

2.

**II. Auditorium:**

- Since we are not going to be air-conditioning the Auditorium, we planned for Ventilation system.
- Three stage ambiator has located above the green room area. Fresh air for the auditorium is supplied through the ambiator which the machine can able to reduce the temperature of the fresh air based on the heat exchanger & ambient condition. The ambiator working principle is explained in the given tender document issued by us.
- Duct from the ambiator is running through the truss area will be connected to the supply air plenum. Plenum will have multiple sets of Jet Nozzles facing toward auditorium for the air distribution. Three levels of nozzles has planned for the proper distribution.
- HVLS fan is planned to locate in the center of Auditorium. HVLS standa for High Volume Low Speed fan. It will help to spread the air which is coming from the ambiator.
- In addition to that, it is planned to provide the slab cooling to have radiant cooling for the Auditorium area.
- Please note that Slab cooling system is not included in the floated tender.

Thanks & regards,

R. V i g n e s h  
HVAC Design Engineer.

Air Treatment Engineering Pvt. Ltd.,  
#L-6,2nd West Street,  
Kamaraj Nagar, Thiruvanmiyur,  
Chennai - 600 041, India.  
Ph: +91-44-2441 2536/2445 4891  
Fax: +91-44-2445 4306  
Mob: +91 9445051793

**Design Notes on the HVAC system submitted by the Consulting Architect and his associates**

FW: Kalakshtra Project  
from Ravi Nilakantan <card@vsnl.com>  
to Works kalakshetra <works@kalakshetra.in>

Date Fri, Oct 1, 2010 at 4:35 PM  
Subject: Kalakshtra Project

Sri. Srinivasan,  
Find note on AC for koothambalam.  
Drgs. are attached with the tender.  
Ravi nil

From: VIGNESH [mailto:vignesh@airtreatment.in]  
Sent: Friday, October 01, 2010 3:55 PM  
To: card@vsnl.com  
Cc: 'Ramesh'  
Subject: RE: Kalakshtra Project

Dear Sir,

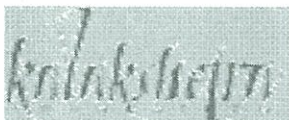
With reference to the telephonic conversation had with you today, Design Notes on the HVAC system as follows.

**I. Green Rooms & Stage Area:**

- Green room and stage considered as Air-conditioning system.
- Chiller system has been planned. Air cooled chilling machine considered.
- Floor wise Ceiling suspended Air handling unit has provided for Green room. Since false ceiling is not going to be provided, circular duct has planned to run along the green room which shall be exposed.
- Stage area will have floor mounted noise controlled AHU which has been located above the green room area. The cooled and dehumidified air will be passes through the duct and let the air out to the stage by means of grilles.

...2

2



Works kalakshetra <works@kalakshetra.in>

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## Koothambalam- HVAC - reg

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Works kalakshetra <works@kalakshetra.in>

Tue, Sep 28, 2010 at 3:12 PM

To: ravi <card@vsnl.com>

Sir,

The Works Committee requested to provide the following papers and details for further processing.

Scope of the HVAC work  
Details of the machineries proposed and functioning  
Detailed layout of the proposal  
other relevent drawings

Kindly arrange to the submitt the above at the earliest

Warm regards

V.Srinivasan

---

Aluminum Grilles Diffusers/ Linear Grilles / Jet Nozzles	Dynacraft, Ravistar, Air Master , Cosmic
Volume Control Damper	Dynacraft, Ravistar, Air Master
Collar Dampers	Dynacraft, Ravistar, Air Master
Fire Damper	Dynacraft, Ravistar, Air Master
Damper Actuators	Belimo / Johnson Controls, Siemens
Silencers	Ruskin, Ravistar
<u>Insulation</u>	
Fiber glass	UP Twiga, Kimmco, Owens coming
Electrometric Nitrile Rubber - Class 'O' as per BS 476 Part 6 & 7	Armacell, Vidoflex, K-flex
Expanded Polystyrene Sections	Beardsell, Lloyd's,
PUF Panels	Venus
HVLS Fan.	Big an, Green hock -

(4)

**LIST OF APPROVED MAKES**

ITEM	APPROVED MAKES
Chiller	BlueStar, Carrier, Trane , York, Clivet, Dunham Bush.
End suction Back pull out pumps	Grundfoss, ITT Bell & Gosset, Armstrong
Lopex Air Ambiator	Toro GreenTech India
Air Handling Units	Blue Star, ETA, Zeco, Caryaire, Edgetech
Ventilation Fans	Kruger, Air-o-vent, Nadi , Nicotra
BTU Meters	Honeywell, Johnson Controls, Siemens , Sauter
VFD	Vaccon , Danfoss
<b>Piping and Fittings</b>	
<b>M.S./G.I.PIPES:</b>	
Up to 150mm diameter	BST, GST, TATA, Jindal.
200mm diameter & above	BST, GST, Jindal, HSL, TATA.
Butterfly valve	Audco, Advance , Inter valve, Danfoss
Motorized Butterfly valve	Belimo, Audco, Danfoss
Balancing valve	TA Hydronics, Danfoss, Advance
Non-return valve	Audco, Advance, Inter valve
'Y' Strainer	Emerald, Sant, Trishul, DS Engineering
Two-way motorized valve (Including Modulating motor)	Honeywell, Johnson Controls, Siemens, Danfoss, Belimo, Sauter
Thermostat	Honeywell, Johnson Controls, Siemens
Water Flow Switch	Honeywell, Johnson Control, Sauter. Anergy
Temp/ Pressure Gauge	Fiebieg, H Guru Taylor,
Air Purge	Anergy
Ball Valves	Zoloto, Audco, Kim, Leader
Air Separator	Anergy, Grundfos
Vibration Isolators/Flexible Connectors	Resistoflex, Dunlop, Cori
<b>Ducting and Accessories</b>	
GI Sheets	TATA/HSL/SAIL/Jindal

Last Modified: 18<sup>th</sup> Aug 2010

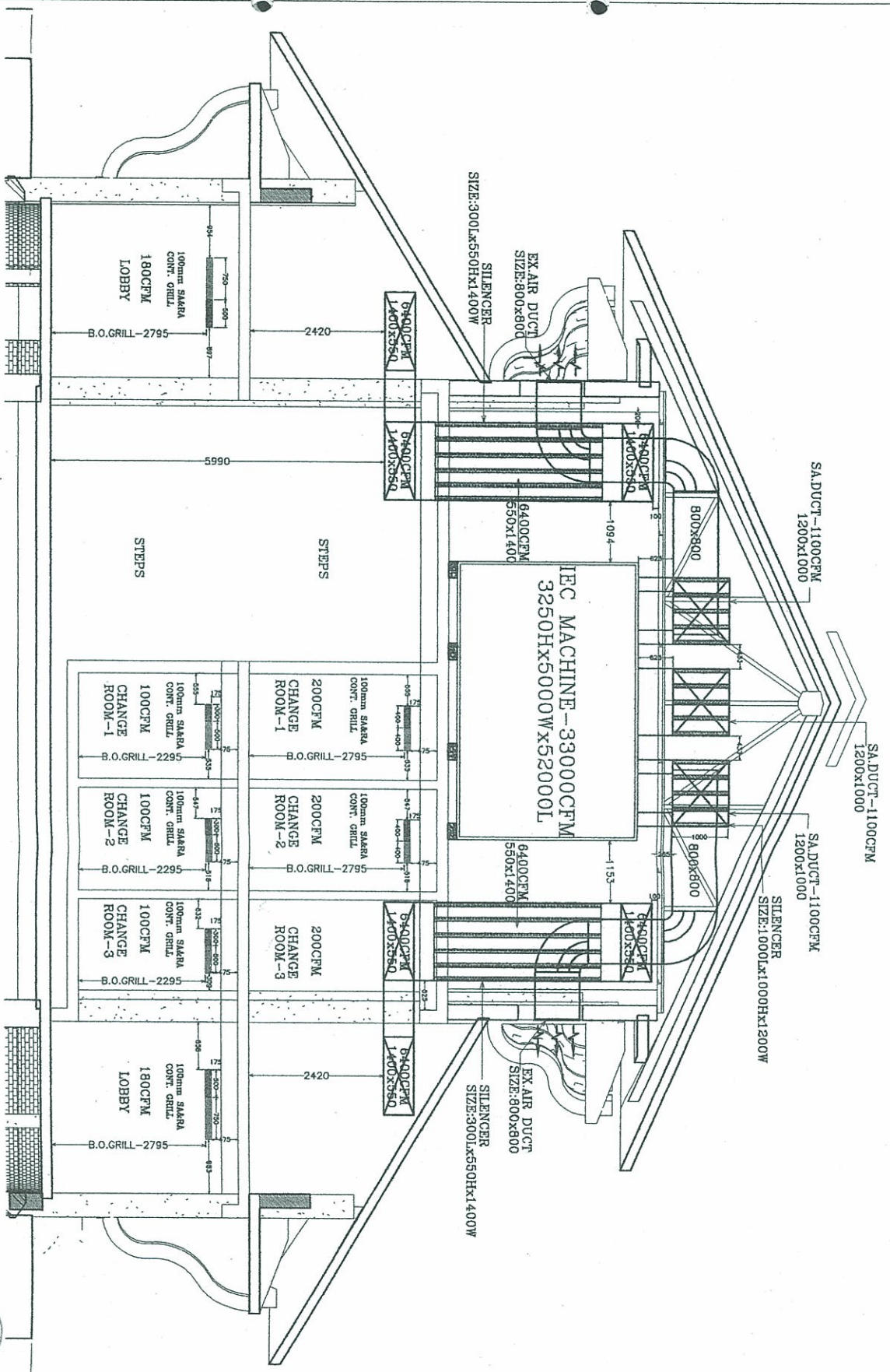
Ver.: R0

Architect: M/S., Centre for Architect Reasearch  
& Design Architecture - Interior -Landscape  
HVAC Consultant: M/s. Air Treatment Engg. Pvt.

5







SECTION C-C

HVAC LEGEND	
01	AIRCOCOLATED SCROLL CHILLER
02	PRIMARY PUMP
03	DX CSU
04	SUPPLY DIFFUSER
05	RETURN DIFFUSER
06	DAMPER
07	SILENCER
08	JET NOZZLES
09	SUPPLY DUCT
10	RETURN DUCT
11	EXHAUST DUCT
12	SUPPLY AIR GRILLE
13	RETURN AIR GRILLE
14	EXHAUST GRILLE
15	THERMAL INSULATION
16	CMS PIPE
17	CMR PIPE
18	PRE INSULATIONS
19	DRAIN PIPE
20	AIR TIGHT PARTITION
21	VOLUME CONTROL DAMPER

**OWNER**  
Kajaksheeta

**PROJECT**  
Kajaksheeta

**TITLE**  
SECTIONAL LAYOUT (SECTION C-C)

**SCALE**  
1:175

**DATE**  
18.08.10

**NO. OF SHEETS**  
5

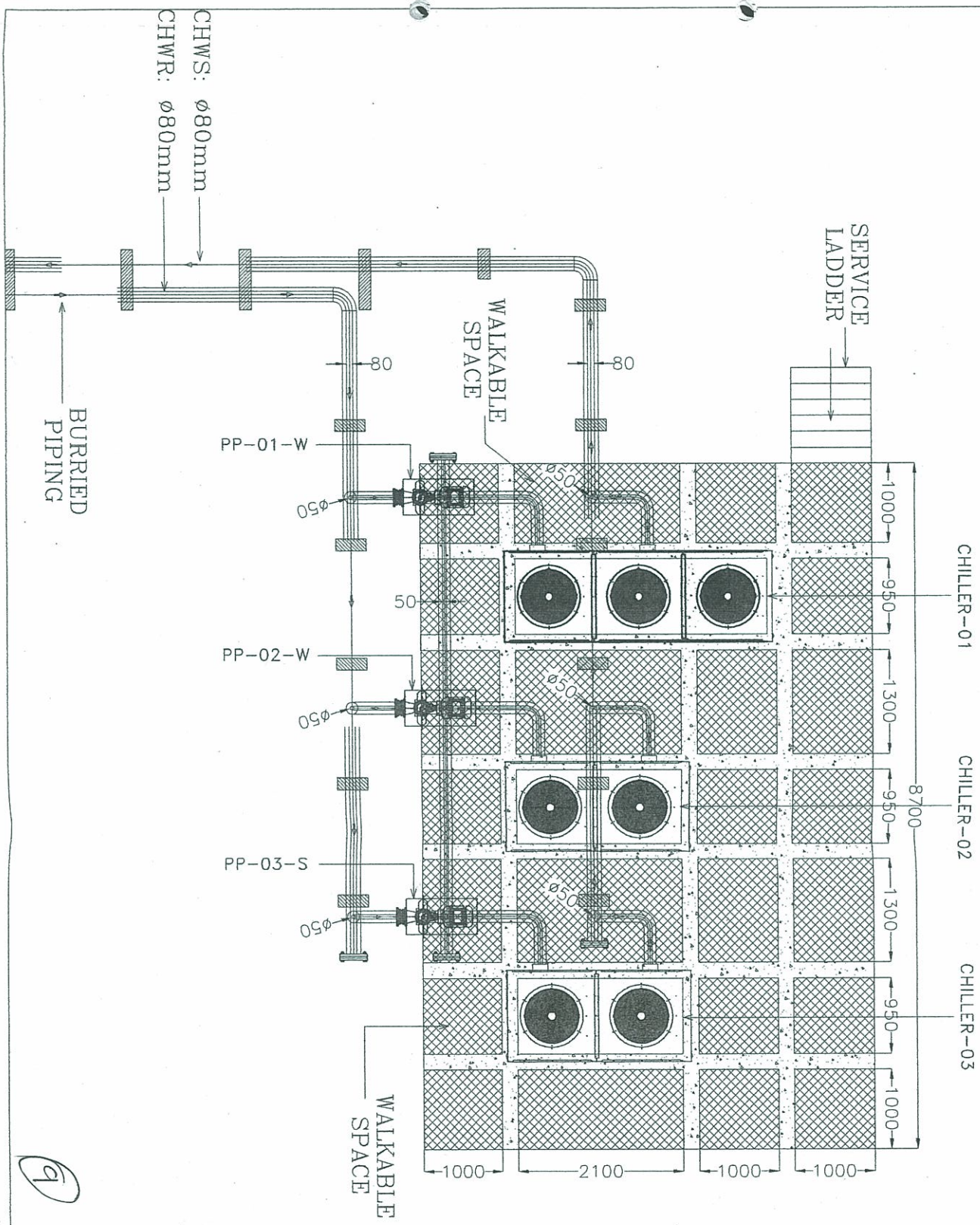
**ARCHITECT**  
Centre for Architectural Research & Design  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 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

R. Vignesh



PROPOSED CHILLER PLANT LOCATION, ARCHITECT TO CONFIRM THE LOCATIONS.

AIR COOLED CHILLER TO BE ELEVATED 2500MM FROM THE FLOOR LEVEL.



HVAC LEGEND	
01	AIR-COOLED SCROLL CHILLER
02	PRIMARY PUMP
03	DX CSU
04	SUPPLY DIFFUSER
06	RETURN DIFFUSER
06	DAMPER
07	SILENCER
08	FET NOZZLES
09	SUPPLY DUCT
10	RETURN DUCT
11	EXHAUST DUCT
12	SUPPLY AIR GRILLE
13	RETURN AIR GRILLE
14	EXHAUST GRILLE
15	THERMAL INSULATION
16	CMS PIPE
17	CMR PIPE
18	PIPE INSULATIONS
19	DRAIN PIPE
20	AIR TIGHT PARTITION
21	VOLUME CONTROL DAMPER

**Project**  
**Kalaśhetra**  
**Kalaśhetra**

**OWNER**  
 PLANT ROOM LAYOUT

**TITLE**  
 PLANT ROOM LAYOUT

**DATE**  
 14.11.17

**SCALE**  
 1:100

**PROJECT NO.**  
 18.03.10

**CLIENT**  
 KALAŚHETRA

**DESIGNER**  
 R. Vignesh



R. Vignesh

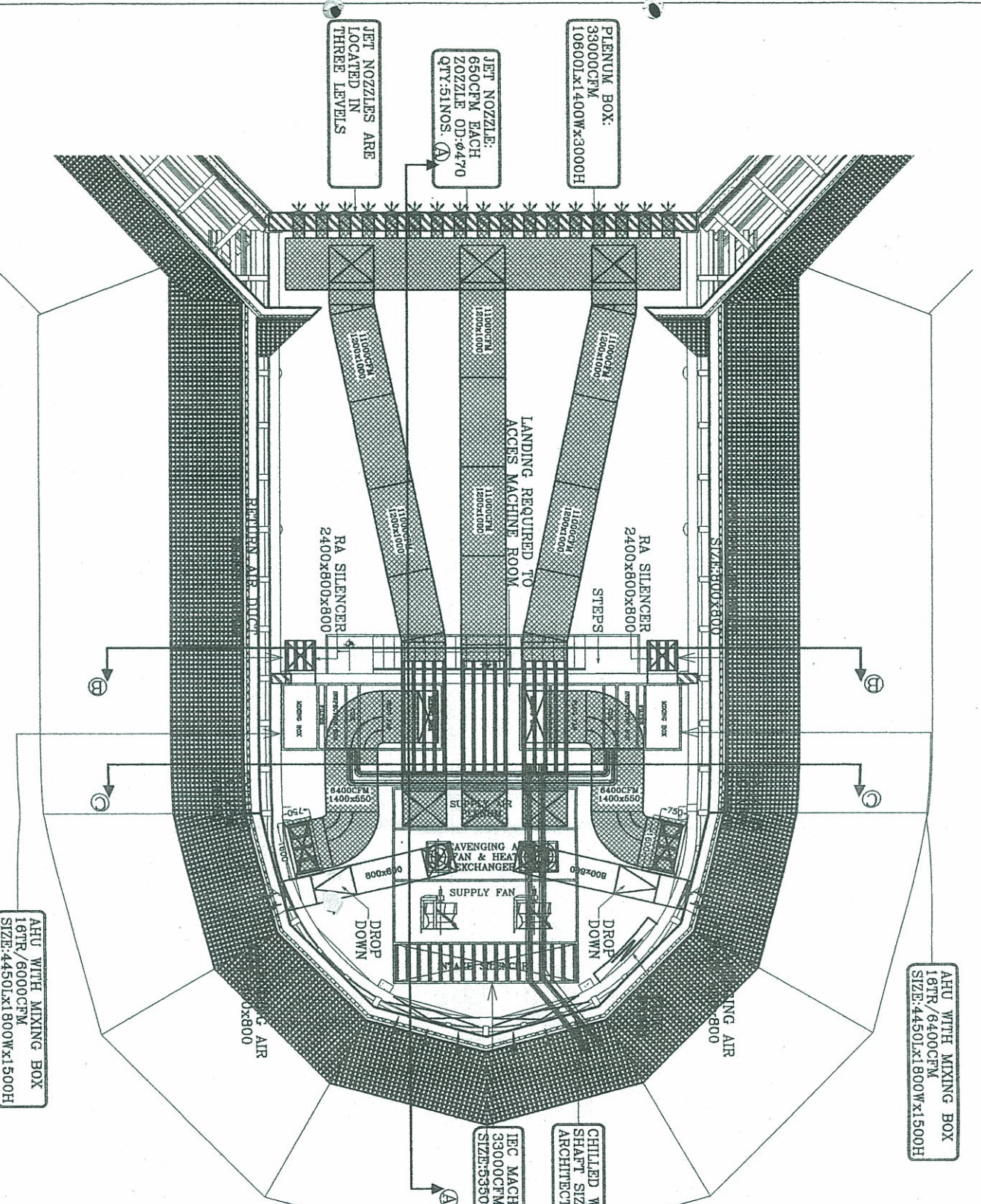
**Centre for Architectural Research & Design**  
 14, 2nd Floor, T. Nagar, Chennai, India  
 Phone: +91 44 2634 1175  
 Email: info@carad.com

**APPROVALS**

DESIGNER:  APPROVED

CLIENT:  APPROVED

CONSTRUCTION:  APPROVED



AHU WITH MIXING BOX  
18TR/6400CFM  
SIZE:4450Lx1800Wx1500H

AHU WITH MIXING BOX  
16TR/6000CFM  
SIZE:4450Lx1800Wx1500H

CHILLED WATER PIPE  
SHAFT SIZE: 900x500  
ARCHITECT TO CONFIRM

IEC MACHINE  
33000CFM  
SIZE:5350Lx5000Wx3250H

JET NOZZLES ARE  
LOCATED IN  
THREE LEVELS

JET NOZZLE:  
650CFM EACH  
NOZZLE OD:φ470  
QTY:51NOS. (A)

PLENUM BOX:  
33000CFM  
10800Lx1400Wx3000H

10

*Ravi R. V. Vepuri*  
AIR TREATMENT ENGINEERING PVT. LTD.  
CHERNAI

HVAC LEGEND

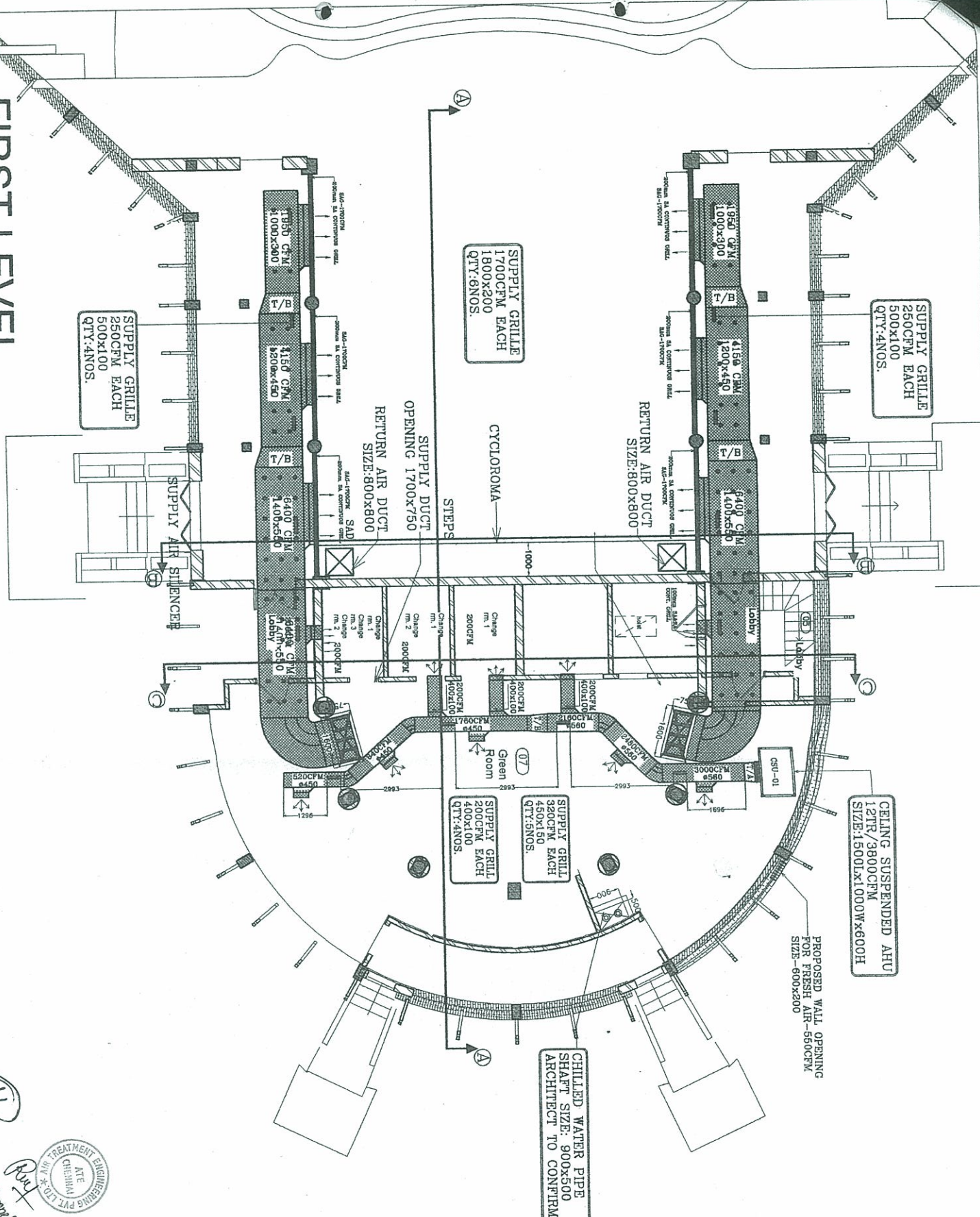
01	AIRCOOLED SCROLL CHILLER	
02	PRIMARY PUMP	
03	DK CSU	
04	SUPPLY DIFFUSER	
05	RETURN DIFFUSER	
06	DAMPER	
07	SILENCER	
08	JET NOZZLES	
09	SUPPLY DUCT	
10	RETURN DUCT	
11	EXHAUST DUCT	
12	SUPPLY AIR GRILLE	
13	RETURN AIR GRILLE	
14	EXHAUST GRILLE	
15	THERMAL INSULATION	
16	CMS PIPE	
17	CWR PIPE	
18	PIPE INSULATIONS	
19	DRAIN PIPE	
20	AIR TIGHT PARTITION	
21	VOLUME CONTROL DAMPER	

SI	16810	REVISION/DATE	ISSUE	DATE
NO	1	ISSUED		
REV	DATE	REVISION/DATE	ISSUE	DATE
NO	DATE	REVISION/DATE	ISSUE	DATE

TITLE	SECOND LEVEL HVAC LAYOUTS
SCALE	1:175
DATE	18.08.10
NO	3

PROJECT: **Kajalashetra**  
OWNER: **Kajalashetra**  
ARCHITECT: **Centre for Architectural Research & Design**  
AIR TREATMENT ENGINEERING PVT. LTD.  
AIR TREATMENT ENGINEERING PVT. LTD.  
AIR TREATMENT ENGINEERING PVT. LTD.

