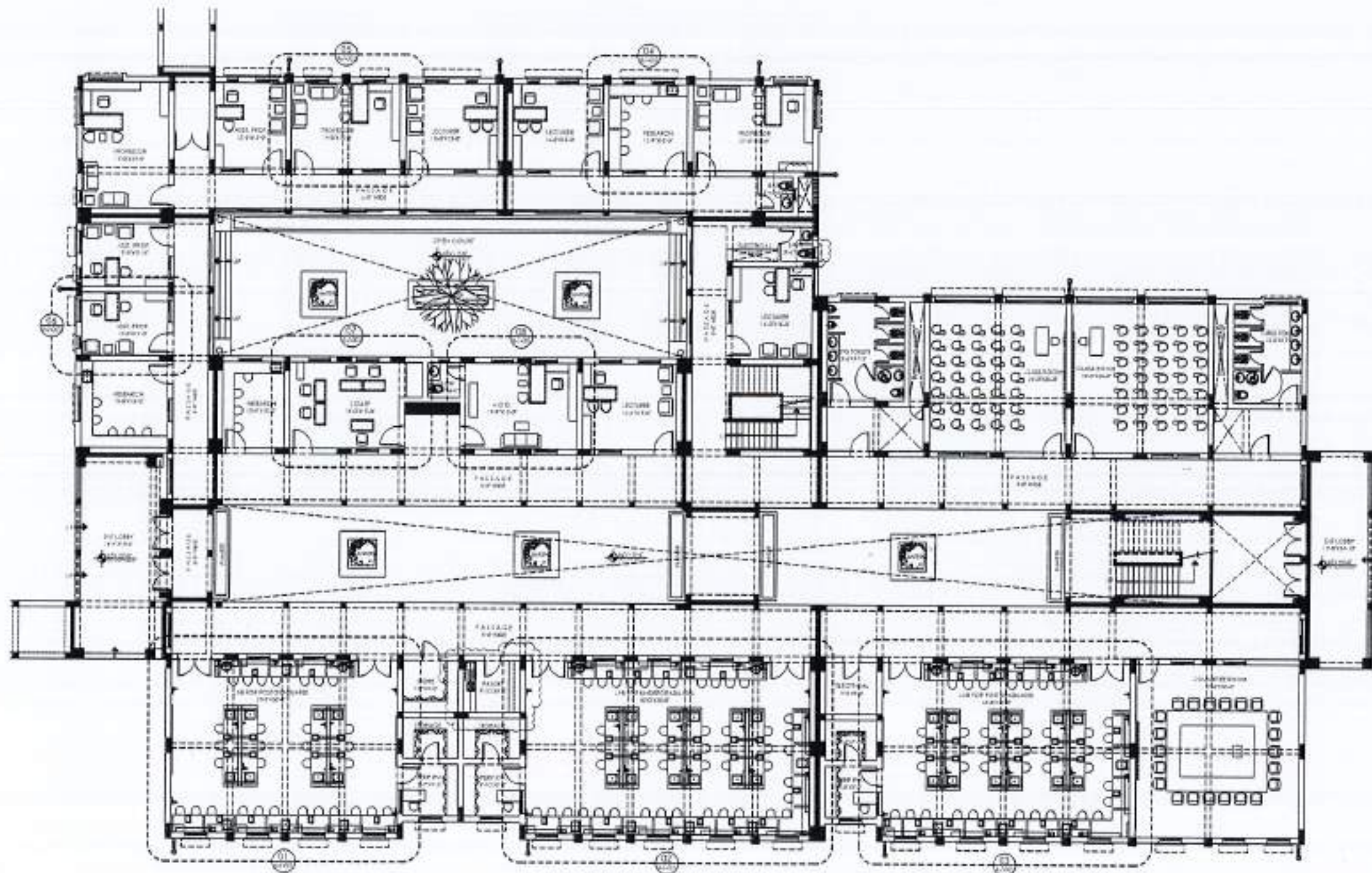
NO. DRAWING SET: 4753/322/BD/C3821











1 GROUND FLOOR PLAN  
WORKING DRAWING



REV. NO.	DATE	ISSUE	REVISION

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAJWALAKOT.

CLIENT:  
 UNIVERSITY OF POONCH, RAJWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECTS  
 MUSHTAQ AND BIALI CONSULTING ENGINEERS  
 24-A HOUSING SOCIETY, WAZIR PURA, LAHORE-75200  
 TEL: (042) 461-8222-461-8223 FAX: (042) 461-8224  
 WWW.MUSHTAQANDBIALI.COM

STRUCTURAL CONSULTANT:  
 mushtaq and biall consulting engineers  
 24-A HOUSING SOCIETY, WAZIR PURA, LAHORE-75200  
 TEL: (042) 461-8222-461-8223 FAX: (042) 461-8224  
 WWW.MUSHTAQANDBIALI.COM

ELECTRICAL CONSULTANT:  
 CP & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 4-BLOCK, GARDEN ROAD, JAMSHEDPUR - 761001

PLUMBING CONSULTANT:  
 CP & ASSOCIATES  
 PLUMBING ENGINEERS  
 4-BLOCK, GARDEN ROAD, JAMSHEDPUR - 761001

JOB NO. DRAWING NO.  
 502 A6-001

REVIEW & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUB PROJECT TITLE:  
 DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 GROUND FLOOR FURNITURE LAYOUT PLAN WORKING DRAWING

DRAWN BY:  
 ANAM

DESIGNED BY:

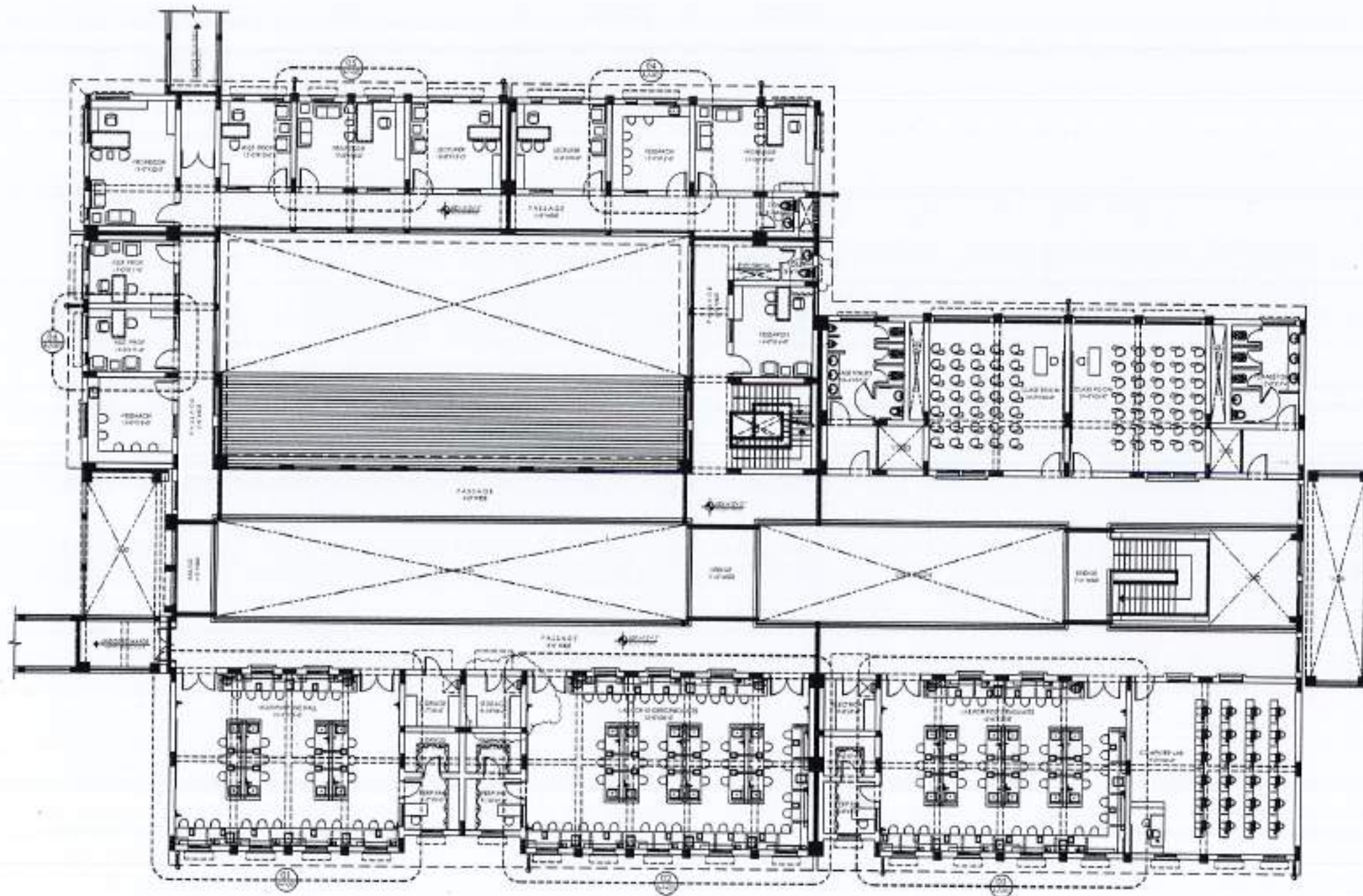
CHECKED BY:

APPROVED BY:

SCALE: 1/4" = 1'-0" DATE: APRIL 2024  
 REVISED BY: 4753/322/BD/03824







1 FIRST FLOOR PLAN  
SCALE: 1/4" = 1'-0"



NO.	DATE	REVISION	BY

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**PROJECT:**  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

**CLIENT:**  
 UNIVERSITY OF PUNJAB RAWALAKOT



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECT:**  
 The Architects  
 100-1000, PUNJAB CAMPUS  
 UNIVERSITY OF PUNJAB, RAWALAKOT  
 PUNJAB, PAKISTAN

**STRUCTURAL CONSULTANT:**  
 mushtaq and bial  
 consulting engineers  
 5th FLOOR, BANGALORE ROAD, KARACHI-74200  
 TEL: 373-42-82, 373-42-83, 373-42-84, 373-42-85  
 FAX: 373-42-86, 373-42-87

**ELECTRICAL CONSULTANT:**  
 C.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 4-41 Road, Chhotagala Campus, Rawalakoat - 1900

**MECHANICAL CONSULTANT:**  
 M/S. (Punjab)  
 100-1000, PUNJAB CAMPUS  
 UNIVERSITY OF PUNJAB, RAWALAKOT  
 PUNJAB, PAKISTAN

**JOB NO.:** 502  
**DESIGN NO.:** A6-002

**OWNER & SUPERVISION CONSULTANT:**  
 NESPAK (PVT.) LIMITED  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

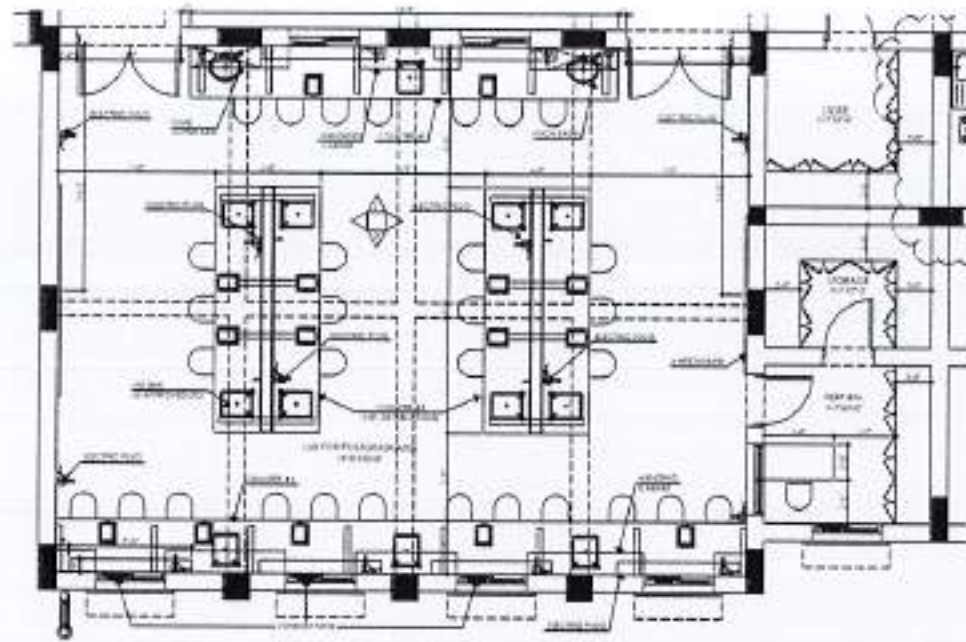
**DRAWING TITLE:**  
 FIRST FLOOR  
 FURNITURE LAYOUT PLAN  
 WORKING DRAWING

**CHECKED BY:** \_\_\_\_\_  
**DESIGN BY:** \_\_\_\_\_  
**PREPARED BY:** \_\_\_\_\_  
**APPROVED BY:** \_\_\_\_\_

**SCALE:** 1/4" = 1'-0"      **DATE:** APRIL 2008  
**REF. DRAWING NO.:** 4753/322/80/03825

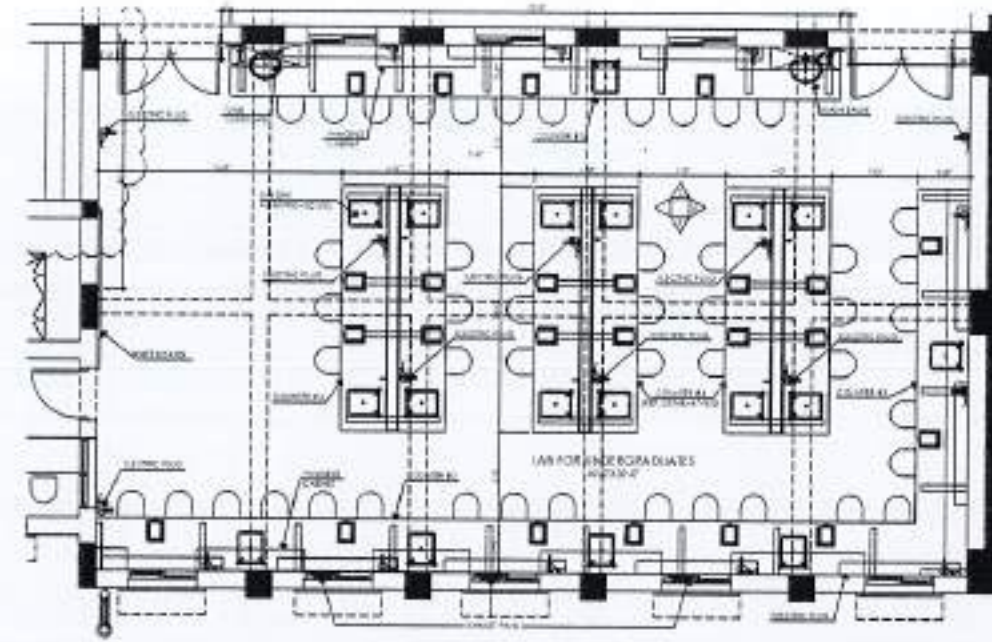






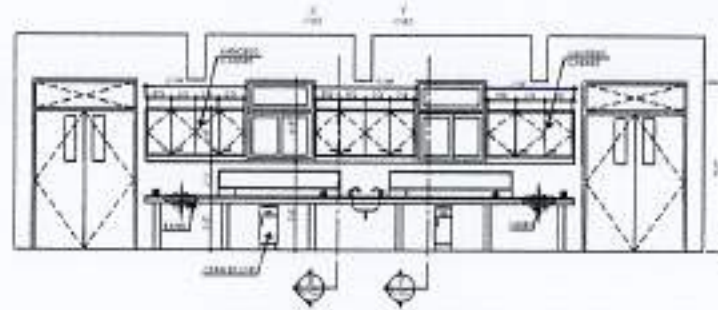
PART PLAN - 01

(TYPICAL LAYOUT)

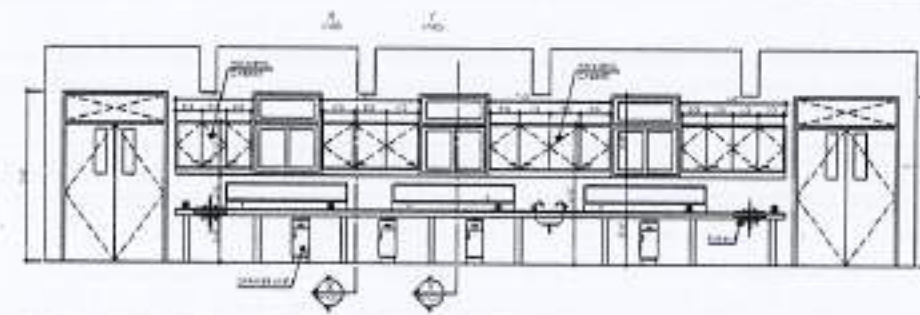


PART PLAN - 02

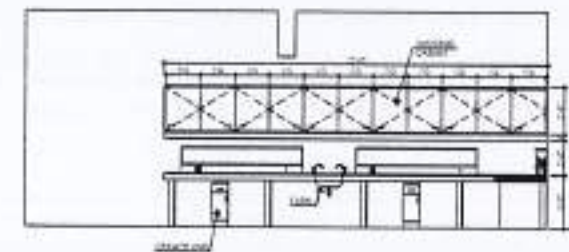
(TYPICAL LAYOUT)



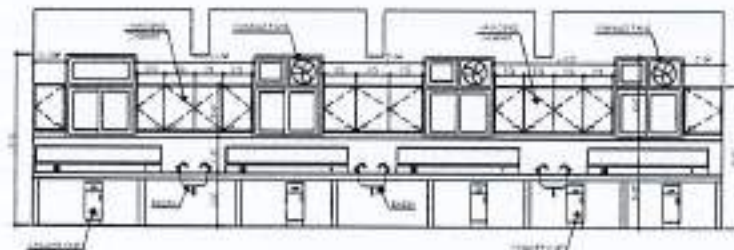
ELEVATION - 01



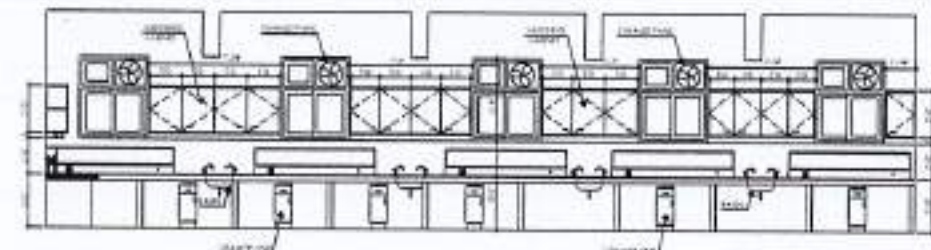
ELEVATION - 03



ELEVATION - 04



ELEVATION - 02



ELEVATION - 05



REV. NO.	DATE	ISSUED	ISSUED BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRAH RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POKHRAH RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 Architecture, Planning, Interior Design, Urban Design, Landscape Architecture, Environmental Planning, Urban Design, Real Estate Development, Construction Management, Project Management, etc.

STRUCTURAL CONSULTANT:  
**mushtaq and bilal**  
 consulting engineers  
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 P.O. BOX 40000, KARACHI-75000, PAKISTAN  
 Email: mushtaqbilal@gmail.com

ELECTRICAL CONSULTANT:  
**E.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 1-AH ROAD / SUBBAN-QUANER AREA-1 / KARACHI

PLUMBING CONSULTANT:  
**E.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 1-AH ROAD / SUBBAN-QUANER AREA-1 / KARACHI

MECHANICAL & MARINE CONSULTANT:  
**E.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 1-AH ROAD / SUBBAN-QUANER AREA-1 / KARACHI

OLD DRAWING NO. JOB NO. DRAWING NO.  
 502 A7-001

REVIEW & SUPERVISION CONSULTANT:  
**NESPAK (PVT.) LIMITED**

AS-PROJECT FILE:  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING FOR:  
 GROUND & FIRST FLOOR  
 FURNITURE DETAILS  
 WORKING DRAWING

CHECKED BY:  
 DRAWN BY:  
 PROJECT NO.:

APPROVED BY:

SCALE: 1/8" = 1'-0" DATE: APRIL 2024



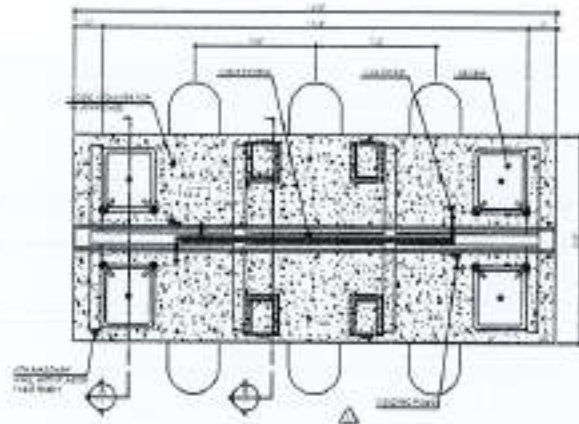






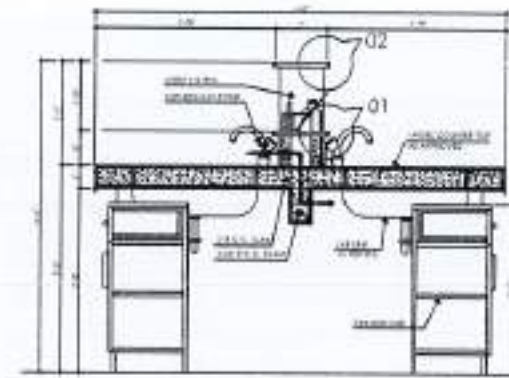






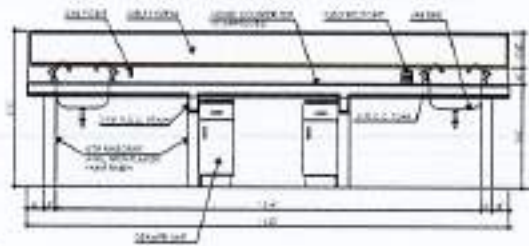
TYPICAL LAB COUNTER DETAIL

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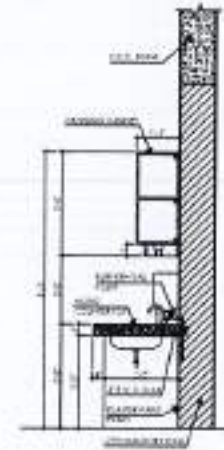
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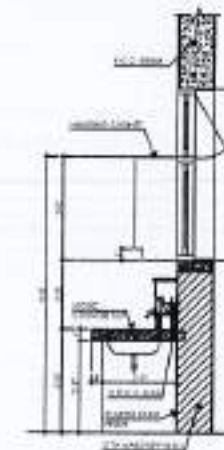
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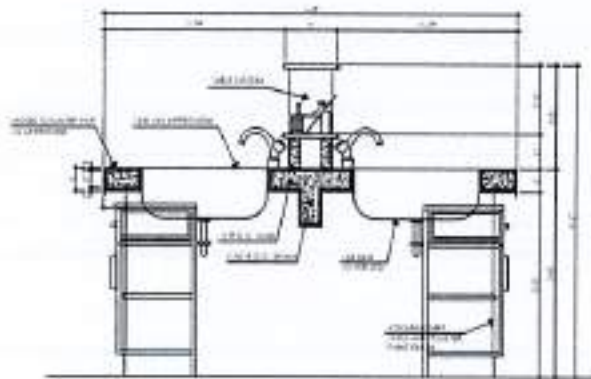
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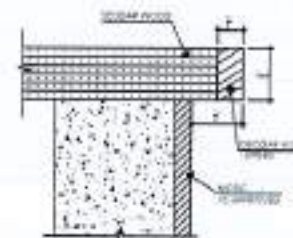
SECTION - Y-Y

SCALE: 1/2"=1'-0"



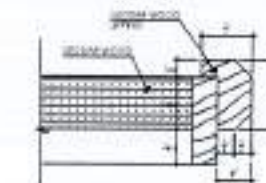
SECTION - A-A

SCALE: 1"=1'-0"



DETAIL - 01

SCALE: 1'-0"=1'-0"



DETAIL - 02

SCALE: 1'-0"=1'-0"



REV.	DATE	BY	CHKD

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOITAGALA CAMPUS UNIVERSITY OF POKHRAI, RAJALAKSHI.

CLIENT:  
 UNIVERSITY OF POKHRAI, RAJALAKSHI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 Architectural Planning Institute  
 100-A, H-8 Road, Islamabad  
 TEL: 373-1111 FAX: 373-1111  
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STRUCTURAL CONSULTANT:  
 mushtaq and bial  
 consulting engineers  
 100-A, H-8 Road, Islamabad  
 TEL: 373-1111 FAX: 373-1111  
 E-MAIL: info@mushtaqandbial.com.pk

ELECTRICAL CONSULTANT:  
 E.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 100-A, H-8 Road, Islamabad

PLUMBING CONSULTANT:  
 P.C. CONSULTANTS  
 100-A, H-8 Road, Islamabad

OLD DRAWING NO:  
 502

DRAWING NO:  
 A7-004

DESIGN & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUB-PROJECT TITLE:  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 GROUND & FIRST FLOOR  
 TYPICAL FURNITURE DETAILS  
 WORKING DRAWING

DRAWN BY:  
 MMH

CHECKED BY:  
 \_\_\_\_\_

APPROVED BY:  
 \_\_\_\_\_

SCALE:  
 1/2"=1'-0"



REVISED BY:  
 4753/322/BD/03829





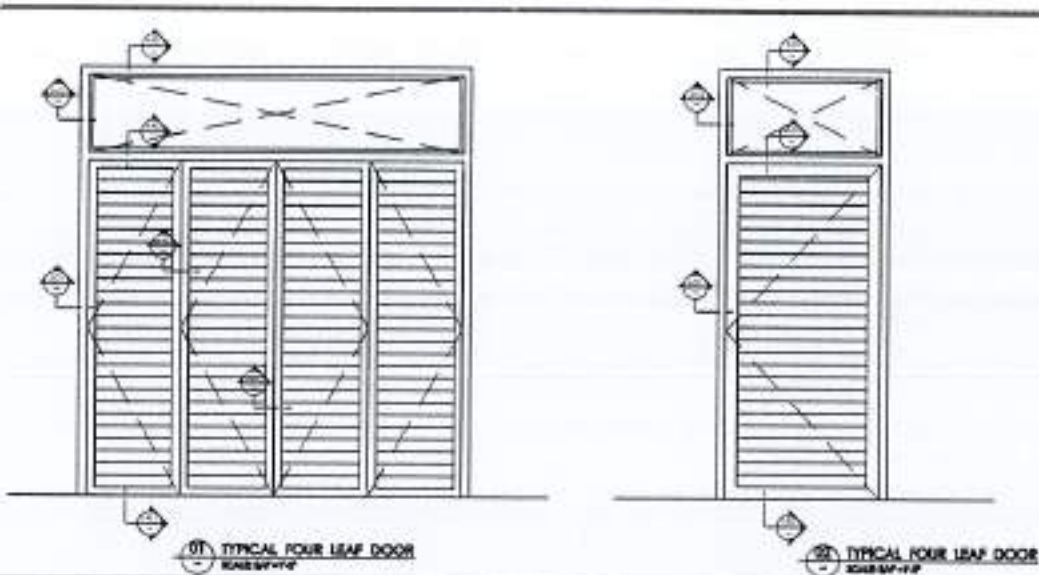




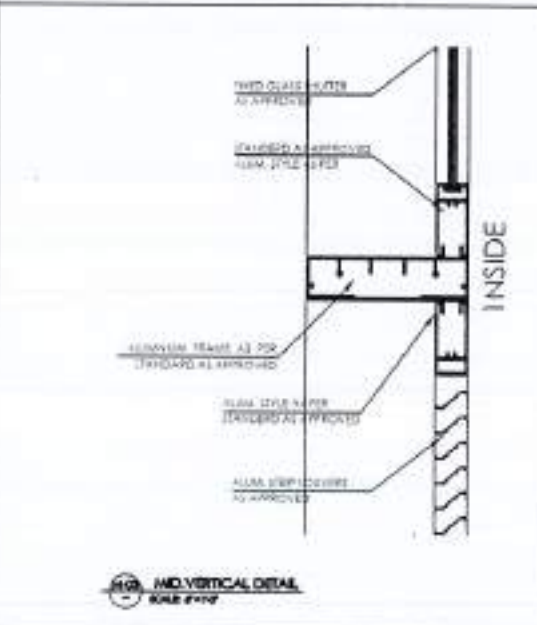
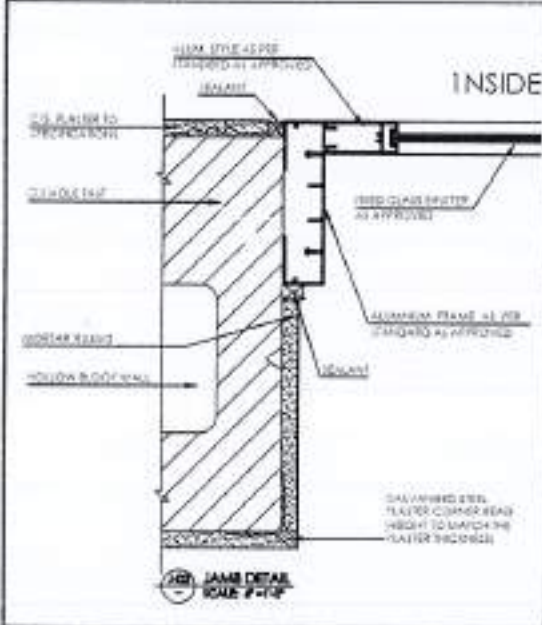
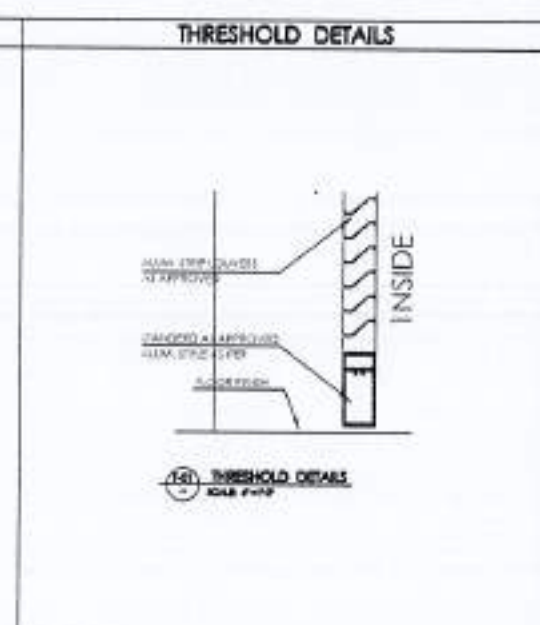
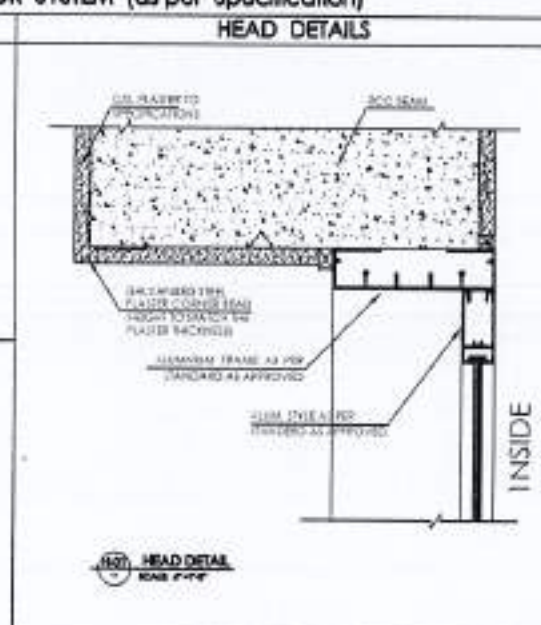
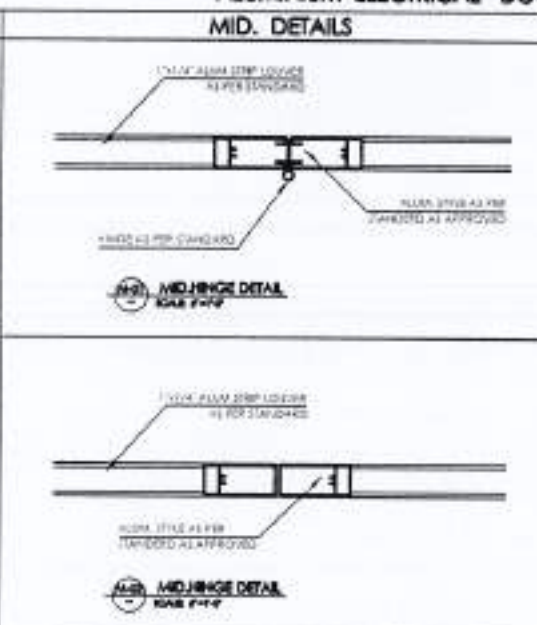
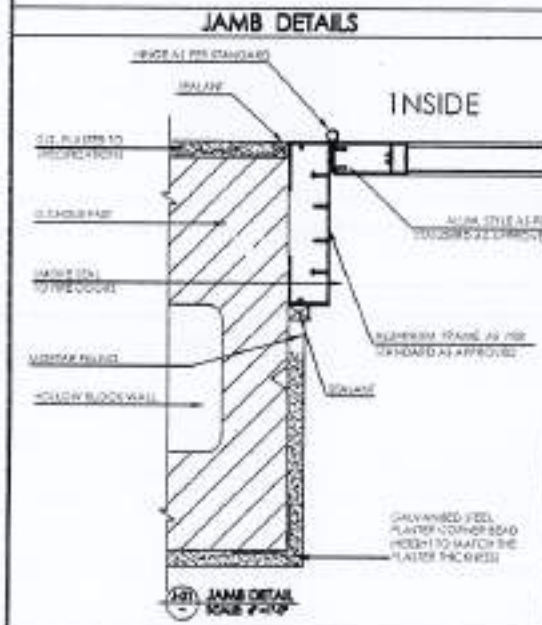








ALUMINIUM ELECTRICAL DOOR SYSTEM (as per Specification)



REV.	DATE	BY	CHKD.

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOISAGALA CAMPUS UNIVERSITY OF POONCH, BAWALAKOT.

CLIENT: UNIVERSITY OF POONCH, BAWALAKOT.



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT:

ARCHITECT: The Architects MUSHTAG & BILAL CONSULTING ENGINEERS

MUSHTAG & BILAL CONSULTING ENGINEERS  
54-A, HAZRA ROAD, BAWALAKOT, DISTRICT CHOISAGALA, PUNJAB, INDIA  
TEL: 91-98151-48484-98151-48484 FAX: 91-98151-48484

TECHNICAL CONSULTANT: mushtag and bilal consulting engineers  
54-A, HAZRA ROAD, BAWALAKOT, DISTRICT CHOISAGALA, PUNJAB, INDIA  
TEL: 91-98151-48484-98151-48484 FAX: 91-98151-48484

TECHNICAL CONSULTANT: C.P. & ASSOCIATES ELECTRICAL ENGINEERS  
54-A, HAZRA ROAD, BAWALAKOT, DISTRICT CHOISAGALA, PUNJAB, INDIA  
TEL: 91-98151-48484-98151-48484 FAX: 91-98151-48484

PROJECT NO: 502 A8-004

REVIEW & APPROVAL CONSULTANT: NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING NO: DETAILS OF ELECTR. DOOR WORKING DRAWING

DATE: 10/11/20

DESIGNER: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

SCALE: 1/4" = 1'-0" DATE: APR. 2020

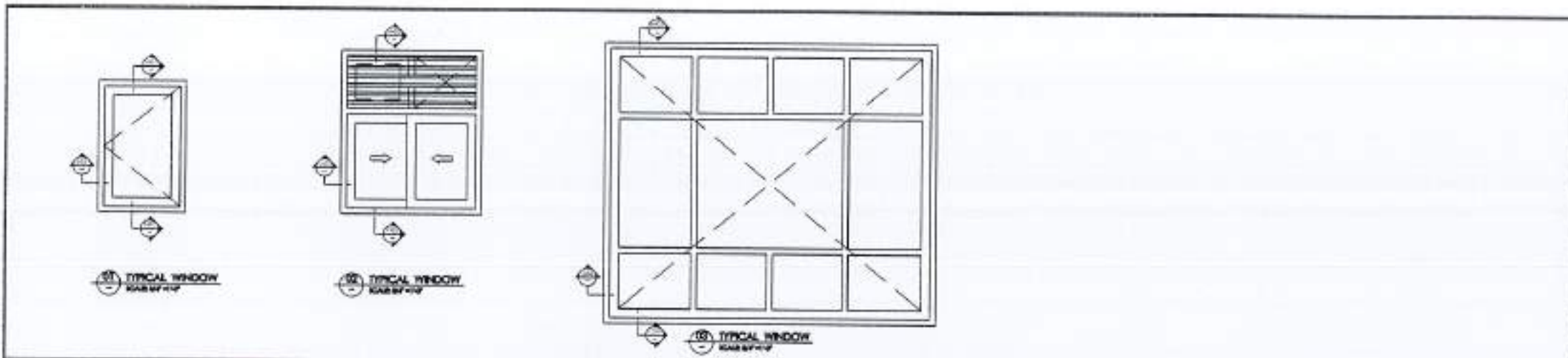
PROJECT NO: 4753/322/30/03833





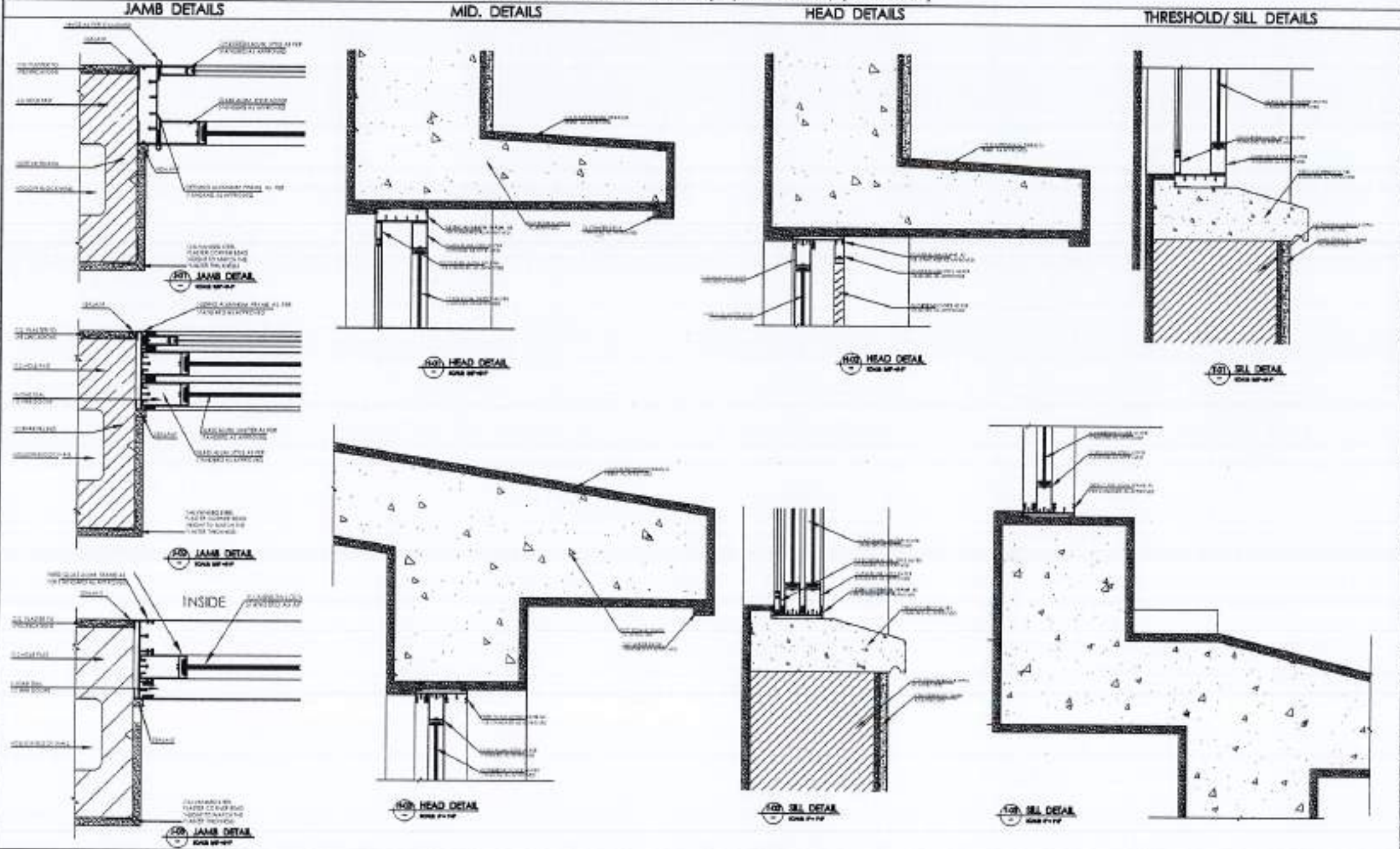






NO.	DATE	REVISION

ALUMINIUM WINDOWS SYSTEM (as per Standard/Specification)



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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHRA, RAWALAKOT.

CLIENT: UNIVERSITY OF POKHRA, RAWALAKOT.

WORK POST:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT:

ARCHITECT: The Architects, Engineers, Planners and Surveyors Association of Pakistan.

TECHNICAL CONSULTANT: mushtaq and bial consulting engineers. 54, HAZRA ROAD, CHANDANWALA, KARACHI-74200. TEL: 35812111-12. FAX: 35812112. WWW: WWW.MSB.COM.PK

MECHANICAL CONSULTANT: E.P.S. ASSOCIATES ELECTRICAL ENGINEERS. 8-A, BANGLA, GHAZIABAD, KARACHI-75300.

PLUMBING CONSULTANT: S.P. ASSOCIATES. 10, HAZRA ROAD, CHANDANWALA, KARACHI-74200.

ENVIRONMENTAL & MANAGEMENT CONSULTANT: ENVIRONMENTAL & MANAGEMENT CONSULTANTS. 10, HAZRA ROAD, CHANDANWALA, KARACHI-74200.

DATE DRAWING MADE: 2018/04/06

JOB NO.: 502

DESIGN NO.: A8-006

REVIEW & SUPERVISION CONSULTANT: NESPAK (PVT.) LIMITED

PROJECT: DEPARTMENT OF AGRICULTURE, AGROBOTANY & SOIL SCIENCE

DRAWING NO.: ALUM. WIN. JOINERY DETAIL, WORKING DRAWING

CHECKED BY:

DESIGNED BY:

APPROVED BY:

SCALE: 1/4\"/>





**SCHEDULE OF FINISHES DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES**

FLOOR	S.NO.	ROOM NAME	FLOOR	SKIRTING	WALL	CEILING	REMARK
GROUND FLOOR	1	ENTRANCE LOBBY	F-07	S-01	W-05	C-01	
	2	STAIR CASE	F-02	S-01	W-05	C-01	
	3	MALE & FEMALE TOILET	F-04	---	W-01&05	C-01&02	
	4	TOILET (FACULTY)	F-04	---	W-01&05	C-01&02	
	5	PASSAGE COURT	F-01	S-01	W-03&5	C-01	
	6	ELECTRICAL	F-01	S-01	W-05	C-01	
	7	STORE	F-01	S-01	W-05	C-01	
	8	PROFESSOR	F-01	S-01	W-05	C-01	
	9	ASSISTANT PROFESSOR	F-01	S-01	W-05	C-01	
	10	LECTURER	F-01	S-01	W-05	C-01	
	11	RESEARCH	F-01	S-01	W-05	C-01	
	12	H.O.D.	F-01	S-01	W-05	C-01	
	13	STAFF	F-01	S-01	W-05	C-01	
	14	LAB FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	15	LAB PREP. FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	16	LAB STORE FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	17	LAB FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	18	LAB PREP. FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	19	LAB STORE FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	20	COMMITTEE ROOM	F-01	S-01	W-05	C-01	
	21	OPEN COURT	F-06	S-01	W-01	C-01	
	22	PANTRY	F-01	S-01	W-01&05	C-01	
	23	CLASS ROOM	F-01	S-01	W-05	C-01	
FLOOR	S.NO.	ROOM NAME	FLOOR	SKIRTING	WALL	CEILING	REMARK
FIRST FLOOR	1	STAIR CASE	F-02	S-01	W-05	C-01	
	2	MALE & FEMALE TOILET	F-04	---	W-01&05	C-01&02	
	3	TOILET (FACULTY)	F-04	---	W-01&05	C-01&02	
	4	PASSAGE COURT	F-01	S-01	W-03&5	C-01	
	5	ELECTRICAL	F-01	S-01	W-05	C-01	
	6	STORE	F-01	S-01	W-05	C-01	
	7	PROFESSOR	F-01	S-01	W-05	C-01	
	8	ASSISTANT PROFESSOR	F-01	S-01	W-05	C-01	
	9	LECTURER	F-01	S-01	W-05	C-01	
	10	RESEARCH	F-01	S-01	W-05	C-01	
	11	LAB FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	12	LAB PREP. FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	13	LAB STORE FOR POSTGRADUATES	F-01	S-01	W-05	C-01	
	14	LAB FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	15	LAB PREP. FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	16	LAB STORE FOR UNDERGRADUATES	F-01	S-01	W-05	C-01	
	17	PANTRY	F-01	S-01	W-01&05	C-01	
	18	CLASS ROOM	F-01	S-01	W-05	C-01	
	19	COMPUTER LAB	F-01	S-01	W-05	C-01	
	20	MULTI PURPOSE HALL	F-01	S-01	W-05	C-01	
	21	BRIDGE	F-01	S-01	W-03&05	C-01	
	22	PASSAGE (ATRIUM)	F-01	S-01	W-03	C-01	
	23	STORE FOR HIGH LEVEL FLOOR	F-01	S-01	W-05	C-01	
FLOOR	S.NO.	ROOM NAME	FLOOR	SKIRTING	WALL	CEILING	REMARK
ROOF	1	STAIR CASE	F-02	S-01	W-05	C-01	
	2	ATRIUM	---	---	---	C-04	

**FINISHES AND MATERIAL LEGEND**

S.NO.	ABBREVIATION	FLOOR FINISHES:
1	F-01	12"X12"X1" TERRAZZO TILES IN WHITE CEMENT WITH APPROVED COLOUR & SHADE AS PER SPECS TO ARCHITECTS APPROVAL
2	F-02	3/4" THICK TERRAZZO (CAST IN SITU) POLISHED FINISH TREAD & RISER WITH ANTI SLIP GROOVES COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
3	F-03	1/2" THICK 12" WIDE TERRAZZO (CAST IN SITU) BORDER APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
4	F-04	6"X6" /12"X12" OR APPROVED SIZE LOCAL CERAMIC TILES MATT FINISH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
5	F-05	C.C. TILE FOR ROOF APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
6	F-06	C.C. TILE FOR COURT AREA, SIZE 12"X12" APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
7	F-07	3/4" THICK TERRAZZO (CAST IN SITU) POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
SKIRTING:		
8	S-01	4" HIGH TERRAZZO TILES SKIRTING POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
9	S-02	4" HIGH C.C. TILES SKIRTING
WALL FINISHES:		
10	W-01	6" X6" /12" X12" OR APPROVED SIZE LOCAL GLAZED CERAMIC TILES OF APPROVED COLOUR DADO APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL (SEE ELEVATION DWG. FOR DETAILS)
11	W-02	18" THICK STONE WALL BUILD WITH BEST LOCAL AVAILABLE STONE AS PER SPECS TO ARCHITECTS APPROVAL
12	W-03	3/4" THICK IN 1:2 RATIO WASH TERRAZZO OVER ROUGH PLASTER APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
13	W-04	36"X12" SIZE LOCAL MARBLE POLISHED WITH APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
14	W-05	3-COATS OF PLASTIC EMULSION PAINT TO INTERNAL PLASTER SURFACE APPROVED COLOUR AS PER SPECS TO ARCHITECTS APPROVAL
15	W-06	ACOUSTIC LINED WOOD PLY WALL PANELING SYSTEM AS PER DESIGN AND ARCHITECTS APPROVAL
CEILING FINISHES:		
16	C-01	SMOOTH CEMENT PLASTER WITH EMULSION PAINT FINISHES SYSTEM, COLOUR AS PER ARCHITECTS APPROVAL
17	C-02	3/4" THICK GEMENT BOARD FALSE CEILING WITH COMPLETE SUSPENSION SYSTEM WITH EMULSION PAINT FINISH SYSTEM COLOUR AS PER ARCHITECTS APPROVAL
18	C-03	ACOUSTIC LINED WOOD PLY FALSE CEILING AND COMPLETE SUSPENSION SYSTEM AS PER SPECS
19	C-04	16 GAUGE PLAIN METAL G.I. SHEET, 10 GAGUGE CORRUGATED SHEET, 12 MM POLYCARBONATED SHEET



REV.	DATE	BY	REASON

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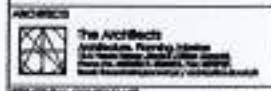
**PROJECT:**  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

**CLIENT:**  
 UNIVERSITY OF POONCH, RAWALAKOT



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT:**



**mushtaq and bial consulting engineers**  
 22/23, 4th & 5th Floor, Block 10, Phase 1, F-7/3, Islamabad.

**REGISTRATION NO.:**  
 E.P. & ASSOCIATES ELECTRICAL ENGINEERS  
 642/2008, Islamabad - 75000

**PLUMBING CONSULTANT:**  
 H. J. J. CONSULTANTS & ENGINEERS  
 10/1, Block 10, Phase 1, F-7/3, Islamabad.

**DATE:** 502 **DRAWING NO.:** A9-001

**REVIEW & SUPERVISION CONSULTANT:**  
**NESPAK (PVT.) LIMITED**

**AS PER PROJECT FILE:**  
 DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

**DRAWING FILE:**  
**FINISHES SCHEDULE WORKING DRAWING**

**DATE:** \_\_\_\_\_  
**DESIGN BY:** \_\_\_\_\_  
**REVISION BY:** \_\_\_\_\_  
**APPROVED BY:** \_\_\_\_\_  
**SCALE:** 1/4" = 1'-0" **DATE:** APRIL 2024  
**REVISED BY:** 4753/322/80/03836











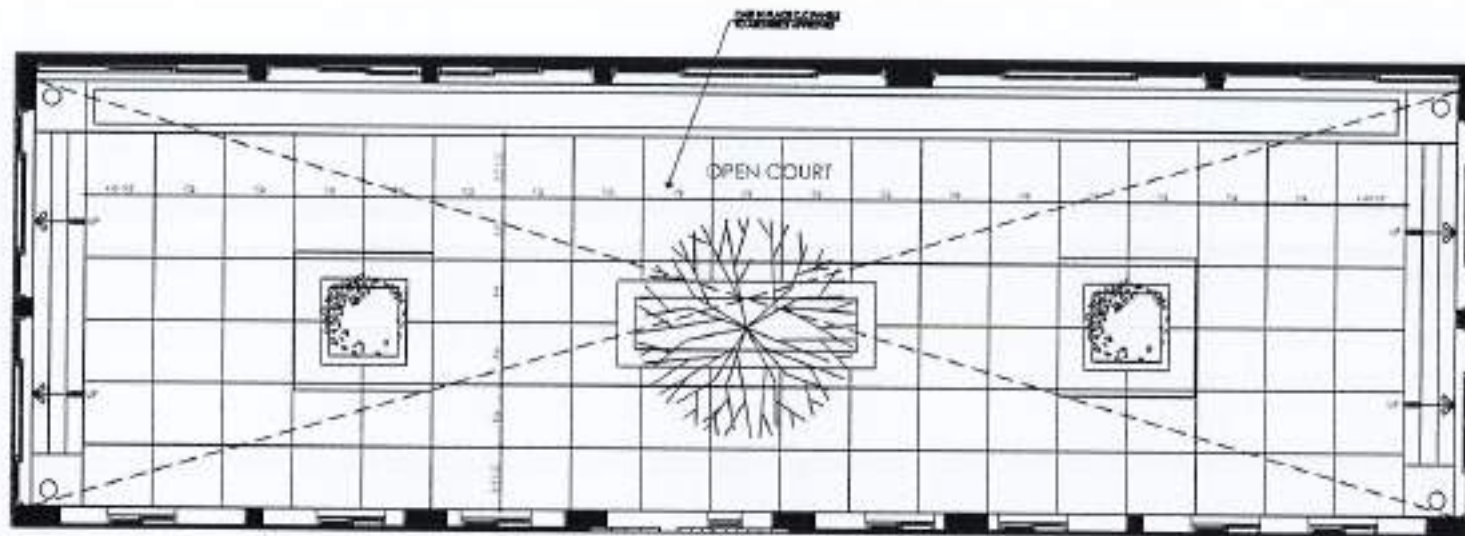




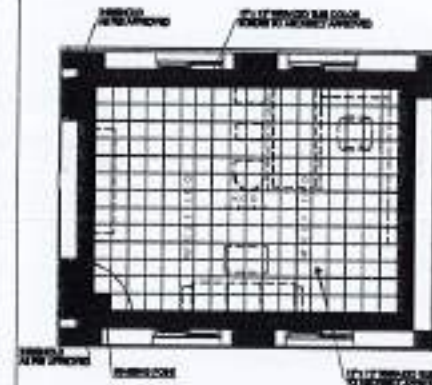








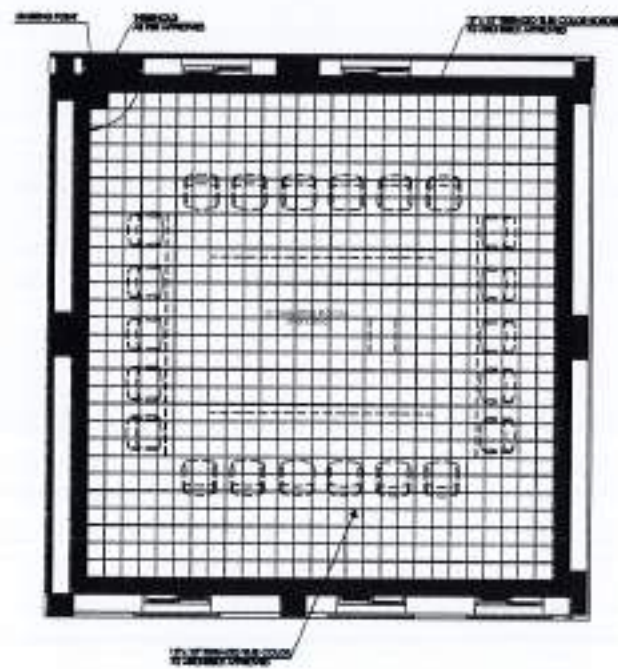
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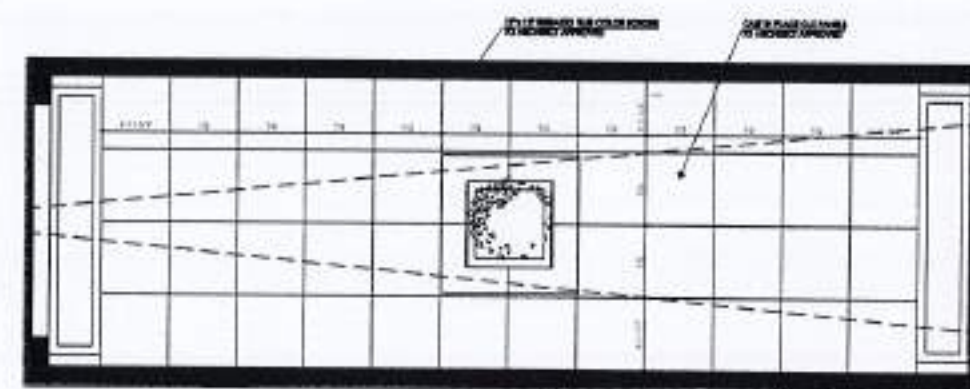
PART PLAN - 06



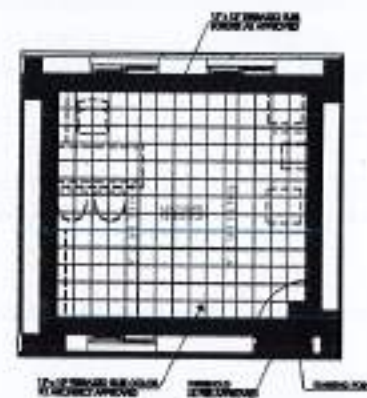
PART PLAN - 07



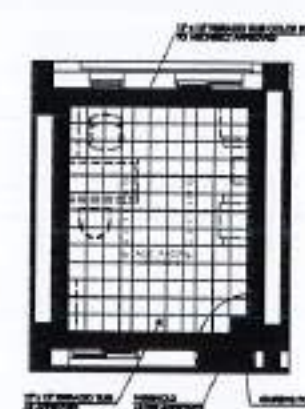
PART PLAN - 08



PART PLAN - 09



PART PLAN - 10



PART PLAN - 09



REV.	DATE	BY	REMARKS

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT: UNIVERSITY OF POONCH, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: The Architects Institution, Poonch, Jammu & Kashmir.

STRUCTURAL CONSULTANT: **mushtaq and bilal consulting engineers** 502, H-802, G.D.M.S. Sector-10, Gurgaon, Haryana.

ELECTRICAL CONSULTANT: **K.P. & ASSOCIATES ELECTRICAL ENGINEERS** 14-B, Block, G.D.M.S. Sector-10, Gurgaon, Haryana.

PLUMBING CONSULTANT: **P.S. Associates**

ENVIRONMENTAL & HEALTH/SANITARY CONSULTANT: **ENVIRONMENTAL & HEALTH/SANITARY CONSULTANTS**

DATE DRAWING SET: 05/04/2024

JOB NO.: 502 DRAWING NO.: A11-004

OWNER & SUPERVISOR CONSULTANT: **NESPAK (PVT.) LIMITED**

SUB-PROJECT FILE: **DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES**

DRAWING TITLE: **GROUND FLOOR FLOORING PLAN (BLOWN UP) WORKING DRAWING**

CHECKED BY: **MMAN**

DRAWN BY: **MMAN**

PROJECT NO:

APPROVED BY:

SCALE: **1/4" = 1'-0"** DATE: **APRIL 2024**

REVISED BY:

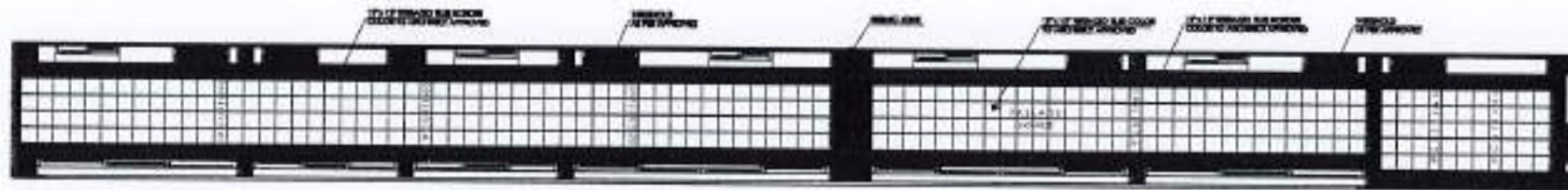
NO. DRAWING SET: **4753/322/BD/03841**











PART PLAN - 05



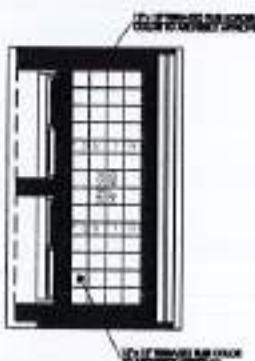
PART PLAN - 06



PART PLAN - 07



PART PLAN - 08



PART PLAN - 09



PART PLAN - 10



NO.	DATE	ISSUED	BY

NOTES:  
 1. THE DRAWING IS THE PROPERTY OF THE ARCHITECT AND NO PART OF IT OR ANY PART OF THE DRAWING MAY BE REPRODUCED, COPIED, REPRODUCED OR USED IN ANY TECHNICAL OR COMMERCIAL PURPOSE WITHOUT THE WRITTEN PERMISSION FROM THE ARCHITECT.  
 2. THE DRAWING IS NOT TO BE CALLED ONLY THESE DRAWINGS TO BE USED.  
 3. ALL DIMENSIONS ARE TO BE REPRODUCED AND TOLERANCE TO BE USED.  
 4. ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT:  
 UNIVERSITY OF POONCH, RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 mushtaq and bilal consulting engineers

STRUCTURAL CONSULTANT:  
 mushtaq and bilal consulting engineers

ELECTRICAL CONSULTANT:  
 E.P. & ASSOCIATES ELECTRICAL ENGINEERS

PLUMBING CONSULTANT:  
 P.P. Associates

MECHANICAL & HEATING CONSULTANT:  
 M.H. Associates

OLD DRAWING NO:  
 502

NEW DRAWING NO:  
 A11-006

DESIGN & EXECUTION CONSULTANT:  
 NESPAK (PVT.) LIMITED

PROJECT TITLE:  
 DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 FIRST FLOOR FLOORING PLAN (BLOWN UP) WORKING DRAWING

DATE:  
 15/04/2024

SCALE:  
 1/4" = 1'-0"

NEW DRAWING NO:  
 4753/322/BD/03843











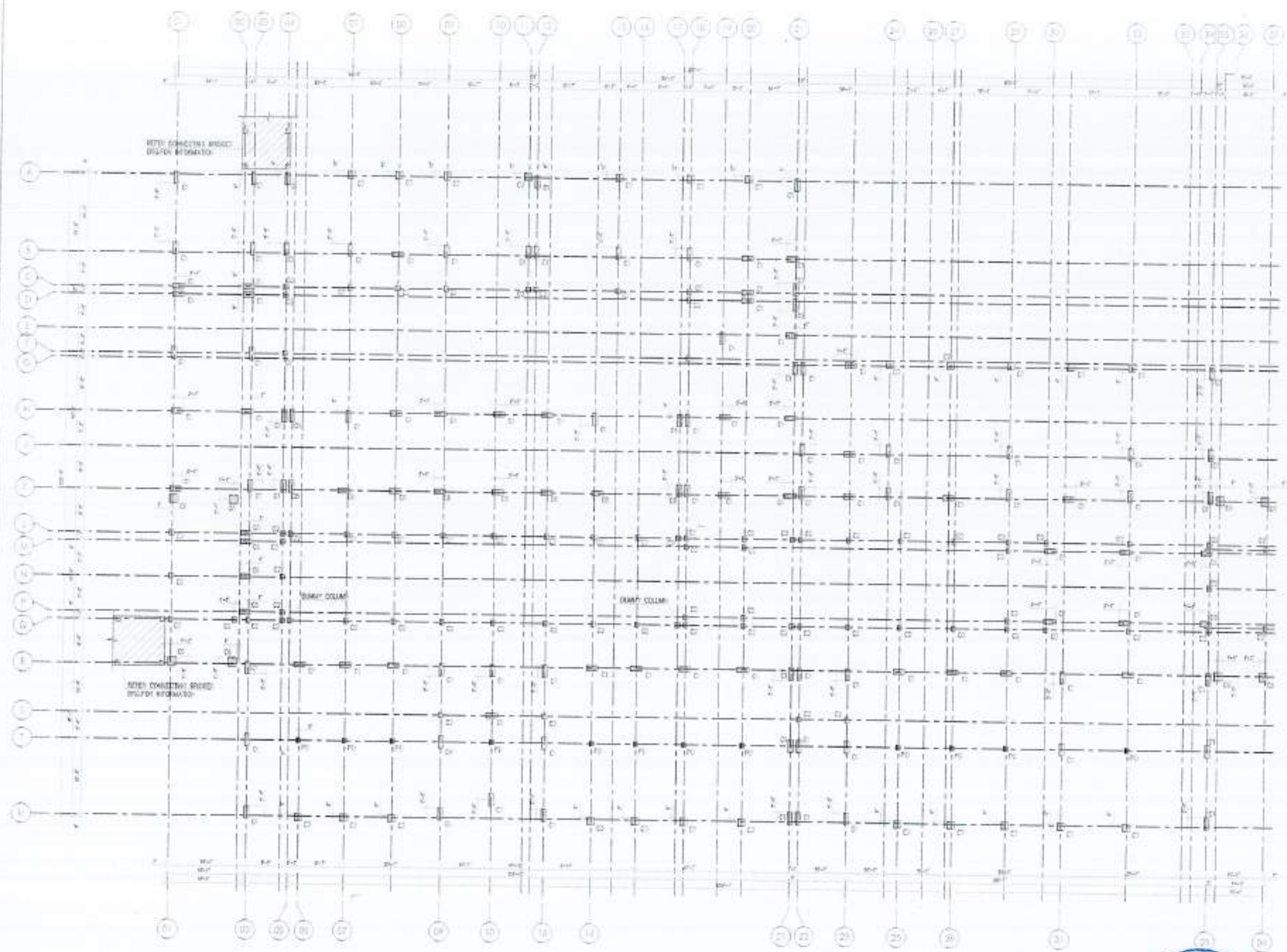












NO.	REVISION	DATE

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

**Muztaz and Bilal**  
 CONSULTING ENGINEERS  
 10, H-10/1, KARACHI CENTRAL, KARACHI-74200  
 TEL: 35833333 FAX: 35833333  
 WWW.MUZTAZANDBILAL.COM

PROJECT NO. 502 AG-000  
 SHEET NO. 502 AG-000

502 AG-000

NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE  
 ROUYNOWY & SOIL SCIENCE

COLUMN LAYOUT PLAN

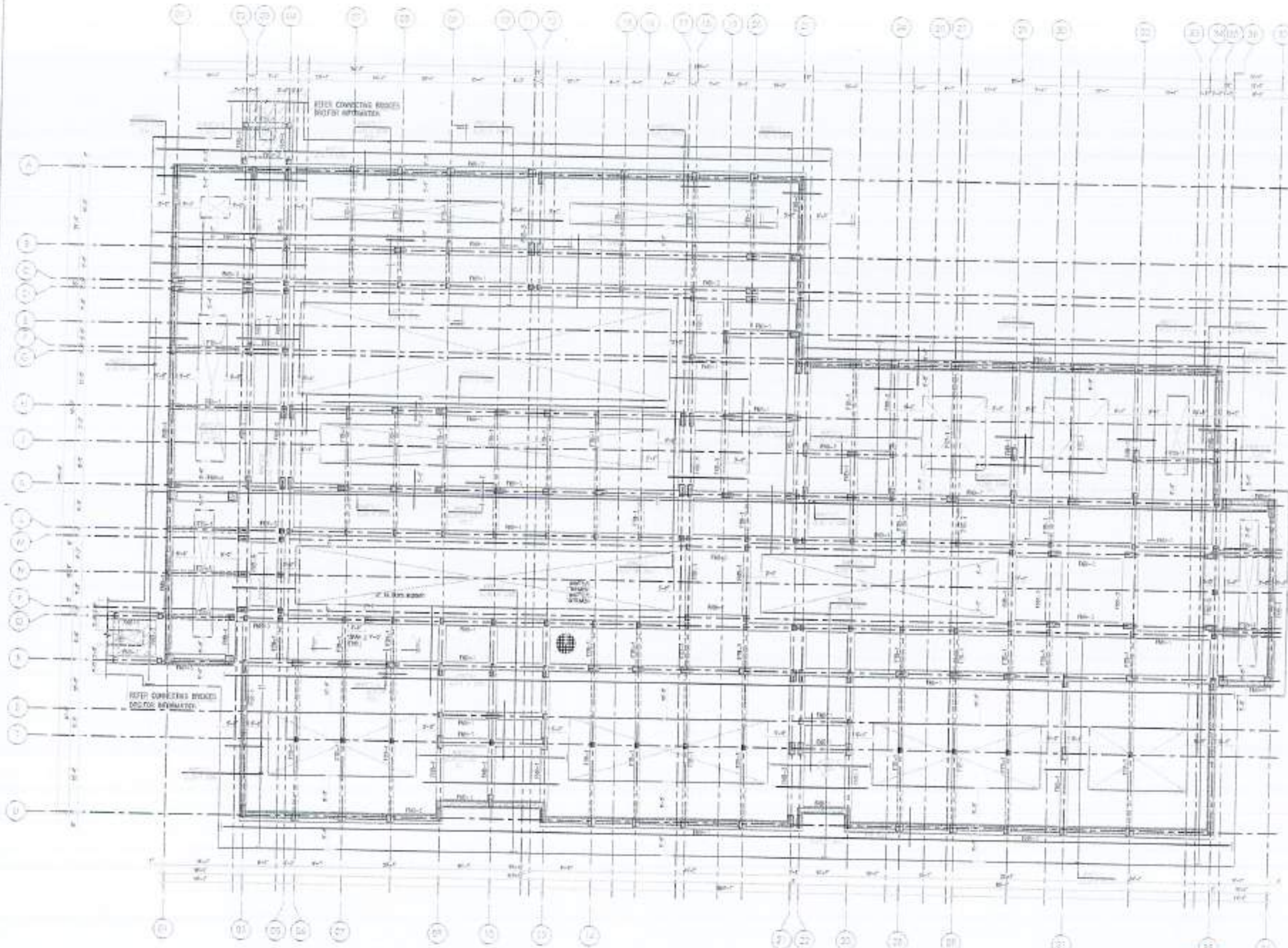
DATE: 10/10/2000











**FOUNDATION LAYOUT PLAN**

**NOTE:**  
 1. REFER TM-72 FOR FOUNDATION BEAM AND SECTION & R.F.C.



COMPLETION OF LEFTOVER WORK  
 OF CHITRAKUT CAMPUS  
 UNIVERSITY OF POKHARA  
 RAWALPINDI

REVISION OF PROJECT DRAWINGS

THE DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

**THE PROJECT**



**mustafic and bilal**  
 consulting engineers

11-A, ESTABLISHED  
 MEDICAL ENGINEER  
 HAZARAT, DISTRICT HAZARAT, PUNJAB

COMMISSIONING & SUPERVISION ENGINEER

502 AD-000

NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE  
 AGRICULTURE & SOIL SCIENCES

FOUNDATION PLAN



4/20/2014/REV/0001

























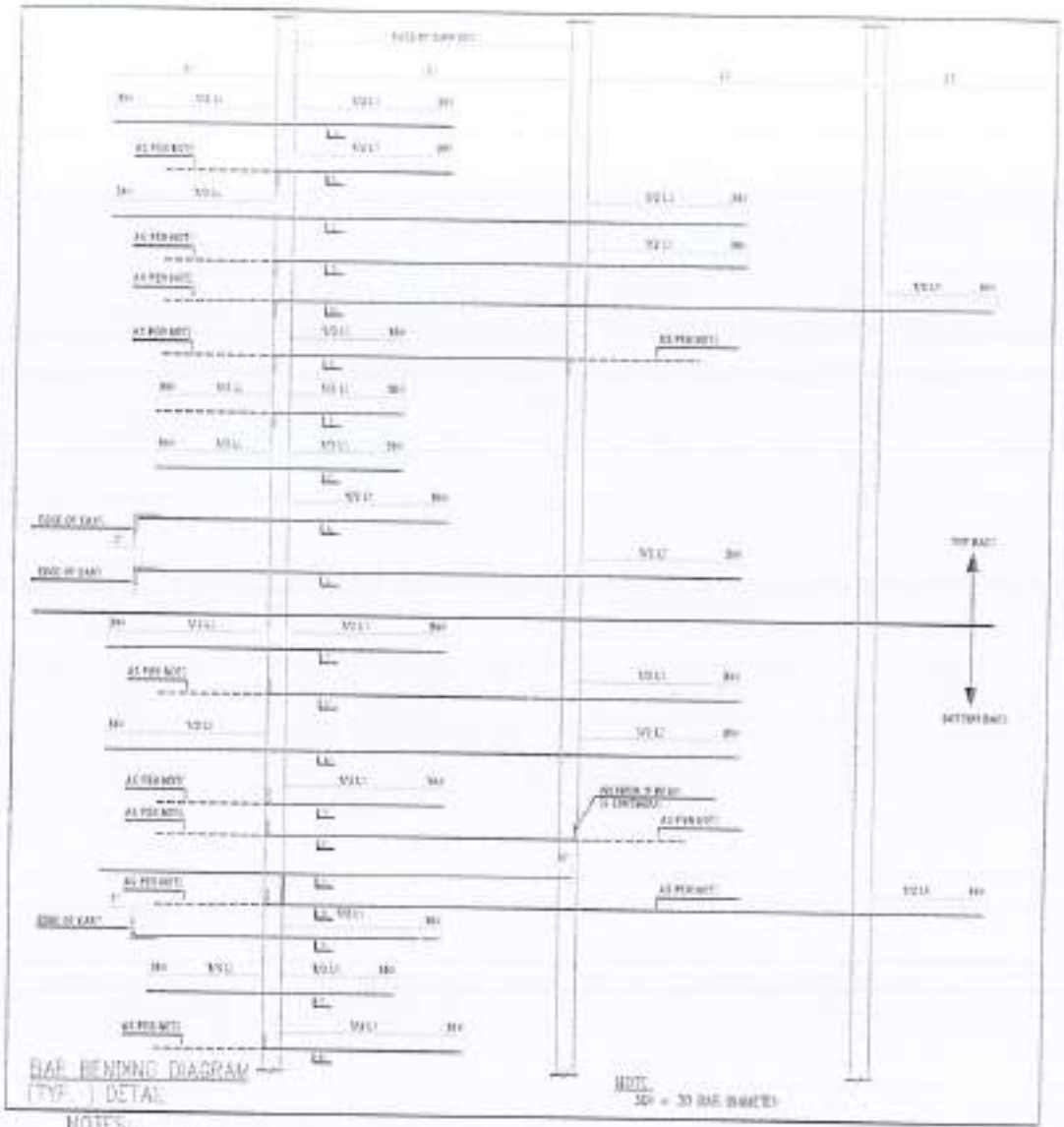






TOP FLOOR BEAM SCHEDULE

BEAM NO.	SPAN		TOP BAR		BOT. BAR		STIRRUPS		REMARKS
	NO.	LENGTH	NO.	SIZE	NO.	SIZE	NO.	SIZE	
BEAM-1	1	10'	10	12	10	12	10	12	
BEAM-2	1	10'	10	12	10	12	10	12	
BEAM-3	1	10'	10	12	10	12	10	12	
BEAM-4	1	10'	10	12	10	12	10	12	
BEAM-5	1	10'	10	12	10	12	10	12	
BEAM-6	1	10'	10	12	10	12	10	12	
BEAM-7	1	10'	10	12	10	12	10	12	
BEAM-8	1	10'	10	12	10	12	10	12	
BEAM-9	1	10'	10	12	10	12	10	12	
BEAM-10	1	10'	10	12	10	12	10	12	
BEAM-11	1	10'	10	12	10	12	10	12	
BEAM-12	1	10'	10	12	10	12	10	12	
BEAM-13	1	10'	10	12	10	12	10	12	
BEAM-14	1	10'	10	12	10	12	10	12	
BEAM-15	1	10'	10	12	10	12	10	12	
BEAM-16	1	10'	10	12	10	12	10	12	
BEAM-17	1	10'	10	12	10	12	10	12	
BEAM-18	1	10'	10	12	10	12	10	12	
BEAM-19	1	10'	10	12	10	12	10	12	
BEAM-20	1	10'	10	12	10	12	10	12	



BEAM STIRRUPS SCHEDULE

SMALLEST LONGITUDINAL BAR NO.	IF $\phi = 12$ IN. USE BELOW BAR NO. OTHERWISE NO. 00	SPACING	TRAFFIC
1	12	4" @	4" @
2	12	4" @	4" @
3	12	4" @	4" @
4	12	4" @	4" @
5	12	4" @	4" @
6	12	4" @	4" @
7	12	4" @	4" @

NOTES:

- 1) SPACING SHALL BE ROUNDED UP TO NEAREST INTENT.
- 2) FOR SPACING:  $3.25' = 4"$
- 3)  $3.50' = 4"$

- NOTES:
- 1) EXTEND TOP BARS UPTO 60BAR# MIN INTO SLAB @ EACH END.
  - 2) EXTEND TOP BARS UPTO 60BAR# MIN INTO SLAB @ EACH END.
  - 3) PROVIDE ALL STIRRUPS WITH 4 LEGS.
  - 4) PROVIDE ALL STIRRUPS WITH 4 LEGS.
  - 5) SEE DETAIL -- 1 FOR INFORMATION.
  - 6) EXTEND BOTTOM BARS UPTO 60 BAR# MIN INTO ADJACENT SPAN.