# FIRST LEVEL



CEILING SUSPENDED AHU  
12TR/3800CFM  
SIZE: 1500Lx1000Wx600H

PROPOSED WALL OPENING  
FOR FRESH AIR-550CFM  
SIZE-600x200

CHILLED WATER PIPE  
SHAFT SIZE: 900x500  
ARCHITECT TO CONFIRM

SUPPLY GRILLE  
1700CFM EACH  
1800x200  
QTY:6 NOS.

SUPPLY GRILLE  
250CFM EACH  
500x100  
QTY:4 NOS.

SUPPLY GRILLE  
250CFM EACH  
500x100  
QTY:4 NOS.

STEPS

SUPPLY DUCT  
OPENING 1700x750  
RETURN AIR DUCT  
SIZE: 800x800

RETURN AIR DUCT  
SIZE: 800x800

CYCLOROMA

STEPS

SUPPLY GRILLE  
200CFM EACH  
400x100  
QTY:4 NOS.

SUPPLY GRILLE  
320CFM EACH  
450x150  
QTY:5 NOS.

### HVAC LEGEND

01	AIRCOOLED SCROLL CHILLER	
02	PRIMARY PUMP	
03	DX CSU	
04	SUPPLY DIFFUSER	
05	RETURN DIFFUSER	
06	DAMPER	
07	SILENCER	
08	JET NOZZLES	
09	SUPPLY DUCT	
10	RETURN DUCT	
11	EXHAUST DUCT	
12	SUPPLY AIR GRILLE	
13	RETURN AIR GRILLE	
14	EXHAUST GRILLE	
15	THERMAL INSULATION	
16	CNS PIPE	
17	CWA PIPE	
18	PIPE INSULATIONS	
19	DRAIN PIPE	
20	AIR TIGHT PARTITION	
21	VOLUME CONTROL DAMPER	

CLIENT: **kalakshetra**  
PROJECT: **kalakshetra**  
OWNER: **kalakshetra**

TITLE: **FIRST LEVEL HVAC LAYOUTS (PART PLAN)**  
DATE: **11.17.10**  
SCALE: **R1**  
DRAWN: **NONESH**  
CHECKED: **NONESH**  
DATE: **19.08.10**  
SHEET NO: **2**

ARCHITECT: **Centre for Architectural Research & Design**  
ADDRESS: **11/11, 11/12, 11/13, 11/14, 11/15, 11/16, 11/17, 11/18, 11/19, 11/20, 11/21, 11/22, 11/23, 11/24, 11/25, 11/26, 11/27, 11/28, 11/29, 11/30, 11/31, 11/32, 11/33, 11/34, 11/35, 11/36, 11/37, 11/38, 11/39, 11/40, 11/41, 11/42, 11/43, 11/44, 11/45, 11/46, 11/47, 11/48, 11/49, 11/50, 11/51, 11/52, 11/53, 11/54, 11/55, 11/56, 11/57, 11/58, 11/59, 11/60, 11/61, 11/62, 11/63, 11/64, 11/65, 11/66, 11/67, 11/68, 11/69, 11/70, 11/71, 11/72, 11/73, 11/74, 11/75, 11/76, 11/77, 11/78, 11/79, 11/80, 11/81, 11/82, 11/83, 11/84, 11/85, 11/86, 11/87, 11/88, 11/89, 11/90, 11/91, 11/92, 11/93, 11/94, 11/95, 11/96, 11/97, 11/98, 11/99, 11/100**

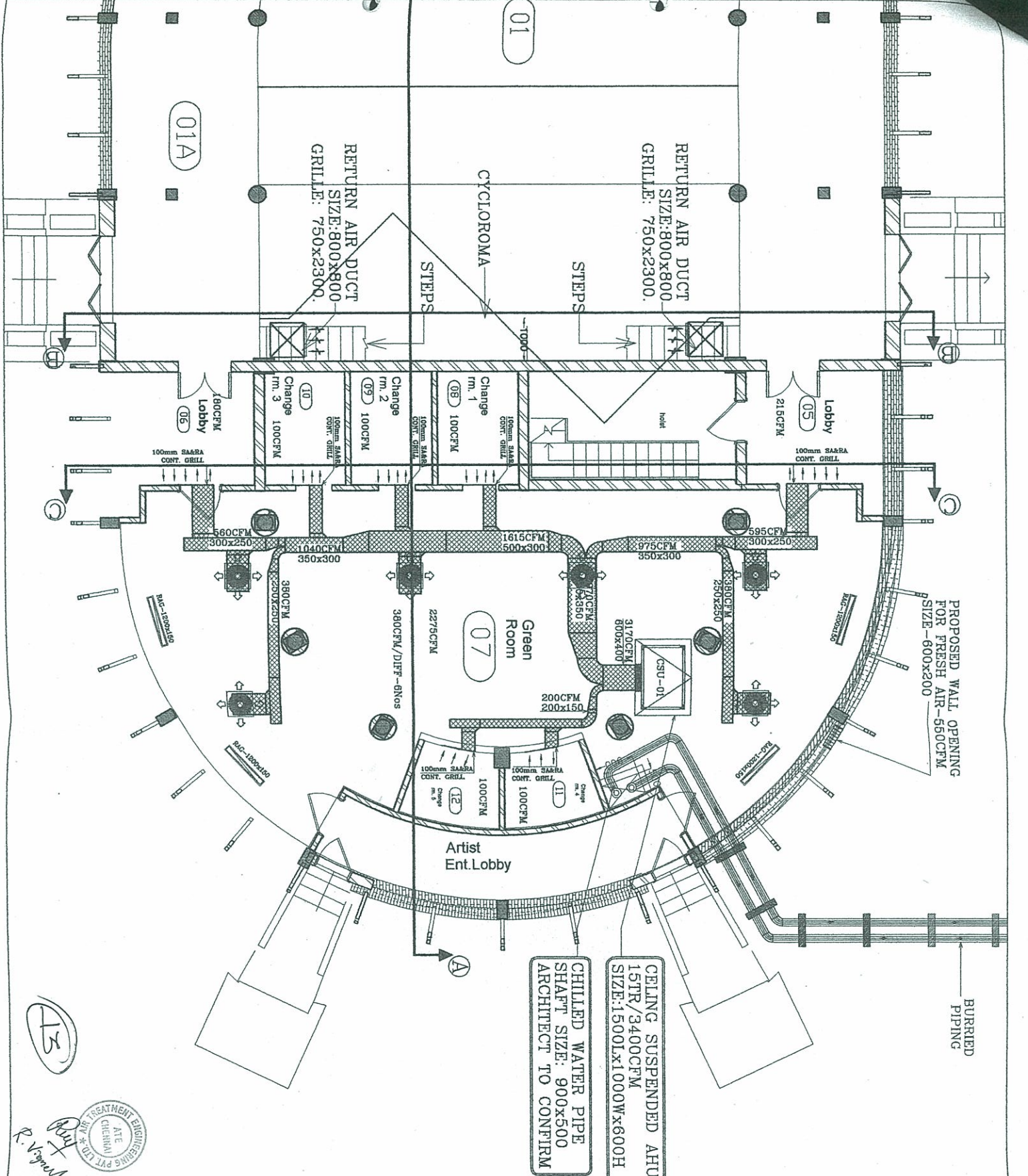
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APPROVED:  DISCUSSION  TENDER  APPROVAL  CONSTRUCTION

11







BURIED PIPING

PROPOSED WALL OPENING FOR FRESH AIR-560CFM SIZE-600x200

CEILING SUSPENDED AHU  
 15TR/3400CFM  
 SHAFT SIZE: 900x500  
 ARCHITECT TO CONFIRM

CHILLED WATER PIPE  
 900x500  
 ARCHITECT TO CONFIRM

HVAC LEGEND

01	AIRCOOLED SCROLL CHILLER	
02	PRIMARY PUMP	
03	DX CSU	
04	SUPPLY DIFFUSER	
05	RETURN DIFFUSER	
06	DAMPER	
07	SILENCER	
08	JET NOZZLES	
09	SUPPLY DUCT	
10	RETURN DUCT	
11	EXHAUST DUCT	
12	SUPPLY AIR GRILLE	
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15	THERMAL INSULATION	
16	CMS PIPE	
17	CMR PIPE	
18	PIPE INSULATIONS	
19	DRAIN PIPE	
20	AIR TIGHT PARTITION	
21	VOLUME CONTROL DAMPER	

ATE AIR TREATMENT ENGINEERING PVT. LTD.  
 GREENHALL  
 R. Vignani

**Kajalashetra**  
**Kajalashetra**

PROJECT: GROUND LEVEL HVAC LAYOUTS (PART PLAN)

SCALE: 1:175

DATE: 18.08.10

WORKSHEET: 1

ARCHITECT: AIR TREATMENT ENGINEERING PVT. LTD.

PROJECT ADDRESS: 10/10, 10/11, 10/12, 10/13, 10/14, 10/15, 10/16, 10/17, 10/18, 10/19, 10/20, 10/21, 10/22, 10/23, 10/24, 10/25, 10/26, 10/27, 10/28, 10/29, 10/30, 10/31, 10/32, 10/33, 10/34, 10/35, 10/36, 10/37, 10/38, 10/39, 10/40, 10/41, 10/42, 10/43, 10/44, 10/45, 10/46, 10/47, 10/48, 10/49, 10/50, 10/51, 10/52, 10/53, 10/54, 10/55, 10/56, 10/57, 10/58, 10/59, 10/60, 10/61, 10/62, 10/63, 10/64, 10/65, 10/66, 10/67, 10/68, 10/69, 10/70, 10/71, 10/72, 10/73, 10/74, 10/75, 10/76, 10/77, 10/78, 10/79, 10/80, 10/81, 10/82, 10/83, 10/84, 10/85, 10/86, 10/87, 10/88, 10/89, 10/90, 10/91, 10/92, 10/93, 10/94, 10/95, 10/96, 10/97, 10/98, 10/99, 10/100

DATE: 18.08.10

SCALE: 1:175

PROJECT: GROUND LEVEL HVAC LAYOUTS (PART PLAN)

ARCHITECT: AIR TREATMENT ENGINEERING PVT. LTD.

PROJECT ADDRESS: 10/10, 10/11, 10/12, 10/13, 10/14, 10/15, 10/16, 10/17, 10/18, 10/19, 10/20, 10/21, 10/22, 10/23, 10/24, 10/25, 10/26, 10/27, 10/28, 10/29, 10/30, 10/31, 10/32, 10/33, 10/34, 10/35, 10/36, 10/37, 10/38, 10/39, 10/40, 10/41, 10/42, 10/43, 10/44, 10/45, 10/46, 10/47, 10/48, 10/49, 10/50, 10/51, 10/52, 10/53, 10/54, 10/55, 10/56, 10/57, 10/58, 10/59, 10/60, 10/61, 10/62, 10/63, 10/64, 10/65, 10/66, 10/67, 10/68, 10/69, 10/70, 10/71, 10/72, 10/73, 10/74, 10/75, 10/76, 10/77, 10/78, 10/79, 10/80, 10/81, 10/82, 10/83, 10/84, 10/85, 10/86, 10/87, 10/88, 10/89, 10/90, 10/91, 10/92, 10/93, 10/94, 10/95, 10/96, 10/97, 10/98, 10/99, 10/100



04<sup>th</sup> October 2010.

To  
Smt. Leela Samson,  
Director,  
Kalakshetra foundation,  
Chennai -6000041.

Dear Smt Leela Samson,  
Please find <sup>TWO</sup> four sets of drawings listed below for construction.

Sub: "Koothambalam"  
Sheet No. 1  
Sheet Name  
Hvac layout

Issued date 04.10.'10  
Count 2Sets.

Thanking you,  
With best regards,

*J.R. Jayakumar*  
*C.I. Ra. Jayakumar*  
Ravi Nilakantan. *C.D.W.*

Encl. As above.

Purpose - Indexed - Tender,  
Details of the drgs.

- 1. Ground lvl. HVAC layout
  - 2. Ground lvl. HVAC layout - Pent plan
  - 3. FF. HVAC layout.
  - 4. FF. HVAC layout - Pent Plan.
  - 5. SF. HVAC layout -
  - 6. Plan to room layout.
  - 7. Sectional layout - Sec - C-C
  - 8. Sectional layout - Sec - A-A.
  - 9. Sectional layout - Sec - B-B
- Total = 9 nos.

Issued by ATE PVT. Ltd,

9 Drawings  
2-sets

CP

Recd.

*[Signature]*  
4<sup>x</sup>/10.

15

59  
5/10/10



C:\ 2009-2010\V.Admin\2. Engineering\i.Plan\Koothambalam\ HVAC work\ .doc	October 04, 2010
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Note

Sub: Re-Submission – Koothambalam – Heating, Ventilation and Air conditioning work (HVAC) - Reg.

Ref: Remarks communicated by Shir.P.T.Krishnan, Works Committee Member

Email addressed to M/s.CARD – Consulting Architect	Page
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Please refer to the remarks communicated on this project to this office on 28.09.2010 (CAO) cited at reference. Replies to the clarification about the design notes on HVAC System and connected drawings were obtained from Shri.Ravinilakantan and his associate HVAV consultant M/s.Air Treatment Engineering Pvt Ltd is submitted for your perusal.

- Design Notes on the HVAC system      Placed below      Page
- Drawings and details of HVAC system    - 9 Nos      Page
- List of approved makes/Brand/manufacturers      Page

Submitted please.

DIRECTOR

Sri.P.T.Krishnan

Draft for approval.

*[Handwritten signature]*

*[Handwritten signature]*  
AO 4/10/10

*[Handwritten signature]*  
CAO  
4/10/10

*[Handwritten signature]*  
DIRECTOR. 4/10  
**(16)**





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Engineering\i.Plan\Koothambalam\ HVAC work\ .doc

October 04, 2010

Note

Sub: Re-Submission – Koothambalam – Heating, Ventilation and Air conditioning work (HVAC) in Kalakshetra Foundation – Award of work - Reg.

Ref: Remarks communicated by Shri.P.T.Krishnan, Works Committee Member  
Email addressed to M/s.CARD/Consulting Architect for clarification Page ①

Please refer to the remarks communicated on this project to this office on 28.09.2010 (CAO) cited at reference. Replies to the clarification about the design notes on HVAC System, connected drawings and list of approved make/ brand were obtained from Shri.Ravi Nilakantan consulting Architect and his associate HVAV consultant M/s.Air Treatment Engineering Pvt Ltd is submitted for your perusal.

- Design Notes on the HVAC system Page ⑬,⑭
- Drawings and details of HVAC system Page ④to⑫
- List of approved makes/Brand/manufacturers Page ②,③

Submitted please.

*Leela Samson*  
DIRECTOR 4/10

*Shri.P.T.Krishnan*

Shri.P.T.Krishnan



81

1, Second Street, Wallace Garden, Chennai 600 006, India  
Phone: (044) 2833 2588, 2833 1759 Fax: (044) 2833 1878

ARCHITECTS

PTK

To:  
Ms. Laela Samson  
Director  
Kalakshetra Foundation  
Thiruvanniyur  
Chennai - 600 041.  
☎: 24521169, 24520836

81

1, Second Street, Wallace Garden, Chennai-600 006, INDIA  
Phone: (044) 2833 4878, 2833 1759 ■ Fax: (044) 2833 1878

October 7, 2010

*Ramesh/Ravi*  
*AD 11/10*

Ms. Leela Samson  
Director  
Kalakshetra Foundation  
Thiruvanmiyur  
Chennai – 600 041.

Dear Madam,

**Sub: Kalakshetra – Koothambalam  
- Air-conditioning and Ventilation work**

In continuation to the recommendation to award the work to M/s. Urimech Systems, the consultant may be requested to ensure the following:

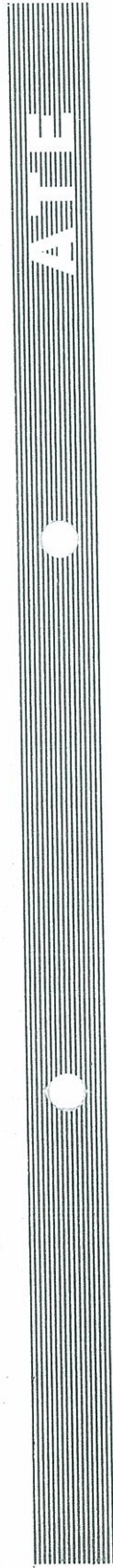
1. In rooms and stage which are to be air-conditioned. The design temperature may be mentioned so that the final installation may be tested for the compliance.
2. Since the auditorium is not air-conditioned, but the stage is air-conditioned, it may be ensured that there is no condensation occurring in the stage.
3. Since the ambiator has a large capacity fan, it may be ensured that the noise level does not affect the stage.

Yours faithfully,

(P.T. KRISHNAN)

ptk/sys1/fsm

*19*



20

Air Treatment Engineering Pvt Ltd

# L - 6, 2nd West Street, Kamaraj Nagar, Thiruvanniyur, Chennai - 600 041. INDIA  
Tele : 24412536 / 24454891 Fax : 24454306 e- mail:chennai@airtreatment.in

• Chennai • Bangalore • Hyderabad • Kolkata • Mumbai • Delhi

KOOTHAMBALAM COMPLIANCE CLARIFICATION

Date : 25<sup>th</sup> Oct 2010

Works Committee

With reference to the queries raised by Mr.V.Srinivasan, we mentioned below our reply.

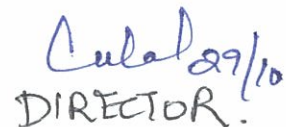
1. Green rooms and stage area is planned to air-conditioned. The designed temperature is 22.77+/- 1°C.
2. Since you have concern about the condensation in the stage, we recommended to change the grilles as a wooden type grilles to avoid problems.
3. We have provided the silencer in the supply and air intake side of the ambiator to maintained the low noise inside the auditorium.

Regards,  
Vignesh.R



25/10/10

Air Treatment Engg Pvt Ltd.,  
Chennai.

  
DIRECTOR.

**BEE CERTIFIED ENERGY SAVING COMPANY**

#L - 6, 2nd West Street, Kamaraj Nagar, Thiruvannamiyur, Chennai - 41. INDIA. Tele : 24412536 / 24454891 Fax : 24454306 e - mail:chennai@airtreatment.in

Chennai • Bangalore • Hyderabad • Kolkatta • Mumbai • Delhi

(21)

22



Works kalakshetra &lt;works@kalakshetra.in&gt;

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## HVAC work at koothambalam - compliance- reg.

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Works kalakshetra &lt;works@kalakshetra.in&gt;

Tue, Oct 19, 2010 at 4:46 PM

To: ravi &lt;card@vsnl.com&gt;, "j.ra.jayakumar jayaramanradhabai" &lt;jrajayakumar27@gmail.com&gt;

Sir,

We are sorry to disturb in this regard, the compliance clarification has not been received sofar.

**The awarding the HVAC work for the koothamabalam to M/s.Unimech systems (chennai) pvt ltd by the work committee with following compliance.**

**In continuation to the recommendation to award to M/s.Unimech systems, the consultant may be requested to ensure the following:**

**In rooms and stage which are to be air conditioned. The design temperature may be mentioned so that the final installation may be tested for the compliance**

**Since the auditorium is not air conditioned, but the stage is air-conditioned, it may be ensured that there is no condensation occurring in the stage.**

**Since the ambiator has a large capacity fan, it may be ensured that noise level does not affect the stage.**

The above may be furnished to this office in hard copy for our reference at the earliest please.

warm regards

V.Srinivasan  
Kalakshetra

---

Emm<sup>a</sup> sent to

To  
M/S. CARD -  
I.RAJ. /COW.

(22)

KOOTHAMBALAM COMPLIANCE CLARIFICATION

Date : 25<sup>th</sup> Oct 2010

Works Committee

With reference to the queries raised by Mr.V.Srinivasan, we mentioned below our reply.

1. Green rooms and stage area is planned to air-conditioned. The designed temperature is 22.77+/- 1°C.
2. Since you have concern about the condensation in the stage, we recommended to change the grilles as a wooden type grilles to avoid problems.
3. We have provided the silencer in the supply and air intake side of the ambiator to maintained the low noise inside the auditorium.

Regards,  
Vignesh.R

*Vignesh.R*

25/10/10

Air Treatment Engg Pvt Ltd.,  
Chennai.