COMPLETION OF LEFTOVER WORK OF CHENABGAH CAMPUS UNIVERSITY OF FOOD AND AGRICULTURE

UNIVERSITY OF FOOD AND AGRICULTURE

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

Mustafa and Bilal Consulting Engineers

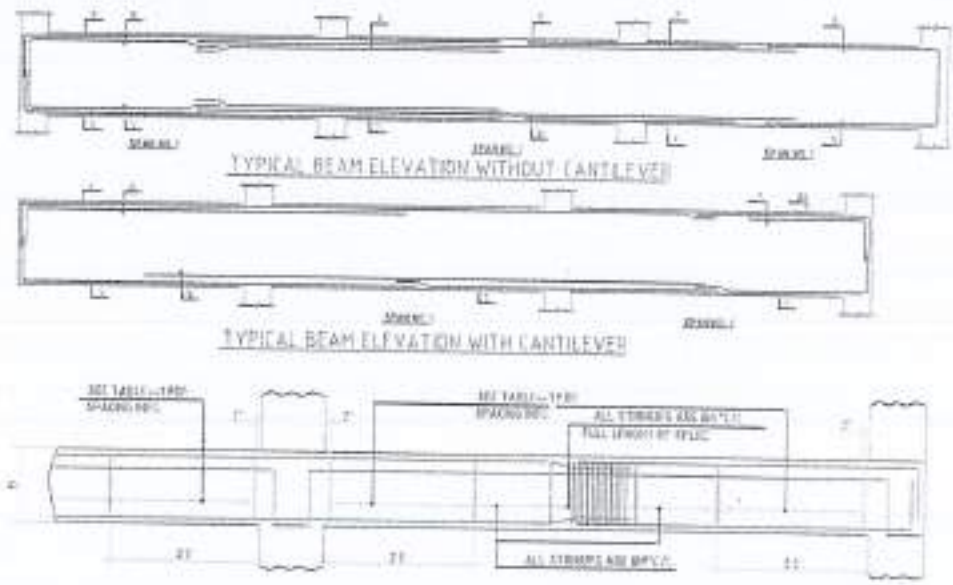
REGISTERED ELECTRICAL ENGINEERS

502 A0-000

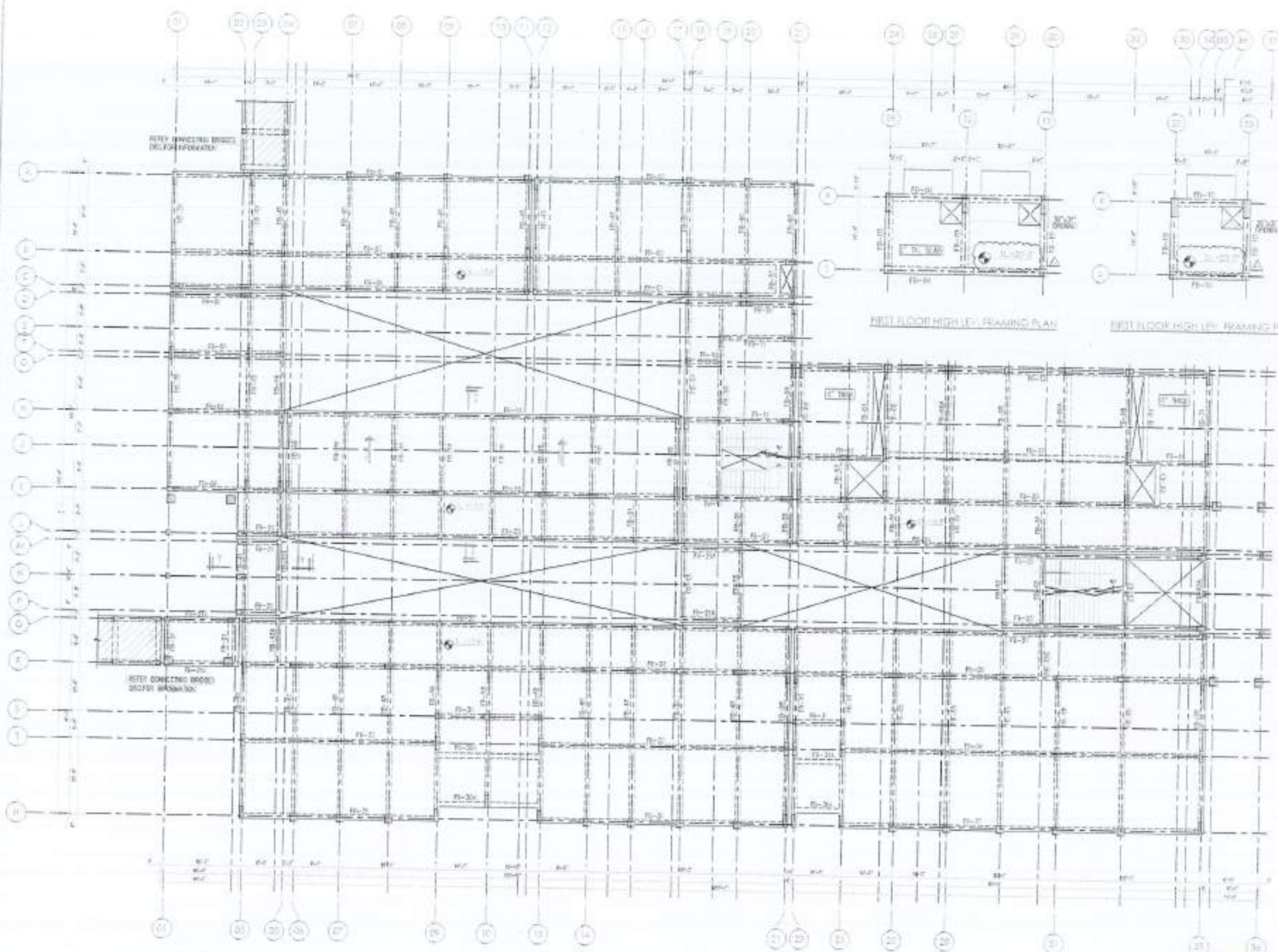
NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE & SOIL SCIENCES

TOP FLOOR BEAM SCHEDULE







REFER BRACING BRIDGE  
DEL FOR FORKAYS

REFER CORRECTING BRIDGE  
DEL FOR BRIDGE

**FIRST FLOOR FRAMING PLAN**

- NOTES:-**
1. ALL STRUCTURAL SLABS ARE 12" THICK UNLESS NOTED OTHERWISE ON PLAN.
  2. REFER DWG. BR-01 & BR-02 FOR BEAM INFO.
  3. REFER DWG. BR-03 FOR SECTION 1-1 & 2-2.
  4. REFER ARCHT. DRAWING FOR SLOPES AND LEVELS.

FIRST FLOOR HIGH LEVEL FRAMING PLAN

FIRST FLOOR HIGH LEVEL FRAMING PLAN



NO.	REVISION

- 1. TO CHECK THE DESIGN OF ALL STRUCTURAL MEMBERS, THE DRAWING IS TO BE CHECKED BY THE DESIGNER & APPROVED BY THE ARCHT. & ENGINEER. THE ARCHT. & ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL MEMBERS.
- 2. NO STRUCTURAL MEMBER SHALL BE DESIGNED WITHOUT THE APPROVAL OF THE ARCHT. & ENGINEER.
- 3. ALL STRUCTURAL MEMBERS SHALL BE DESIGNED AS PER THE REQUIREMENTS OF THE ARCHT. & ENGINEER.
- 4. THE ARCHT. & ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL MEMBERS.

COMPLETION OF LEFT OVER WORK OF DISTAGAL CAMPUS UNIVERSITY OF POKHARA PAKISTAN

DESIGNED BY: M. H. HUSSAIN



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT



**MUSHTAQ AND BIALI**  
CONSULTING ENGINEERS  
20-A, PAFI, KARACHI, PAKISTAN  
TEL: 37322222 FAX: 37322222  
WWW.MUSHTAQANDBIALI.COM

A.E.A. ASSOCIATE ELECTRICAL ENGINEER

DESIGNED BY: M. H. HUSSAIN

CHECKED BY: M. H. HUSSAIN

502 AC-000

NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE, ANIMAL SCIENCE & FISHERIES

LIST OF DRAWINGS WORKING DRAWING



4753/2002/EDUC/0286



# LIST OF DRAWING VETERINARY & ANIMAL SCIENCE

SHEET Nos.	DESCRIPTION	DRAWING NO
001	TITLE SHEET	
002	LIST OF DRAWINGS	04G01
003	GENERAL NOTES	04G02
004	COLUMN LAYOUT PLAN (PART-1)	04G03
005	COLUMN LAYOUT PLAN (PART-2)	04G04
006	TYPICAL COLUMN DETAILS	04G05
007	FOUNDATION PLAN (PART-1)	04G06
008	FOUNDATION PLAN (PART-2)	04G07
009	TYPICAL FOUNDATION SECTIONS	04G08
010	PLINTH BEAM FRAMING PLAN (PART-1)	04G09
011	PLINTH BEAM FRAMING PLAN (PART-2)	04G10
012	PLINTH BEAM ELEVATION & SECTIONS	04G11
013	FIRST FLOOR FRAMING PLAN (PART-1)	04G12
014	FIRST FLOOR FRAMING PLAN (PART-2)	04G13
015	FIRST FLOOR REINF. PLAN (PART-1)	04G14
016	FIRST FLOOR REINF. PLAN (PART-2)	04G15
017	ROOF FRAMING PLAN (PART-1)	04G16
018	ROOF FRAMING PLAN (PART-2)	04G17
019	ROOF REINF. PLAN (PART-1)	04G18
020	ROOF REINF. PLAN (PART-2)	04G19
021	TOP ROOF FRAMING PLAN (PART-1)	04G20
022	TOP ROOF FRAMING PLAN (PART-2)	04G21
023	ROOF SECTIONS	04G22
024	FIRST FLOOR BEAM SCHEDULE (SHEET-1)	04G23
025	FIRST FLOOR BEAM SCHEDULE (SHEET-2)	04G24
026	ROOF BEAM SCHEDULE (SHEET-1)	04G25
027	ROOF BEAM SCHEDULE (SHEET-2)	04G26
028	TOP ROOF BEAM SCHEDULE	04G27
029	MISCELLANEOUS DETAILS (SHEET-1)	04G28
030	MISCELLANEOUS DETAILS (SHEET-2)	04G29
031	MISCELLANEOUS DETAILS (SHEET-3)	04G30



REV. NO.	DATE	REASON	REMARKS

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**PROJECT:**  
RECONSTRUCTION OF  
UNIVERSITY OF AZAD JAMSHEDPUR  
CHOTAGALA CAMPUS, KHAMARUJI,  
AZAD JAMSHEDPUR & RAJSHAHI

**CLIENT:**  
EARTHQUAKE RECONSTRUCTION &  
REHABILITATION AUTHORITY (ER&R)

**GOVERNMENT OF PAKISTAN  
ISLAMABAD, PAKISTAN**

**NOTED FOR:**

**DATE:**

**ARCHITECT:**  
The Architect  
ARCHITECT: MUSHTAQ AND BILAL  
CONSULTING ENGINEERS  
PLOT NO. 10, SECTOR 10, ISLAMABAD  
TEL: 37311111, 37311112, 37311113, 37311114  
FAX: 37311115, 37311116, 37311117, 37311118

**STRUCTURAL CONSULTANT:**  
**mushtaq and bilal  
consulting engineers**  
PLOT NO. 10, SECTOR 10, ISLAMABAD  
TEL: 37311111, 37311112, 37311113, 37311114  
FAX: 37311115, 37311116, 37311117, 37311118

**ELECTRICAL CONSULTANT:**  
**K. P. S. ASSOCIATES**  
ELECTRICAL ENGINEERS  
SUITE 101, SECTOR 10, ISLAMABAD, PAKISTAN  
TEL: 37311111, 37311112, 37311113, 37311114  
FAX: 37311115, 37311116, 37311117, 37311118

**PLUMBING CONSULTANT:**  
**PKS Associates**  
ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
SUITE 101, SECTOR 10, ISLAMABAD, PAKISTAN  
TEL: 37311111, 37311112, 37311113, 37311114  
FAX: 37311115, 37311116, 37311117, 37311118

**DEPARTMENT OF VETERINARY  
& ANIMAL SCIENCE**

**TITLE:**  
GENERAL NOTES

**FOR:**  
ISSUED FOR CONSTRUCTION

**DATE:**  
25/05/2011

**CODE:** WINDUWAL CREDIT: 4444/2011

**SCALE:** AS SHOWN DATE: MARCH-2011

**DATE:** 25/05/2011

**NO.:** MB-0840M GN-01











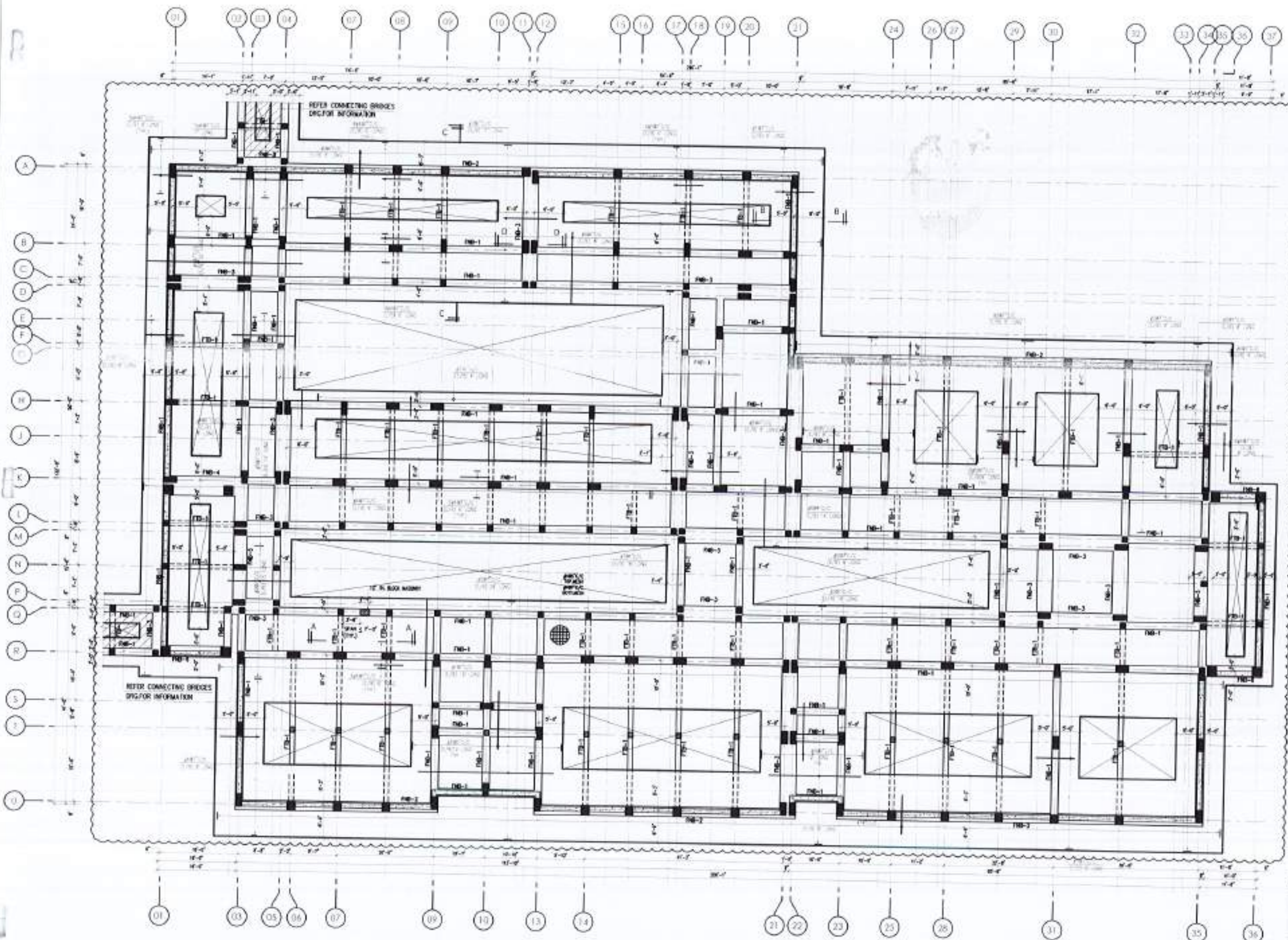












**FOUNDATION LAYOUT PLAN**

NOTES:-  
1- REFER FN-02 FOR FOUNDATION BEAM AND SECTIONS INFO.

ALL FOUNDATIONS AND COLUMNS HAVE ALREADY BEEN CONSTRUCTED.

NO.	DATE	REVISION

- 1. THE DRAWING IS A PRELIMINARY DESIGN AND NOT TO BE USED FOR CONSTRUCTION WITHOUT THE APPROVAL OF THE ARCHITECT.
- 2. THE DRAWING IS A PRELIMINARY DESIGN AND NOT TO BE USED FOR CONSTRUCTION WITHOUT THE APPROVAL OF THE ARCHITECT.
- 3. THE DRAWING IS A PRELIMINARY DESIGN AND NOT TO BE USED FOR CONSTRUCTION WITHOUT THE APPROVAL OF THE ARCHITECT.

COMPLETION OF LEFTOVER WORK OF CHOTADIA CAMPUS UNIVERSITY OF PUNJAB RAJALAKOT  
UNIVERSITY OF PUNJAB RAJALAKOT  
RAJALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

ARCHITECT: **The Architects**  
 STRUCTURAL CONSULTANT: **mushtaq and bilal consulting engineers**  
 ELECTRICAL CONSULTANT: **K.P. & ASSOCIATES ELECTRICAL ENGINEERS**  
 MECHANICAL CONSULTANT: **M. J. Khan**  
 ENVIRONMENTAL & MANAGEMENT CONSULTANT:

502 A0-000  
**NESPAK (PVT.) LIMITED**

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

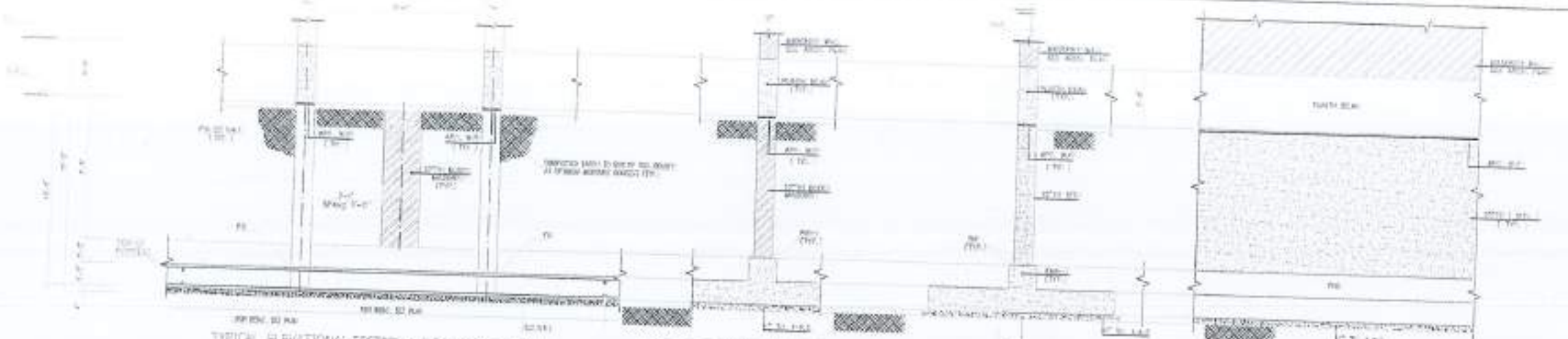
NO.	DATE	REVISION

4753/323/8D/03G05







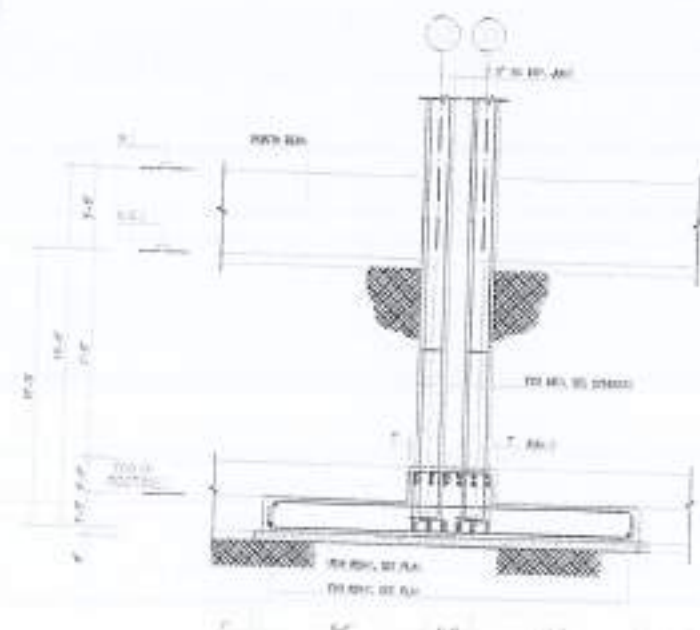
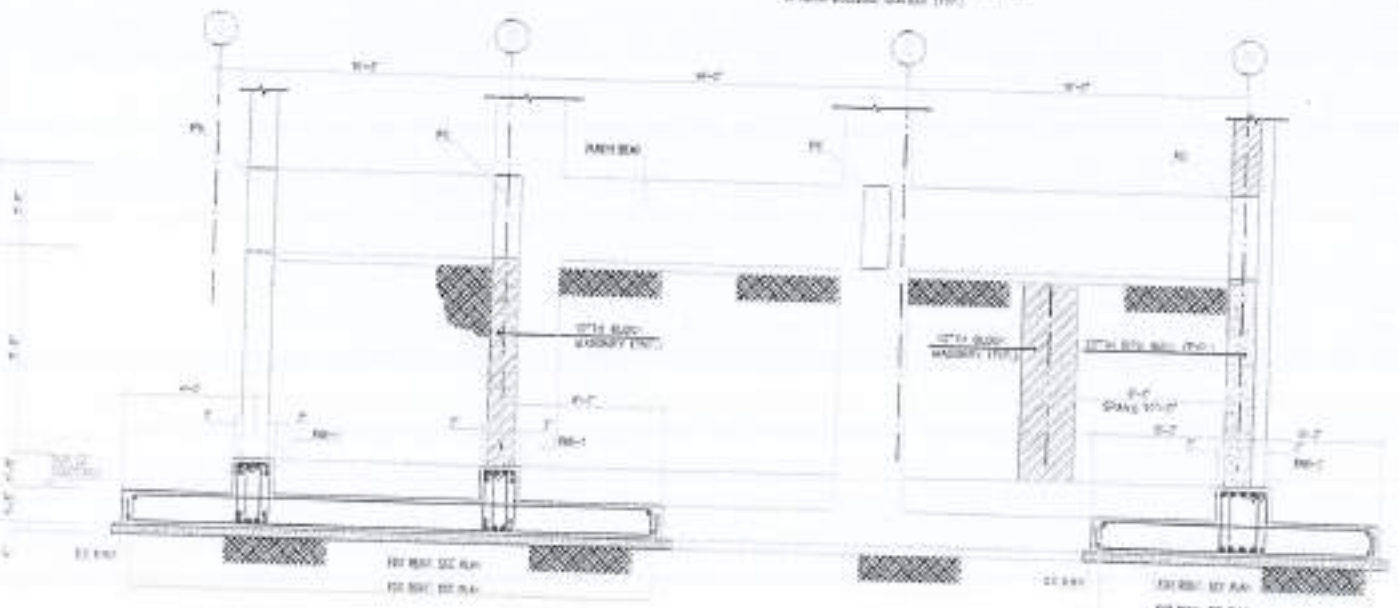
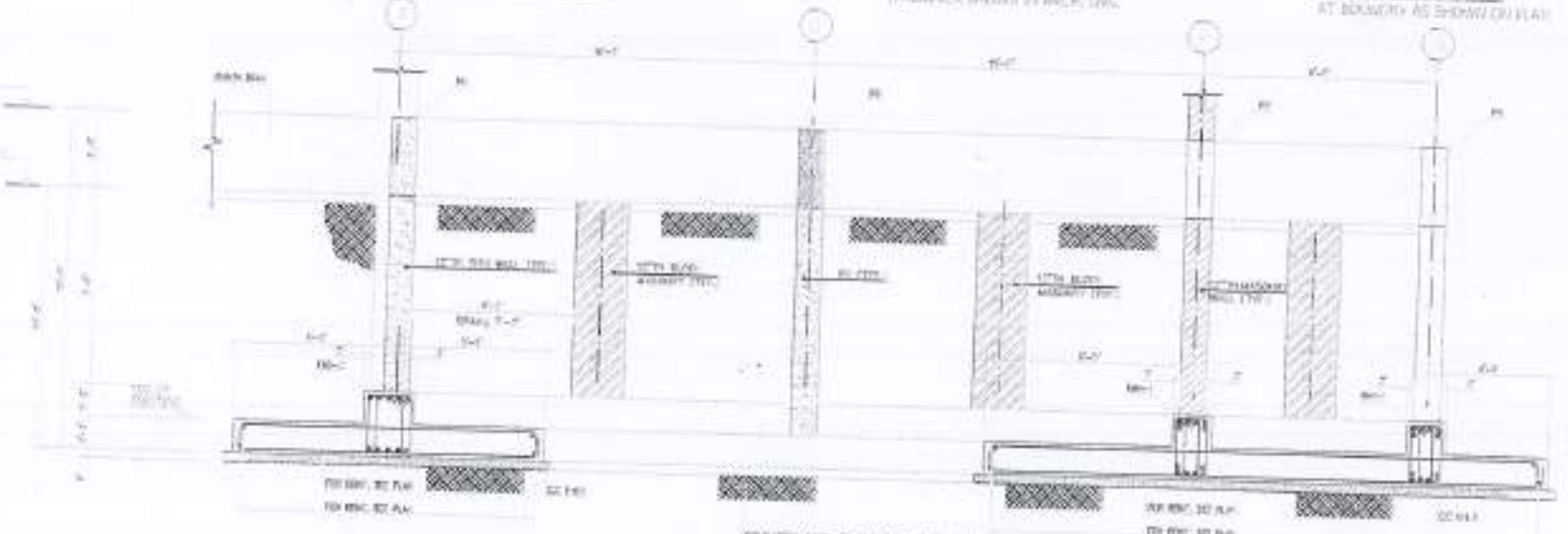


TYPICAL ELEVATIONAL SECTION A-A SHOWING SITUATION BELOW PLINTH BEAM

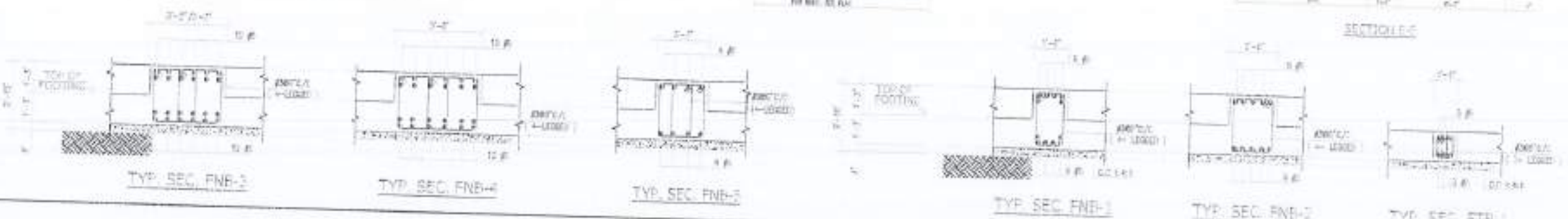
TYP. SEC. OF PE BELOW BLOCK MASONRY WHEREVER SHOWN IN ARCH. DRG.

TYPICAL SECTION B-B AT BOUNDARY AS SHOWN ON PLAN

TYPICAL SECTION C-C



SECTION D-D



TYP. SEC. FNB-3

TYP. SEC. FNB-4

TYP. SEC. FNB-5

TYP. SEC. FNB-1

TYP. SEC. FNB-2

TYP. SEC. FTB-1

NO.	REVISION

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THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND STRUCTURES AND FOR THE PROTECTION OF THE ADJACENT PROPERTIES.

CONTRIBUTOR OF LEFTOVER WORK OF CHINAJAL CAMPUS UNIVERSITY OF PESHAWAR, PESHAWAR.

DESIGNED BY: [Name]

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT



**AAB**  
MUSHTAQ AND BILAL  
CONSULTING ENGINEERS  
10-A, 10-B, 10-C, 10-D, 10-E, 10-F, 10-G, 10-H, 10-I, 10-J, 10-K, 10-L, 10-M, 10-N, 10-O, 10-P, 10-Q, 10-R, 10-S, 10-T, 10-U, 10-V, 10-W, 10-X, 10-Y, 10-Z, 10-AA, 10-AB, 10-AC, 10-AD, 10-AE, 10-AF, 10-AG, 10-AH, 10-AI, 10-AJ, 10-AK, 10-AL, 10-AM, 10-AN, 10-AO, 10-AP, 10-AQ, 10-AR, 10-AS, 10-AT, 10-AU, 10-AV, 10-AW, 10-AX, 10-AY, 10-AZ, 10-BA, 10-BB, 10-BC, 10-BD, 10-BE, 10-BF, 10-BG, 10-BH, 10-BI, 10-BJ, 10-BK, 10-BL, 10-BM, 10-BN, 10-BO, 10-BP, 10-BQ, 10-BR, 10-BS, 10-BT, 10-BU, 10-BV, 10-BW, 10-BX, 10-BY, 10-BZ, 10-CA, 10-CB, 10-CC, 10-CD, 10-CE, 10-CF, 10-CG, 10-CH, 10-CI, 10-CJ, 10-CK, 10-CL, 10-CM, 10-CN, 10-CP, 10-CQ, 10-CR, 10-CS, 10-CT, 10-CU, 10-CV, 10-CW, 10-CX, 10-CY, 10-CZ, 10-DA, 10-DB, 10-DC, 10-DD, 10-DE, 10-DF, 10-DG, 10-DH, 10-DI, 10-DJ, 10-DK, 10-DM, 10-DN, 10-DO, 10-DP, 10-DQ, 10-DR, 10-DS, 10-DT, 10-DU, 10-DV, 10-DW, 10-DX, 10-DY, 10-DZ, 10-EA, 10-EB, 10-EC, 10-ED, 10-EE, 10-EF, 10-EG, 10-EH, 10-EI, 10-EJ, 10-EK, 10-EL, 10-EM, 10-EN, 10-EO, 10-EP, 10-EQ, 10-ER, 10-ES, 10-ET, 10-EU, 10-EV, 10-EW, 10-EX, 10-EY, 10-EZ, 10-FA, 10-FB, 10-FC, 10-FD, 10-FE, 10-FF, 10-FG, 10-FH, 10-FI, 10-FJ, 10-FK, 10-FL, 10-FM, 10-FN, 10-FO, 10-FP, 10-FQ, 10-FR, 10-FS, 10-FT, 10-FU, 10-FV, 10-FW, 10-FX, 10-FY, 10-FZ, 10-GA, 10-GB, 10-GC, 10-GD, 10-GE, 10-GF, 10-GG, 10-GH, 10-GI, 10-GJ, 10-GK, 10-GL, 10-GM, 10-GN, 10-GO, 10-GP, 10-GQ, 10-GR, 10-GS, 10-GT, 10-GU, 10-GV, 10-GW, 10-GX, 10-GY, 10-GZ, 10-HA, 10-HB, 10-HC, 10-HD, 10-HE, 10-HF, 10-HG, 10-HH, 10-HI, 10-HJ, 10-HK, 10-HL, 10-HM, 10-HN, 10-HO, 10-HP, 10-HQ, 10-HR, 10-HS, 10-HT, 10-HU, 10-HV, 10-HW, 10-HX, 10-HY, 10-HZ, 10-IA, 10-IB, 10-IC, 10-ID, 10-IE, 10-IF, 10-IG, 10-IH, 10-II, 10-IJ, 10-IK, 10-IL, 10-IM, 10-IN, 10-IO, 10-IP, 10-IQ, 10-IR, 10-IS, 10-IT, 10-IU, 10-IV, 10-IW, 10-IX, 10-IY, 10-IZ, 10-JA, 10-JB, 10-JC, 10-JD, 10-JE, 10-JF, 10-JG, 10-JH, 10-JI, 10-JJ, 10-JK, 10-JL, 10-JM, 10-JN, 10-JO, 10-JP, 10-JQ, 10-JR, 10-JS, 10-JT, 10-JU, 10-JV, 10-JW, 10-JX, 10-JY, 10-JZ, 10-KA, 10-KB, 10-KC, 10-KD, 10-KE, 10-KF, 10-KG, 10-KH, 10-KI, 10-KJ, 10-KK, 10-KL, 10-KM, 10-KN, 10-KO, 10-KP, 10-KQ, 10-KR, 10-KS, 10-KT, 10-KU, 10-KV, 10-KW, 10-KX, 10-KY, 10-KZ, 10-LA, 10-LB, 10-LC, 10-LD, 10-LE, 10-LF, 10-LG, 10-LH, 10-LI, 10-LJ, 10-LK, 10-LL, 10-LM, 10-LN, 10-LO, 10-LP, 10-LQ, 10-LR, 10-LS, 10-LT, 10-LU, 10-LV, 10-LW, 10-LX, 10-LY, 10-LZ, 10-MA, 10-MB, 10-MC, 10-MD, 10-ME, 10-MF, 10-MG, 10-MH, 10-MI, 10-MJ, 10-MK, 10-ML, 10-MN, 10-MO, 10-MP, 10-MQ, 10-MR, 10-MS, 10-MT, 10-MU, 10-MV, 10-MW, 10-MX, 10-MY, 10-MZ, 10-NA, 10-NB, 10-NC, 10-ND, 10-NE, 10-NF, 10-NG, 10-NH, 10-NI, 10-NJ, 10-NK, 10-NL, 10-NM, 10-NO, 10-NP, 10-NQ, 10-NR, 10-NS, 10-NT, 10-NU, 10-NV, 10-NW, 10-NX, 10-NY, 10-NZ, 10-OA, 10-OB, 10-OC, 10-OD, 10-OE, 10-OF, 10-OG, 10-OH, 10-OI, 10-OJ, 10-OK, 10-OL, 10-OM, 10-ON, 10-OO, 10-OP, 10-OQ, 10-OR, 10-OS, 10-OT, 10-OU, 10-OV, 10-OW, 10-OX, 10-OY, 10-OZ, 10-PA, 10-PB, 10-PC, 10-PD, 10-PE, 10-PF, 10-PG, 10-PH, 10-PI, 10-PJ, 10-PK, 10-PL, 10-PM, 10-PN, 10-PO, 10-PP, 10-PQ, 10-PR, 10-PS, 10-PT, 10-PU, 10-PV, 10-PW, 10-PX, 10-PY, 10-PZ, 10-QA, 10-QB, 10-QC, 10-QD, 10-QE, 10-QF, 10-QG, 10-QH, 10-QI, 10-QJ, 10-QK, 10-QL, 10-QM, 10-QN, 10-QO, 10-QP, 10-QQ, 10-QR, 10-QS, 10-QT, 10-QU, 10-QV, 10-QW, 10-QX, 10-QY, 10-QZ, 10-RA, 10-RB, 10-RC, 10-RD, 10-RE, 10-RF, 10-RG, 10-RH, 10-RI, 10-RJ, 10-RK, 10-RL, 10-RM, 10-RN, 10-RO, 10-RP, 10-RQ, 10-RR, 10-RS, 10-RT, 10-RU, 10-RV, 10-RW, 10-RX, 10-RY, 10-RZ, 10-SA, 10-SB, 10-SC, 10-SD, 10-SE, 10-SF, 10-SG, 10-SH, 10-SI, 10-SJ, 10-SK, 10-SL, 10-SM, 10-SN, 10-SO, 10-SP, 10-SQ, 10-SR, 10-SS, 10-ST, 10-SU, 10-SV, 10-SW, 10-SX, 10-SY, 10-SZ, 10-TA, 10-TB, 10-TC, 10-TD, 10-TE, 10-TF, 10-TG, 10-TH, 10-TI, 10-TJ, 10-TK, 10-TL, 10-TM, 10-TN, 10-TO, 10-TP, 10-TQ, 10-TR, 10-TS, 10-TT, 10-TU, 10-TV, 10-TW, 10-TX, 10-TY, 10-TZ, 10-UA, 10-UB, 10-UC, 10-UD, 10-UE, 10-UF, 10-UG, 10-UH, 10-UI, 10-UJ, 10-UK, 10-UL, 10-UM, 10-UN, 10-UO, 10-UP, 10-UQ, 10-UR, 10-US, 10-UT, 10-UY, 10-UZ, 10-VA, 10-VB, 10-VC, 10-VD, 10-VE, 10-VF, 10-VG, 10-VH, 10-VI, 10-VJ, 10-VK, 10-VL, 10-VM, 10-VN, 10-VO, 10-VP, 10-VQ, 10-VR, 10-VS, 10-VT, 10-VU, 10-VV, 10-VW, 10-VX, 10-VY, 10-VZ, 10-WA, 10-WB, 10-WC, 10-WD, 10-WE, 10-WF, 10-WG, 10-WH, 10-WI, 10-WJ, 10-WK, 10-WL, 10-WM, 10-WN, 10-WO, 10-WP, 10-WQ, 10-WR, 10-WS, 10-WT, 10-WU, 10-WV, 10-WX, 10-WY, 10-WZ, 10-XA, 10-XB, 10-XC, 10-XD, 10-XE, 10-XF, 10-XG, 10-XH, 10-XI, 10-XJ, 10-XK, 10-XL, 10-XM, 10-XN, 10-XO, 10-XP, 10-XQ, 10-XR, 10-XS, 10-XT, 10-XU, 10-XV, 10-XW, 10-XX, 10-XY, 10-XZ, 10-YA, 10-YB, 10-YC, 10-YD, 10-YE, 10-YF, 10-YG, 10-YH, 10-YI, 10-YJ, 10-YK, 10-YL, 10-YM, 10-YN, 10-YO, 10-YP, 10-YQ, 10-YR, 10-YS, 10-YT, 10-YU, 10-YV, 10-YW, 10-YX, 10-YY, 10-YZ, 10-ZA, 10-ZB, 10-ZC, 10-ZD, 10-ZE, 10-ZF, 10-ZG, 10-ZH, 10-ZI, 10-ZJ, 10-ZK, 10-ZL, 10-ZM, 10-ZN, 10-ZO, 10-ZP, 10-ZQ, 10-ZR, 10-ZS, 10-ZT, 10-ZU, 10-ZV, 10-ZW, 10-ZX, 10-ZY, 10-ZZ

502 A0-000

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VETERINARY & ANIMAL SCIENCE

PEP FOUNDATION, SE-10



4753/023180/24/001

























BAY NO.	SPAN	BAY NO.	SPAN		SPAN		SPAN		SPAN		TOTAL NO. OF BEAMS	TOTAL NO. OF JOINTS
			1	2	1	2	1	2	1	2		
1	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
2	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
3	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
4	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
5	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
6	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
7	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
8	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
9	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
10	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
11	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
12	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
13	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
14	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
15	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
16	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
17	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
18	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
19	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
20	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
21	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
22	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
23	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
24	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
25	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
26	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
27	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
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29	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
30	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
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33	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
34	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
35	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
36	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
37	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
38	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
39	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
40	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
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78	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
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80	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
81	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
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98	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
99	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
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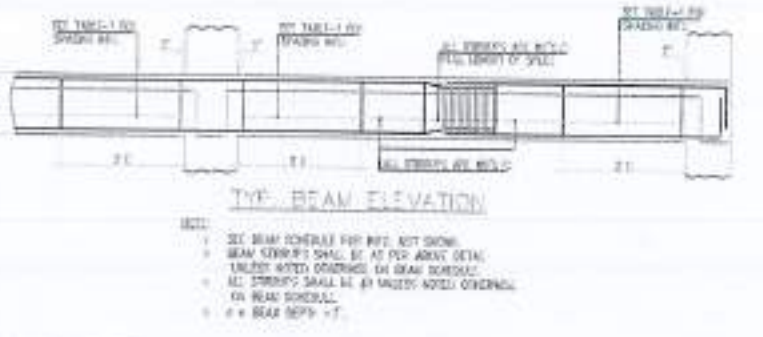
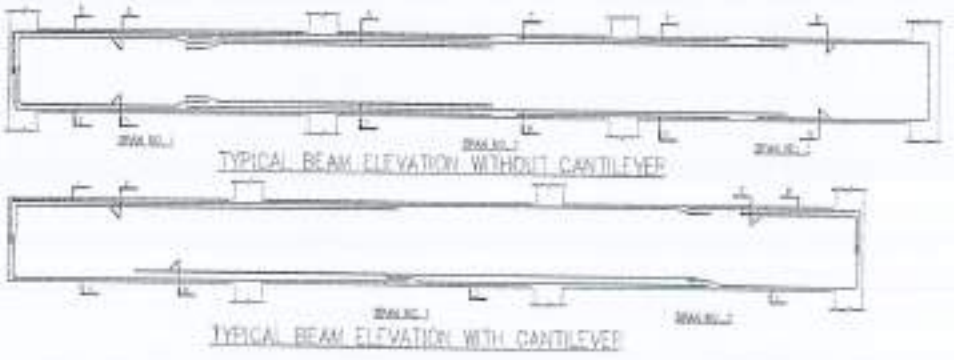
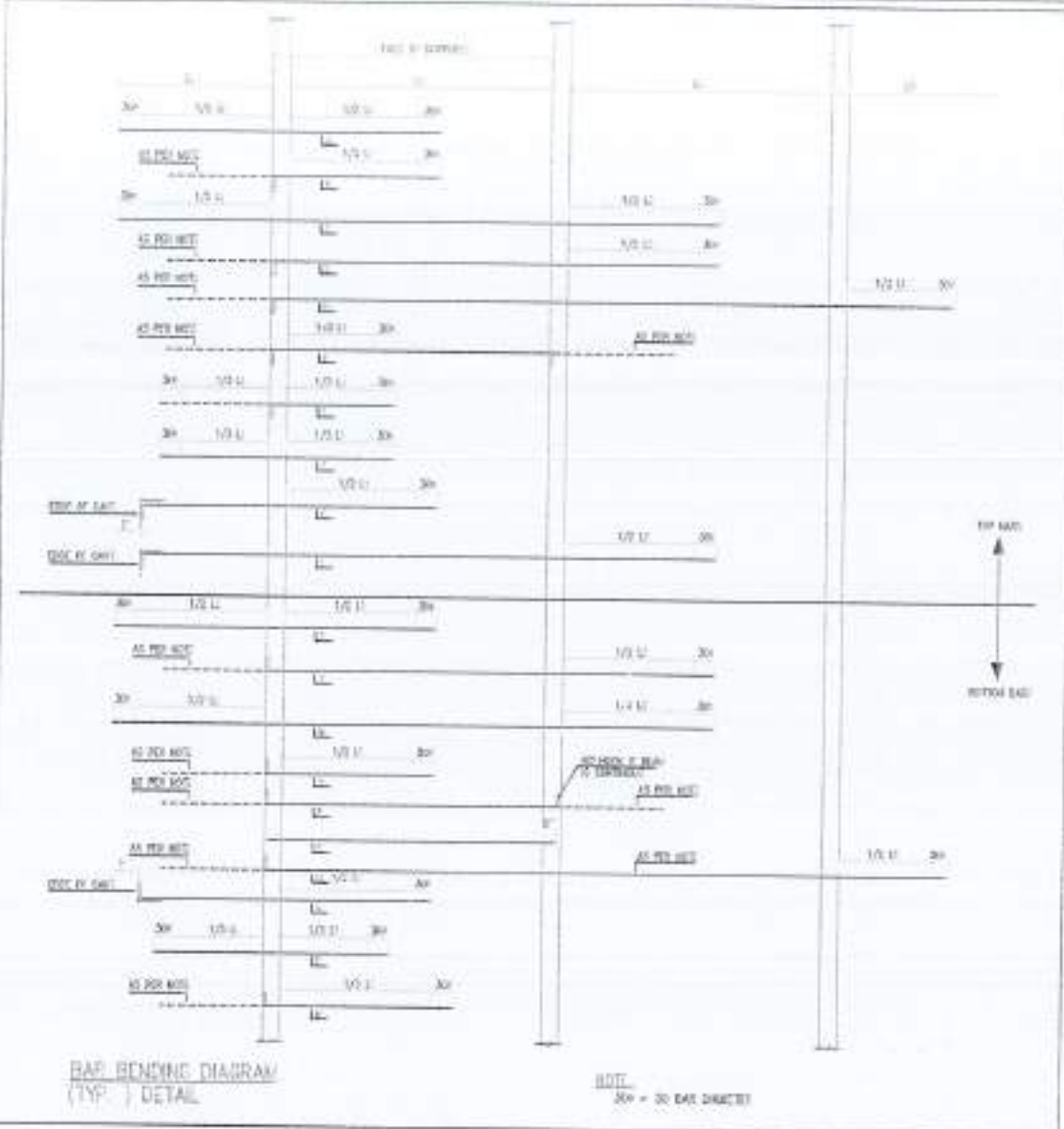


TABLE - BEAM STIRRUP SPACING

BEAM NO.	SPAN	STIRRUP NO.	STIRRUP SIZE	STIRRUP SPACING
1	12'	1	#4	12"
2	12'	2	#4	12"
3	12'	3	#4	12"
4	12'	4	#4	12"
5	12'	5	#4	12"
6	12'	6	#4	12"
7	12'	7	#4	12"
8	12'	8	#4	12"
9	12'	9	#4	12"
10	12'	10	#4	12"















# LIST OF DRAWING

## HI-TECH, LIBRARY AND GIRLS COMMON ROOM

SHEET Nos.	DESCRIPTION	DRAWING NO
001	TITLE SHEET	
002	LIST OF DRAWINGS	SD-01
003	GENERAL NOTES	GN-01
004	COLUMN LAYOUT PLAN	CO-01
005	FOUNDATION PLAN	FN-01
006	FOUNDATION DETAILS	FN-02
007	PLINTH BEAM FRAMING PLAN	PB-01
008	FIRST FLOOR FRAMING PLAN	FR-01
009	ROOF LEVEL FRAMING PLAN	FR-02
010	BEAM SCHEDULE	BM-01
011	BEAM SCHEDULE	BM-02
012	STAIR CASE DETAILS	ST-01



REV.	DATE	BY	REMARKS

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PROJECT:  
COMPLETION OF LEFTOVER WORK  
OF CHORAGALA CAMPUS  
UNIVERSITY OF PUNJAB  
RAWALAKOT.

CLIENT:  
UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES  
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The Architect:  
MUSHTAQ AND BILAL  
CONSULTING ENGINEERS

STRUCTURAL CONSULTANT:  
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K.F. & ASSOCIATES  
ENVIRONMENTAL ENGINEERS  
B-1/100, G-7/10, Jinnah Avenue, F-7/2

SCALE: DRAWING NO:  
502 A0-000

PREPARED BY:  
NESPAC (PVT.) LIMITED

FOR PROJECT TO:  
DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
LIST OF DRAWINGS  
WORKING DRAWING

DATE:  
DRAWN BY:  
DESIGNED BY:  
CHECKED BY:

APPROVED BY:

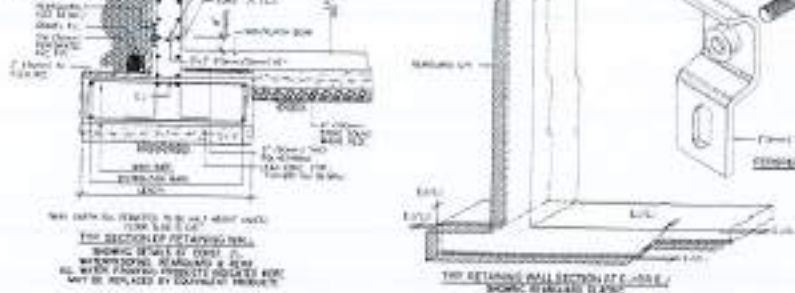
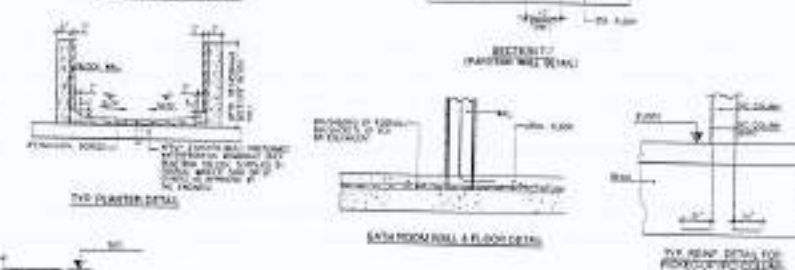
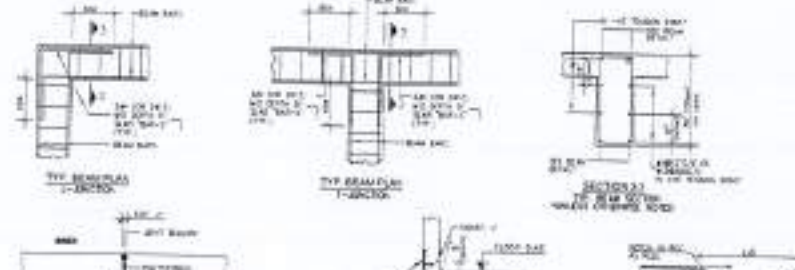
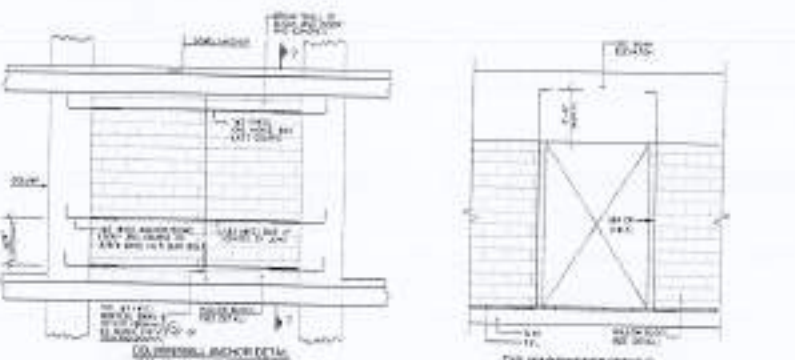
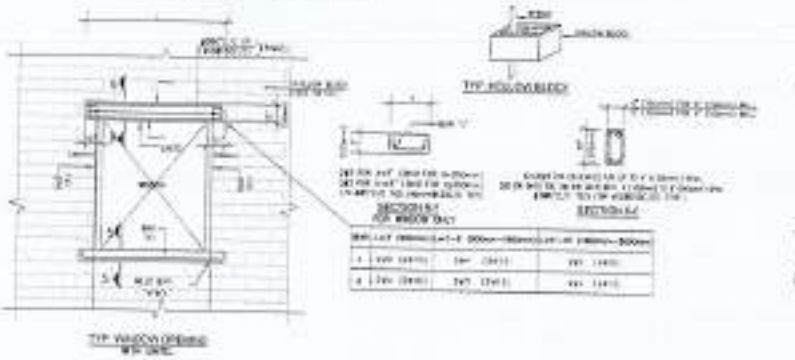
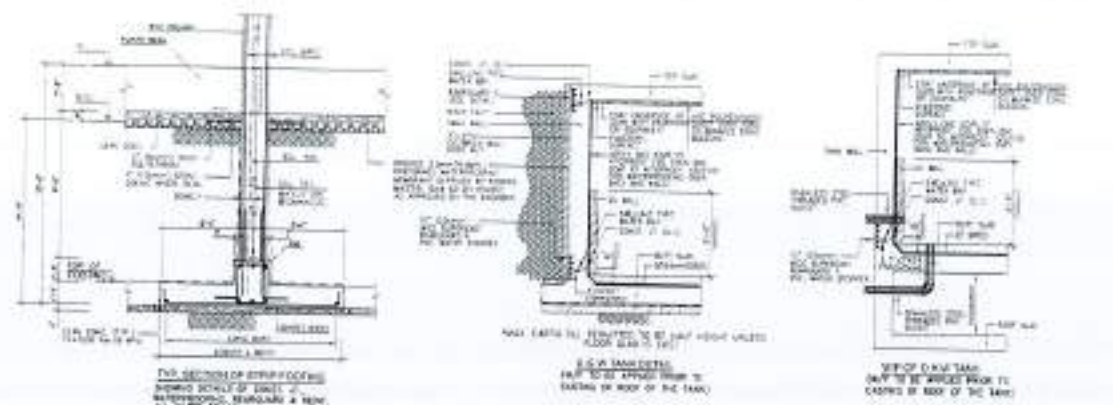
SCALE: DATE:  
NEXT: APRIL 2011

PROJECT NO:  
4753/322/BD/03B00









**GENERAL NOTES**

1. ALL WORK SHALL BE ACCORDING TO THE SPECIFICATIONS AND STANDARDS OF THE PAKISTAN STANDARDS AUTHORITY (PSA).
2. ALL MATERIALS SHALL BE OF THE BEST QUALITY AND SHALL BE SUPPLIED BY THE CONTRACTOR.
3. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.
5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL SERVICES AND UTILITIES AT ALL TIMES.
6. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SERVICES AND UTILITIES.
8. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SERVICES AND UTILITIES.
10. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.

NO.	DESCRIPTION	QUANTITY	UNIT	REMARKS
1	CONCRETE	1000	CUM	
2	STEEL	100	TONS	
3	BRICKS	10000	SQ. METERS	
4	PLASTER	1000	SQ. METERS	
5	PAINT	100	LITERS	
6	GLASS	100	SQ. METERS	
7	DOORS	10	NO.	
8	WINDOWS	10	NO.	
9	ROOFING	1000	SQ. METERS	
10	MECHANICAL	1000	SQ. METERS	

**REVISIONS**

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDER	10/10/2024
2	REVISED PER COMMENTS	15/10/2024
3	REVISED PER COMMENTS	20/10/2024
4	REVISED PER COMMENTS	25/10/2024
5	REVISED PER COMMENTS	30/10/2024

**LEGEND**

SYMBOL	DESCRIPTION
1	CONCRETE
2	STEEL
3	BRICKS
4	PLASTER
5	PAINT
6	GLASS
7	DOORS
8	WINDOWS
9	ROOFING
10	MECHANICAL

**GENERAL NOTES**

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7	DOORS	10	NO.	
8	WINDOWS	10	NO.	
9	ROOFING	1000	SQ. METERS	
10	MECHANICAL	1000	SQ. METERS	

**REVISIONS**

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDER	10/10/2024
2	REVISED PER COMMENTS	15/10/2024
3	REVISED PER COMMENTS	20/10/2024
4	REVISED PER COMMENTS	25/10/2024
5	REVISED PER COMMENTS	30/10/2024

**GENERAL NOTES**

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NO.	DATE	ISSUE	REVISION
1	10/10/2024	ISSUED FOR TENDER	
2	15/10/2024	REVISED PER COMMENTS	
3	20/10/2024	REVISED PER COMMENTS	
4	25/10/2024	REVISED PER COMMENTS	
5	30/10/2024	REVISED PER COMMENTS	

**COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF FOONCH, RAWALAKOT.**

**CLIENT:**  
UNIVERSITY OF FOONCH, RAWALAKOT

**LOCATION:**  
UNIVERSITY OF FOONCH, RAWALAKOT



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECT:**  
The Architects  
MUSHTAQ AND BILAL CONSULTING ENGINEERS

**STRUCTURAL CONSULTANTS:**  
MUSHTAQ AND BILAL CONSULTING ENGINEERS

**ELECTRICAL CONSULTANTS:**  
E.P. & ASSOCIATES ELECTRICAL ENGINEERS

**MECHANICAL CONSULTANTS:**  
E.P. & ASSOCIATES MECHANICAL ENGINEERS

**MECHANICAL CONSULTANTS:**  
E.P. & ASSOCIATES MECHANICAL ENGINEERS

**502 A0-000**

**PREPARED BY:**  
NESPAC (PVT.) LIMITED

**PROJECT TITLE:**  
DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

**DRAWING TITLE:**  
LIST OF DRAWINGS WORKING DRAWING

**CADRE:**  
ARCHITECT

**DESIGNER:**  
ARCHITECT

**CHECKER:**  
ARCHITECT

**DATE:**  
10/10/2024

**SCALE:**  
AS SHOWN

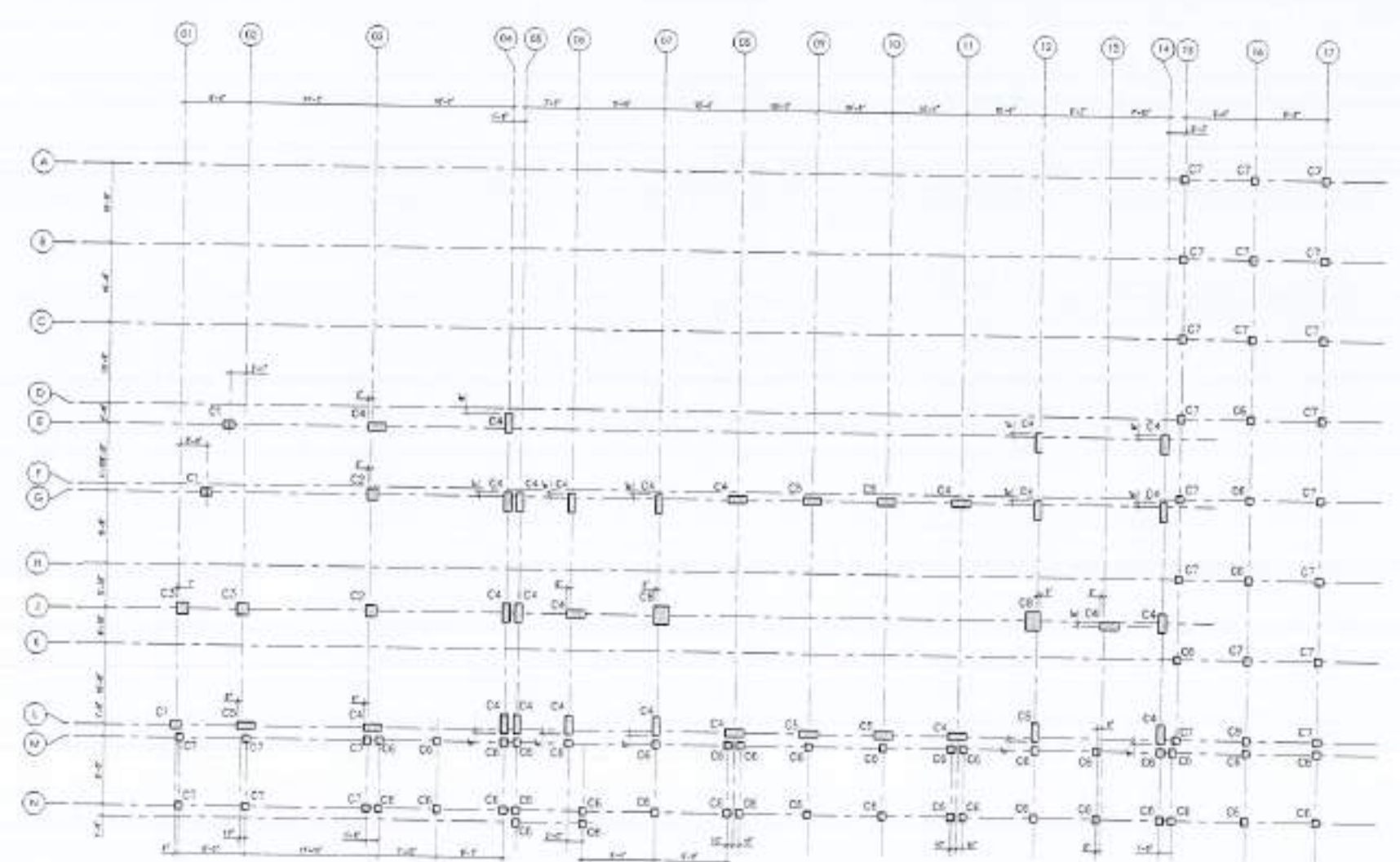
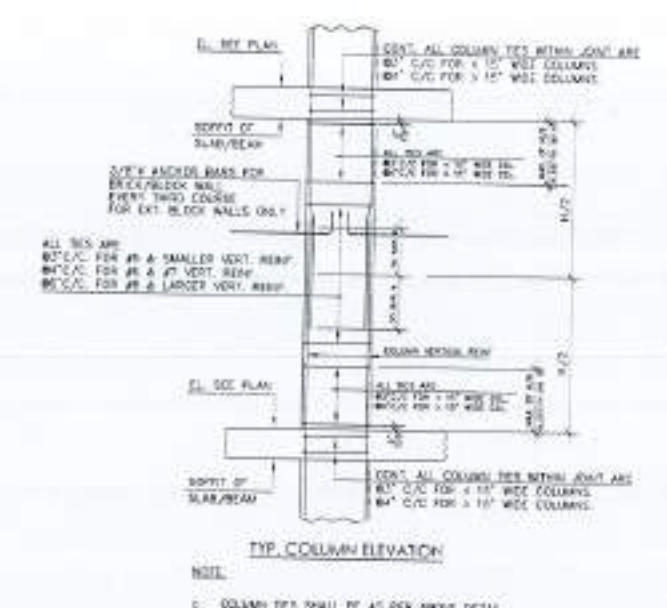
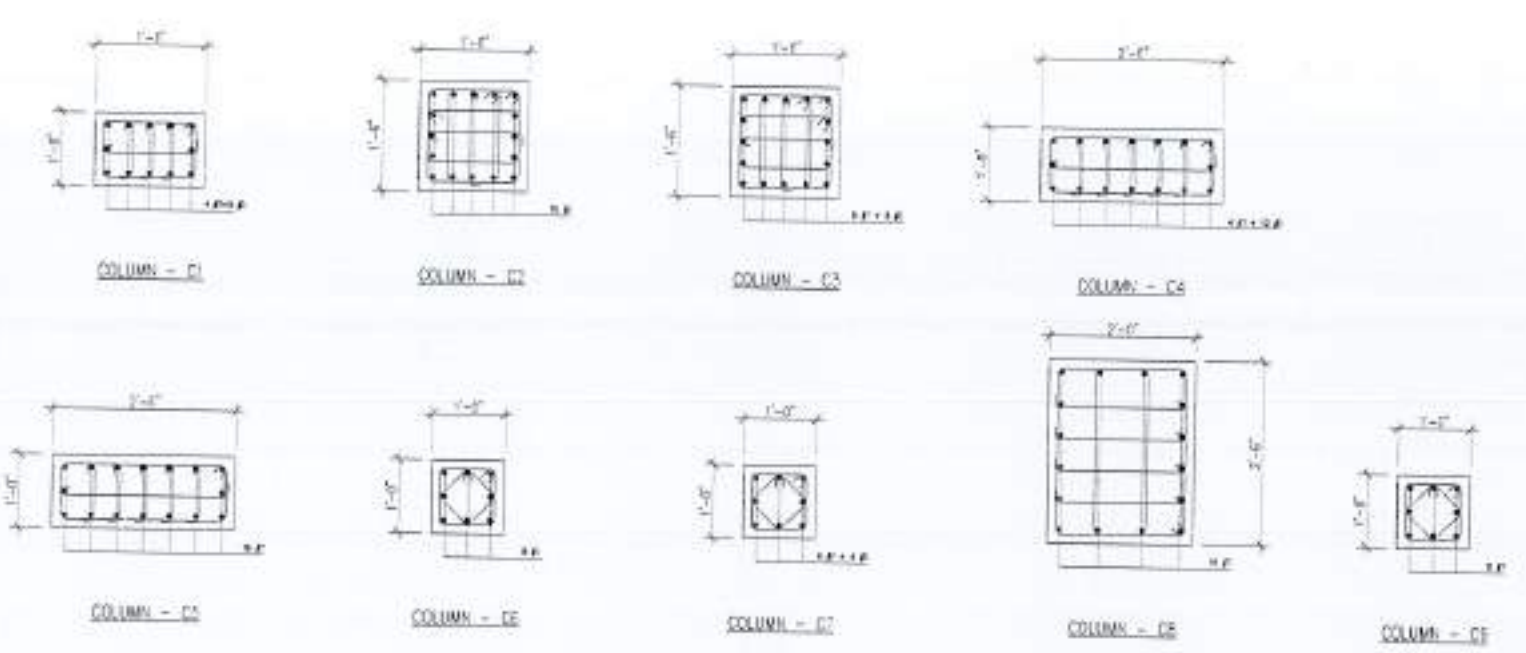
**4753/322/BD/00000**











**COLUMN LAYOUT PLAN**  
 NOTE:  
 1- ALL COLUMNS ARE CENTERED ON GRID UNLESS NOTED OTHERWISE ON PLAN.



REV. NO.	DATE	BY	CHKD.	REMARKS

PROJECT:  
 COMPLETION OF LEFTOVER WORK  
 OF CHOTAGALA CAMPUS  
 UNIVERSITY OF PUNJAB  
 RAWALPIND.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALPIND

WORKSHOP:

THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
  
 The Architects  
 11-A, F-7/2, Phase-7, Islamabad  
 P.O. Box 1000, Islamabad

STRUCTURAL CONSULTANT:  
  
 mushtaq and bilal  
 consulting engineers  
 300, KODR ROAD, ISLAMABAD, PAKISTAN  
 TEL: 011-358-02148-49314852148-5148  
 FAX: 011-358-02148-5148-5148

ELECTRICAL CONSULTANT:  
 S F & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 Plot No. 1, Gulshan-e-Iqbal Road, Islamabad

PLUMBING CONSULTANT:  
  
 Environmental & Management Solutions  
 10/1, F-7/2, Phase-7, Islamabad

DATE: 08/04/2011  
 DRAWING NO:

502 A0-000

OWNER & SUPERVISOR CONSULTANT:  
 NESPAK (PVT.) LIMITED

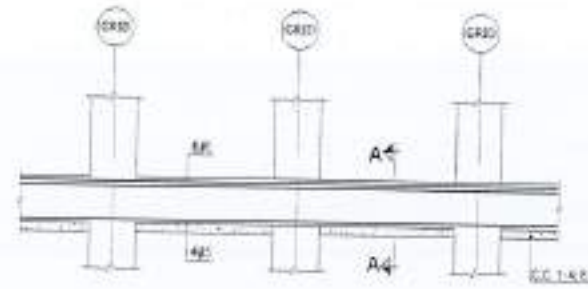
JOB PROJECT NO:  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 LIST OF DRAWINGS  
 WORKING DRAWING

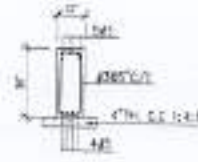
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BY:	
CHECKED BY:	
APPROVED BY:	
SCALE:	AS SHOWN
DATE:	08/04/2011
PROJECT NO:	4753/322/BD/03800



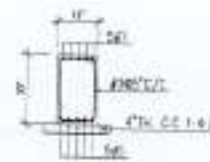




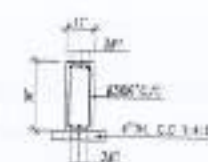
TYPICAL ELEV. OF PLINTH BEAM



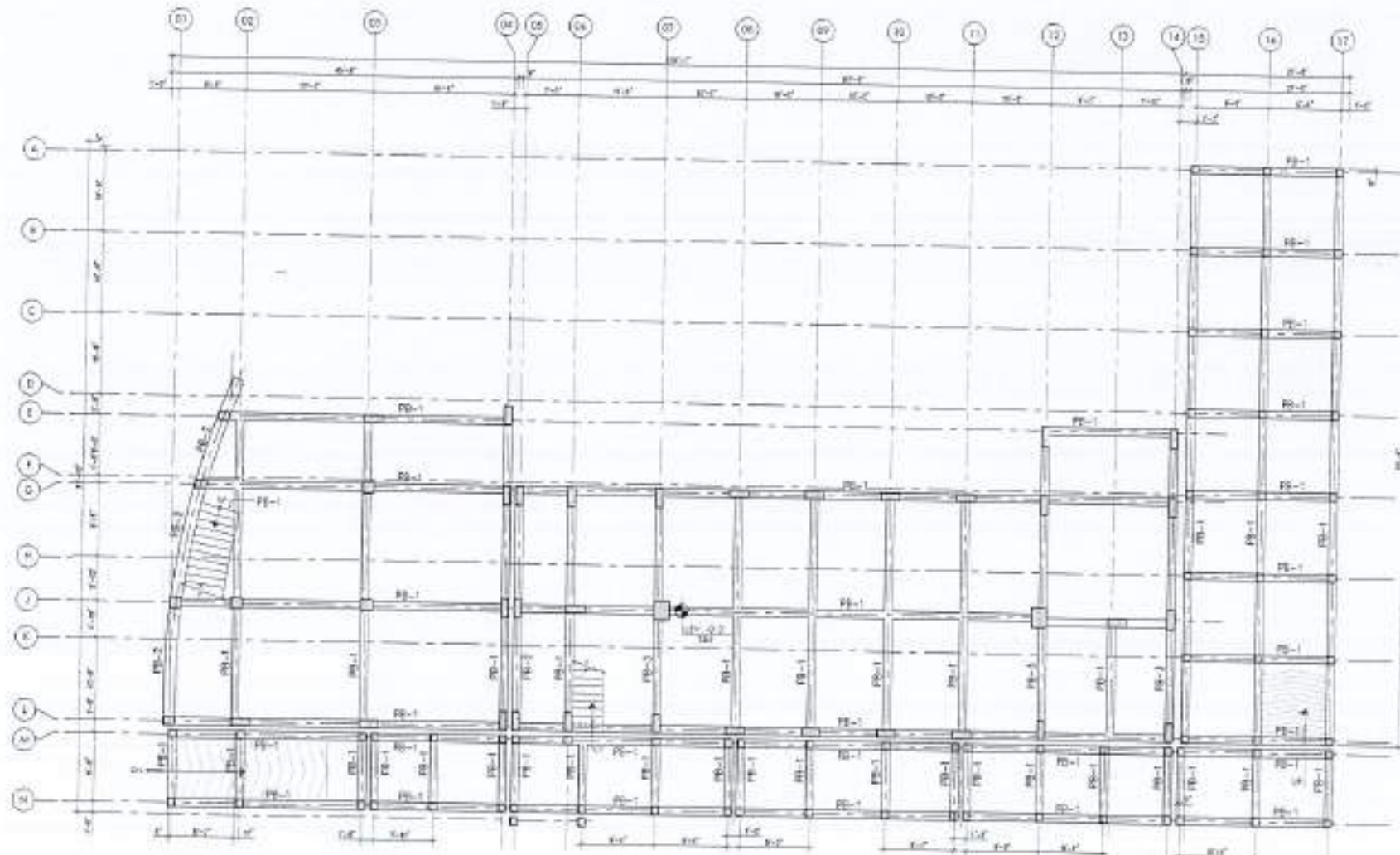
TYP. SEC. OF PB-1



TYP. SEC. OF PB-2



TYP. SEC. OF PB-3



PLINTH BEAM PLAN



REV.	DATE	BY	CHKD.

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPINDI

CITY: UNIVERSITY OF PUNJAB RAWALPINDI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: The Architects  
 MUSHTAQ AND BILAL CONSULTING ENGINEERS  
 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

ELECTRICAL CONSULTANT: K. P. & ASSOCIATES ELECTRICAL ENGINEERS

PLUMBING CONSULTANT: Environmental & Sanitary Services

DRAWING NO: 502 A0-000

NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

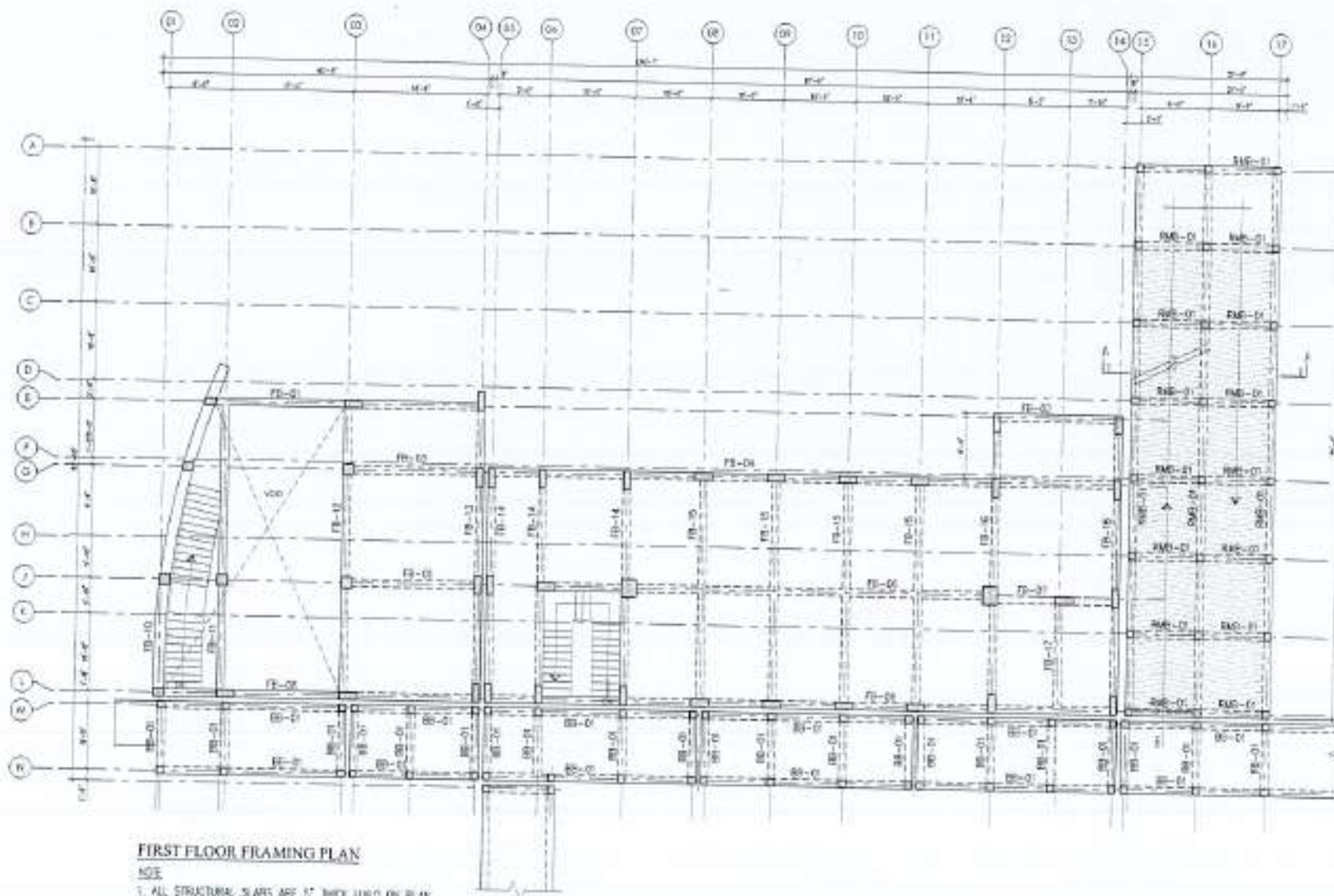
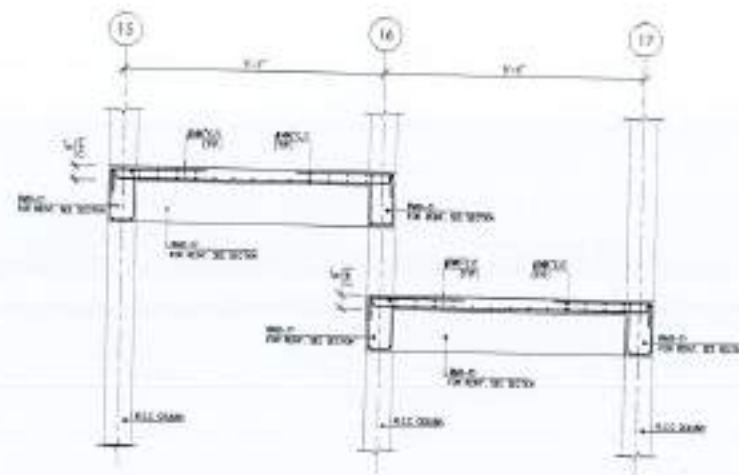
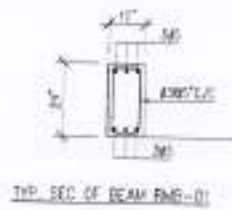
LIST OF DRAWINGS WORKING DRAWING

DATE: 07/04/2023

BY: 4753/322/BO/03800







**FIRST FLOOR FRAMING PLAN**

**NOTE**

1. ALL STRUCTURAL SLABS ARE 1" THICK UNLESS NOTED OTHERWISE.
2. REFER TO BEAM BR-01 & RBM-01 FOR BEAM REIN. INFO.
3. ALL BRIDGE BEAMS ARE BR-01.
4. ALL RAMP BEAMS ARE RBM-01.



REV.	DATE	BY	CHKD.

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**PROJECT:**  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

**CLIENT:**  
UNIVERSITY OF PUNJAB RAWALAKOT



**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.**

**ORIGINAL DESIGN CONSULTANT**

**ARCHITECT:**  
The Architects  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad

**STRUCTURAL CONSULTANT:**  
**mushtaq and bilal consulting engineers**  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad

**ELECTRICAL CONSULTANT:**  
E P A ASSOCIATES  
ELECTRICAL ENGINEERS  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad

**DRAWING CONSULTANT:**  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad  
11-A, F-7/2, Islamabad

**DESIGNING BY:**

**502**      **A0-000**

**PREPARED BY:**  
**NESPAK (PVT.) LIMITED**

**DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES**

**LIST OF DRAWINGS WORKING DRAWING**

**DATE:** 14/11/2024  
**SCALE:** 1/4" = 1'-0"  
**PROJECT NO.:** 4753/322/8D/03800













LIST OF DRAWING	
DWG. NO.	DRAWING TITLE
-	JOB TITLE & COVER SHEET
F00	FIXTURES SCHEDULE, LEGENDS & LIST OF DRAWINGS
F01	GROUND FLOOR PLAN PLUMBING LAYOUT
F02	FIRST FLOOR PLAN PLUMBING LAYOUT
F03	FIRST FLOOR HIGH LEVEL PLAN PLUMBING LAYOUT
F04	CLEAR STORY LEVEL PLAN
F05	TOP ROOF PLAN PLUMBING LAYOUT
F06 TO F10	ENLARGED TOILET AND LABS. DETAIL PLUMBING LAYOUT
T14	MISCELLANEOUS DETAIL SHEET

FIXTURE CONNECTIONS SCHEDULE			
FIXTURES	COLD WATER	HOT WATER	DRAIN PIPE
WC (ENGLISH)	20 mm	-	100
WC (ASIAN)	20 mm	-	100
LAVATORY	20 mm	20 mm	50
SHOWER	20 mm	20 mm	50
KITCHEN SINK	20 mm	20 mm	50
URINAL	20 mm	-	50

NOTES:

- 1-ALL DIMENSIONS ARE IN INCHES UNLESS AS NOTED.
- 2-ALL PIPE SIZES FOR P.P.R ARE OUTER DIA.
- 3-HORIZONTAL CLAMPING OF PIPES 10. TIMES OF DIA OF PIPE.
- 4-VERTICAL CLAMPING OF PIPES 15. TIMES OF DIA OF PIPE.

LEGEND	
SYMBOL / ABBR.	DESCRIPTION
T/A	TO ABOVE
F/A	FROM ABOVE
T/B	TO BELOW
F/B	FROM BELOW
DN	DOWN
TYP.	TYPICAL
ENE.	EMBEDDED
F	FIRST FLOOR
GF	GROUND FLOOR
BC	BB COCK
MS	MUSLIN SHOWER
V	ISOLATION VALVE
CV	CHECK VALVE / NON RETURN VALVE
B.F.S	BELOW FLOOR SLAB
@A.F.C	AT ABOVE FALSE CEILING

LEGEND	
SYMBOL / ABBR.	DESCRIPTION
CW	COLD WATER SUPPLY PIPE
HW	HOT WATER SUPPLY PIPE
GAS PIPE	GAS SUPPLY PIPE
SP	(SP) SOIL PIPE
SS	(SS) SOIL STACK
WP	(WP) WASTE PIPE
WS	(WS) WASTE STACK
VP	(VP) VENT PIPE
VS	(VS) VENT STACK
SW	(SW) SEWERAGE PIPE
GV / IV	GATE VALVE / ISOLATION VALVE
WC	WASHBASIN COUNTER TOP
WP	WASHBASIN PEDESTAL
SH	SHOWER
LAB SINK	LAB SINK
FD	FLOOR DRAIN
GT	GULLY TRAP
MH	MANHOLE
NH COVER	GOOD MANHOLE COVER
E.O.H.W.G.	ELECTRICAL OPERATED HOT WATER GEYSER
FCO / COP	FLOOR CLEAN OUT / CLEAN OUT PLUG
FLOW ARROW	FLOW ARROW
PPE DOWN (DN)	PIPE DOWN (DN)
PPE UP	PIPE UP



REV.	DATE	ISSUE	REMARKS

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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPINDI.

CLIENT: UNIVERSITY OF PUNJAB RAWALPINDI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: THE ARCHITECTS  
 2010-2011 PUNJAB UNIVERSITY  
 2011-2012 PUNJAB UNIVERSITY  
 2012-2013 PUNJAB UNIVERSITY  
 2013-2014 PUNJAB UNIVERSITY

ELECTRICAL CONSULTANT: K.P. & ASSOCIATES ELECTRICAL ENGINEERS  
 8-4 Bldg. G-10/40-42/40/40/40/40/40

PLUMBING CONSULTANT: NESPAC (PVT.) LIMITED  
 401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000

502

NESPAC (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

LIST OF DRAWING - FIXTURE CON. SCHEDULE & ABBREVIATION SHEET

DATE: 14/04/2024

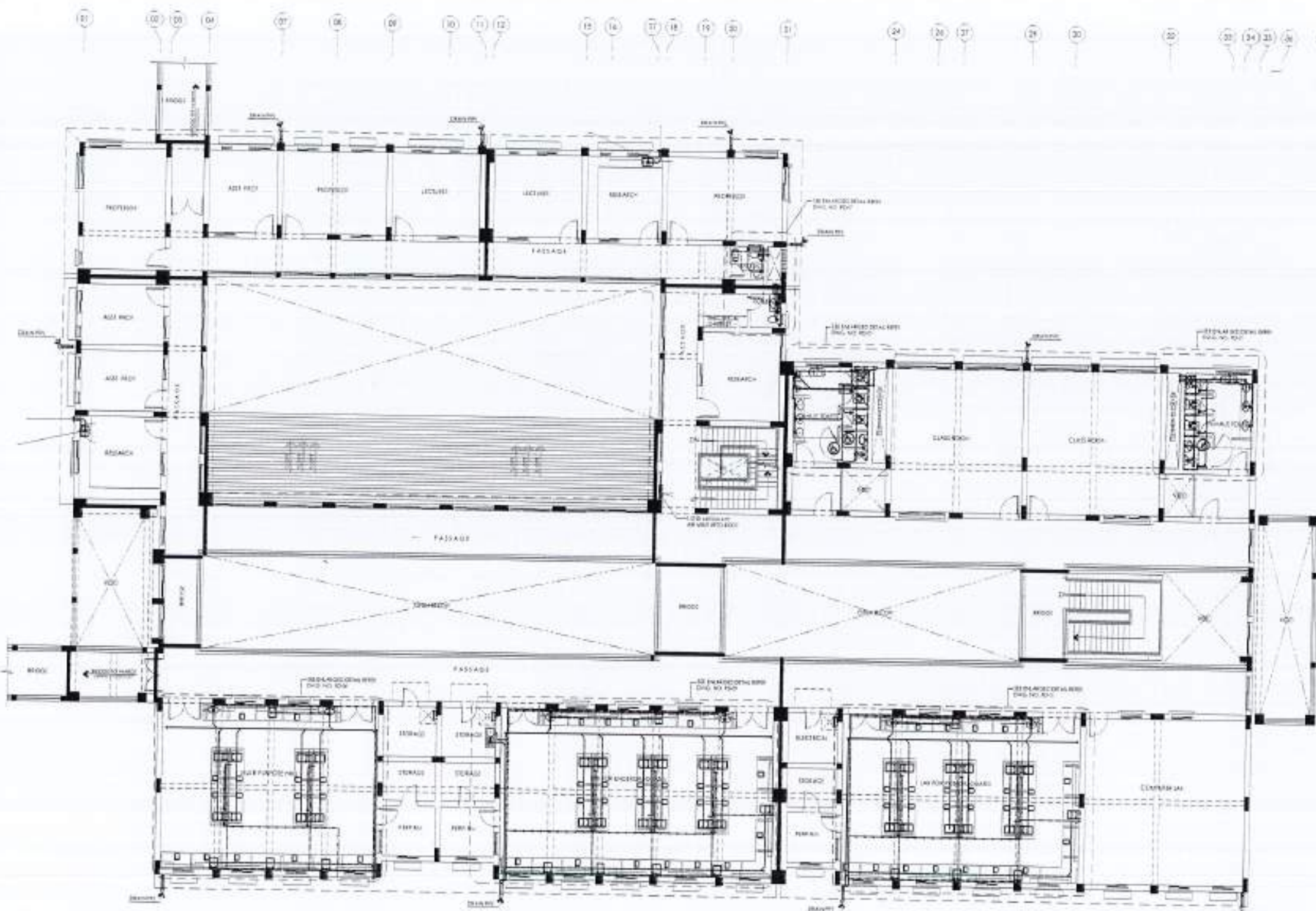
4753/326/BD/03F00











REV. NO.	DATE	BY	CHKD.

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPINDI.

CURF:  
 UNIVERSITY OF PUNJAB, RAWALPINDI.

NO. OF FLOOR:  
 NORTH EAST

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECT  
 ARCHITECTURE, PLANNING, INTERIORS, ENVIRONMENTAL DESIGN, LANDSCAPE ARCHITECTURE, PROJECT MANAGEMENT & CONSTRUCTION MANAGEMENT.

STRUCTURAL CONSULTANT:  
 **AAB**  
**mushtaq and bilal**  
 consulting engineers  
 204 HOOR STREET, SHARDA TOWN, KARACHI-7500  
 TEL: 37311111-1111, 37311111-1111 FAX: 37311111-1111  
 E-MAIL: MUSHTAQ@GMAIL.COM

ELECTRICAL CONSULTANT:  
 K.P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 8-AI-ROAD, GULSHAN-E-NAHAR, ISLAMABAD

PLUMBING CONSULTANT:  
 **K.P. Associates**  
 ENGINEERING & MANAGEMENT CONSULTANTS  
 11-AI-ROAD, GULSHAN-E-NAHAR, ISLAMABAD

DRAWING NO:  
 502

DATE:  
 18-11-20

PREPARED BY:  
 NESPAC (PVT.) LIMITED

FOR PROJECT USE:  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 FIRST FLOOR PLAN  
 PLUMBING LAYOUT

SCALE:  
 1/8" = 1'-0"

DATE:  
 18-11-20

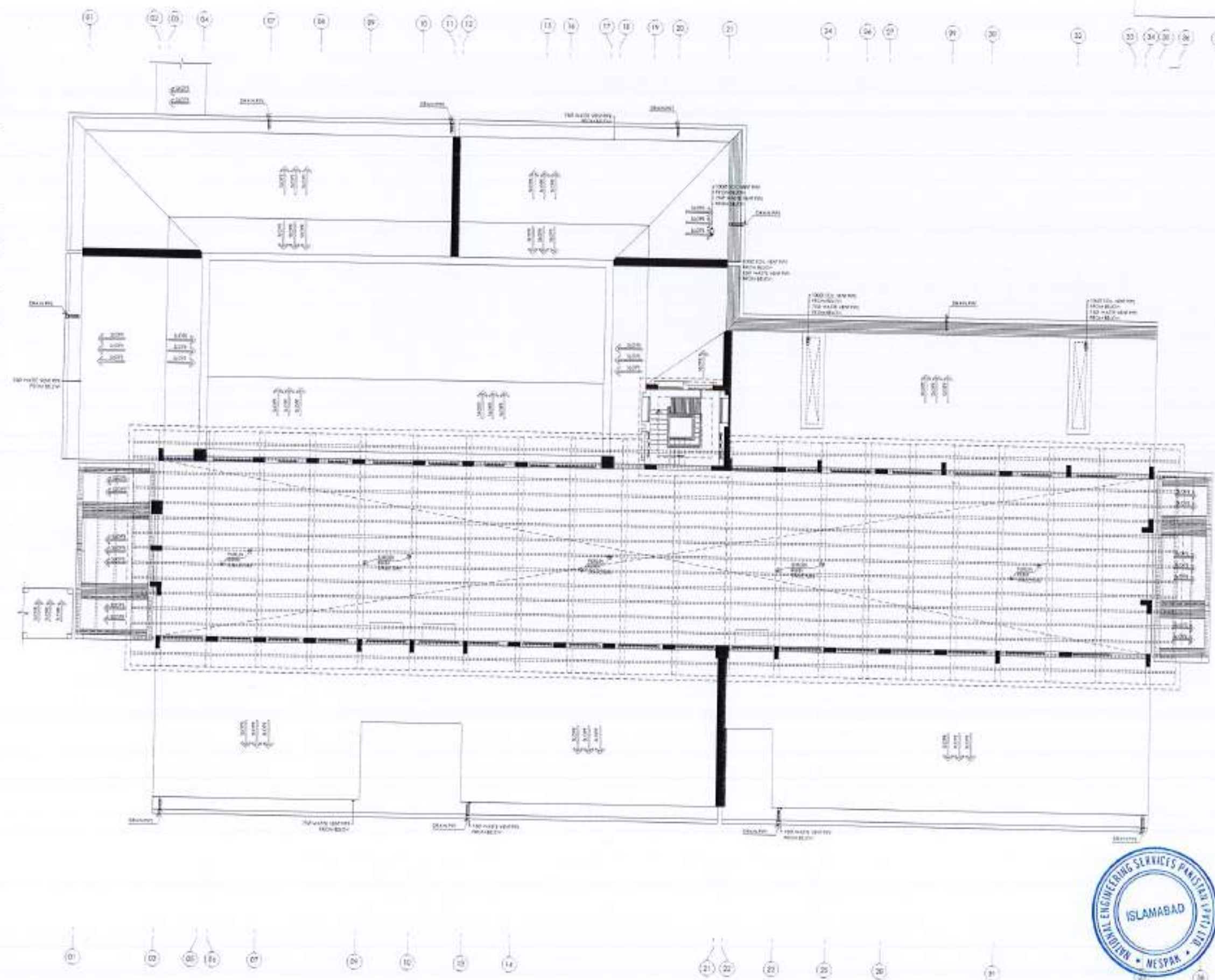
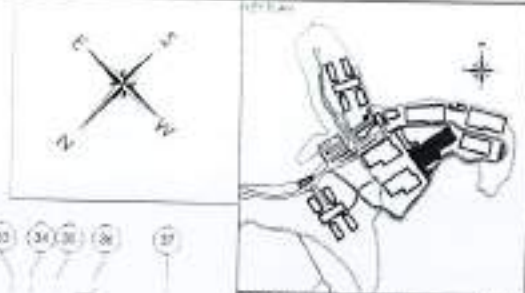
PROJECT NO:  
 4753/326/BD/03P02











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PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA RAJAKOTI

CLIENT: UNIVERSITY OF POKHARA RAJAKOTI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

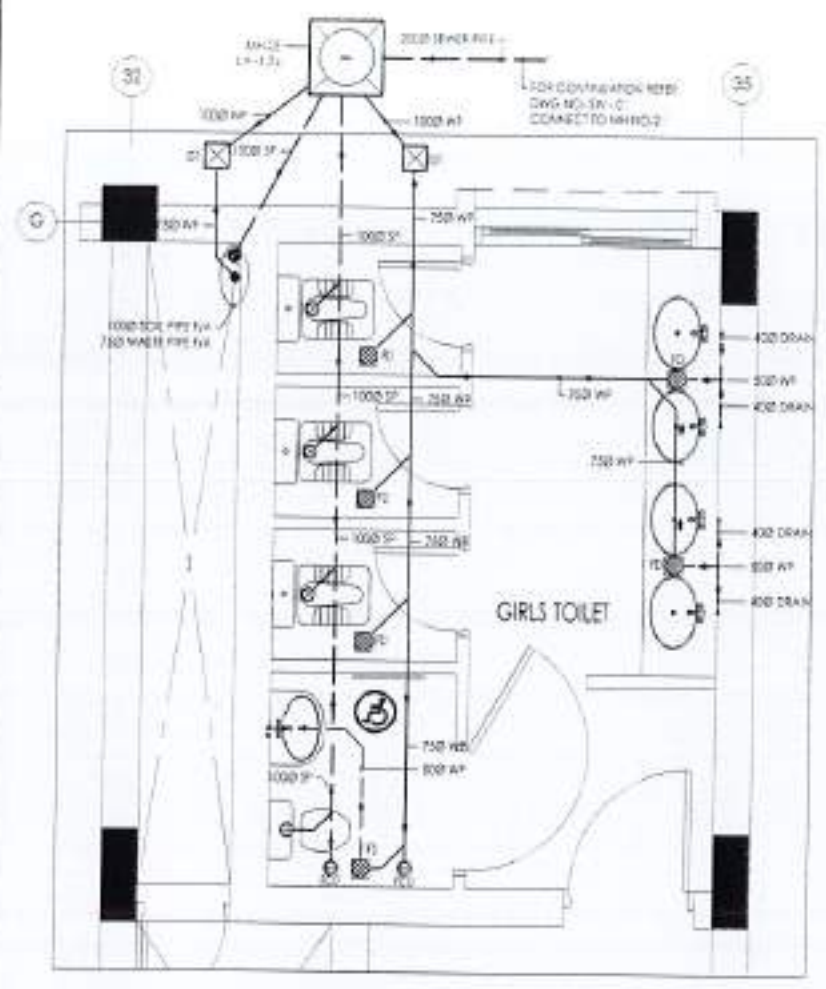
ORIGINAL DESIGN CONSULTANT

ARCHITECT: **the Architects**  
 ENGINEERS (PVT.) LTD.  
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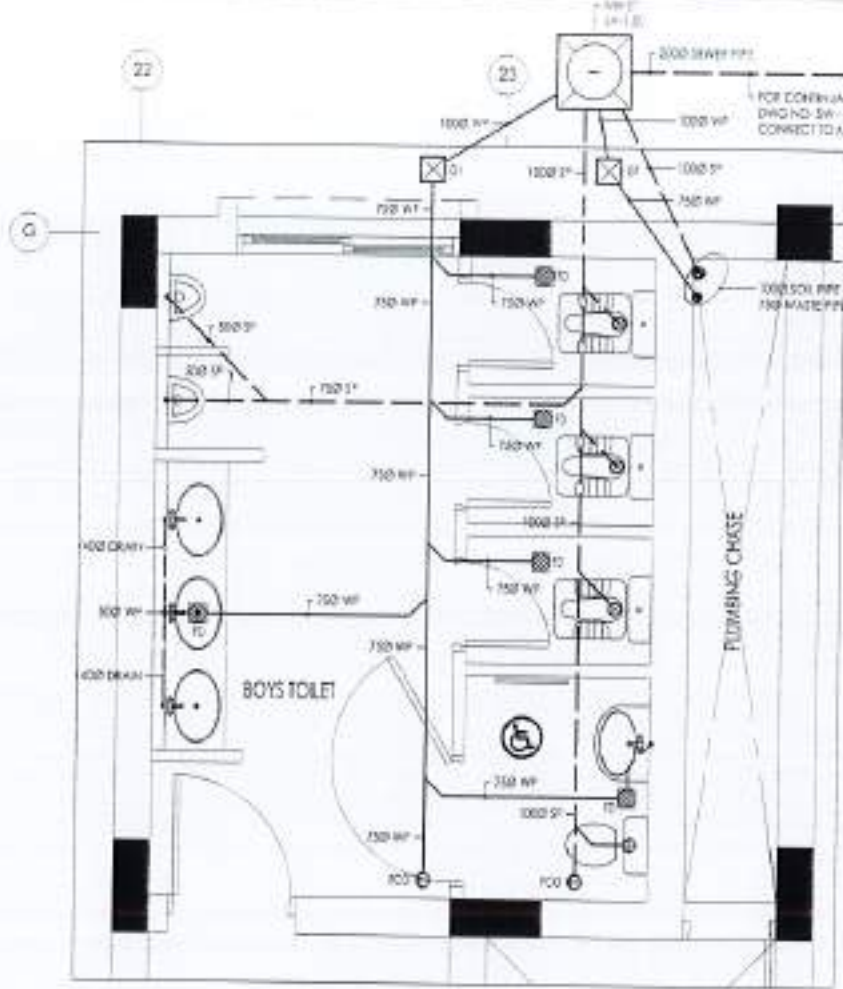




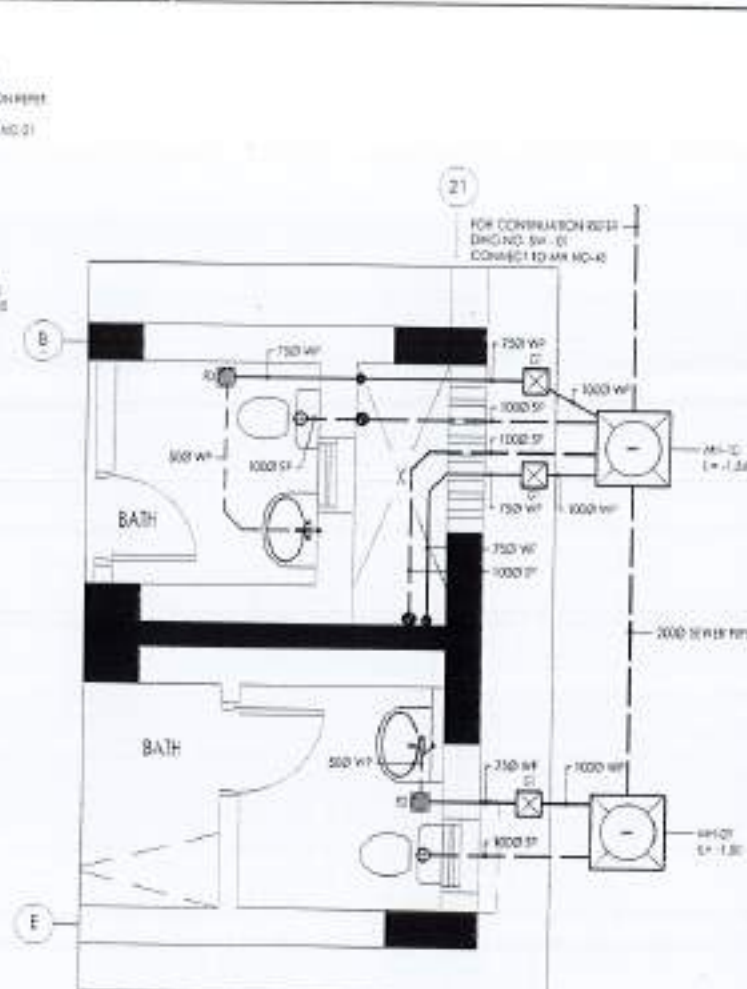




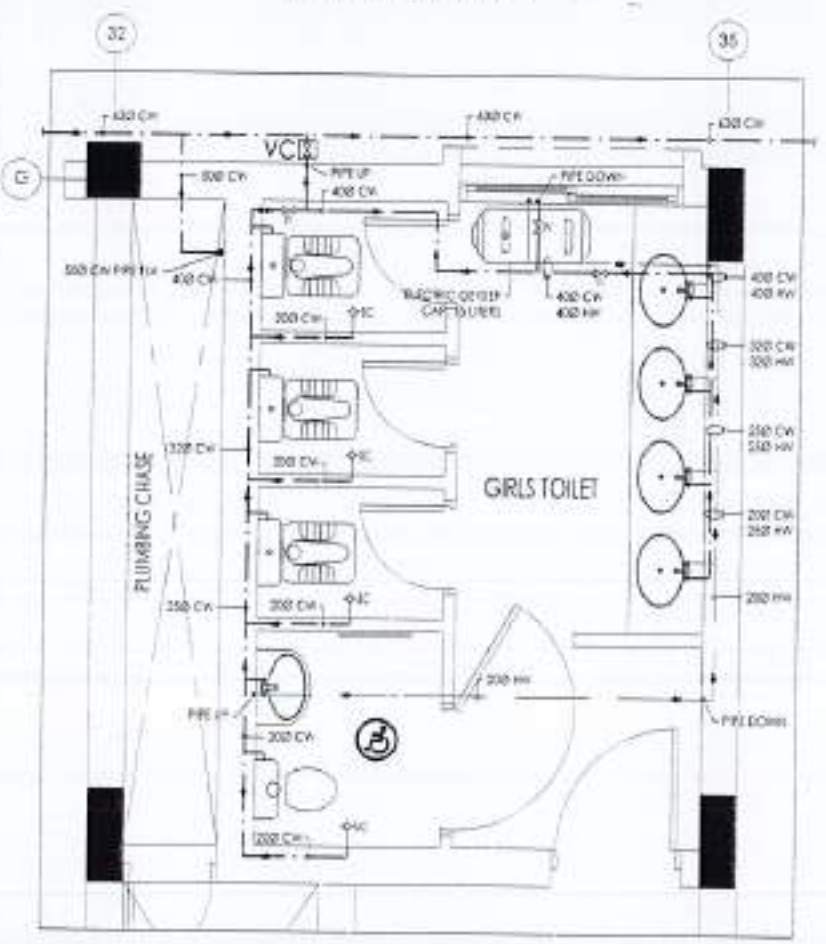
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SOIL & WASTE PIPING



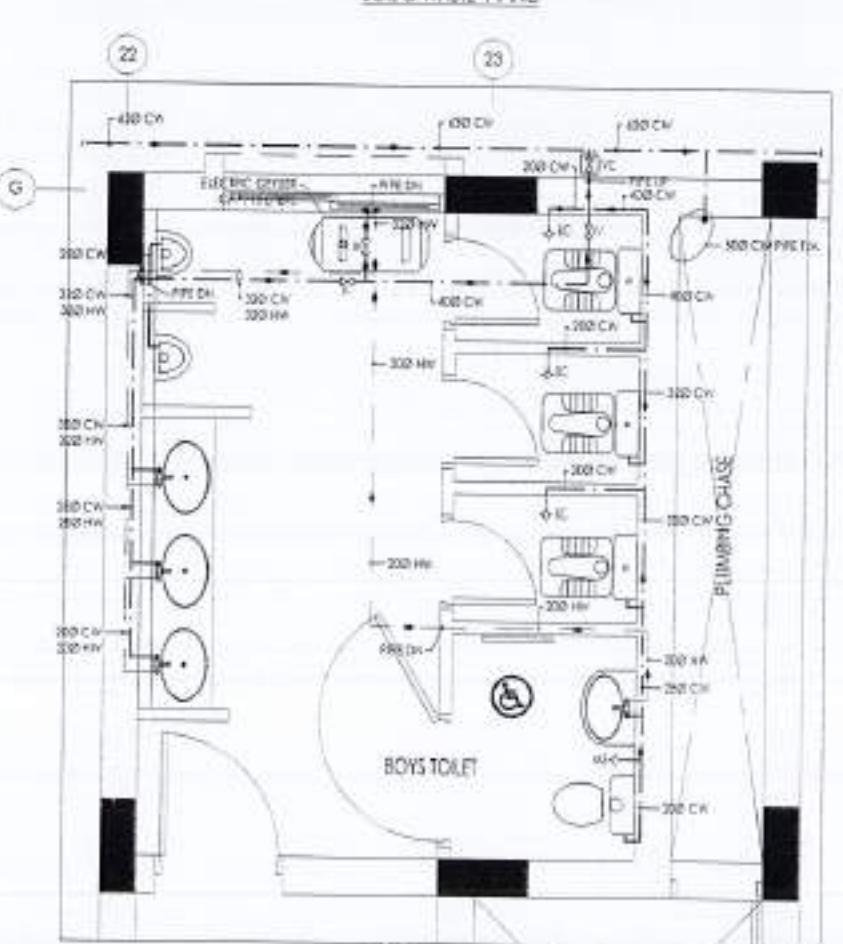
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SOIL & WASTE PIPING



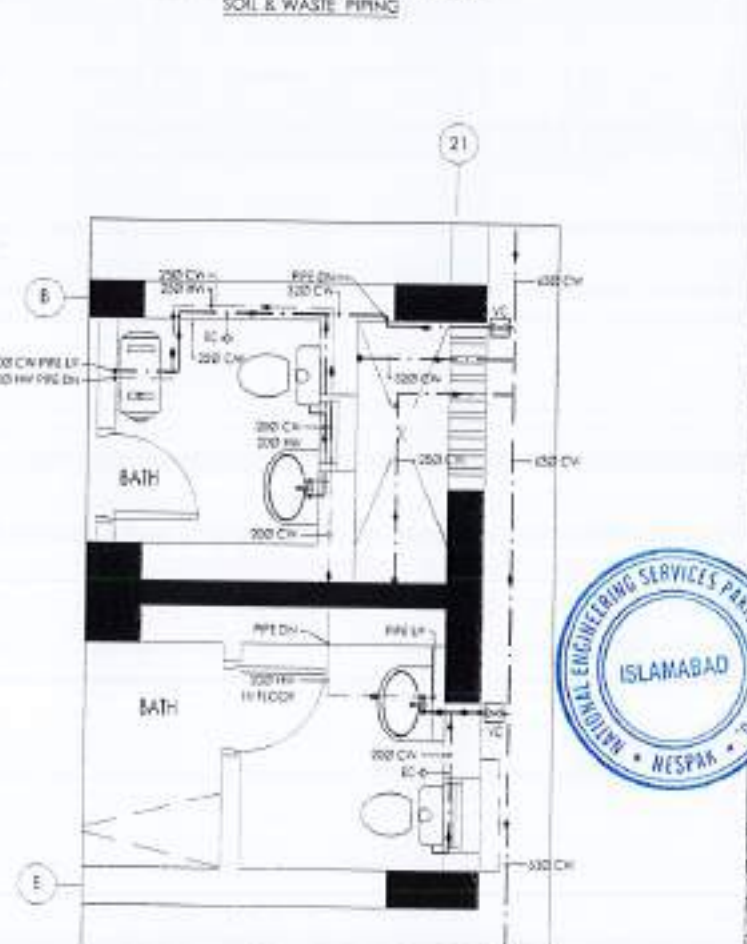
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SOIL & WASTE PIPING



ENLARGED TOILET DETAIL GROUND FLOOR  
COLD & HOT PIPING



ENLARGED TOILET DETAIL GROUND FLOOR  
COLD & HOT PIPING



ENLARGED TOILET DETAIL GROUND FLOOR  
COLD & HOT PIPING

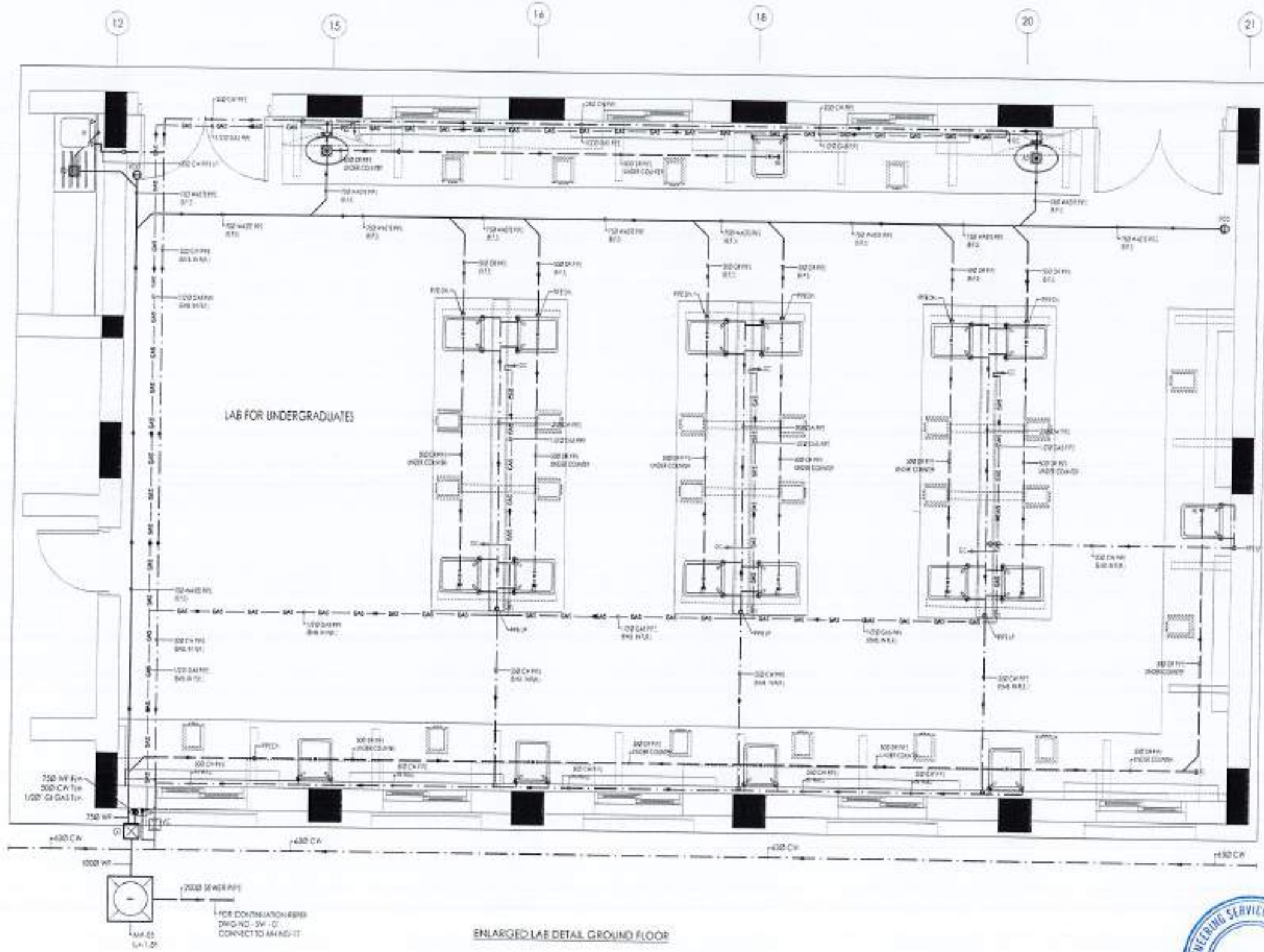
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<p>CLIENT: UNIVERSITY OF POKHARA RAWALAKOT</p>			
<p>THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.</p>			
<p>ORIGINAL DESIGN CONSULTANT</p>			
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<p>STRUCTURAL CONSULTANT:  K P &amp; ASSOCIATES ELECTRICAL ENGINEER 8-98 B/5, DAFARUJI JAMALI ROAD, KARACHI-75000</p>			
<p>PLUMBING CONSULTANT:  mushtaq and bial consulting engineers 34, NOKOR ROAD, SHARAF PURA, KARACHI-7500 TEL: 9951-450-4130/321760-4332 KARACHI-75000 FAX: 9951-450-4130</p>			
DRAWN: 502		DATE: 03/04/2024	
<p>DESIGNED BY: NESPAK (PVT.) LIMITED</p>			
<p>DEPARTMENT OF AGRICULTURE ECONOMY &amp; SOIL SCIENCES</p>			
<p>PROJECT TITLE: ENLARGED TOILET DETAILS GROUND FLOOR PLUMBING LAYOUT</p>			
<p>SCALE: 1/2" = 1'-0"</p>			
<p>DATE: APRIL 2024</p>			
<p>PROJECT NUMBER: 4753/326/BD/03/06</p>			











REV	DATE	BY	REASON

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CLIENT:  
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ELECTRICAL CONSULTANT:  
 E.T.A. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 84A HOOD CANAL, SHARDA TOWER, KARACHI-7500

PLUMBING CONSULTANT:  
  
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DRAWING NO:  
 502

REVIEW & SUPERVISION:  
**NESPAK (PVT.) LIMITED**

DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 ENLARGED LAB LAYOUT  
 GROUND FLOOR  
 PLUMBING LAYOUT

DATE: \_\_\_\_\_  
 DESIGNER: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 SCALE: 1/4" = 1'-0" DATE: APRIL 2024  
 SHEET NO: 4753/326/BD/03F08



ENLARGED LAB DETAIL GROUND FLOOR





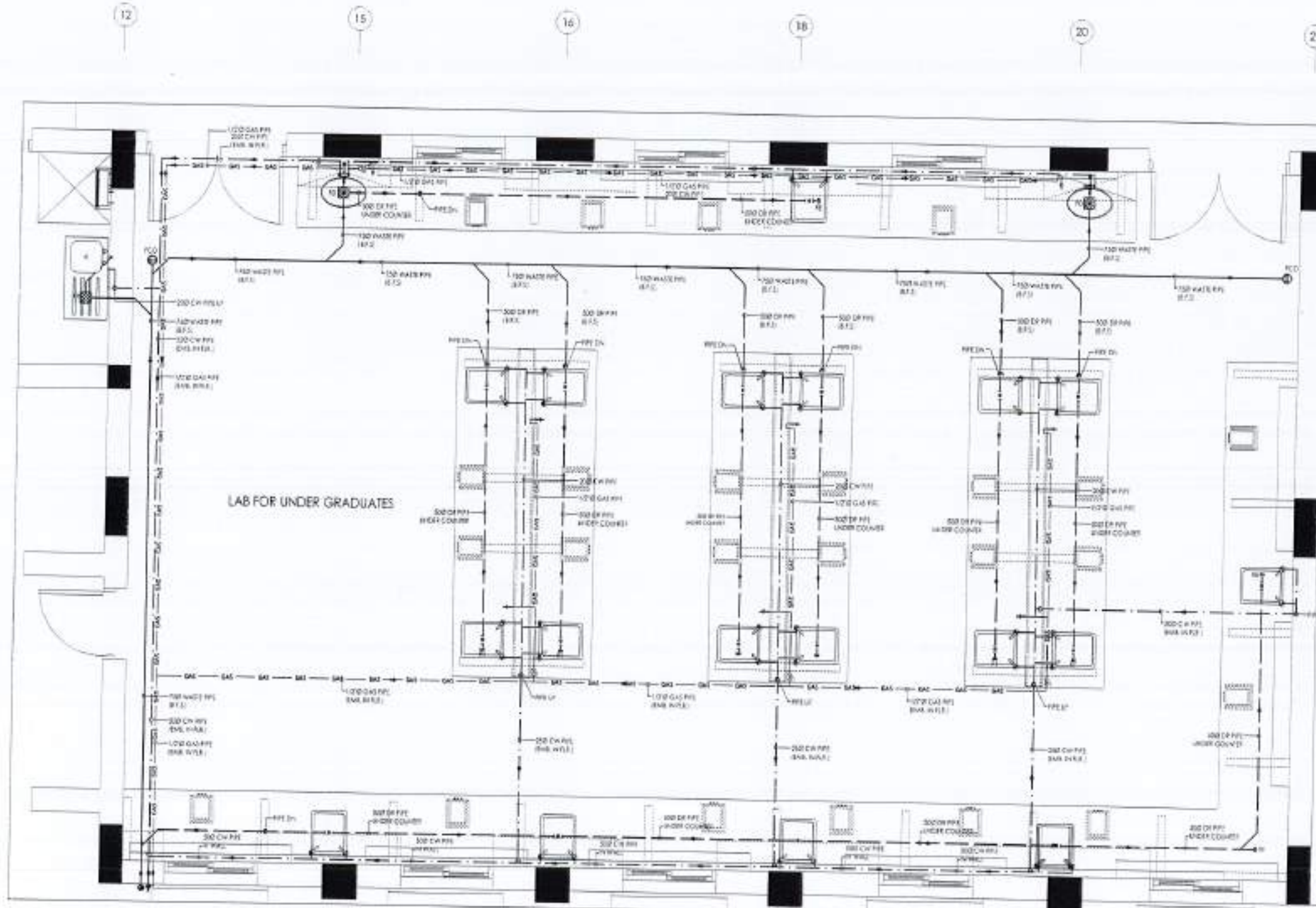












FIRST FLOOR ENLARGED UNDERGRADS LAB. DETAIL PLUMBING LAYOUT



NO.	DATE	REVISION

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOIAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALPINDI.  
 CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALPINDI.  
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ELECTRICAL CONSULTANT:  
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 ELECTRICAL ENGINEERS  
 8-AF Block, G-1/2 Street, Sector 7, Islamabad

MECHANICAL CONSULTANT:  
  
 K. P. & ASSOCIATES  
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FOR PROJECT FILE:  
 DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
 ENLARGED LAB LAYOUT FIRST FLOOR

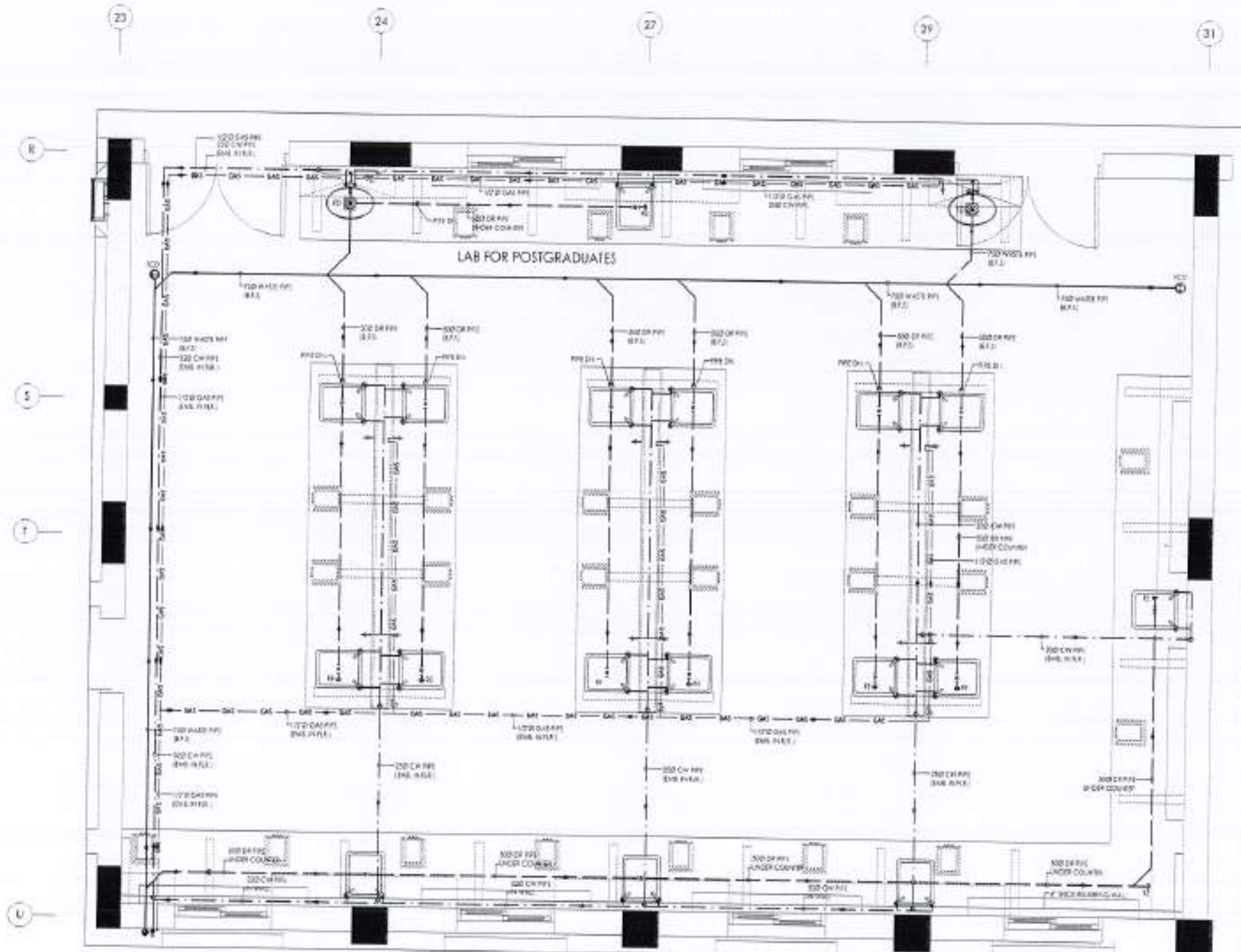
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 CHECKED: NAJIB  
 APPROVED: NAJIB

SCALE: 1/2" = 1'-0"  
 DATE: MAR 2024

REVISED BY: 4753/326/BD/03P12







FIRST FLOOR ENLARGED POSTGRADS LAB. DETAIL PLUMBING LAYOUT



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 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

CLIENT:  
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 WWW: www.thearchitects.com

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 WWW: www.mushtaqbilal.com

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 ELECTRICAL ENGINEERS  
 4th Floor, Gulshan-e-Iqbal, Karachi, 75200

PLUMBING CONSULTANT:  
  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
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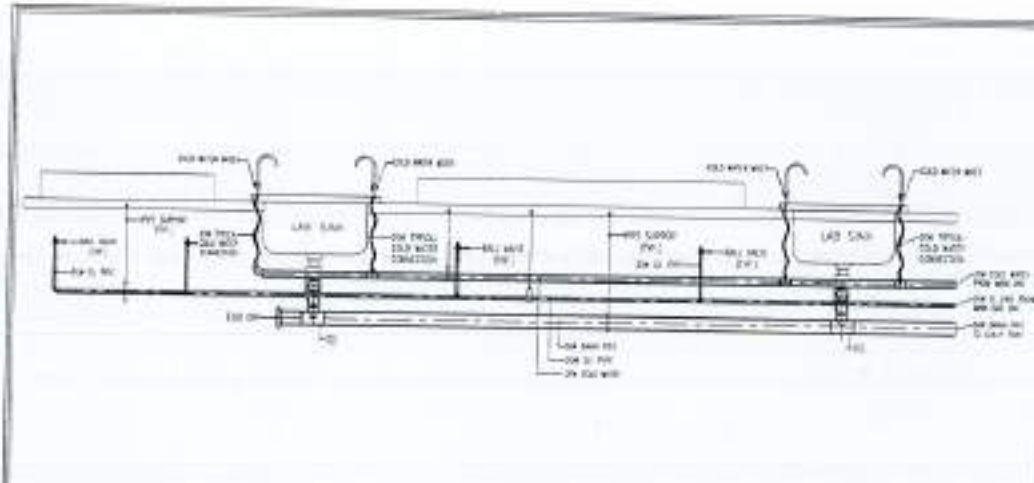
DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

DRAWING TITLE:  
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 FIRST FLOOR  
 PLUMBING LAYOUT

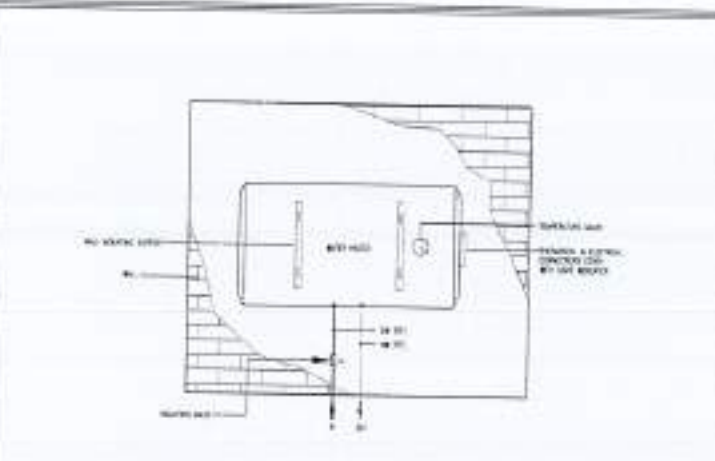
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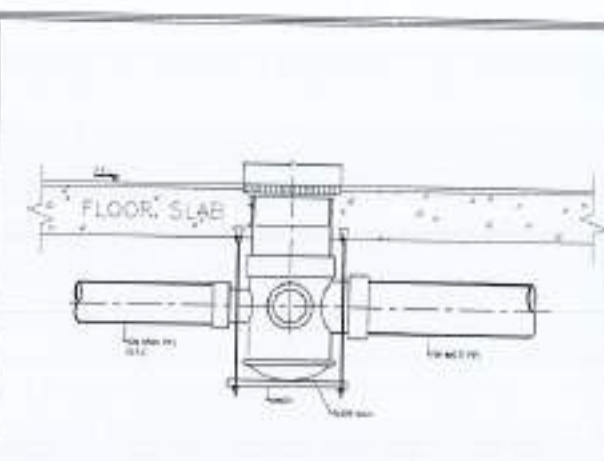




LARSINE DETAIL



ELECTRIC WATER HEATER HANGING DETAILS



DETAIL OF FLOOR DRAIN



REV. NO.	DATE	ISSUE	REMARKS

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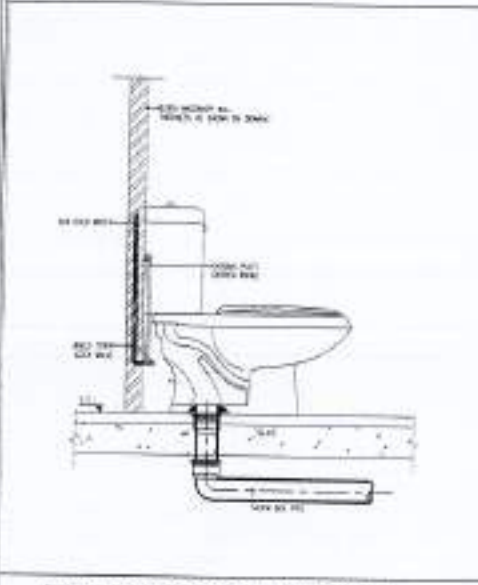
ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECTS  
 ADDRESS: PUNJAB CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.  
 PROJECT NO.:

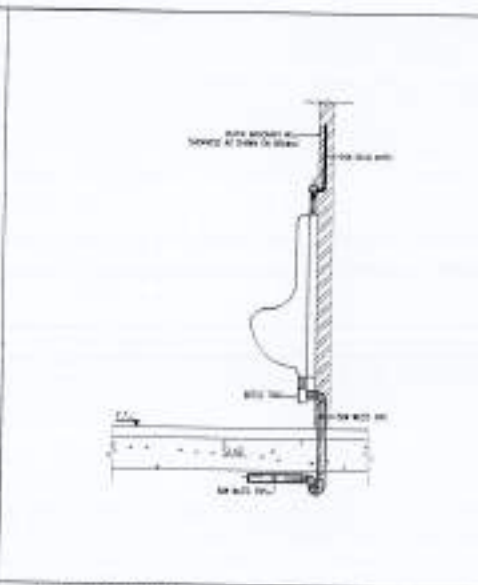
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**mushtaq and bilal**  
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ELECTRICAL CONSULTANT:  
 E. F. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 4-B, B-Block, G-Street, G-7/1, ISLAMABAD, PUNJAB, PAKISTAN.

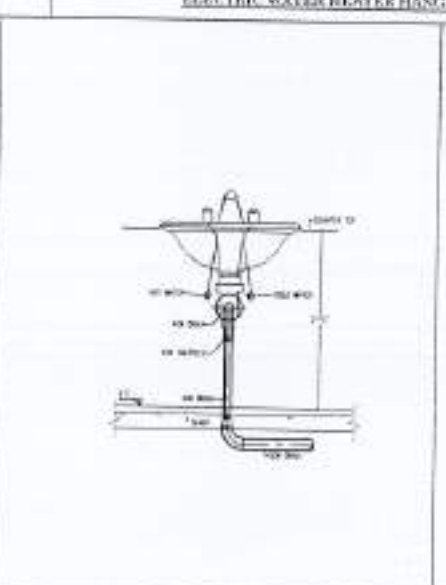
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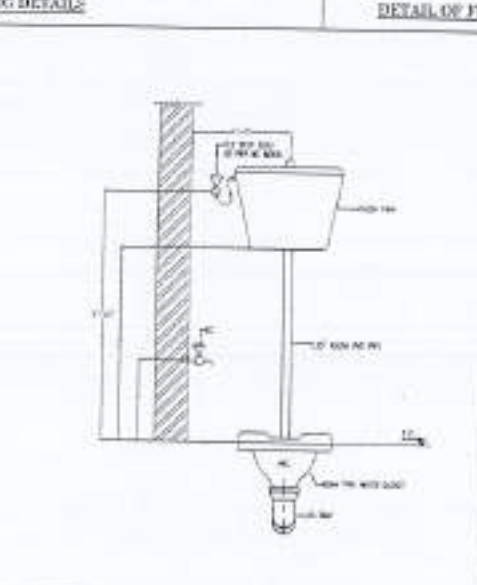
DETAIL OF EUROPEAN TYPE WATER CLOSET



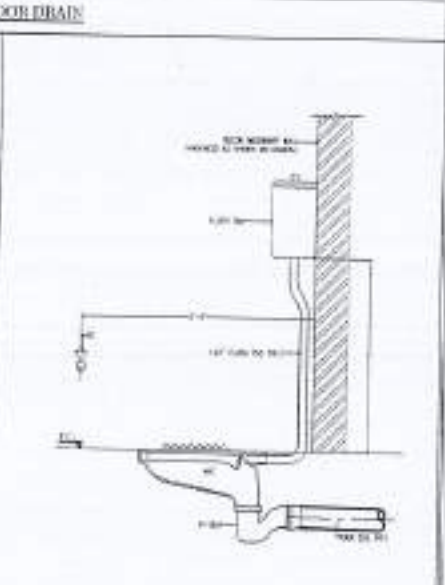
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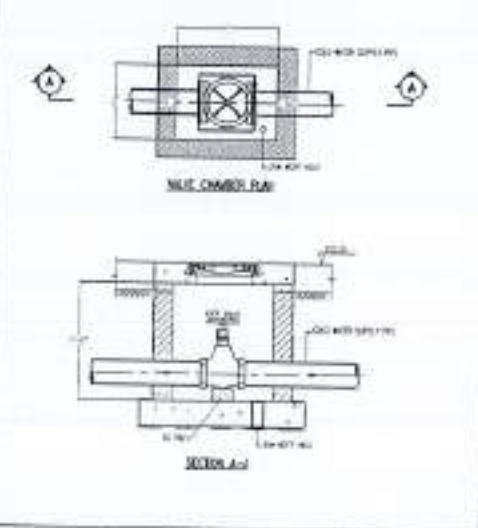
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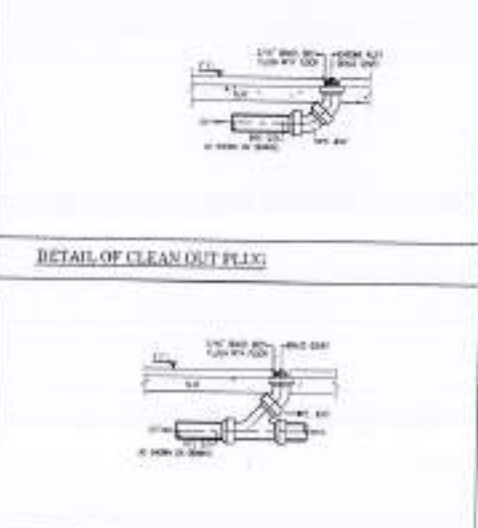
FRONT VIEW OF ASIAN TYPE WATER CLOSET



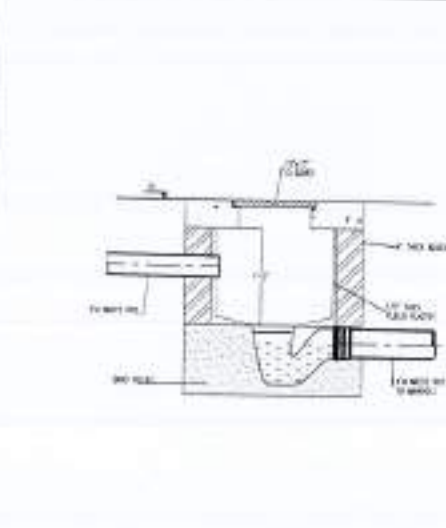
SIDE VIEW OF ASIAN TYPE WATER CLOSET



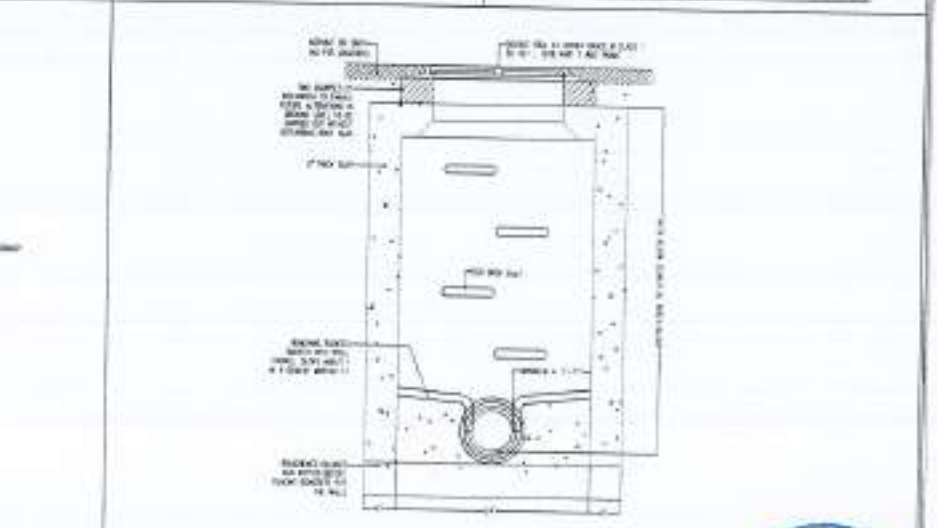
TYPICAL DETAIL OF VALVE CHAMBER



DETAIL OF RUNNING CLEAN OUT PLY



GULLY TRAP DETAIL



DETAIL OF MANHOLE











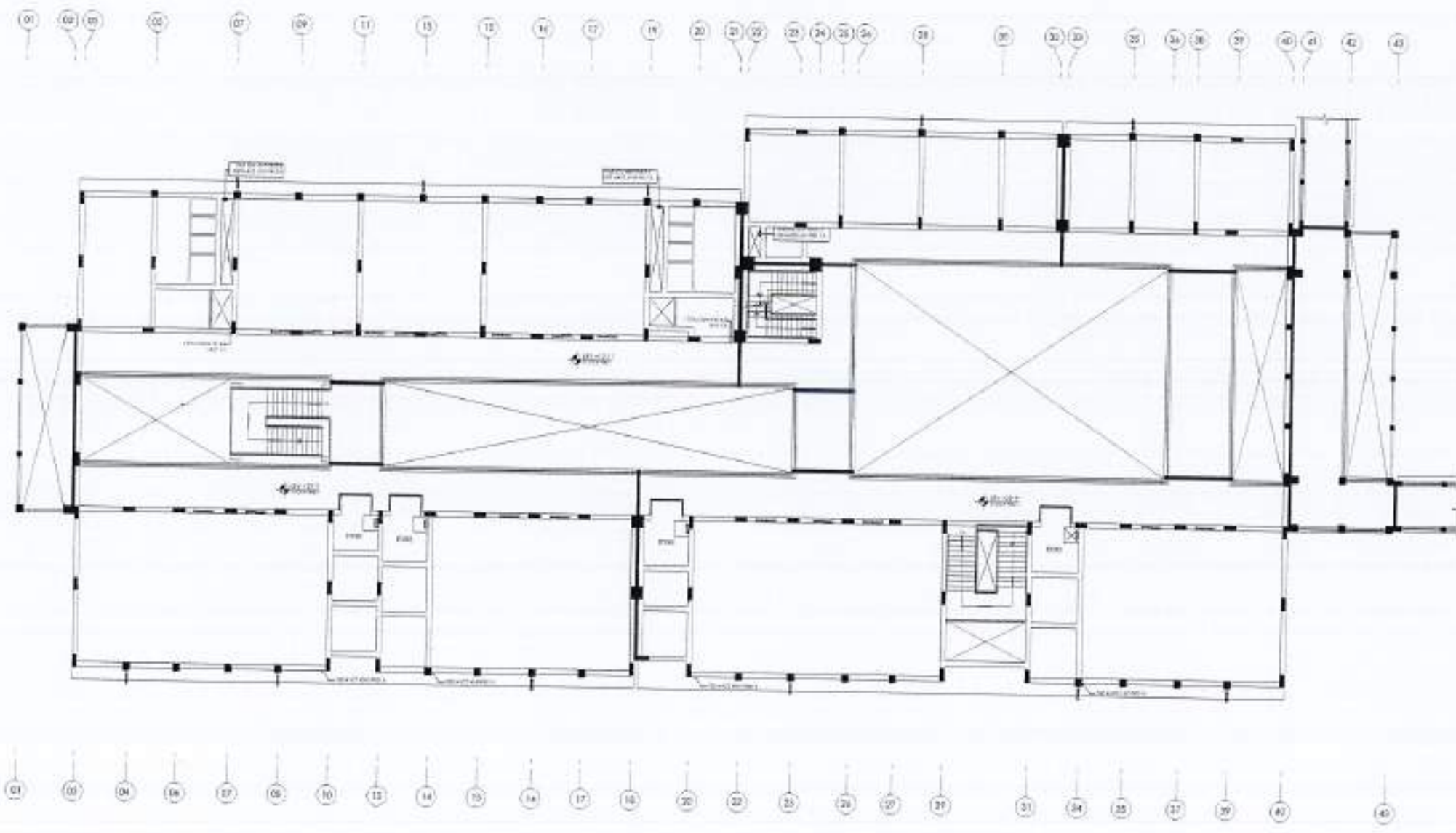












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 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.  
 CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

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DRAWING TITLE:  
 11. FLOOR HIGH LEVEL PLAN  
 PLUMBING LAYOUT

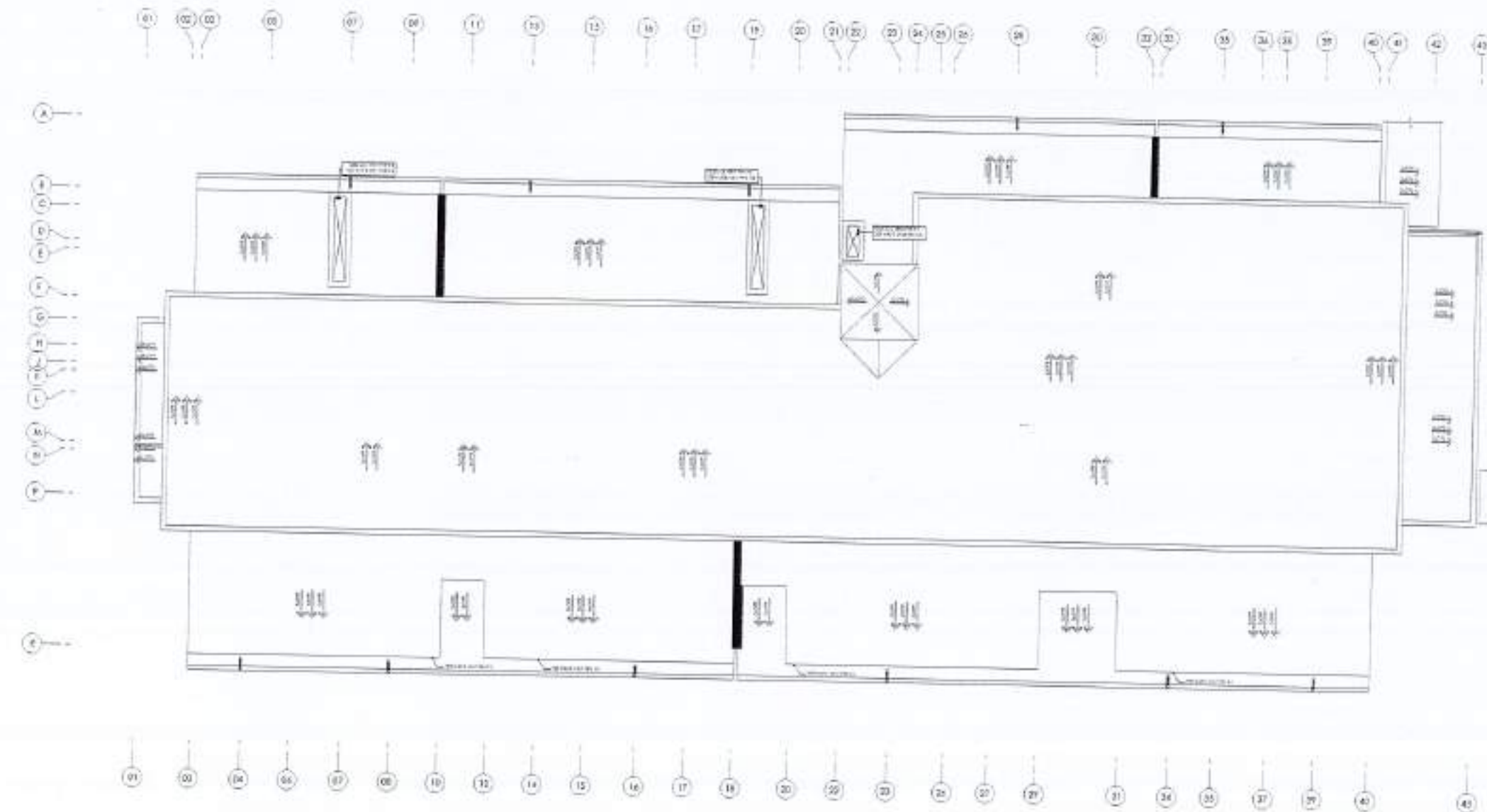
CHECKED BY:  
 WAJAMAT  
 DESIGNED BY:  
 REVISIONS:  
 APPROVED BY:

SCALE:  
 1/2" = 1'-0"      1/8" = 1'-0"  
 DATE:  
 4/16/2024  
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PROJECT:  
COMPLETION OF LEFTOVER WORK  
OF CHOTAGALA CAMPUS  
UNIVERSITY OF Poonch  
RAWALAKOT.