Clarification obtained from the HVAC consultant  
M/s. ATE Pvt-Ltd,

Submitting for information please,

*[Signature]*

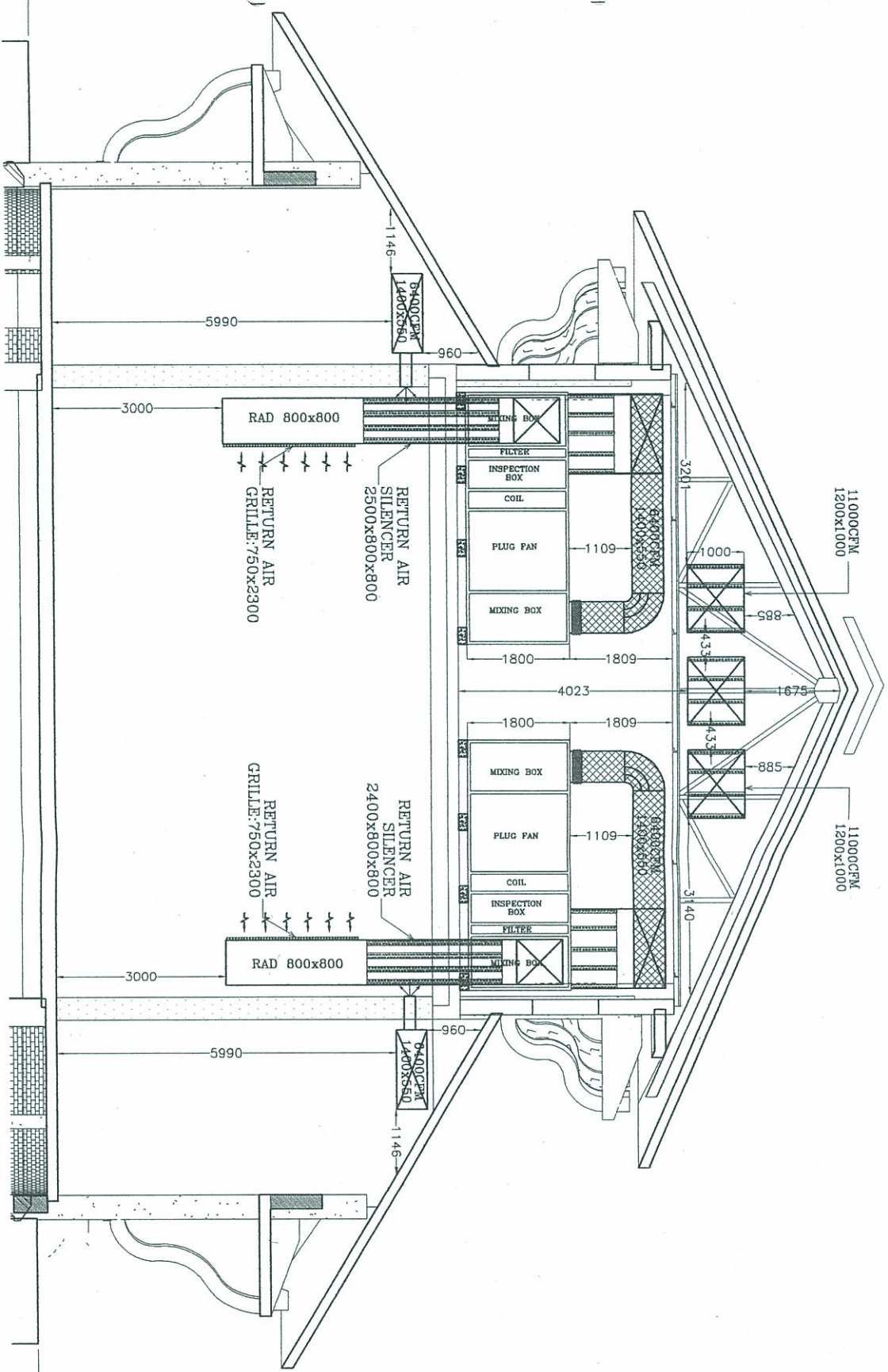
*[Signature]*  
26/10/10  
AD

*[Signature]*  
26/10/10

*[Signature]*  
29/10  
DIRECTOR

213

BEE CERTIFIED ENERGY SAVING COMPANY



SECTION B-B

HVAC LEGEND	
01	AIRCOOLED SCROLL CHILLER
02	PRIMARY PUMP
03	DX CSU
04	SUPPLY DIFFUSER
05	RETURN DIFFUSER
06	DAMPER
07	SILENCER
08	JET NOZZLES
09	SUPPLY DUCT
10	RETURN DUCT
11	EXHAUST DUCT
12	SUPPLY AIR GRILLE
13	RETURN AIR GRILLE
14	EXHAUST GRILLE
15	THERMAL INSULATION
16	CMS PIPE
17	CMR PIPE
18	PIPE INSULATIONS
19	DRAIN PIPE
20	AIR TIGHT PARTITION
21	VOLUME CONTROL DAMPER

NO.	REVISION	DATE	BY	CHKD.
1	ISSUED FOR PERMIT	15.08.10		
2	FOR CONSTRUCTION	16.08.10		

PROJECT: **kalakshetra**  
 PRODUCT: **kalakshetra**  
 CLIENT: **kalakshetra**

TITLE: SECTIONAL LAYOUT (SECTION B-B)  
 SCALE: 1:175  
 DATE: 16.08.10  
 SHEET NO: 7  
 DRAWN: MONESH

24  
 P. Vignesh  
 AIR CONDITIONING ENGINEERING

PURPOSE:  DISCUSSION  TENDER  APPROVAL  CONSTRUCTION  
 ARCHITECT: **Centre for Architectural Research & Design**  
 4/1, 1st Floor, Anna Salai, Chennai - 600 002  
 TEL: 044-2610-1111, 2610-1112  
 FAX: 044-2610-1113  
 E-MAIL: cenar@calakshetra.in  
 WWW: www.cenar.in

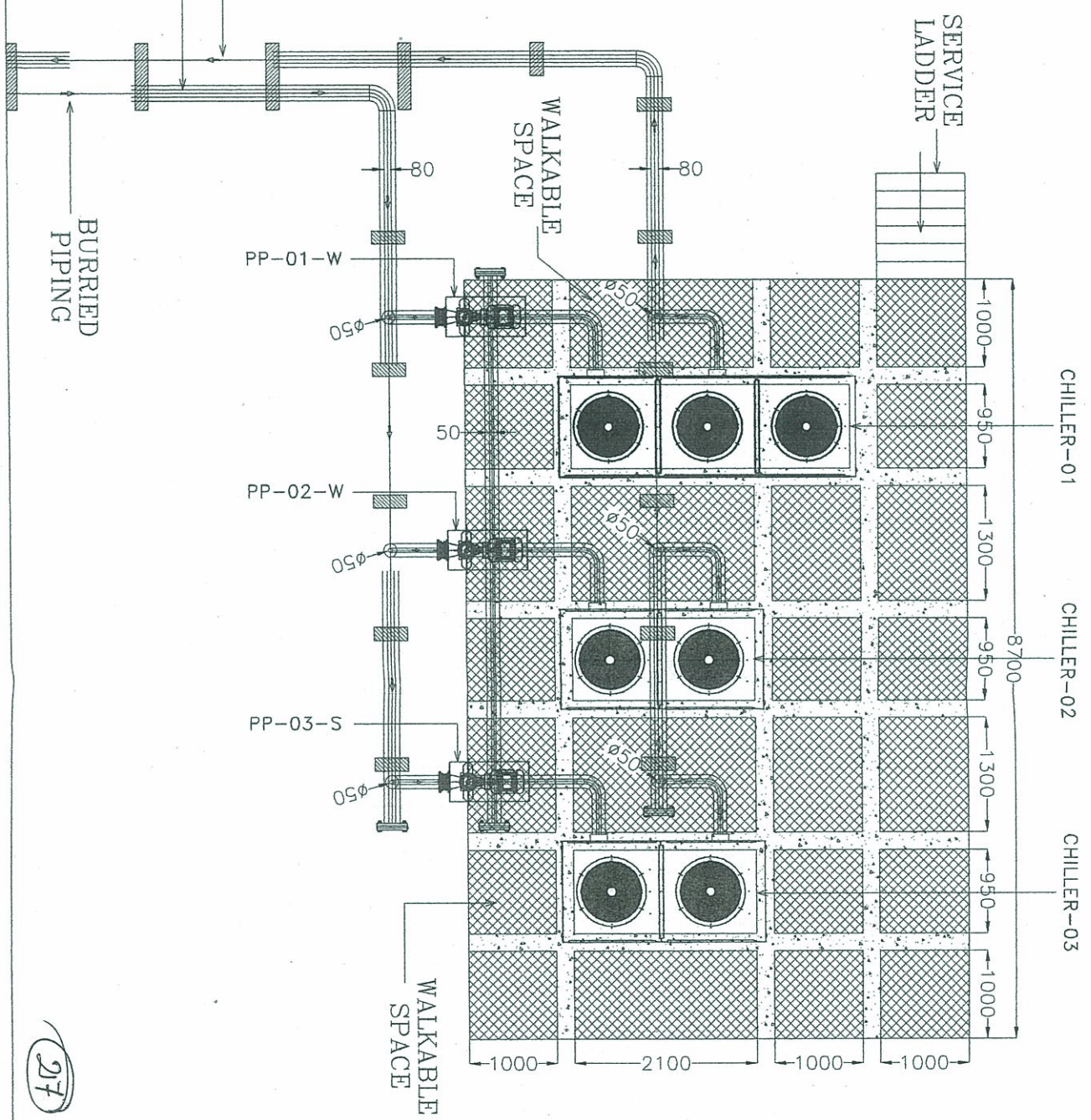






PROPOSED CHILLER PLANT LOCATION. ARCHITECT TO CONFIRM THE LOCATIONS.

AIR COOLED CHILLER TO BE ELEVATED 2500MM FROM THE FLOOR LEVEL



HVAC LEGEND	
01	AIRCOOLED SCROLL CHILLER
02	PRIMARY PUMP
03	DX CSU
04	SUPPLY DIFFUSER
05	RETURN DIFFUSER
06	DAMPER
07	SILENCER
08	JET NOZZLES
09	SUPPLY DUCT
10	RETURN DUCT
11	EXHAUST DUCT
12	SUPPLY AIR GRILLE
13	RETURN AIR GRILLE
14	EXHAUST GRILLE
15	THERMAL INSULATION
16	CMS PIPE
17	CMR PIPE
18	PIPE INSULATIONS
19	DRAIN PIPE
20	AIR TIGHT PARTITION
21	VOLUME CONTROL DAMPER

*R. Vignesh*  
 AIR TREATMENT ENGINEERING  
 PVT. LTD.  
 CHENNAI

**PROJECT:** Kalakshetra  
**OWNER:** Kalakshetra  
**TITLE:** PLANT ROOM LAYOUT  
**DATE:** 19.08.10  
**SCALE:** 1:75  
**SHEET NO:** 4

**ARCHITECT:** Centers for Architectural Research & Design  
**DATE:** 19.08.10

**PURPOSE:** DISCUSSION  TENDER  APPROVAL  CONSTRUCTION

217










Fax: +91-44-2445 4306

Mob:+91 9445051793

E-mail : [vignesh@airtreatment.in](mailto:vignesh@airtreatment.in)

[chennai@airtreatment.in](mailto:chennai@airtreatment.in)

Website: [www.airtreatment.in](http://www.airtreatment.in)

 Please do not print this email unless it is abso lutely necessary. Spread environmental awareness.

---

**From:** [card@vsnl.com](mailto:card@vsnl.com) [mailto:[card@vsnl.com](mailto:card@vsnl.com)]  
**Sent:** Friday, October 01, 2010 1:02 PM  
**To:** 'ATE'  
**Cc:** 'VIGNESH'; 'Velu'  
**Subject:** FW: Kalasam erection work - reg.

## URGENT

Sri. Ramesh,

HVAC WO is pending execution for clarifications.

Please provide the same immediately.

Regards,

ravi

---

**From:** Works kalakshetra [mailto:[works@kalakshetra.in](mailto:works@kalakshetra.in)]  
**Sent:** Friday, October 01, 2010 11:38 AM  
**To:** ravi; j.ra.jayakumar jayaramanradhabai  
**Subject:** Kalasam erection work - reg.

Sir,

The Kalasam refurbishing work is being done and ready soon.





## 2. Auditorium :

- ❖ Since we are not going to be air-conditioning the Auditorium, we planned for Ventilation system.
- ❖ Three stage ambiator has located above the green room area. Fresh air for the auditorium is supplied through the ambiator which the machine can able to reduce the temperature of the fresh air based on the heat excchanger & ambient condition. The ambiator working principle is explained in the given tender document issued by us.
- ❖ Duct from the ambiator is running through the truss area will be connected to the supply air plenum. Plenum will have multiple sets of Jet Nozzles facing toward auditorium for the air distribution. Three levels of nozzles has planned for the proper distribution.
- ❖ HVLS fan is planned to locate in the center of Auditorium. HVLS standa for High Volume Low Speed fan. It will help to spread the air which is coming from the ambiator.
- ❖ In addition to that, it is planned to provide the slab cooling to have radiant cooling for the Auditorium area.

Please note that Slab cooling system is not included in the floated tender.

Thanks & regards,

**R. Vignesh**

HVAC Design Engineer.

**ATE**

**Air Treatment Engineering Pvt. Ltd.,**

#L-6,2nd West Street,

Kamaraj Nagar, Thiruvanmiyur,

Chennai - 600 041, India.

Ph : +91-44-2441 2536/2445 4891

*ZZ*



Works kalakshetra &lt;works@kalakshetra.in&gt;

---

**FW: Kalakshtra Project**

---

Ravi Niilakantan <card@vsnl.com>  
To: Works kalakshetra <works@kalakshetra.in>

Fri, Oct 1, 2010 at 4:35 PM

Sri. Srinivasan,

Find note on AC for koothambalam.

Drgs. are attached with the tender.

Ravi niil

---

**From:** VIGNESH [mailto:vignesh@airtreatment.in]  
**Sent:** Friday, October 01, 2010 3:55 PM  
**To:** card@vsnl.com  
**Cc:** 'Ramesh'  
**Subject:** RE: Kalakshtra Project

Dear Sir,

With reference to the telephonic conversation had with you today, Design Notes on the HVAC system as follows.

**1. Green Rooms & Stage Area :**

- ❖ Green room and stage considered as Air-conditioning system.
- ❖ Chiller system has been planned. Air cooled chilling machine considered.
- ❖ Floor wise Ceiling suspended Air handling unit has provided for Green room. Since false ceiling is not going to be provided, circular duct has planned to run along the green room which shall be exposed.
- ❖ Stage area will have floor mounted noise controled AHU which has been located above the green room area. The cooled and dehumidified air will be passes through the duct and let the air out to the stage by means of grilles.

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**KALAKSHETRA - KOOTHAMBALAM FLOOR  
SLAB COOLING WORKS - BILL OF QUANTITIES**

Sl. No	Description	Unit	Qty.	M/s. Caavery Agro Agencies		M/s. Vibrant Industries Ltd.	
				Unit Rate in Rs.	Total Amount in Rs.	Unit Rate in Rs.	Total Amount in Rs.
1	Supply of 1/2" Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	Mts.	4700	30.00	141,000.00	45.50	213,850.00
2	Laying, fixing and installation and testing of 1/2" Composite Pipes with required clamps as per drawing and site requirement.	Mts.	4700	30.00	141,000.00	25.00	117,500.00
3	Supply of 2" Composite pipes Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	Mts.	500	300.00	150,000.00	244.30	122,150.00
4	Laying, fixing and installation and testing of 2" Composite Pipes with required clamps as per drawing and site requirement.	Mts.	500	200.00	100,000.00	50.00	25,000.00
5	Supply, Laying, fixing and installation of Dia 63 mm Stainless Steel Pipe	Mts.	30	1,200.00	36,000.00	1,600.00	48,000.00
6	1/2" Ball Valve	Nos.	70	190.00	13,300.00	250.00	17,500.00
7	Butterfly Isolation valve for 40mm Dia pipe	Nos.	6	2,200.00	13,200.00	1,400.00	8,400.00
8	Butterfly Isolation valve for 65mm Dia pipe	Nos.	3	3,300.00	9,900.00	1,700.00	5,100.00
9	Pressure Independent Balancing Valve	Nos.	35	12,000.00	420,000.00	11,500.00	402,500.00
10	Y-Strainer for 65mm Dia pipe	No.	1	1,550.00	1,550.00	1,200.00	1,200.00
11	Non Return Valve for 65mm Dia pipe	No.	1	750.00	750.00	1,700.00	1,700.00
12	Centrifugal back pullout Pump with VFD 64USGPM	No.	1	40,000.00	40,000.00	72,500.00	72,500.00
13	Multi Stage Sand Filter for 64USGPM	No.	1	150,000.00	150,000.00	98,500.00	98,500.00
14	Filling Material for Sand Filter	No.	1	40,000.00	40,000.00	25,000.00	25,000.00
15	Heat Exchanger	No.	1	32,000.00	32,000.00	50,000.00	50,000.00
16	25 Litre Indl. Water Heater	Nos.	2	15,000.00	30,000.00	20,000.00	40,000.00
17	Stage Warm water Circulation Pump with starter	No.	1	15,000.00	15,000.00	20,000.00	20,000.00
18	Valves, Accessories and Laying Charges Lump Sum	No.	1	15,000.00	15,000.00	15,000.00	15,000.00
Sub Total					1,348,700.00		1,283,900.00
Discount @				7.50%	101,152.50		
Total					1,247,547.50		
Local Tax @				4.00%	49,901.90		51,356.00
Service Tax @				10.30%			132,241.70
Grand Total					1,297,449.40		1,467,497.70

**KALAKSHETRA - SLAB COOLING BOQ**

**BILL OF QUANTITIES**

Sl. No	Description	Qty	Rate	Amount
		Mtr/No	Rs	
1	Supply of 1/2" Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	4700	45.50	213,850.00
2	Laying, fixing and installation and testing of 1/2" Composite Pipes with required clamps as per drawing and	4700	25.00	117,500.00
3	Supply of 2" Composite pipes Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	500	244.30	122,150.00
4	Laying, fixing and installation and testing of 2" Composite Pipes with required clamps as per drawing and site	500	50.00	25,000.00
5	Supply, Laying, fixing and installation of Dia 63 mm Stainless Steel Pipe	30	1,600.00	48,000.00
6	1/2" Ball Valve	70	250.00	17,500.00
7	Butterfly Isolation valve for 40mm Dia pipe	6	1,400.00	8,400.00
8	Butterfly Isolation valve for 65mm Dia pipe	3	1,700.00	5,100.00
9	Pressure Independent Balancing Valve	35	11,500.00	402,500.00
10	Y-Strainer for 65mm Dia pipe	1	1,200.00	1,200.00
11	Non Return Valve for 65mm Dia pipe	1	1,700.00	1,700.00
12	Centrifugal back pullout Pump with VFD 64USGPM	1	72,500.00	72,500.00
13	Multi Stage Sand Filter for 64USGPM	1	98,500.00	98,500.00
14	Filling Material for Sand Filter	1	25,000.00	25,000.00
15	Heat Exchanger	1	50,000.00	50,000.00
16	25 Litre Indl. Water Heater	2	20,000.00	40,000.00
17	Stage Warm water Circulation Pump with starter	1	20,000.00	20,000.00
18	Valves , Accessories and Laying Charges Lump Sum	1	15,000.00	15,000.00
	Sub Total			1,283,900.00
	Local Tax @		4.00%	51,356.00
	Service Tax @		10.30%	132,241.70
	Grand Total			1,467,497.70





# CAAUVERY AGRO AGENCIES

NO. 81, Sarvamangala Homes, Seethalai Sathanar Street, NH 1, Maraimalai Nagar - 603 209  
 Tel : 044 - 47 468 969, Fax : 044 - 47 400 500, E.Mail: cauvery@vsnl.com

## PROFORMA INVOICE

Kalakshetra Foundation  
 Besant nagar  
 Chennai  
 Kind Att:

Proforma Inv.No  
 Date:  
 Order Details  
 Party TAN No:

51  
 11-Nov-10

Sl. No	Description	Qty	Rate	Amount	Discounted price	Goted	Profit	Amount
		Mtr/No	Rs					
1	Supply of 1/2" Vista Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	4700	30.00	141,000.00	2.25	27.75	12.75	59925
2	Laying, fixing and installation and testing of 1/2" Vista Composite Pipes with required clamps as per drawing	4700	30.00	141,000.00	2.25	27.75	5	23500
3	Supply of 2" Vista Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	500	300.00	150,000.00	22.50	277.50	30	15000
4	Laying, fixing and installation and testing of 2" Vista Composite Pipes with required clamps as per drawing	500	200.00	100,000.00	15.00	185.00	50	25000
5	Supply, Laying, fixing and installation of Dia 63mm Stainless Steel Pipe	30	1,200.00	36,000.00	90.00	1,110.00	0	0
6	1/2" Ball Valve	70	190.00	13,300.00	14.25	175.75	20	1400
7	Butterfly Isolation valve for 40mm Dia pipe	6	2,200.00	13,200.00	165.00	2,035.00	1000	6000
8	Butterfly Isolation valve for 65mm Dia pipe	3	3,300.00	9,900.00	247.50	3,052.50	1000	3000
9	Pressure Independent Balancing Valve	35	12,000.00	420,000.00	900.00	11,100.00	8000	280000
10	Y-Strainer for 65mm Dia pipe	1	1,550.00	1,550.00	116.25	1,433.75	500	500
11	Non Return Valve for 65mm Dia pipe	1	750.00	750.00	56.25	693.75	0	0
12	Centrifugal back pullout Pump with VFD 64USGPM	1	40,000.00	40,000.00	3,000.00	37,000.00	-13000	-13000
13	Multi Stage Sand Filter for 64USGPM	1	150,000.00	150,000.00	11,250.00	138,750.00	20000	20000
14	Filling Material for Sand Filter	1	40,000.00	40,000.00	3,000.00	37,000.00	30000	30000
15	Heat Exchanger	1	32,000.00	32,000.00	2,400.00	29,600.00	-20000	-20000
16	25 Litre Inhd. Water Heater	2	15,000.00	30,000.00	1,125.00	13,875.00		
17	Stage Warm water Circulation Pump with starter	1	15,000.00	15,000.00	1,125.00	13,875.00		
18	Valves, Accessories and Laying Charges Lump Sum	1	15,000.00	15,000.00	1,125.00	13,875.00		

138

To:

Date: 13 Dec 2010

The Director,  
Kalakshetra Foundations,  
Thiruvanmiyur,  
Chennai - 600 041.

Dear Sir,

Sub: ATE's recommendation for appointment of Vendor for Koothambalam Floor Slab Cooling Works.

With reference to the above subject, based on the discussions we had with the various vendors, the final prices given by the vendors are as under:

- |                                 |   |                   |
|---------------------------------|---|-------------------|
| 1. M/s. Cauvery Agro Agencies   | : | ₹ 12, 97, 449. 40 |
| 2. M/s. Vibrant Industries Ltd. | : | ₹ 14, 67, 497. 00 |

Our recommendation is as under:

Kalakshetra Koothambalam Floor Slab Cooling Vendor has to satisfy the following conditions:

1. Vendor to establish dedicated design team within 4 days and Vendor shall prepare and submit construction drawings including technical submittal and get the approval from Consultant.
2. There must be a full time dedicated team for this Project, who has no other work other than this site.
3. Completion schedule of the project within end of December 2010 including handing over.
4. For review meetings, the design head and the Project head must be present at site.

Based on the above conditions, we recommend you to place the order on  
M/s. CAUVERY AGRO AGENCIES

Thanking you,  
For Air Treatment Engineering Pvt. Ltd,

Mr. R. P. S. Ramesh,  
MD & Principal Consultant

Kamaraj Nagar, Thiruvannamiyur,

Chennai - 600 041, India

Phone : +91-44-2441 2536/2445 4891

Mobile : 094450 51796

E-mail : velmurugan@airtreatment.in

chennai@airtreatment.in

Website: www.airtreatment.in



---

**4 attachments**



**Kalakshetra - ATE Recommendation Letter for Slab Cooling Works.jpg**  
218K

 **Kalakshetra Slab Cooling - Comm. Comparison..pdf**  
45K

 **Caauvery - Kalakshetra Quote Latest.xlsm**  
16K

 **Vibrant - Kalakshetra Quote Latest - Dec 11, 2010.xls**  
23K

40





## FW: Kalakshetra - ATE Recommendation Letter for Slab Cooling Works

Ravi Nilakantan <card@vsnl.com>

Mon, Dec 13, 2010 at 8:11 PM

To: director@kalakshetra.in, Works kalakshetra <works@kalakshetra.in>

Cc: "j.ra.jayakumar jayaramanradhabai" <jrajayakumar27@gmail.com>

Smt. Leelaji,

Please find the floor cooling quotes and recommendation.

This is for your information and necessary action.

Regards,

Ravi niilakantan

**From:** Velu [mailto:velmurugan@airtreatment.in]

**Sent:** Monday, December 13, 2010 5:04 PM

**To:** card@vsnl.com

**Cc:** 'kpsr'; ayyappan@airtreatment.in

**Subject:** Kalakshetra - ATE Recommendation Letter for Slab Cooling Works

**Importance:** High

Kind Attn: Sri. Ravi Nilakantan,

Dear Sir,

Please find attached the Recommendation letter & Commercial comparison for Slab Cooling Works for Kalakshetra Foundations, Chennai to your further actions.

Please confirm the receipt of this mail.

Thanks & regards,

**Velmurugan. A**

Air Treatment Engineering Pvt. Ltd.,

#L-6,2nd West Street,

(41)

- What is the schedule of completion – delivery of materials and completion of work specified in quotes
- It is seen from the M/s.Caauvery Agro Agencies quote that discounted price quoted, profit and amount. What does it means?

This is issued the approval of competent authority.

*Director may kindly see before issue.*

~~Deputy Director~~

*[Signature]*  
EO  
16/12/10

*[Signature]*  
AO 16/12/10

*[Signature]*  
CAO 16/12/10

Deputy Director

*[Signature]*  
24/12

Director.

*Calal*  
21/12

*Director may kindly see before issue.*

Based on the approval note dated 16.12.2010 (page 42), the draft <sup>letter</sup> addressed to the Consulting Architect M/s.CARD, is submitted for approval before issue to ~~M/s.CARD~~

C:\2010-2011\V.Admin\2.Engineering\i.Plan\Kootambalam\HVAC work.doc	14 December 2010
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M/s.CARD,  
# 10A, 2<sup>nd</sup> floor, Dhanalakshmi Colony,  
1<sup>st</sup> street, Vadapalani,  
Chennai 600 026.

Kind Attention. Architect Shri.Ravi Niilakantan

*Siv,*

Sub: Koothambalam – Heating, ventilation and Air conditioning work (HVAC) –Slab Cooling work– Reg.

- Ref: i) The tender ref: Kalashetra/MS/BOQ dated 27<sup>th</sup> August, .2010 from M/s.Unimech Systems (Chennai) Pvt ltd.  
 ii) The revised offer ref: Kalakshetra/PGK/BOQ/R-1, dated 15.09.2010 from M/s.Unimech Systems (Chennai) Pvt ltd.  
 iii) The revised offer ref: Kalakshetra/PGK/BOQ/R-2, dated 16<sup>th</sup> September, 2010 M/s.Unimech Systems (Chennai) Pvt ltd.  
 iv) Justification letter from M/s.ATE pvt ltd dated 20.09.2010  
 v) The award of letter recommendation from M/s.CARD dated 21<sup>st</sup> September 2010  
 vi) Email with 4 attachments from M/s.CARD dated Mon, Dec 13, 2010 at 8.11 P.M.