CLIENT:  
UNIVERSITY OF Poonch RAWALAKOT

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DRAWING TITLE:  
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PLUMBING LAYOUT**

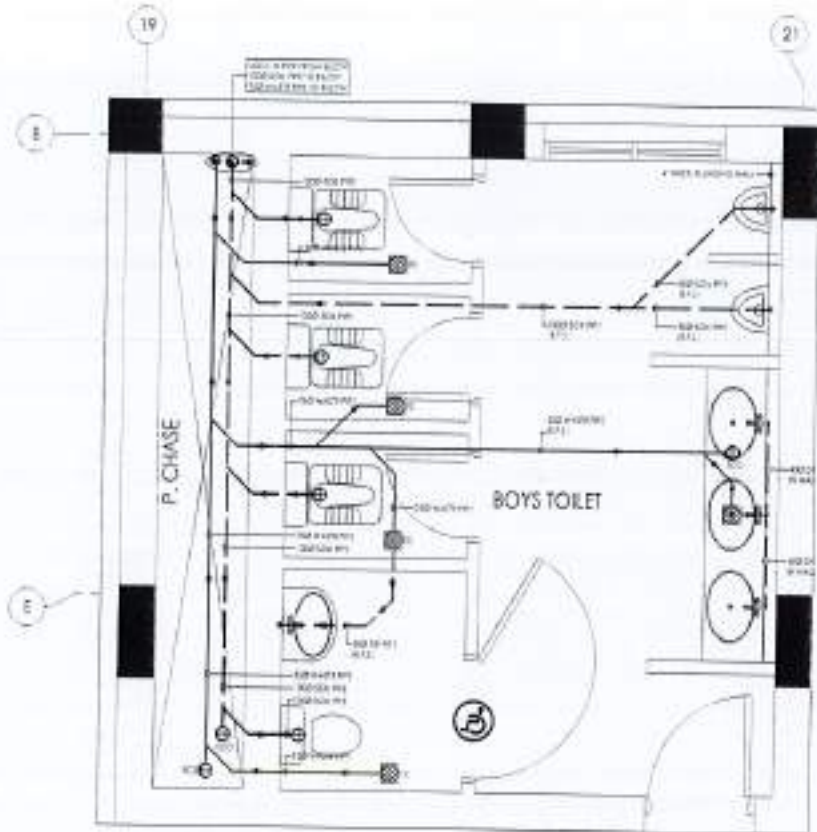
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DATE: 10 APR 2024  
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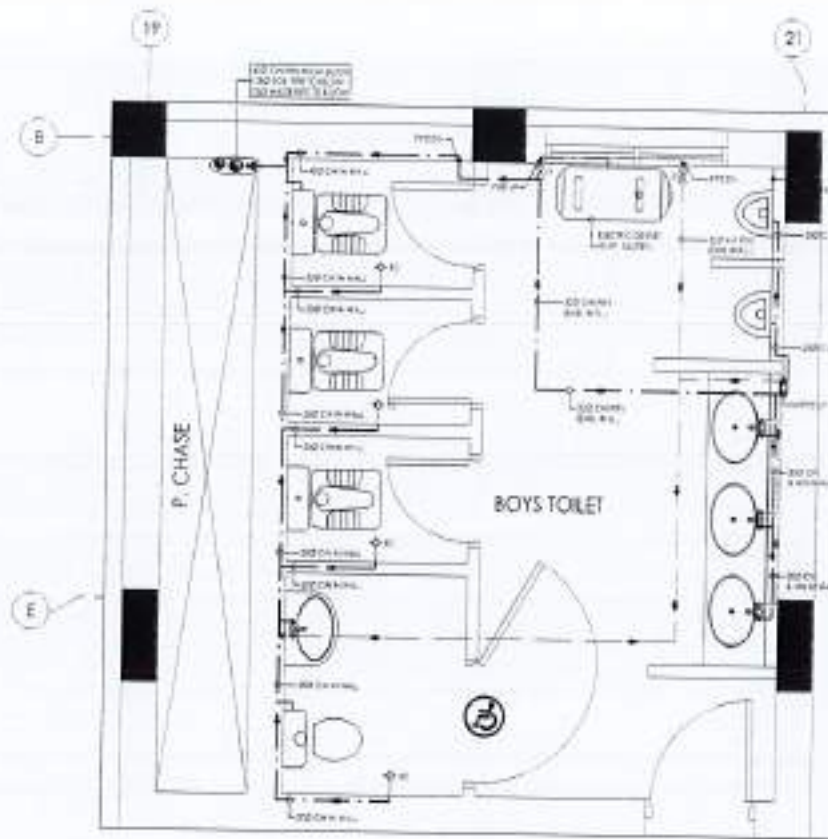




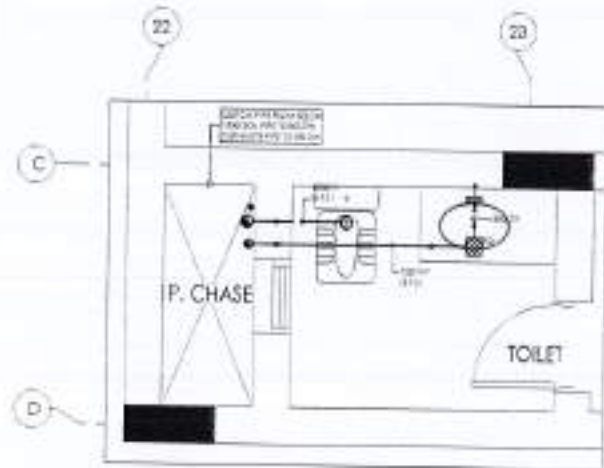




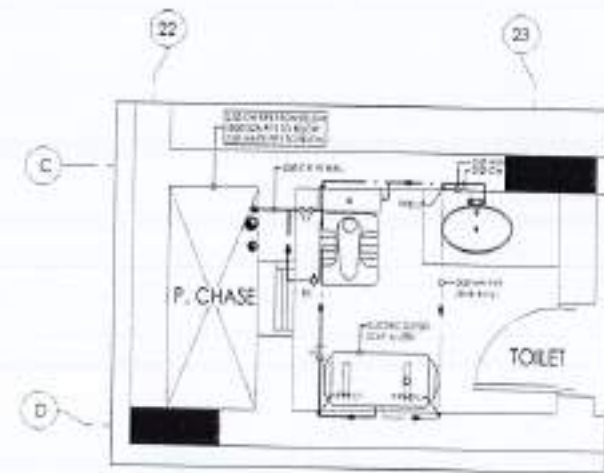
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FIRST FLOOR ENLARGED BOYS TOILET DETAIL-02  
COLD AND HOT WATER PIPING



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 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT,  
 CLIENT:  
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DRAWING TITLE:  
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 PLUMBING LAYOUT

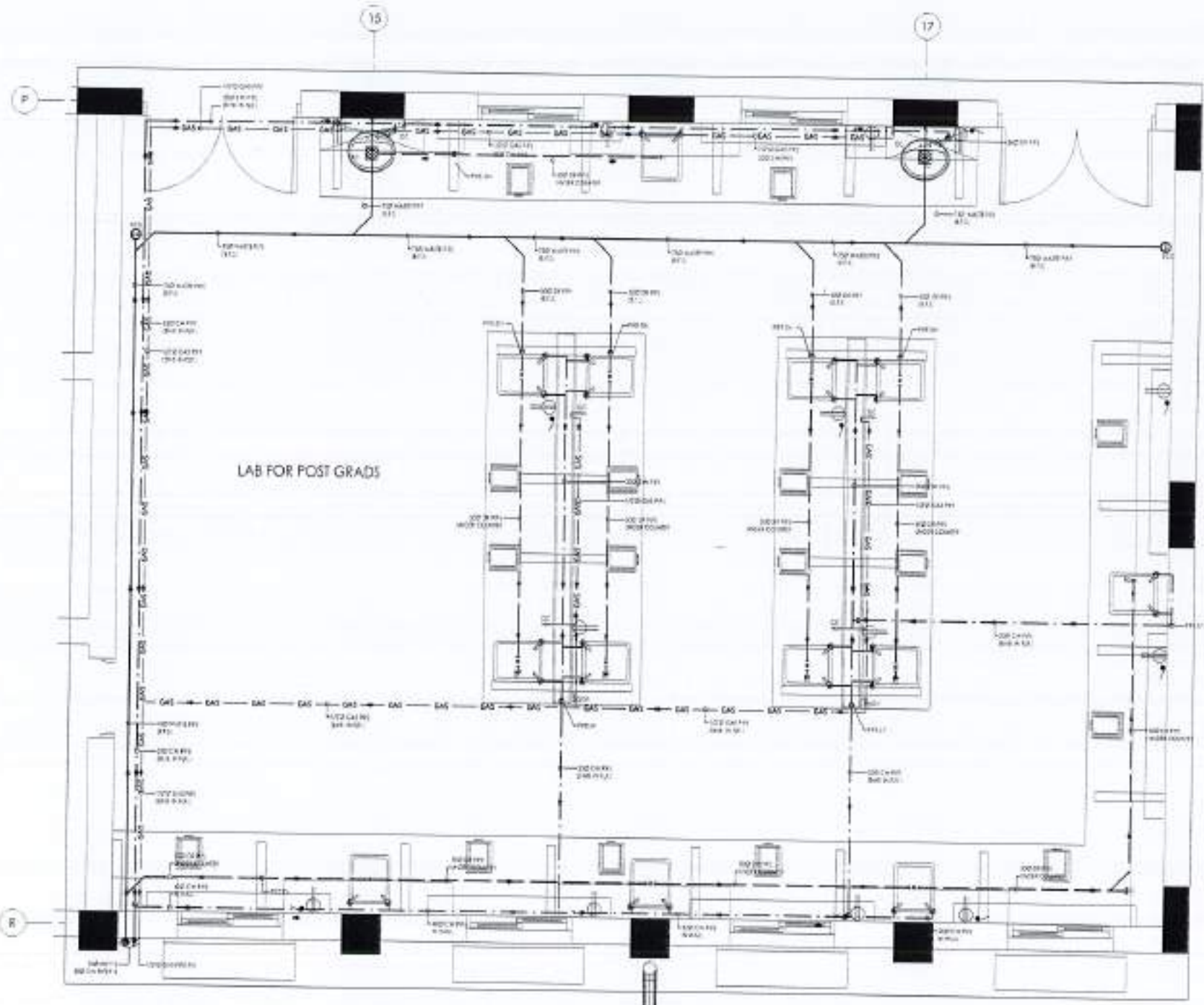
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COMPLETION OF LEFT OVER WORK  
OF CHOTAGALA CAMPUS  
UNIVERSITY OF PUNJAB  
RAWALAKOT.

CLIENT:  
UNIVERSITY OF PUNJAB RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

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JOB NO.: 502

DESIGNED & SUPERVISED BY:  
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PROJECT TITLE:  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
ENLARGE POST GRADS LAB DETAIL-05 PLUMBING LAYOUT

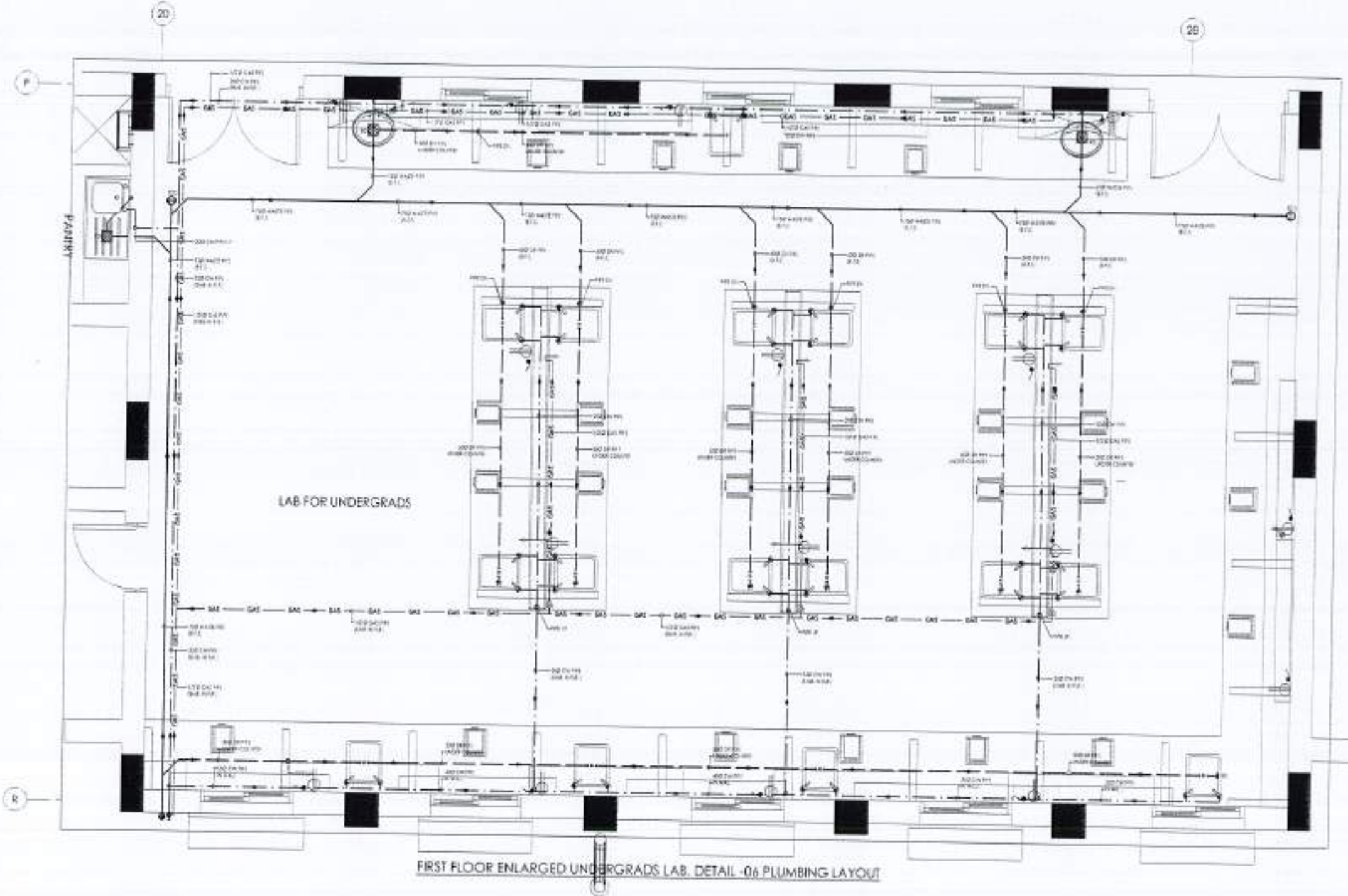
CASE NO.: W/10/11/11

DATE: 10/11/11

SCALE: 1/2" = 1'-0" DATE: APR 2014  
DRAWN BY: 4753/326/BD/04F08







FIRST FLOOR ENLARGED UNDERGRADS LAB. DETAIL -06 PLUMBING LAYOUT

REV.	DATE	BY	REMARKS

NOTES:

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH, RAWALAKOT.

CLIENT:  
UNIVERSITY OF POONCH, RAWALAKOT.

WORK NO.:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
Architecture Planning Studio  
101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

REGISTERED CONSULTANT  
**mushtaq and bilal**  
 consulting engineers  
 88, KOTLI BAZAR, KARACHI-75100, PAKISTAN  
 TEL: 35881111, 35881112, 35881113, 35881114, 35881115, 35881116, 35881117, 35881118, 35881119, 35881120, 35881121, 35881122, 35881123, 35881124, 35881125, 35881126, 35881127, 35881128, 35881129, 35881130, 35881131, 35881132, 35881133, 35881134, 35881135, 35881136, 35881137, 35881138, 35881139, 35881140, 35881141, 35881142, 35881143, 35881144, 35881145, 35881146, 35881147, 35881148, 35881149, 35881150, 35881151, 35881152, 35881153, 35881154, 35881155, 35881156, 35881157, 35881158, 35881159, 35881160, 35881161, 35881162, 35881163, 35881164, 35881165, 35881166, 35881167, 35881168, 35881169, 35881170, 35881171, 35881172, 35881173, 35881174, 35881175, 35881176, 35881177, 35881178, 35881179, 35881180, 35881181, 35881182, 35881183, 35881184, 35881185, 35881186, 35881187, 35881188, 35881189, 35881190, 35881191, 35881192, 35881193, 35881194, 35881195, 35881196, 35881197, 35881198, 35881199, 35881200.

ELECTRICAL CONSULTANT:  
 R. P. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 84-B, BAZAR, KARACHI-75100, PAKISTAN  
 TEL: 35881111, 35881112, 35881113, 35881114, 35881115, 35881116, 35881117, 35881118, 35881119, 35881120, 35881121, 35881122, 35881123, 35881124, 35881125, 35881126, 35881127, 35881128, 35881129, 35881130, 35881131, 35881132, 35881133, 35881134, 35881135, 35881136, 35881137, 35881138, 35881139, 35881140, 35881141, 35881142, 35881143, 35881144, 35881145, 35881146, 35881147, 35881148, 35881149, 35881150, 35881151, 35881152, 35881153, 35881154, 35881155, 35881156, 35881157, 35881158, 35881159, 35881160, 35881161, 35881162, 35881163, 35881164, 35881165, 35881166, 35881167, 35881168, 35881169, 35881170, 35881171, 35881172, 35881173, 35881174, 35881175, 35881176, 35881177, 35881178, 35881179, 35881180, 35881181, 35881182, 35881183, 35881184, 35881185, 35881186, 35881187, 35881188, 35881189, 35881190, 35881191, 35881192, 35881193, 35881194, 35881195, 35881196, 35881197, 35881198, 35881199, 35881200.

FOUNDING CONSULTANT:  
**Environmental & Management Consultants**  
 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

NO. 502

NESPAK (PVT.) LIMITED

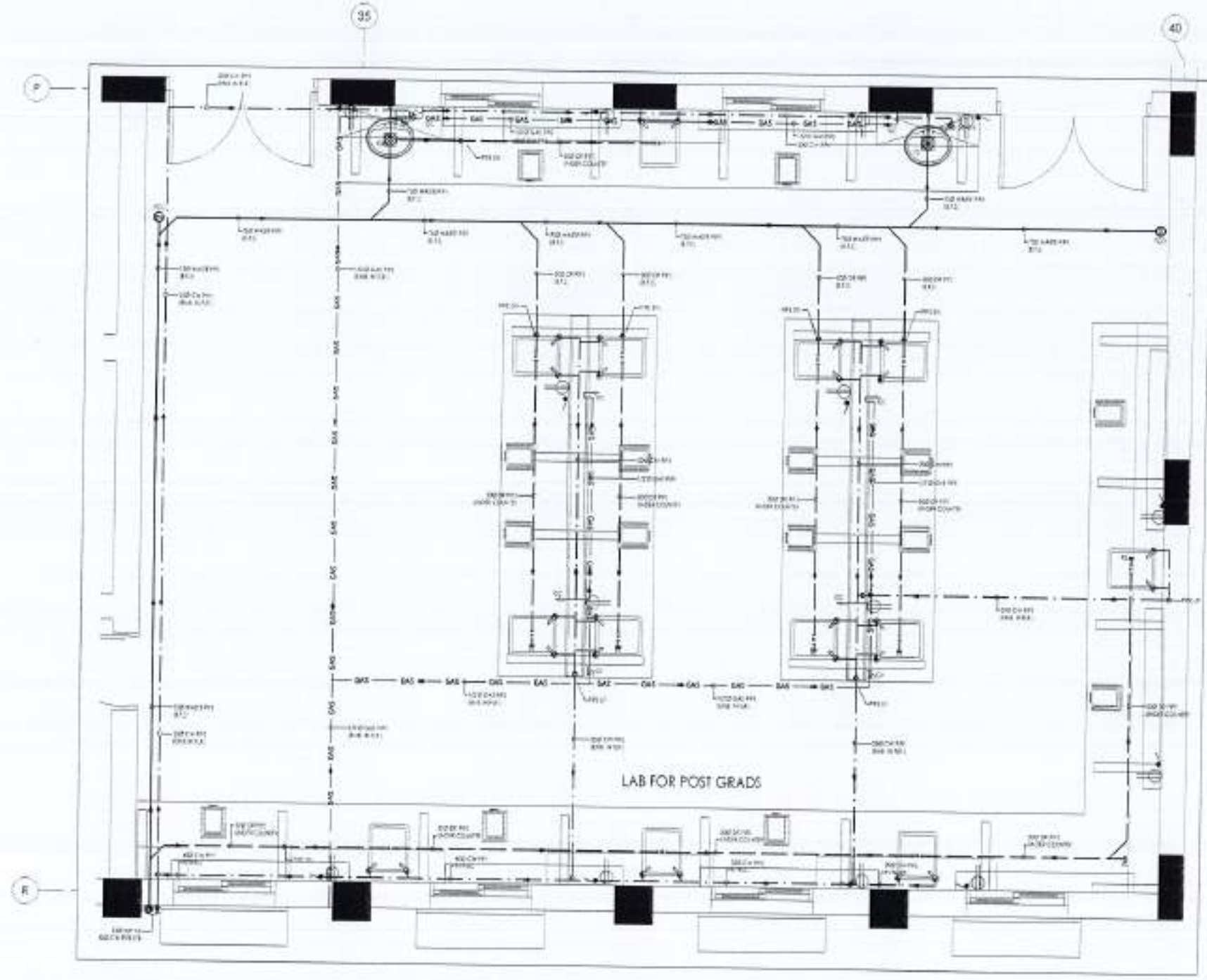
LAB PROJECT TITLE:  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
ENLARGE UNDERGRADS LAB, DETAIL-06 PLUMBING LAYOUT

DATE: \_\_\_\_\_  
 DESIGNER: \_\_\_\_\_  
 CHECKER: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 SCALE: 1/8" = 1'-0" DATE: APRIL 2022  
 PROJECT NO: 4753/326/BO/04R09







FIRST FLOOR ENLARGED POST GRADS LAB, DETAIL -07 PLUMBING LAYOUT



NO.	DATE	REVISION	BY

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- ANY DELAY IN WORK TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT:  
COMPLETION OF LEFT OVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

CLIENT:  
UNIVERSITY OF PUNJAB RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

PROJECT:  
THE ARCHITECT:  
MUSHTAQ AND BILAL CONSULTING ENGINEERS  
30A, MOON CHAN, DARRAT NABAL, KARACHI-75200  
TEL: 3731 4811-4333 3331 4811-4333 FAX: 3731 4811-4333  
WWW.MUSHTAQANDBILAL.COM

STRUCTURAL CONSULTANT:  
MAB  
mushtaq and bilal consulting engineers

ELECTRICAL CONSULTANT:  
K.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
B-16/1001, GHAZIABAD, KARACHI-75200

PLUMBING CONSULTANT:  
K.P. & ASSOCIATES  
ELECTRICAL ENGINEERS  
B-16/1001, GHAZIABAD, KARACHI-75200

PREPARED BY:  
502

DESIGNED BY:  
NESPAC (PVT.) LIMITED

PROJECT TITLE:  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

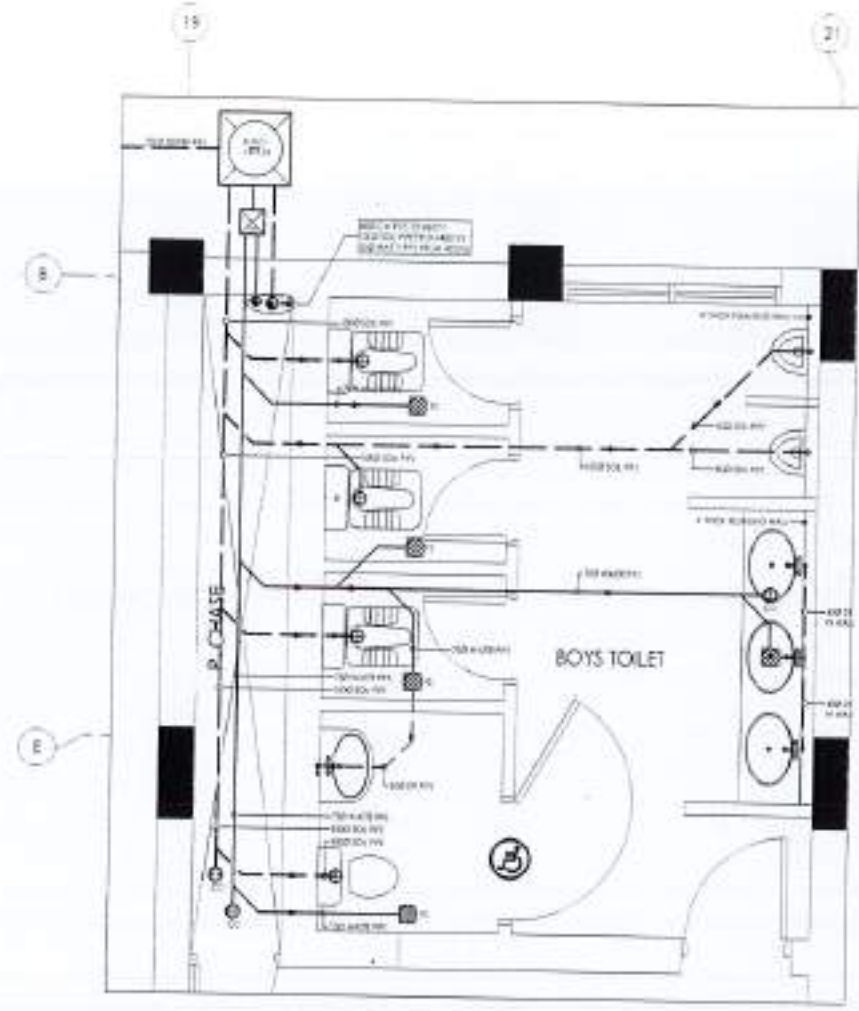
DRAWING TITLE:  
ENLARGED POST GRADS LAB, DETAIL-07 PLUMBING LAYOUT

CADRE:  
MALAKH  
SCALE:  
10 = 1/2  
DATE:  
APRIL 2024  
DRAWING NO:  
4753/326/BD/04F10

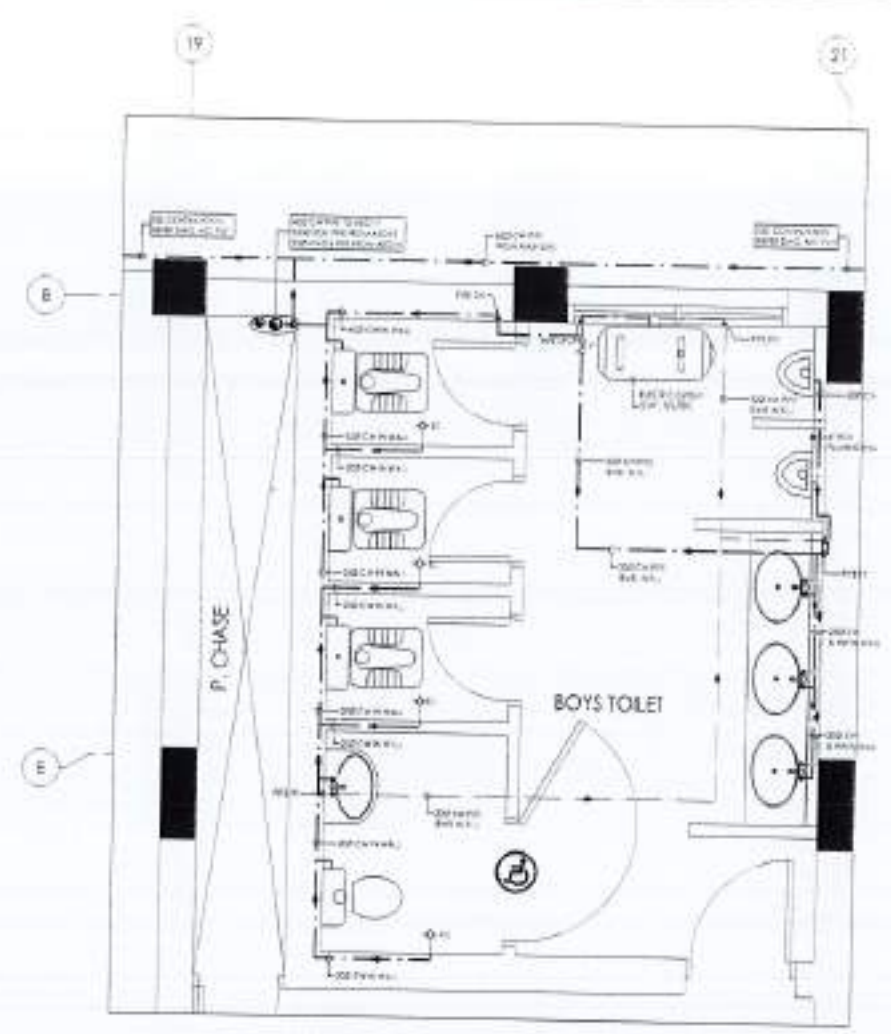




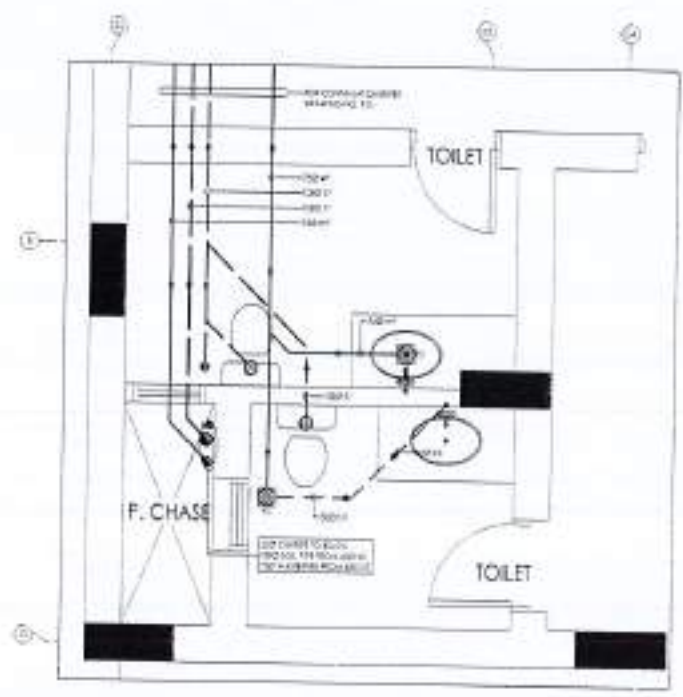




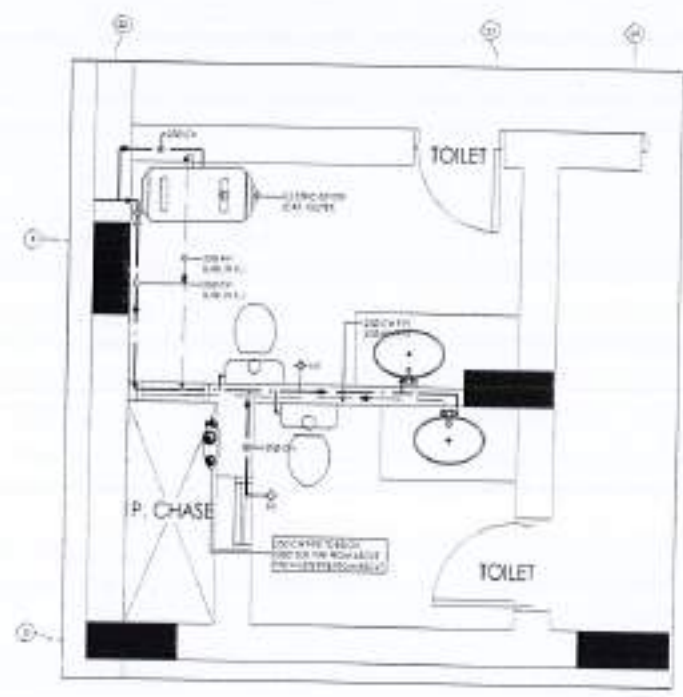
GROUND FLOOR ENLARGED BOYS TOILET DETAIL-09  
SOIL AND WASTE WATER PIPING



GROUND FLOOR ENLARGED BOYS TOILET DETAIL-09  
COLD AND HOT WATER PIPING



GROUND FLOOR ENLARGED TOILET DETAIL-10  
SOIL AND WASTE WATER PIPING



GROUND FLOOR ENLARGED TOILET DETAIL-10  
COLD AND HOT WATER PIPING



REV.	DATE	BY	REMARKS

NOTES:

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- ALL DIMENSIONS ARE TO BE CHECKED AND VERIFIED ON SITE.
- ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT:  
COMPLETION OF LEFT OVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH RAWALAKOT

CLIENT:  
UNIVERSITY OF POONCH RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
JAWAHAR PUNJABI GROUP  
21-A, WAZIRPUR, P.O. WAZIRPUR  
P.O. BOX 1000, ISLAMABAD, PAKISTAN  
TEL: 3731-4241, 3731-4242, 3731-4243, 3731-4244, 3731-4245  
FAX: 3731-4246, 3731-4247, 3731-4248, 3731-4249

STRUCTURAL CONSULTANT:  
**MB**  
mushtaq and bilal  
consulting engineers  
806, VOORDEGAARD, ISLAMABAD, PAKISTAN  
TEL: 3731-4241, 3731-4242, 3731-4243, 3731-4244, 3731-4245  
FAX: 3731-4246, 3731-4247, 3731-4248, 3731-4249

ELECTRICAL CONSULTANT:  
**E.P.A. ASSOCIATES**  
ELECTRICAL ENGINEERS  
P.O. BOX 1000, ISLAMABAD, PAKISTAN

PLUMBING CONSULTANT:  
**E.A. Associates**  
MECHANICAL & MANAGEMENT CONSULTANTS  
22-A, WAZIRPUR, ISLAMABAD, PAKISTAN  
TEL: 3731-4241, 3731-4242, 3731-4243, 3731-4244, 3731-4245  
FAX: 3731-4246, 3731-4247, 3731-4248, 3731-4249

SCALE: 502

PREPARED BY:  
NESPAK (PVT.) LIMITED

PROJECT TITLE:  
DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

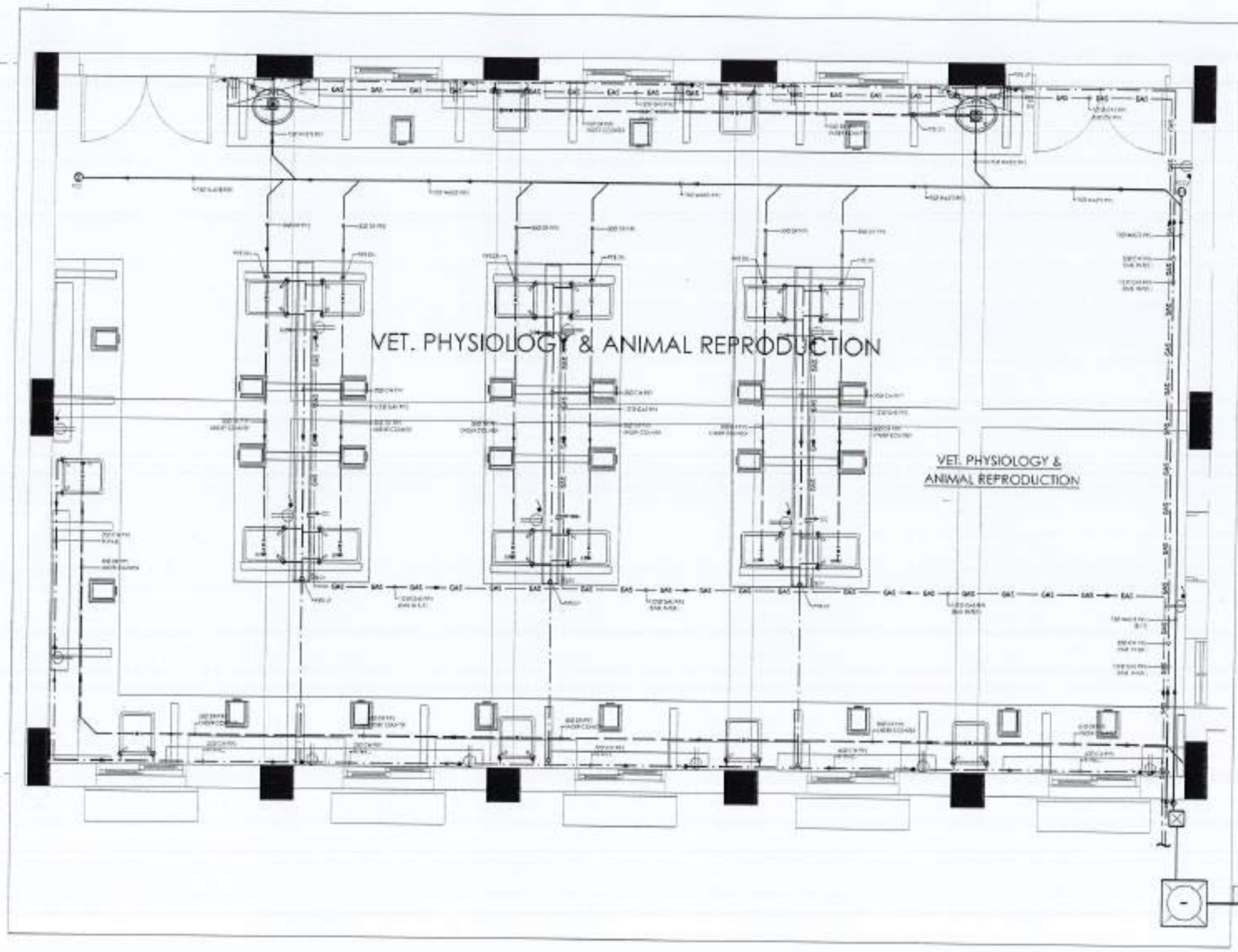
DRAWING TITLE:  
ENLARGE TOILETS DETAIL-09 & 10  
PLUMBING LAYOUT

DATE: 2021-1-10  
DRAWN BY: WAJAHAT  
CHECKED BY:  
APPROVED BY:



SCALE: 1:10  
DATE: APRIL 2021  
DRAWING NO: 4753/326/BD/04F12





GROUND FLOOR ENLARGED VET. PHYSIOLOGY & ANIMAL REPRODUCTION LAB. DETAIL -11 PLUMBING LAYOUT



REV. NO.	DATE	REASON

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THIS DRAWING IS NOT TO BE SCALED UP OR DOWN WITHOUT THE ARCHITECT'S PERMISSION.

ALL DIMENSIONS ARE TO BE RECHECKED AND VERIFIED ON SITE.

ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT: COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POONCH RAWALAKOT.

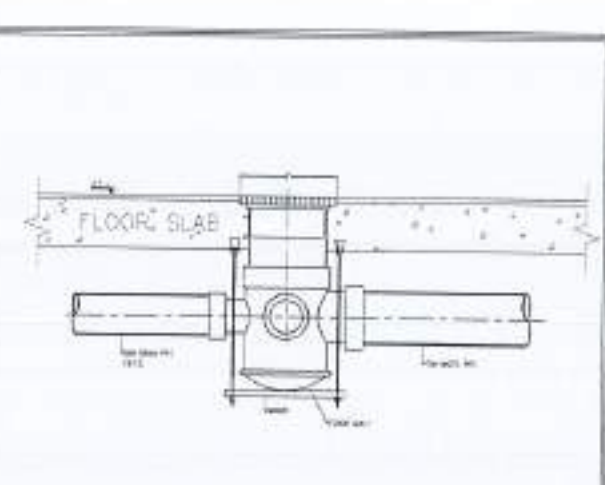
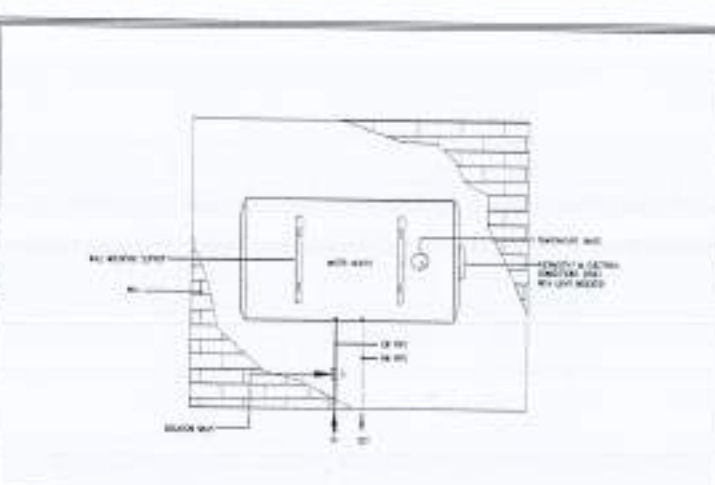
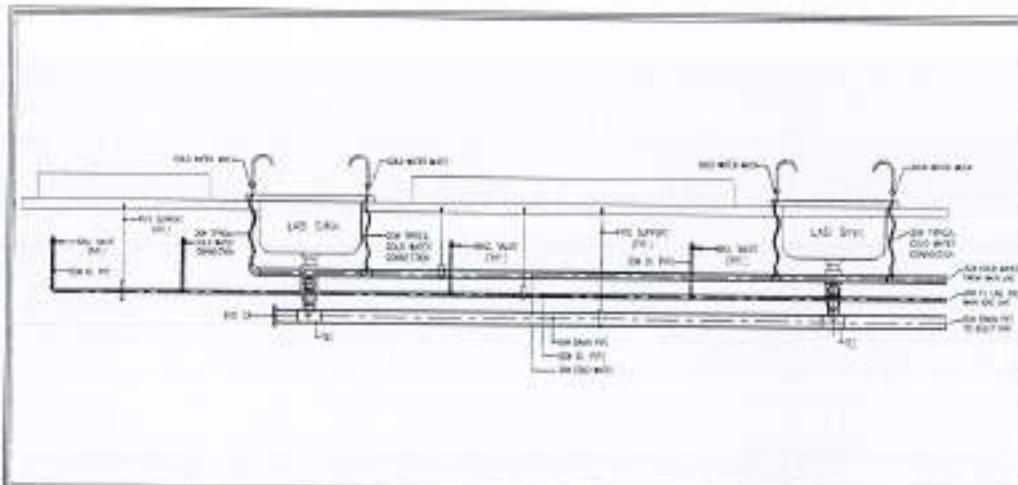
CLIENT: UNIVERSITY OF POONCH RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT: **THE ARCHITECT**  
 10-A, HUDA ROAD, PHASE-1, ISLAMABAD.  
 TEL: 3581-3582, 3583-3584, 3585-3586, 3587-3588, 3589-3590, 3591-3592, 3593-3594, 3595-3596, 3597-3598, 3599-3600, 3601-3602, 3603-3604, 3605-3606, 3607-3608, 3609-3610, 3611-3612, 3613-3614, 3615-3616, 3617-3618, 3619-3620, 3621-3622, 3623-3624, 3625-3626, 3627-3628, 3629-3630, 3631-3632, 3633-3634, 3635-3636, 3637-3638, 3639-3640, 3641-3642, 3643-3644, 3645-3646, 3647-3648, 3649-3650, 3651-3652, 3653-3654, 3655-3656, 3657-3658, 3659-3660, 3661-3662, 3663-3664, 3665-3666, 3667-3668, 3669-3670, 3671-3672, 3673-3674, 3675-3676, 3677-3678, 3679-3680, 3681-3682, 3683-3684, 3685-3686, 3687-3688, 3689-3690, 3691-3692, 3693-3694, 3695-3696, 3697-3698, 3699-3700, 3701-3702, 3703-3704, 3705-3706, 3707-3708, 3709-3710, 3711-3712, 3713-3714, 3715-3716, 3717-3718, 3719-3720, 3721-3722, 3723-3724, 3725-3726, 3727-3728, 3729-3730, 3731-3732, 3733-3734, 3735-3736, 3737-3738, 3739-3740, 3741-3742, 3743-3744, 3745-3746, 3747-3748, 3749-3750, 3751-3752, 3753-3754, 3755-3756, 3757-3758, 3759-3760, 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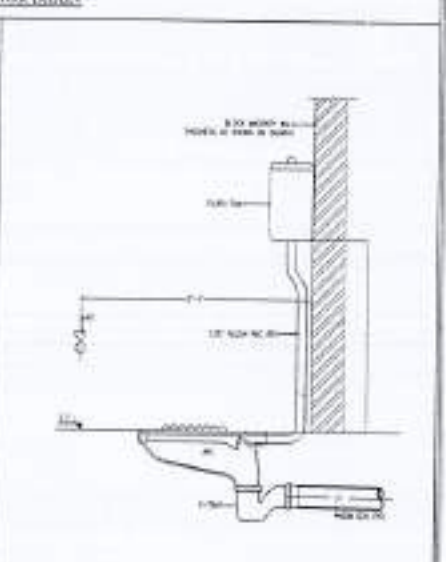
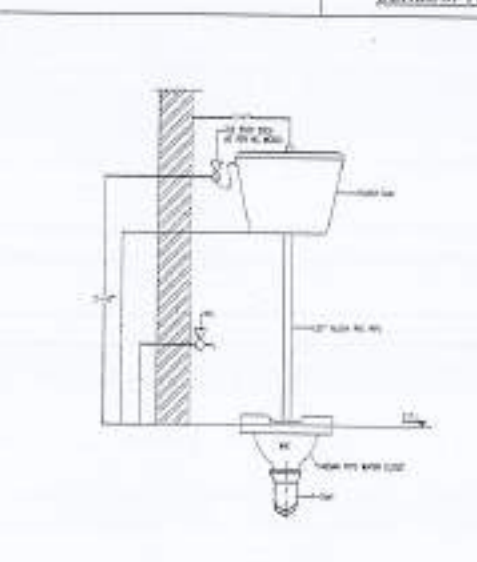
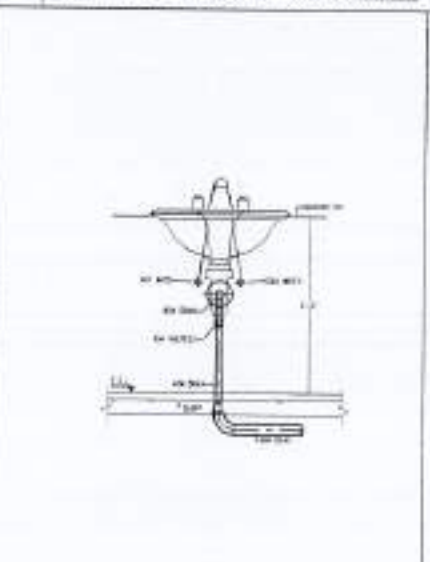
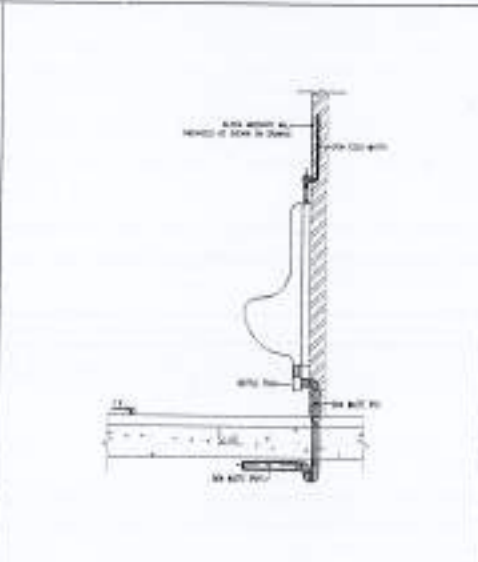
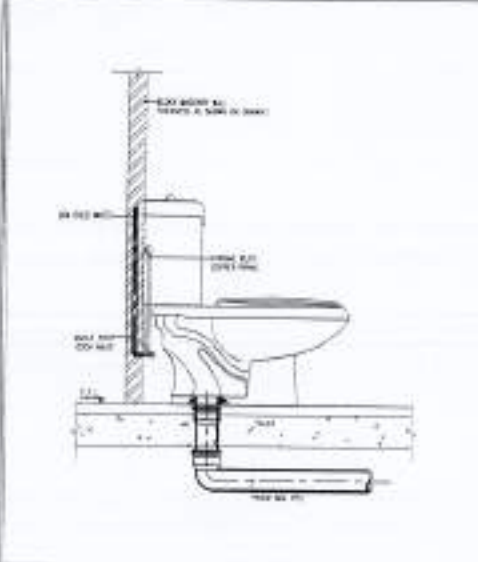




LAV SINK DETAIL

ELECTRIC WATER HEATER HANGING DETAIL

DETAIL OF FLOOR DRAIN



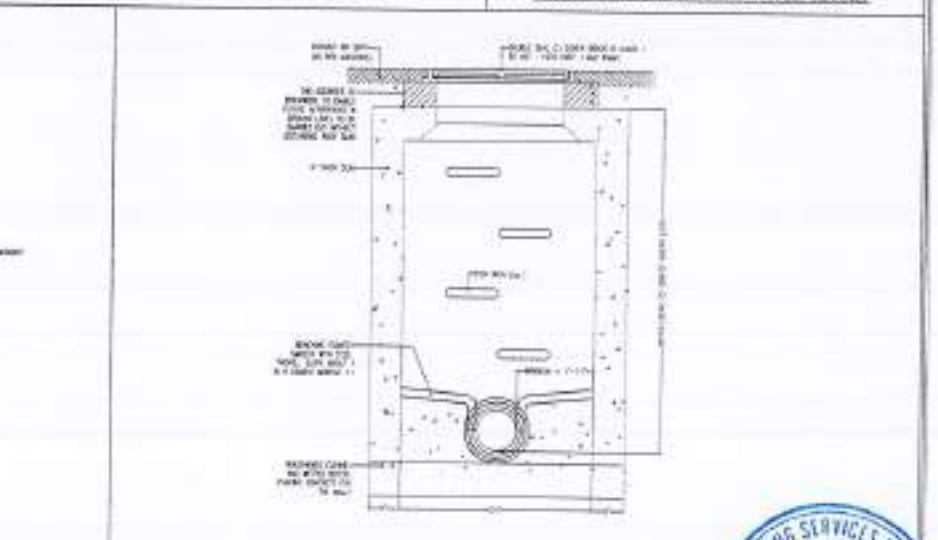
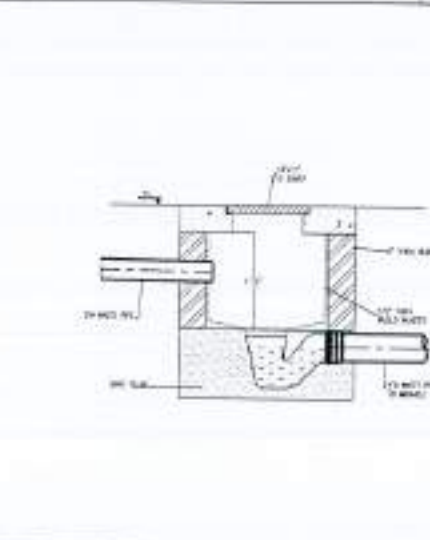
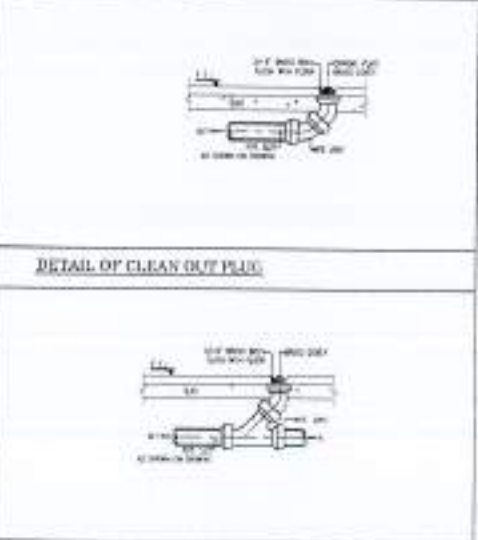
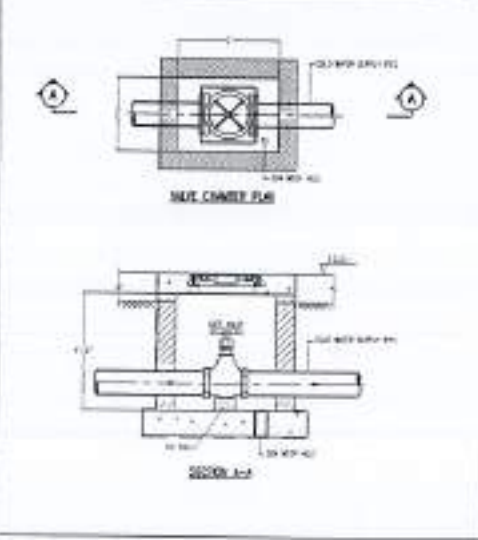
DETAIL OF EUROPEAN TYPE WATER CLOSET

DETAIL OF URINAL

DETAIL OF LAVATORY

FRONT VIEW OF ASIAN TYPE WATER CLOSET

SIDE VIEW OF ASIAN TYPE WATER CLOSET



TYPICAL DETAIL OF VALVE CHAMBER

DETAIL OF RUNNING CLEAN OUT PLUG

GULLY TRAP DETAIL

DETAIL OF MANHOLE

REV.	DATE	ISSUED	BY

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 24, HUDA ROAD, PHASE II, GATE NO. 1, ISLAMABAD.

MECHANICAL CONSULTANT:  
**mushtaq and bilal**  
 consulting engineers  
 24, HUDA ROAD, PHASE II, GATE NO. 1, ISLAMABAD.

ELECTRICAL CONSULTANT:  
**E.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 24, HUDA ROAD, PHASE II, GATE NO. 1, ISLAMABAD.

PLUMBING CONSULTANT:  
**M. A. Anwar**  
 24, HUDA ROAD, PHASE II, GATE NO. 1, ISLAMABAD.

DRAWING NO.:  
**502**

OWNER & SUPERVISION CONSULTANT:  
**NESPAK (PVT.) LIMITED**

FOR PROJECT TITLE:  
 DEPARTMENT OF VETERINARY & ANIMAL SCIENCE

DRAWING TITLE:  
 MISCELLANEOUS DETAIL SHEET

CHECKED BY:  
 WALI AHMED

DESIGNED BY:  
 WALI AHMED

APPROVED BY:  
 WALI AHMED

SCALE:  
 ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE.

DATE:  
 20/04/2024





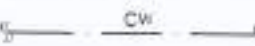




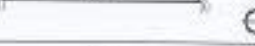









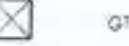








LIST OF DRAWING	
DWG. NO.	DRAWING TITLE
-	JOB TITLE & COVER SHEET
F00	FIXTURES SCHEDULE, LEGENDS & LIST OF DRAWINGS
F01	GROUND FLOOR PLAN PLUMBING LAYOUT
F02	FIRST FLOOR PLAN PLUMBING LAYOUT
F03	ROOF PLAN PLUMBING LAYOUT
F04	ENLARGED TOILET DETAILS PLUMBING LAYOUT
F05	ENLARGED LABS. DETAIL PLUMBING LAYOUT
F06	ENLARGED LABS. DETAIL PLUMBING LAYOUT
F07	MISCELLANEOUS DETAIL SHEET

FIXTURE CONNECTIONS SCHEDULE			
FIXTURES	COLD WATER	HOT WATER	DRAIN PIPE
WC (ENGLISH)	20mm	-	100
WC (ASIAN)	20mm	-	100
LAVATORY	20mm	20mm	50
SHOWER	20mm	20mm	50
KITCHEN SINK	20mm	20mm	50
URINAL	20mm	-	50

**NOTES:**

- 1-ALL DIMENSIONS ARE IN INCHES UNLESS AS NOTED.
- 2-ALL PIPE SIZES FOR P.P.R ARE OUTER DIA.
- 3-HORIZONTAL CLAMPING OF PIPES 10, TIMES OF DIA OF PIPE.
- 4-VERTICAL CLAMPING OF PIPES 1.5, TIMES OF DIA OF PIPE.

LEGEND	
SYMBOL / ABBR.	DESCRIPTION
T/A	TO ABOVE
F/A	FROM ABOVE
T/B	TO BELOW
F/B	FROM BELOW
DN	DOWN
TYP.	TYPICAL
EMB.	EMBEDDED
FF	FIRST FLOOR
GR	GROUND FLOOR
BC	BIB COCK
MS	MUSLIM SHOWER
IV	ISOLATION VALVE
CV	CHECK VALVE / NON RETURN VALVE
B.F.S	BELOW FLOOR SLAB
B.A.F.C	AT ABOVE FALSE CEILING

LEGEND	
SYMBOL / ABBR.	DESCRIPTION
 CW	COLD WATER SUPPLY PIPE
 HW	HOT WATER SUPPLY PIPE
 GAS PIPE	GAS SUPPLY PIPE
 SP	(SP) SOIL PIPE
 SS	(SS) SOIL STACK
 WP	(WP) WASTE PIPE
 WS	(WS) WASTE STACK
 VP	(VP) VENT PIPE
 VS	(VS) VENT STACK
 SW	(SW) SEWERAGE PIPE
 GV / IV	GATE VALVE / ISOLATION VALVE
 WB	WASH BASIN COUNTER TOP
 WE	WASH BASIN PEDESTAL
 SH	SHOWER
 LAB SINK	LAB SINK
 FD	FLOOR DRAIN
 GT	GULLY TRAP
 MH	MANHOLE
 MH COVER	600B MANHOLE COVER
 ELECTRICAL OPERATED HOT WATER GEYSER	ELECTRICAL OPERATED HOT WATER GEYSER
 FCO / COP	FLOOR CLEAN OUT / CLEAN OUT PLUG
 FLOW ARROW	FLOW ARROW
 PIPE DOWN (DN)	PIPE DOWN (DN)
 PIPE UP	PIPE UP





REV. NO.	DATE	BY	REASON

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**PROJECT:**  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB, RAWALAKOT.  
**CLIENT:**  
 UNIVERSITY OF PUNJAB, RAWALAKOT.

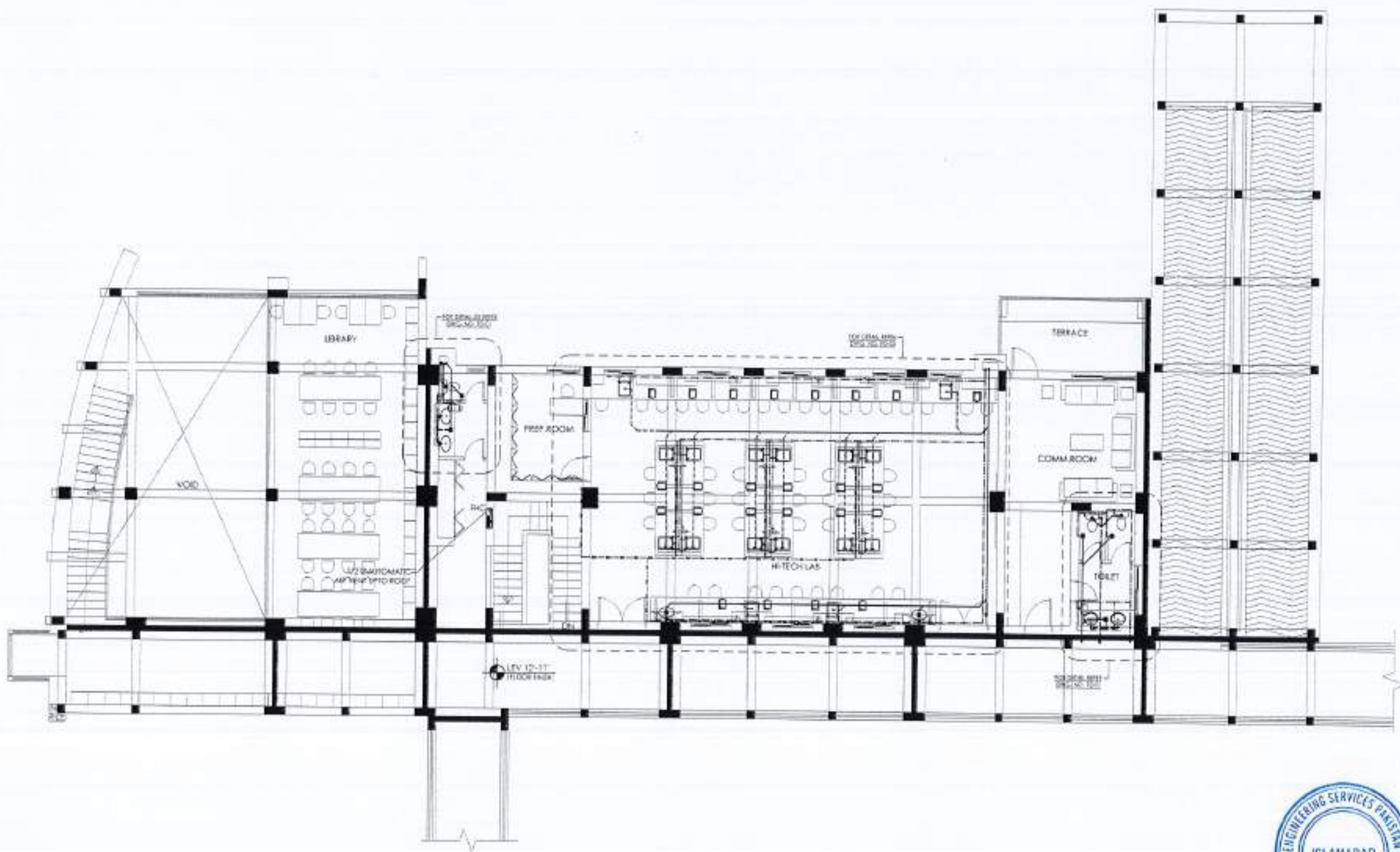
**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ORIGINAL DESIGN CONSULTANT**  
 ARCHITECT:  
 THE ARCHITECTS  
 ARCHITECTURE PLANNING DESIGN  
 24-A PAFK ROAD, B-17, CHAKRAHAR  
 PAFK ROAD, B-17, CHAKRAHAR  
 PAFK ROAD, B-17, CHAKRAHAR  
 PAFK ROAD, B-17, CHAKRAHAR  
**STRUCTURAL CONSULTANT:**  
  
 mushtaq and bilal  
 consulting engineers  
 204, 100th STREET, SHARHAT, PAFK ROAD, B-17, CHAKRAHAR  
 TEL: 031-4591132/031-4591133 FAX: 031-4591134  
 E-MAIL: mushtaqbilal@hotmail.com  
**ELECTRICAL CONSULTANT:**  
 E.P.S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1st Floor, Sector-4, Phase-1, F-7/3, Islamabad  
**PLUMBING CONSULTANT:**  
 NESPAC (PVT.) LIMITED  
**ENVIRONMENTAL & MANAGEMENT CONSULTANTS:**  
 NESPAC (PVT.) LIMITED  
**DRAWING NO.:**  
 502  
**DRAWING TITLE:**  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM  
**DRAWING TITLE:**  
 LIST OF DRAWING LEGENDS SYMBOLS & FIXTURE CONNECTIONS  
**CAD:** WALIYAT  
**PROJECT:**  
**PROJECT:**  
**PROJECT:**  
**SCALE:** N.T.S. **DATE:** APRIL 2024  
**NEW DRAWING NO.:** 4753/326/BD/06P00









REV. NO.	DATE	BY	REMARKS

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.  
 CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 The Architects  
 11-A, HUDA ROAD, PHASE-1, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOT.  
 STRUCTURAL CONSULTANT:  
  
 mushtaq and bilal consulting engineers  
 10-A, HUDA ROAD, PHASE-1, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOT.

ELECTRICAL CONSULTANT:  
 K. P. A. ASSOCIATES  
 ELECTRICAL ENGINEER  
 1-A, BOX, GULSHAN E AZADI, F-7/2, ISLAMABAD.

PLUMBING CONSULTANT:  
  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 10-A, HUDA ROAD, PHASE-1, GATE NO. 1, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALAKOT.

NO. OF DRAWING: 502  
 DRAWING NO. 502

REVIEW & SUPERVISION CONSULTANT:  
 NESPAK (PVT.) LIMITED

SUBJECT: HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE: FIRST FLOOR PLAN PLUMBING LAYOUT

DATE: 14/04/2021  
 DESIGNER:  
 CHECKER:  
 APPROVED BY:

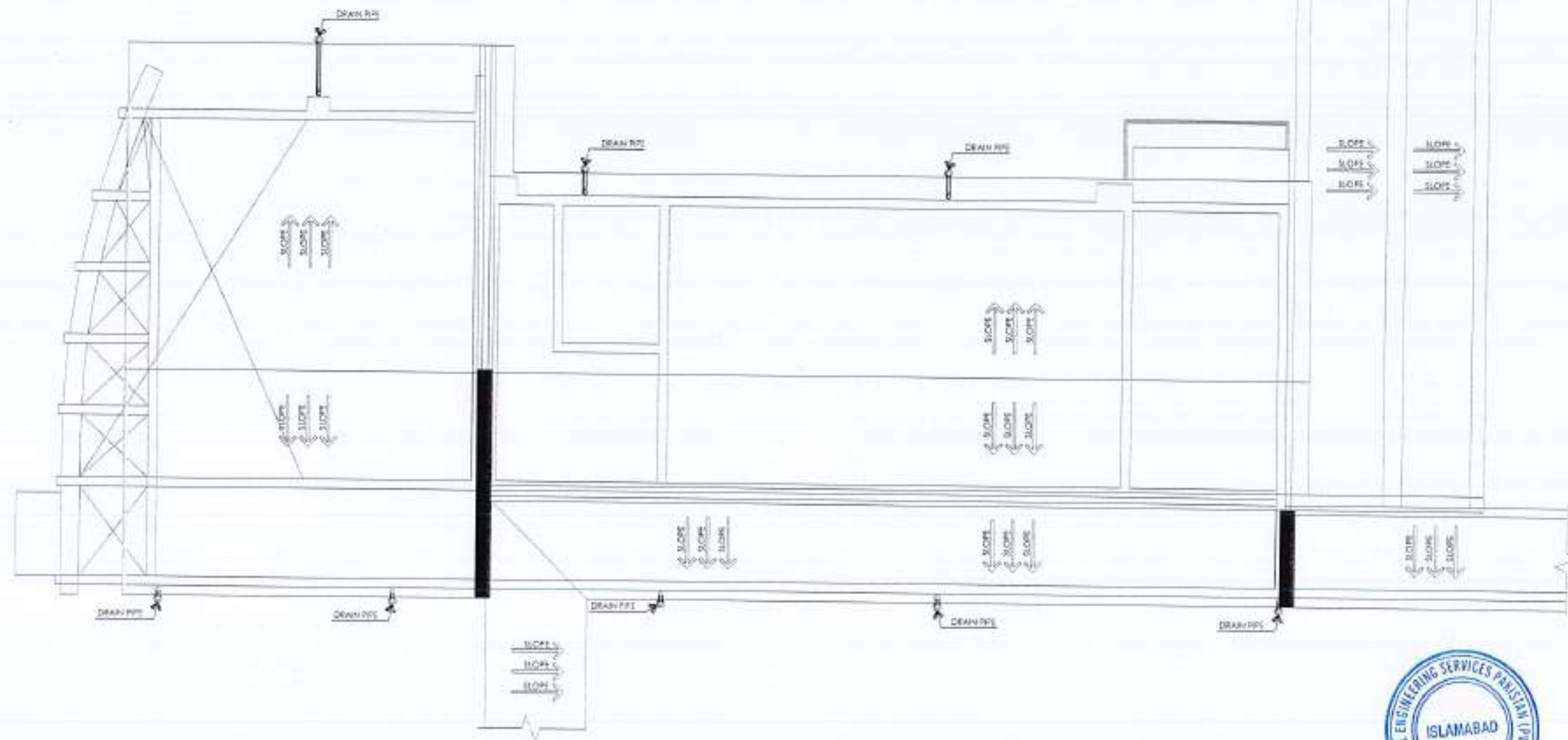
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 DATE: APRIL 2021  
 DRAWING NO.: 4753/326/BO/06FD2







01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17



REV	DATE	BY	REMARKS

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

ARCHITECT:  
 The Architect  
 24-A, Feroz Road, Phase-1, G-7/1, Islamabad.  
 TEL: 3730-4100 FAX: 3730-4100  
 E-MAIL: info@the-architect.com

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**mushtaq and bilal**  
 consulting engineers  
 24A, HOOR ROAD, PHASE 1, G-7/1, ISLAMABAD-75200  
 TEL: 3730-4100 FAX: 3730-4100  
 E-MAIL: info@mushtaqbilal.com

ELECTRICAL CONSULTANT:  
 E.P.E. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 14-A, BAITI, DUBLIN ROAD, KARACHI-75200

PLUMBING CONSULTANT:  
  
**NESPAC (PVT.) LIMITED**  
 22-A, FEROZ ROAD, PHASE 1, G-7/1, ISLAMABAD-75200  
 TEL: 3730-4100 FAX: 3730-4100  
 E-MAIL: info@nepak.com

PROJECT NO: 502

DESIGN & SUPERVISION CONSULTANT:  
**NESPAC (PVT.) LIMITED**

SUB-PROJECT TITLE:  
 HI-TECH, LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
 ROOF PLAN PLUMBING LAYOUT

CITY: ISLAMABAD  
 REGION: ISLAMABAD  
 NO. FLOOR:    
 APPROVED BY:    
 SCALE: 1/8" = 1'-0" DATE: APR 2024  
 REV. DRAWING NO: 4753/326/BD/06F03











NO.	DATE	BY	REVISION

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPINDI.  
 CLIENT:  
 UNIVERSITY OF PUNJAB, RAWALPINDI.

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
 THE ARCHITECT  
 ARCHITECTURAL PARTNERS (PVT) LTD.  
 100, H-8, MARKET, ISLAMABAD.  
 (STRUCTURAL CONSULTANT)  
  
**mushtaq and bilal**  
 consulting engineers  
 2ND FLOOR, SEWEE, CHOTAGALA CAMPUS, UNIVERSITY OF PUNJAB, RAWALPINDI.  
 TEL: 051-400-1100, 051-400-1101, 051-400-1102  
 FAX: 051-400-1103, 051-400-1104, 051-400-1105

ELECTRICAL CONSULTANT:  
 E F & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1st Floor, Sunrise Centre, F-7/1, Islamabad.

PLUMBING CONSULTANT:  
  
 E.F. ASSOCIATES  
 ENVIRONMENTAL & MANAGEMENT ENGINEERS  
 100, H-8, MARKET, ISLAMABAD.  
 TEL: 051-400-1100, 051-400-1101, 051-400-1102  
 FAX: 051-400-1103, 051-400-1104, 051-400-1105

DRAWING NO:  
 502

OWNER & SUPERVISION CONSULTANT:  
 NESPAC (PVT.) LIMITED

FOR PROJECT TITLE:  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
 GROUND FLOOR PLAN ENLARGED LAB PLUMBING LAYOUT

DATE:  
 04/04/2024

DESIGNER:  
 NESPAC

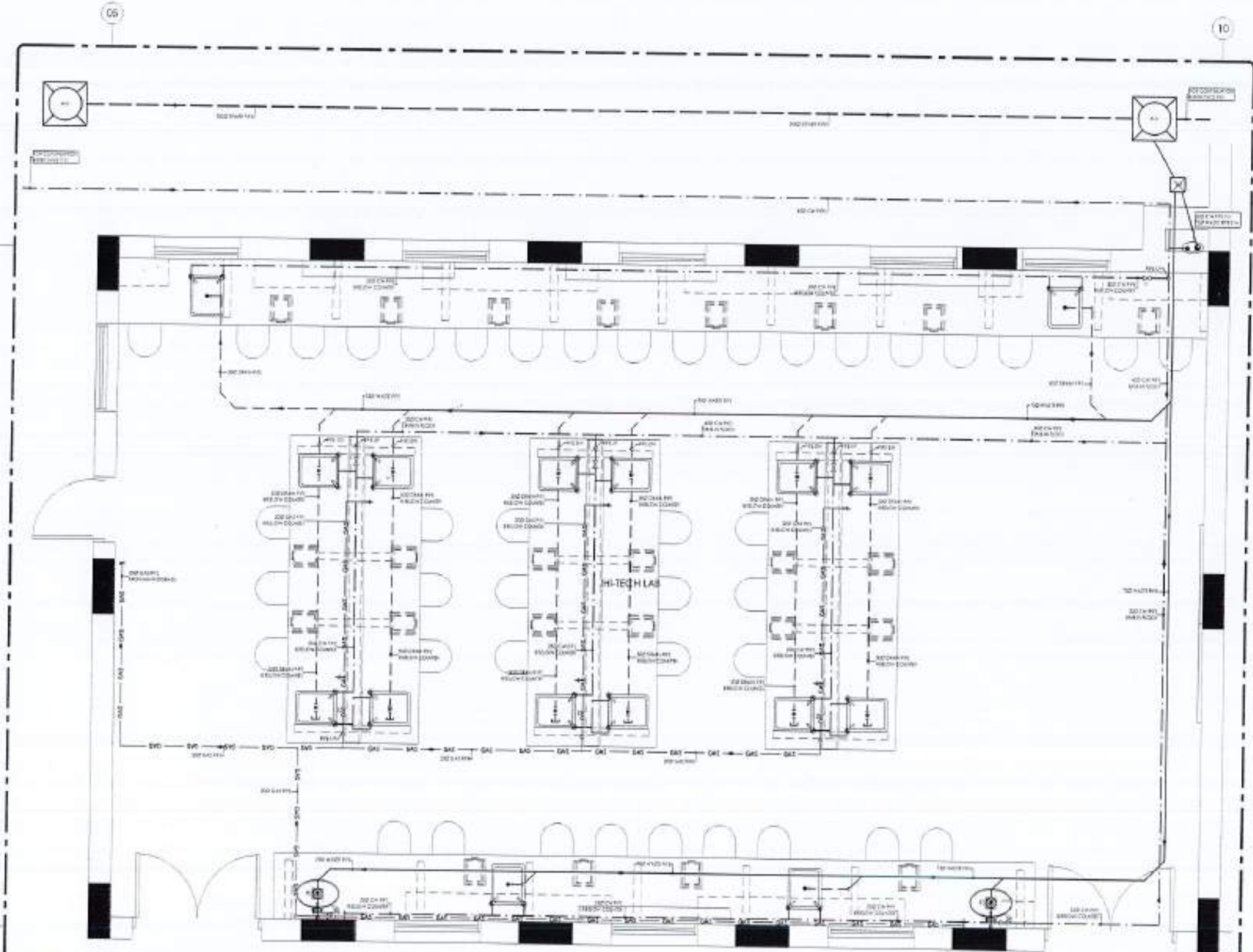
REVISIONS:

APPROVED BY:

SCALE:  
 1:10

DATE:  
 APRIL 2024

PROJECT NO:  
 4753/326/BD/06F05



GROUND FLOOR PLAN ENLARGED LAB  
 DETAIL PLUMBING LAYOUT





REV.	DATE	BY	REMARKS

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PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOISAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALPINDI.