*page 35 to 41*

~~We have received your letter cited in reference (vi) above, In this connection, the following points need to be clarified, before finalising the matter at our end.~~

- Have this (slab cooling work) work covered in the original scope of work entrusted to M/s.Unimech engineers <sup>or is the same</sup> OR supplementary work. ?
- The need for this work proposal and justification.
- Only two quotations were received and it needs minimum three quotations for finalising the work.
- No EMD provision and terms and conditions of the quotation has been obtained and forwarded.
- All the quotes and recommendation were received by email and further these may be requested to get the hard copy duly signed by the supplier may be forward for record.
- The justification for accepting the rates and quotation needs to be given while submitting the final recommendation by M/s.CARD.
- What is the financial terms of the quotes received?

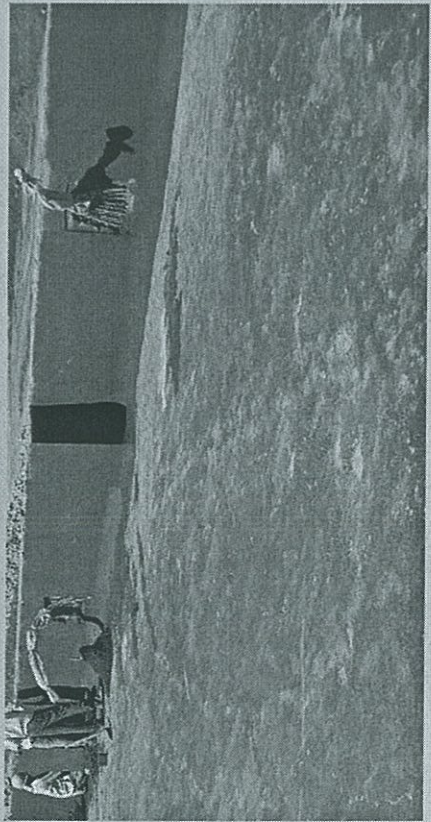
*along with a rate analysis (based on accepted PND/old job cost rept Rate).*

43

# Radiant Cooling- Construction sequence

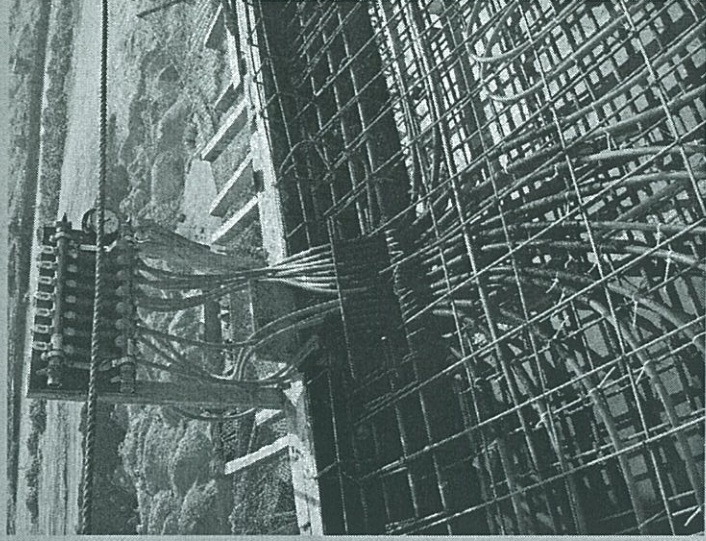
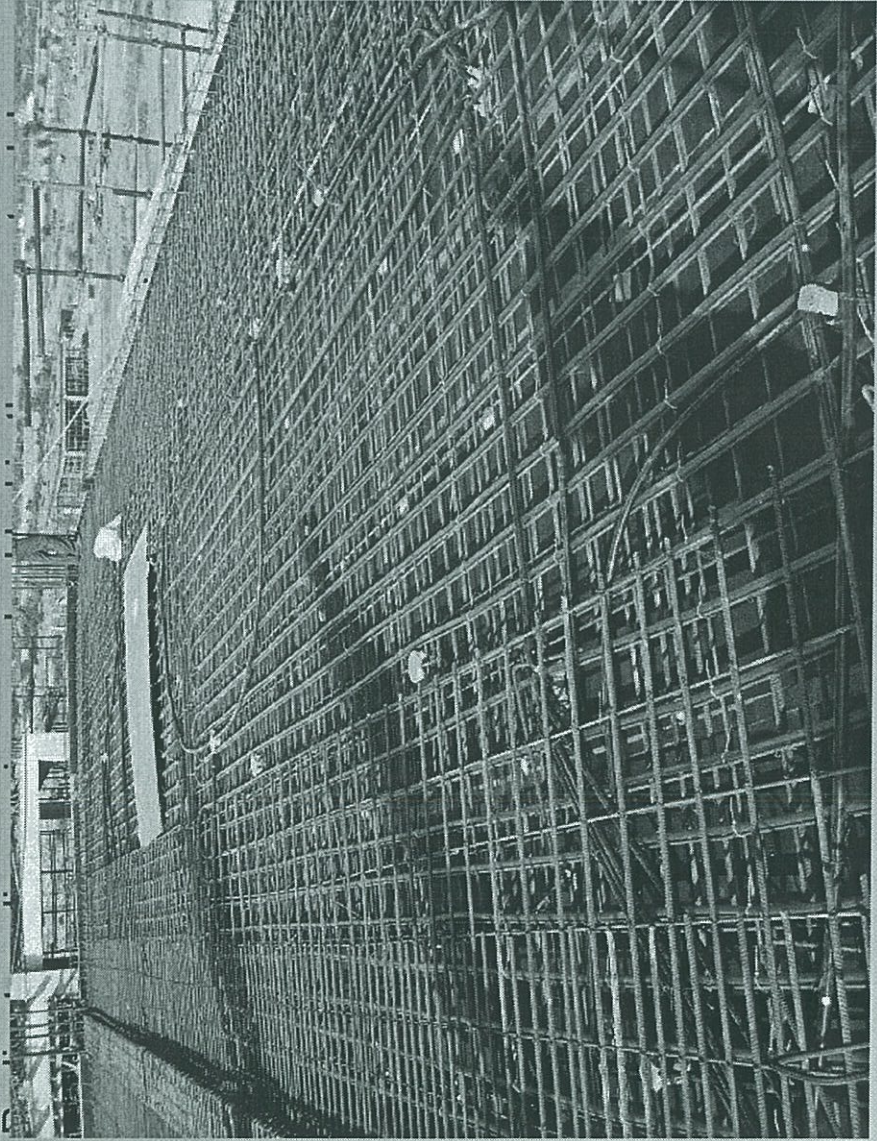
Case Study – SDB-1, Pocharam campus, Hyderabad

Radiant cooling – pipes embedded in the concrete slab



# Radiant Cooling- Construction sequence

Case Study - SDB-1, Pocharam campus, Hyderabad



45

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48

18/5

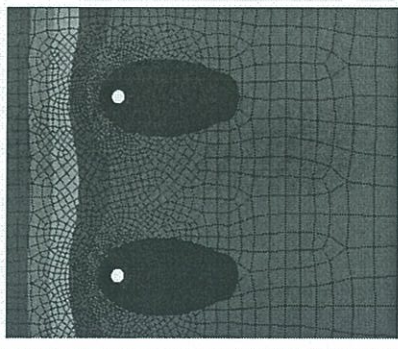
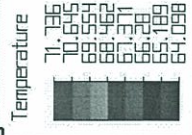
# Geothermal Radiant Floor Slabs

## Geothermal Radiant

- Geothermal Loop Temperatures are Ideal for Radiant Floor Cooling
  - 52 – 56 deg. F.
- Floor Slab Acts as “Water Side Economizer”
- Use Water to Water HP’s or Chiller/Heater
  - Need to Produce Hot Water for Heating
- No Vapor Compression Refrigeration for Cooling
  - Radiant Floor Slab can provide sensible cooling capacity for Classroom
  - DOAS Provides Latent Cooling Capacity
- DOAS Can Utilize 52 deg. F Geothermal Water to Maintain Required Dewpoint Temps.

**Additional Conditions:**  
 1/2 in RAUPEX, 6in O.D.  
 Film Coefficient: 1.85 (BTU/hr-ft<sup>2</sup>-°F)  
 There are no additional conditions.  
 With these conditions and the material properties listed the following results were obtained

MCWT (°F)	Flow (gpm)	Output (BTU / ft <sup>2</sup> )	Average Floor Surface Temp (°F)
64		8.7	71.6
68		6.0	73.3
70		4.7	74.1
72		3.3	75.0



FEM Model results of a radiant cooling floor slab design using a program developed by Algor. Illustration courtesy of Rehau, Inc.

(46)

*Handwritten signature*

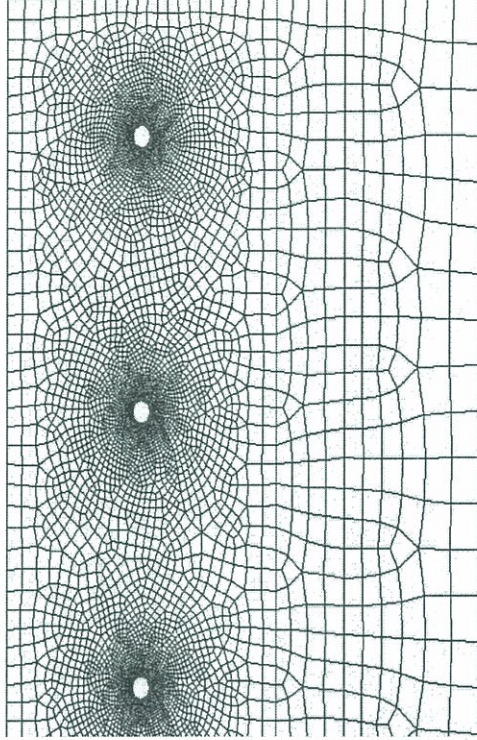
# Geothermal Radiant Floor Slabs

## Radiant Cooling Concepts

- Human Comfort Equation
  - $T_{\text{resultant}} = 0.5 * (T_{\text{ambient}} + \text{MRT})$
  - MRT = Mean Radiant Temperature
- Long Response Time
- Utilizes Thermal Mass to Store Energy
- Slab Surface Temperature is Controlled
- Computer Simulations
  - CFD
  - FEM
- Manufacturer's Programs
  - Rehau

Material Properties York University Cooling Model (Slab)

Material	Color	K-Value (BTU/h/in °F)
Concrete (8 in)	Green	0.046
Insulation	Red	0.0014
Radiant X	Pink	0.02
Gypsum	Purple	0.0183



FEM Modeling results of a radiant cooling floor slab design using a program developed by Algor. Illustration courtesy of Rehau, Inc.

47

16/19

52

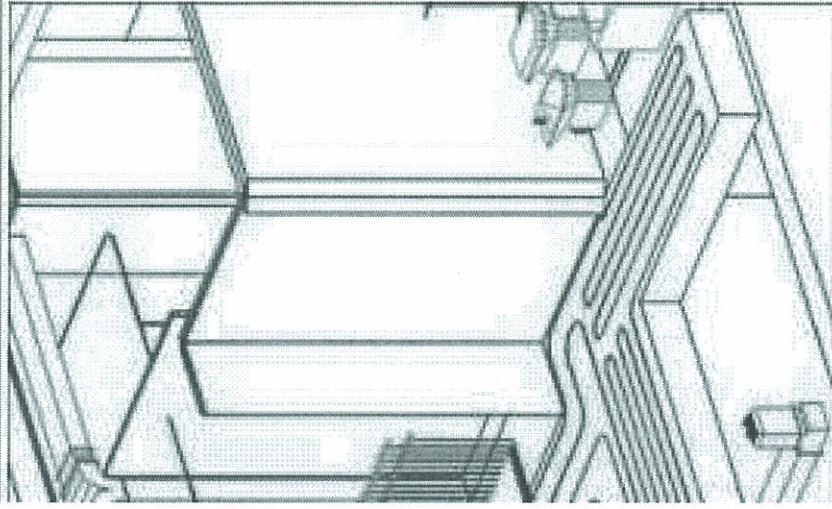
47

Control

# Geothermal Radiant Floor Slabs

## Radiant Cooling Concepts

- PEX Tubing Embedded in Concrete
- Ideal Water Temperature Ranges
  - 58 – 62 Deg. F.
- Floor Acts as Large Radiator
- Natural Buoyancy Effects
  - Cool Air at Surface is Drawn up as it is Heated by People, Computers, etc.
- Stratification
  - Warm air is Stratified High
- Sponge Effect
  - Radiant Floor “Soaks” up solar gain and does not allow re-radiation



(98)

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15

15/5



# Slab cooling

By M/s.CARD and ATE

49

Cardal

52

14/15

Attached few slides showing details of slab cooling for Kalakshetra

**K.P.S.Ramesh**

**Principal Consultant and MD**

Air Treatment Engineering Pvt. Ltd.,

#L-6,2nd West Street,

Kamaraj Nagar, Thiruvanmiyur,

Chennai - 600 041, India

Ph : +91-44-2441 2536/2445 4891

Fax: +91-44-2445 4306

Mob: +91-9444387876

E-mail : [kpsramesh@airtreatment.in](mailto:kpsramesh@airtreatment.in)

[chennai@airtreatment.in](mailto:chennai@airtreatment.in)

Website: [www.airtreatment.in](http://www.airtreatment.in)

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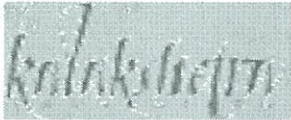
**2 attachments**

 **Presentation.ppt**  
1809K

 **RADIANT COOLING.DOCX**  
580K

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Works kalakshetra <works@kalakshetra.in>

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## FW: slides on slab cooling

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Ravi Nilakantan <card@vsnl.com>  
To: Works kalakshetra <works@kalakshetra.in>

Mon, Dec 27, 2010 at 5:26 PM

FYI.

Ravi

---

**From:** Ravi Nilakantan [mailto:card@vsnl.com]  
**Sent:** Tuesday, December 07, 2010 12:10 PM  
**To:** 'director@kalakshetra.in'  
**Cc:** 'jrajayakumar27@gmail.com'  
**Subject:** FW: slides on slab cooling

Smt. Leelaji,

Enclosed are the design notes for floor cooling (sustainable) prepared by our HVAC consultant for Koothambalam.

Its news that Infosys Hyderabad is doing a similar cooling methodology.

For information.

Regards,

Ravi nilakantan

---

**From:** kps.Ramesh [mailto:ateramesh@gmail.com]  
**Sent:** Monday, December 06, 2010 11:14 AM  
**To:** card@vsnl.com  
**Cc:** card@vsnl.net; businesssec  
**Subject:** slides on slab cooling

Sir,

(51)

Calat



55  
11/19

**DELIVERY NOTE**

(Original)

<b>CAAUVERY AGRO AGENCIES</b> Sarvamangala Homes 81 Seethalai Sathanar Street NH1, Maraimalai Nagar PIN 603 209 Tamil Nadu 603209 E-mail : cauvery@vsnl.com	Delivery Note No. <b>207</b>	Dated <b>7-Dec-2010</b>
	Supplier's Ref.	Mode/Terms of Payment <b>against delivery</b>
Buyer <b>Kalakshetra Foundation</b> Besant Nagar Chennai	Buyer's Order No. <b>E Mail</b>	Dated <b>7-Dec-2010</b>
	Despatch Document No.	Dated
	Despatched through	Destination
	Terms of Delivery	

Description of Goods	Quantity	Rate	per	Disc. %	Amount
1014 Vista Composite Pipe	700.00 Mts				
4050 Vista Composite Pipes	500.00 Mts				
<b>Total</b>		<b>1,200.00 Mts</b>			

E. & O. E.

101  
08/12/10

*Kallum*  
*R. Kishor Vel*

SECURITY Dept.  
KALAKSHETRA FOUNDATION  
THIRUVANMIYUR,  
CHENNAI - 600 041.

Company's VATTIN : 33443161807  
Company's CST No. : 41256/27-09-95  
Recd. in Good Condition

*A. R. Rajan*  
*C. S. R. Rajan*  
for CAAUVERY AGRO AGENCIES  
Authorized Signatory



*ES*

*Calat*

50

10/19

### DELIVERY NOTE

(Original)

#### CAAUVERY AGRO AGENCIES

Sarvamangala Homes  
81 Seethalai Sathanar Street  
NH1, Maraimalai Nagar  
PIN 603 209  
Tamil Nadu  
603209

E-mail : cauvery@vsnl.com

Buyer

#### Kalakshetra Foundation

Besant Nagar  
Chennai

Delivery Note No.

196

Dated

25-Nov-2010

Mode/Terms of Payment

against delivery

Supplier's Ref.

Other Reference(s)

Nil

Buyer's Order No.

Dated

E.Mail

19-Nov-2010

Despatch Document No.

Dated

Despatched through

Destination

Terms of Delivery

Description of Goods	Quantity	Rate	per	Disc. %	Amount
----------------------	----------	------	-----	---------	--------

1014 Vista Composite Pipe

1,854.00 Mts

Total 1,854.00 Mts

E. & O. E.

42

10/25/10  
Kalyan  
R. K. Srinivas

SECURITY Dept.  
KALAKSHETRA FOUNDATION  
THE COVILMIYUR,  
CHENNAI - 600 041.

Company's VAT TIN : 33443161807  
Company's CST No. : 41256/27-09-95

Recd. in Good Condition

for CAAUVERY AGRO AGENCIES

S. S. Venkatesh  
Authorised Signatory



D. N. Rajeev  
C.O.W.  
(S. N. Srinivasan)

59

Calad

5/9  
19

**DELIVERY NOTE**

(Original)

<b>CAAUVERY AGRO AGENCIES</b> Sarvamangala Homes 81 Seethalai Sathanar Street NH1, Maraimalai Nagar PIN 603 209 Tamil Nadu 603209 E-mail : cauvery@vsnl.com Buyer <b>Kalakshetra Foundation</b> Besant Nagar Chennai	Delivery Note No.	Dated
	<b>190</b>	<b>18-Nov-2010</b>
	Supplier's Ref.	Mode/Terms of Payment
	Buyer's Order No.	<b>against delivery</b>
	<b>E.Mail</b>	Other Reference(s)
	Despatch Document No.	<b>Nil</b>
Despatched through	Dated	<b>18-Nov-2010</b>
Terms of Delivery	Dated	
	Destination	

Description of Goods	Quantity	Rate	per	Disc. %	Amount
<b>1014 Vista Composite Pipe</b>	<b>2,150.00 Mts</b>				
<b>Total</b>		<b>2,150.00 Mts</b>			

E. & O. E.

*Recd*  
S/G. V. Nagam 18/11/10

SECURITY Dept.  
KALAKSHETRA FOUNDATION  
THIRU...  
CHENNAI... 041.

Company's VAT TIN : 33443161807  
Company's CST No. : 41256/27-09-95

Recd. in Good Condition

for CAAUVERY AGRO AGENCIES

*S. S. Veeriahali*  
Authorised Signatory



*F. Na. Jayaraj*  
*C.O.O.*  
*(S. Na. Jayaraman)*  
**55**

*Culal*

# INVOICE

(Original)

<b>CAAUVERY AGRO AGENCIES</b> Sarvamangala Homes 81 Seethalai Sathanar Street NH1, Maraimalai Nagar PIN 603 209 Tamil Nadu 603209 E-mail : cauvery@vsnl.com	Invoice No.	Dated
	176	7-Dec-2010
	Delivery Note	Mode/Terms of Payment
Buyer <b>Kalakshetra Foundation</b> Besant Nagar Chennai	Supplier's Ref.	Other Reference(s)
	Buyer's Order No.	Dated
	E.Mail	7-Dec-2010
	Despatch Document No.	Dated
	Despatched through	Destination
Terms of Delivery		


Description of Goods	Quantity	Rate	per	Disc. %	Amount
1014 Vista Composite Pipe	4,700.00 Mts ✓	30.00	Mts	7.50 %	1,30,425.00
4050 Vista Composite Pipes	500.00 Mts ✓	300.00	Mts	7.50 %	1,38,750.00
					2,69,175.00
<b>OUTPUT VAT @ 4%</b>				4 %	<b>10,767.00</b>
<b>Total</b>	<b>5,200.00 Mts</b>				<b>2,79,942.00</b>

Amount Chargeable (in words) E. & O. E.

**Rs. Two Lakh Seventy Nine Thousand Nine Hundred Forty Two Only**

Company's VAT TIN : 33443161807  
 Company's CST No. : 41256/27-09-95

Declaration  
 We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

for CAAUVERY AGRO AGENCIES  
  
 Authorised Signatory

*Qty checked as per DC attached on 7/12/10*



This is a Computer Generated Invoice

*S. Na. Raju*  
*G. Na. Jayakumar*

(56)

*Culap*



60

6/19

KALAKSHETRA - SLAB COOLING BOQ				
BILL OF QUANTITIES				
Sl. No	Description	Qty	Rate	Amount
		Mtr/No	Rs	
1	Supply of 1/2" Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	4700	45.50	213,850.00
2	Laying, fixing and installation and testing of 1/2" Composite Pipes with required clamps as per drawing	4700	25.00	117,500.00
3	Supply of 2" Composite pipes Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	500	244.30	122,150.00
4	Laying, fixing and installation and testing of 2" Composite Pipes with required clamps as per drawing and site	500	50.00	25,000.00
5	Supply, Laying, fixing and installation of Dia 63 mm Stainless Steel Pipe	30	1,600.00	48,000.00
6	1/2" Ball Valve	70	250.00	17,500.00
7	Butterfly Isolation valve for 40mm Dia pipe	6	1,400.00	8,400.00
8	Butterfly Isolation valve for 65mm Dia pipe	3	1,700.00	5,100.00
9	Pressure Independent Balancing Valve	35	11,500.00	402,500.00
10	Y-Strainer for 65mm Dia pipe	1	1,200.00	1,200.00
11	Non Return Valve for 65mm Dia pipe	1	1,700.00	1,700.00
12	Centrifugal back pullout Pump with VFD 64USGPM	1	72,500.00	72,500.00
13	Multi Stage Sand Filter for 64USGPM	1	98,500.00	98,500.00
14	Filling Material for Sand Filter	1	25,000.00	25,000.00
15	Heat Exchanger	1	50,000.00	50,000.00
16	25 Litre Indl. Water Heater	2	20,000.00	40,000.00
17	Stage Warm water Circulation Pump with starter	1	20,000.00	20,000.00
18	Valves , Accessories and Laying Charges Lump Sum	1	15,000.00	15,000.00
	Sub Total			1,283,900.00
	Local Tax @		4.00%	51,356.00
	Service Tax @		10.30%	132,241.70
	Grand Total			1,467,497.70

*D. Ra. Rajasekhar*  
*C.O.W.*  
*C.I. Ra. Jagakumar*

*A. V. Velmurugan*  


*Card*

57

# CAAUVERY AGRO AGENCIES

NO. 81, Sarvamangala Homes, Seethalai Sathanar Street, NH 1, Maraimalai Nagar - 603 209  
Tel : 044 - 47 468 969, Fax : 044 - 47 400 500, E.Mail: cauvery@vsnl.com

## PROFORMA INVOICE

Kalakshetra Foundation Besant nagar Chennai Kind Att:		Proforma Inv.No	51	
		Date:	11-Nov-10	
		Order Details		
		Party TAN No:		
Sl. No	Description	Qty Mtr/No	Rate Rs	Amount
1	Supply of 1/2" Vista Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	4700	30.00	141,000.00
2	Laying, fixing and installation and testing of 1/2" Vista Composite Pipes with requirwed clamps as per drawing	4700	30.00	141,000.00
3	Supply of 2" Vista Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	500	300.00	150,000.00
4	Laying, fixing and installation and testing of 2" Vista Composite Pipes with requirwed clamps as per drawing	500	200.00	100,000.00
5	Supply , Laying, fixing and installation of Dia 63mm Stainless Steel Pipe	30	1,200.00	36,000.00
6	1/2" Ball Valve	70	190.00	13,300.00
7	Butterfly Isolation valve for 40mm Dia pipe	6	2,200.00	13,200.00
8	Butterfly Isolation valve for 65mm Dia pipe	3	3,300.00	9,900.00
9	Pressure Independent Balancing Valve	35	12,000.00	420,000.00
10	Y-Strainer for 65mm Dia pipe	1	1,550.00	1,550.00
11	Non Return Valve for 65mm Dia pipe	1	750.00	750.00
12	Centrifugal back pullout Pump with VFD 64USGPM	1	40,000.00	40,000.00
13	Multi Stage Sand Filter for 64USGPM	1	150,000.00	150,000.00
14	Filling Material for Sand Filter	1	40,000.00	40,000.00
15	Heat Exchanger	1	32,000.00	32,000.00
16	25 Litre Indl. Water Heater	2	15,000.00	30,000.00
17	Stage Warm water Circulation Pump with starter	1	15,000.00	15,000.00
18	Valves , Accessories and Laying Charges Lump Sum	1	15,000.00	15,000.00
	Sub Total			1,348,700.00
	Discount @		7.50%	101,152.50
	Total			1,247,547.50
	Local Tax @		4.00%	49,901.90
	Grand Total			1,297,449.40
For Caauvery Agro Agencies				
VAT TIN No.: 33500362978 Area Code: 049				
CST No.: 843016 / 30.12.05				
		Authorised Signatory		
<b>VISTA PIPES - The Name that Spells the QUALITY</b>				

Offer Terms :			
Excise Duty : Included			
Taxes	CST / Vat / Local taxes extra as applicable		
Freight	Included up to your Door		
Insurance	Extra to Your account		
Payment	50% advance along with order 30% on supply prorata basis and balance 20 % on Completion.		
Delivery	Pipes and fittings 1 week Sand filter and Pump 4 weeks from the date of receipt of your confirmed order with advance		

D. Ra Jayaram  
C.O.W.  
C.S. Ra. Jayakumar

(ES)

Angu  
C.A. Velmurugan



Calal

**KALAKSHETRA - KOOOTHAMBALAM FLOOR  
SLAB COOLING WORKS - BILL OF QUANTITIES**

Sl. No	Description	Unit	Qty.	M/s. Caauevery Agro Agencies		M/s. Vibrant Industries Ltd.,	
				Unit Rate in Rs.	Total Amount in Rs.	Unit Rate in Rs.	Total Amount in Rs.
1	Supply of 1/2" Composite pipe Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	Mts.	4700	30.00	141,000.00	45.50	213,850.00
2	Laying, fixing and installation and testing of 1/2" Composite Pipes with required clamps as per drawing and site requirement.	Mts.	4700	30.00	141,000.00	25.00	117,500.00
3	Supply of 2" Composite pipes Manufactured as per IS 15450 ISI marked pipes for under floor cooling including delivery at site labour for laying and fixing.	Mts.	500	300.00	150,000.00	244.30	122,150.00
4	Laying, fixing and installation and testing of 2" Composite Pipes with required clamps as per drawing and site requirement.	Mts.	500	200.00	100,000.00	50.00	25,000.00
5	Supply, Laying, fixing and installation of Dia 63 mm Stainless Steel Pipe	Mts.	30	1,200.00	36,000.00	1,600.00	48,000.00
6	1/2" Ball Valve	Nos.	70	190.00	13,300.00	250.00	17,500.00
7	Butterfly Isolation valve for 40mm Dia pipe	Nos.	6	2,200.00	13,200.00	1,400.00	8,400.00
8	Butterfly Isolation valve for 65mm Dia pipe	Nos.	3	3,300.00	9,900.00	1,700.00	5,100.00
9	Pressure Independent Balancing Valve	Nos.	35	12,000.00	420,000.00	11,500.00	402,500.00
10	Y-Strainer for 65mm Dia pipe	No.	1	1,550.00	1,550.00	1,200.00	1,200.00
11	Non Return Valve for 65mm Dia pipe	No.	1	750.00	750.00	1,700.00	1,700.00
12	Centrifugal back pulout Pump with VFD 64USGPM	No.	1	40,000.00	40,000.00	72,500.00	72,500.00
13	Multi Stage Sand Filter for 64USGPM	No.	1	150,000.00	150,000.00	98,500.00	98,500.00
14	Filling Material for Sand Filter	No.	1	40,000.00	40,000.00	25,000.00	25,000.00
15	Heat Exchanger	No.	1	32,000.00	32,000.00	50,000.00	50,000.00
16	25 Litre Incl. Water Heater	Nos.	2	15,000.00	30,000.00	20,000.00	40,000.00
17	Stage Warm water Circulation Pump with starter	No.	1	15,000.00	15,000.00	20,000.00	20,000.00
18	Valves , Accessories and Laying Charges Lump Sum	No.	1	15,000.00	15,000.00	15,000.00	15,000.00
	Sub Total				1,348,700.00		1,283,900.00
	Discount @			7.50%	101,152.50		
	Total				1,247,547.50		51,356.00
	Local Tax @			4.00%	49,901.90		132,241.70
	Service Tax @			10.30%			
	Grand Total				1,297,449.40		1,467,497.70

*D. Dr. Rajaraj*  
*15-12-2010*

65

*Salal*

*(Signature)*



# Air Treatment Engineering Pvt Ltd

## Consultants

- MEP
- ELV
- Noise Control & Acoustics
- Green Buildings
- Design for COM
- Design for PC

To:

Date: 13 Dec 2010

The Director,  
Kalakshetra Foundations,  
Thiruvanmiyur,  
Chennai – 600 041.

Dear Sir,

Sub: ATE's recommendation for appointment of Vendor for Koothambalam Floor Slab Cooling Works.

With reference to the above subject, based on the discussions we had with the various vendors, the final prices given by the vendors are as under:

- |                                 |   |                   |
|---------------------------------|---|-------------------|
| 1. M/s. Caaavery Agro Agencies  | : | ₹ 12, 97, 449. 40 |
| 2. M/s. Vibrant Industries Ltd. | : | ₹ 14, 67, 497. 00 |

Our recommendation is as under:

Kalakshetra Koothambalam Floor Slab Cooling Vendor has to satisfy the following conditions:

1. Vendor to establish dedicated design team within 4 days and Vendor shall prepare and submit construction drawings including technical submittal and get the approval from Consultant.
2. There must be a full time dedicated team for this Project, who has no other work other than this site.
3. Completion schedule of the project within end of December 2010 including handing over.
4. For review meetings, the design head and the Project head must be present at site.

Based on the above conditions, we recommend you to place the order on  
*M/s. CAAUVERY AGRO AGENCIES*

Thanking you,  
For **Air Treatment Engineering Pvt. Ltd,**

Mr. K. P. S. Ramesh,  
MD & Principal Consultant

**BEE CERTIFIED ENERGY SAVING COMPANY**

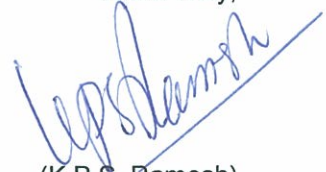
#L - 6, 2nd West Street, Kamaraj Nagar, Thiruvanmiyur, Chennai - 41. INDIA. Tele : 24412536 / 24454891 Fax : 24454306 e - mail:chennai@airtreatment.in

Chennai • Bangalore • Hyderabad • Kolkatta • Mumbai • Delhi

Steps in Kalakshetra:

1. Slab cooling using normal water / chilled water by controlling the water temperature above the dew point in the auditorium area
2. Fresh air supply to auditorium through multistage indirect evaporative cooling
3. Increased air circulation using HVLS fan in auditorium
4. Air-conditioning in the stage
5. Slab warming by hot water coils in the stage as a precaution for avoiding condensation

Yours Truly,



(K.P.S. Ramesh)

For Air Treatment Engineering Pvt. Ltd.,

**CONTROL:**

- When using surface systems for cooling it is important to control surface temperatures or water temperatures to avoid condensation. One possibility is to set a lower limit for the supply water temperature to equal the dew point temperature, i.e. absolute humidity in the space.
- In many applications surface heating and cooling systems are combined with a ventilation system. In this case the supply air is preconditioned to obtain a supply air temperature lower than the space temperature and remove latent loads by dehumidification. In this way the humidity, i.e. the dew point, will be controlled and the performance of the radiant cooling systems is then increased.
- Using pipes embedded in the concrete slabs will result in a system with a very high thermal Mass. In this case individual room control is not applicable. In most cases a zone control (south north), where the supply water temperature, the average water temperature or the flow rate may differ from zone to zone, is used.
- Relative small temperature differences between the heated or cooled surface and the space are typical for surface heating and cooling systems. This results in a significant degree of self control, because a small change in this temperature difference will influence the heat transfer between the cooled or heated surface and the space significantly.
- For a well designed building with a low heating and low cooling load a concrete slab system may be controlled at a constant core (water ) temperature year round. If for example the core is kept at 22 °C the system will heat at room temperatures below 22 °C and cool when the room temperature increases above 22 °C.

**ADVANTAGES:**

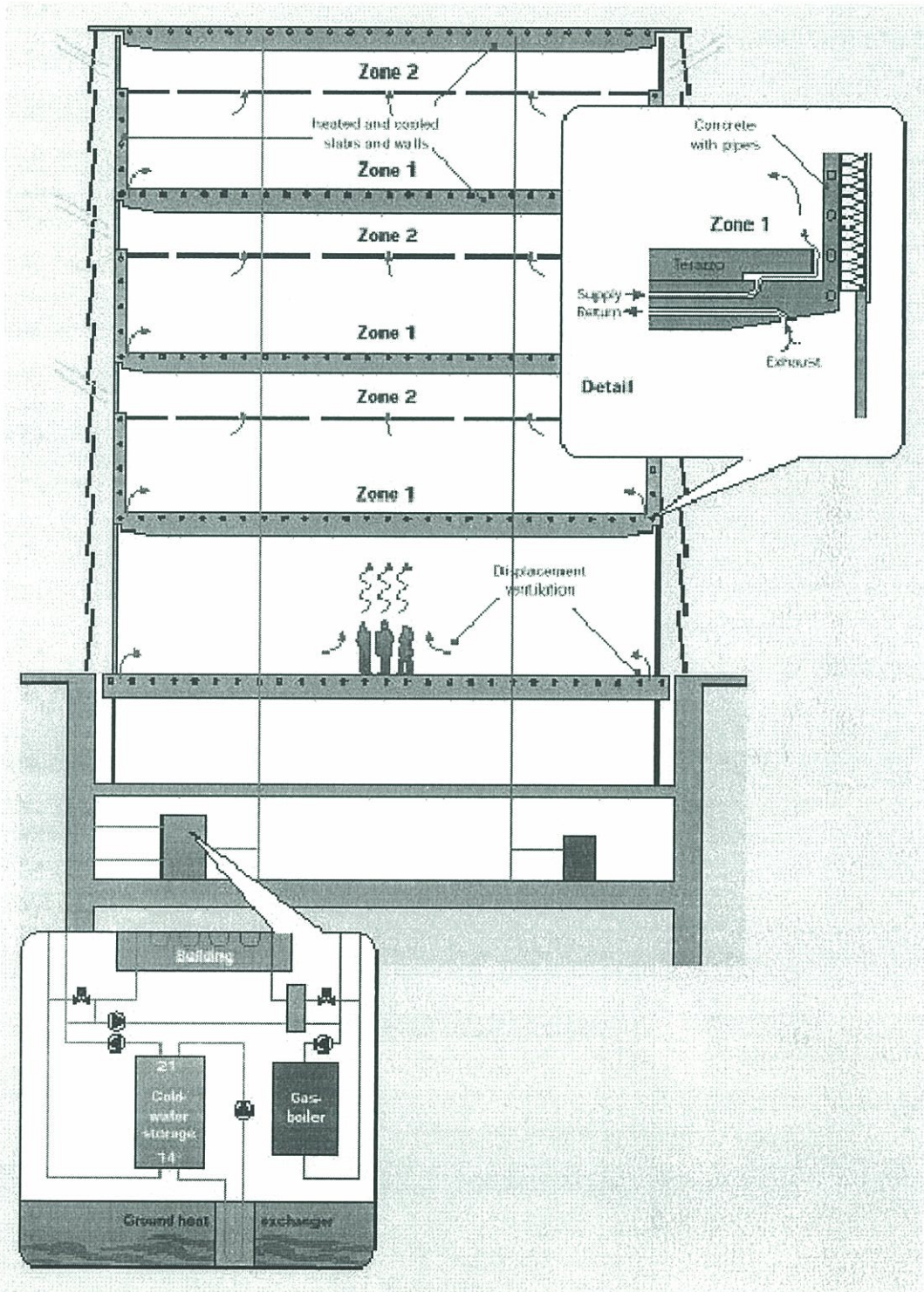
- Low cost per unit surface area.
- Larger active surface.
- Conditioning surfaces not air –May allow more extreme air temperatures while maintain the same account of comfort.
- More “extreme” air temperatures should result in less infiltration heat gain/loss
- Can be used to remove solar loads directly from receiving structural elements
- Thermal energy can be transported more efficiently with water than with air
- The avoidance of false ceilings has the big advantage of reducing the total building height, result is significant savings on construction costs and materials used.
- Higher Water temperature & thus reduces load on Chiller.
- Improve the efficiency of Equipments like chiller & Boiler.
- Better Indoor air quality.

**LIMITATIONS:**

- Back and edge losses—may require more insulation
- Choice of floor covering might decrease system efficiency
- Condensation potential (indoor rain)—cooling systems may require an air loop to avoid moisture condensing on the system

Office building with concrete slab heating / cooling, ventilation system, outside sunscreens and radiators.

A sample building with pipes embedded in walls and concrete slabs for heating and cooling. Details how the displacement ventilation and the generation system for cooling and heating.



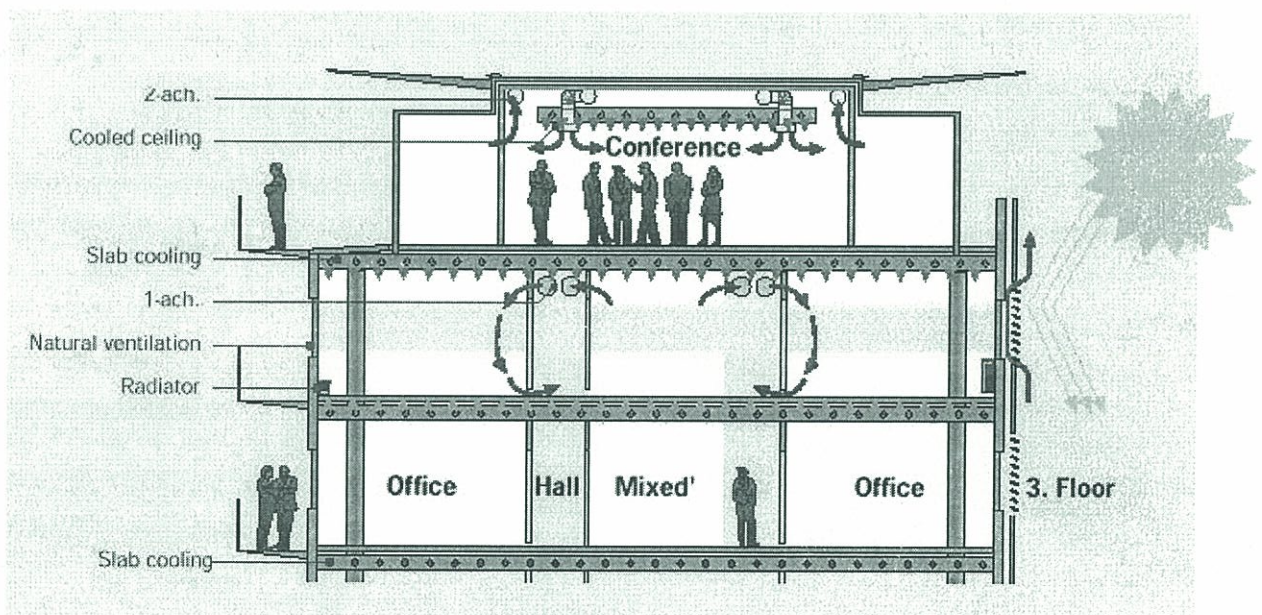
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## Air Treatment Engineering Pvt Ltd

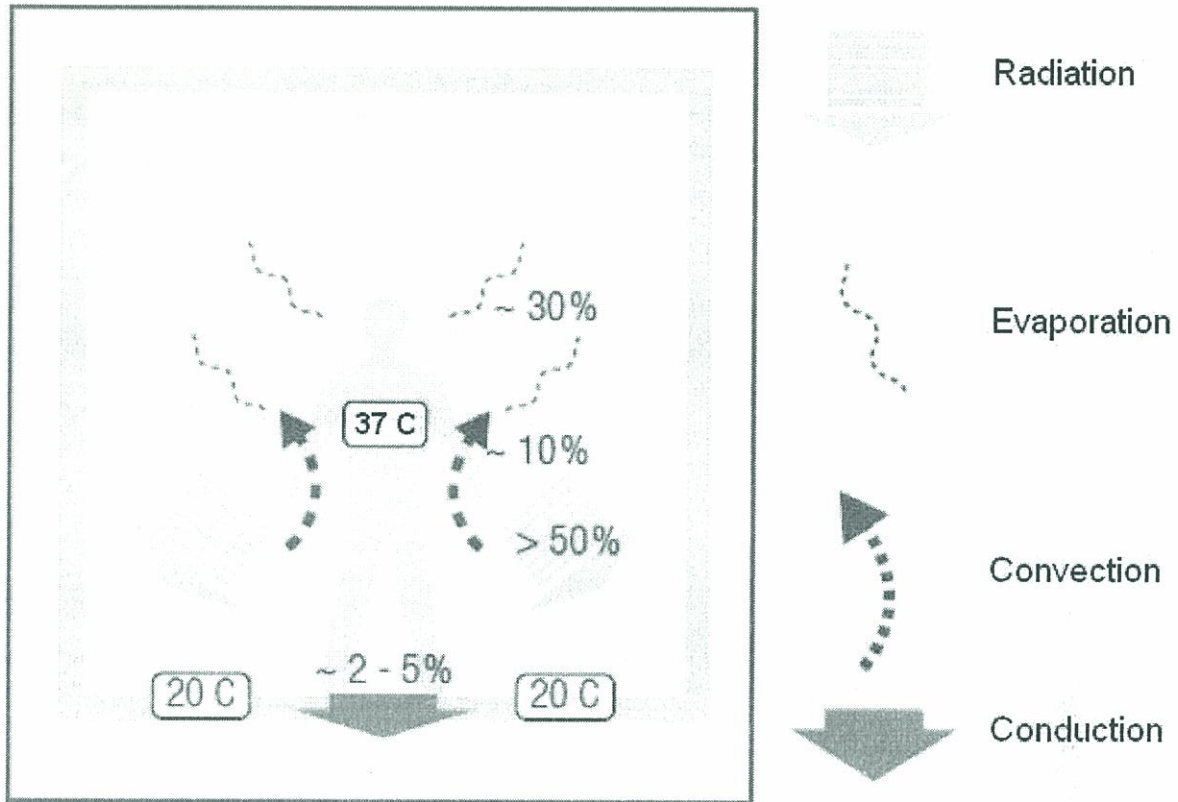
- If the humidity is not controlled, the cooling capacity may be further reduced in order to avoid surface condensations.
- To obtain the same capacities with the pipes embedded in the centre of the concrete slabs, an even wider water temperature range would be needed. This would, however, make it almost impossible to control the system because of the much greater thermal mass. Therefore much lower capacities should be used when designing concrete slab systems.
- In office buildings it is very common to use a raised floor for running cables. In the case of concrete slab cooling, most of the heat transfer will then be over the ceiling side, which means suspended ceilings should not be used.

Total heat exchange coefficient (convection + radiation) between surface and space for heating and cooling, acceptable surface temperatures and capacity by 20 °C room temperature for heating and 26 °C room temperature for cooling

		Total heat Exchange coefficient ( W/m <sup>2</sup> °K)		Acceptable surface temperature ( °C)		Maximum Capacity (W/m <sup>2</sup> )	
		Heating	Cooling	Max. Heating	Max. Cooling	Heating	Cooling
Floor	Perimeter	11	7	35	20	165	42
	Occupied Zone	11	7	29	20	99	42
Wall		8	8	~ 40	17	160	72
Ceiling		6	11	~ 27	17	42	99







- Figure shows that above 50% of heat coming from the men is only Radiant heat.
- And the less than 50% of heat coming from the men is conduction , convection & Evaporation.
- So it is necessary to control Mean Radiant temperature.

**HEATING AND COOLING CAPACITY:**

- Important factors for the heating and cooling if hydronic systems embedded in concrete slabs are the heat exchange coefficient between the slab surface and the indoor space.
- The acceptable minimum and maximum slab surface temperatures based on comfort, consideration of the dew point in the space, and heat transfer between the pipes and surfaces.
- The heat exchange coefficient depends on the position of the surface and the surface temperature in relation to the room temperature, While the radiant heat exchange coefficient is for all cases approximately 5.5 W/m<sup>2</sup>K, the convective heat exchange coefficient will change.
- The heat transfer between the embedded pipes and the surface of wall, ceiling or floor will as long as there is no airspace in the construction, follow the same physics for heat conduction.
- The heating and sensible cooling capacities mentioned above are for systems, where the pipes are positioned near the surface of ceiling or floor. This will require water temperatures within the range 15 to 45 °C depending on the construction of ceilings and floors.

*(Handwritten signature)*

## Modes of heat transfer

### Conventional Air conditioning

Gas

Least Efficient

Convection

### Radiant cooling

Liquid

Solid

Most Efficient

Conduction

Radiation

### THERMAL COMFORT:

- Radiant heat exchange between the human body and its surroundings has a significant influence on thermal comfort, and the mean radiant temperature (MRT) is an important factor in assessing this exchange.
- As the conventional mixed air systems cool building spaces only through convection, air temperature is considered as main factor is thermal condition Parameters & the importance of mean radiant temperature is over looked.
- In summer , the operative range is between 23°C & 26°C
- In Winter ,the operative range is between 20°C & 24°C
- The radiant cooling provides thermal comfort by controlling surface temperatures instead of indoor air temperature.
- With radiant cooling, heat rejection by radiation increases and perspiration decreases relative to conventional mixed air systems.

## Air Treatment Engineering Pvt Ltd

### DESIGN PRINCIPLES:

- The Radiant slab cooling system circulates constant flow, High temperature water around (16°C to 21°C) in Polyethylene pipes embedded in the concrete slabs.
- Beside the direct cooling and/or heating capacity of the flooring, the thermal storage capacity in the concrete slabs is being used.
- Floor acts a Large Radiator,
- This concept is working based on natural Buoyancy effects.
- Cool Air at Surface is drawn up as it is heated by People, Computers, etc.
- Warm air is Stratified High.
- Radiant Floor "Soaks" up solar gain and does not allow re-radiation
- Floor Slab Acts as "Water Side Economizer
- Concrete slab cooling and heating systems can use relative high water temperatures for cooling and relative low water temperature for heating. This increases the possibility of using renewable energy sources like ground heat exchangers, solar energy for heating and cooling and free night cooling. It also increases the efficiency of boilers, refrigeration machines and heat pumps
- The slab cooling system was intended to handle the base sensible cooling load which was occurred by People, Equipment & Solar heat gains.
- Water Vs Air as Heat transfer medium

Specific heat of water	-	4.187 KJ/kg°K
Density of water	-	1000 kg / m <sup>3</sup>
Specific heat of air	-	1.005 KJ/kg°K
Density of air	-	1.25 kg / m <sup>3</sup>

- Water can store 3400 times more thermal energy per unit volume than air.

## RADIANT SLAB COOLING

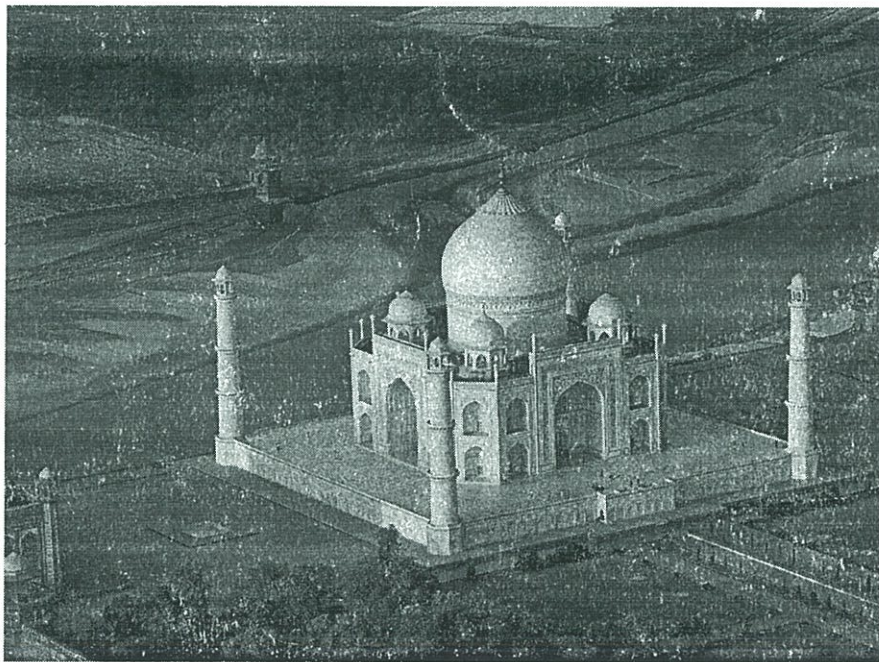
### INTRODUCTION:

A new trend which started in the early Nineties in Switzerland (Meierhans, 1993 & 1996) involves the use of thermal storage capacity of the concrete slabs between each storey in multi storey buildings. Pipes carrying water for heating & cooling are embedded in the centre of the concrete slab.