CITY:  
 UNIVERSITY OF PUNJAB RAWALPINDI

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

ARCHITECT:  
 The Architects  
 24-A, F-7/1, Phase-7, Islamabad  
 TEL: 3731 4444 FAX: 3731 4444  
 WWW: WWW.THEARCHITECTS.COM

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**mushtaq and bilal**  
 consulting engineers  
 84-A, HOOD ROAD, PHASE 7, ISLAMABAD  
 TEL: 3731 4444 FAX: 3731 4444  
 WWW: WWW.MUSHTAQANDBILAL.COM

ELECTRICAL CONSULTANT:  
 E. F. S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 84-A HOOD ROAD, PHASE 7, ISLAMABAD  
 TEL: 3731 4444 FAX: 3731 4444

PLUMBING CONSULTANT:  
  
**E.F.S. ASSOCIATES**  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 84-A HOOD ROAD, PHASE 7, ISLAMABAD  
 TEL: 3731 4444 FAX: 3731 4444

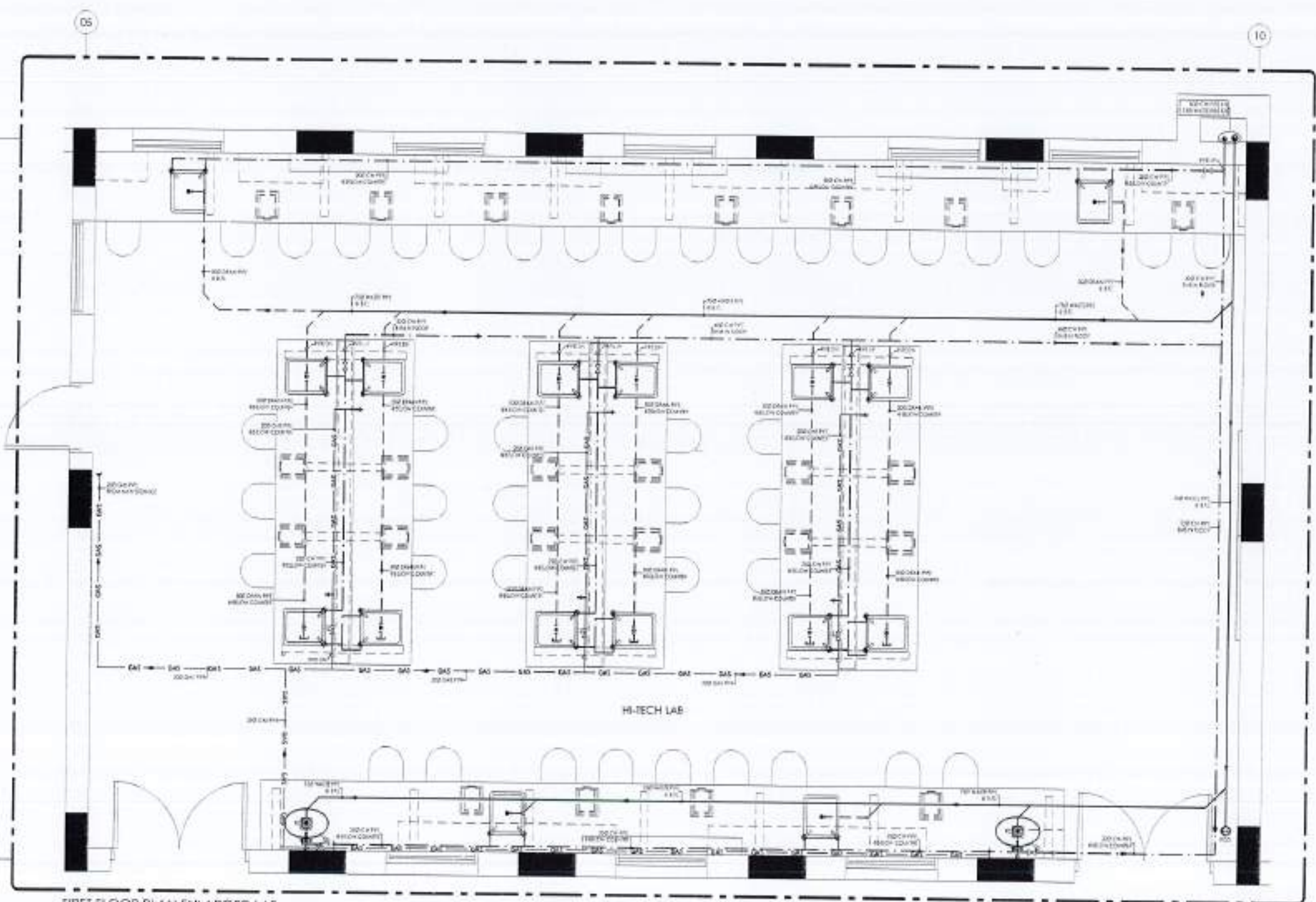
DATE: 04/04/2024  
 DRAWING NO: 502

CLIENT/SUPPLIER/OWNER:  
**NESPAC (PVT.) LIMITED**

PROJECT TITLE:  
 HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
 FIRST FLOOR PLAN ENLARGED LAB PLUMBING LAYOUT

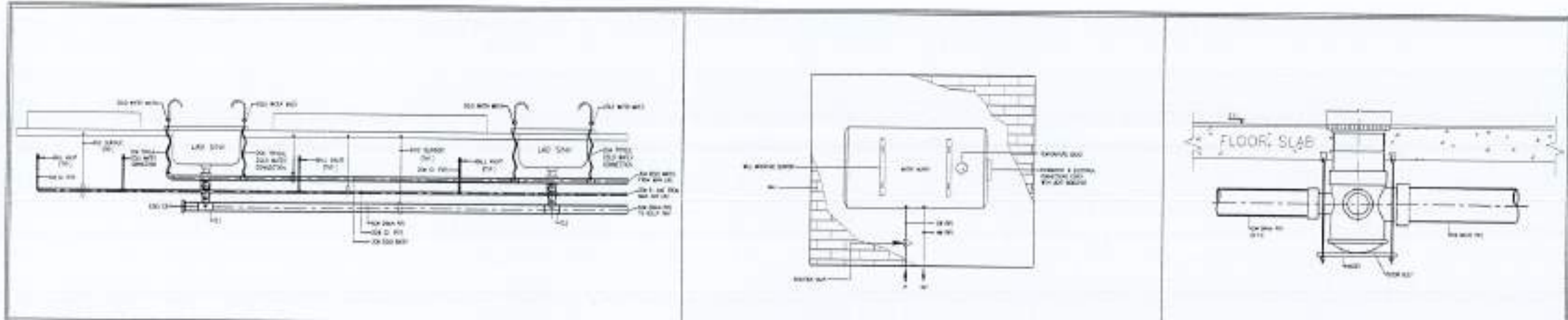
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 DATE: APRIL 2024  
 PROJECT NO: 4753/326/BO/D6FD6



FIRST FLOOR PLAN ENLARGED LAB  
 DETAIL PLUMBING LAYOUT



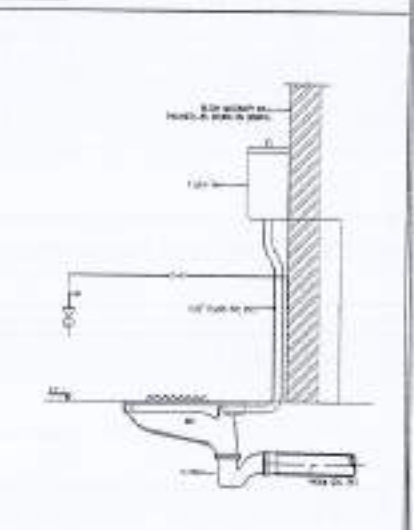
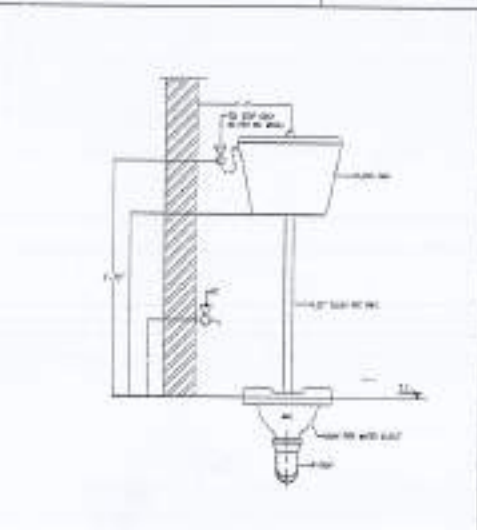
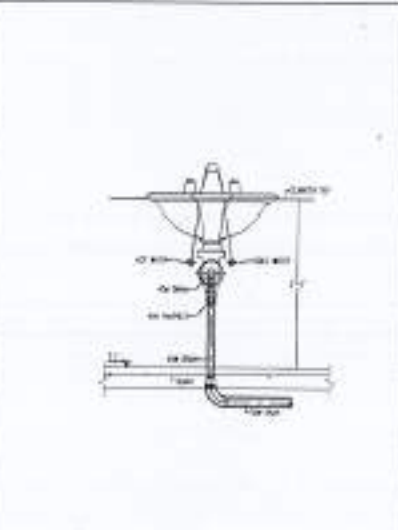
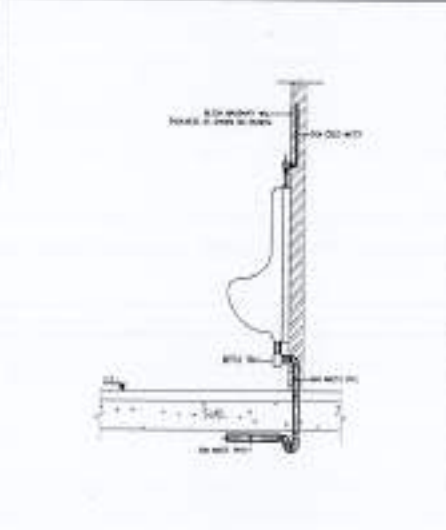
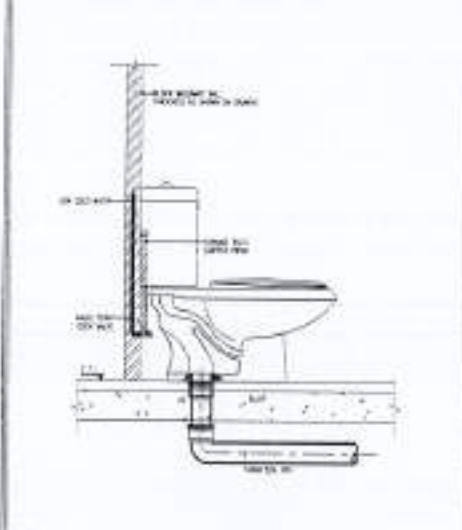




LAB SINK DETAIL

ELECTRIC WATER HEATER HANGING DETAIL

DETAIL OF FLOOR DRAIN



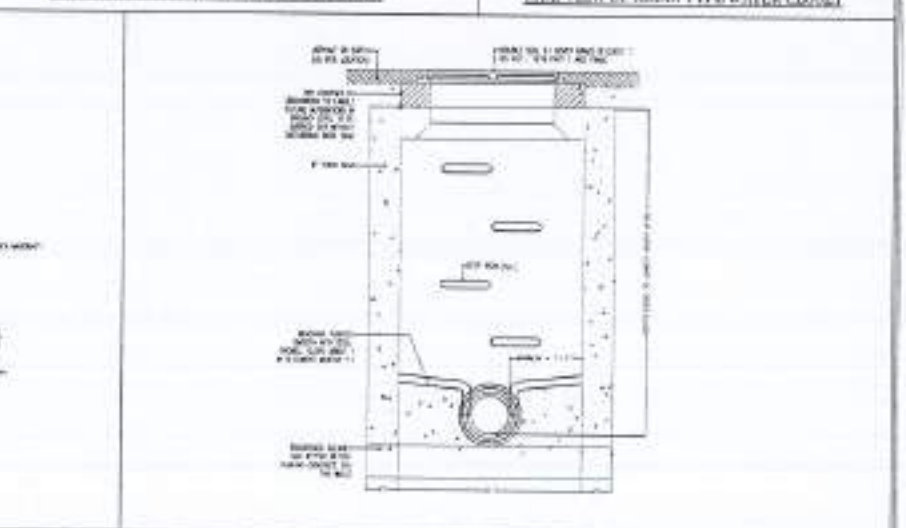
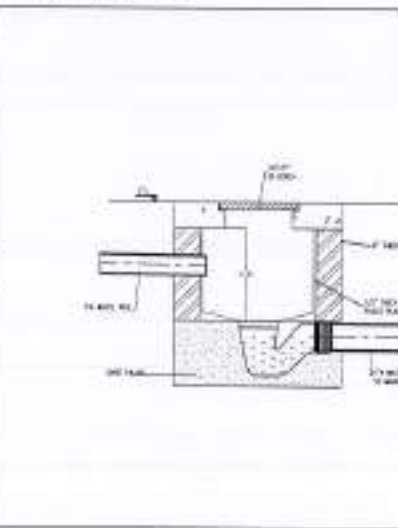
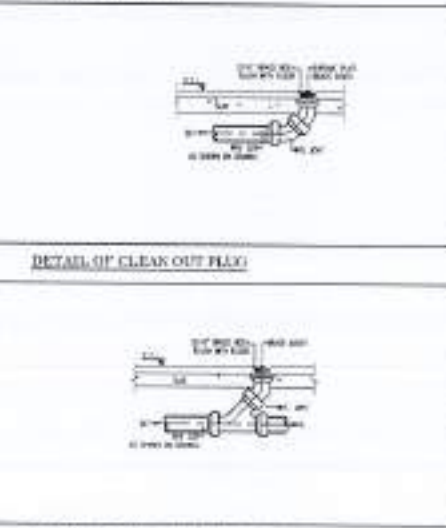
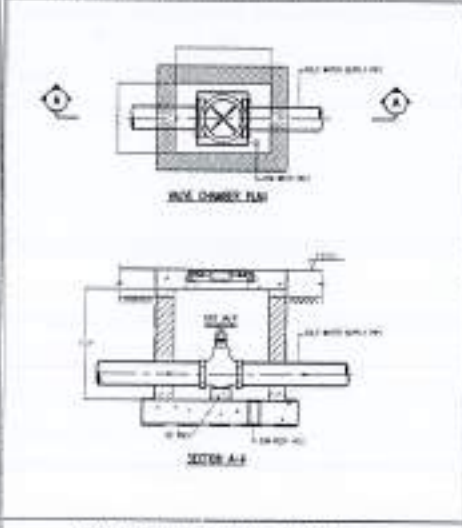
DETAIL OF EUROPEAN TYPE WATER CLOSET

DETAIL OF URINAL

DETAIL OF LAVATORY

FRONT VIEW OF ASIAN TYPE WATER CLOSET

SIDE VIEW OF ASIAN TYPE WATER CLOSET



TYPICAL DETAIL OF VALVE CHAMBER

DETAIL OF RUNNING CLEAN OUT TRAP

GULLY TRAP DETAIL

DETAIL OF SECHOLE

REV.	DATE	BY	CHKD.

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB BAWALAKOT.

CLIENT:  
UNIVERSITY OF PUNJAB BAWALAKOT

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
THE ARCHITECTS  
Architecture Planning Interiors  
114 FORT ROAD, SUITE 1100, KARACHI  
TEL: 37320113, 37320114, 37320115  
WWW.AUSTINARCHITECTS.COM

STRUCTURAL CONSULTANT:  
AAB

MUSHTAQ AND BILAL CONSULTING ENGINEERS  
204, BLOOR STREET, 4TH FLOOR, KARACHI-75200  
TEL: 37320113, 37320114, 37320115  
WWW.MUSHTAQANDBILAL.COM

ELECTRICAL CONSULTANT:  
R.P.S. ASSOCIATES  
ELECTRICAL ENGINEERS  
4-A, BLOOR STREET, 4TH FLOOR, KARACHI-75200

MECHANICAL CONSULTANT:  
R.P.S. ASSOCIATES  
MECHANICAL ENGINEERS  
4-A, BLOOR STREET, 4TH FLOOR, KARACHI-75200

DESIGNED BY:  
R.P.S. ASSOCIATES

NO: 502

DESIGNED BY:  
NESPAK (PVT.) LIMITED

PROJECT TITLE:  
HI-TECH LIBRARY AND GIRLS COMMON ROOM

DRAWING TITLE:  
MISCELLANEOUS DETAIL SHEET

CAD: WAJAHAT  
DESIGN: WAJAHAT  
CHECKED: WAJAHAT  
APPROVED: WAJAHAT

DATE: 04/01/2024  
DRAWING NO: 4753/326/BD/06F07







**LIST OF DRAWINGS:**

DRAWING NOS.	TITLE.
E-00	LIST OF DRAWING.
E-01	GROUND FLOOR LIGHTING PLAN.
E-02	GROUND FLOOR POWER & DATA VOICE PLAN.
E-03	GROUND FLOOR FIRE ALARAM PLAN.
E-04	FIRST FLOOR LIGHTING PLAN.
E-05	FIRST FLOOR POWER & DATA VOICE PLAN.
E-06	FIRST FLOOR FIRE ALARAM PLAN.
E-07	DETAILS OF LIGHTING PROTECTION
E-08	ROOF PLAN LIGHTING PROTECTION
E-09	SINGLE LINE DIAGRAM
E-10	SCHEMATIC DIAGRAM
E-11	LEGENDS, NOTES & DETAILS

REV.	DATE	BY	REMARKS

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PROJECT:  
 Reconstruction of  
 University of Azad Jammu Kashmir,  
 CHOTIADALA CAMPUS, BARMALDI,  
 AZAD JAMMU & KASHMIR.

CLIENT:  
 BATHINDALA RECONSTRUCTION &  
 REHABILITATION AUTHORITY (BRA)

GOVERNMENT OF PAKISTAN,  
 ISLAMABAD, PAKISTAN.

SCALE:  
 AS SHOWN

THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWING.

ARCHITECT:  
 The Architect  
 Registered Professional Engineer  
 P. No. 1000/1000/1000/1000/1000  
 1000/1000/1000/1000/1000

STRUCTURAL CONSULTANT:  
 mushtaq and bial  
 consulting engineers  
 1000/1000/1000/1000/1000  
 1000/1000/1000/1000/1000

ELECTRICAL CONSULTANT:  
 E.P.A. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 1000/1000/1000/1000/1000

PLUMBING CONSULTANT:  
 Environmental & Management Consultants  
 1000/1000/1000/1000/1000

DEPARTMENT  
 DEPARTMENT OF AGRICULTURE  
 VETERINARY & ANIMAL SCIENCE

TITLE  
 LIST OF DRAWING

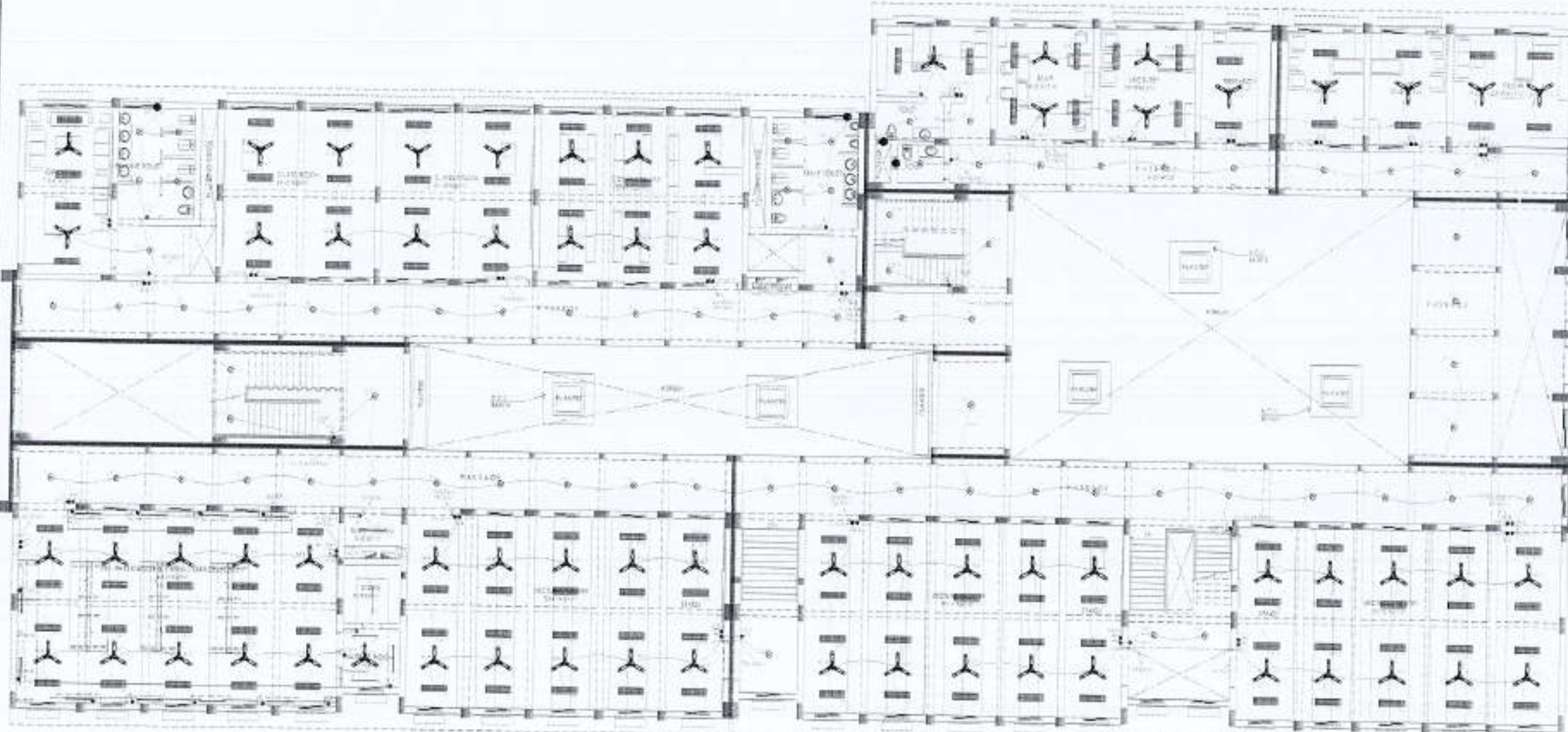
FILE NO.  
 -

DATE  
 10/10/2010

NO. 502  
 E-00

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
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GROUND FLOOR PLAN



REV.	DATE	BY	CHKD.	REMARKS

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PROJECT:  
 Reconstruction of University of Azad Jammu Kashmir, CHOITAGALA CAMPUS, BARAMULLA, AZAD JAMMU & KASHMIR

CLIENT:  
 BATHING RECONSTRUCTION & REHABILITATION AUTHORITY (BRIA)

GOVERNMENT OF PUNJAB  
 GILANWALA, PUNJAB

MEMORANDUM

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ARCHITECT:  
 The Architect  
 100, PUNJAB STREET, PUNJAB  
 PUNJAB, INDIA

STRUCTURAL CONSULTANT:  
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 CONSULTING ENGINEERS  
 100, PUNJAB STREET, PUNJAB  
 PUNJAB, INDIA

ELECTRICAL CONSULTANT:  
 I F S ASSOCIATES  
 ELECTRICAL ENGINEERS  
 100, PUNJAB STREET, PUNJAB  
 PUNJAB, INDIA

PLANNING CONSULTANT:  
 IFS Associates  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 100, PUNJAB STREET, PUNJAB  
 PUNJAB, INDIA

DEPARTMENT:  
 DEPARTMENT OF AGRICULTURE  
 VETERINARY & ANIMAL SCIENCE

NO:  
 GROUND FLOOR PLAN  
 LIGHTING LAYOUT

FOR:

ISSUE DATE:

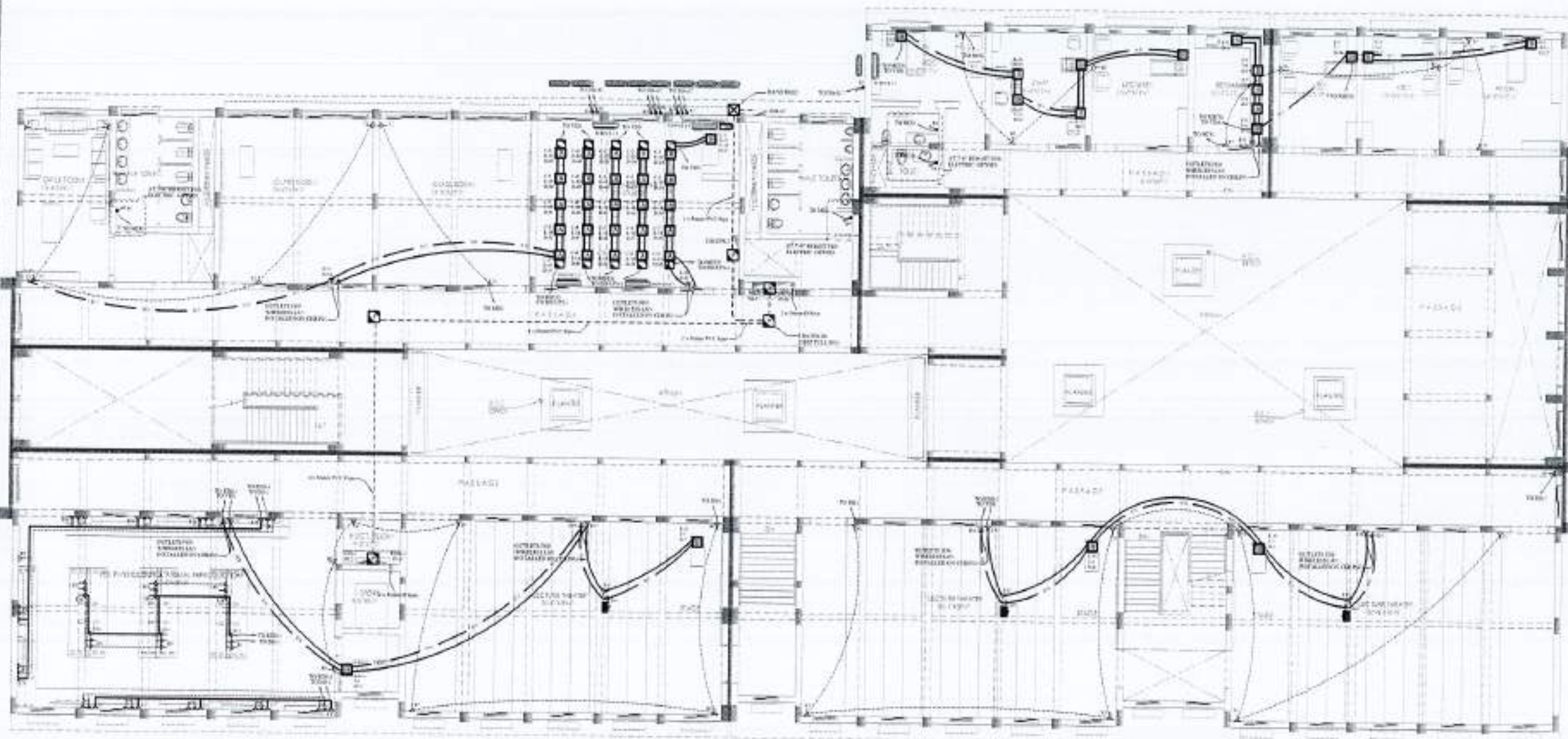
DATE: 11/05/2024

SCALE: 1/8" = 1'-0"

NO: 502 E-01

NOTES:  
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GROUND FLOOR PLAN



REV. NO.	DATE	BY	REVISION

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PROJECT  
 Reconstruction of University of Azad Jammu & Kashmir, CHOUDAGALA CAMPUS, BANJARAFAT, AZAD JAMMU & KASHMIR

CLIENT  
 EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY AREA

GOVERNMENT OF PUNJAB, BANJARAFAT, PAKISTAN

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

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DEPARTMENT  
 DEPARTMENT OF AGRICULTURE, VETERINARY & ANIMAL SCIENCE

SCALE  
 GROUND FLOOR PLAN  
 POWER & DATA LAYOUT

DATE  
 10-04-2021

DESIGNER	MANAGER	CHECKER	APPROVER
DATE		DATE	
10-04-2021		10-04-2021	
NO. OF SHEETS		DRAWING NO.	
502		E-02	

NOTES  
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PROJECT:  
 RECONSTRUCTION OF  
 UNIVERSITY OF AZAD JAMMU KASHMIR,  
 CHOTTAGALA CAMPUS, KAWAIBARI,  
 AZAD JAMMU & KASHMIR

CLIENT:  
 EARTHQUAKE RECONSTRUCTION &  
 REHABILITATION AUTHORITY (ER&RA)

GOVERNMENT OF PUNJAB  
 SLAMNAGU PAKISTAN

NO. OF SHEETS: 01

THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWING.

ARCHITECT:  

 The Architects  
 INTERNATIONAL PRACTICE GROUP  
 24, WAPDA HOUSE, 2ND FLOOR, WAPDA OFFICE COMPOUND,  
 CHAKRA 1, WAPDA HOUSE, WAPDA OFFICE COMPOUND,  
 KARACHI-75100, PAKISTAN

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 mushiq and bial  
 consulting engineers  
 24, WAPDA HOUSE, 2ND FLOOR, WAPDA OFFICE COMPOUND,  
 CHAKRA 1, WAPDA HOUSE, WAPDA OFFICE COMPOUND,  
 KARACHI-75100, PAKISTAN

ELECTRICAL CONSULTANT:  
 F. F. S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 8-20 B-10, GROUND FLOOR, JALALI SQUARE, KARACHI

PLANNING CONSULTANT:  

 I.A.A. Associates  
 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

DEPARTMENT  
 DEPARTMENT OF AGRICULTURE  
 VETERINARY & ANIMAL SCIENCE

TITLE  
 GROUND FLOOR PLAN  
 FIRE ALARM LAYOUT

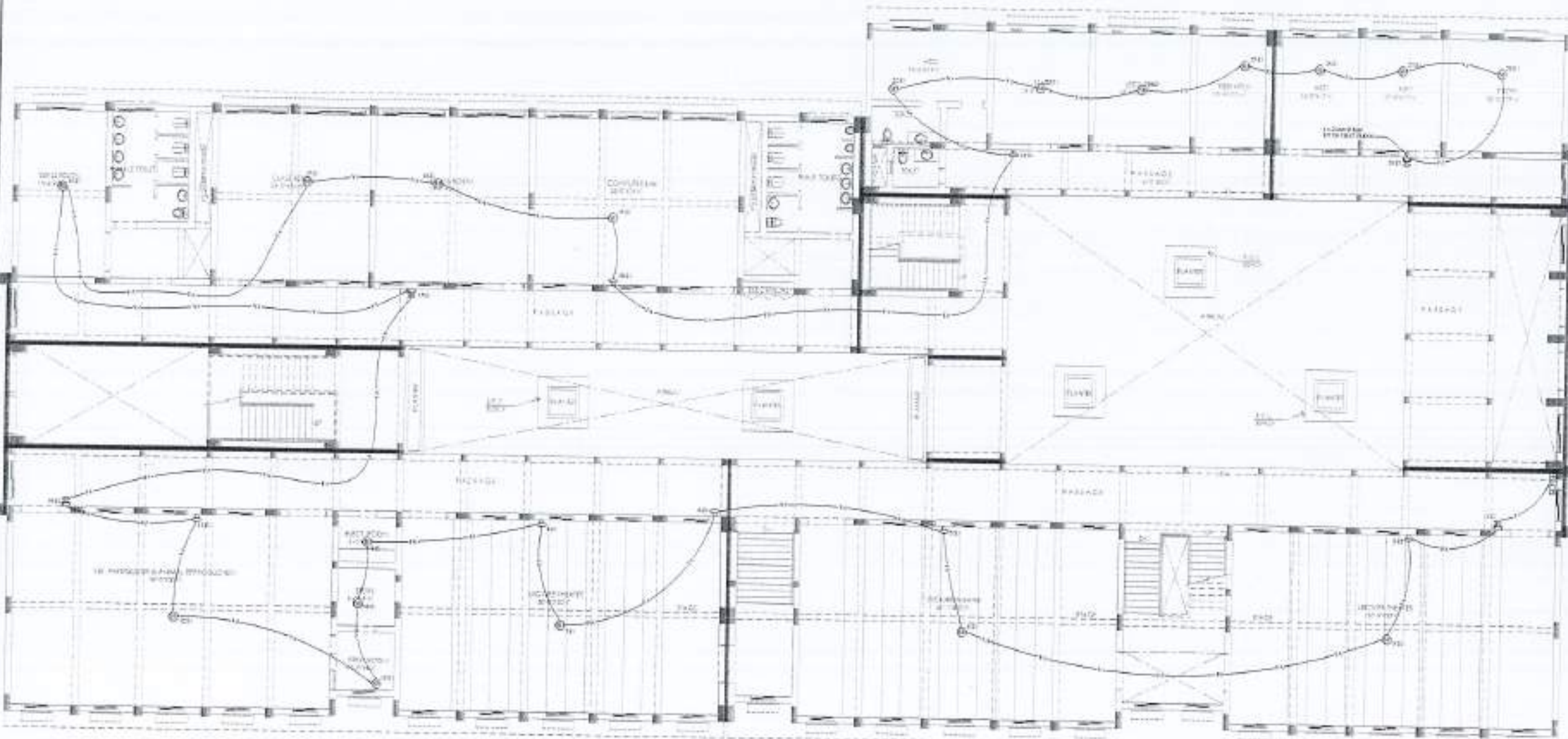
FOR  
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DATE  
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NO. OF SHEETS  
 1 OF 1

SCALE  
 1/8" = 1'-0"

DATE  
 24 APR 2023



GROUND FLOOR PLAN

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
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REV	DATE	REASON

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PROJECT:  
 Reconstruction of  
 University of Azad Jammu Kashmir,  
 CHOITACILLA CAMPUS, BAKKALROT,  
 AZAD JAMMU & KASHMIR.

CLIENT:  
 BAKSHAWAL RECONSTRUCTION &  
 REHABILITATION AUTHORITY (BRA)

GOVERNMENT OF PUNJAB  
 BAKHAWAL PUNJAB

DATE: 04/04/2022

THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWING.

PREPARED BY:  
 The Arch Arch  
 11-B, Main Road, Sector 14, Gurgaon,  
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 E-mail: info@thearcharch.com

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 E-mail: info@mushtaqandbial.com

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 E-mail: info@ksassociates.com

DEPARTMENT:  
 DEPARTMENT OF AGRICULTURE  
 VETERINARY & ANIMAL SCIENCE

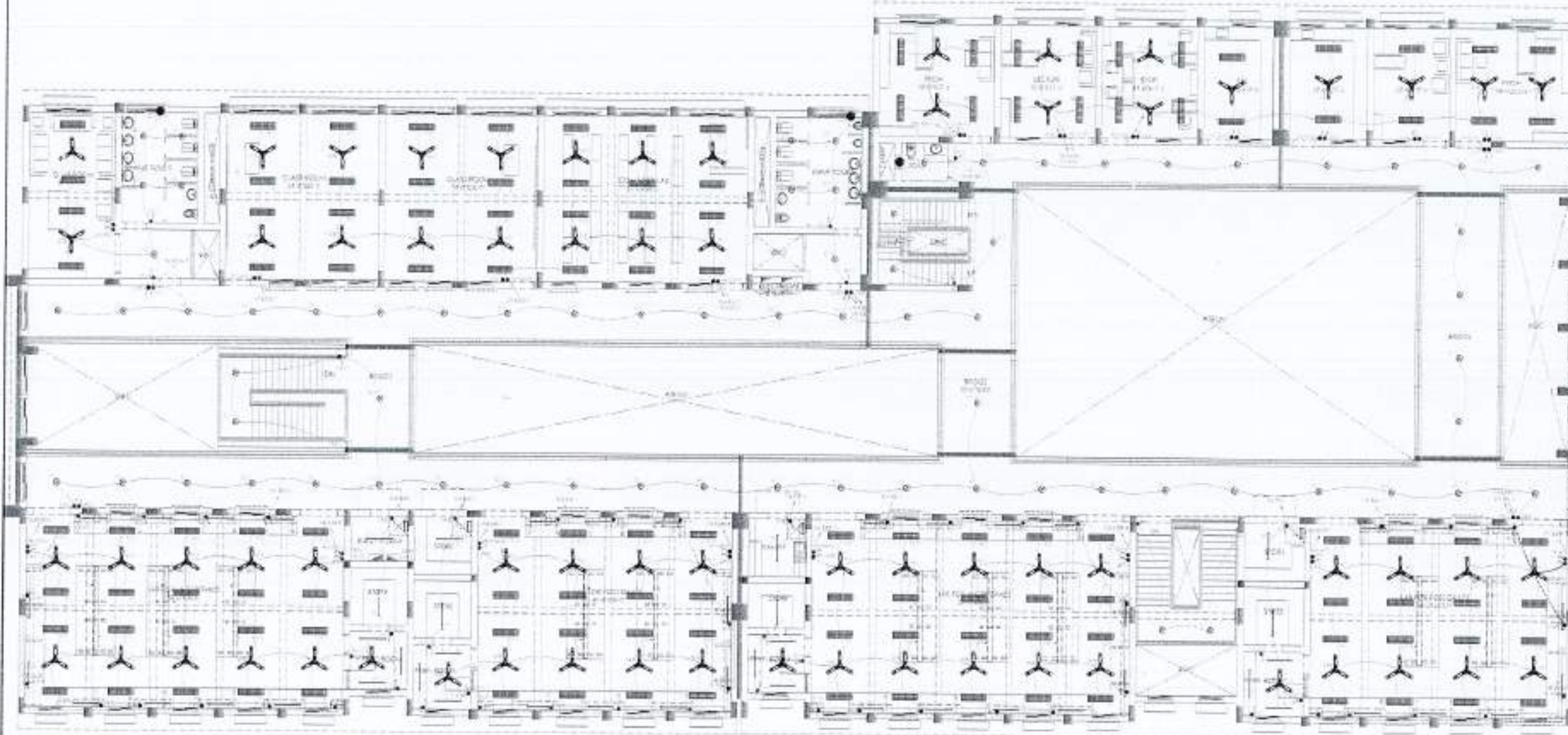
TITLE:  
 FIRST FLOOR PLAN  
 LIGHTING LAYOUT

FOR: -

DATE: -

DATE:	DATE:
PREPARED BY:	CHECKED BY:
DATE: 04/04/2022	DATE: 04/04/2022

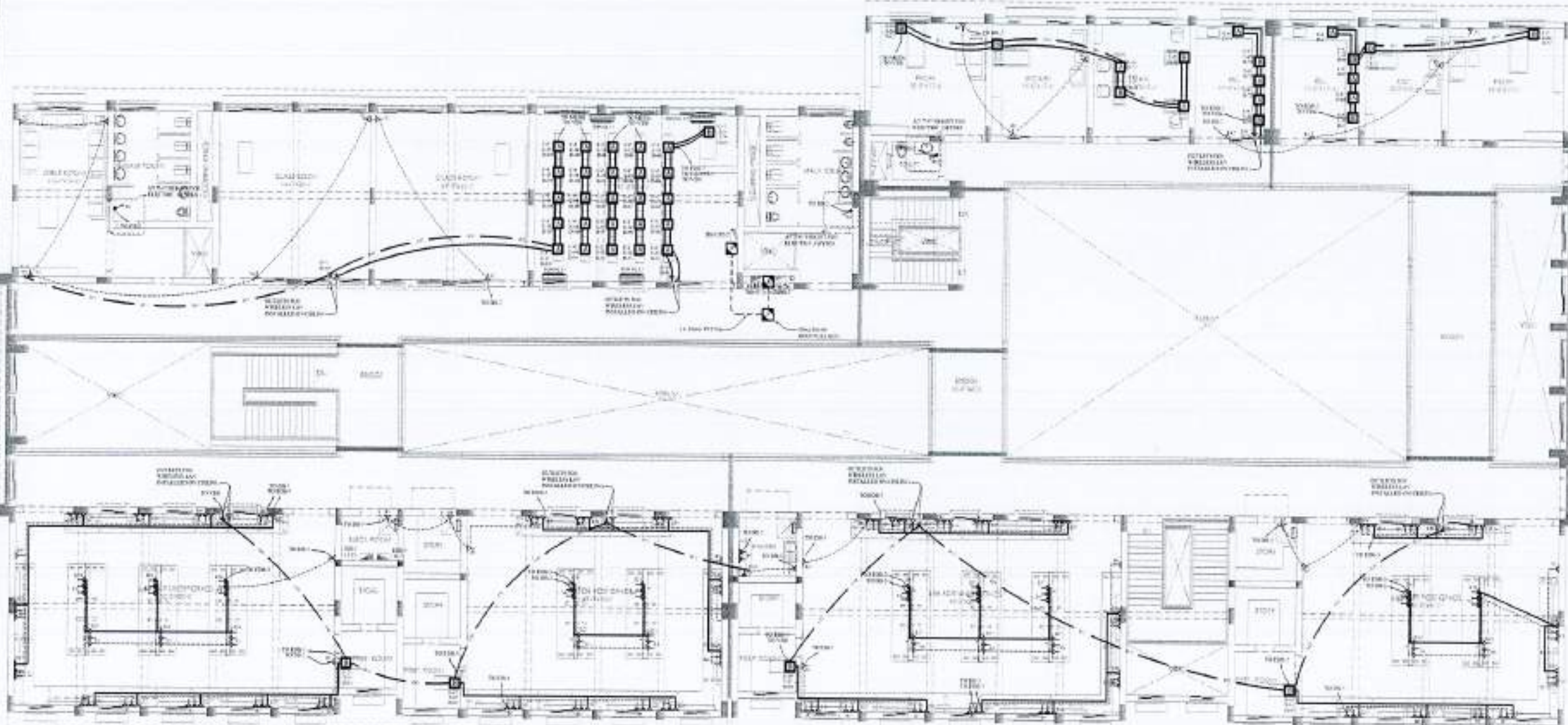
NO: 502	NO: E-04
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FIRST FLOOR PLAN

NOTES:  
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FIRST FLOOR PLAN



NO.	DATE	BY	REVISION

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PROJECT:  
 Reconstruction of  
 University of Azad Jammu Kashmir,  
 CHOUDAGALA CAMPUS, BAKKARDI,  
 AZAD JAMMU & KASHMIR

CLIENT:  
 UNIVERSITY RECONSTRUCTION &  
 REHABILITATION AUTHORITY (URRA)

GOVERNMENT OF PAKISTAN  
 ISLAMABAD, PAKISTAN

NO. OF FLOOR:  

THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWINGS.

ARCHITECT:  
 The Architects  
 Associates, Planning, Design,  
 Construction & Project Management  
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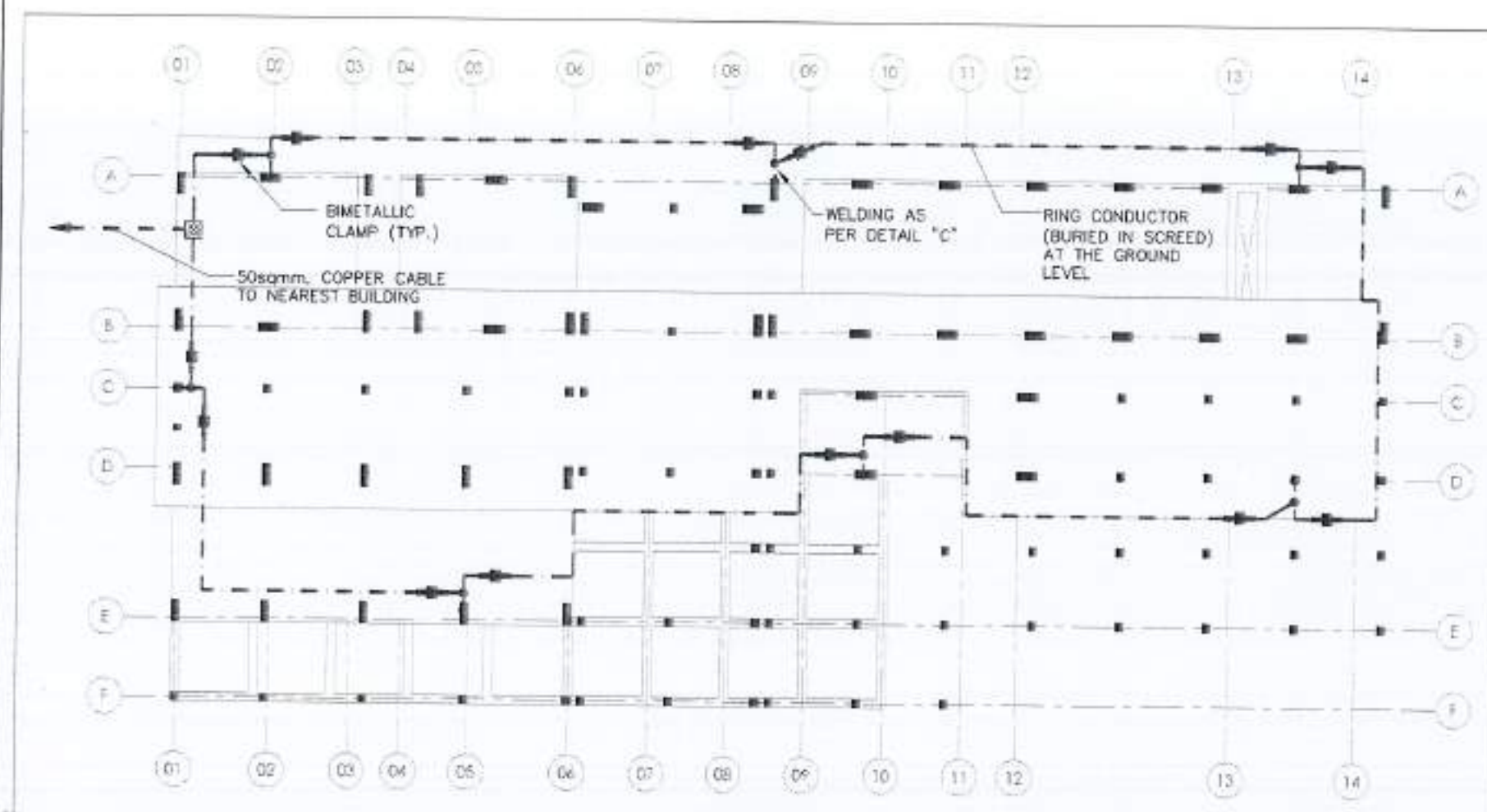
STRUCTURAL CONSULTANT:  
**mustaq and bial**  
 consulting engineers  
 20, H-8/2, Phase-8, Block-8, F-8/2,  
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ELECTRICAL CONSULTANT:  
**E & A ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 10, H-8/2, Phase-8, Block-8, F-8/2,  
 G-8/2, H-8/2, I-8/2, J-8/2, K-8/2, L-8/2,  
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 FC-8/2, FD-8/2, FE-8/2, FF-8/2, FG-8/2,  
 FH-8/2, FI-8/2, FJ-8/2, FK-8/2, FL-8/2, FM-8/2,  
 FN-8/2, FO-8/2, FP-8/2, FQ-8/2, FR-8/2,  
 FS-8/2, FT-8/2, FU-8/2, FV-8/2, FW-8/2,  
 FX-8/2, FY-8/2, FZ-8/2, GA-8/2, GB-8/2,  
 GC-8/2, GD-8/2, GE-8/2, GF-8/2, GG-8/2,  
 GH-8/2, GI-8/2, GJ-8/2, GK-8/2, GL-8/2, GM-8/2,  
 GN-8/2, GO-8/2, GP-8/2, GQ-8/2, GR-8/2,  
 GS-8/2, GT-8/2, GU-8/2, GV-8/2, GW-8/2,  
 GX-8/2, GY-8/2, GZ-8/2, HA-8/2, HB-8/2,  
 HC-8/2, HD-8/2, HE-8/2, HF-8/2, HG-8/2,  
 HH-8/2, HI-8/2, HJ-8/2, HK-8/2, HL-8/2, HM-8/2,  
 HN-8/2, HO-8/2, HP-8/2, HQ-8/2, HR-8/2,  
 HS-8/2, HT-8/2, HU-8/2, HV-8/2, HW-8/2,  
 HX-8/2, HY-8/2, HZ-8/2, IA-8/2, IB-8/2,  
 IC-8/2, ID-8/2, IE-8/2, IF-8/2, IG-8/2,  
 IH-8/2, II-8/2, IJ-8/2, IK-8/2, IL-8/2, IM-8/2,  
 IN-8/2, IO-8/2, IP-8/2, IQ-8/2, IR-8/2,  
 IS-8/2, IT-8/2, IU-8/2, IV-8/2, IW-8/2,  
 IX-8/2, IY-8/2, IZ-8/2, JA-8/2, JB-8/2,  
 JC-8/2, JD-8/2, JE-8/2, JF-8/2, JG-8/2,  
 JH-8/2, JI-8/2, JJ-8/2, JK-8/2, JL-8/2, JM-8/2,  
 JN-8/2, JO-8/2, JP-8/2, JQ-8/2, JR-8/2,  
 JS-8/2, JT-8/2, JU-8/2, JV-8/2, JW-8/2,









**NOTES FOR LIGHTNING PROTECTION**

1. ALL CONDUCTIVE PARTS TO BE BONDED WITH LIGHTNING PROTECTION NETWORK THROUGH STRANDED COPPER CONDUCTOR.
2. CONDUCTORS USED FOR BONDING WILL HAVE A GREEN/YELLOW SHEATH.
3. PROVIDE BRASS SADDLES TO SECURELY FASTEN VERTICAL AND HORIZONTAL CONDUCTORS AS SHOWN.
4. ALL NUTS/BOLTS TO BE OF 16mm DIA BRASS.
5. CONNECTIONS AT EARTH TEST CLAMP AND COPPER EARTH ROD TO BE THROUGH COMPRESSION LUGS.
6. EARTH RODS TO BE HAMMERED IN THE GROUND.
7. PROVIDE CONDUCTOR JOINTING CLAMP ON DOWN CONDUCTOR CLOSE TO MAIN EARTH TERMINAL AS SHOWN IN GROUNDING SCHEMATIC DIAGRAM.
8. WELDING BETWEEN ANY RE-BARS TO BE DONE AS PER DETAIL "C".
9. FOUNDATION INTERCONNECTION IS SHOWN, THE ABOVE SCHEME ALSO APPLIES TO ALL OTHER BUILDINGS (EXCEPT CENTRAL POWER PLANT & MOSQUE).
10. RE-BARS OF COLUMNS SHALL BE USED AS DOWN CONDUCTOR.
11. TWO RE-BARS SHALL BE USED IN EACH COLUMN AS SHOWN FOR THIS PURPOSE.
12. THE RE-BARS SHALL BE WELDED TOGETHER AS SHOWN TO CREATE ELECTRICAL CONTINUITY FROM ROOF TOP TO COLUMN FOUNDATION.
13. COLUMN RE-BARS (DOWN CONDUCTORS) SHALL BE JOINED TO ROOF AIR TERMINATION NETWORK, AND RING CONDUCTOR (BURIED IN SCREED) AT THE GROUND LEVEL AS SHOWN.



NO.	DATE	REVISION	REMARKS

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**PROJECT:**  
 Reconstruction of University of Azad Jammu Kashmir, CHOUDAGALA CAMPUS, BARAMULLA, AZAD JAMMU & KASHMIR.

**CLIENT:**  
 EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERRA)

**GOVERNMENT OF PAKISTAN**  
 ISLAMABAD, PAKISTAN

**ARCHITECT:**  
 AUSTEC ARCHITECTS

**THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.**

**ARCHITECT:**  
 The Architects  
 Professional Firm  
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**STRUCTURAL CONSULTING:**  
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 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

**ELECTRICAL CONSULTING:**  
 F. P. S. ASSOCIATES  
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 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453,

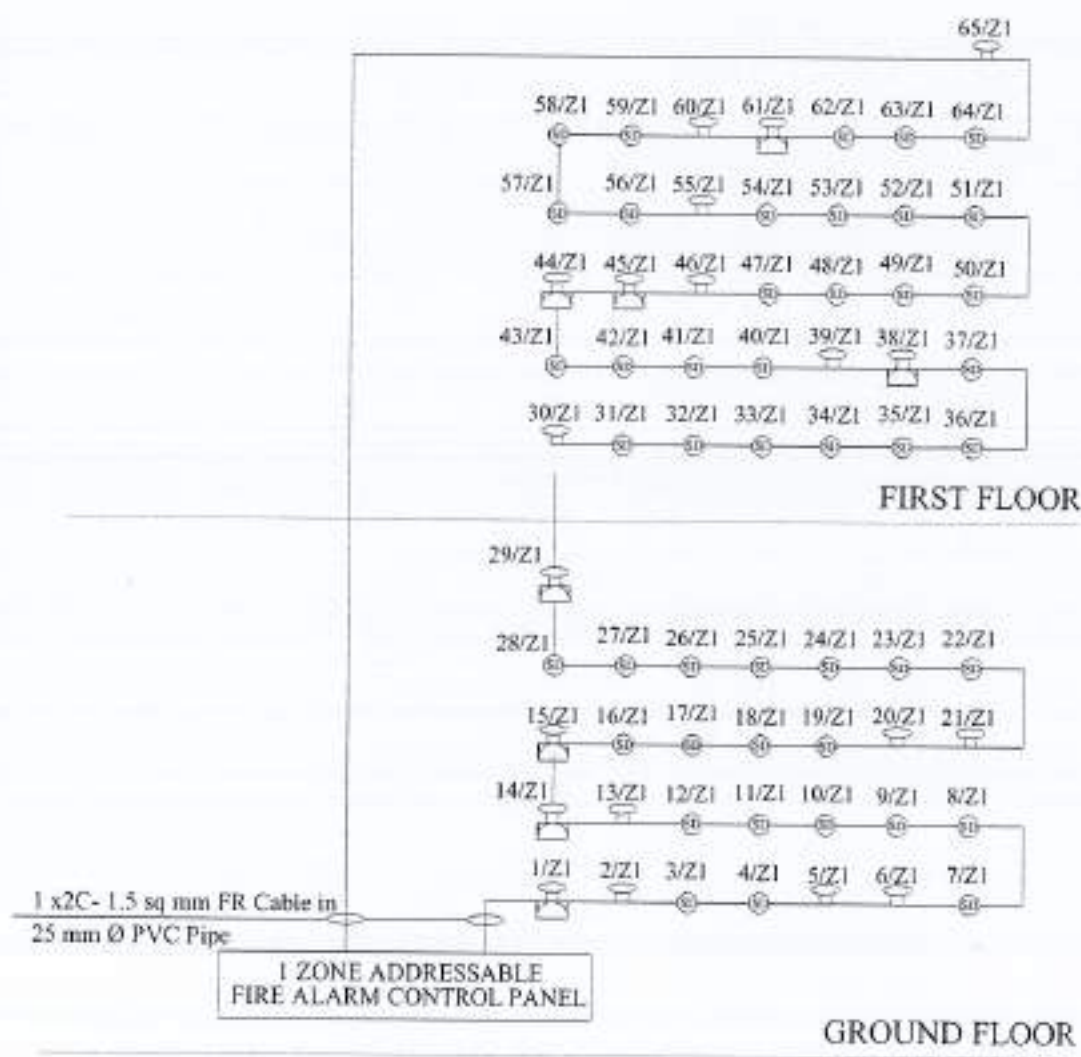




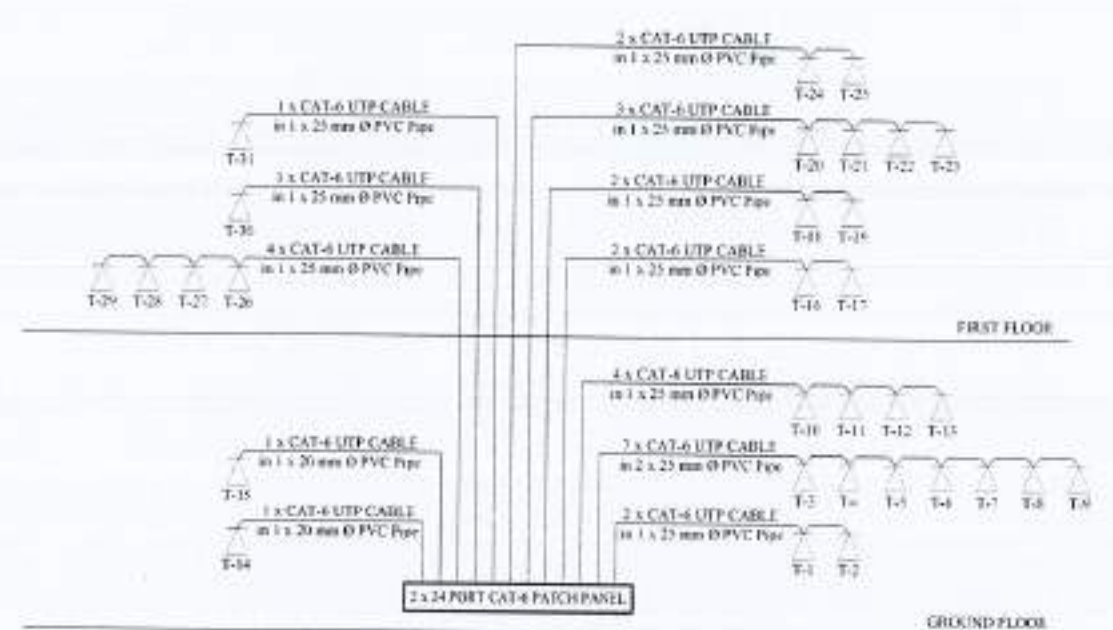




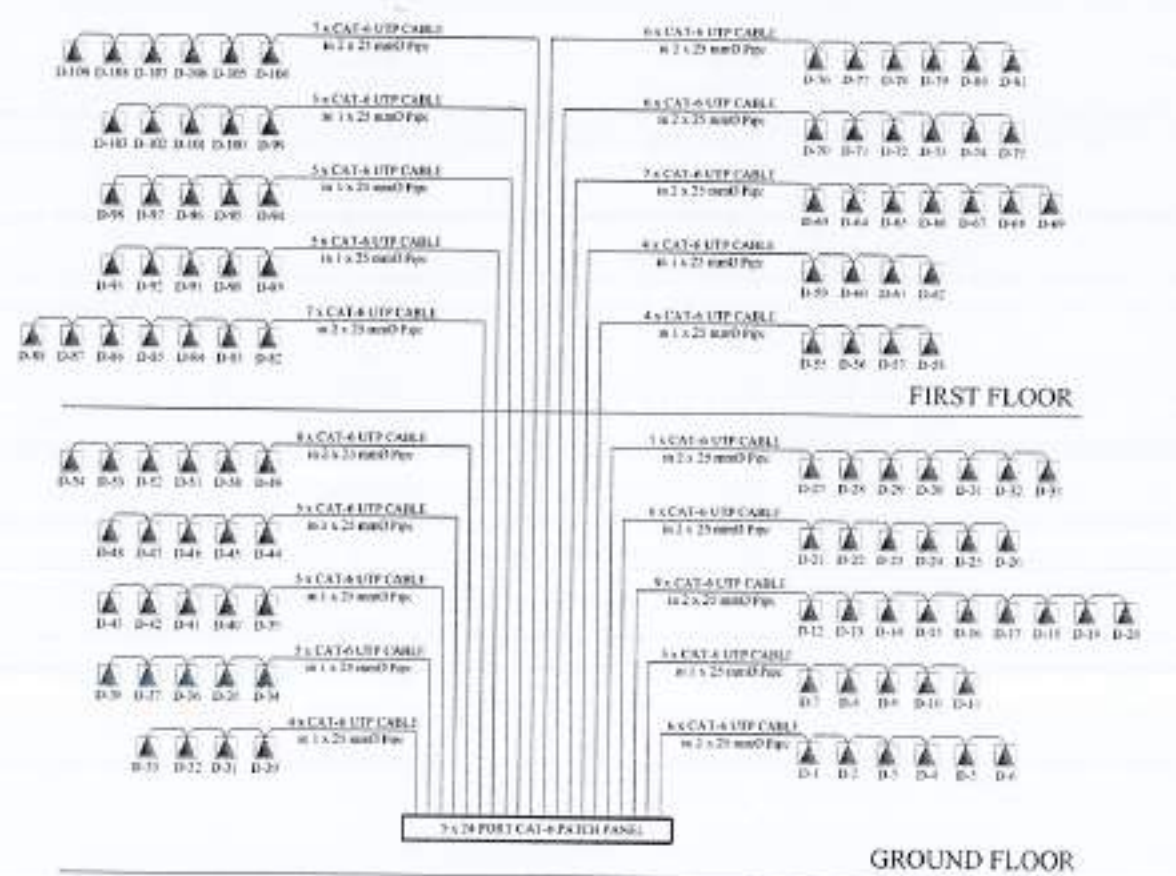




**FIRE ALARM SYSTEM SCHEMATIC DIAGRAM**



**VOICE SYSTEM SCHEMATIC DIAGRAM**



**DATA SYSTEM SCHEMATIC DIAGRAM**



REV. NO.	DATE	ISSUE	REMARKS

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PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHITRADOLA CAMPUS, BAHAWALNUR, AZAD JAMMU & KASHMIR

CLIENT: EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ER&A)

GOVERNMENT OF PAKISTAN ISLAMABAD, PAKISTAN

NOTHING HEREIN

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ARCHITECT: The Architect, Earthquake Reconstruction & Rehabilitation Authority (ER&A), Islamabad, Pakistan.

STRUCTURAL CONSULTANT: **mushtaq and bial** consulting engineers, 100-A, H-8, Islamabad, Pakistan.

ELECTRICAL CONSULTANT: **E & A ASSOCIATES**, ELECTRICAL ENGINEERS, 100-A, H-8, Islamabad, Pakistan.

PLANNING CONSULTANT: **ER&A**, Islamabad, Pakistan.

DEPARTMENT OF AGRICULTURE, VETERINARY & ANIMAL SCIENCE

TITLE: SCHEMATIC DIAGRAM

DATE: 01-APR-2023

502 E-10



**LEGEND:**

SYMBOL	DESCRIPTION	MOUNTING HEIGHT (FL)
	10A ONE WAY SWITCH	7'-2"
	10A TWO WAY SWITCH	7'-2"
	32A DOUBLE POLE SAFETY BREAKER	7'-2"
	CEILING MOUNTED LIGHT FIXTURE (1 x 18W FLC LAMP)	CEILING
	CEILING LIGHT FIXTURE TCS-240 (2 x 36W FLUORESCENT LAMP)	CEILING
	FLUORESCENT LIGHT FIXTURE (TMS 015138)	CEILING/COUNTER
	SWEEP CEILING FAN (60W)	CEILING
	GLASS FITTED EXHAUST FAN (60W)	8'-0"
	WALL BRACKET FAN (60W)	7'-6"
	5A, 3 PIN SWITCH SOCKET OUTLET (100W)	8'-0"
	5A, 3 PIN SWITCH SOCKET OUTLET (100W)	7'-2"
	15A, 3 PIN SWITCH SOCKET OUTLET (100W)	7'-2"
	16A, SHOKO SOCKET OUTLET (100W)	7'-0"
	13A, FLAT PIN SWITCH SOCKET OUTLET (100W)	CEILING
	WALL MOUNTED SPLIT A/C	8'-0"
	A/C COMPRESSOR	.....
	1 x 13A FLAT PIN SSO + 1 x 16A SHOKO SOCKET + 1 x DATA OUTLET	FURNITURE
	1 x 13A FLAT PIN SSO + 1 x 16A SHOKO SOCKET + 1 x DATA OUTLET + 2 x VOICE OUTLET	FURNITURE
	FLOOR BOX	FLOOR
	TELEPHONE OUTLET	8'-0"
	DATA OUTLET	CEILING
	VOICE DATA RACK	4'-0"
	SMOKE DETECTOR	CEILING
	HEAT DETECTOR	CEILING
	FIRE ALARM SOUNDER & MANUAL CALL POINT	4'-0"
	FIRE ALARM CONTROL PANEL	7'-0"
	VOLT METER 0 - 500 VOLT 16 A, 7 POSITION	.....
	VOLT SELECTOR SWITCH	.....
	DISTRIBUTION BOARD	4'-0"
	EARTHING SET / TO BE GROUNDED	.....
	PROJECTOR	CEILING
	SINGLE POLE MINIATURE CIRCUIT BREAKER	.....
	DOUBLE POLE MINIATURE CIRCUIT BREAKER	.....
	TRIPLE POLE MINIATURE CIRCUIT BREAKER	.....
	TRIPLE POLE MOLDED CASE CIRCUIT BREAKER	.....
	CONDUIT IN CEILING	.....
	CONDUIT IN WALL / FLOOR	.....
	CIRCUIT TO DB	.....
S1,S2,S3	NUMBER OF SWITCHES	.....
R,Y,B	COLOUR OF CIRCUITS	.....
T1,T2,T3	NUMBER OF TELEPHONE EXTENTION	.....
D1,D2,D3	NUMBER OF DATA POINT	.....
C1,C2,C3	NUMBER OF UPS CIRCUITS	.....
E1,E2,E3	NUMBER OF EMERGENCY CIRCUITS	.....

**CABLE TYPE SCHEDULE**

WIRING APPLICATION	CABLE TYPE
INDOOR CIRCUIT- LIGHTING	3 x 2.5sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
INDOOR POINT- LIGHTING	3 x 2.5sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
INDOOR CIRCUIT- GENERAL POWER OUTLETS	3 x 4sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
INDOOR POINT- GENERAL POWER OUTLETS	3 x 2.5sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
OUTDOOR CIRCUIT- LIGHTING	3-C 0.3/0.5kV Cu/PVC/PVC CABLE, CONDUCTOR SIZE AS PER DRAWING
OUTDOOR POINT- LIGHTING	3-C 0.3/0.5kV Cu/PVC/PVC CABLE, CONDUCTOR SIZE AS PER DRAWING
OUTDOOR CIRCUIT- GENERAL POWER OUTLETS	4sqmm 3-C 0.3/0.5kV Cu/PVC CABLE
OUTDOOR POINT- GENERAL POWER OUTLETS	2.5sqmm 3-C 0.3/0.5kV Cu/PVC CABLE
INDOOR POWER DISTRIBUTION	4 x 1-C 0.6/1kV Cu/PVC CABLES + 1-C 0.6/1kV Cu/PVC CABLE AS ECG, CONDUCTOR SIZES AS PER DRAWING
VOICE/DATA OUTLETS	CAT-6 UTP 25PAIR SOLID BARE COPPER CONDUCTORS, 4 PAIRS CABLED TOGETHER WITH A FLEXED COAT SEPARATOR, THERMOPLASTIC POLYURETHAN INSULATION AND FLAME RETARDANT THERMOPLASTIC JACKET, APPROVED COLOUR, COMPLIANT TO ANSI/TIA/EIA-568-B.2-1 AND RATED CM AS PER NEC ARTICLE 800
VOICE/DATA PATCH CABLES	375 LONG MOLDED SHAGLESS PATCH CABLE, CAT-6 UTP 25PAIR STRANDED TIN COPPER CONDUCTORS, 4 PAIRS CABLED WITH CORE SEPARATOR, THERMOPLASTIC POLYURETHAN INSULATION AND FLAME RETARDANT THERMOPLASTIC JACKET, APPROVED COLOUR, COMPLIANT TO ANSI/TIA/EIA-568-B.2-1 AND RATED CM AS PER NEC ARTICLE 800
FIRE ALARM SYSTEM DEVICES	1.5sqmm 2-C 0.3/0.5kV CABLE, STRANDED BARE COPPER CONDUCTORS, LOW SMOKE ZERO HALOGEN (LSZH) INSULATION, NON-INSULATED CPC, OVERALL SCREEN AND LSZH SHEATH(TYPICAL)

**CONDUIT FILL SCHEDULE**

S#	CABLE TYPE	20mm Dia (0.75" Dia)	25mm Dia (1.0" Dia)	30mm Dia (1.25" Dia)	38mm Dia (1.5" Dia)	50mm Dia (2.0" Dia)
1	2.5sqmm	6	11	15	-	-
2	4sqmm	8	8	12	17	-
3	6sqmm	5	7	11	15	-
4	10sqmm	-	5	7	11	15
5	CAT-6	-	6	10	15	25
6	0.6-1kV	-	5	7	11	15
7	1.5sqmm FA	-	2	-	-	-

**DISTRIBUTION PANEL CONSTRUCTION DETAILS**

- DBs/LT PANELS SHALL BE FABRICATED FROM 16 SWG SHEET STEEL WITH WELDED, GRINDED AND FINISHED ANGLE-IRON FRAME - WORK INDEXES PROTECTION CLASS TO BE IP-54
- DBs/LT PANELS SHALL BE ELECTRO-STATICALLY COATED WITH POWDER OF COLOUR RAL 7032 AND THEN GIVEN BAKES
- REFER TO DB/LT PANEL SCHEMATICS FOR CABLE ENTRY/EXIT TYPE
- HMOCKETS REQUIRED FOR INCOMING/OUTGOING CABLES
- LT PANELS SHALL HAVE ISOLATED HANDLES WITHOUT KEY
- DBs/LT PANELS WITH ALL COMPONENTS AND ACCESSORIES SHALL BE SUITABLE FOR FRONT OPERATION ONLY
- ALL DBs/LT PANELS SHALL HAVE 200mm EXTRA SPACE
- EACH DB/LT PANEL TO HAVE SUFFICIENT SPACE ON NEUTRAL AND EARTH BARS 'N' AND 'E' BARS TO HAVE PRE-DRILLED HOLES FOR CABLE CONNECTIONS
- EACH DB/LT PANEL TO HAVE INSIDE POCKET WITH AS-BUILT DRAWING
- EACH DB/LT PANEL TO BE TESTED AT MANUFACTURER'S WORKS FOR INSULATION AND FUNCTIONAL OPERATION OF ALL COMPONENTS AND DEVICES
- ALL INCOMING CIRCUIT BREAKERS TO BE OF ADJUSTABLE TYPE
- CIRCUIT BREAKER CHARACTERISTICS TO BE AS FOLLOWS:
  - \* RCBS FOR LIGHTING CIRCUITS TYPE 'B'
  - \* RCBS FOR OTHER SERVICES TYPE 'C'
- EXCEPT WHERE NOTED OTHERWISE, ALL OUTGOING RCBS TO HAVE 100 + 10kA
- FLEXIBLE COPPER STRIP SHALL BE PROVIDED FOR EARTHING OF THE DOOR OF DB/LT PANEL
- ONLY WAKES DETAILED IN THE TENDER DOCUMENTS ARE TO BE USED

**GENERAL INSTALLATION**

- ACCESS TO ELECTRICAL EQUIPMENT SHALL NOT BE DENIED BY ACCUMULATION OF WIRES SUCH ACCUMULATION SHALL ALSO BE ALLOWED TO DENY REMOVAL OF PANELS, INCLUDING SUSPENDED CEILING PANELS
- INSPECTION BOX, PULL BOX, JUNCTION BOX, ETC. SHALL BE PROVIDED AS SHOWN IN THE DRAWING AND WHERE NECESSARY FOR CASE OF CABLE PULLING
- DIFFERENT SYSTEMS WIRING TO BE RUN IN SEPARATE CONDUITS
- UNLESS NOTED OTHERWISE ALL BACK BOXES SHALL BE OF 16 SWG SHEET STEEL, POWDER COATED, WITH PROVISION FOR EARTH CONNECTION
- ALL NON - CURRENT CARRYING PARTS IN OUTER CASINGS OF EQUIPMENT SUCH AS MV & LV PANELS, DISTRIBUTION BOARDS, CABLE TRAYS, AUXILIARY CONSTRUCTION FOR EQUIPMENT ETC. SHALL BE CONNECTED TO THE GROUNDING/ EARTHING SYSTEM AT REQUIRED NUMBER OF POINTS WITH SPECIFIED SIZES OF CONDUCTORS. WATER PIPES ALONG ELECTRICAL LINES SHALL BE JOINED TO THE EARTHING SYSTEM WITH 20sqmm SINGLE CORE, COPPER CONDUCTOR PVC CABLE
- ELECTRICAL POINTS FOR EQUIPMENT SHALL BE INSTALLED IN CO-ORDINATION WITH THE ARRANGEMENT OF OTHER SERVICES, SUCH AS COMMUNICATION SYSTEMS, HVAC, PLUMBING ETC. THE LOCATION ON ELECTRICAL DRAWINGS IS ONLY INDICATIVE
- ARRANGEMENT OF ELECTRICAL EQUIPMENT ON ELECTRICAL DRAWINGS ARE TENTATIVE, EXACT ARRANGEMENT OF EQUIPMENT SHALL BE MADE IN VIEW OF ITS PHYSICAL DIMENSIONS AND EASE OF MAINTENANCE
- CONDUIT/DUCT RUN UNDER FLOOR SHALL HAVE A MINIMUM COVER OF 2 INCHES FROM TOP OF CONDUIT/DUCT TO FINISH FLOOR LEVEL
- BEFORE DETERMINING THE CUT LENGTHS OF CABLE, THE ACTUAL MEASUREMENT AT SITE SHALL BE MADE WITH PROVISION FOR SLACK AT LV PANELS/ DISTRIBUTION BOARDS AND SPARE LENGTH FOR LOOPS AS REQUIRED
- ALL UNDERGROUND CONDUITS AFTER INSTALLATION SHALL BE PLUGGED AND SEALED AT BOTH ENDS AND JOINTS TO AVOID INGRESS OF WATER INTO PIPES
- WIRING SHALL BE CONTINUOUS LOOPING-IN TYPE AND NO JOINT IN WIRES SHALL BE ALLOWED
- THE WIRING SYSTEM SHALL BE LAID ONLY AFTER THE CONDUIT SYSTEM IS COMPLETELY INSTALLED AND ALL OUTLET BOXES, ETC. ARE FIXED IN POSITION
- UNLESS NOTED OTHERWISE, ALL CONDUITS ARE OF PVC
- REFER TO CABLE TYPE SCHEDULE FOR SPECIFIC CABLES TO BE EMPLOYED AS PER THE APPLICATION
- FOR ALLOWED FILL OF CONDUITS, REFER TO THE CONDUIT FILL SCHEDULE
- ALL IDENTIFY PINS ABOVE FALSE CEILING SHALL BE LABELED/IMPRESSED WITH THE NAME OF CORRECTIVE SERVICES

**SYSTEM SPECIFIC NOTES**

- COMMUNICATION CABLES SHALL BE SEPARATED FROM ELECTRICAL LIGHT OR POWER CONDUCTORS
- A CONDUIT MUST CONTAIN CIRCUITS OF EITHER ONLY ONE PHASE OR ALL THE PHASES
- RUN GREEN-YELLOW OR GREEN SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED SIZES AS PROTECTIVE EARTH CONDUCTOR (EGC) ALL ALONG LIGHT AND POWER WIRING
- UNLESS NOTED OTHERWISE, ALL WIRING TO LIGHT AND SOCKET CIRCUITS SHALL BE CARRIED OUT WITH SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED VOLTAGE GRADE IN CONCEALED PVC CONDUIT OF SPECIFIED SIZE
- LIGHT CONTROL SWITCHES SHALL BE INSTALLED 9 INCHES AWAY FROM THE SIDE OF DOOR IN ROOMS
- EACH CIRCUIT TO HAVE ITS INDEPENDENT NEUTRAL AND EARTH CONDUCTOR RUN FROM DB
- FOR EXACT LOCATION OF LIGHTING FIXTURES REFER TO ARCHITECTURAL DRAWINGS
- THE ELECTRICAL RESISTANCE OF ETC TOGETHER WITH EARTH LEAD AND ELECTRODE SHOULD NOT EXCEED 0.25 OHM IF IT EXCEEDS, THE CONTRACTOR SHALL OBTAIN INSTRUCTIONS FROM ARCHITECT

**GENERAL NOTES**

- FOLLOWING NOTES SHALL IN GENERAL APPLY TO ALL ELECTRICAL DRAWINGS THE INSTRUCTIONS IN THESE NOTES SHALL BE FOLLOWED UNLESS STATED OTHERWISE
- THESE NOTES SHALL BE APPLICABLE TO THE ENTIRE ELECTRICAL WORKS IF THE SITE CONDITIONS NECESSITATE ANY ALTERATIONS OR DEVIATIONS, THE DIRECTIONS OF THE CONSULTANT SHALL BE OBSERVED AS FINAL INSTRUCTIONS
- ALL ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC DRAWINGS & ALL OTHER RELEVANT DETAILS
- DIMENSIONS/MEASUREMENTS GIVEN IN LAYOUT AND DETAILED DRAWINGS ARE APPROXIMATE, THE CONTRACTOR SHALL BE RESPONSIBLE TO CALCULATE THE ACTUAL DIMENSIONS/ MEASUREMENTS ACCORDING TO STRUCTURAL AND ARCHITECTURAL DRAWINGS
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ALL RELEVANT DETAILS TO THE CONSULTANT FOR APPROVAL ACCORDING TO THE GENERAL CONDITIONS OF CONTRACT WELL IN TIME BEFORE COMMENCEMENT OF THAT WORK
- PROPER CO-ORDINATION OF ELECTRICAL WORKS WITH OTHER SERVICES SHALL BE CARRIED OUT AT SITE
- THE WAKES STATED IN THE TENDER DRAWINGS (SCHEDULE) ARE FOR REFERENCE TO A PARTICULAR CLASS OF QUALITY OR PERFORMANCE REQUIREMENTS, EQUIVALENT OR BETTER WAKES SHALL ALSO BE OFFERED, APPROVAL OF EQUIVALENCE OF WAKES SHALL BE THE DIRECTION OF CONSULTANT'S OFFICE
- DO NOT SCALE THE DRAWINGS



REV	DATE	DESCRIPTION

THE DRAWING IS THE SOLE PROPERTY OF HAS BE ARCHITECTS. NO PART OR SUBSTANTIAL OR PART OF THE DRAWING MAY BE REPRODUCED, COPIED, SCANNED, REPRODUCED OR USED IN ANY TECHNICAL OR COMMERCIAL PURPOSE WITHOUT PRIOR WRITTEN PERMISSION FROM HAS BE ARCHITECTS.

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ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE THE COMMENCEMENT OF WORK ON SITE.

PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHOTIAGALA CAMPUS, BAHAWALNOR, AZAD JAMMU & KASHMIR

CLIENT: EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERA)

GOVERNMENT OF PAKISTAN, ISLAMABAD PAKISTAN

NO. OF FLOOR:  

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ARCHITECT: The Architects ASSOCIATES PVT. LTD. (PUNJAB) PVT. LTD. 100, BAHAWALNOR ROAD, ISLAMABAD PAKISTAN

STRUCTURAL CONSULTANT: mushiq and bilal Consulting Engineers 100, BAHAWALNOR ROAD, ISLAMABAD PAKISTAN

ELECTRICAL CONSULTANT: P P & ASSOCIATES ELECTRICAL ENGINEERS 100, BAHAWALNOR ROAD, ISLAMABAD PAKISTAN

PLUMBING CONSULTANT: VA Associates ENVIRONMENTAL & MANAGEMENT CONSULTANTS 100, BAHAWALNOR ROAD, ISLAMABAD PAKISTAN

DEPARTMENT OF AGRICULTURE VETERINARY & ANIMAL SCIENCE

TITLE: LEGENDS, NOTES & DETAILS

FOR:  

DATE	DESIGNER	CHECKED

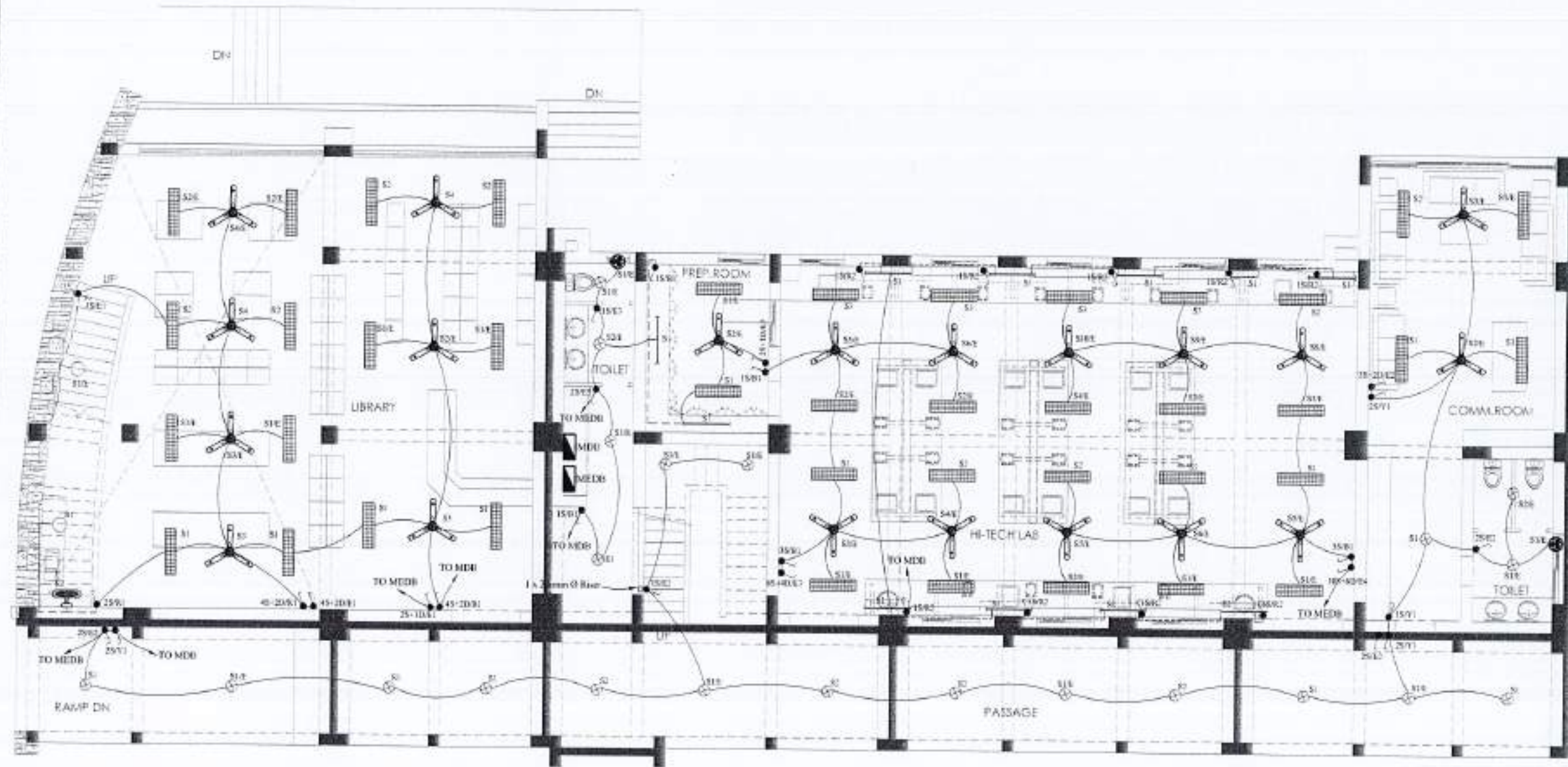
502 E-11



### LIST OF DRAWINGS:

DRAWING NOS.	TITLE.
E-01	GROUND FLOOR LIGHTING PLAN.
E-02	GROUND FLOOR POWER & DATA VOICE PLAN.
E-03	GROUND FLOOR FIRE ALARAM PLAN.
E-04	FIRST FLOOR LIGHTING PLAN.
E-05	FIRST FLOOR POWER & DATA VOICE PLAN.
E-06	FIRST FLOOR FIRE ALARAM PLAN.
E-07	DETAILS OF LIGHTING PROTECTION
E-08	ROOF PLAN LIGHTING PROTECTION
E-09	SINGLE LINE & SCHEMATIC DIAGRAM
E-10	LEGENDS, NOTES & DETAILS





GROUND FLOOR PLAN



REV. NO.	DATE	BY	REVISION

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PROJECT:  
 Reconstruction of University of Azad Jammu Kashmir, CHOUDGALA CAMPUS, BARAMULLA, AZAD JAMMU & KASHMIR

CLIENT:  
 EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (EREA)

GOVERNMENT OF PUNJAB  
 SHARADH PATTAN  
 MASTHEAD



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ARCHITECT:  
 HAS BE ARCHITECTS  
 11-A, ZAMAN Q. BAZAR, P.O. BOX NO. 1000, SHERIDAN ROAD, PAFKOT, ISLAMABAD, PAKISTAN

STRUCTURAL CONSULTANT:  
 AAS  
 MUSTAQ AND BIAL CONSULTING ENGINEERS  
 11-A, ZAMAN Q. BAZAR, PAFKOT, ISLAMABAD, PAKISTAN

ELECTRICAL CONSULTANT:  
 W. F. S. ASSOCIATES  
 ELECTRICAL ENGINEER  
 11-A, ZAMAN Q. BAZAR, PAFKOT, ISLAMABAD, PAKISTAN

PLUMBING CONSULTANT:  
 M. A. ANSARI  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 11-A, ZAMAN Q. BAZAR, PAFKOT, ISLAMABAD, PAKISTAN

DEPARTMENT OF AGRICULTURE  
 HI-TECH, LIBRARY AND GIRLS COMMON ROOM

FILE NO:  
 GROUND FLOOR PLAN LIGHTING LAYOUT WORKING DRAWING

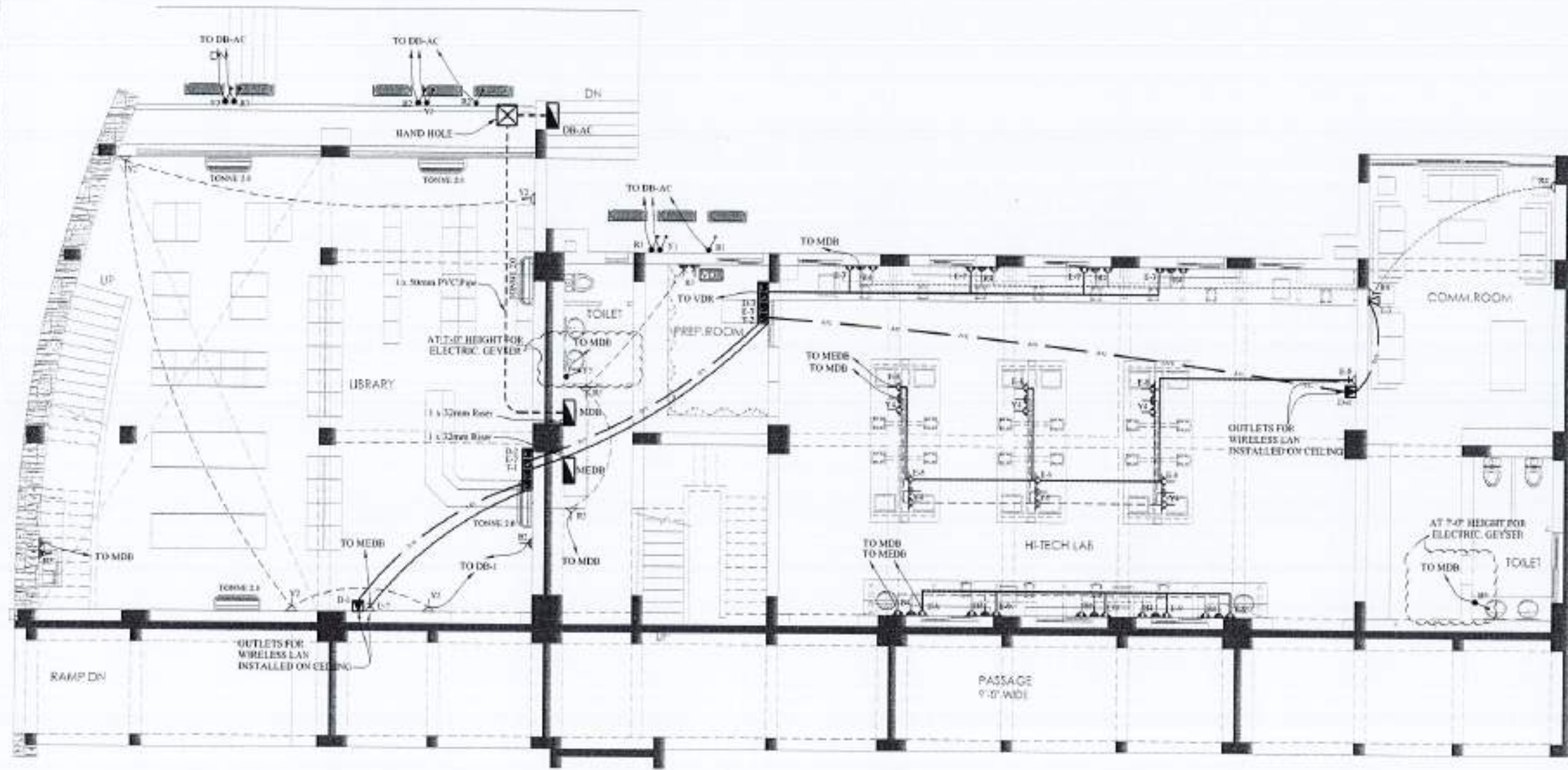
SCALE:  
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DATE:  
 11-APR-2023

NO. OF SHEETS:  
 502 E-01

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
 02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES  
 03 IN CASE OF ANY DISCREPANCY IN DRAWINGS, KINDLY CO-ORDINATE WITH CONSULTANT PRIOR TO START OF WORK.





GROUND FLOOR PLAN



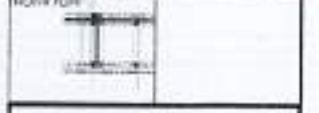
REV.	DATE	ISSUE	BY

NOTE:  
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 2. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT.  
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PROJECT:  
 Reconstruction of University of Azad Jammu Kashmir, CHOTAGALA CAMPUS, PAKISTAN, AZAD JAMMU & KASHMIR

CLIENT:  
 EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERA)

GOVERNMENT OF PAKISTAN, ISLAMABAD, PAKISTAN



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ARCHITECT:  
 The Architect  
 (Incorporated in Pakistan)  
 11-A, F-7/1, Phase-7, Islamabad  
 Phone: 37321111, 37321112, 37321113  
 Fax: 37321114, 37321115

STRUCTURAL CONSULTANT:  
 mushlag and bilal  
 consulting engineers  
 24, Block 22, Phase 7, Islamabad  
 Phone: 37321111, 37321112, 37321113  
 Fax: 37321114, 37321115

ELECTRICAL CONSULTANT:  
 E. P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 14-B, Block 22, Phase 7, Islamabad  
 Phone: 37321111, 37321112, 37321113  
 Fax: 37321114, 37321115

PLUMBING CONSULTANT:  
 P. A. Associates  
 ENVIRONMENTAL & SANITATION CONSULTANTS  
 14-B, Block 22, Phase 7, Islamabad  
 Phone: 37321111, 37321112, 37321113  
 Fax: 37321114, 37321115

DEPARTMENT:  
 DEPARTMENT OF AGRICULTURE  
 HI-TECH, LIBRARY  
 AND GIRLS COMMON ROOM

TITLE:  
 GROUND FLOOR PLAN  
 POWER & DATA LAYOUT  
 WORKING DRAWING

SCALE:  
 1:1

DATE:  
 04 APR 2011

CHECKED BY:  
 MARIAM

DATE:  
 04 APR 2011

DRAWING NO:  
 502 E-02

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
 02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES  
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REV. NO.	DATE	DESCRIPTION

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NO DRAWING IS NOT TO BE USED ONLY WHEN SPECIFIC TO BE USED.

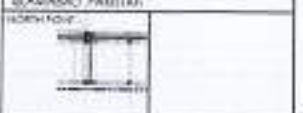
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ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK (DATE).

PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHOTIAGA CAMPUS, RAJAMUQ, AZAD JAMMU & KASHMIR.

CLIENT: EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERA).

GOVERNOR OF PAKISTAN ISLAMABAD PAKISTAN.



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ARCHITECT: The Architect, 10/10, 11/11, 12/12, 13/13, 14/14, 15/15, 16/16, 17/17, 18/18, 19/19, 20/20, 21/21, 22/22, 23/23, 24/24, 25/25, 26/26, 27/27, 28/28, 29/29, 30/30, 31/31, 32/32, 33/33, 34/34, 35/35, 36/36, 37/37, 38/38, 39/39, 40/40, 41/41, 42/42, 43/43, 44/44, 45/45, 46/46, 47/47, 48/48, 49/49, 50/50, 51/51, 52/52, 53/53, 54/54, 55/55, 56/56, 57/57, 58/58, 59/59, 60/60, 61/61, 62/62, 63/63, 64/64, 65/65, 66/66, 67/67, 68/68, 69/69, 70/70, 71/71, 72/72, 73/73, 74/74, 75/75, 76/76, 77/77, 78/78, 79/79, 80/80, 81/81, 82/82, 83/83, 84/84, 85/85, 86/86, 87/87, 88/88, 89/89, 90/90, 91/91, 92/92, 93/93, 94/94, 95/95, 96/96, 97/97, 98/98, 99/99, 100/100.

STRUCTURAL CONSULTANT: **AAZ** musthoo and bial consulting engineers. 10/10, 11/11, 12/12, 13/13, 14/14, 15/15, 16/16, 17/17, 18/18, 19/19, 20/20, 21/21, 22/22, 23/23, 24/24, 25/25, 26/26, 27/27, 28/28, 29/29, 30/30, 31/31, 32/32, 33/33, 34/34, 35/35, 36/36, 37/37, 38/38, 39/39, 40/40, 41/41, 42/42, 43/43, 44/44, 45/45, 46/46, 47/47, 48/48, 49/49, 50/50, 51/51, 52/52, 53/53, 54/54, 55/55, 56/56, 57/57, 58/58, 59/59, 60/60, 61/61, 62/62, 63/63, 64/64, 65/65, 66/66, 67/67, 68/68, 69/69, 70/70, 71/71, 72/72, 73/73, 74/74, 75/75, 76/76, 77/77, 78/78, 79/79, 80/80, 81/81, 82/82, 83/83, 84/84, 85/85, 86/86, 87/87, 88/88, 89/89, 90/90, 91/91, 92/92, 93/93, 94/94, 95/95, 96/96, 97/97, 98/98, 99/99, 100/100.

ELECTRICAL CONSULTANT: **E F & ASSOCIATES** ELECTRICAL ENGINEER. 10/10, 11/11, 12/12, 13/13, 14/14, 15/15, 16/16, 17/17, 18/18, 19/19, 20/20, 21/21, 22/22, 23/23, 24/24, 25/25, 26/26, 27/27, 28/28, 29/29, 30/30, 31/31, 32/32, 33/33, 34/34, 35/35, 36/36, 37/37, 38/38, 39/39, 40/40, 41/41, 42/42, 43/43, 44/44, 45/45, 46/46, 47/47, 48/48, 49/49, 50/50, 51/51, 52/52, 53/53, 54/54, 55/55, 56/56, 57/57, 58/58, 59/59, 60/60, 61/61, 62/62, 63/63, 64/64, 65/65, 66/66, 67/67, 68/68, 69/69, 70/70, 71/71, 72/72, 73/73, 74/74, 75/75, 76/76, 77/77, 78/78, 79/79, 80/80, 81/81, 82/82, 83/83, 84/84, 85/85, 86/86, 87/87, 88/88, 89/89, 90/90, 91/91, 92/92, 93/93, 94/94, 95/95, 96/96, 97/97, 98/98, 99/99, 100/100.

PLUMBING CONSULTANT: **E F & ASSOCIATES** PLUMBING ENGINEER. 10/10, 11/11, 12/12, 13/13, 14/14, 15/15, 16/16, 17/17, 18/18, 19/19, 20/20, 21/21, 22/22, 23/23, 24/24, 25/25, 26/26, 27/27, 28/28, 29/29, 30/30, 31/31, 32/32, 33/33, 34/34, 35/35, 36/36, 37/37, 38/38, 39/39, 40/40, 41/41, 42/42, 43/43, 44/44, 45/45, 46/46, 47/47, 48/48, 49/49, 50/50, 51/51, 52/52, 53/53, 54/54, 55/55, 56/56, 57/57, 58/58, 59/59, 60/60, 61/61, 62/62, 63/63, 64/64, 65/65, 66/66, 67/67, 68/68, 69/69, 70/70, 71/71, 72/72, 73/73, 74/74, 75/75, 76/76, 77/77, 78/78, 79/79, 80/80, 81/81, 82/82, 83/83, 84/84, 85/85, 86/86, 87/87, 88/88, 89/89, 90/90, 91/91, 92/92, 93/93, 94/94, 95/95, 96/96, 97/97, 98/98, 99/99, 100/100.

DEPARTMENT OF AGRICULTURE HI-TECH LIBRARY AND GIRLS COMMON ROOM.

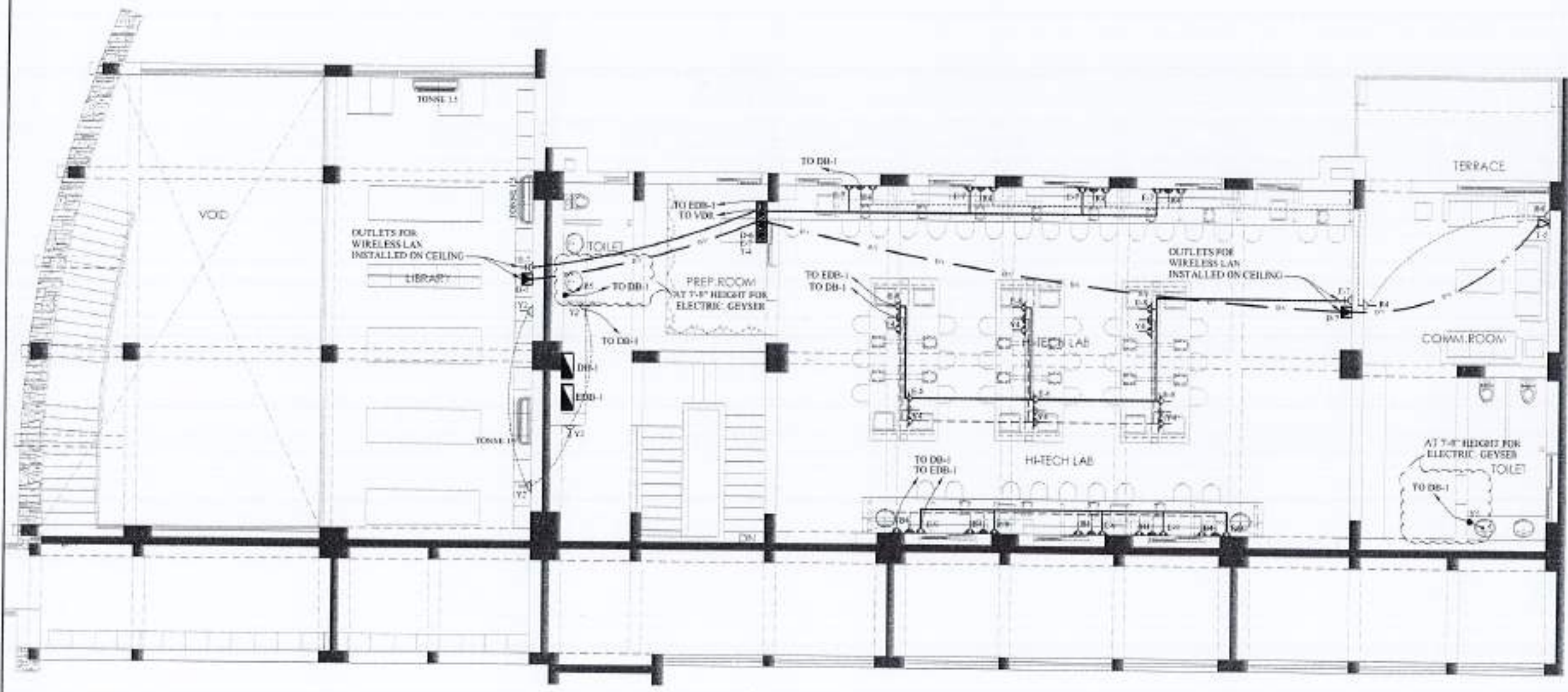
TITLE: FIRST FLOOR PLAN POWER & DATA LAYOUT WORKING DRAWING.

FOR: -

REVISIONS:

DATE	BY	CHECKED

502 E-05



NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
 02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES  
 03 IN CASE OF ANY DISCREPANCY IN DRAWINGS, KINDLY CO-ORDINATE WITH CONSULTANT PRIOR TO START OF WORK





REV	DATE	ISSUED	REMARKS

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ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHOUDGALA CAMPUS, BAHAWALPUR, AZAD JAMMU & KASHMIR

CLIENT: EARDFORWARD RECONSTRUCTION & REHABILITATION AUTHORITY (ERRA)

GOVERNMENT OF PUNJAB (LAHORE)



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

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ELECTRICAL CONSULTANT: **K P S ASSOCIATES** ELECTRICAL ENGINEERS 8-AI Road, Lahore, Pakistan. Tel: 373-2222222

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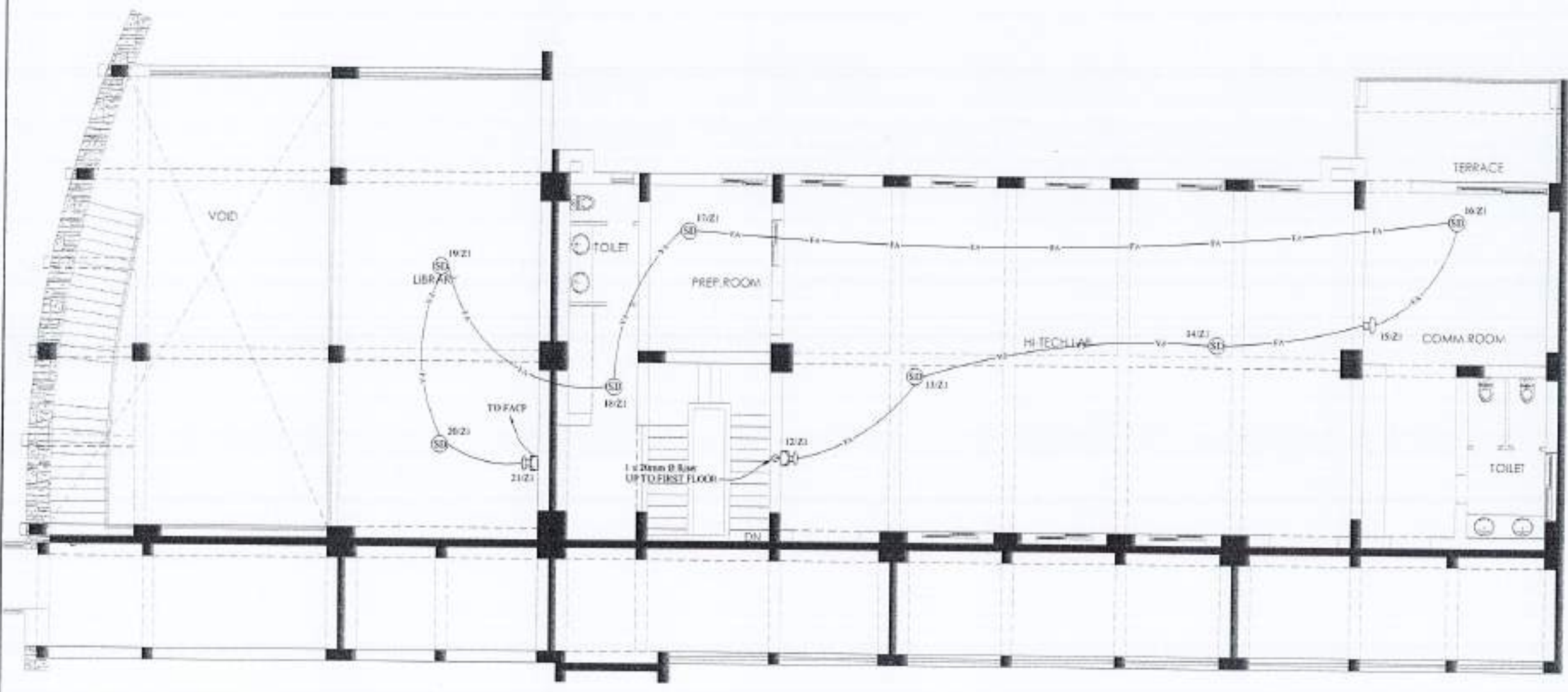
FIRST FLOOR PLAN FIRE ALARM LAYOUT WORKING DRAWING

SCALE: 1:100

DATE: 24 APR 2023

CALL: 502

DRAWING NO: E-06



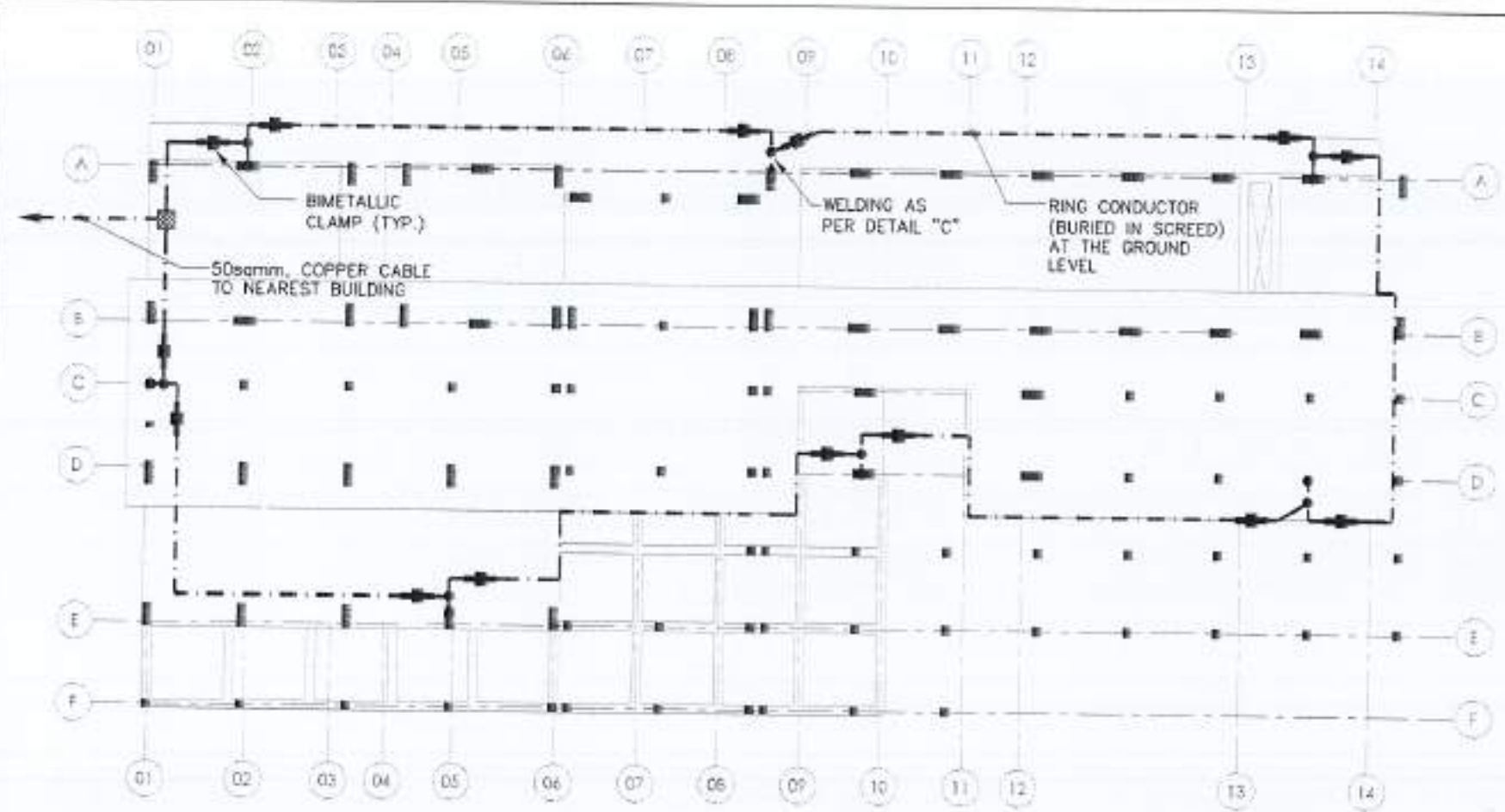
NOTES

01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING

02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES

03 IN CASE OF ANY DISCREPANCY IN DRAWINGS, KINDLY CO-ORDINATE WITH CONSULTANT PRIOR TO START OF WORK





**NOTES FOR LIGHTNING PROTECTION**

1. ALL CONDUCTIVE PARTS TO BE BONDED WITH LIGHTNING PROTECTION NETWORK THROUGH STRANDED COPPER CONDUCTOR.
2. CONDUCTORS USED FOR BONDING WILL HAVE A GREEN/YELLOW SHEATH.
3. PROVIDE BRASS SADDLES TO SECURELY FASTEN VERTICAL AND HORIZONTAL CONDUCTORS AS SHOWN.
4. ALL NUTS/BOLTS TO BE OF 16mm DIA BRASS.
5. CONNECTIONS AT EARTH TEST CLAMP AND COPPER EARTH ROD TO BE THROUGH COMPRESSION LUGS.
6. EARTH RODS TO BE HAMMERED IN THE GROUND.
7. PROVIDE CONDUCTOR JOINTING CLAMP ON DOWN CONDUCTOR CLOSE TO MAIN EARTH TERMINAL AS SHOWN IN GROUNDING SCHEMATIC DIAGRAM.
8. WELDING BETWEEN ANY RE-BARS TO BE DONE AS PER DETAIL "C".
9. FOUNDATION INTERCONNECTION IS SHOWN, THE ABOVE SCHEME ALSO APPLIES TO ALL OTHER BUILDINGS (EXCEPT CENTRAL POWER PLANT & MOSQUE).
10. RE-BARS OF COLUMNS SHALL BE USED AS DOWN CONDUCTOR.
11. TWO RE-BARS SHALL BE USED IN EACH COLUMN AS SHOWN FOR THIS PURPOSE.
12. THE RE-BARS SHALL BE WELDED TOGETHER AS SHOWN TO CREATE ELECTRICAL CONTINUITY FROM ROOF TOP TO COLUMN FOUNDATION.
13. COLUMN RE-BARS (DOWN CONDUCTORS) SHALL BE JOINED TO ROOF AIR TERMINATION NETWORK, AND RING CONDUCTOR (BURIED IN SCREED) AT THE GROUND LEVEL AS SHOWN.



NO.	DATE	ISSUE	REVISION

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 ALL DIMENSIONS ARE TO BE IN METERS UNLESS OTHERWISE SPECIFIED.  
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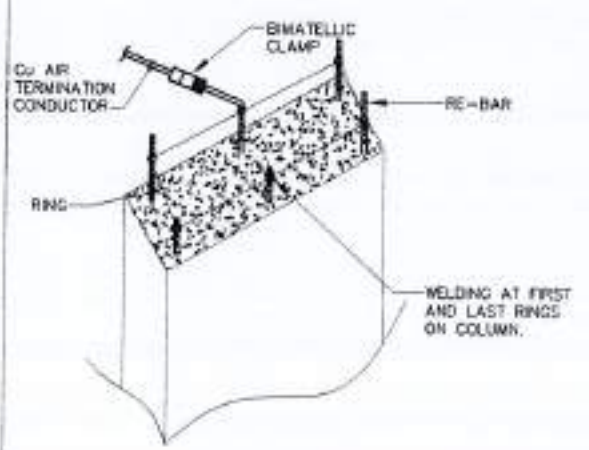
PROJECT:  
 RECONSTRUCTION OF  
 UNIVERSITY OF ADDIS ABABA KASHMIRI  
 CHORAGALA CAMPUS, BAWAJARDI  
 ATAD JAWAB & BASHAK

CLIENT:  
 EARNGUARD RECONSTRUCTION &  
 REHABILITATION AUTHORITY (ER&RA)

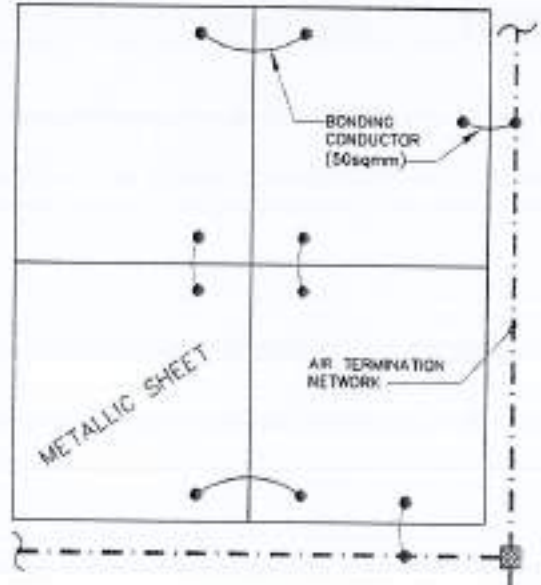
GOVERNMENT OF PAKISTAN  
 ISLAMABAD PAKISTAN



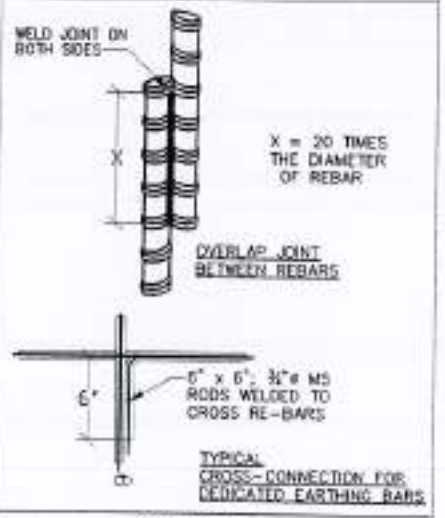
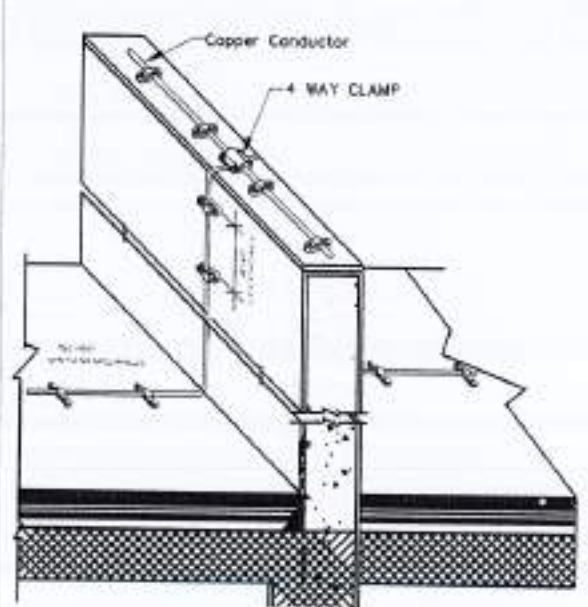
FOUNDATION INTERCONNECTION: SCHEME ALSO APPLIES TO ALL OTHER BUILDINGS (EXCEPT CENTRAL POWER PLANT & MOSQUE)



DETAIL-B: RE-BAR & AIR TERMINATION DETAIL



- NOTES
1. EACH SECTION OF ROOF THE METALLIC SHEET SHALL BE BONDED WITH THE ADJACENT SECTION THROUGH A 50sqmm Cu CONDUCTOR.
  2. BONDING OF METALLIC SHEETS IS ALSO REQUIRED WITH AIR TERMINATION NETWORK AS SHOWN.



DETAIL - C

LEGENDS

	BIMETALLIC CLAMP
	4 WAY CLAMP MADE OF COPPER OR BRASS
	50sqmm HARD DRAWN BARE COPPER LIGHTNING CONDUCTOR AIR TERMINATION
	35sqmm GREEN/YELLOW PVC INSULATED STRANDED COPPER CABLE FOR BONDING



4 WAY CONDUCTOR CLAMP BIMETALLIC CLAMP

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

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TITLE:  
 DETAILS OF LIGHTNING PROTECTION

NO.:

DATE:

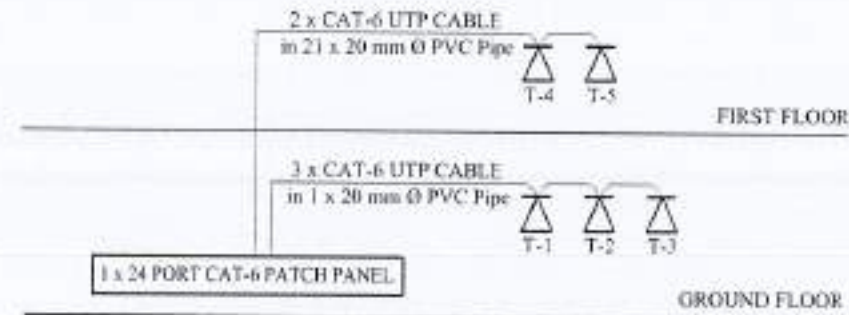
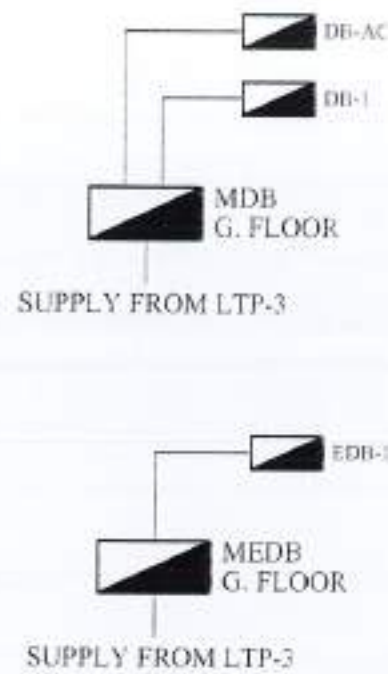
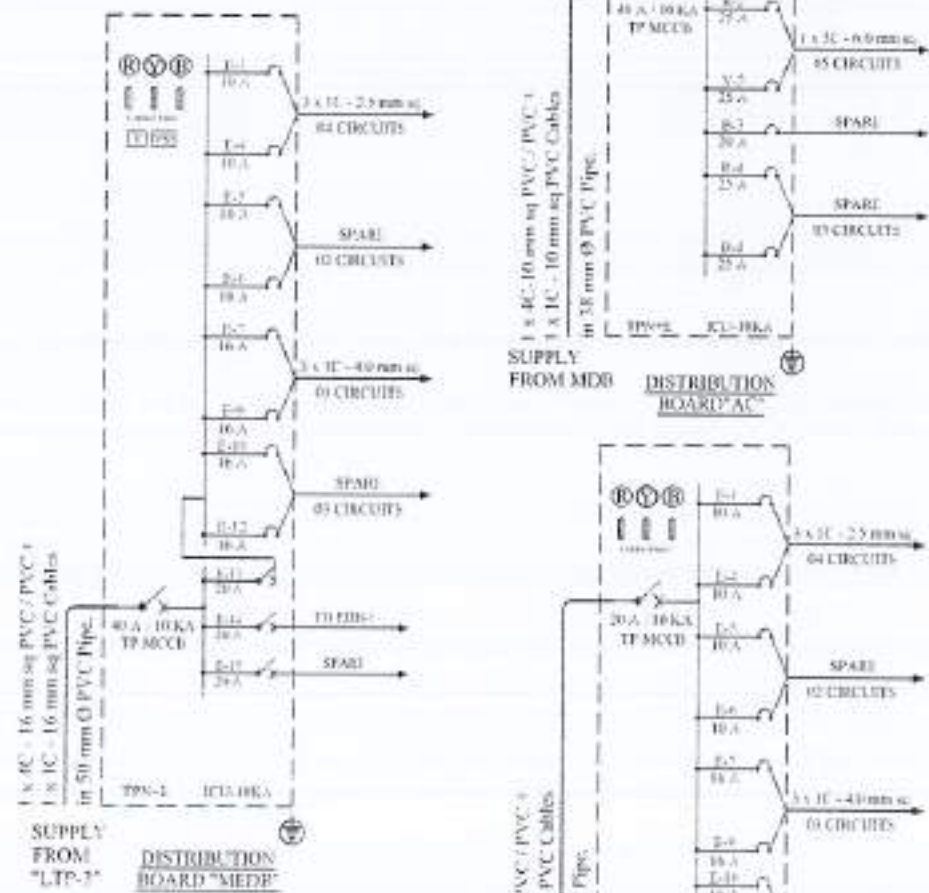
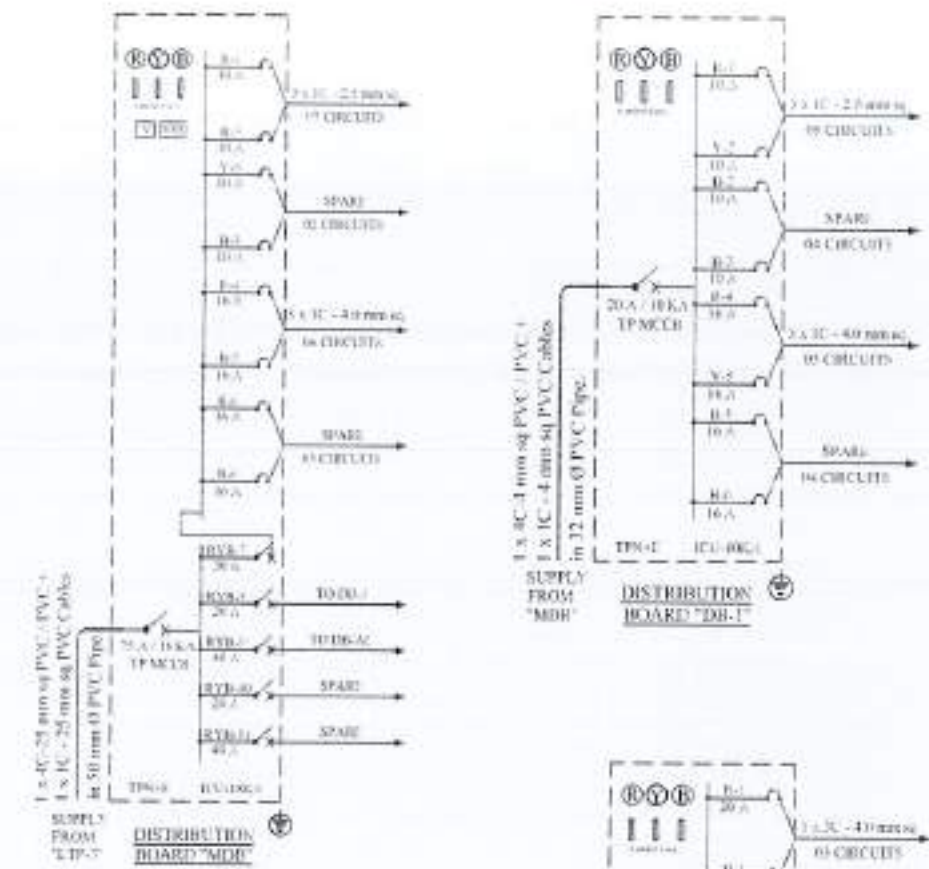
SCALE:

502 E-07

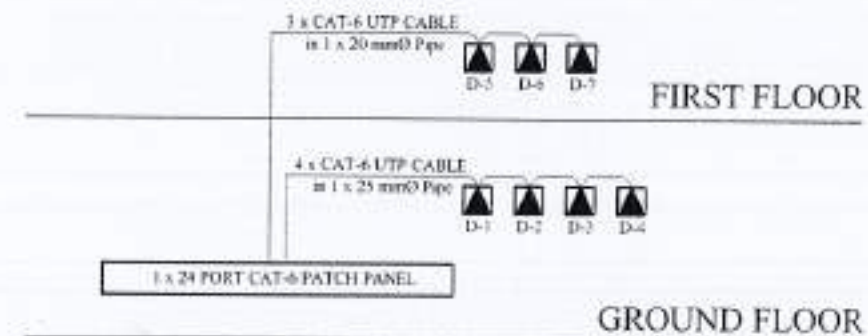




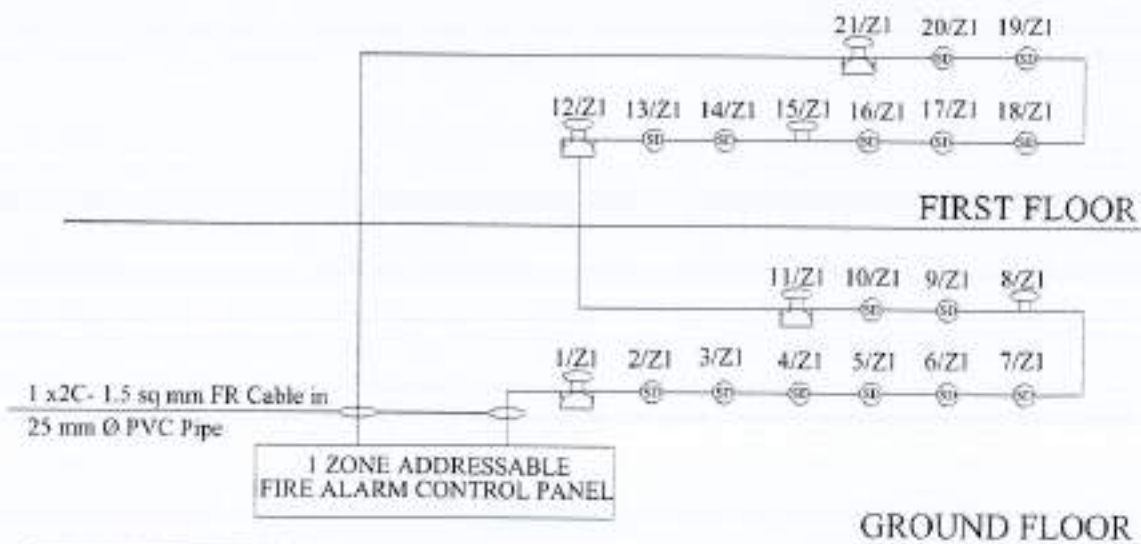




VOICE SYSTEM SCHEMATIC DIAGRAM



DATA SYSTEM SCHEMATIC DIAGRAM



FIRE ALARM SYSTEM SCHEMATIC DIAGRAM



REV	DATE	ISSUE	REMARKS

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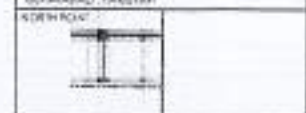
ALL DIMENSIONS ARE TO BE CHECKED AND VERIFIED ON SITE.

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PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHOITALGALA CAMPUS, BAWAJAR, AZAD JAMMU & KASHMIR.

CLIENT: EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERRA).

GOVERNMENT OF PAKISTAN, ISLAMABAD, PAKISTAN.



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

AAZ ENGINEERS AND ARCHITECTS

STRUCTURAL CONSULTANT: mushtaq and bial consulting engineers

ELECTRICAL CONSULTANT: K F A ASSOCIATES ELECTRICAL ENGINEERS

ENVIRONMENTAL & MANAGEMENT CONSULTANTS

DEPARTMENT OF AGRICULTURE HI-TECH LIBRARY AND GIRLS COMMON ROOM

SINGLE LINE & SCHEMATIC DIAGRAM WORKING DRAWING

DATE	ISSUED	REVISION

NO.	DATE	BY	CHECKED
502	20 APR 2022		
E-09			



LEGEND:		
SYMBOL	DESCRIPTION	INSTALLING HEIGHT (F.F.)
	1BA ONE WAY SWITCH	3'-0"
	1BA TWO WAY SWITCH	3'-0"
	32A DOUBLE POLE SAFETY BREAKER	3'-0"
	CEILING MOUNTED LIGHT FIXTURE (1 x 10W P.L.C LAMP)	CEILING
	FLUORESCENT LIGHT FIXTURE (TMS 015236)	CEILING
	CEILING LIGHT FIXTURE TCS-240 (2 x 36W FLUORESCENT LAMP)	CEILING
	FLUORESCENT LIGHT FIXTURE (TMS 015136)	CEILING / COUNTER
	SWEEP CEILING FAN (60W)	CEILING
	GLASS FITTED EXHAUST FAN (40W)	8'-0"
	WALL BRACKET FAN (60W)	7'-0"
	5A, 3 PIN SWITCH SOCKET OUTLET (100W)	0'-0"
	5A, 3 PIN SWITCH SOCKET OUTLET (100W)	3'-0"
	15A, 3 PIN SWITCH SOCKET OUTLET (1000W)	3'-0"
	16A, SHOKO SOCKET OUTLET (100W)	7'-0"
	13A, FLAT PIN SWITCH SOCKET OUTLET (100W)	CEILING
	WALL MOUNTED SPLIT A/C	8'-0"
	A/C COMPRESSOR	.....
	1 x 13A FLAT PIN SSO + 1 x 16A SHOKO SOCKET + 1 x DATA OUTLET	(FURNITURE)
	1 x 13A FLAT PIN SSO + 1 x 16A SHOKO SOCKET + 1 x DATA OUTLET + 1 x VOICE OUTLET	(FURNITURE)
	FLOOR BOX	FLOOR
	TELEPHONE OUTLET	8'-0"
	DATA OUTLET	CEILING
	VOICE DATA RACK	4'-0"
	SMOKE DETECTOR	CEILING
	HEAT DETECTOR	CEILING
	FIRE ALARM SOUNDER & MANUAL CALL POINT	4'-0"
	FIRE ALARM CONTROL PANEL	5'-0"
	VOLT METER 0-500 VOLT 10 A, 3 POSITION	.....
	VOLT SELECTOR SWITCH	.....
	DISTRIBUTION BOARD	4'-0"
	EARTHING SET / TO BE GROUNDED	.....
	PROJECTOR	CEILING
	SINGLE POLE MINIATURE CIRCUIT BREAKER	.....
	DOUBLE POLE MINIATURE CIRCUIT BREAKER	.....
	TRIPLE POLE MINIATURE CIRCUIT BREAKER	.....
	TRIPLE POLE MOLDED CASE CIRCUIT BREAKER	.....
	CONDUIT IN CEILING	.....
	CONDUIT IN WALL / FLOOR	.....
	CIRCUIT TO DB	.....
S1,S2,S3...	NUMBER OF SWITCHES	.....
R,Y,B	COLOUR OF CIRCUITS	.....
T1,T2,T3	NUMBER OF TELEPHONE EXTENSION	.....
D1,D2,D3	NUMBER OF DATA POINT	.....
C1,C2,C3	NUMBER OF UPS CIRCUITS	.....
E1,E2,E3	NUMBER OF EMERGENCY CIRCUITS	.....

CABLE TYPE SCHEDULE	
WIRING APPLICATION	CABLE TYPE
INDOOR CIRCUIT- LIGHTING	3 x 2.5sqmm 1-C 0.3/0.5KV Cu/PVC CABLES
INDOOR POINT- LIGHTING	3 x 2.5sqmm 1-C 0.3/0.5KV Cu/PVC CABLES
INDOOR CIRCUIT- GENERAL POWER OUTLETS	3 x 4sqmm 1-C 0.3/0.5KV Cu/PVC CABLES
INDOOR POINT- GENERAL POWER OUTLETS	3 x 2.5sqmm 1-C 0.3/0.5KV Cu/PVC CABLES
OUTDOOR CIRCUIT- LIGHTING	3-C 0.3/0.5KV Cu/PVC/PVC CABLE, CONDUCTOR SIZE AS PER DRAWING
OUTDOOR POINT- LIGHTING	3-C 0.3/0.5KV Cu/PVC/PVC CABLE, CONDUCTOR SIZE AS PER DRAWING
OUTDOOR CIRCUIT- GENERAL POWER OUTLETS	4sqmm 3-C 0.3/0.5KV Cu/PVC CABLE
OUTDOOR POINT- GENERAL POWER OUTLETS	2.5sqmm 3-C 0.3/0.5KV Cu/PVC CABLE
INDOOR POWER DISTRIBUTION	4 x 1-C 0.6/1KV Cu/PVC CABLES + 1-C 0.6/1KV Cu/PVC CABLE AS E.C.C. CONDUCTOR SIZES AS PER DRAWING
VOICE/DATA OUTLETS	CAT-6 UTP 23AWG SOLID BARE COPPER CONDUCTORS, 4 PAIRS CABLED TOGETHER WITH A FLENNER CORE SEPARATOR, THERMOPLASTIC POLYOLEFIN INSULATION AND FLAME RETARDANT THERMOPLASTIC JACKET, APPROVED COLOUR, COMPLIANT TO ANSI/TIA/EIA-568-B2-1 AND RATED CM AS PER NEC ARTICLE 800
VOICE/DATA PATCH CABLES	2x LONG MOLDED SHAGBEE PATCH CABLE, CAT-6 UTP 23AWG STRANDED TIN COPPER CONDUCTORS, 4 PAIRS CABLED WITH CORE SEPARATOR, THERMOPLASTIC POLYOLEFIN INSULATION AND FLAME RETARDANT THERMOPLASTIC JACKET, APPROVED COLOUR, COMPLIANT TO ANSI/TIA/EIA-568-B2-1 AND RATED CM AS PER NEC ARTICLE 800
FIRE ALARM SYSTEM SERVICES	18sqmm 2-C 0.3/0.5KV CABLE, STRANDED BARE COPPER CONDUCTORS, LOW SMOKE ZERO HALOGEN (LSZH) INSULATION, NON-INSULATED CPC, OVERALL SCREEN AND LSZH SHEATH(TYPICAL)

CONDUIT FILL SCHEDULE						
Sl.#	CABLE TYPE	20mm Dia (0.78" DIA)	25mm Dia (1.0" DIA)	32mm Dia (1.25" DIA)	38mm Dia (1.5" DIA)	50mm Dia (2.0" DIA)
1	2.5sqmm	8	11	15	-	-
2	4sqmm	8	8	12	17	-
3	6sqmm	8	7	11	15	-
4	10sqmm	-	8	7	11	15
5	CAT-6	-	8	11	15	22
6	R5-6/3	-	8	7	11	16
7	1.5sqmm FA	-	2	-	-	-

- ### DISTRIBUTION PANEL CONSTRUCTION DETAILS
- DBs/LT PANELS SHALL BE FABRICATED FROM 16 SWG SHEET STEEL WITH WELDED, ORNED AND FINISHED ANGLE-IRON FRAME- WORK INGRESS PROTECTION CLASS TO BE IP-54.
  - DBs/LT PANELS SHALL BE ELECTRO-STATICALLY COATED WITH POWDER OF COLOUR RAL 7035 AND THEN OVEN BAKE.
  - REFER TO DB/LT PANEL SCHEMATICS FOR CABLE ENTRY/EXIT TYPE.
  - KNOCKOUTS REQUIRED FOR INCOMING/OUTGOING CABLES.
  - LT PANELS SHALL HAVE DOOR HANDLES WITHOUT KEYS.
  - DBs/LT PANELS WITH ALL COMPONENTS AND ACCESSORIES SHALL BE SUITABLE FOR FRONT OPERATION ONLY.
  - ALL DBs/LT PANELS SHALL HAVE 200mm EXTRA SPACE.
  - EACH DB/LT PANEL TO HAVE SUFFICIENT SPACE ON NEUTRAL AND EARTH BARS 'N' AND 'E' BARS TO HAVE PRE-DRILLED HOLES FOR CABLE CONNECTIONS.
  - EACH DB/LT PANEL TO HAVE INSIDE POCKET WITH AS-BUILT DRAWING.
  - EACH DB/LT PANEL TO BE TESTED AT MANUFACTURER'S WORKS FOR INSULATION AND FUNCTIONAL OPERATION OF ALL COMPONENTS AND DEVICES.
  - ALL INCOMING CIRCUIT BREAKERS TO BE OF ADJUSTABLE TYPE.
  - CIRCUIT BREAKER CHARACTERISTICS TO BE AS FOLLOWS:
    - \* MCBs FOR LIGHTING CIRCUITS - TYPE 'B'
    - \* MCBs FOR OTHER SERVICES - TYPE 'C'
  - EXCEPT WHERE NOTED OTHERWISE, ALL OUTGOING MCBs TO HAVE Icu = 10KA.
  - FLEXIBLE COPPER STRIP SHALL BE PROVIDED FOR EARTHING OF THE DOOR OF DB/LT PANEL.
  - ONLY NAMES DETAILLED IN THE TENDER DOCUMENTS ARE TO BE USED.

- ### GENERAL INSTALLATION
- ACCESS TO ELECTRICAL EQUIPMENT SHALL NOT BE DENIED BY ACCUMULATION OF WIRES, SUCH ACCUMULATION SHALL ALSO BE ALLOWED TO BEYOND REMOVAL OF PANELS, INCLUDING SUSPENDED CEILING PANELS.
  - INSPECTION BOX, PULL BOX, JUNCTION BOX, ETC. SHALL BE PROVIDED AS SHOWN IN THE DRAWING AND WHERE NECESSARY FOR EASE OF CABLE PULLING.
  - DIFFERENT SYSTEMS WIRING TO BE RUN IN SEPARATE CONDUITS.
  - UNLESS NOTED OTHERWISE ALL BACK BOXES SHALL BE OF 3/4 SWG SHEET STEEL, POWDER COATED, WITH PROVISION FOR EARTH CONNECTION.
  - ALL NON-CURRENT CARRYING PARTS IN OUTER CASINGS OF EQUIPMENT SUCH AS HV & LV PANELS, DISTRIBUTION BOARDS, CABLE TRAYS, AUXILIARY CONSTRUCTION FOR EQUIPMENT ETC. SHALL BE CONNECTED TO THE GROUNDING/ EARTHING SYSTEM AT REQUIRED NUMBER OF POINTS WITH SPECIFIED SIZES OF CONDUCTORS. WATER PIPES ALONG ELECTRICAL LINES SHALL BE BONDED TO THE EARTHING SYSTEM WITH 30sqmm SINGLE CORE, COPPER CONDUCTOR PVC CABLE.
  - ELECTRICAL POINTS FOR EQUIPMENT SHALL BE INSTALLED IN CO-ORDINATION WITH THE RELEVANT DRAWINGS OF OTHER SERVICES, SUCH AS COMMUNICATION SYSTEMS, HVAC, PLUMBING ETC. THE LOCATION ON ELECTRICAL DRAWINGS IS ONLY INDICATIVE.
  - ARRANGEMENT OF ELECTRICAL EQUIPMENT IN ELECTRICAL DRAWINGS ARE TENTATIVE, EXACT ARRANGEMENT OF EQUIPMENT SHALL BE MADE IN VIEW OF ITS PHYSICAL DIMENSIONS AND EASE OF MAINTENANCE.
  - CONDUIT/DUCT RUN UNDER FLOOR SHALL HAVE A MINIMUM EDGE OF 2 INCHES FROM TOP OF CONDUIT/DUCT TO FINISH FLOOR LEVEL.
  - BEFORE DETERMINING THE CUT LENGTHS OF CABLE, THE ACTUAL MEASUREMENT AT SITE SHALL BE MADE WITH PROVISION FOR SLACK AT LV PANELS/ DISTRIBUTION BOARDS AND SPARE LENGTH FOR LOOPS AS REQUIRED.
  - ALL UNDERGROUND CONDUITS AFTER INSTALLATION SHALL BE PLUGGED AND SEALED AT BOTH ENDS AND JOINTS TO AVOID INGRESS OF WATER AND PESTS.
  - WIRING SHALL BE CONTINUOUS LOOPING-IN TYPE AND NO JOINTS IN WIRES SHALL BE ALLOWED.
  - THE WIRING SYSTEM SHALL BE Laid ONLY AFTER THE CONDUIT SYSTEM IS COMPLETELY INSTALLED AND ALL BUFILE ENDS, ETC. ARE FIXED IN POSITION.
  - UNLESS NOTED OTHERWISE, ALL CONDUITS ARE OF PVC.
  - REFER TO CABLE TYPE SCHEDULE FOR SPECIFIC CABLES TO BE EMPLOYED AS PER THE APPLICATION.
  - FOR ALLOWED FILL OF CONDUITS, REFER TO THE CONDUIT FILL SCHEDULE.
  - ALL CONDUITS RUN ABOVE FALSE CEILING SHALL BE LABELLED/IMPRINTED WITH THE NAMES OF RESPECTIVE SERVICES.

- ### SYSTEM SPECIFIC NOTES
- COMMUNICATION CABLES SHALL BE SEPARATED FROM ELECTRICAL LIGHT OR POWER CONDUCTORS.
  - A CONDUIT MUST CONTAIN CIRCUITS OF EITHER ONLY ONE PHASE OR ALL THE PHASES.
  - RUN GREEN-YELLOW OR GREEN SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED SIZES AS PROTECTIVE EARTH CONDUCTOR (ECC) ALL ALONG LIGHT AND POWER WIRING.
  - UNLESS NOTED OTHERWISE, ALL WIRING TO LIGHT AND SOCKET CIRCUITS SHALL BE CARRIED OUT WITH SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED VOLTAGE GRADE IN CONCEALED PVC CONDUIT OF SPECIFIED SIZE.
  - LIGHT CONTROL SWITCHES SHALL BE INSTALLED 9 INCHES AWAY FROM THE SIDE OF DOOR IN ROOMS.
  - EACH CIRCUIT TO HAVE ITS INDEPENDENT NEUTRAL AND EARTH CONDUCTOR RUN FROM DB.
  - FOR EXACT LOCATION OF LIGHTING FIXTURES REFER TO ARCHITECTURAL DRAWINGS.
  - THE ELECTRICAL RESISTANCE OF E.C.C. TOGETHER WITH EARTH LEAD AND ELECTRODE SHALL NOT EXCEED ONE OHM. IF IT EXCEEDS, THE CONTRACTOR SHALL OBTAIN INSTRUCTION FROM CONSULTANT TO BE CHANGED.

- ### GENERAL NOTES
- FOLLOWING NOTES SHALL IN GENERAL APPLY TO ALL ELECTRICAL DRAWINGS, THE INSTRUCTIONS IN THESE NOTES SHALL BE FOLLOWED UNLESS STATED OTHERWISE.
  - THESE NOTES SHALL BE APPLICABLE TO THE ENTIRE ELECTRICAL WORKS OF THE SITE. CONSULTANT NECESSITATE ANY ALTERATIONS OR DEVIATIONS, THE DIRECTIONS OF THE CONSULTANT SHALL BE OBSERVED AS FINAL INSTRUCTIONS.
  - ALL ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC DRAWINGS & ALL OTHER RELEVANT DETAILS.
  - DIMENSIONS/MEASUREMENTS GIVEN IN LAYOUT AND DETAILED DRAWINGS ARE APPROXIMATE, THE CONTRACTOR SHALL BE RESPONSIBLE TO CALCULATE THE ACTUAL DIMENSIONS/ MEASUREMENTS ACCORDING TO STRUCTURAL AND ARCHITECTURAL DRAWINGS.
  - THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ALL RELEVANT DETAILS TO THE CONSULTANT FOR APPROVAL, ACCORDING TO THE GENERAL CONDITIONS OF CONTRACT WELL IN TIME BEFORE COMMENCEMENT OF THAT WORK.
  - PROPER CO-ORDINATION OF ELECTRICAL WORKS WITH OTHER SERVICES SHALL BE CARRIED OUT AT SITE.
  - THE MAKES STATED IN THE TENDER DRAWINGS/DOCUMENTS ARE FOR REFERENCE TO A PARTICULAR CLASS OF QUALITY OR PERFORMANCE REQUIREMENT, EQUIVALENT OR BETTER MAKES COULD ALSO BE OFFERED, APPROVAL OF EQUIVALENCE OF MAKES SHALL BE THE DISCRETION OF CONSULTANT/ OWNER.
  - DO NOT SCALE THE DRAWINGS.



REV.	DATE	BY	CHKD.	REVISION

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ANY DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE COMMENCEMENT OF WORK.

PROJECT: Reconstruction of University of Azad Jammu & Kashmir, CHOTAGALA CAMPUS, BARAMULLA, AZAD JAMMU & KASHMIR.

CLIENT: UNIVERSITY OF AZAD JAMMU & KASHMIR, CHOTAGALA CAMPUS, BARAMULLA, AZAD JAMMU & KASHMIR.

DESIGN: ELECTRICAL RECONSTRUCTION & SUBSTITUTION AUTHORITY (E.S.A.)

GOVERNMENT OF PAKISTAN (JAMMU & KASHMIR)

SCALE: AS SHOWN

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ARCHITECT: THE ARCHITECTS AND ENGINEERS PVT. LTD. (A PROFESSIONAL AND CIVIL ENGINEERING FIRM) 100-A, MAIN ROAD, SHERIDAN COLONY, ISLAMABAD.

STRUCTURAL CONSULTANT: **mushtaq and bial** consulting engineers. 100-A, MAIN ROAD, SHERIDAN COLONY, ISLAMABAD.

ELECTRICAL CONSULTANT: E.P.E. ASSOCIATES ELECTRICAL ENGINEERS. 100-A, MAIN ROAD, SHERIDAN COLONY, ISLAMABAD.

PLUMBING CONSULTANT: **PKC** CONSULTANTS. ENVIRONMENTAL & MANAGEMENT CONSULTANTS. 100-A, MAIN ROAD, SHERIDAN COLONY, ISLAMABAD.

OWNER: DEPARTMENT OF AGRICULTURE, HITECH, LIBRARY AND GIRLS COMMON ROOM.

TITLE: LEGENDS, NOTES & DETAILS WORKING DRAWING.

DATE: 10-04-2010

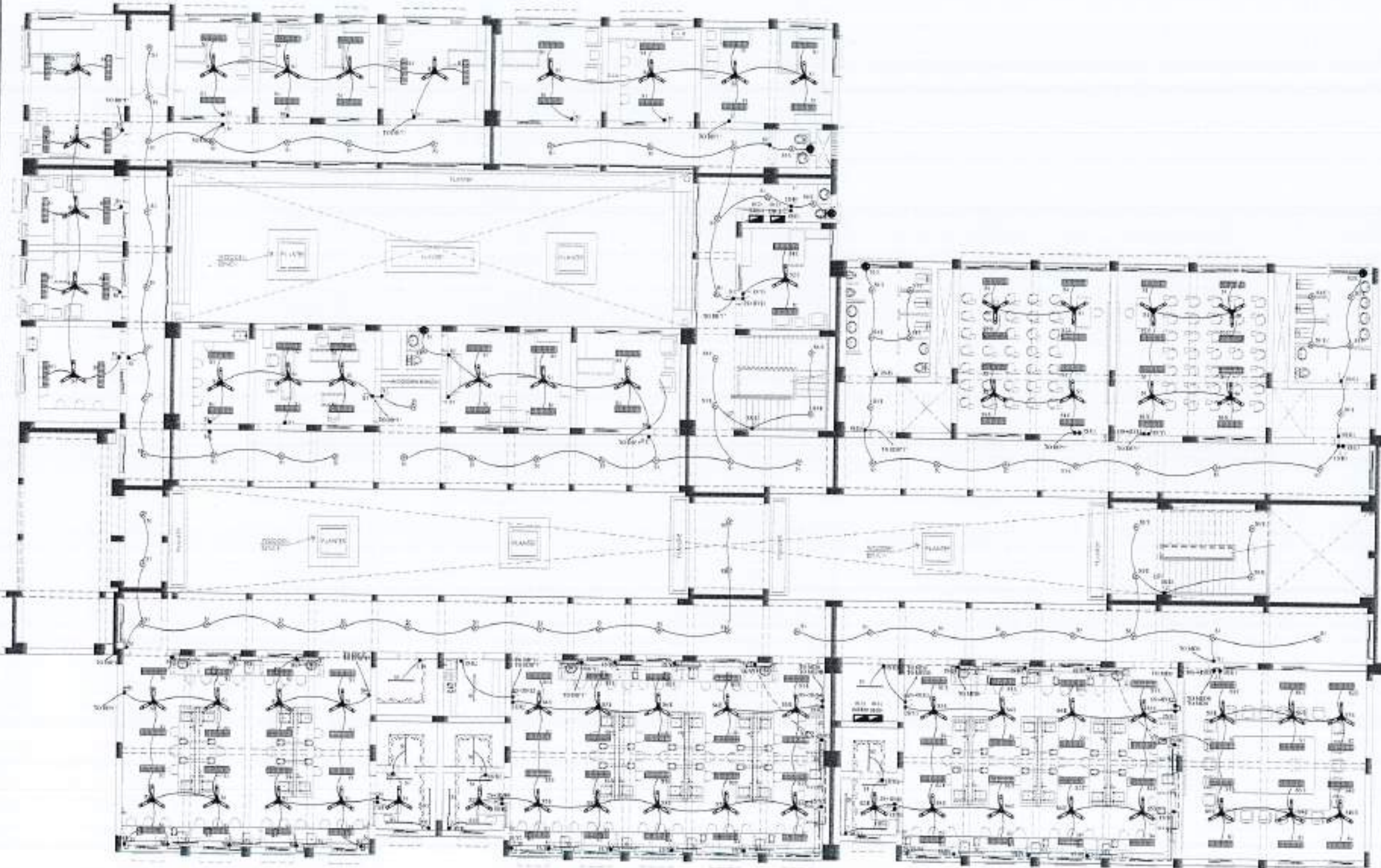
SCALE: 10:1



## LIST OF DRAWINGS:

DRAWING NOS.	TITLE.
E-01	GROUND FLOOR LIGHTING PLAN.
E-02	GROUND FLOOR POWER & DATA VOICE PLAN.
E-03	GROUND FLOOR FIRE ALARAM PLAN.
E-04	FIRST FLOOR LIGHTING PLAN.
E-05	FIRST FLOOR POWER & DATA VOICE PLAN.
E-06	FIRST FLOOR FIRE ALARAM PLAN.
E-07	DETAILS OF LIGHTING PROTECTION
E-08	ROOF PLAN LIGHTING PROTECTION
E-09	SINGLE LINE DIAGRAM
E-10	SCHEMATIC DIAGRAM
E-11	LEGENDS, NOTES & DETAILS





GROUND FLOOR



NO	DATE	REVISION

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PROJECT:  
 Reconstruction of University of Azad Jomhooi Kermine, CHEHRAGALA CAMPUS, BANABADI, AZAD AVENUE & EASTSIDE.

CLIENT:  
 SAVHGHAN RECONSTRUCTION & REHABILITATION AUTHORITY (SRA).

GOVERNMENT OF PAKISTAN ISLAMABAD, PAKISTAN

NO. OF FLOORS:  
 NORTH FLOOR

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ARCHITECT:  
 **Austic Architects**  
 PUNJAB, PAKISTAN

STRUCTURAL CONSULTANT:  
 **mushiq and bial**  
 CONSULTING ENGINEERS  
 24 HADIMOTE STREET, KARACHI, PAKISTAN

ELECTRICAL CONSULTANT:  
**K.P. & ASSOCIATES**  
 ELECTRICAL ENGINEERS  
 4-B, PAFK, GARDEN & WAZIR ABAD, ISLAMABAD

PLUMBING CONSULTANT:  
 **K.A. Associates**  
 ENGINEERING, ARCHITECTURE & MANAGEMENT CONSULTANTS  
 10/1, PAFK, GARDEN & WAZIR ABAD, ISLAMABAD

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCE

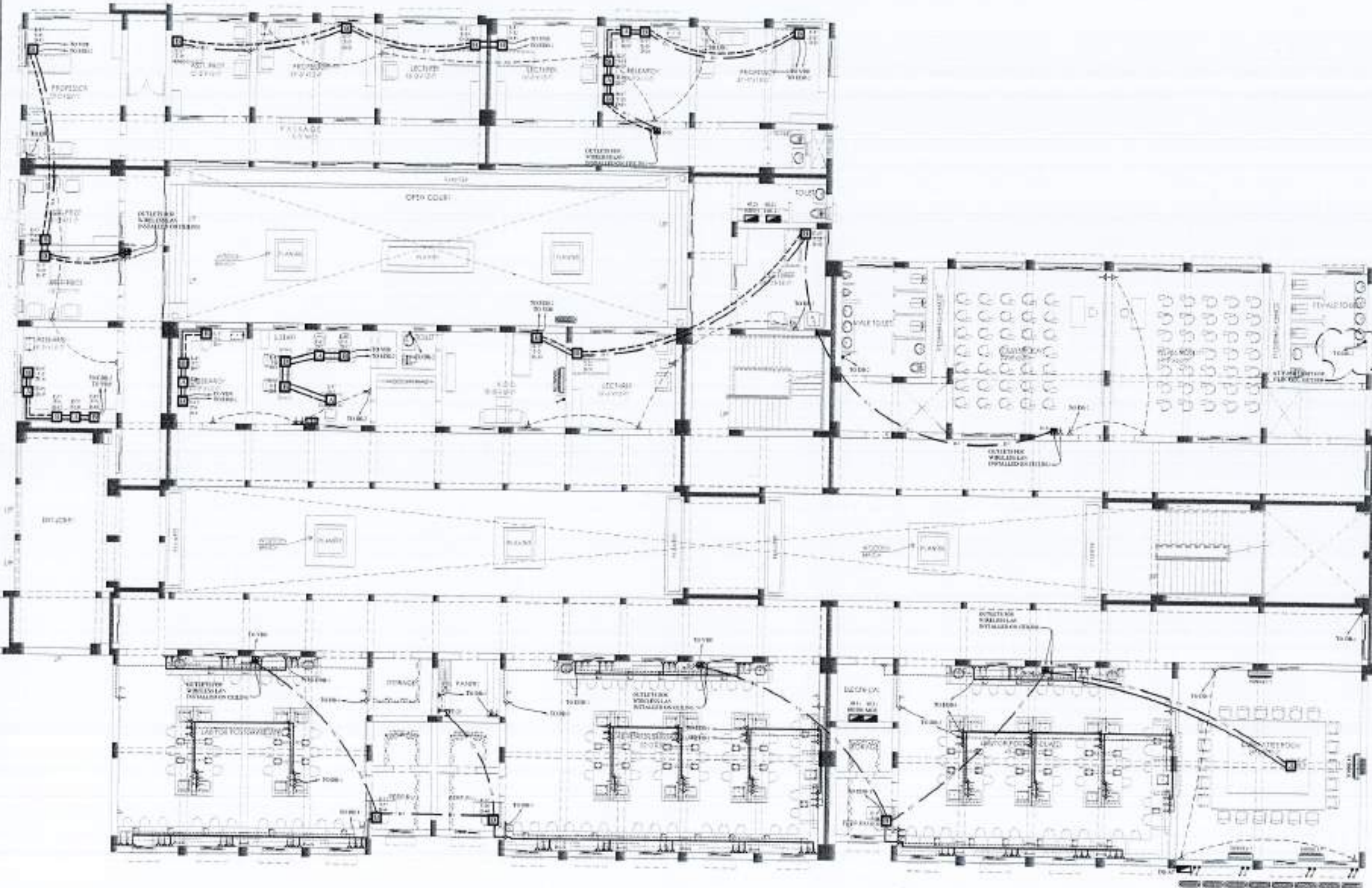
TITLE:  
 GROUND FLOOR PLAN LIGHTING LAYOUT WORKING DRAWING

DATE:  
 -

NO.	NAME	DESIGNATION
DESIGNED BY		
CHECKED BY		
DATE	30 APRIL 2021	
NO.	502	E-01

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
 02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES  
 03 IN CASE OF ANY DISCREPANCY IN DRAWINGS, KINDLY CO-ORDINATE WITH CONSULTANT PRIOR TO START OF WORK.