### NEED FOR RADIANT SLAB COOLING:

- Building account for one third of global non-renewable energy use.
- Space cooling through air-conditioning typically provided through electric compressor-driven refrigeration, contributing a significant portion of commercial building energy use with direct or indirect negative environmental impacts
- As an alternative to conventional air conditioning, radiant cooling has the potential to improve energy efficiency & Thermal comfort.

### HISTORICAL OVERVIEW: (TAJ MAHAL, INDIA):

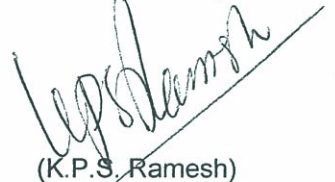


- Thermal energy stored in thick Walls & Floors.
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Steps in Kalakshetra:

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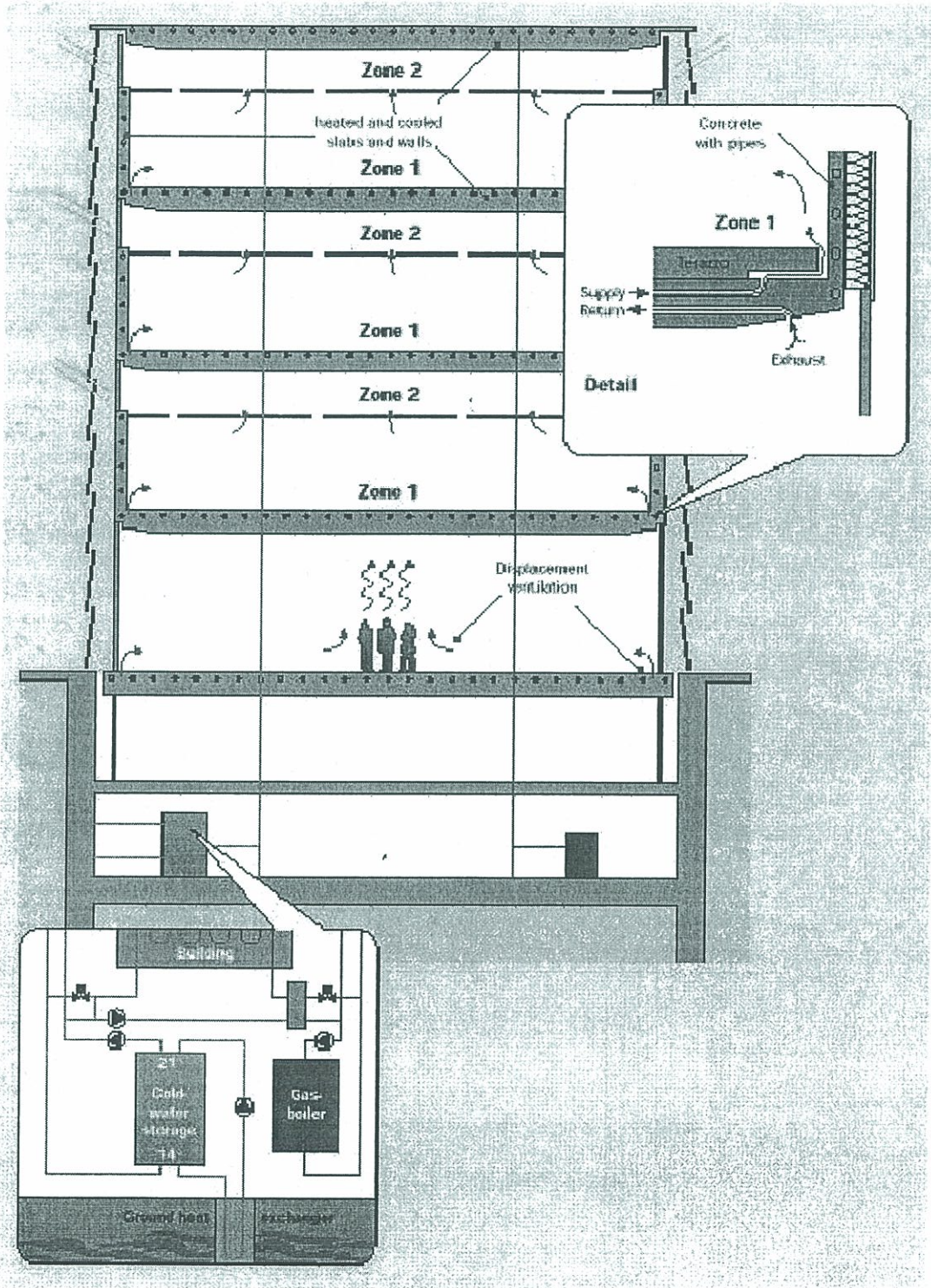
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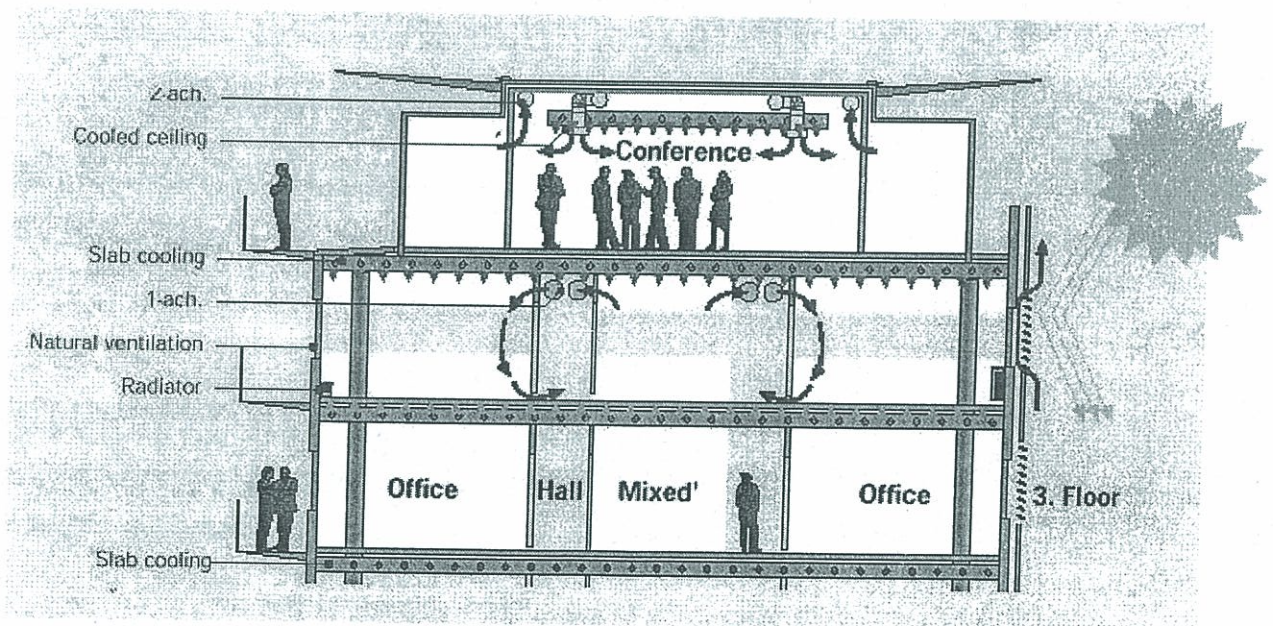


# Air Treatment Engineering Pvt Ltd

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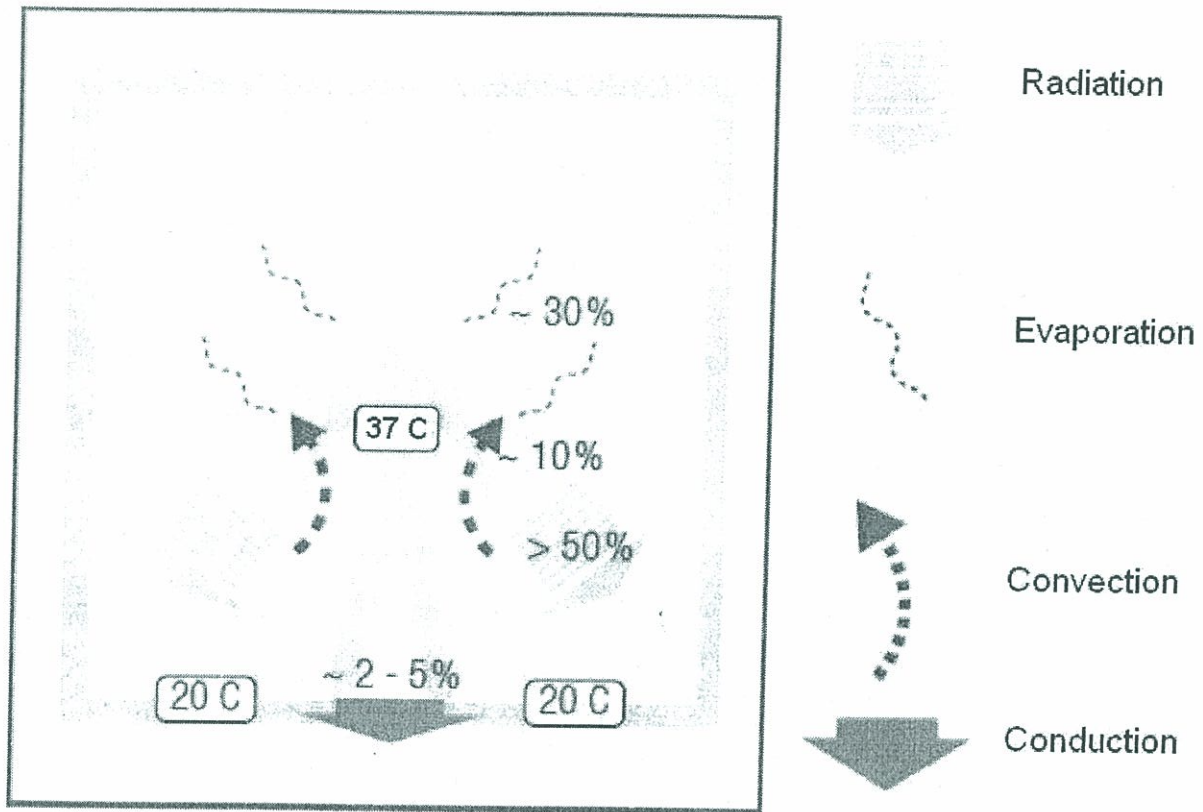
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72



70



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73

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Liquid

Solid

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# Air Treatment Engineering Pvt Ltd

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75

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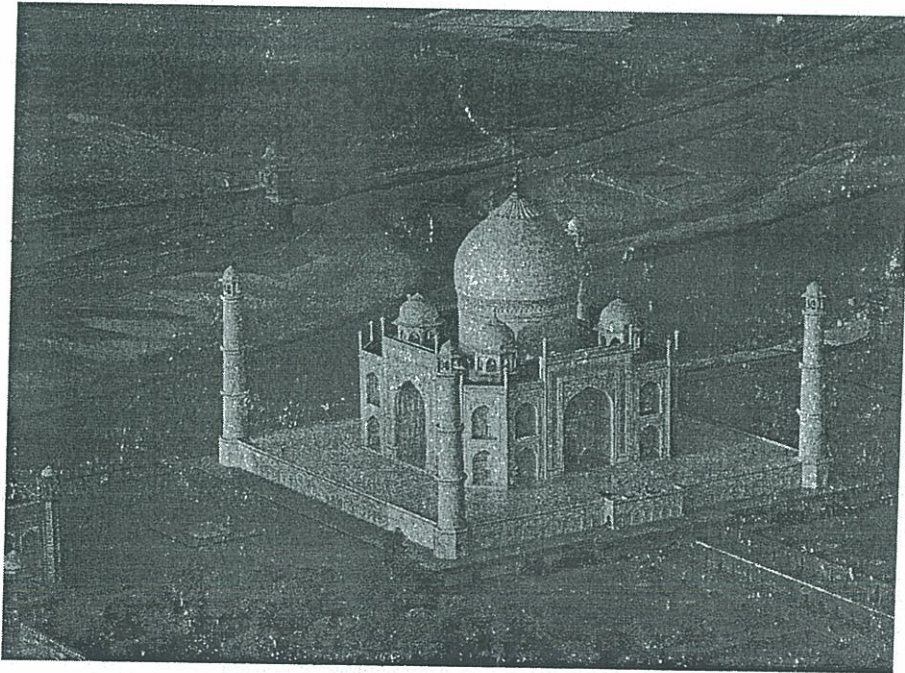
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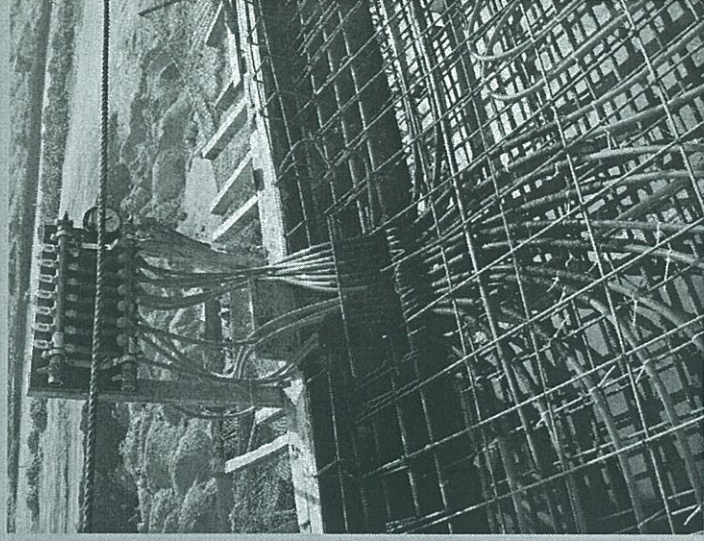
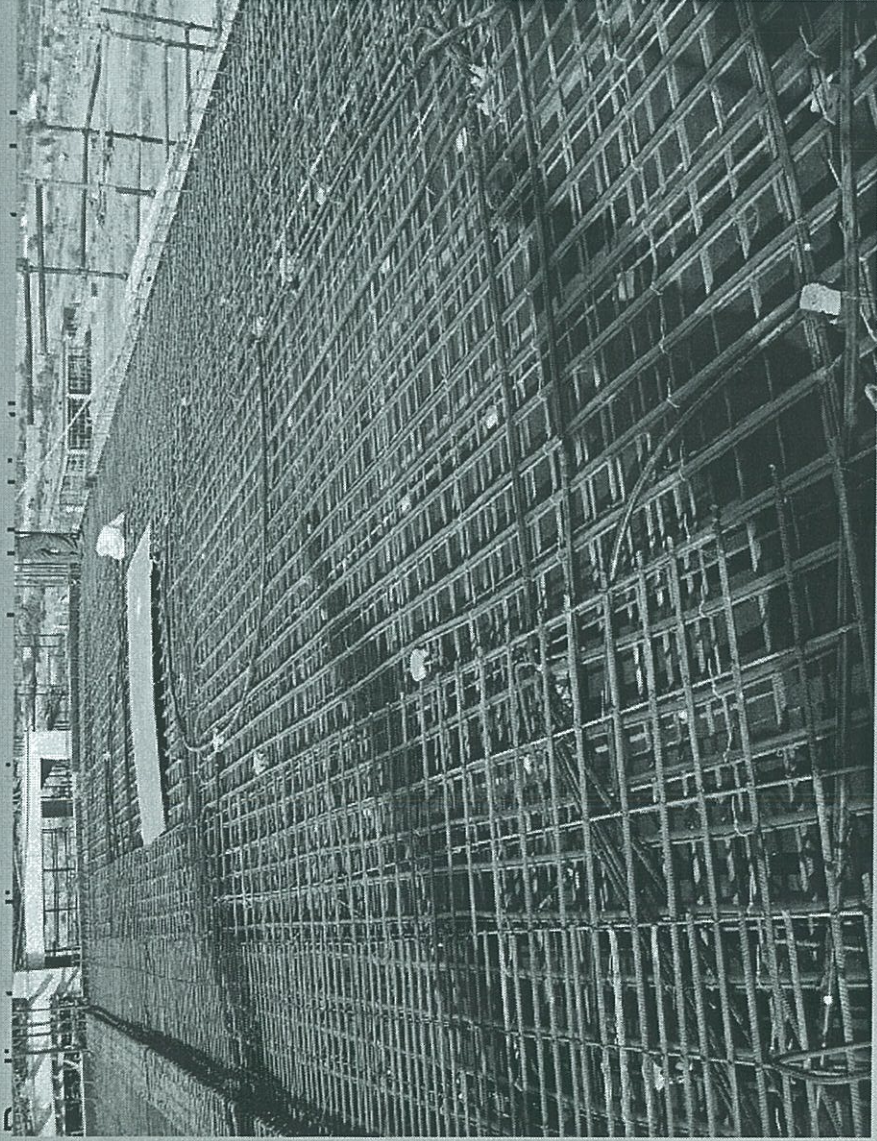
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Page 1 of 8

**BEE CERTIFIED ENERGY SAVING COMPANY**

# Radiant Cooling- Construction sequence

Case Study – SDB-1, Pocharam campus, Hyderabad



# Geothermal Radiant Floor Slabs

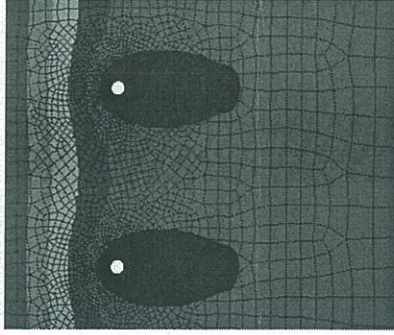
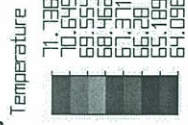
## Geothermal Radiant

- Geothermal Loop Temperatures are Ideal for Radiant Floor Cooling
  - 52 – 56 deg. F.
- Floor Slab Acts as “Water Side Economizer”
- Use Water to Water HP’s or Chiller/Heater
  - Need to Produce Hot Water for Heating
- No Vapor Compression Refrigeration for Cooling
  - Radiant Floor Slab can provide sensible cooling capacity for Classroom
  - DOAS Provides Latent Cooling Capacity
- DOAS Can Utilize 52 deg. F Geothermal Water to Maintain Required Dewpoint Temps.

### Additional Conditions:

1/2 in RAUPEX, 6in O.C.  
 Film Coefficient: 1.65 (BTU/hr-ft<sup>2</sup>-°F)  
 There are no additional conditions applied to the side of the model.  
 With these conditions and the material properties listed the following results were obtained

MCWT (°F)	Flow Output (BTU / ft <sup>2</sup> )	Average Floor Surface Temp (°F)
64	8.7	71.6
68	6.0	73.3
70	4.7	74.1
72	3.3	75.0



FEM Modeling results of a radiant cooling floor slab design using a program developed by Algor. Illustration courtesy of Rehau, Inc.

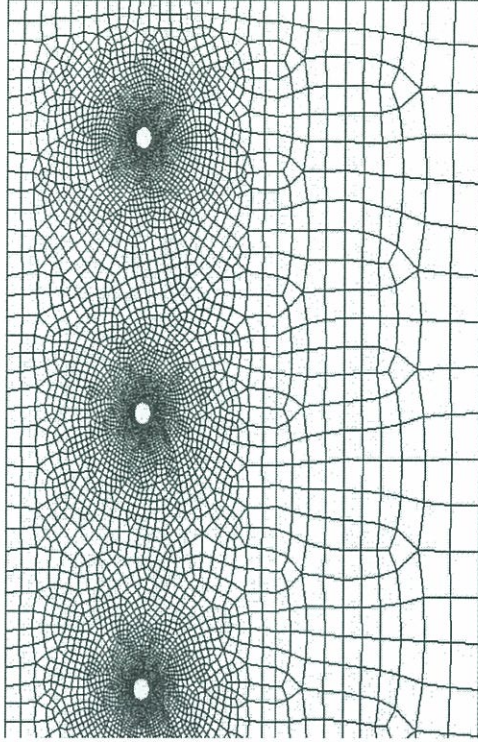
# Geothermal Radiant Floor Slabs

## Radiant Cooling Concepts

- Human Comfort Equation
  - $T_{\text{resultant}} = 0.5 * (T_{\text{ambient}} + \text{MRT})$
  - MRT = Mean Radiant Temperature
- Long Response Time
- Utilizes Thermal Mass to Store Energy
- Slab Surface Temperature is Controlled
- Computer Simulations
  - CFD
  - FEM
  - Manufacturer's Programs
    - Rehau

Material Properties York University Cooling Model (Slab)

Material	Color	K-Value (BTU/h/in °F)
Concrete (8 in)	Green	0.045
Insulation	Red	0.0014
Radiant X	Pink	0.02
Glass	Purple	0.0183

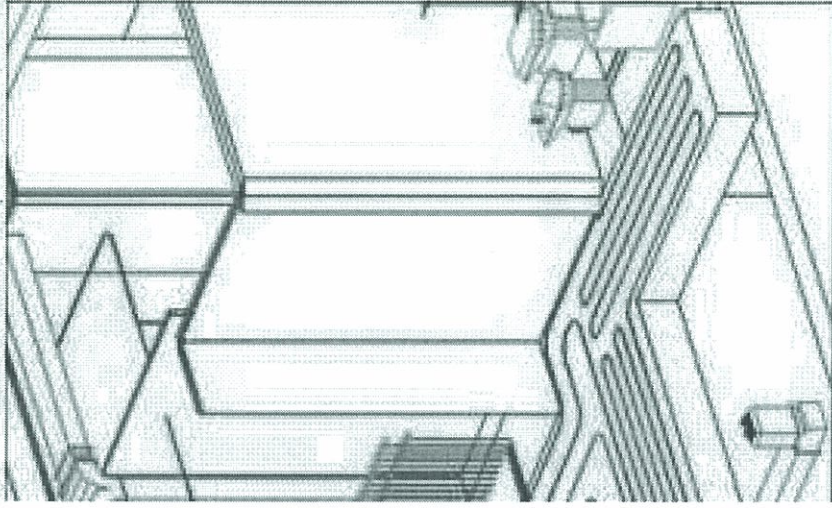


FEM Modeling results of a radiant cooling floor slab design using a program developed by Algor. Illustration courtesy of Rehau, Inc.

## Geothermal Radiant Floor Slabs

### Radiant Cooling Concepts

- PEX Tubing Embedded in Concrete
- Ideal Water Temperature Ranges
  - 58 – 62 Deg. F.
- Floor Acts as Large Radiator
- Natural Buoyancy Effects
  - Cool Air at Surface is Drawn up as it is Heated by People, Computers, etc.
- Stratification
  - Warm air is Stratified High
- Sponge Effect
  - Radiant Floor "Soaks" up solar gain and does not allow re-radiation





# Slab cooling

By M/s.CARD and ATE

18

1



रसो वै सः

Kalakshetra Foundation

45

C:\2010-2011\V.Admin\2.Engineering\i.Plan\Kootambalam\HVAC work.doc	14 December 2010
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M/s.CARD,  
# 10A, 2<sup>nd</sup> floor, Dhanalakshmi Colony,  
1<sup>st</sup> street, Vadapalani,  
Chennai 600 026.

Kind Attention. Architect Shri.Ravi Nilakantan

Sub: Koothambalam – Heating, ventilation and Air conditioning work (HVAC) –Slab Cooling work– Reg.

- Ref: i) The tender ref: Kalakshetra/MS/BOQ dated 27<sup>th</sup> August, .2010 from M/s.Unimech Systems (Chennai) Pvt ltd.  
ii) The revised offer ref: Kalakshetra/PGK/BOQ/R-1, dated 15.09.2010 from M/s.Unimech Systems (Chennai) Pvt ltd.  
iii) The revised offer ref: Kalakshetra/PGK/BOQ/R-2, dated 16<sup>th</sup> September, 2010 M/s.Unimech Systems (Chennai) Pvt ltd.  
iv) Justification letter from M/s.ATE pvt ltd dated 20.09.2010  
v) The award of letter recommendation from M/s.CARD dated 21<sup>st</sup> September 2010  
vi) Email with 4 attachments from M/s.CARD dated Mon, Dec 13, 2010 at 8.11 P.M.

With reference to your letter cited in reference (vi) above, the following points need to be clarified.

- Have this (slab cooling work) work covered in the original scope of work entrusted to M/s.Unimech engineers or is the same supplementary work?
- The need for this work proposal and justification.
- Only two quotations were received and it needs minimum three quotations for Finalising the work.
- No EMD provision and terms and conditions of the quotation has been obtained and forwarded.
- All the quotes and recommendation were received by email and further these may be requested to get the hard copy duly signed by the supplier may be forward for record.
- The justification for accepting the rates along with a rate analysis (based on accepted PWD /other government department rate) and quotation needs to be given while submitting the final recommendation by M/s.CARD.
- What is the financial terms of the quotes received?
- What is the schedule of completion – delivery of materials and completion of work specified in quotes
- It is seen from the M/s.Caauvery Agro Agencies quote that discounted price quoted, profit and amount. What does it means?