GROUND FLOOR

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
 02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES  
 03 IN CASE OF ANY DISCREPANCY IN DRAWINGS, KINDLY CO-ORDINATE WITH CONSULTANT PRIOR TO START OF WORK.



NO.	DATE	BY	REVISION

PROJECT:  
 Reconstruction of  
 University of Azad Jammu & Kashmir  
 CHOITAGALA CAMPUS, BARAMULLA  
 AZAD JAMMU & KASHMIR

CLIENT:  
 BARRIQUADE RECONSTRUCTION &  
 REHABILITATION AUTHORITY (BIRA)

GOVERNMENT OF PAKISTAN  
 ISLAMABAD PAKISTAN

THIS DRAWING SUPERSEDES  
 ALL PREVIOUS DRAWING

ARCHITECT:  
 The Architects  
 11, PAFKOT ROAD, PAFKOT  
 PAFKOT, DISTRICT SUDHANPUR, PAFKOT  
 PAFKOT, DISTRICT SUDHANPUR, PAFKOT

STRUCTURAL CONSULTANT:  
 mushtoo and bial  
 consulting engineer  
 11, PAFKOT ROAD, PAFKOT  
 PAFKOT, DISTRICT SUDHANPUR, PAFKOT

ELECTRICAL CONSULTANT:  
 T & ASSOCIATES  
 ELECTRICAL ENGINEER  
 11, PAFKOT ROAD, PAFKOT  
 PAFKOT, DISTRICT SUDHANPUR, PAFKOT

PLUMBING CONSULTANT:  
 M.A. Associates  
 ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
 11, PAFKOT ROAD, PAFKOT  
 PAFKOT, DISTRICT SUDHANPUR, PAFKOT

DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCE

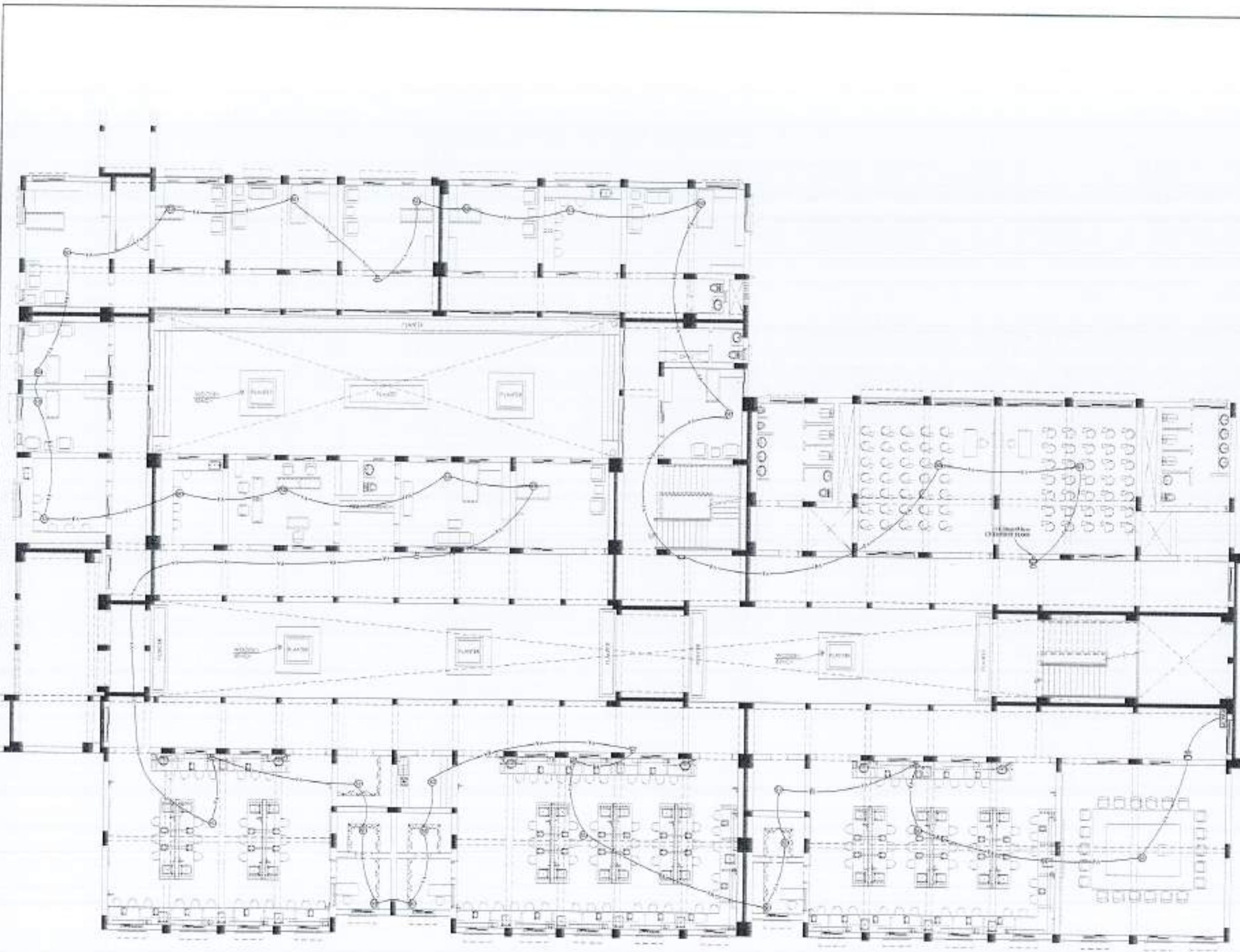
TITLE:  
 GROUND FLOOR PLAN  
 POWER & DATA LAYOUT  
 WORKING DRAWING

NO.

DATE:

DRAWN BY	CHECK BY
U. AMIN	MARAN
DATE: 18-04-2011	DATE: 24-APRIL 2011
502	E-02





REV. NO.	DATE	ISSUED	BY

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PROJECT:  
 Reconstruction of University of Azad Jammu Kashmir, CHIDENAGLA CAMPUS, BAWALAKOT, AZAD JAMMU & KASHMIR

CLIENT:  
 UNIVERSITY RECONSTRUCTION & REHABILITATION AUTHORITY (URRA)

GOVERNMENT OF PAKISTAN  
 ISLAMABAD, PAKISTAN

DESIGNER:  
 M. MUSTAFA

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.

ARCHITECT:  
 THE ARCHITECT  
 ARCHITECTS & ENGINEERS  
 11, CHANDLER ROAD, 1ST FLOOR, GATE NO. 10, MOODS & MANSIONS, G-7/2, F-7/1, KARACHI-75200

STRUCTURAL CONSULTANT:  
 **AAZ**  
**mushiq and bial**  
 consulting engineers  
 88, HAZRAT NURUDDIN ROAD, KARACHI-75200  
 P.O. BOX 1000, KARACHI-75200

ELECTRICAL CONSULTANT:  
 F. P. & ASSOCIATES  
 ELECTRICAL ENGINEERS  
 8, HAZRAT NURUDDIN ROAD, KARACHI-75200

PLUMBING CONSULTANT:  
 **M. Mustafa**  
 MECHANICAL & PLUMBING CONSULTANT  
 11, CHANDLER ROAD, 1ST FLOOR, GATE NO. 10, MOODS & MANSIONS, G-7/2, F-7/1, KARACHI-75200

DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCE

TITLE:  
 GROUND FLOOR PLAN  
 FIRE ALARM LAYOUT  
 WORKING DRAWING

SCALE:  
 1:1

DATE:  
 11/04/2023

DRAWING NO:  
 502 E-03

NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
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REV.	DATE	ISSUE	REVISION

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ANY DISCREPANCY IS TO BE REPORTED TO THE ARCHITECT PRIOR TO COMMENCEMENT OF WORK ON SITE.

PROJECT  
 Reconstruction of  
 University of Azad Jammu Kashmir,  
 CHOUGANIA CAMPUS, BANASKOT,  
 AZAD JAMMU & KASHMIR

CDM  
 EARTHQUAKE RECONSTRUCTION &  
 REHABILITATION AUTHORITY (ERA)

GOVERNMENT OF PAKISTAN  
 ISLAMABAD, PAKISTAN

NO. 10/2019

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 ALL PREVIOUS DRAWING.

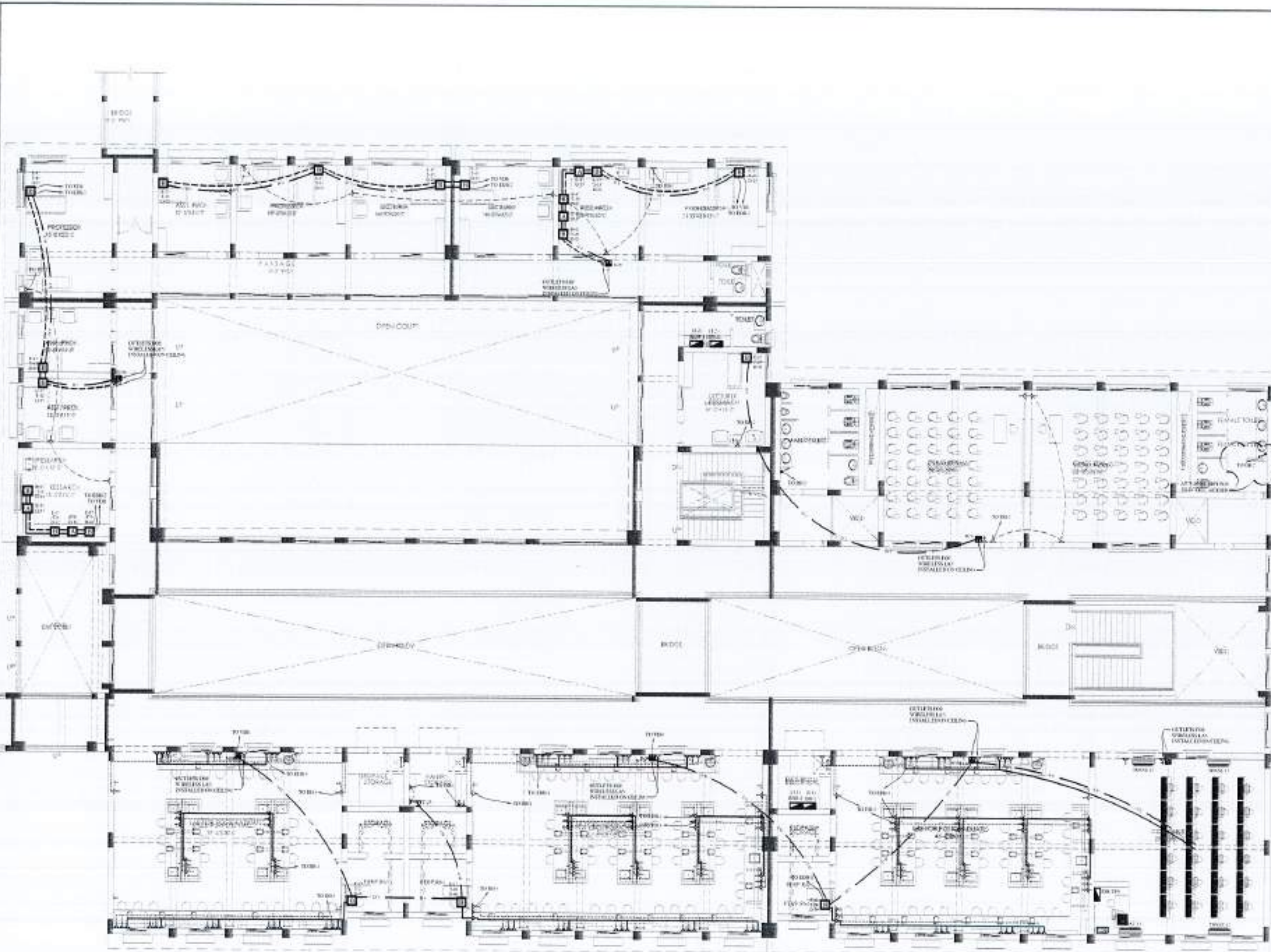
ARCHITECT  
 The Architects  
 117/118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

STRUCTURAL CONSULTANT  
 mushiq and bial  
 consulting engineers  
 117/118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

ELECTRICAL CONSULTANT  
 I. P. & ASSOCIATES  
 ELECTRICAL ENGINEERING  
 8-Ah-2001, Gulshan-e-Jamuna, Karachi-75200

PLUMBING CONSULTANT  
 Environmental & Management Consultants  
 117/118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 61





FIRST FLOOR  
GROUND FLOOR



NO.	DATE	REVISION	REMARKS

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PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHOWAGALA CAMPUS, BAKHARALI, AZAD JAMMU & KASHMIR.

CLIENT: EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ER&RA)

GOVERNMENT OF PAKISTAN  
JAMMU & KASHMIR

DATE: 06/04/2021

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ARCHITECT:  
 The Architects  
 Registration No. 1000/2010  
 10, BANGALORE ROAD, KARACHI-74200  
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 AAZ mushtaq and bial consulting engineers  
 10, BANGALORE ROAD, KARACHI-74200  
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ELECTRICAL CONSULTANT:  
 K & B ASSOCIATES ELECTRICAL ENGINEERS  
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PLUMBING CONSULTANT:  
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DEPARTMENT: DEPARTMENT OF AGRICULTURE, AGRONOMY & SOIL SCIENCE

TITLE: FIRST FLOOR PLAN POWER & DATA LAYOUT WORKING DRAWING

SCALE: 1:100

DATE: 06/04/2021

DESIGNER: (SIGNATURE)

NO.	DATE	REVISION	REMARKS

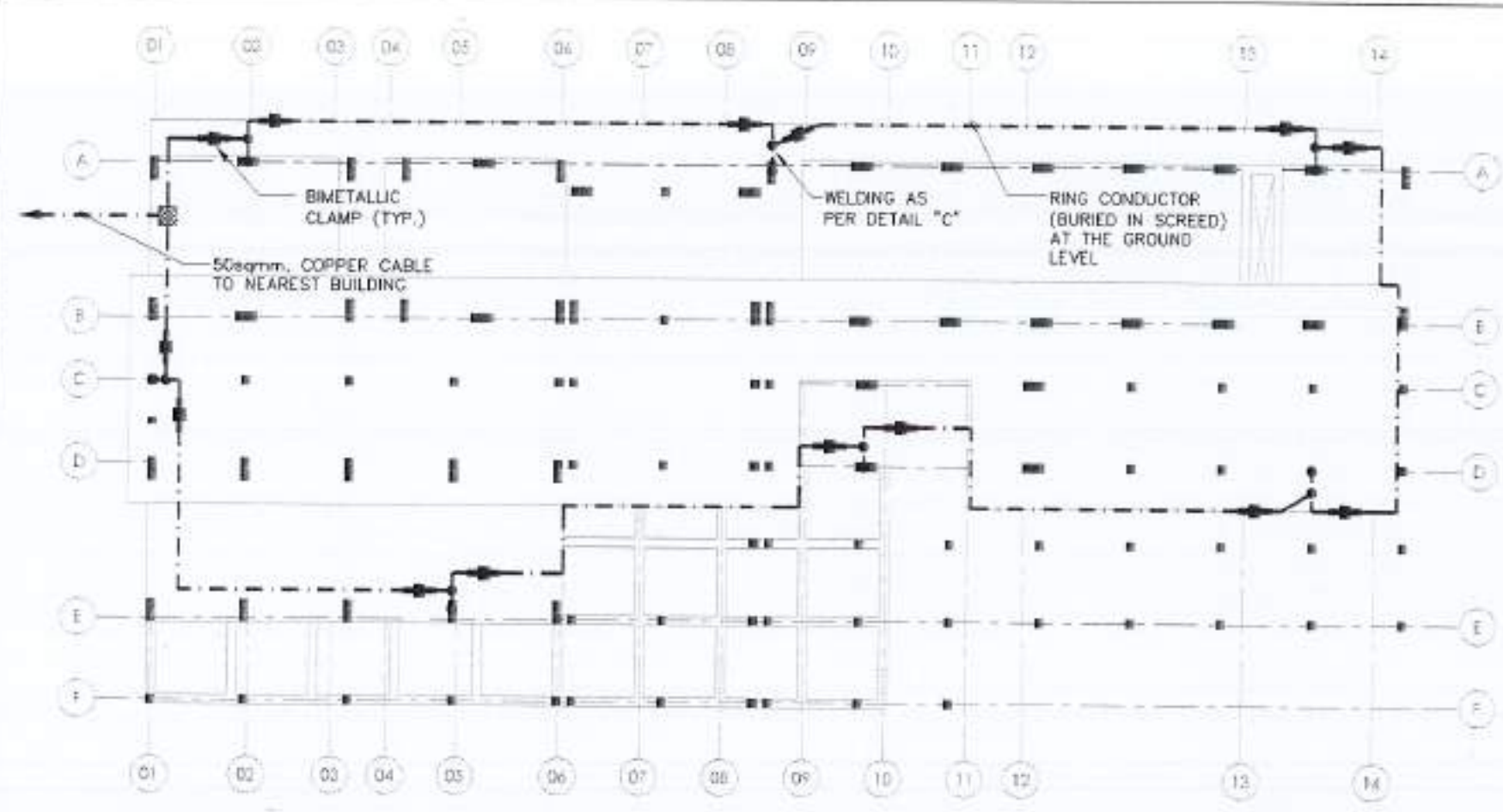
NOTES:  
 01 SEPARATE PIPES & BACK BOXES SHALL BE USE FOR EMERGENCY & NORMAL WIRING  
 02 PULL BOXES TO INSTALLED WHERE NECESSARY TO PULL WIRES OR CABLES  
 03 IN CASE OF ANY DISCREPANCY IN DRAWINGS, KINDLY CO-ORDINATE WITH CONSULTANT PRIOR TO START OF WORK

502 E-05





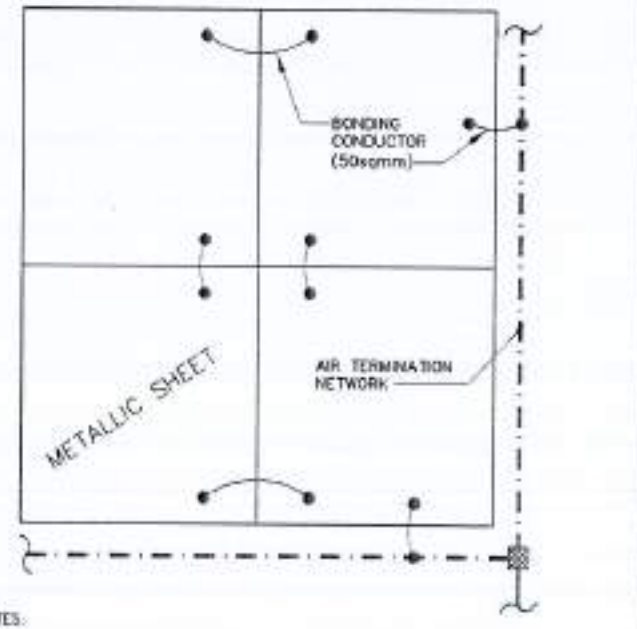
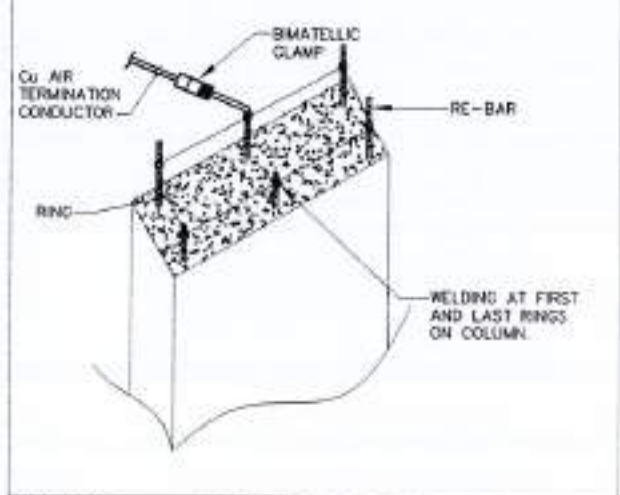




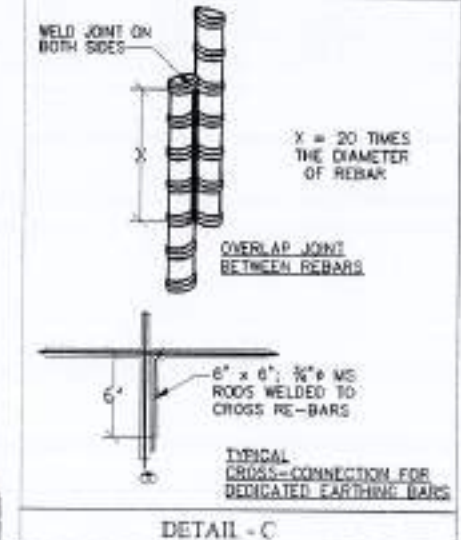
**NOTES FOR LIGHTNING PROTECTION**

1. ALL CONDUCTIVE PARTS TO BE BONDED WITH LIGHTNING PROTECTION NETWORK THROUGH STRANDED COPPER CONDUCTOR.
2. CONDUCTORS USED FOR BONDING WILL HAVE A GREEN/YELLOW SHEATH.
3. PROVIDE BRASS SADDLES TO SECURELY FASTEN VERTICAL AND HORIZONTAL CONDUCTORS AS SHOWN.
4. ALL NUTS/BOLTS TO BE OF 16mm DIA BRASS.
5. CONNECTIONS AT EARTH TEST CLAMP AND COPPER EARTH ROD TO BE THROUGH COMPRESSION LUGS.
6. EARTH RODS TO BE HAMMERED IN THE GROUND.
7. PROVIDE CONDUCTOR JOINTING CLAMP ON DOWN CONDUCTOR CLOSE TO MAIN EARTH TERMINAL AS SHOWN IN GROUNDING SCHEMATIC DIAGRAM.
8. WELDING BETWEEN ANY RE-BARS TO BE DONE AS PER DETAIL "C".
9. FOUNDATION INTERCONNECTION IS SHOWN, THE ABOVE SCHEME ALSO APPLIES TO ALL OTHER BUILDINGS (EXCEPT CENTRAL POWER PLANT & MOSQUE).
10. RE-BARS OF COLUMNS SHALL BE USED AS DOWN CONDUCTOR.
11. TWO RE-BARS SHALL BE USED IN EACH COLUMN AS SHOWN FOR THIS PURPOSE.
12. THE RE-BARS SHALL BE WELDED TOGETHER AS SHOWN TO CREATE ELECTRICAL CONTINUITY FROM ROOF TOP TO COLUMN FOUNDATION.
13. COLUMN RE-BARS (DOWN CONDUCTORS) SHALL BE JOINED TO ROOF AIR TERMINATION NETWORK, AND RING CONDUCTOR (BURIED IN SCREED) AT THE GROUND LEVEL AS SHOWN.

FOUNDATION INTERCONNECTION: SCHEME ALSO APPLIES TO ALL OTHER BUILDINGS (EXCEPT CENTRAL POWER PLANT & MOSQUE)



- NOTES:**
1. EACH SECTION OF ROOF THE METALLIC SHEET SHALL BE BONDED WITH THE ADJACENT SECTION THROUGH A 50sqmm Cu CONDUCTOR.
  2. BONDING OF METALLIC SHEETS IS ALSO REQUIRED WITH AIR TERMINATION NETWORK AS SHOWN.



**LEGENDS**

	BIMETALLIC CLAMP
	4 WAY CLAMP MADE OF COPPER OR BRASS
	50sqmm HARD DRAWN BARE COPPER LIGHTNING CONDUCTOR AIR TERMINATION
	35sqmm GREEN/YELLOW PVC INSULATED STRANDED COPPER CABLE FOR BONDING

4 WAY CONDUCTOR CLAMP    BIMETALLIC CLAMP

BONDING OF METALLIC SHEETS WITH AIR TERMINATION NETWORK

INSTALLATION OF ROOF MESH NETWORK

REV	DATE	BY	REMARKS

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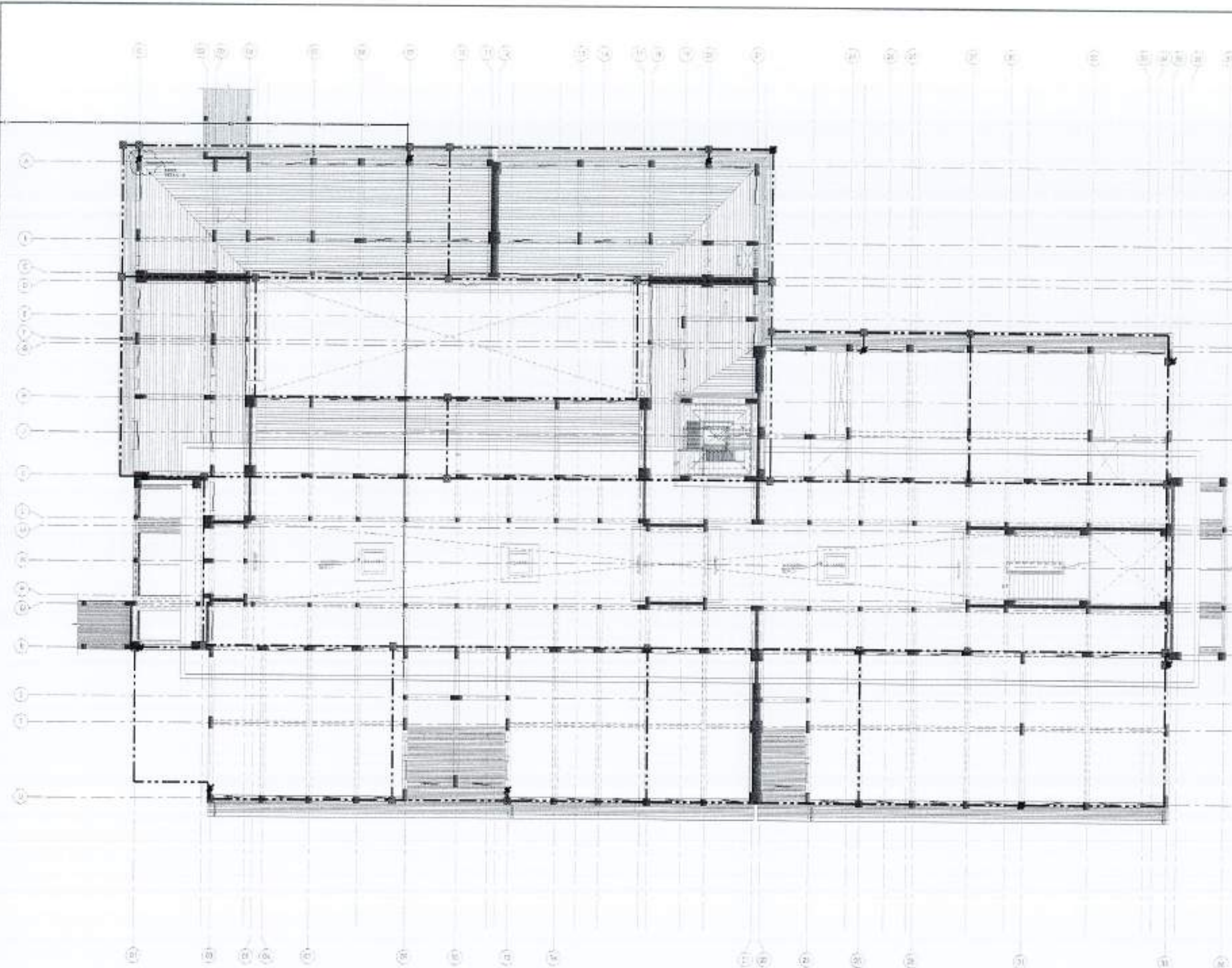
**PROJECT:**  
Reconstruction of University of Azad Jammu Kashmir, CHOWDALA CAMPUS, BAHAWALPUR, AZAD JAMMU & KASHMIR.

**CLIENT:**  
EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERRA)

**GOVERNMENT OF PAKISTAN ISLAMABAD PAKISTAN**

**ARCHITECT:**  
AAS mushiq and bial consulting engineers  
100-A/40, 43/44, 45/46, 47/48, 49/50, 51/52, 53/54, 55/56, 57/58, 59/60, 61/62, 63/64, 65/66, 67/68, 69/70, 71/72, 73/74, 75/76, 77/78, 79/80, 81/82, 83/84, 85/86, 87/88, 89/90, 91/92, 93/94, 95/96, 97/98, 99/100, 101/102, 103/104, 105/106, 107/108, 109/110, 111/112, 113/114, 115/116, 117/118, 119/120, 121/122, 123/124, 125/126, 127/128, 129/130, 131/132, 133/134, 135/136, 137/138, 139/140, 141/142, 143/144, 145/146, 147/148, 149/150, 151/152, 153/154, 155/156, 157/158, 159/160, 161/162, 163/164, 165/166, 167/168, 169/170, 171/172, 173/174, 175/176, 177/178, 179/180, 181/182, 183/184, 185/186, 187/188, 189/190, 191/192, 193/194, 195/196, 197/198, 199/200, 201/202, 203/204, 205/206, 207/208, 209/210, 211/212, 213/214, 215/216, 217/218, 219/220, 221/222, 223/224, 225/226, 227/228, 229/230, 231/232, 233/234, 235/236, 237/238, 239/240, 241/242, 243/244, 245/246, 247/248, 249/250, 251/252, 253/254, 255/256, 257/258, 259/260, 261/262, 263/264, 265/266, 267/268, 269/270, 271/272, 273/274, 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PROJECT:  
 RECONSTRUCTION OF  
 UNIVERSITY OF AZAD JAMSHU KANUN  
 CHOTAGALA CAMPUS, BANGLADESH  
 AZAD JAMSHU KANUN

CLIENT:  
 EARTHQUAKE RECONSTRUCTION &  
 REHABILITATION AUTHORITY (ERA)

GOVERNMENT OF PAKISTAN  
 ISLAMABAD PAKISTAN

DATE: 24 APRIL 2015

THIS DRAWING SUPERSEDES  
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DEPARTMENT  
 DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCE

TITLE  
 ROOF PLAN  
 LIGHTNING PROTECTION  
 WORKING DRAWING

FOR:  
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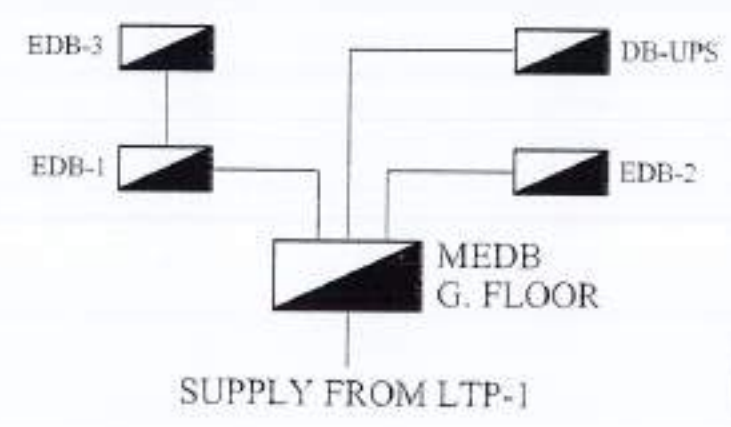
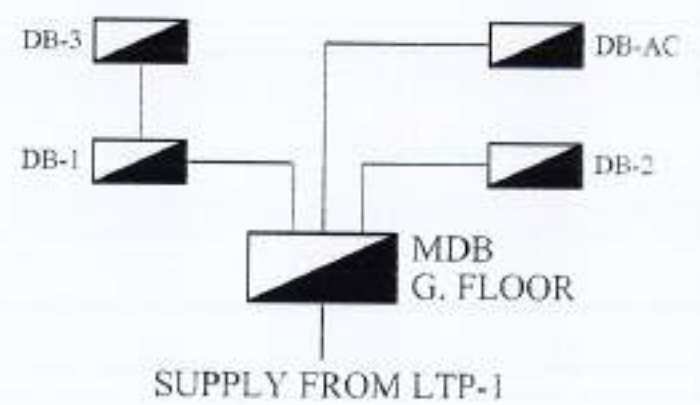
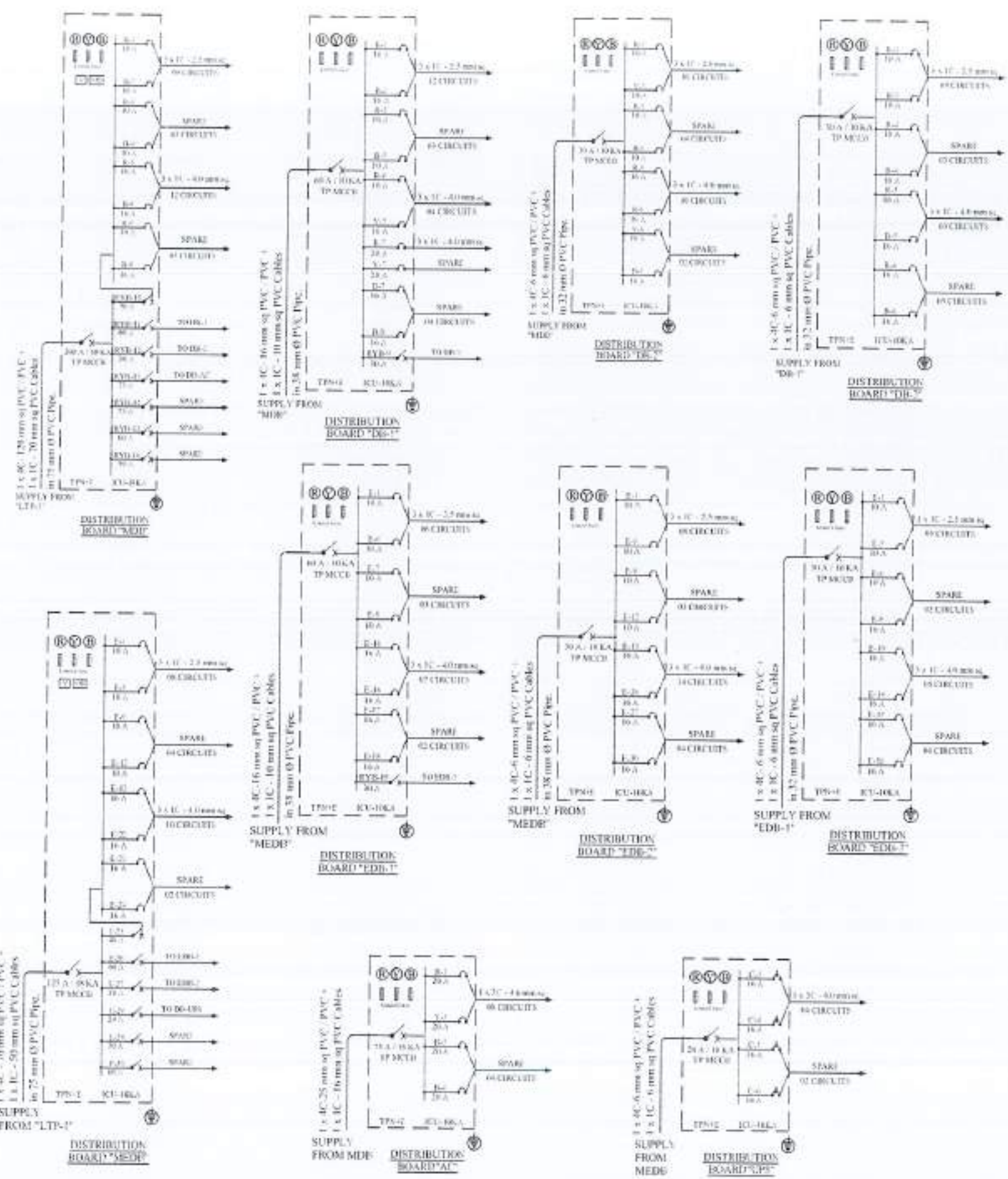
DATE: 24 APRIL 2015  
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 DRAWING NO:

502 E-08

LIGHTNING PROTECTION  
 ROOF LAYOUT

NOTE:  
 FOR LEGENDS, NOTES, RE-BAR DETAIL  
 REFER DRAWING NO. E-07 (ADMIN BLOCK)





NO.	DATE	ISSUED	REVISION

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PROJECT  
 Reconstruction of University of Azad Jammu Kashmir, DUSTAGALA CAMPUS, BAWALAD, AZAD JAMMU & KASHMIR

CLIENT  
 EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERA)

GOVERNMENT OF PAKISTAN  
 ISLAMABAD PAKISTAN

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 E.A. Associates  
 10, BAHAR NAGAR, LAHORE, PAKISTAN

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCE

TITLE  
 SINGLE LINE DIAGRAM WORKING DRAWING

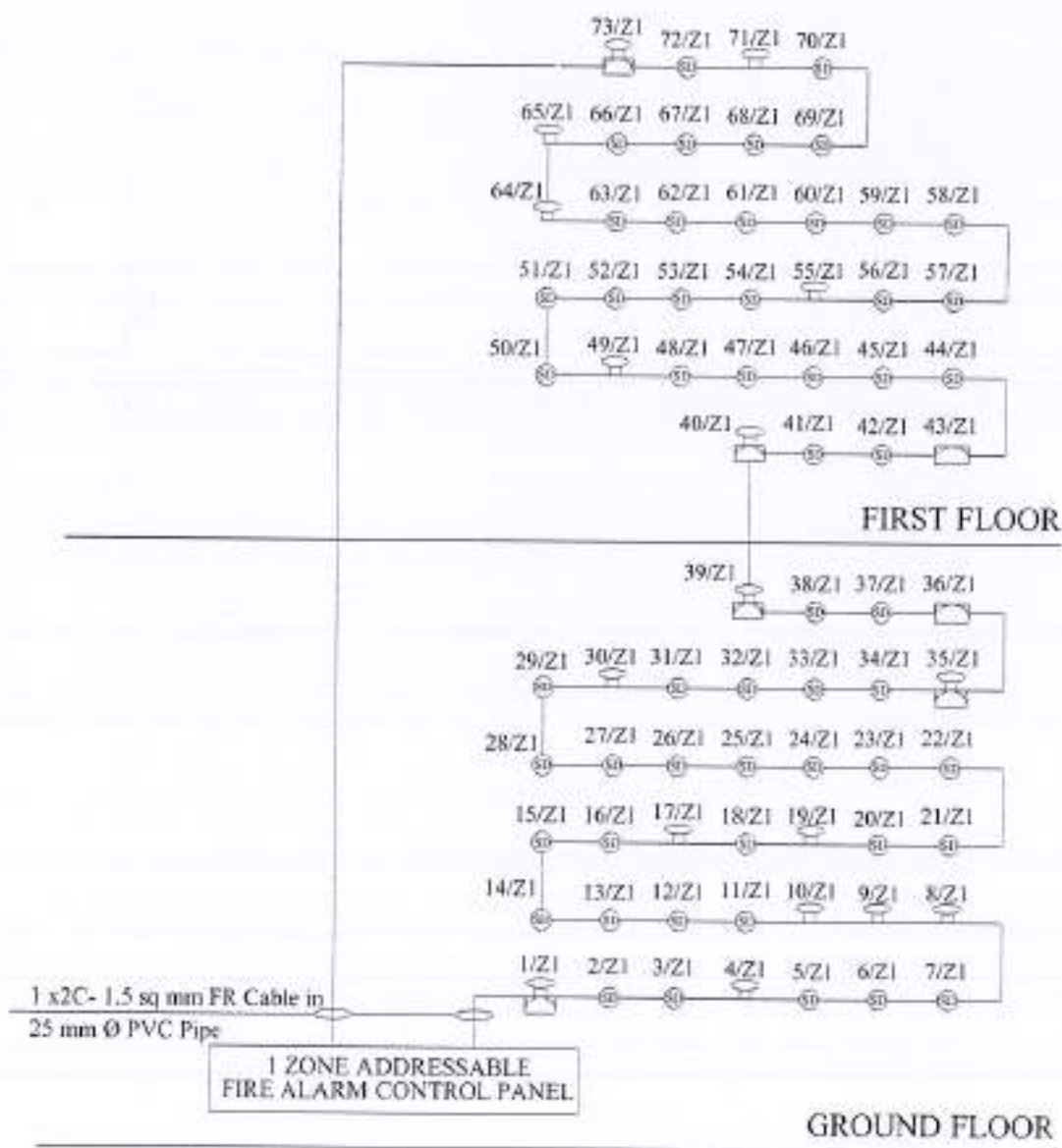
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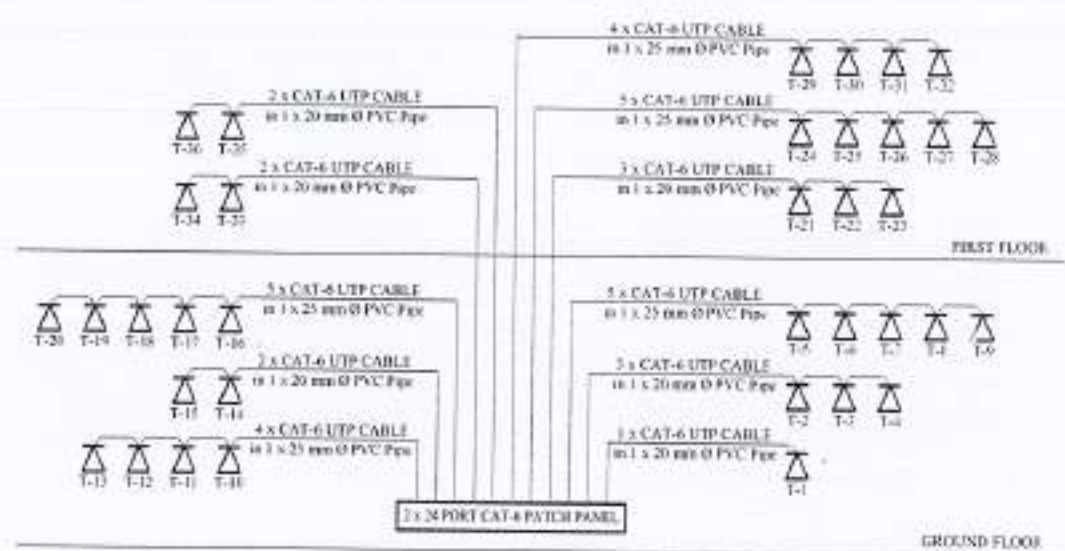
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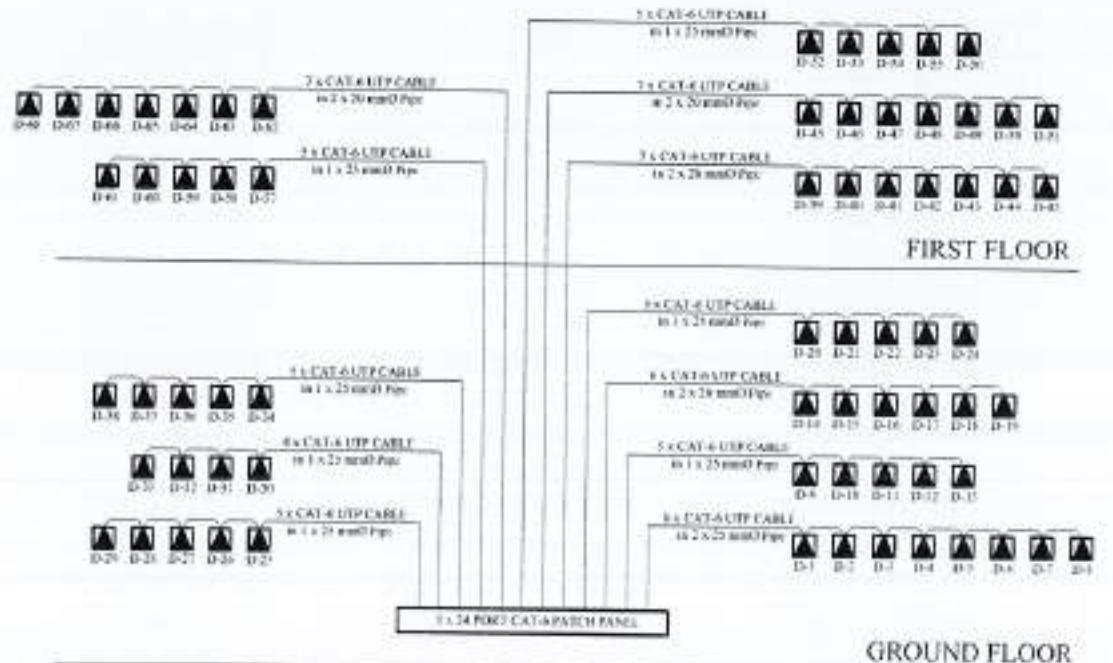




**FIRE ALARM SYSTEM SCHEMATIC DIAGRAM**



**VOICE SYSTEM SCHEMATIC DIAGRAM**



**DATA SYSTEM SCHEMATIC DIAGRAM**



REV. NO.	DATE	BY	REMARKS

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CLIENT: EARTHQUAKE RECONSTRUCTION & EDUCATION AUTHORITY (EREA)

GOVERNMENT OF PAKISTAN ISLAMABAD PAKISTAN

ARCHITECT: ARCHITECTS

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STRUCTURAL CONSULTANT: CONSULTING ENGINEERS

ELECTRICAL CONSULTANT: ELECTRICAL ENGINEER

PLUMBING CONSULTANT: ENVIRONMENTAL & MANAGEMENT CONSULTANTS

DEPARTMENT OF AGRICULTURE AGRONOMY & SOIL SCIENCE

SCHEMATIC DIAGRAM WORKING DRAWING

DATE: 11/01/2011

NO: 502

REV: E-10



**LEGEND:**

SYMBOL	DESCRIPTION	MOUNTING HEIGHT (F.F.F)
	10A ONE WAY SWITCH	3'-3"
	10A TWO WAY SWITCH	3'-3"
	32A DOUBLE POLE SAFETY BREAKER	3'-3"
	CEILING MOUNTED LIGHT FIXTURE (1 x 18W PLC LAMP)	CEILING
	FLUORESCENT LIGHT FIXTURE (TMS 015-236)	CEILING
	CEILING LIGHT FIXTURE TCS-240 (2 x 36W FLUORESCENT LAMP)	CEILING
	FLUORESCENT LIGHT FIXTURE (TMS 015-136)	CEILING / COUNTER
	SWEEP CEILING FAN (60W)	CEILING
	GLASS FITTED EXHAUST FAN (60W)	6'-0"
	WALL BRACKET FAN (60W)	7'-0"
	5A, 3 PIN SWITCH SOCKET OUTLET (100W)	6'-0"
	5A, 3 PIN SWITCH SOCKET OUTLET (100W)	3'-3"
	15A, 3 PIN SWITCH SOCKET OUTLET (100W)	2'-3"
	16A SHOKO SOCKET OUTLET (100W)	7'-0"
	13A FLAT PIN SWITCH SOCKET OUTLET (100W)	CEILING
	WALL MOUNTED SPLIT A/C	8'-0"
	A/C COMPRESSOR	.....
	1x 13A FLAT PIN SSD + 1x 16A SHOKO SOCKET + 1x DATA OUTLET	FURNITURE
	1x 13A FLAT PIN SSD + 1x 16A SHOKO SOCKET + 1x DATA OUTLET + 1x VOICE OUTLET	FURNITURE
	FLOOR BOX	FLOOR
	TELEPHONE OUTLET	0'-0"
	DATA OUTLET	CEILING
	VOICE DATA RACK	4'-0"
	SMOKE DETECTOR	CEILING
	HEAT DETECTOR	CEILING
	FIRE ALARM SOUNDER & MANUAL CALL POINT	4'-0"
	FIRE ALARM CONTROL PANEL	3'-0"
	VOLT METER 0 - 500 VOLT 16A, 7 POSITION	.....
	VOLT SELECTOR SWITCH	.....
	DISTRIBUTION BOARD	4'-0"
	EARTHING SET / TO BE GROUNDED	.....
	PROJECTOR	CEILING
	SINGLE POLE MINIATURE CIRCUIT BREAKER	.....
	DOUBLE POLE MINIATURE CIRCUIT BREAKER	.....
	TRIPLE POLE MINIATURE CIRCUIT BREAKER	.....
	TRIPLE POLE MOLDED CASE CIRCUIT BREAKER	.....
	CONDUIT IN CEILING	.....
	CONDUIT IN WALL / FLOOR	.....
	CIRCUIT TO DB	.....
S1, S2, S3	NUMBER OF SWITCHES	.....
R, Y, B	COLOUR OF CIRCUITS	.....
T1, T2, T3	NUMBER OF TELEPHONE EXTENSION	.....
D1, D2, D3	NUMBER OF DATA POINT	.....
CL, C2, C3	NUMBER OF UPS CIRCUITS	.....
E1, E2, E3	NUMBER OF EMERGENCY CIRCUITS	.....

**CABLE TYPE SCHEDULE**

WIRING APPLICATION	CABLE TYPE
INDOOR CIRCUIT- LIGHTING	3 x 2.5sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
INDOOR POINT- LIGHTING	3 x 2.5sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
INDOOR CIRCUIT- GENERAL POWER OUTLETS	3 x 4sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
INDOOR POINT- GENERAL POWER OUTLETS	3 x 2.5sqmm 1-C 0.3/0.5kV Cu/PVC CABLES
OUTDOOR CIRCUIT- LIGHTING	3-C 0.3/0.5kV Cu/PVC/PVC CABLE, CONDUCTOR SIZE AS PER DRAWING
OUTDOOR POINT- LIGHTING	3-C 0.3/0.5kV Cu/PVC/PVC CABLE, CONDUCTOR SIZE AS PER DRAWING
OUTDOOR CIRCUIT- GENERAL POWER OUTLETS	4sqmm 3-C 0.3/0.5kV Cu/PVC CABLE
OUTDOOR POINT- GENERAL POWER OUTLETS	2.5sqmm 3-C 0.3/0.5kV Cu/PVC CABLE
INDOOR POWER DISTRIBUTION	4 x 1-C 0.6/1kV Cu/PVC CABLES + 1-C 0.6/1kV Cu/PVC CABLE AS EGC, CONDUCTOR SIZES AS PER DRAWING
VOICE/DATA OUTLETS	CAT-6 UTP 23AWG SOLID BARE COPPER CONDUCTORS, 4 Pairs CABLED TOGETHER WITH A FLEXIBLE CORE SEPARATOR, THERMOPLASTIC RO. TOLERIN INSULATION AND FLAME RETARDANT THERMOPLASTIC JACKET, APPROVED COLOUR, COMPLIANT TO ANSI / TIA/EIA-568-B.2-1 AND RATED CM AS PER NEC ARTICLE 800
VOICE/DATA PATCH CABLES	2m LONG MOLDED SHIELDLESS PATCH CABLE, CAT-6 UTP 23AWG STRANDED 19 COPPER CONDUCTORS, 4 Pairs CABLED WITH CORE SEPARATOR, THERMOPLASTIC POLYURETHAN INSULATION AND FLAME RETARDANT THERMOPLASTIC JACKET, APPROVED COLOUR, COMPLIANT TO ANSI / TIA/EIA-568-B.2-1 AND RATED CM AS PER NEC ARTICLE 800
FIRE ALARM SYSTEM DEVICES	1.5sqmm 2-C 0.3/0.5kV CABLE; STRANDED BARE COPPER CONDUCTORS, 10W SHIELD ZERO HALOGEN (LSZH) INSULATION, NON-INSULATED CPC, OVERALL SCREEN AND LSZH SHEATH(TYPICAL)

**CONDUIT FILL SCHEDULE**

S#	CABLE TYPE	20mm DIA (0.75" DIA)	25mm DIA (1.0" DIA)	32mm DIA (1.25" DIA)	35mm DIA (1.37" DIA)	50mm DIA (2.0" DIA)
1	2.5sqmm	5	11	15	-	-
2	4sqmm	6	6	12	17	-
3	6sqmm	5	7	11	15	-
4	10sqmm	-	5	7	11	15
5	CAT-6	-	6	10	15	20
F	RD-E/G	-	5	7	11	15
7	1.5sqmm FA	-	2	-	-	-

**DISTRIBUTION PANEL CONSTRUCTION DETAILS**

- 38w/LT PANELS SHALL BE FABRICATED FROM 16 SWG SHEET STEEL WITH WELDED, GROUND AND FINISHED ANGLE-IRON FRAME. WORK INGRESS PROTECTION CLASS TO BE IP-34.
- 38w/LT PANELS SHALL BE ELECTRO-STATICALLY COATED WITH POWDER OF COLOUR RAL 7032 AND THEN OVEN BAKED.
- REFER TO DB/LT PANEL SCHEMATICS FOR CABLE ENTRY/EXIT TYPE.
- W/DOORITS REQUIRED FOR INCOMING/OUTGOING CABLES.
- LT PANELS SHALL HAVE 100mm HANDLE WITHOUT KEY.
- 38w/LT PANELS WITH ALL COMPONENTS AND ACCESSORIES SHALL BE SUITABLE FOR FRONT OPERATION ONLY.
- ALL 38w/LT PANELS SHALL HAVE 20% EXTRA SPACE.
- EACH DB/LT PANEL TO HAVE SUFFICIENT SPACE ON NEUTRAL AND EARTH BARS 'N' AND 'E' BARS TO HAVE PRE-DRILLED HOLES FOR CABLE CONNECTIONS.
- EACH DB/LT PANEL TO HAVE INSIDE POCKET WITH AS-BUILT DRAWING.
- EACH DB/LT PANEL TO BE TESTED AT MANUFACTURER'S WORKS FOR INSULATION AND FUNCTIONAL OPERATION OF ALL COMPONENTS AND DEVICES.
- ALL INCOMING CIRCUIT BREAKERS TO BE OF ADJUSTABLE TYPE.
- CIRCUIT BREAKER CHARACTERISTICS TO BE AS FOLLOWS:
  - MCBs FOR LIGHTING CIRCUITS - TYPE 'B'
  - MCBs FOR OTHER SERVICES - TYPE 'C'
- EXCEPT WHERE NOTED OTHERWISE, ALL OUTGOING MCBs TO HAVE Icu = 10KA.
- FLEXIBLE COPPER STRIP SHALL BE PROVIDED FOR EARTHING OF THE DOOR OF DB/LT PANEL.
- ONLY MAKES DETAILED IN THE TENDER DOCUMENTS ARE TO BE USED.

**GENERAL INSTALLATION**

- ACCESS TO ELECTRICAL EQUIPMENT SHALL NOT BE DENIED BY ACCUMULATION OF WIRES. SUCH ACCUMULATION SHALL ALSO BE ALLOWED TO BEYOND REMOVAL OF PANELS, INCLUDING SUSPENDED CEILING PANELS.
- INSPECTION BOX, PULL BOX, JUNCTION BOX, ETC. SHALL BE PROVIDED AS SHOWN IN THE DRAWING AND WHERE NECESSARY FOR EASE OF CABLE PULLING.
- DIFFERENT SYSTEMS WIRING TO BE RUN IN SEPARATE CONDUITS.
- UNLESS NOTED OTHERWISE ALL BACK BOXES SHALL BE OF 16 SWG SHEET STEEL, POWDER COATED, WITH PROVISION FOR EARTH CONNECTION.
- ALL MCV - CURRENT CARRYING PARTS AND OUTER CASINGS OF EQUIPMENT SUCH AS MV & LV PANELS, DISTRIBUTION BOARDS, CABLE TRAYS, AUXILIARY CONSTRUCTION FOR EQUIPMENT ETC. SHALL BE CONNECTED TO THE GROUNDING/ EARTHING SYSTEM AT REQUIRED NUMBER OF POINTS WITH SPECIFIED SIZES OF CONDUCTORS. WATER PIPES ALONG ELECTRICAL LINES SHALL BE BONDED TO THE EARTHING SYSTEM WITH 20sqmm SINGLE CORE COPPER CONDUCTOR PVC CABLE.
- ELECTRICAL POINTS FOR EQUIPMENT SHALL BE INSTALLED IN CO-ORDINATION WITH THE RELEVANT DRAWINGS OF OTHER SERVICES, SUCH AS COMMUNICATION SYSTEMS, HVAC, PLUMBING ETC. THE LOCATION ON ELECTRICAL DRAWINGS IS ONLY INDICATIVE.
- ARRANGEMENT OF ELECTRICAL EQUIPMENT OR ELECTRICAL BRACKETS ARE TENTATIVE. EXACT ARRANGEMENT OF EQUIPMENT SHALL BE MADE IN VIEW OF ITS PHYSICAL DIMENSIONS AND EASE OF MAINTENANCE.
- CONDUIT/DUCT RUN UNDER FLOOR SHALL HAVE A MINIMUM COVER OF 2 INCHES FROM TOP OF CONDUIT/DUCT TO FINISH FLOOR LEVEL.
- BEFORE DETERMINING THE CUT LENGTHS OF CABLE, THE ACTUAL MEASUREMENT AT SITE SHALL BE MADE WITH PROVISION FOR SLACK AT LV PANELS/ DISTRIBUTION BOARDS AND SPARE LENGTH FOR LOOPS AS REQUIRED.
- ALL UNDERGROUND CONDUITS AFTER INSTALLATION SHALL BE PLUGGED AND SEALED AT BOTH ENDS AND JOINTS TO AVOID INGRESS OF WATER INTO PIPES.
- WIRING SHALL BE CONTINUOUS LOOPING-IN TYPE AND NO JOINT BY WIRES SHALL BE ALLOWED INSTALLED AND ALL OUTLET BOXES, ETC. ARE FIXED IN POSITION.
- THE WIRING SYSTEM SHALL BE LAID ONLY AFTER THE CONDUIT SYSTEM IS COMPLETELY INSTALLED AND ALL OUTLET BOXES, ETC. ARE FIXED IN POSITION.
- UNLESS NOTED OTHERWISE, ALL CONDUITS ARE OF PVC.
- REFER TO CABLE TYPE SCHEDULE FOR SPECIFIC CABLES TO BE EMPLOYED AS PER THE APPLICATION.
- FOR ALLOWED FILL OF CONDUITS, REFER TO THE CONDUIT FILL SCHEDULE.
- ALL CONDUITS RUN ABOVE FALSE CEILING SHALL BE LABELLED/PRINTED WITH THE NAMES OF RESPECTIVE SERVICES.

**SYSTEM SPECIFIC NOTES**

- COMMUNICATION CABLES SHALL BE SEPARATED FROM ELECTRICAL LIGHT OR POWER CONDUCTORS.
- A CONDUIT MUST CONTAIN CIRCUITS OF EITHER ONLY ONE PHASE OR ALL THE PHASES.
- RUN GREEN-YELLOW OR GREEN SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED SIZES AS PROTECTIVE EARTH CONDUCTOR (ECC) ALL ALONG LIGHT AND POWER WIRING.
- UNLESS NOTED OTHERWISE, ALL WIRING TO LIGHT AND SOCKET CIRCUITS SHALL BE CARRIED OUT WITH SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED VOLTAGE GRADE IN CONCRETE/ PVC CONDUIT OF SPECIFIED SIZE.
- LIGHT CONTROL SWITCHES SHALL BE INSTALLED 6 INCHES AWAY FROM THE SIDE OF DOOR IN ROOMS.
- EACH CIRCUIT TO HAVE ITS INDEPENDENT NEUTRAL AND EARTH CONDUCTOR RUN FROM DB.
- FOR EXACT LOCATION OF LIGHTING FIXTURES REFER TO ARCHITECTURAL DRAWINGS.
- THE ELECTRICAL RESISTANCE OF ECC TOGETHER WITH EARTH LEAD AND ELECTRODE SHOULD NOT EXCEED ONE OHM IF IT EXCEEDS, THE CONTRACTOR SHALL OBTAIN INSTRUCTION FROM CONSULTANT FOR ANY CHANGE.

**GENERAL NOTES**

- FOLLOWING NOTES SHALL IN GENERAL APPLY TO ALL ELECTRICAL DRAWINGS. THE INSTRUCTIONS IN THESE NOTES SHALL BE FOLLOWED UNLESS STATED OTHERWISE.
- THESE NOTES SHALL BE APPLICABLE TO THE ENTIRE ELECTRICAL WORKS. IF THE SITE CONDITIONS NECESSITATE ANY ALTERATIONS OR REVISIONS, THE DIRECTIONS OF THE CONSULTANT SHALL BE OBSERVED AS FINAL INSTRUCTIONS.
- ALL ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC DRAWINGS & ALL OTHER RELEVANT DETAILS.
- DIMENSIONS/MEASUREMENTS GIVEN IN LAYOUT AND DETAILED DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALCULATE THE ACTUAL DIMENSIONS/ MEASUREMENTS ACCORDING TO STRUCTURAL AND ARCHITECTURAL DRAWINGS.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ALL RELEVANT DETAILS TO THE CONSULTANT FOR APPROVAL, ACCORDING TO THE GENERAL CONDITIONS OF CONTRACT WELL IN TIME BEFORE COMMENCEMENT OF THAT WORK.
- PROPER CO-ORDINATION OF ELECTRICAL WORKS WITH OTHER SERVICES SHALL BE CARRIED OUT AT SITE.
- THE MAKES STATED BY THE TENDER DRAWINGS/DOCUMENTS ARE FOR REFERENCE TO A PARTICULAR CLASS OF QUALITY OR PERFORMANCE EQUIPMENT. EQUIVALENT OR BETTER MAKES COULD ALSO BE OFFERED. APPROVAL OF EQUIVALENCE OF MAKES SHALL BE THE DISCRETION OF CONSULTANT/ OWNER.
- DO NOT SCALE THE DRAWINGS.



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PROJECT: Reconstruction of University of Azad Jammu Kashmir, CHITTODALA CAMPUS, RAHAWAL, AZAD JAMMU & KASHMIR.

CLIENT: EARTHQUAKE RECONSTRUCTION & REHABILITATION AUTHORITY (ERA).

GOVERNMENT OF PUNJAB, LAHORE, PAKISTAN.

NO. OF SHEETS: 10

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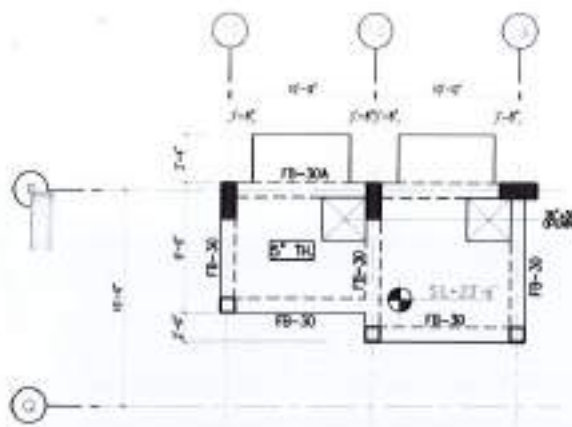
**CONSULTANT**

**THE ARCHITECT**  
 M. A. H. KHAN  
 ARCHITECT  
 10-A, 10-B, 10-C, 10-D, 10-E, 10-F, 10-G, 10-H, 10-I, 10-J, 10-K, 10-L, 10-M, 10-N, 10-O, 10-P, 10-Q, 10-R, 10-S, 10-T, 10-U, 10-V, 10-W, 10-X, 10-Y, 10-Z, 10-AA, 10-AB, 10-AC, 10-AD, 10-AE, 10-AF, 10-AG, 10-AH, 10-AI, 10-AJ, 10-AK, 10-AL, 10-AM, 10-AN, 10-AO, 10-AP, 10-AQ, 10-AR, 10-AS, 10-AT, 10-AU, 10-AV, 10-AW, 10-AX, 10-AY, 10-AZ, 10-BA, 10-BB, 10-BC, 10-BD, 10-BE, 10-BF, 10-BG, 10-BH, 10-BI, 10-BJ, 10-BK, 10-BL, 10-BM, 10-BN, 10-BO, 10-BP, 10-BQ, 10-BR, 10-BS, 10-BT, 10-BU, 10-BV, 10-BW, 10-BX, 10-BY, 10-BZ, 10-CA, 10-CB, 10-CC, 10-CD, 10-CE, 10-CF, 10-CG, 10-CH, 10-CI, 10-CJ, 10-CK, 10-CL, 10-CM, 10-CN, 10-CO, 10-CP, 10-CQ, 10-CR, 10-CS, 10-CT, 10-CU, 10-CV, 10-CW, 10-CX, 10-CY, 10-CZ, 10-DA, 10-DB, 10-DC, 10-DD, 10-DE, 10-DF, 10-DG, 10-DH, 10-DI, 10-DJ, 10-DK, 10-DL, 10-DM, 10-DN, 10-DO, 10-DP, 10-DQ, 10-DR, 10-DS, 10-DT, 10-DU, 10-DV, 10-DW, 10-DX, 10-DY, 10-DZ, 10-EA, 10-EB, 10-EC, 10-ED, 10-EE, 10-EF, 10-EG, 10-EH, 10-EI, 10-EJ, 10-EK, 10-EL, 10-EM, 10-EN, 10-EO, 10-EP, 10-EQ, 10-ER, 10-ES, 10-ET, 10-EU, 10-EV, 10-EW, 10-EX, 10-EY, 10-EZ, 10-FA, 10-FB, 10-FC, 10-FD, 10-FE, 10-FF, 10-FG, 10-FH, 10-FI, 10-FJ, 10-FK, 10-FL, 10-FM, 10-FN, 10-FO, 10-FP, 10-FQ, 10-FR, 10-FS, 10-FT, 10-FU, 10-FV, 10-FW, 10-FX, 10-FY, 10-FZ, 10-GA, 10-GB, 10-GC, 10-GD, 10-GE, 10-GF, 10-GG, 10-GH, 10-GI, 10-GJ, 10-GK, 10-GL, 10-GM, 10-GN, 10-GO, 10-GP, 10-GQ, 10-GR, 10-GS, 10-GT, 10-GU, 10-GV, 10-GW, 10-GX, 10-GY, 10-GZ, 10-HA, 10-HB, 10-HC, 10-HD, 10-HE, 10-HF, 10-HG, 10-HH, 10-HI, 10-HJ, 10-HK, 10-HL, 10-HM, 10-HN, 10-HO, 10-HP, 10-HQ, 10-HR, 10-HS, 10-HT, 10-HU, 10-HV, 10-HW, 10-HX, 10-HY, 10-HZ, 10-IA, 10-IB, 10-IC, 10-ID, 10-IE, 10-IF, 10-IG, 10-IH, 10-II, 10-IJ, 10-IK, 10-IL, 10-IM, 10-IN, 10-IO, 10-IP, 10-IQ, 10-IR, 10-IS, 10-IT, 10-IU, 10-IV, 10-IW, 10-IX, 10-IY, 10-IZ, 10-JA, 10-JB, 10-JC, 10-JD, 10-JE, 10-JF, 10-JG, 10-JH, 10-JI, 10-JJ, 10-JK, 10-JL, 10-JM, 10-JN, 10-JO, 10-JP, 10-JQ, 10-JR, 10-JS, 10-JT, 10-JU, 10-JV, 10-JW, 10-JX, 10-JY, 10-JZ, 10-KA, 10-KB, 10-KC, 10-KD, 10-KE, 10-KF, 10-KG, 10-KH, 10-KI, 10-KJ, 10-KK, 10-KL, 10-KM, 10-KN, 10-KO, 10-KP, 10-KQ, 10-KR, 10-KS, 10-KT, 10-KU, 10-KV, 10-KW, 10-KX, 10-KY, 10-KZ, 10-LA, 10-LB, 10-LC, 10-LD, 10-LE, 10-LF, 10-LG, 10-LH, 10-LI, 10-LJ, 10-LK, 10-LL, 10-LM, 10-LN, 10-LO, 10-LP, 10-LQ, 10-LR, 10-LS, 10-LT, 10-LU, 10-LV, 10-LW, 10-LX, 10-LY, 10-LZ, 10-MA, 10-MB, 10-MC, 10-MD, 10-ME, 10-MF, 10-MG, 10-MH, 10-MI, 10-MJ, 10-MK, 10-ML, 10-MN, 10-MO, 10-MP, 10-MQ, 10-MR, 10-MS, 10-MT, 10-MU, 10-MV, 10-MW, 10-MX, 10-MY, 10-MZ, 10-NA, 10-NB, 10-NC, 10-ND, 10-NE, 10-NF, 10-NG, 10-NH, 10-NI, 10-NJ, 10-NK, 10-NL, 10-NM, 10-NO, 10-NP, 10-NQ, 10-NR, 10-NS, 10-NT, 10-NU, 10-NV, 10-NW, 10-NX, 10-NY, 10-NZ, 10-OA, 10-OB, 10-OC, 10-OD, 10-OE, 10-OF, 10-OG, 10-OH, 10-OI, 10-OJ, 10-OK, 10-OL, 10-OM, 10-ON, 10-OO, 10-OP, 10-OQ, 10-OR, 10-OS, 10-OT, 10-OU, 10-OV, 10-OW, 10-OX, 10-OY, 10-OZ, 10-PA, 10-PB, 10-PC, 10-PD, 10-PE, 10-PF, 10-PG, 10-PH, 10-PI, 10-PJ, 10-PK, 10-PL, 10-PM, 10-PN, 10-PO, 10-PP, 10-PQ, 10-PR, 10-PS, 10-PT, 10-PU, 10-PV, 10-PW, 10-PX, 10-PY, 10-PZ, 10-QA, 10-QB, 10-QC, 10-QD, 10-QE, 10-QF, 10-QG, 10-QH, 10-QI, 10-QJ, 10-QK, 10-QL, 10-QM, 10-QN, 10-QO, 10-QP, 10-QQ, 10-QR, 10-QS, 10-QT, 10-QU, 10-QV, 10-QW, 10-QX, 10-QY, 10-QZ, 10-RA, 10-RB, 10-RC, 10-RD, 10-RE, 10-RF, 10-RG, 10-RH, 10-RI, 10-RJ, 10-RK, 10-RL, 10-RM, 10-RN, 10-RO, 10-RP, 10-RQ, 10-RR, 10-RS, 10-RT, 10-RU, 10-RV, 10-RW, 10-RX, 10-RY, 10-RZ, 10-SA, 10-SB, 10-SC, 10-SD, 10-SE, 10-SF, 10-SG, 10-SH, 10-SI, 10-SJ, 10-SK, 10-SL, 10-SM, 10-SN, 10-SO, 10-SP, 10-SQ, 10-SR, 10-SS, 10-ST, 10-SU, 10-SV, 10-SW, 10-SX, 10-SY, 10-SZ, 10-TA, 10-TB, 10-TC, 10-TD, 10-TE, 10-TF, 10-TG, 10-TH, 10-TI, 10-TJ, 10-TK, 10-TL, 10-TM, 10-TN, 10-TO, 10-TP, 10-TQ, 10-TR, 10-TS, 10-TT, 10-TU, 10-TV, 10-TW, 10-TX, 10-TY, 10-TZ, 10-UA, 10-UB, 10-UC, 10-UD, 10-UE, 10-UF, 10-UG, 10-UH, 10-UI, 10-UJ, 10-UK, 10-UL, 10-UM, 10-UN, 10-UO, 10-UP, 10-UQ, 10-UR, 10-US, 10-UT, 10-UV, 10-UW, 10-UX, 10-UY, 10-UZ, 10-VA, 10-VB, 10-VC, 10-VD, 10-VE, 10-VF, 10-VG, 10-VH, 10-VI, 10-VJ, 10-VK, 10-VL, 10-VM, 10-VN, 10-VO, 10-VP, 10-VQ, 10-VR, 10-VS, 10-VT, 10-VU, 10-VV, 10-VW, 10-VX, 10-VY, 10-VZ, 10-WA, 10-WB, 10-WC, 10-WD, 10-WE, 10-WF, 10-WG, 10-WH, 10-WI, 10-WJ, 10-WK, 10-WL, 10-WM, 10-WN, 10-WO, 10-WP, 10-WQ, 10-WR, 10-WS, 10-WT, 10-WU, 10-WV, 10-WX, 10-WY, 10-WZ, 10-XA, 10-XB, 10-XC, 10-XD, 10-XE, 10-XF, 10-XG, 10-XH, 10-XI, 10-XJ, 10-XK, 10-XL, 10-XM, 10-XN, 10-XO, 10-XP, 10-XQ, 10-XR, 10-XS, 10-XT, 10-XU, 10-XV, 10-XW, 10-XX, 10-XY, 10-XZ, 10-YA, 10-YB, 10-YC, 10-YD, 10-YE, 10-YF, 10-YG, 10-YH, 10-YI, 10-YJ, 10-YK, 10-YL, 10-YM, 10-YN, 10-YO, 10-YP, 10-YQ, 10-YR, 10-YS, 10-YT, 10-YU, 10-YV, 10-YW, 10-YX, 10-YZ, 10-ZA, 10-ZB, 10-ZC, 10-ZD, 10-ZE, 10-ZF, 10-ZG, 10-ZH, 10-ZI, 10-ZJ, 10-ZK, 10-ZL, 10-ZM, 10-ZN, 10-ZO, 10-ZP, 10-ZQ, 10-ZR, 10-ZS, 10-ZT, 10-ZU, 10-ZV, 10-ZW, 10-ZX, 10-ZY, 10-ZZ.

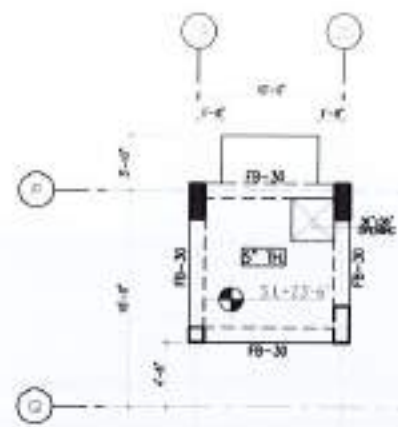
**ELECTRICAL CONSULTANT:**  
 K. P. S. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 4-BLOCK, GULSHAN E-5, KARACHI-75300

**PLUMBING CONSULTANT:**  
 M. A. H. KHAN  
 ARCHITECT  
 10-A, 10-B, 10-C, 10-D, 10-E, 10-F, 10-G, 10-H, 10-I, 10-J, 10-K, 10-L, 10-M, 10-N, 10-O, 10-P, 10-Q, 10-R, 10-S, 10-T, 10-U, 10-V, 10-W, 10-X, 10-Y, 10-Z, 10-AA, 10-AB, 10-AC, 10-AD, 10-AE, 10-AF, 10-AG, 10-AH, 10-AI, 10-AJ, 10-AK, 10-AL, 10-AM, 10-AN, 10-AO, 10-AP, 10-AQ, 10-AR, 10-AS, 10-AT, 10-AU, 10-AV, 10-AW, 10-AX, 10-AY, 10-AZ, 10-BA, 10-BB, 10-BC, 10-BD, 10-BE, 10-BF, 10-BG, 10-BH, 10-BI, 10-BJ, 10-BK, 10-BL, 10-BM, 10-BN, 10-BO, 10-BP, 10-BQ, 10-BR, 10-BS, 10-BT, 10-BU, 10-BV, 10-BW, 10-BX, 10-BY, 10-BZ, 10-CA, 10-CB, 10-CC, 10-CD, 10-CE, 10-CF, 10-CG, 10-CH, 10-CI, 10-CJ, 10-CK, 10-CL, 10-CM, 10-CN, 10-CO, 10-CP, 10-CQ, 10-CR, 10-CS, 10-CT, 10-CU, 10-CV, 10-CW, 10-CX, 10-CY, 10-CZ, 10-DA, 10-DB, 10-DC, 10-DD, 10-DE, 10-DF, 10-DG, 10-DH, 10-DI, 10-DJ, 10-DK, 10-DM, 10-DN, 10-DO, 10-DP, 10-DQ, 10-DR, 10-DS, 10-DT, 10-DU, 10-DV, 10-DW, 10-DX, 10-DY, 10-DZ, 10-EA, 10-EB, 10-EC, 10-ED, 10-EE, 10-EF, 10-EG, 10-EH, 10-EI, 10-EJ, 10-EK, 10-EL, 10-EM, 10-EN, 10-EO, 10-EP, 10-EQ, 10-ER, 10-ES, 10-ET, 10-EU, 10-EV, 10-EW, 10-EX, 10-EY, 10-EZ, 10-FA, 10-FB, 10-FC, 10-FD, 10-FE, 10-FF, 10-FG, 10-FH, 10-FI, 10-FJ, 10-FK, 10-FL, 10-FM, 10-FN, 10-FO, 10-FP, 10-FQ, 10-FR, 10-FS, 10-FT, 10-FU, 10-FV, 10-FW, 10-FX, 10-FY, 10-FZ, 10-GA, 10-GB, 10-GC, 10-GD, 10-GE, 10-GF, 10-GG, 10-GH, 10-GI, 10-GJ, 10-GK, 10-GL, 10-GM, 10-GN, 10-GO,

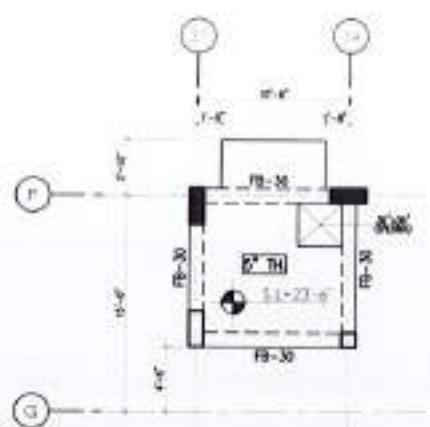




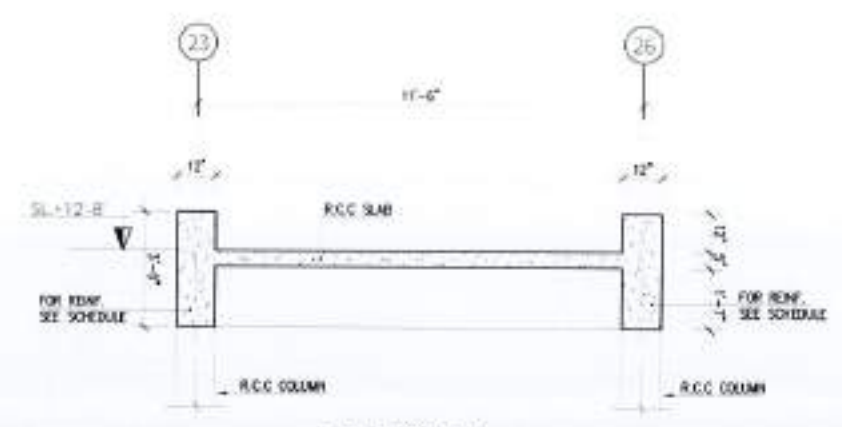
FIRST FLOOR HIGH LEV. FRAMING PLAN



FIRST FLOOR HIGH LEV. FRAMING PLAN



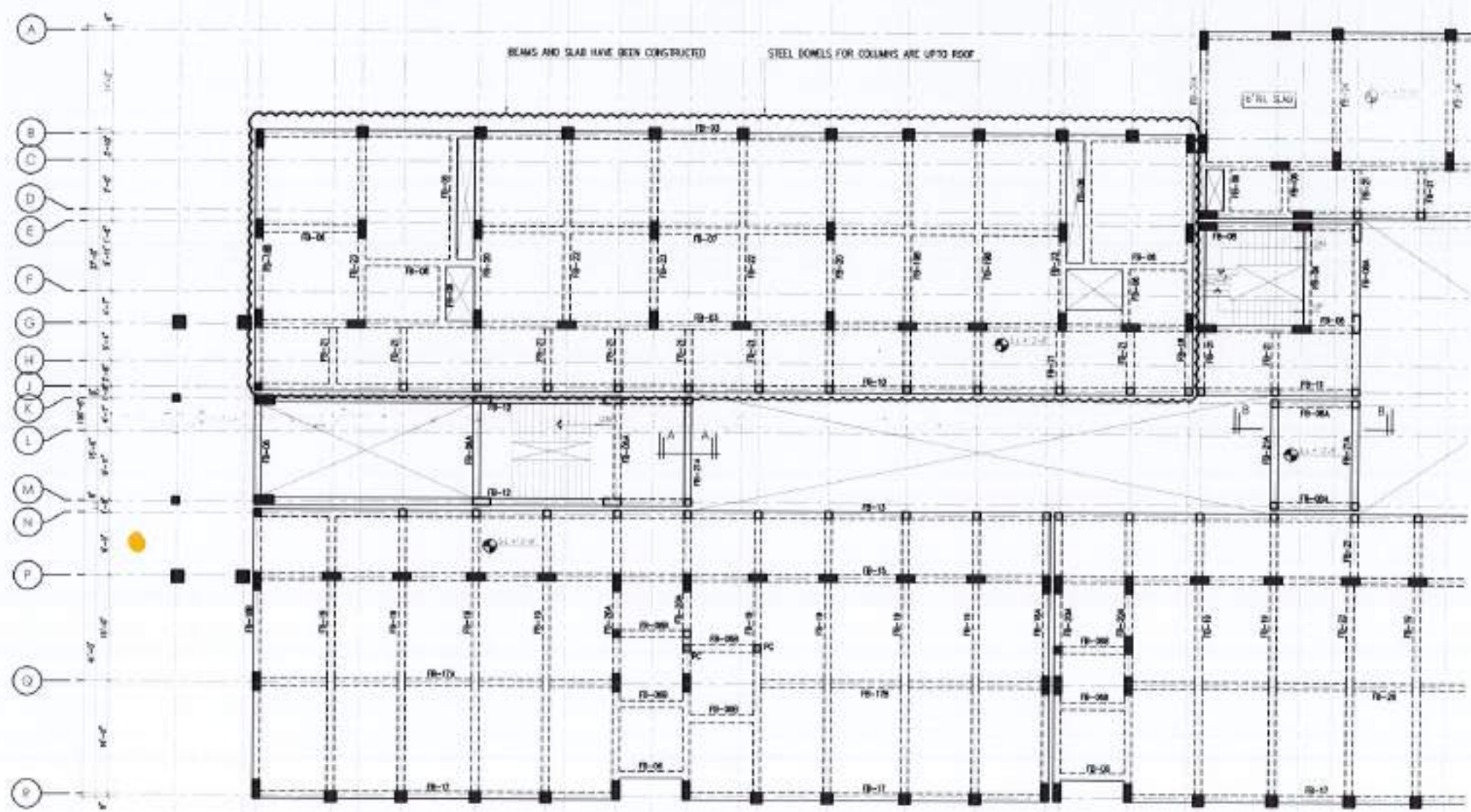
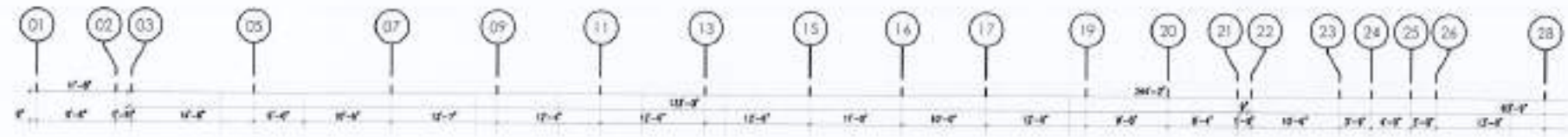
FIRST FLOOR HIGH LEV. FRAMING PLAN



SECTION B-B



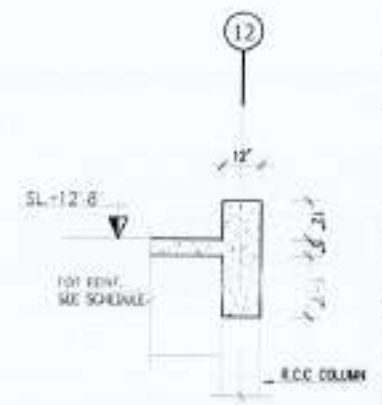
NO.	DATE	REVISION



FIRST FLOOR FRAMING PLAN @ S.L.+12'-8"

- NOTES:-
1. ALL STRUCTURAL SLABS ARE 5" THICK UNLESS NOTED OTHERWISE ON PLAN.
  2. REFER DWG. BM-01 & BM-02 FOR BEAM INFO.
  3. FOR LEVELS SEE ARCH. DRG. ALSO.
  4. REFER MC-01, MC-02 & MC-03 FOR STAIR DETAILS.

BEAMS & SLABS (CLOUDED PORTION)  
HAVE BEEN CONSTRUCTED



SECTION A-A

PROJECT  
COMPLETION OF LEFTOVER WORK  
OF CHOIAGALA CAMPUS  
UNIVERSITY OF FOONSHI  
RAWALPINDI.

CLIENT  
UNIVERSITY OF FOONSHI  
RAWALPINDI.

DATE  
APRIL 2024

SCALE  
AS SHOWN

THIS DRAWING SUPERSEDES  
ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT  
The Architects  
Architectural Services  
11-A, 11-B, 11-C, 11-D, 11-E, 11-F, 11-G, 11-H, 11-I, 11-J, 11-K, 11-L, 11-M, 11-N, 11-O, 11-P, 11-Q, 11-R, 11-S, 11-T, 11-U, 11-V, 11-W, 11-X, 11-Y, 11-Z, 11-AA, 11-AB, 11-AC, 11-AD, 11-AE, 11-AF, 11-AG, 11-AH, 11-AI, 11-AJ, 11-AL, 11-AM, 11-AN, 11-AO, 11-AP, 11-AQ, 11-AR, 11-AS, 11-AT, 11-AU, 11-AV, 11-AW, 11-AX, 11-AY, 11-AZ, 11-BA, 11-BB, 11-BC, 11-BD, 11-BE, 11-BF, 11-BG, 11-BH, 11-BI, 11-BJ, 11-BL, 11-BM, 11-BN, 11-BO, 11-BP, 11-BQ, 11-BS, 11-BT, 11-BU, 11-BV, 11-BW, 11-BX, 11-BY, 11-BZ, 11-CA, 11-CB, 11-CC, 11-CD, 11-CE, 11-CF, 11-CG, 11-CH, 11-CI, 11-CJ, 11-CL, 11-CM, 11-CN, 11-CO, 11-CP, 11-CQ, 11-CS, 11-CT, 11-CU, 11-CV, 11-CW, 11-CX, 11-CY, 11-CZ, 11-DA, 11-DB, 11-DC, 11-DD, 11-DE, 11-DF, 11-DG, 11-DH, 11-DI, 11-DJ, 11-DM, 11-DN, 11-DO, 11-DP, 11-DQ, 11-DS, 11-DT, 11-DU, 11-DV, 11-DW, 11-DX, 11-DY, 11-DZ, 11-EA, 11-EB, 11-EC, 11-ED, 11-EE, 11-EF, 11-EG, 11-EH, 11-EI, 11-EJ, 11-EL, 11-EM, 11-EN, 11-EO, 11-EP, 11-EQ, 11-ES, 11-ET, 11-EU, 11-EV, 11-EW, 11-EX, 11-EY, 11-EZ, 11-FA, 11-FB, 11-FC, 11-FD, 11-FE, 11-FF, 11-FG, 11-FH, 11-FI, 11-FJ, 11-FL, 11-FM, 11-FN, 11-FO, 11-FP, 11-FQ, 11-FS, 11-FT, 11-FU, 11-FV, 11-FW, 11-FX, 11-FY, 11-FZ, 11-GA, 11-GB, 11-GC, 11-GD, 11-GE, 11-GF, 11-GG, 11-GH, 11-GI, 11-GJ, 11-GL, 11-GM, 11-GN, 11-GO, 11-GP, 11-GQ, 11-GS, 11-GT, 11-GU, 11-GV, 11-GW, 11-GX, 11-GY, 11-GZ, 11-HA, 11-HB, 11-HC, 11-HD, 11-HE, 11-HF, 11-HG, 11-HH, 11-HI, 11-HJ, 11-HL, 11-HM, 11-HN, 11-HO, 11-HP, 11-HQ, 11-HS, 11-HT, 11-HU, 11-HV, 11-HW, 11-HX, 11-HY, 11-HZ, 11-IA, 11-IB, 11-IC, 11-ID, 11-IE, 11-IF, 11-IG, 11-IH, 11-II, 11-IJ, 11-IL, 11-IM, 11-IN, 11-IO, 11-IP, 11-IQ, 11-IS, 11-IT, 11-IU, 11-IV, 11-IW, 11-IX, 11-IY, 11-IZ, 11-JA, 11-JB, 11-JC, 11-JD, 11-JE, 11-JF, 11-JG, 11-JH, 11-JI, 11-JJ, 11-JL, 11-JM, 11-JN, 11-JO, 11-JP, 11-JQ, 11-JS, 11-JT, 11-JU, 11-JV, 11-JW, 11-JX, 11-JY, 11-JZ, 11-KA, 11-KB, 11-KC, 11-KD, 11-KE, 11-KF, 11-KG, 11-KH, 11-KI, 11-KJ, 11-KL, 11-KM, 11-KN, 11-KO, 11-KP, 11-KQ, 11-KS, 11-KT, 11-KU, 11-KV, 11-KW, 11-KX, 11-KY, 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11-XA, 11-XB, 11-XC, 11-XD, 11-XE, 11-XF, 11-XG, 11-XH, 11-XI, 11-XJ, 11-XL, 11-XM, 11-XN, 11-XO, 11-XP, 11-XQ, 11-XS, 11-XT, 11-XU, 11-XV, 11-XW, 11-XX, 11-XY, 11-XZ, 11-YA, 11-YB, 11-YC, 11-YD, 11-YE, 11-YF, 11-YG, 11-YH, 11-YI, 11-YJ, 11-YL, 11-YM, 11-YN, 11-YO, 11-YP, 11-YQ, 11-YS, 11-YT, 11-YU, 11-YV, 11-YW, 11-YX, 11-YZ, 11-ZA, 11-ZB, 11-ZC, 11-ZD, 11-ZE, 11-ZF, 11-ZG, 11-ZH, 11-ZI, 11-ZJ, 11-ZL, 11-ZM, 11-ZN, 11-ZO, 11-ZP, 11-ZQ, 11-ZS, 11-ZT, 11-ZU, 11-ZV, 11-ZW, 11-ZX, 11-ZY, 11-ZZ, 11-AA, 11-AB, 11-AC, 11-AD, 11-AE, 11-AF, 11-AG, 11-AH, 11-AI, 11-AJ, 11-AL, 11-AM, 11-AN, 11-AO, 11-AP, 11-AQ, 11-AS, 11-AT, 11-AU, 11-AV, 11-AW, 11-AX, 11-AY, 11-AZ, 11-BA, 11-BB, 11-BC, 11-BD, 11-BE, 11-BF, 11-BG, 11-BH, 11-BI, 11-BJ, 11-BL, 11-BM, 11-BN, 11-BO, 11-BP, 11-BQ, 11-BS, 11-BT, 11-BU, 11-BV, 11-BW, 11-BX, 11-BY, 11-BZ, 11-CA, 11-CB, 11-CC, 11-CD, 11-CE, 11-CF, 11-CG, 11-CH, 11-CI, 11-CJ, 11-CL, 11-CM, 11-CN, 11-CO, 11-CP, 11-CQ, 11-CS, 11-CT, 11-CU, 11-CV, 11-CW, 11-CX, 11-CY, 11-CZ, 11-DA, 11-DB, 11-DC, 11-DD, 11-DE, 11-DF, 11-DG, 11-DH, 11-DI, 11-DJ, 11-DM, 11-DN, 11-DO, 11-DP, 11-DQ, 11-DS, 11-DT, 11-DU, 11-DV, 11-DW, 11-DX, 11-DY, 11-DZ, 11-EA, 11-EB, 11-EC, 11-ED, 11-EE, 11-EF, 11-EG, 11-EH, 11-EI, 11-EJ, 11-EL, 11-EM, 11-EN, 11-EO, 11-EP, 11-EQ, 11-ES, 11-ET, 11-EU, 11-EV, 11-EW, 11-EX, 11-EY, 11-EZ, 11-FA, 11-FB, 11-FC, 11-FD, 11-FE, 11-FF, 11-FG, 11-FH, 11-FI, 11-FJ, 11-FL, 11-FM, 11-FN, 11-FO, 11-FP, 11-FQ, 11-FS, 11-FT, 11-FU, 11-FV, 11-FW, 11-FX, 11-FY, 11-FZ, 11-GA, 11-GB, 11-GC, 11-GD, 11-GE, 11-GF, 11-GG, 11-GH, 11-GI, 11-GJ, 11-GL, 11-GM, 11-GN, 11-GO, 11-GP, 11-GQ, 11-GS, 11-GT, 11-GU, 11-GV, 11-GW, 11-GX, 11-GY, 11-GZ, 11-HA, 11-HB, 11-HC, 11-HD, 11-HE, 11-HF, 11-HG, 11-HH, 11-HI, 11-HJ, 11-HL, 11-HM, 11-HN, 11-HO, 11-HP, 11-HQ, 11-HS, 11-HT, 11-HU, 11-HV, 11-HW, 11-HX, 11-HY, 11-HZ, 11-IA, 11-IB, 11-IC, 11-ID, 11-IE, 11-IF, 11-IG, 11-IH, 11-II, 11-IJ, 11-IL, 11-IM, 11-IN, 11-IO, 11-IP, 11-IQ, 11-IS, 11-IT, 11-IU, 11-IV, 11-IW, 11-IX, 11-IY, 11-IZ, 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11-PB, 11-PC, 11-PD, 11-PE, 11-PF, 11-PG, 11-PH, 11-PI, 11-PJ, 11-PL, 11-PM, 11-PN, 11-PO, 11-PP, 11-PQ, 11-PS, 11-PT, 11-PU, 11-PV, 11-PW, 11-PX, 11-PY, 11-PZ, 11-QA, 11-QB, 11-QC, 11-QD, 11-QE, 11-QF, 11-QG, 11-QH, 11-QI, 11-QJ, 11-QL, 11-QM, 11-QN, 11-QO, 11-QP, 11-QQ, 11-QS, 11-QT, 11-QU, 11-QV, 11-QW, 11-QX, 11-QY, 11-QZ, 11-RA, 11-RB, 11-RC, 11-RD, 11-RE, 11-RF, 11-RG, 11-RH, 11-RI, 11-RJ, 11-RL, 11-RM, 11-RN, 11-RO, 11-RP, 11-RQ, 11-RS, 11-RT, 11-RU, 11-RV, 11-RW, 11-RX, 11-RY, 11-RZ, 11-SA, 11-SB, 11-SC, 11-SD, 11-SE, 11-SF, 11-SG, 11-SH, 11-SI, 11-SJ, 11-SL, 11-SM, 11-SN, 11-SO, 11-SP, 11-SQ, 11-SS, 11-ST, 11-SU, 11-SV, 11-SW, 11-SX, 11-SY, 11-SZ, 11-TA, 11-TB, 11-TC, 11-TD, 11-TE, 11-TF, 11-TG, 11-TH, 11-TI, 11-TJ, 11-TL, 11-TM, 11-TN, 11-TO, 11-TP, 11-TQ, 11-TS, 11-TT, 11-TU, 11-TV, 11-TW, 11-TX, 11-TY, 11-TZ, 11-UA, 11-UB, 11-UC, 11-UD, 11-UE, 11-UF, 11-UG, 11-UH, 11-UI, 11-UJ, 11-UL, 11-UM, 11-UN, 11-UO, 11-UP, 11-UQ, 11-US, 11-UT, 11-UU, 11-UV, 11-UW, 11-UX, 11-UY, 11-UZ, 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502 A0-000

NESPAK (PVT.) LIMITED

VETERINARY & ANIMAL SCIENCE

FIRST FLOOR FRAMING PLAN

DATE	NO.	REV.

4753/323/3D/04G13





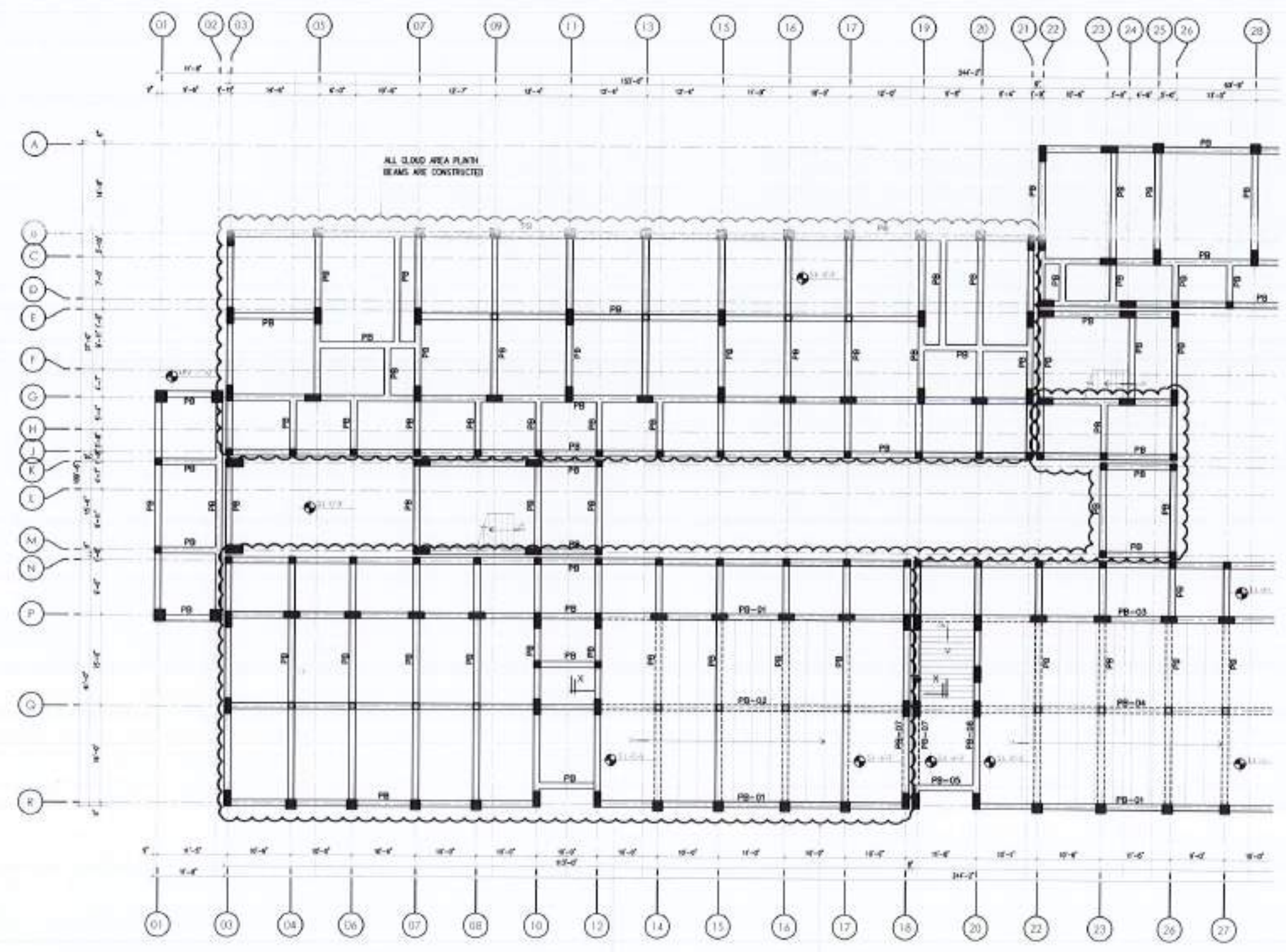












**PLINTH BEAM FRAMING PLAN @ S.L -0'-3" / -6'-3"**  
 NOTES:  
 1. REFER DWG. NO. PS-01 FOR PLINTH BEAMS AND SECTIONS INFORMATION DETAILS

PINTH BEAMS STD. PLAZO

REV	DATE	BY	CHKD

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 PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALAI CAMPUS  
 UNIVERSITY OF POKHARA  
 RAWALAKOT,  
 DISTRICT:  
 UNIVERSITY OF POKHARA  
 NORTH-1024

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

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VETERINARY & ANIMAL SCIENCE

PLINTH BEAM FRAMING PLAN

DATE: 10/01/2024  
 DRAWN BY: [Name]  
 CHECKED BY: [Name]  
 APPROVED BY: [Name]  
 SCALE: 1:100  
 SHEET NO: 4/12  
 TOTAL SHEETS: 12  
 PROJECT NO: 4753/323/8D/04G09





REV	DATE	BY	CHKD

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PROJECT:  
COMPLETION OF LEFTOVER WORK OF CHOTAGAJA CAMPUS UNIVERSITY OF PESHAWAR RAWALPINDI

CLIENT:  
UNIVERSITY OF PESHAWAR RAWALPINDI

SCALE:  
AS SHOWN

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT:  
The Architects  
1. Ghossein & Partners  
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4. Ghossein & Partners

STRUCTURAL CONSULTANT:  
**mushtaq and bilal**  
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104, 4000 BEAT 11, CHAND PHELA, ISLAMABAD  
TEL: 3581 4100-4101-4102-4103-4104-4105-4106  
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1. Ghossein & Partners  
2. Ghossein & Partners  
3. Ghossein & Partners  
4. Ghossein & Partners

502 A0-000

NESPAK (PVT.) LIMITED

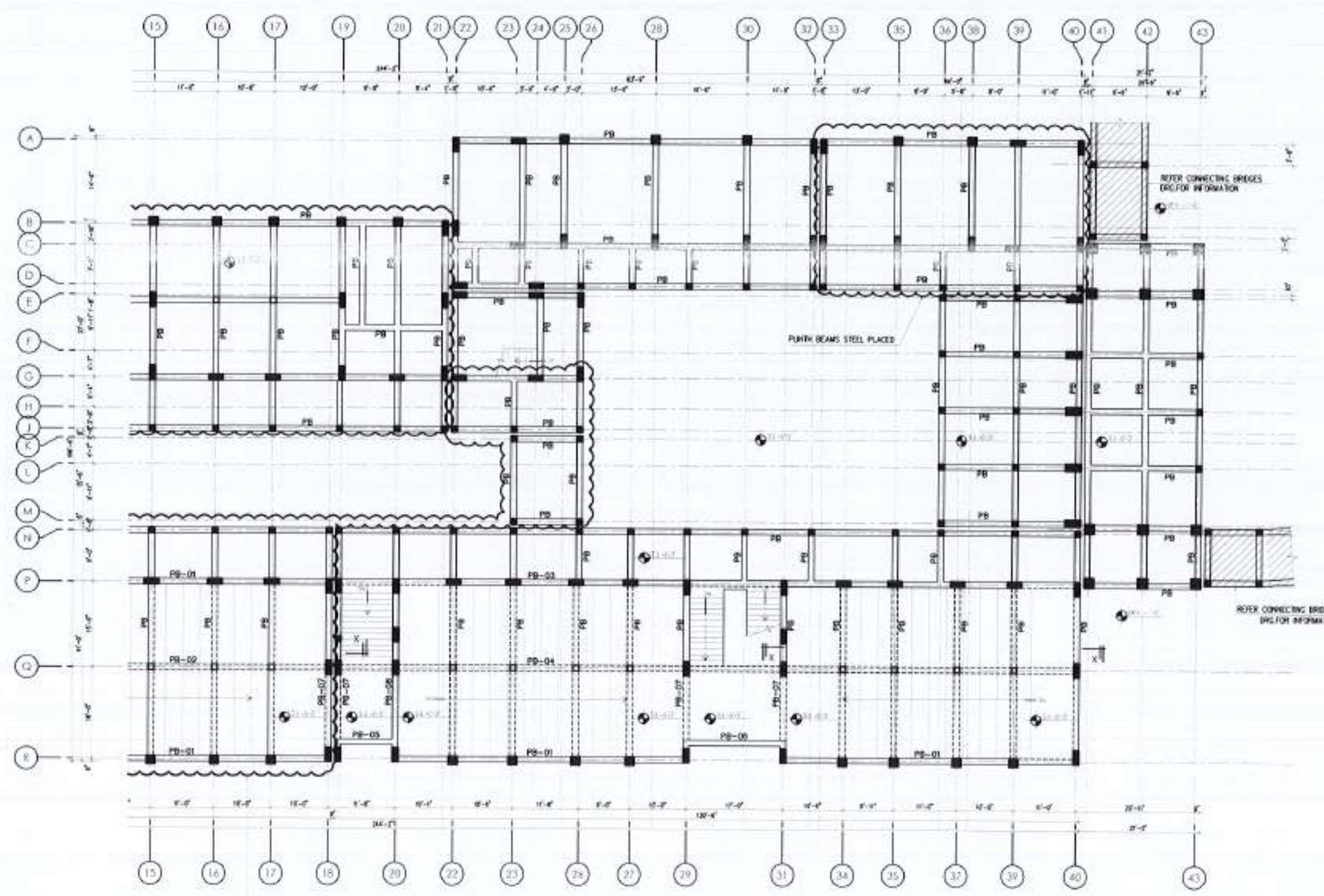
VETERINARY & ANIMAL SCIENCE

PLINTH BEAM FRAMING PLAN

DATE: 10/10/2023

DESIGNER: M. A. H. H.

4753/323/BD/04310

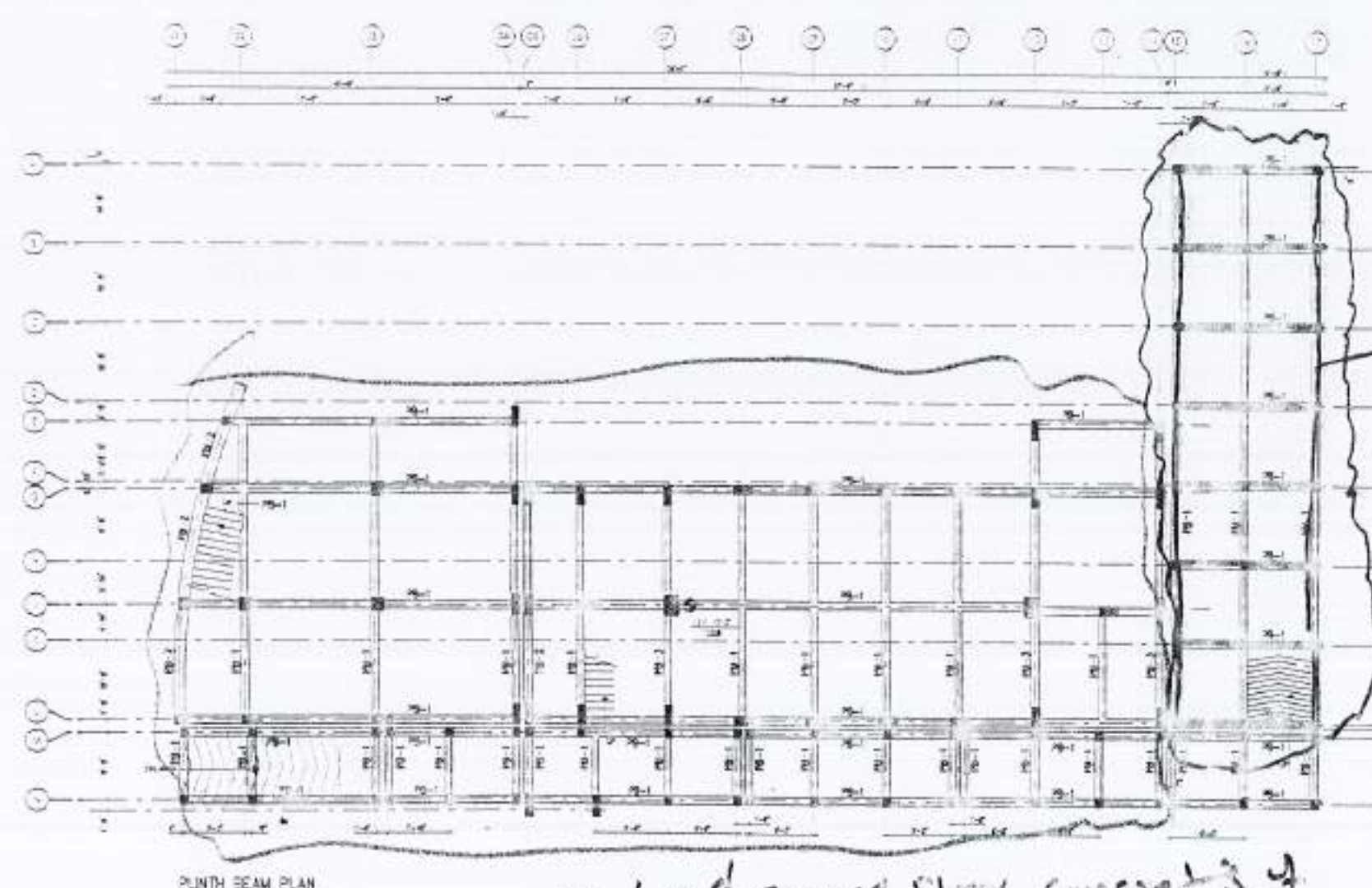
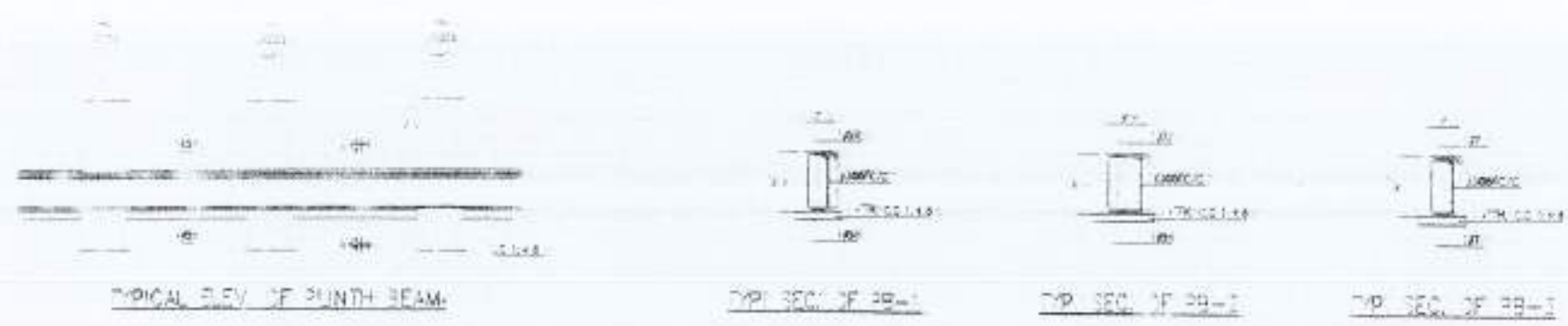


PLINTH BEAM FRAMING PLAN @ S.L -0'-3" / -6'-3"

NOTES:  
1. REFER DWG. NO. PS-01 FOR PLINTH BEAMS AND SECTIONS INFORMATION DETAIL.

PLINTH BEAMS ARE NOT YET CONSTRUCTED EXCEPT PLINTH BEAMS MENTIONED IN CLOUDED PORTION





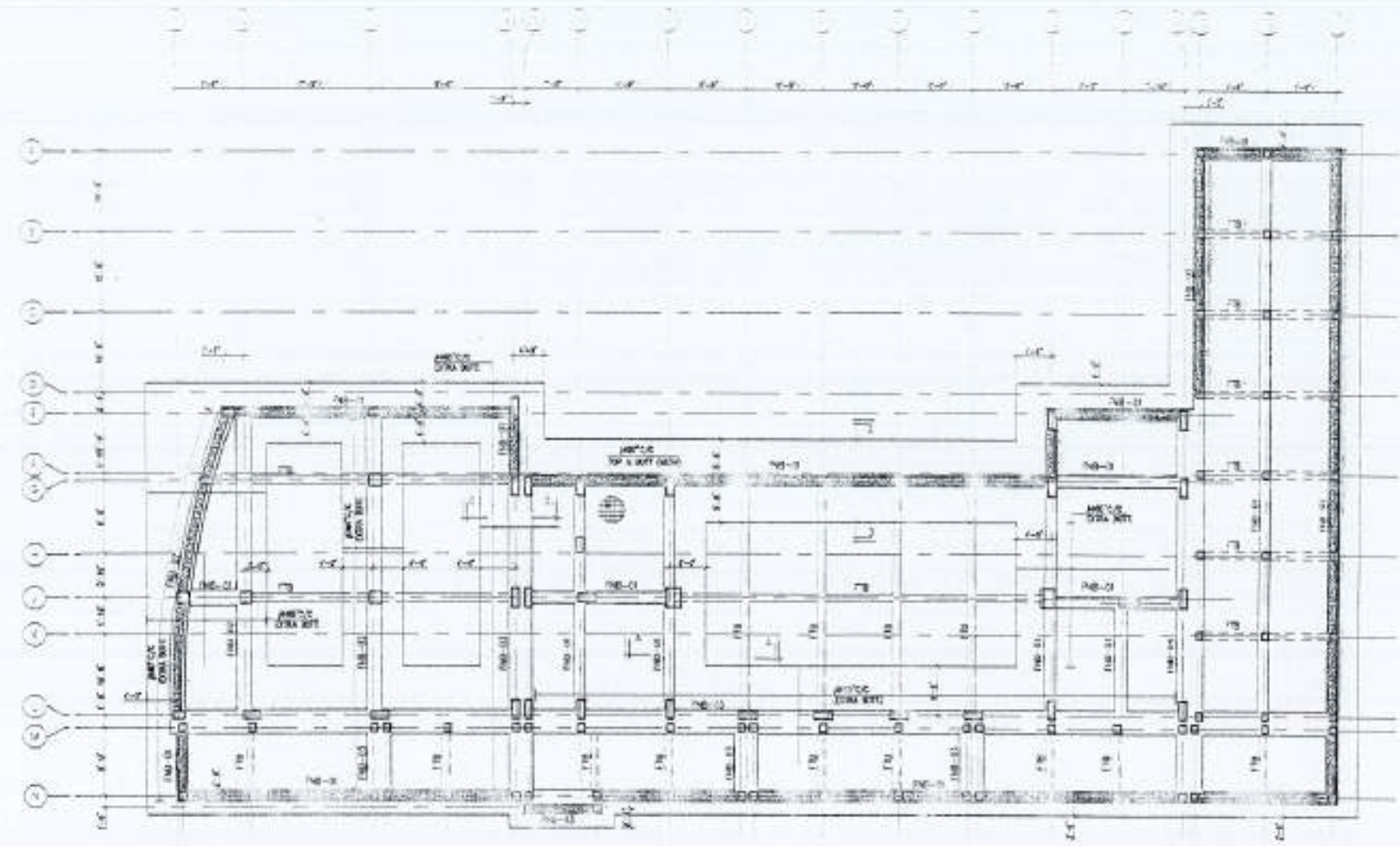
columns concrete  
Review  
Done up to  
2nd floor

Slab and ground floor concrete of  
column completed.



<p>THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS.</p> <p>ORIGINAL DESIGN CONSULTANT</p> <p>ARCHITECT: </p> <p>STRUCTURAL CONSULTANT: </p> <p>ELECTRICAL CONSULTANT: C.P.L. ASSOCIATES ELECTRICAL ENGINEERS</p> <p>MECHANICAL CONSULTANT: </p> <p>ENVIRONMENTAL &amp; MANAGEMENT CONSULTANT: </p> <p>DRAWING NO: 502 A0-000</p> <p>PROJECT: NESPAK (PVT.) LIMITED</p> <p>LOCATION: H-TECH LIBRARY AND GIRLS COMMON ROOM</p> <p>DRAWING TITLE: PUNTH BEAM PLAN</p> <p>DATE: 17/03/2010</p> <p>SCALE: 1/10</p> <p>DATE: 17/03/2010</p> <p>BY: 17/03/2010</p> <p>CHECKED: 17/03/2010</p> <p>APPROVED: 17/03/2010</p> <p>DATE: 17/03/2010</p> <p>BY: 17/03/2010</p> <p>CHECKED: 17/03/2010</p> <p>APPROVED: 17/03/2010</p>	
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**FOUNDATION PLAN**

NOTE:  
 \* ALL FOUNDATION BEAMS ARE FNB-01 UNLESS NOTED OTHERWISE.

ALL FOUNDATION HAVE ALREADY BEEN CONSTRUCTED.

REV	NO	DATE	DESCRIPTION

- THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWINGS AND SHOULD BE USED ONLY AS A REFERENCE. ANY CHANGES SHOULD BE INDICATED BY A REVISION TABLE.
- THE DESIGNER IS NOT RESPONSIBLE FOR THE CONSTRUCTION OF THE WORK.
- ALL DIMENSIONS ARE TO BE INDICATED AND CHECKED AS SHOWN.
- THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF PUNJAB RAWALAKOT.

CLIENT:  
 UNIVERSITY OF PUNJAB RAWALAKOT



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

**ORIGINAL DESIGN CONSULTANT**

ARCHITECT:  
 THE ARCHITECTS  
 ARCHITECTURAL DESIGNERS  
 14, HAFIZ JALALI ROAD, CHAKRAHAR  
 P.O. BOX 100, RAWALAKOT, PUNJAB, PAKISTAN

STRUCTURAL CONSULTANT:  
  
**mustaq and bilal**  
 consulting engineers  
 14, HAFIZ JALALI ROAD, CHAKRAHAR  
 P.O. BOX 100, RAWALAKOT, PUNJAB, PAKISTAN

ELECTRICAL CONSULTANT:  
 K.A. ASSOCIATES  
 ELECTRICAL ENGINEERS  
 14, HAFIZ JALALI ROAD, CHAKRAHAR  
 P.O. BOX 100, RAWALAKOT, PUNJAB, PAKISTAN

PLUMBING CONSULTANT:  
 THE ARCHITECTS  
 ARCHITECTURAL DESIGNERS  
 14, HAFIZ JALALI ROAD, CHAKRAHAR  
 P.O. BOX 100, RAWALAKOT, PUNJAB, PAKISTAN

ENVIRONMENTAL & MANAGEMENT CONSULTANTS:  
 THE ARCHITECTS  
 ARCHITECTURAL DESIGNERS  
 14, HAFIZ JALALI ROAD, CHAKRAHAR  
 P.O. BOX 100, RAWALAKOT, PUNJAB, PAKISTAN

SCALE: 1:100  
 DATE: 05/05/2024

502 A0-000

NESPAK (PVT.) LIMITED

HI-TECH LIBRARY AND GIRLS COMMON ROOM

FOUNDATION PLAN

DESIGNER:  
 MUSTAQ AND BILAL

APPROVED BY:  
 MUSTAQ AND BILAL

SCALE: 1:100  
 DATE: 05/05/2024  
 PWA/DESIGN/SP/4753/323/ED/DWG02





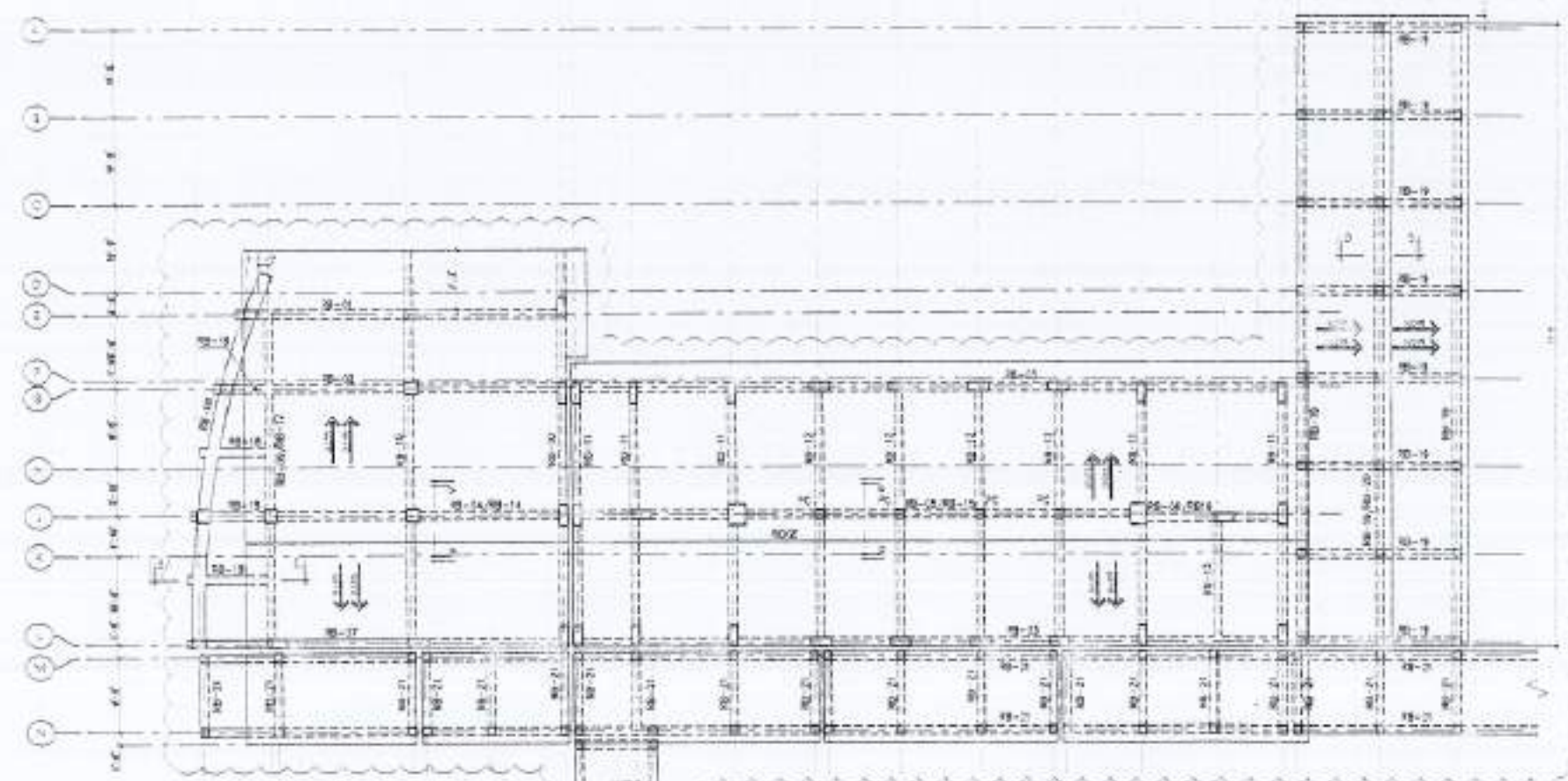
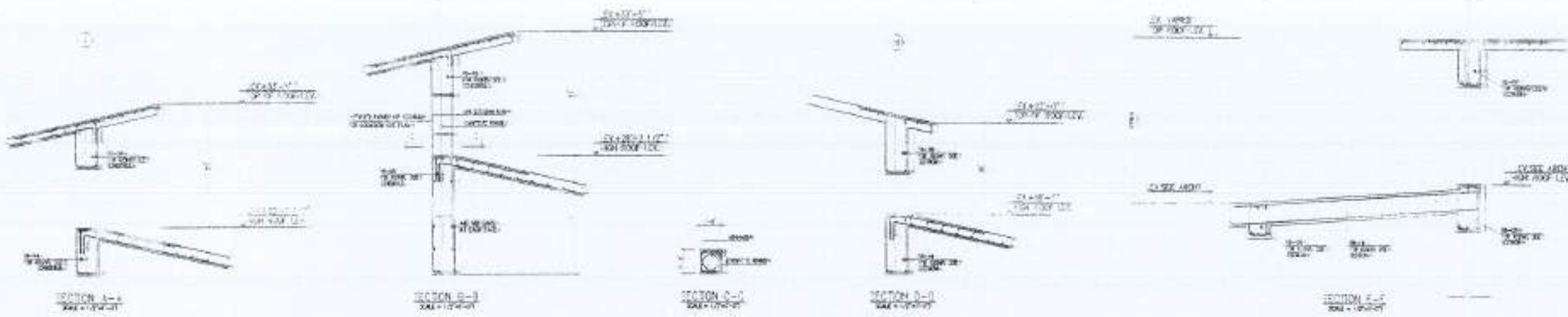




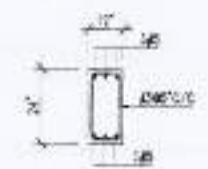
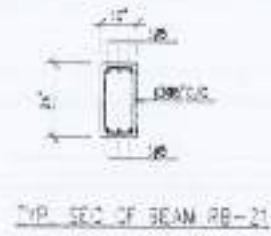








WORK TO BE DONE  
ALL COLUMNS, BEAMS  
& SLABS HAVE TO BE  
CONSTRUCTED.



PROJECT	COMPLETION OF LIFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY OF POKHARA RAJAWADI
CLIENT	UNIVERSITY OF POKHARA RAJAWADI
DATE	
SCALE	
DESIGNER	
CHECKER	
APPROVER	

THIS DRAWING SUPERSEDES  
ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

THE ARCHITECTS  
MUSTAFA AND BICAL  
CONSULTING ENGINEERS

STRUCTURAL CONSULTANTS  
**A3**  
mustafa and bical  
consulting engineers

GENERAL CONSULTANTS  
E. P. ASSOCIATES  
ELECTRICAL ENGINEERS

ENVIRONMENTAL & MANAGEMENT CONSULTANTS  
E. P. ASSOCIATES

502 A0-000

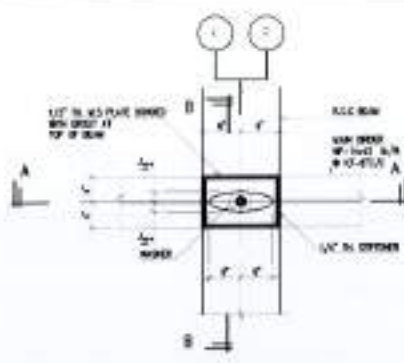
NESPAK (PVT.) LIMITED

H-TECH LIBRARY  
AND GIRLS COMMON ROOM

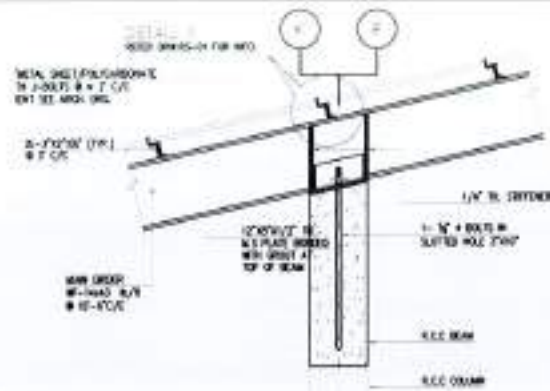
ROOF FLOOR FRAMING PLAN

DATE	18/04/2014
DESIGNER	
CHECKER	
APPROVER	
SCALE	1/4" = 1'-0"
PROJECT NO.	4755/323/BD/06G08

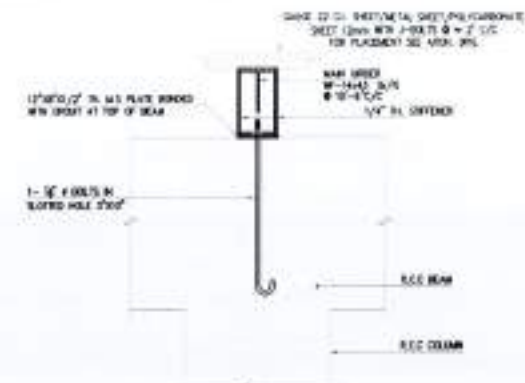




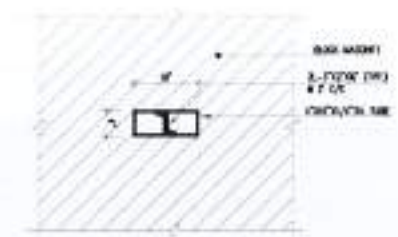
PLAN  
REF. CONF. DETAIL OF GIRDER



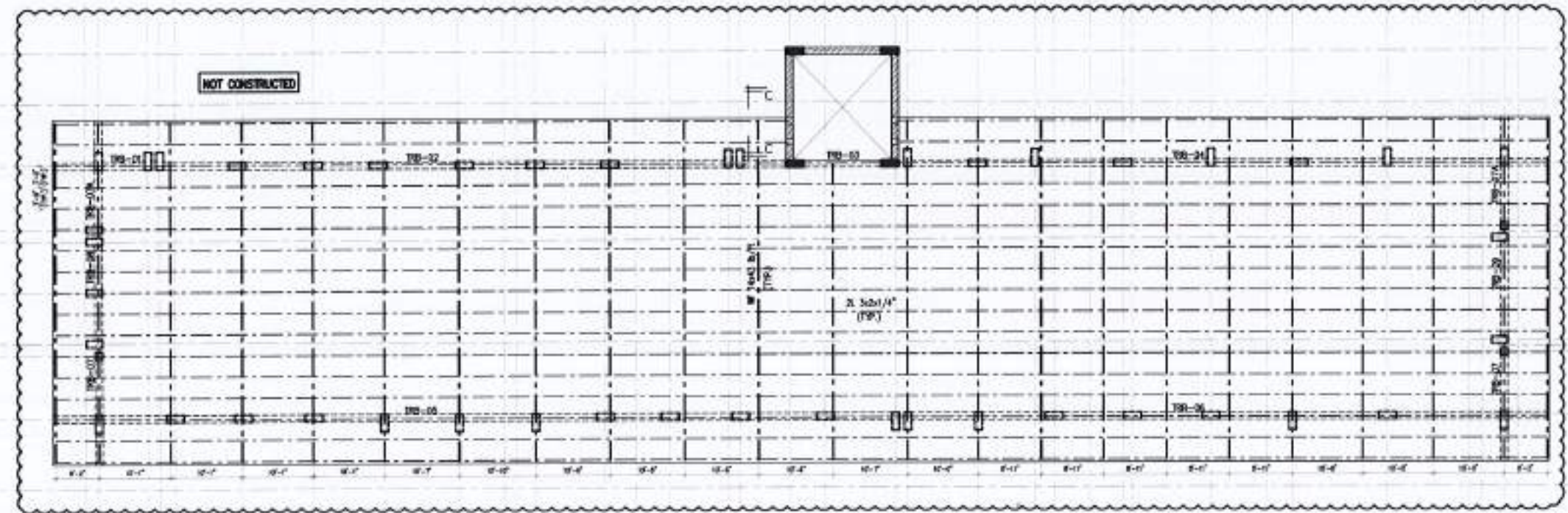
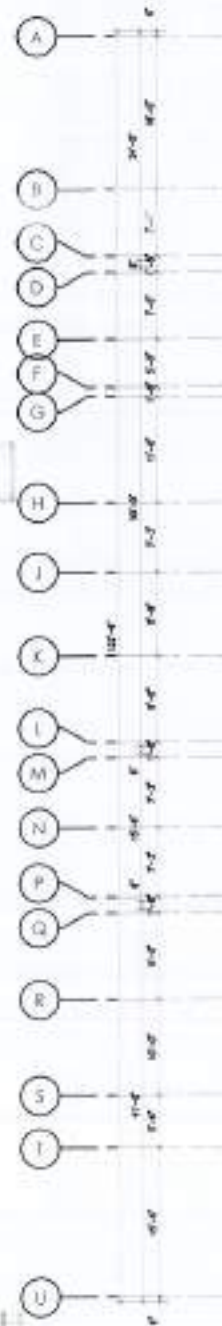
SECTION A-A



SECTION B-B



SECTION C-C



TOP ROOF FRAMING PLAN



NO.	DATE	BY	CHKD.

- 1. THE DRAWING IS TO BE USED IN CONJUNCTION WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
- 2. THE DRAWING IS TO BE USED IN CONJUNCTION WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
- 3. THE DRAWING IS TO BE USED IN CONJUNCTION WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
- 4. THE DRAWING IS TO BE USED IN CONJUNCTION WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.

PROJECT  
COMPLETION OF LEFTOVER WORK  
OF CHITAGALA CAMPUS  
UNIVERSITY OF POKHRAH  
RAWALPINDI

CLIENT  
UNIVERSITY OF POKHRAH RAWALPINDI

WORK NO.  
502 A0-000

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

ARCHITECT  
The Architects  
Mushtaq and Bilal  
Consulting Engineers

STRUCTURAL CONSULTANT  
C & S ASSOCIATES  
STRUCTURAL ENGINEERS

PLANNING CONSULTANT  
Z & Associates

ENVIRONMENTAL & MANAGEMENT CONSULTANT  
Z & Associates

502 A0-000

NESPAK (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

TOP ROOF FRAMING PLAN

DATE: 01/01/2011  
SCALE: 1/4" = 1'-0"  
DRAWN BY: [Name]  
CHECKED BY: [Name]  
DATE: 01/01/2011  
DRAWING NO: 4753/323/80/03G11





NO.	DATE	REVISION

NOTES:

1. THIS DRAWING IS TO BE USED ONLY FOR THE WORK SHOWN THEREIN. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES.
2. THE DRAWING IS TO BE USED ONLY FOR THE WORK SHOWN THEREIN. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES.
3. THE DRAWING IS TO BE USED ONLY FOR THE WORK SHOWN THEREIN. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES.
4. THE DRAWING IS TO BE USED ONLY FOR THE WORK SHOWN THEREIN. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES.

PROJECT:

COMPLETION OF LEFTOVER WORK OF CHOTAGALA CAMPUS UNIVERSITY CREATION RAWALAKOTI.

CLIENT:

UNIVERSITY OF PUNJAB RAWALAKOTI

SCALE:

THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

PROJECT:

The Architects  
Architectural Planning  
Interior Design  
Structural Engineering  
Mechanical Engineering  
Electrical Engineering  
Civil Engineering

STRUCTURAL CONSULTING

**mushtaq and bilal**  
consulting engineers

100-1000 (1000) SHARAFABAD, KARACHI-75200  
100-1000 (1000) SHARAFABAD, KARACHI-75200  
100-1000 (1000) SHARAFABAD, KARACHI-75200

PROJECT CONSULTANTS

**K.P.A. ASSOCIATES**  
ELECTRICAL ENGINEERS

100-1000 (1000) SHARAFABAD, KARACHI-75200  
100-1000 (1000) SHARAFABAD, KARACHI-75200

DESIGNED BY:

ENVIRONMENTAL & RECONSTRUCTION ENGINEERS  
100-1000 (1000) SHARAFABAD, KARACHI-75200  
100-1000 (1000) SHARAFABAD, KARACHI-75200

502 A0-000

**NESPAK (PVT.) LIMITED**

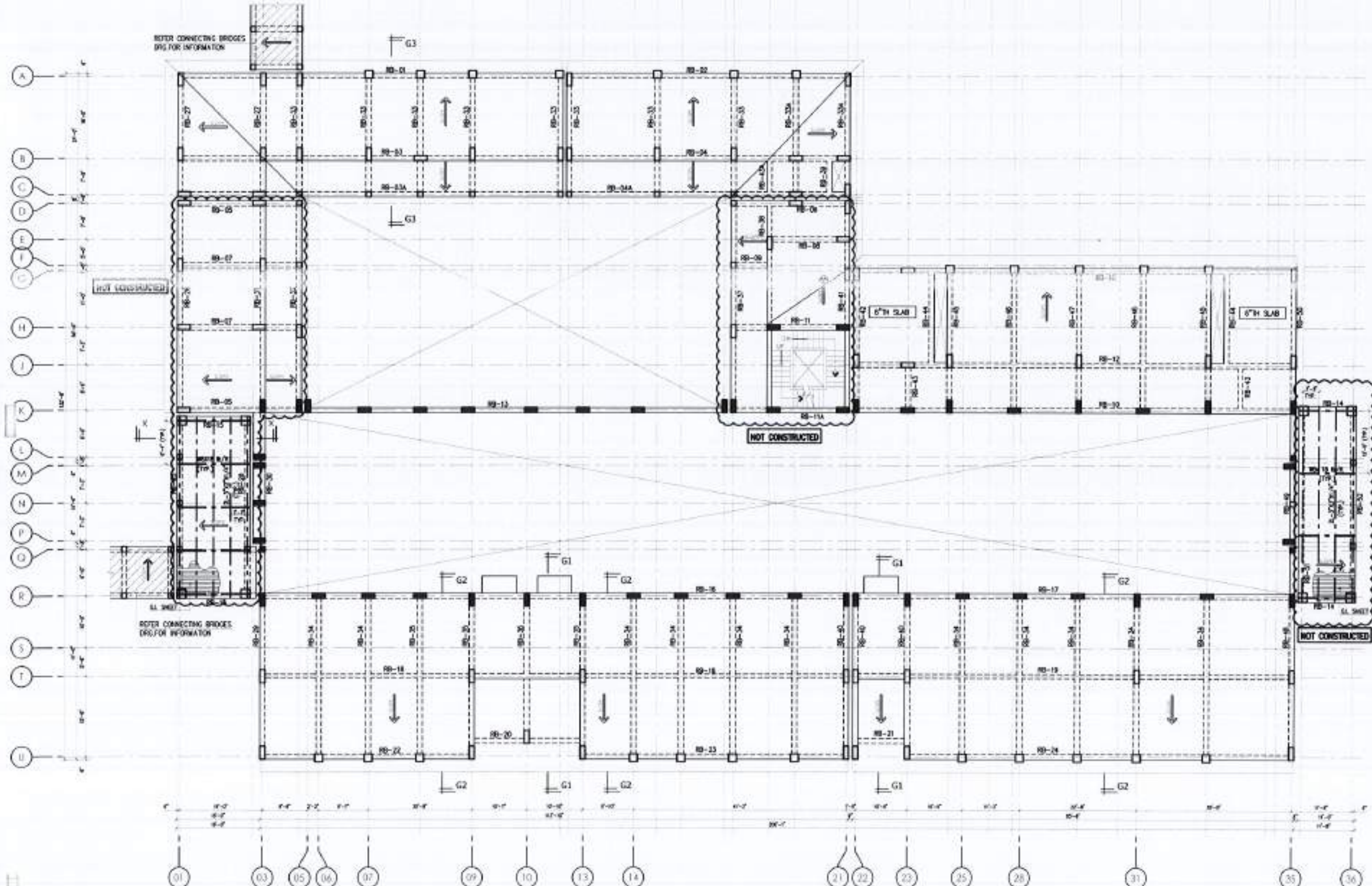
DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

DATE: 10/10/2018

4753/323/8D/03G10



**ROOF FRAMING PLAN**

**NOTES:-**

1. ALL STRUCTURAL SLABS ARE 5" THICK UNLESS NOTED OTHERWISE ON PLAN.
2. REFER DWG. BM-03 & BM-04 FOR BEAM INFO.
3. REFER DWG. RS-01 FOR SECTION X-X, G1-G1, G2-G2 AND G3-G3.
4. REFER ARCHL DWG FOR SLOPES AND LEVELS.

ROOF SLAB HAS ALREADY BEEN CONSTRUCTED, EXCEPT NOTED IN CLOUDED AREA





NO.	DATE	REVISION

- NOTE:
- 1. THIS DRAWING IS THE PROPERTY OF NESPAC. NO PART OF THIS DRAWING MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT THE WRITTEN PERMISSION OF NESPAC (PVT.) LIMITED.
  - 2. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION WITHOUT THE WRITTEN PERMISSION OF NESPAC (PVT.) LIMITED.
  - 3. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
  - 4. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.

PROJECT:  
 COMPLETION OF LEFTOVER WORK OF CHITAGALA CAMPUS UNIVERSITY OF AGRICULTURE RAWALPINDI

CLIENT:  
 UNIVERSITY OF AGRICULTURE RAWALPINDI



THIS DRAWING SUPERSEDES ALL PREVIOUS DRAWING.

ORIGINAL DESIGN CONSULTANT

PROJECT:  
 The Architects  
 NESPAC (PVT.) LIMITED  
 4753/323/80/03G03

PREPARED BY:  
  
**mushtaq and bilal**  
 consulting engineers  
 DR. MOHAMMAD SHARAFUZZAMAN, MANAGER  
 110-112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000

ENGINEERING CONSULTANT:  
  
**mushtaq and bilal**  
 consulting engineers  
 DR. MOHAMMAD SHARAFUZZAMAN, MANAGER  
 110-112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000

PROJECT NO.:  
 502 / A0-000

DESIGNED BY:  
 NESPAC (PVT.) LIMITED

DEPARTMENT OF AGRICULTURE  
 AGRONOMY & SOIL SCIENCES

PROJECT NO.:  
 COLUMN LAYOUT PLAN

DATE:  
 10/10/2024

SCALE:  
 1:100

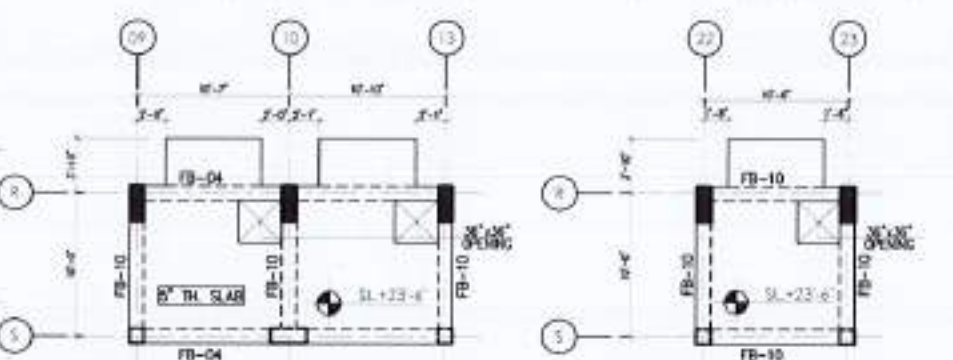
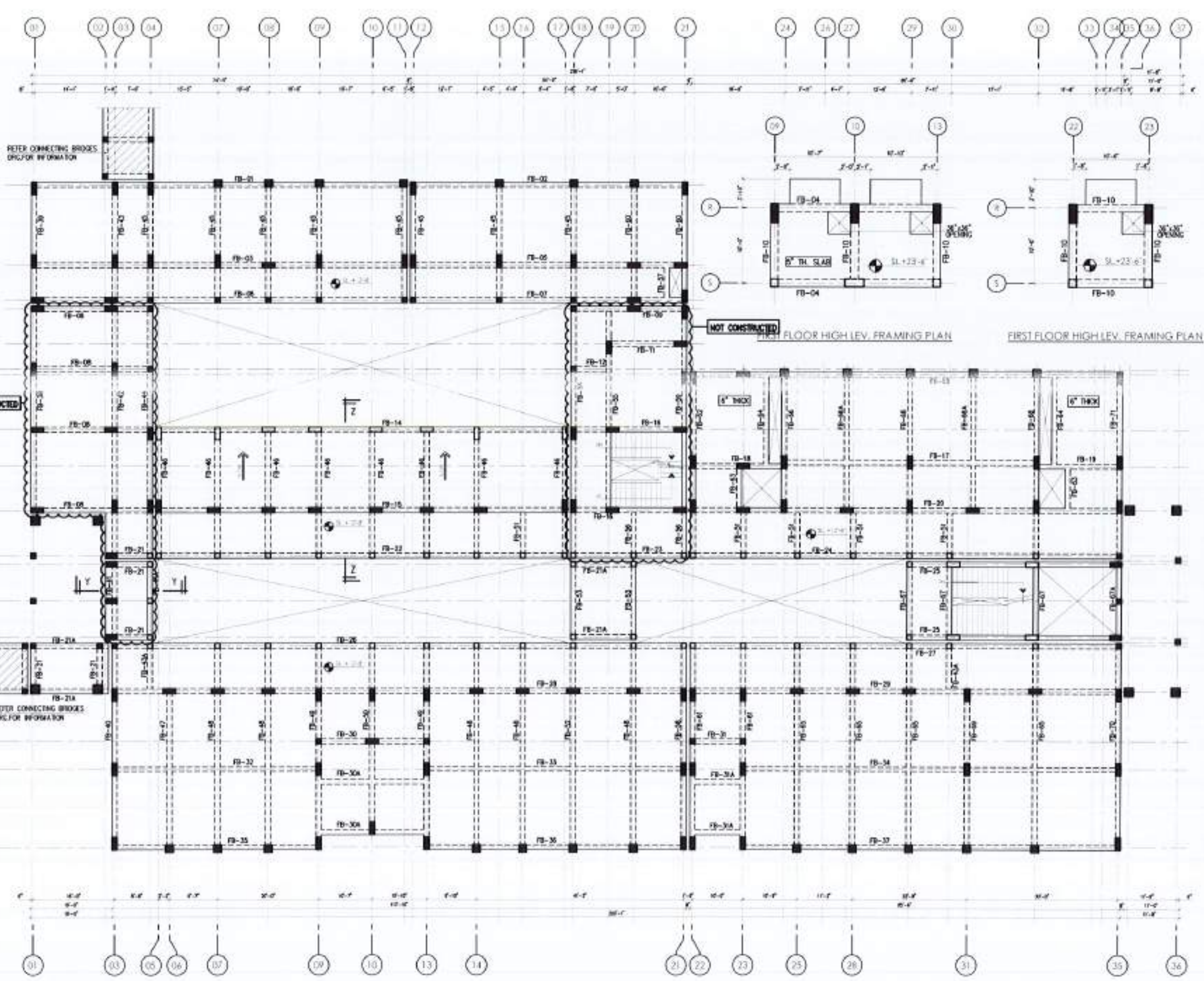
PROJECT NO.:  
 4753/323/80/03G03

**COLUMN LAYOUT PLAN**

- NOTES:  
 1. ALL COLUMNS ARE CENTERED ON GRID INTERSECTION UNLESS NOTED ON PLAN.  
 2. REFER DWG. CO-02 FOR COLUMN DETAILS.

ALL COLUMNS HAVE ALREADY BEEN CONSTRUCTED, EXCEPT NOTED IN CLOUDED AREA





REFER CONNECTING BRIDGES  
ENC FOR INFORMATION

NOT CONSTRUCTED

NOT CONSTRUCTED

REFER CONNECTING BRIDGES  
ENC FOR INFORMATION

- FIRST FLOOR FRAMING PLAN**
- NOTES-**
1. ALL STRUCTURAL SLABS ARE 5" THICK UNLESS NOTED OTHERWISE ON PLAN.
  2. REFER DWG. BM-01 & BM-02 FOR BEAM INFO.
  3. REFER DWG.RS-01 FOR SECTION Y-Y & Z-Z.
  4. REFER ARCH'L DRAWING FOR SLOPES AND LEVELS.

GROUND FLOOR SLAB HAS ALREADY BEEN CONSTRUCTED.  
EXCEPT NOTED IN CLOUDED AREA

REV	DATE	BY	CHKD

- NOTES**
1. THIS DRAWING IS A PART OF THE PROJECT AND SHALL BE USED ONLY FOR THE PROJECT FOR WHICH IT IS ISSUED.
  2. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT.
  3. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
  4. ANY DISCREPANCY BETWEEN THIS DRAWING AND THE ARCHITECT'S DRAWING SHALL BE THE RESPONSIBILITY OF THE ARCHITECT.

COMPLETION OF LEFTOVER WORK  
OF CHITRADALA CAMPUS  
UNIVERSITY OF FOONCHI  
RAWALPURI

C-104  
UNIVERSITY OF FOONCHI RAWALPURI

SCALE: 1/8" = 1'-0"

THIS DRAWING SUPERSEDES  
ALL PREVIOUS DRAWING.

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THE ARCHITECTS  
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502 A0-000

**NESPAK (PVT.) LIMITED**

DEPARTMENT OF AGRICULTURE  
AGRONOMY & SOIL SCIENCES

PROJECT TITLE  
FIRST FLOOR REIN. PLAN

DESIGNER  
CHECKER  
DATE

SCALE: 1/8" = 1'-0"

PROJECT NO.  
4753/323/8D/03G08