This is issued the approval of competent authority.

EQ 21/12/10

Received  
copy of letter  
D. Ra. Jayaram  
C.J. Ra. Jayaram  
c-o-w.  
21/12/10

Founder: Smt Rukmini Devi  
Chairman: Justice Sri S. Mohan  
Director & Secretary: Ms. Leela Samson



E-mail: admin@kalakshetra.in  
Phone: +91-(0)44-24520836/4057/1844  
Fax: +91-(0)44-24524359

Tiruvanmiyur, Chennai 600 041, India

www.kalakshetra.in

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Note:

Sub: Koothambalam – Heating , ventilation and Air conditioning work (HVAC) –Slab Cooling work – Award of work – Reg.

Ref: Email with 4 attachment from M/s.CARD dated Mon, Dec 13,2010 at 8.11 P.M. - Page 41.

The consulting Architect Shri.Ravi Niilakantan from M/s.CARD has sent the email for slab cooling work, which included ~~email~~ two quotes from the suppliers. Further the Consultant forwarded HVAC Consultant's M/s.ATE recommendation and comparison statement. Page 32 to 41

The following further points need to be obtained from M/s.CARD, before finalising the matter at our end.

- Have this (slab cooling work) work covered in the original scope of work entrusted to M/s.Unimech engineers OR supplementary work?
- The need for this work proposal and justification ~~may be submitted.~~
- Only two quotations were received and it needs minimum three quotations for finalising.
- No EMD provision and terms and conditions of the quotation ~~were~~ <sup>has been</sup> obtained and forwarded.
- All the quotes and recommendation were received by email only. Hard copy duly signed by the supplier may be forwarded for record.
- The justification for accepting the rates and quotation needs to be given while submitting the final recommendation by M/s.CARD.
- What is the financial terms ~~accepted?~~ <sup>of the quotes received?</sup>
- What is the schedule of completion – delivery of materials and completion of work specified? ~~in the quotes.~~
- It is seen from the M/s.Cauvery Agro agencies quote that discounted price quoted, profit and amount, what does it means? P38/c

Based on the reply from the Consulting Architect Shri.Ravi Niilakantan/M/s.CARD, the file will be put up again please.

Submitted please.

*J. Ramech*  
AO 14.12.10

*[Signature]*  
EO 14/12/10

*[Signature]*  
CAO 14/12/10

Deputy Director *[Signature]*

Director. *[Signature]*

*Calal*  
16/12

*[Signature]*



15  
1/19

**CENTRE FOR ARCHITECTURAL RESEARCH & DESIGN**  
ARCHITECTURE ○ LANDSCAPE ○ INTERIORS

29.12.2010.

Smt. Leela Samson,

✓ Director,

Kalakshetra Foundaton,

Thiruvanmiyur,

Chennai – 600041.

Ref: C:\2011-2011\V.Admin\2.Engineering\i.Plan\Koothambalam\HVAC work.doc dt.14.12.2010.

Sub: Koothambalam-Heating\ventilation and air-conditioning work (HVAC) – Slab cooling

Dear Smt. Leelaji,

With reference to the above I clarify the following:

- Slab cooling is not in Ms. Unimech engineers' scope.
- Reg. justification, our consultant Sri. Ramesh had prepared explanations, which was forwarded to you on the 13<sup>th</sup> Dec.2010.
- Only 2 quotations were received. This is not a scheduled work. These are sustainable procedures and large vendor base is unavailable at the moment.
- SD & EMD not insisted, due to the point mentioned above. Bills will be certified after delivery and completion as running payments. Retentions will be made.
- Intimations are provided by mail and hard copies are also provided.
- As mentioned earlier, there are no clear CPWD rates available for sustainable works. Rates are arrived logically.
- Value of work is @ 14lacs. Bills will be progressive payments with retention. We could identify only 2 vendors.
- Completion by Jan 20<sup>th</sup> 2011. Piping work is 80% complete and RCC protection completed at site.
- Clear quote from Ms. Caaavery Agro Agencies is enclosed.

Regards,

  
Ravi niilakantan

Encl: Ms. Caaavery quote

Caled

(95)

viii	What is the schedule of completion – delivery of materials and completion of work specified in quotes <i>Page 45</i>	Completion by Jan20th 2011. Piping work is 80% complete and RCC protection completed at site. <i>Page 65</i>	May be considered
ix	It is seen from the M/s.Caaavery Agro Agencies quote that discounted price quoted, profit and amount. What does it means? <i>Page 45</i>	Clear quote from M/s.Caaavery Agro Agencies enclosed <i>Page 65</i>	Since obtained

Based on the clarification issued by M/s.CARD, on the pointed received by us, this contract may be awarded to M/s.Caaavery Agro Agencies at a total cost of Rs.12, 97,449.40 (Rupees twelve lakh ninety seven thousand four hundred and forty nine and forty paise only) as per the terms and conditions suggested by the consulting Architect M/s.CARD- Shri.Ravi Nilakantan.

If approved, the papers may be submitted to works committee for approval, an additional expenditure sanction for Rs.12, 97,449.40 (Rupees twelve lakh ninety seven thousand four hundred and forty nine and forty paise only) towards slab cooling work at koothambalam. (A)

*S. Ramachandran*  
AO  
20.1.11

*J. S. G. N.*  
CAO  
29/1/11

Deputy Director

DIRECTOR

*Cardal*  
29/1

(A) also may be ensured -  
*K. S. S.*  
28.1.

*S. S. S.*  
EO  
20/1/11

(26)

ii.	The need for this work proposal and justification may be submitted for obtaining expenditure sanction and approval from the competent authority. <i>Page 65</i>	Reg. justification, our consultant (his associates) Sri.Ramesh had prepared Explanations, which was forwarded to you on 13 <sup>th</sup> December 2010. <i>Page 66-73</i>	Placed at page 47-54/c
iii.	Only two quotations were received and it needs minimum three quotations for Finalising work. <i>Page 45</i>	Only two quotations were received. This is not a scheduled work. These are Sustainable procedures and large vendor base is unavailable at the moment. <i>Page 65</i>	Customised items may be considered as recommended by M/s.CARD
iv.	No EMD provision and terms and conditions of the quotation were not obtained and forwarded <i>Page 45</i>	SD&EMD not insisted, due to the point mentioned above. Bills will be certified after delivery and completion as running payments. Retentions will be made. <i>Page 65</i>	May be considered
v.	All the quotes and recommendation were received by email and further these may be requested to get the hard copy duly signed by the agency may be obtained. <i>Page 45</i>	Intimations are provided by mail and hard copies are also provided. <i>Page 65</i>	Hard copies received from the consulting Architect and placed below at page no.59,60,61
vi	The justification for accepting the rates and quotation needs to be given while submitting the final recommendation by M/s.CARD <i>Page 45</i>	As mentioned earlier, there are no clear CPWD rates are available for sustainable works. Rates are arrived logically <i>Page 65</i>	In view of the reply by M/s.CARD, this may be considered.
vii	What is the financial terms of the quotes received? <i>Page 45</i>	Value of work is 14 lakh. Bills will be progressive payments with retention. We could identify only 2 vendors. <i>Page 65</i>	No clear financial terms indicated

(87)

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Sub: Koothambalam – Heating, Ventilation and Air conditioning work (HVAC) –Slab Cooling work – Additional expenditure sanction - Award of work – Reg.

- Ref:i) Email with 4 attachment from M/s.CARD  
 Dated Mon, Dec 13, 2010 at 8.11pm -P 31 - 42  
 ii) Clarification note sent to M/s.CARD dated 14<sup>th</sup> December 2010 -P 43, 44  
 iii) Reply submitted by M/s.CARD dated 29.12.2010 -P 46 - 65

**Chronology**

- All the tender documents were received by J.Ra.Jeyakumar/ M/s.CARD/M/s/ATE, and sent to Kalakshetra Foundation on 02.09.2010 for opening. Opened tenders documents were sent to the Consulting Architect M/s.CARD with comments for further recommendation on the same day.
- M/s.CARD, M/s.ATE given their recommendation and justification for awarding the work of Heating, Ventilation and Air conditioning work at Koothambalam was forwarded to Kalakshetra Foundation on 21.9.2010, to release the work order in favour of M/s.Unimech systems at a total cost of Rs. 1.18 crore.
- Based on the recommendations, the works committee approved to award the work in favour of M/s.Unimech systems on 7.10.2010 and 19.10.2010 with clarification.
- The work order dated 8.10.2010 issued to M/s.Unimech systems on 12.10.2010

Page 7, 8  
HVAC work file

Page 60-63  
HVAC work file.

Page 132  
HVAC work file.

Page 123-125  
HVAC work file

The HVAC work at Koothambalam is under progress, Meanwhile, M/s.CARD given the proposal for slab cooling work. This is an additional item of work beyond the HVAC work entrusted to M/s.Unimech Engineers. In this connection, the clarification note was sent to M/s.CARD on 14<sup>th</sup> Dec 2010

Page 45

Further the work involves specialisation in slab cooling for which a separate tender condition is formalised by M/s.CARD.

In continuation of above subject, The Consulting Architect, M/s.CARD/Shri. Ravi Nilakantan submitted the reply in point by point for the following.

Page 65

S. No.	Query raised by the Kalakshetra	Reply given by the M/s.CARD	Further Remarks
i.	Have this (slab cooling work) work covered in the original scope of work entrusted to M/s.Unimech engineers OR supplementary work	Slab cooling is not in M/s.UNIMECH Engineers scope  Page 65	This is an additional item for which separate sanction is required

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vii	What is the financial terms of the quotes received?  <i>page 45</i>	Value of work is 14 lakh. Bills will be progressive payments with retention. We could identify only 2 vendors. <i>Page 65</i>	No clear financial terms indicated
viii	What is the schedule of completion - delivery of materials and completion of work specified in quotes  <i>page 45</i>	Completion by Jan20th 2011. Piping work is 80% complete and RCC protection completed at site. <i>page 65</i>	May be considered
ix	It is seen from the M/s.Caaavery Agro Agencies quote that discounted price quoted, profit and amount. What does it means? <i>page 45</i>	Clear quote from M/s.Caaavery Agro Agencies enclosed  <i>Page 65</i>	Since obtained

It is submitted that based on the clarification issued by M/s.CARD, , this contract may be awarded to M/s.Caaavery Agro Agencies at a total cost of Rs.12, 97,449.40 (Rupees twelve lakh ninety seven thousand four hundred and forty nine and forty paise only) as per the terms and conditions suggested by the consulting Architect M/s.CARD- Shri.Ravi Niilakantan.

*page 64 This.*

The file containing the relevant papers are submitted to works committee for approval, for an additional expenditure sanction for Rs.12, 97,449.40 (Rupees twelve lakh ninety seven thousand four hundred and forty nine and forty paise only) towards slab cooling work (HVAV work) at Koothambalam.

*Cola Samson*  
 DIRECTOR  
*9/2011*

*Machavi Nudgal*  
 Smt. Machavi Nudgal

Shri. P.T.Krishnan

*In addition to the above queries and clarifications, its customary to include one year's guarantee (defects liability period) for the performance of the system in the price. The terms as stated is orient on this. This needs clarification as there are several mechanical components in the system. A description of the maintenance schedule may also be obtained from the supplier.*

*P. T. Krishnan*  
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ii.	The need for this work proposal and justification may be submitted for obtaining expenditure sanction and approval from the competent authority. <u>Page 45</u>	Reg. justification, our consultant (his associates) Sri.Ramesh had prepared Explanations, which was forwarded to you on 13 <sup>th</sup> December 2010. <u>Page 66-73</u>	Placed at page 47-54/c
iii.	Only two quotations were received and it needs minimum three quotations for Final. ing work.  <u>page 45</u>	Only two quotations were received. This is not a scheduled work. These are Sustainable procedures and large vendor base is unavailable at the moment. <u>Page 65</u>	Customised items may be considered as recommended by M/s.CARD
iv.	No EMD provision and terms and conditions of the quotation were not obtained and forwarded  <u>page 45</u>	SD&EMD not insisted, due to the point mentioned above. Bills will be certified after delivery and completion as running payments. Retentions will be made. <u>page 65</u>	May be considered
v.	All the quotes and recommendation were received by email and further these may be requested to get the hard copy duly signed by the agency may be obtained. <u>Page 45</u>	Intimations are provided by mail and hard copies are also provided.  <u>Page 65</u>	Hard copies received from the consulting Architect and placed below at page no.59,60,61
vi	The justification for accepting the rates and quotation needs to be given while submitting the final recommendation by M/s.CARD <u>Page 45</u>	As mentioned earlier, there are no clear CPWD rates are available for sustainable works. Rates are arrived logically <u>Page 65</u>	In view of the reply by M/s.CARD, this may be considered.



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## Kalakshetra Foundation

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Sub: Koothambalam – Heating, Ventilation and Air conditioning work (HVAC) –Slab Cooling work – Additional expenditure sanction - Award of work – Reg.

Ref:i) Email with 4 attachment from M/s.CARD

Dated Mon, Dec 13, 2010 at 8.11pm

–P 31 - 42

ii) Clarification note sent to M/s.CARD dated 14<sup>th</sup> December 2010

–P 43, 44

iii) Reply submitted by M/s.CARD dated 29.12.2010

–P 46 - 65

### Chronology

- All the tender documents were received for opening by J.Ra.Jayakumar/ M/s.CARD and his associates M/s. Air Treatment Engineering Pvt ltd and sent to Kalakshetra Foundation on 02.09.2010. Page 7, 8  
HVAC work file
- Opened tenders documents were sent to the Consulting Architect M/s.CARD with comments for further recommendation on the same day.
- M/s.CARD and his associates M/s.ATE given their recommendation and justification for awarding the work of Heating, Ventilation and Air conditioning work at Koothambalam favour of M/s.Unimech systems at a total cost of Rs. 1.18 crore was forwarded to Kalakshetra Foundation on 21.9.2010 Page 60-63  
HVAC work file
- Based on the recommendations, the works committee approved to award the work in favour of M/s.Unimech systems on 7.10.2010 and 19.10.2010 Page 132  
HVAC work file
- The work order dated 8.10.2010 issued to M/s.Unimech systems on 12.10.2010 Page 123-125  
HVAC work file
- Clarification note was sent to M/s.CARD on 14<sup>th</sup> Dec 2010 — Page 45 / thro.
- Reply from M/s CARD received on 29.12.2010 — Page 65 / thro

The HVAC work at Koothambalam is under progress. Meanwhile, M/s.CARD given the proposal for slab cooling work. This is an additional item of work beyond the HVAC work entrusted to M/s.Unimech Engineers. Further the work involves specialisation in slab cooling for which a separate tender condition is formalised by M/s.CARD. As this is a additional work beyond the already awarded work of HVAC work, it is submitted for the works for the approval of the same. Page 66-73  
Page 65 / thro.

To facilitate the works Committee, it is also submitted along with the reply given by M/s Card for the query raised and the further remarks of the Kalakshetra Foundation thereon.

S. No.	Query raised by the Kalakshetra	Reply given by the M/s.CARD	Further Remarks
i.	Have this (slab cooling work) work covered in the original scope of work entrusted to M/s.Unimech engineers OR supplementary work <span style="float: right;">Page 45</span>	Slab cooling is not in M/s.UNIMECH Engineers scope <span style="float: right;">Page 65</span>	This is an additional item for which separate sanction is required

Founder: Smt Rukmini Devi  
Chairman: Justice Sri S. Mohan  
Director & Secretary: Ms. Leela Samson



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Phone: +91-(0)44-24520836/4057/1844  
Fax: +91-(0)44-24524359

(91)



Works kalakshetra <works@kalakshetra.in>

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## slab cooling work at koothambalam - clarification- requested- Reg

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Works kalakshetra <works@kalakshetra.in>  
To: ravi <card@vsnl.com>

Fri, Feb 11, 2011 at 6:45 PM

Sir,

The papers of slab cooling work at Koothambalam was sent to works committee for approval and they requested the following,

*'In addition to the queries and clarifications, its customary to include one year's guarnatee(Defects liability period for the performance of the system in the price. The terms as stated is silent on this. This needs clarification as there are several mechancial components in the system. A description of the maintenance schedule may also be obtained from the supplier.'*

Submitted

V.Srinivasan  
kalakshetra

(92)



# CAAUVERY AGRO AGENCIES

Chennai Office : ~~116, Kamaraj Avenue 2nd Street, Chennai - 20~~ ☎: ~~52 116 666, 52 117 117~~

E-mail : ~~cauvery@kitechindia.com~~ Website : ~~www.kitechindia.com~~

Salem Office : New # 55, Kalanguthu Street, Salem - 636 001. ☎: (0427) 226 7171, 553 5353

E-mail : cauveryslm@kitechindia.com

84/5 Perundar Jala, NH 1, Maraimalai Nagar,  
PIN - 603 209 - Ph: 47400400

15<sup>th</sup> Feb 2011

The Director  
Kalakshetra Foundations,  
Thiruvanniyur,  
Chennai- 600 041.

DIRECTOR.

Sub: Slab Cooling Works – Warranty & Maintenance Schedule.

Sir / Madam,

With reference to your query on maintenance of the under slab cooling system we are enclosing the same duly signed by Mr. Jayakumar and Air Treatment Systems. Since Mr. Ravi Neelakandan Architect is out of town we were not able to get his signature. He has informed us he will be signing the same in your office during his next visit. In the mean time considering the long delay please issue us the work order and arrange for payment.

Thank You

For Caaavery Agro Agencies,

S. S. Venkatesan.

Authorized Signatory,

For Air Treatment Engg.  
15/2/11.



P. Ra. Dujare  
C.O.W.  
(S. Ra. Jayakumar)  
15/2/11

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# CAAUVERY AGRO AGENCIES

Chennai Office : ~~116, Kamaraj Avenue 2nd Street, Chennai - 20.~~ ☎: ~~52 116 666, 52 117 117~~

E-mail : ~~cauvery@kitecindia.com~~ Website : ~~www.kitecindia.com~~

Salem Office : New # 55, Kalanguthu Street, Salem - 636 001. ☎: (0427) 226 7171, 553 5353

E-mail : cauveryslm@kitecindia.com

8415 Pavendar Salai, HHI, Maraimalai Nagar.  
PIN - 603 209. Ph: 47 400 400

15<sup>th</sup> Feb 2011

The Director  
Kalakshetra Foundations,  
Thiruvanmiyur,  
Chennai- 600 041.

DIRECTOR

Sub: Slab Cooling Works – Warranty & Maintenance Schedule.

Sir / Madam,

Warranty for the materials supplied and installed by us shall be for the period of one year against any manufacturing and installation defects.

The routine maintenance schedule for proper maintenance for the material supplied by us is as follows,

Routine Maintenance Schedule:

- |                    |   |                  |
|--------------------|---|------------------|
| 1. Pumps           | - | Once in 30 days. |
| 2. Heat Exchangers | - | Once in 30 days. |
| 3. Sand Filter     | - | Once in 15 days. |

We will provide four services once in three months. Routine maintenance and operations will be done by client.

Thank You

For Cauvery Agro Agencies,

*S. S. Venkatesh*

Authorized Signatory,

*S. Ra. Rajee*  
c.o.w.  
*C.J. Ra. Jayakumar*  
1512/11

For Air Treatment Engr.  
*Amrith*  
15/2/11



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Note

Sub: Re-Submission - Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) – Slab Cooling work – Additional expenditure sanction – Award of work – Reg.

- Ref:i) Email with 4 attachment from M/s.CARD  
 Dated Mon, Dec 13, 2010 at 8.11pm **-P 31 - 42**
- ii) Clarification note sent to M/s.CARD dated 14<sup>th</sup> December 2010 **-P 43, 44**
- iii) Reply submitted by M/s.CARD dated 29.12.2010 **-P 46 - 65**
- iv) Remarks communicated in the note by Shri.P.T.Krishnan, Works Committee Member **-P 77**
- v) Email addressed to M/s.CARD/Consulting Architect for clarification **P- 80**
- iv) Reply submitted by the contractor M/s.Caaavery Agro Agencies, endorsed by M/s.CARD representative and M/s.ATE representative dated 15.2.2011. **P-81, 82**

The reply to the clarification pointed out by the Works Committee Member Shri.P.T.Krishnan for the HVAC-Slab cooling proposal at Koothambalam was obtained from the M/s.CARD, is resubmitted for approval please.

part c

*[Handwritten signature]*  
EO  
18/2/11

*[Handwritten signature]*  
AO 21/2/11

*[Handwritten signature]*  
CAO 21/2/2011

Deputy Director

*[Handwritten signature]*

Director.

*[Handwritten signature]*  
21/2

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ससो वै सः

## Kalakshetra Foundation

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Sub: Re-Submission - Koothambalam – Heating, Ventilation and Air conditioning  
Work (HVAC) – Slab Cooling work – Additional expenditure sanction –  
Award of work – Reg.

Ref:i) Email with 4 attachment from M/s.CARD

Dated Mon, Dec 13, 2010 at 8.11pm - P 31 - 42

ii) Clarification note sent to M/s.CARD dated 14<sup>th</sup> December 2010 - P 43, 44

iii) Reply submitted by M/s.CARD dated 29.12.2010 - P 46 - 65

iv) Remarks communicated in the note by Shri.P.T.Krishnan, Works  
Committee Member - P 77

v) Email addressed to M/s.CARD/Consulting Architect for clarification- P- 80

iv) Reply submitted by the contractor M/s.Caaavery Agro Agencies, endorsed  
by M/s.CARD representative and M/s.ATE representative dated  
15.2.2011. - P-81, 82

Please refer to the remarks communicated on this proposal in the note; replies to the  
clarification were obtained from the contractor M/s.Caaavery Agro Agencies and  
endorsed by the Consulting Architect M/s.CARD/ Shri.Ravi Nilakantan, and his  
associate M/s.Air Treatment Engineering Pvt Ltd HVAC consultant is submitted for  
your approval

This issue with approval of the Competent Authority.

Submitted for approval of Works Committee, please

### Orders of Works Committee

DIRECTOR

Smt. Machavi Mudgal

Shri.P.T.Krishnan

22-02-11

Founder: Smt Rukmini Devi  
Chairman: Justice Sri S. Mohan  
Director & Secretary: Ms. Leela Samson



E-mail: admin@kalakshetra.in  
Phone: +91-(0)44-24520836/4057/1844  
Fax: +91-(0)44-24524359

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AND Bank's details.

Kindly provide your company PAN, TIN and service tax Nos in writing, for remitting the tax deductions amount to the concerned departments

Please note that any Non-tendered items for the work should be allowed after going through the rate analysis and approval of Consulting Architect Sri.Ravi Nilakantan and his associates M/s Air Treatment Engineering Pvt Ltd HVAC consultant and approval of works committee.

During the period of execution of work, if the work of the contractor is found to be not satisfactory and specification / details or if there is considerable delay in progress, the contract is liable to be terminated without notice and also without assigning any reason.

The receipt of this letter may please be acknowledged for having agreed for the terms and returned. *for one year space to material supplied / installed space using manufacturing and installation defects to be*

*to be submitted by you. Forward to it, for to New material schedule to be followed sheet 8:- Pump: one in each Head Sheet: one in each Sand & Gravel - one in each*

Before commencing the work, a formal agreement may be entered, incorporating the terms and conditions given in the tender schedule.

Yours faithfully,

Leela Samson  
DIRECTOR.

Copy to

- 1. M/s.CARD  
Sri.Ravi Nilakantan  
# 10A, 2<sup>nd</sup> floor, Dhanalakshmi Colony, 1<sup>st</sup> street,  
Vadapalani, Chennai 600 026.
- 2. M/s.Air Treatment Engineering Pvt Ltd,  
HVAC consultants,  
# L - 6, 2<sup>nd</sup> West Street, Kamaraj Nagar,  
Thiruvanmiyur, Chennai 600 041.
- 3. M/s.Madras Electrical Consultants,  
No.6, Park Avenue 1<sup>st</sup> cross street,  
Velachery, Chennai 600 042.

Draft for approval please

*S. Samson*  
AO

*ASG*  
CAO

Deputy Director

Director

*Incorporate*

- (1) Mention of guarantee that works committee had mentioned
- (2) Material at site payment terms to be corrected, if its a split payment.

*EO*

*98*  
*The W.O is issued on pro Art 2.09 of Contract & submitted after correction of*  
*ASG*  
*(1) Pl. put up a revised letter. Has 1 2 2 been*

Draft work order

86.

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To

M/s.CAAUVERY AGRO AGENCIES,  
No.81, Sarvamangala Homes,  
Seethalai Sathanar Street,  
NH 1, Maraimalai Nagar 603 209,

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – Award of work – Reg

Ref: i) Your offer dated 11<sup>th</sup> November 2010

- ii) Recommendation from M/s.CARD and his associates M/s.Air treatment Engineering HVAC consultant 13 December 2010, for Rs.1297449.40
- iii) Your warranty and Maintenance schedule dated 15<sup>th</sup> February 2011.

- Page 64

1 Page 62, 63

1 Page 82

Based on recommendation of works committee, The Director, Kalakshetra Foundation is pleased to accept in principle award the work of slab cooling at Koothambalam was awarded to you at a total cost of Rs.12, 97,449.40 Nett. (Rupees Twelve lakh ninety seven thousand four hundred and forty nine and paise forty only) agreed item rate contract with the specifications and as per the description of work enclosed herewith. This amount is inclusive of all in respects. This is a firm price and **No** escalation will be accepted on any account, where any particular work is decided to be withdrawn from the contract by us, there the contract value will also get reduced correspondingly.

Page 84.

The work may be executed in consultation with Consulting Architect M/s.CARD Shri. Ravi Nilakantan and his associates M/s.Air treatment engineering Pvt ltd / HVAC Consultant. The work should be executed by you under the supervision of a competent site Engineer /Technical persons as per the terms and conditions given by the consultant Architect

Time is the essence of the contract and the work should be completed in all respects on or before 10<sup>th</sup> March 2011 in all respects as per the schedule of completion given in the conditions. Any delay in the completion of the work beyond prescribed date will result in levy of liquidated damages or penalty clause will be applied as per the agreement terms. No extension of time will be considered.

*Payment will be made at 70% of bill value & material received at site*  
~~The payment terms – Material at site 70% of value and progressive running bills after certification by the consultant Architect.Sri.Ravi Nilakantan and his associates M/s.Air Treatment Engineering Pvt ltd HVAC consultant.~~

Page 64

Please note that deduction towards, income tax, VAT as applicable and 10% retention amount of bill value as recommended, which will be refunded after liability period one year subject to the performance of the work.

Page 64

.....2

99

The General terms of the contract will be included in the Agreement. Before commencing the work, a formal agreement may be entered, incorporating the terms and conditions given in the tender schedule.

The receipt of this letter may please be acknowledged for having agreed for the terms and returned.

Yours faithfully,

Leela Samson  
DIRECTOR.

Copy to

1. M/s.CARD  
Sri.Ravi Nilakantan  
# 10A, 2<sup>nd</sup> floor, Dhanalakshmi Colony, 1<sup>st</sup> street,  
Vadapalani, Chennai 600 026.
2. M/s.Air Treatment Engineering Pvt ltd,  
HVAC consultants,  
# L - 6, 2<sup>nd</sup> West Street, Kamaraj Nagar,  
Thiruvanmiyur, Chennai 600 041.
3. M/s.Madras Electrical Consultants,  
No.6, Park Avenue 1<sup>st</sup> cross street,  
Velachery, Chennai 600 042.

*EO 01/03/11*

*S. Samson*  
AO 1/3/11

*f*  
CAO 1/3/11

Deputy Director

*K. Suresh*  
1/3

Director

*Leela Samson*  
1/3

100

The payment terms:-

For the purpose of the materials and labour in the proforma invoice No.51 dated 11.11.2010 as submitted by M/s.Caaavery Agro Agencies will be considered as ' *schedule of work in the contracts*' and the payment will be regulated accordingly the rates given in the proforma invoice.

- i) 70% of payment will be released against the value of materials received at site as per the items covered in the proforma invoice sl.no.1, 3, 6-17 after certification by the consultant Architect.Shri.Ravi Niilakantan and his associates M/s.Air Treatment Engineering Pvt ltd - HVAC consultant.
- ii) The payment of labour charges will be made progressively on completion (for the items covered in sl.no. 2, 4, 5 & 18) and based on certification by M/s.CARD-Shri. Ravi Niilakantan and his associates M/s.Air Treatment Engineering Pvt ltd - HVAC consultant, supported by the measurements of works in details recorded in the measurement book and duly certified by M/s.CARD.
- iii) Balance payment (for items in sl.no.1,3,6-17) will be released after satisfactorily completion and commissioning after certification by the consultant Architect.Shri.Ravi Niilakantan and his associates M/s.Air Treatment Engineering Pvt ltd - HVAC consultant subject to the retention amount.

Please note that deduction towards, income tax, VAT as applicable and 10% retention amount of bill value as recommended, which will be refunded after liability period one year subject to the performance of the work.

Page 64

Kindly provide your company PAN, TIN, Banker details with IFSC code No and Service tax No in writing, for remitting the tax deductions amount to the concerned departments

During the period of execution of work, if the work of the contractor is found to be not satisfactory and specification / details or if there is considerable delay in progress, the contract is liable to be terminated without notice and also without assigning any reason. The warranty for one year against the materials supplied/ installed against any manufacturing and installation defects to be executed by you. Further to it the following maintenance schedule to be followed strictly:-

Page 82

- |     |                 |                    |
|-----|-----------------|--------------------|
| i   | Pumps           | - Once in 30 days  |
| ii  | Heat Exchangers | - Once in 30 days  |
| iii | Sand Filter     | - Once in 15 days. |

## DRAFT FOR APPROVAL please.

C:\ 2009-2010\V.Admin\2. Engineering\i.Plan\Koothambalam\ HVAC slab cooling work.doc	February 24, 2011
---	-------------------

To

M/s.CAAUVERY AGRO AGENCIES,  
No.81, Sarvamangala Homes,  
Seethalai Sathanar Street,  
NH 1, Maraimalai Nagar 603 209,

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – Award of work – Reg

Ref: i) Your offer dated 11<sup>th</sup> November 2010 P - 64  
ii) Recommendation from M/s.CARD and his associates M/s.Air treatment  
Engineering HVAC consultant 13 December 2010, for Rs.1297449.40-P-62, 63  
iii) Your warranty and Maintenance schedule dated 15<sup>th</sup> February 2011. -P-82

Based on recommendation of works committee, The Director, Kalakshetra Foundation is pleased to accept in principle award the work of slab cooling at Koothambalam was awarded to you at a total cost of Rs.12, 97,449.40 Nett. (Rupees Twelve lakh ninety seven thousand four hundred and forty nine and paise forty only) agreed item rate contract with the specifications and as per the description of work enclosed herewith. This amount is inclusive of all in respects. This is a firm price and no escalation will be accepted on any account, where any particular work is decided to be withdrawn from the contract by us, there the contract value will also get reduced correspondingly.

Page 84

The work may be executed in consultation with Consulting Architect M/s.CARD Shri. Ravi Nilakantan and his associates M/s.Air treatment engineering Pvt ltd / HVAC Consultant. The work should be executed by you under the supervision of a competent site Engineer /Technical persons as per the terms and conditions given by the consultant Architect

Time is the essence of the contract and the work should be completed in all respects on or before 20<sup>th</sup> March 2011 in all respects as per the schedule of completion given in the conditions. No extension of time will be considered.

Any delay in the completion of the work beyond prescribed date will result in levy of liquidated damages or penalty clause at the rate of 0.2% of the total cost of the whole per day subject to a maximum of 5% of the contract value.

During the period of execution of work if the work of contractor is found to be not satisfactory or there is considerable delay in progress, the work is liable to be terminated without notice and without assigning any reason

.....2

(102)

The General terms of the contract will be included in the Agreement. Before commencing the work, a formal agreement may be entered, incorporating the terms and conditions given in the tender schedule.

The receipt of this letter may please be acknowledged for having agreed for the terms and returned.

Yours faithfully,



Leela Samson  
DIRECTOR.

Copy to

1. M/s.CARD  
Sri.Ravi Niilakantan  
# 10A, 2<sup>nd</sup> floor, Dhanalakshmi Colony, 1<sup>st</sup> street,  
Vadapalani, Chennai 600 026.
2. M/s.Air Treatment Engineering Pvt ltd,  
HVAC consultants,  
# L - 6, 2<sup>nd</sup> West Street, Kamaraj Nagar,  
Thiruvanmiyur, Chennai 600 041.
- 3 M/s.Madras Electrical Consultants,  
No.6, Park Avenue 1<sup>st</sup> cross street,  
Velachery, Chennai 600 042.

Work order.

Received.

G. Sankaran

1/3/2011

103

The payment terms:-

For the purpose of the materials and labour in the proforma invoice No.51 dated 11.11.2010 as submitted by M/s.Caauverly Agro Agencies will be considered as ' *schedule of work in the contracts*' and the payment will be regulated accordingly the rates given in the proforma invoice.

- i) 70% of payment will be released against the value of materials received at site as per the items covered in the proforma invoice sl.no.1, 3, 6-17 after certification by the consultant Architect.Shri.Ravi Niilakantan and his associates M/s.Air Treatment Engineering Pvt ltd - HVAC consultant.
- ii) The payment of labour charges will be made progressively on completion (for the items covered in sl.no. 2, 4, 5 & 18) and based on certification by M/s.CARD-Shri. Ravi Niilakantan and his associates M/s.Air Treatment Engineering Pvt ltd - HVAC consultant, supported by the measurements of works in details recorded in the measurement book and duly certified by M/s.CARD.
- iii) Balance payment (for items in sl.no.1,3,6-17) will be released after satisfactorily completion and commissioning after certification by the consultant Architect.Shri.Ravi Niilakantan and his associates M/s.Air Treatment Engineering Pvt ltd - HVAC consultant subject to the retention amount.

Please note that deduction towards, income tax, VAT as applicable and 10% retention amount of bill value as recommended, which will be refunded after liability period one year subject to the performance of the work.

Kindly provide your company PAN, TIN, Banker details with IFSC code No and Service tax No in writing, for remitting the tax deductions amount to the concerned departments

During the period of execution of work, if the work of the contractor is found to be not satisfactory and specification / details or if there is considerable delay in progress, the contract is liable to be terminated without notice and also without assigning any reason. The warranty for one year against the materials supplied/ installed against any manufacturing and installation defects to be executed by you. Further to it the following maintenance schedule to be followed strictly:-

- i Pumps - Once in 30 days
- ii Heat Exchangers - Once in 30 days
- iii Sand Filter - Once in 15 days.

.....3  
(109)

o/c

92

C:\2009-2010\V.Admin\2. Engineering\i.Plan\Koothambalam\ HVAC slab cooling work.doc	February 24, 2011
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To

M/s.CAAUVERY AGRO AGENCIES,  
No.81, Sarvamangala Homes,  
Seethalai Sathanar Street,  
NH 1, Maraimalai Nagar 603 209,

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – Award of work – Reg

- Ref: i) Your offer dated 11<sup>th</sup> November 2010 P - 64  
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iii) Your warranty and Maintenance schedule dated 15<sup>th</sup> February 2011. -P-82

Based on recommendation of works committee, The Director, Kalakshetra Foundation is pleased to accept in principle award the work of slab cooling at Koothambalam was awarded to you at a total cost of Rs.12, 97,449.40 Nett. (Rupees Twelve lakh ninety seven thousand four hundred and forty nine and paise forty only) agreed item rate contract with the specifications and as per the description of work enclosed herewith. This amount is inclusive of all in respects. This is a firm price and no escalation will be accepted on any account, where any particular work is decided to be withdrawn from the contract by us, there the contract value will also get reduced correspondingly.

The work may be executed in consultation with Consulting Architect M/s.CARD Shri. Ravi Nilakantan and his associates M/s.Air treatment engineering Pvt ltd / HVAC Consultant. The work should be executed by you under the supervision of a competent site Engineer /Technical persons as per the terms and conditions given by the consultant Architect

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Any delay in the completion of the work beyond prescribed date will result in levy of liquidated damages or penalty clause at the rate of 0.2% of the total cost of the whole per day subject to a maximum of 5% of the contract value.

During the period of execution of work if the work of contractor is found to be not satisfactory or there is considerable delay in progress, the work is liable to be terminated without notice and without assigning any reason

.....2

105



The General terms of the contract will be included in the Agreement. Before commencing the work, a formal agreement may be entered, incorporating the terms and conditions given in the tender schedule.

The receipt of this letter may please be acknowledged for having agreed for the terms and returned.

Yours faithfully,



Leela Samson  
DIRECTOR.

Copy to

- 1. M/s.CARD  
Sri.Ravi Niilakantan  
# 10A, 2<sup>nd</sup> floor, Dhanalakshmi Colony, 1<sup>st</sup> street,  
Vadapalani, Chennai 600 026.
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HVAC consultants,  
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- 3 M/s.Madras Electrical Consultants,  
No.6, Park Avenue 1<sup>st</sup> cross street,  
Velachery, Chennai 600 042.

106

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|-----|-----------------|--------------------|
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| ii  | Heat Exchangers | - Once in 30 days  |
| iii | Sand Filter     | - Once in 15 days. |



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## Kalakshetra Foundation

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C:\ 2009-2010\V.Admin\2. Engineering\i.Plan\Koothambalam\  
HVAC slab cooling work.doc

February 24, 2011

To

M/s.CAAUVERY AGRO AGENCIES,  
No.81, Sarvamangala Homes,  
Seethalai Sathanar Street,  
NH 1, Maraimalai Nagar 603 209,

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – Award of work – Reg

- Ref: i) Your offer dated 11<sup>th</sup> November 2010 P - 64  
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iii) Your warranty and Maintenance schedule dated 15<sup>th</sup> February 2011. -P-82

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During the period of execution of work if the work of contractor is found to be not satisfactory or there is considerable delay in progress, the work is liable to be terminated without notice and without assigning any reason

.....2

Founder: Smt Rukmini Devi  
Chairman: Justice Sri S. Mohan  
Director & Secretary: Ms. Leela Samson



E-mail: admin@kalakshetra.in  
Phone: +91-(0)44-24520836/4057/1844  
Fax: +91-(0)44-24524359

108



# CAAUVERY AGRO AGENCIES

Chennai Office : 116, Kamaraj Avenue 2nd Street, Chennai - 20. ☎: 52 116 666, 52 117 117

E-mail : cauvery@kitecindia.com/Website : www.kitecindia.com

Salem Office : New # 55, Kalanguthu Street, Salem - 636 001. ☎: (0427) 226 7171, 553 5353

E-mail : cauveryslm@kitecindia.com

February 27, 2011

Kalakshetra Foundation  
Chennai.

Dear Sirs,

We kindly request you to release the payment as per the account details provided below.

## Payment Procedure

1. By RTGS: Please request your bank to transfer the desired amount by RTGS to our bank account as per the account details given below.

Name of the account: Caaavery Agro Agencies,

Our A/c. No. 834 595 170 - C/A.

PAN NO:- AACFC 7488G

Indian Bank, Adyar Branch I F S Code No.: is IDIB000A002.

For Caaavery Agro Agencies

*S. S. Karthikeyan*

Proprietor

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**INVOICE**

(Original)

<b>CAAUVERY AGRO AGENCIES</b> Sarvamangala Homes 81 Seethalai Sathanar Street NH1, Maraimalai Nagar PIN 603 209 Tamil Nadu 603209 E-mail : cauvery@vsnl.com	Invoice No.	Dated
	<b>233</b>	<b>24-Feb-2011</b>
	Delivery Note	Mode/Terms of Payment
		<b>Immediately</b>
	Supplier's Ref.	Other Reference(s)
		<b>Nil</b>
Buyer <b>Kalakshetra Foundation</b> Besant Nagar Chennai	Buyer's Order No.	Dated
	Despatch Document No.	Dated
	Despatched through	Destination
Terms of Delivery		

Description of Goods	Quantity	Rate	per	Disc. %	Amount
1014 Vista Composite Pipe	4,700.00 Mts	30.00	Mts	7.50 %	1,30,425.00
4050 Vista Composite Pipes	500.00 Mts	300.00	Mts	7.50 %	1,38,750.00
					2,69,175.00
<b>OUTPUT VAT @ 4%</b>			4 %		<b>10,767.00</b>
<b>Total</b>					<b>2,79,942.00</b>

*Qty checked OK as per the DC attached. certified the payment as per PO 70%.*

*195959.40/-*

*P. R. Rajappa 4/10/11*

Amount Chargeable (in words) **Rs. Two Lakh Seventy Nine Thousand Nine Hundred Forty Two Only** E. & O. E.

*D. Ra. Jayaram 4/13/11*  
*C. S. Ra. Jayakumar*



Company's VAT TIN : 33443161807  
Company's CST No. : 41256/27-09-95

Declaration  
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

for CAAUVERY AGRO AGENCIES  
*S. S. Veerabalan*  
Authorised Signatory

This is a Computer Generated Invoice

*All the items covered in item no ① & ③ of the previous Invoice dated 24.02.2011 has been received and brought into the Bank Register and satisfactory condition.*

*D. Ra. Jayaram 24/2/2011*

**110**

# Caaavery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## INVOICE

Kallakshetra Foundation, Besant Nagar, Chennai.	Date	24.02.2011
	Inv. No:	186
	TIN No:	33443161807

**Cost of VISTA PE-AL-PE Composite pipes and VISTA COMPOSITE Fittings**

S.NO.	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1	1014 Vista Composite pipe laying, Installation and testing charges with necessary clams for under slab cooling at your auditorium	3300	Mtr	30.00 ✓	99,000.00 ✓
	Discount @			7.5%	7,425.00
	<b>Total</b>				91,575.00 ✓

*R. Na. Rajan*  
*C.S. Na. Rajakumar*  
*4/3/11*

*Qty checked on  
Work Comp letedat  
SITE*

*R. Raja Ayyappan*  
**[R. RAJA AYYAPPAN]**



**Note: Vista Composite Pipes are Manufactured as per ISI 15450  
For Caaavery Agro Agencies**

*S. S. Veinathan*  
Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

(111)

Payable to the supplier as per terms and Invoice No.233  
 Dated 24.02.2011 - 70% of payment against the materials  
 Received at site = Rs.2, 79,942/- @ 70%

1,95,959.00 | Page 97

Payable to the supplier as per the terms Invoice No.186 dated  
 24.02.2011 - progressive on completion

91,575.00 | Page 98

Deductions: 1,95,959.00 = 3919.00  
 2% Income tax on Rs. 2,87,534.00 = 5,751.00 (-)  
~~2% VAT on labour charge (Rs.91,575) = 1,832.00 (-) (not)~~  
 10% Retention amount on Rs. 2,87,534.00 = 28,753.00 (-)

2,87,534.00  
 1,95,959.00  
 23,515.00  
 36,336.00 (-)

(A) w/ 50% contribution in workup. May not be paid

Payable to the contractor 1,95,959.00 - 19,596.00

2,51,198.00 | 1,72,444

i).. Total tendered value Rs. 12,97,449.40  
 ii) In this bill payment =Rs. 2,87,534.00 (A)  
 1,95,959.00

- M/s.Cauvery Agro Agencies - Banker details
- Banker name : Indian Bank
  - Account No : 834595170
  - Name of the branch : Adyar branch
  - Type of Account : Current Account
  - Banker IFSC No. : IDIB000A002

Page 96

Submitted for approval of payment:

S.No	Bill amount	Deductions	Gross amount
1	In this bill value		2,87,534.00
2	Income tax	5,751.00	3919.00
	VAT	1,832.00	23,515.00
	Retention amount	28,753.00	19,596.00
	Nett payable to the contractor		2,51,198.00

1,95,959.00

1,72,444

S. Ramiah  
 AO 5/3/11

(Signature)  
 5/3/11

Deputy Director

DIRECTOR

The material part of the bill may be released  
 as per the work order placed at P 97/2 since the M/S book  
 for labour cost was not submitted, the amount  
 relating to labour charges as claimed in invoice dated 24.2.2011  
 (P 98) is not allowed. The net amount payable  
 towards material supply is 1,72,444/- may be paid to payee.

May be opted. Rabenu  
 5/3

(Signature)  
 EO 5/3/11

(Signature)  
 5/3/11

(Signature)  
 5/3

112

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – First and part bill payment- Approval of – Reg

- Ref: i) The schedule of works in the contracts M/s.Caaavery agro agencies P – 64  
 ii) The warranty and Maintenance schedule dated 15<sup>th</sup> February 2011 P – 82  
 iii) Recommendation from M/s.CARD and his associates M/s.ATE consultant  
 13<sup>th</sup> December 2010 P-62  
 iv) Work order issued to M/s.Caaavery agro agencies P-93,94,95  
 v) Invoice No.233 dated 24 Feb 2011 -Supply of materials P97  
 vi) Invoice No.186 24.02.2011 - Labour charges P 98

**Chronology**

Based on recommendation of works committee, the work was awarded to M/s.Caaavery Agro Agencies at a total cost of Rs.12, 97,449.40 Nett.

Page 93  
94  
95

M/s. Caaavery Agro Agencies delivered the materials on 24.02.2011, payment made to the contractor M/s. Caaavery Agro Agencies for the materials certified by M/s.CARD/Shri.J.Ra.Jayakaumar and HVAC consultant M/s.Air Treatment Engineering private authorized person for the items as per the invoice No. 233 dated 24.02.2011

Page 97

Towards labour charges, payment made to the contractor M/s. Caaavery Agro Agencies for the materials certified by M/s.CARD/Shri.J.Ra.Jayakaumar and HVAC consultant M/s.Air Treatment Engineering private authorized person for the items as per the invoice No. 186 dated 24.02.2011

Page 98

Based on above certification, payment has been worked out based on the tender quantity and rate as per the schedule of items covered with reference to quantity. The payment in the current bill is restricted to:

- a). Items in the tendered schedule and
- b) For quantities as available in the tendered schedule

As per the payment terms covered in the schedule of works in the contracts

- i) 70% of payment will be released against the value of materials received at site as per the items covered in the proforma invoice sl.no.1, 3, 6-17.
- ii) The payment of labour charges will be made progressively on completion (for the items covered in sl.no. 2, 4, 5 & 18) supported by the measurements of works in details recorded in the measurement book and duly certified by M/s.CARD.
- iii) Balance payment (for items in sl.no.1, 3, 6-17) will be released after satisfactorily completion and commissioning after certification by the consultant subject to the retention amount. ....2

Page 91.

*(Handwritten signature)*



701



Works kalakshetra <works@kalakshetra.in>

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## Slab cooling work - M.Book entry -reg.

---

Works kalakshetra <works@kalakshetra.in>

Sat, Mar 5, 2011 at 4:27 PM

To: ravi <card@vsnl.com>

Cc: "j.ra.jayakumar jayaramanradhabai" <jrajayakumar27@gmail.com>

Bcc: dd@kalakshetra.in, CAO Kalakshetra <cao@kalakshetra.in>, ao@kalakshetra.in

Dear sir,

Please refer to the invoice no. 186 dated 24.2.2011 for Rs.91,575/- towards slab cooling work of M/s.Caaavery Agro Agencies, laying labour charges and certified by M/s.CARD / Shri.J.ra.Jayakumar, inspite of our repeated reminders and personal follow up the concerned Measurement book is not submitted for processing the bill. The same may be furnished at the earliest for checking and processing this bill amouting Rs.91,575/-

V.Srinivasan  
Kalakshetra

114

O/C

# KALAKSHETRA

F O U N D A T I O N

C:\2010-2011\V.Admin\2.Engineering\i.Plan\Kootambalam\HVAC\slab cooling work.doc	March 7, 2011
--	---------------

To  
M/s.Caaavery Agro Agencies,  
Maraimalai Nagar,

Sir,  
Sub: Name of the work: Slab cooling work at Koothambalam - HVAC work- First and part bill  
Payment - Remittance advice - regarding

We have now forwarded a request to our banker to remit Rs. **1, 72,444/-** (Rupees One lakh seventy two thousand four hundred and forty only) in your account through NEFT/RTGS today, towards first and part bill payment for the above work to the following account and banker details.

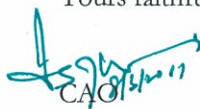
Account No.	834595170
Name of the banker	Indian Bank,
Branch	Adyar Branch
IFSC code no.	IDIB000A002

The summary of the amount remitted is as follows;

In Rs.	Contract value	Total submitted bill value	Total passed sofar	Current bill value	Bill No/Date	Disallowed value	Total amount passed	Add Service tax	Gross bill value	Deductions				Nett amount	Remarks
										IT	VAT	Retention	Mobilisation		
	12,97,449.40	2,79,942.00	2,79,942.00@70%=Rs.1,95,959.0	1,95,959.00	Invoice No.233 dated 24.2.2011	91,575.00	1,95,959.00	0.00	1,95,959.00	3,919.00	0.00	19,596.00	0.00	<b>1,72,444/-</b>	Supporting Measurement ☆ requested to process the payment for the Labour charges
		91,575.00 ☆ 3,71,517.00													

Kindly acknowledge

Yours faithfully,

  
CA

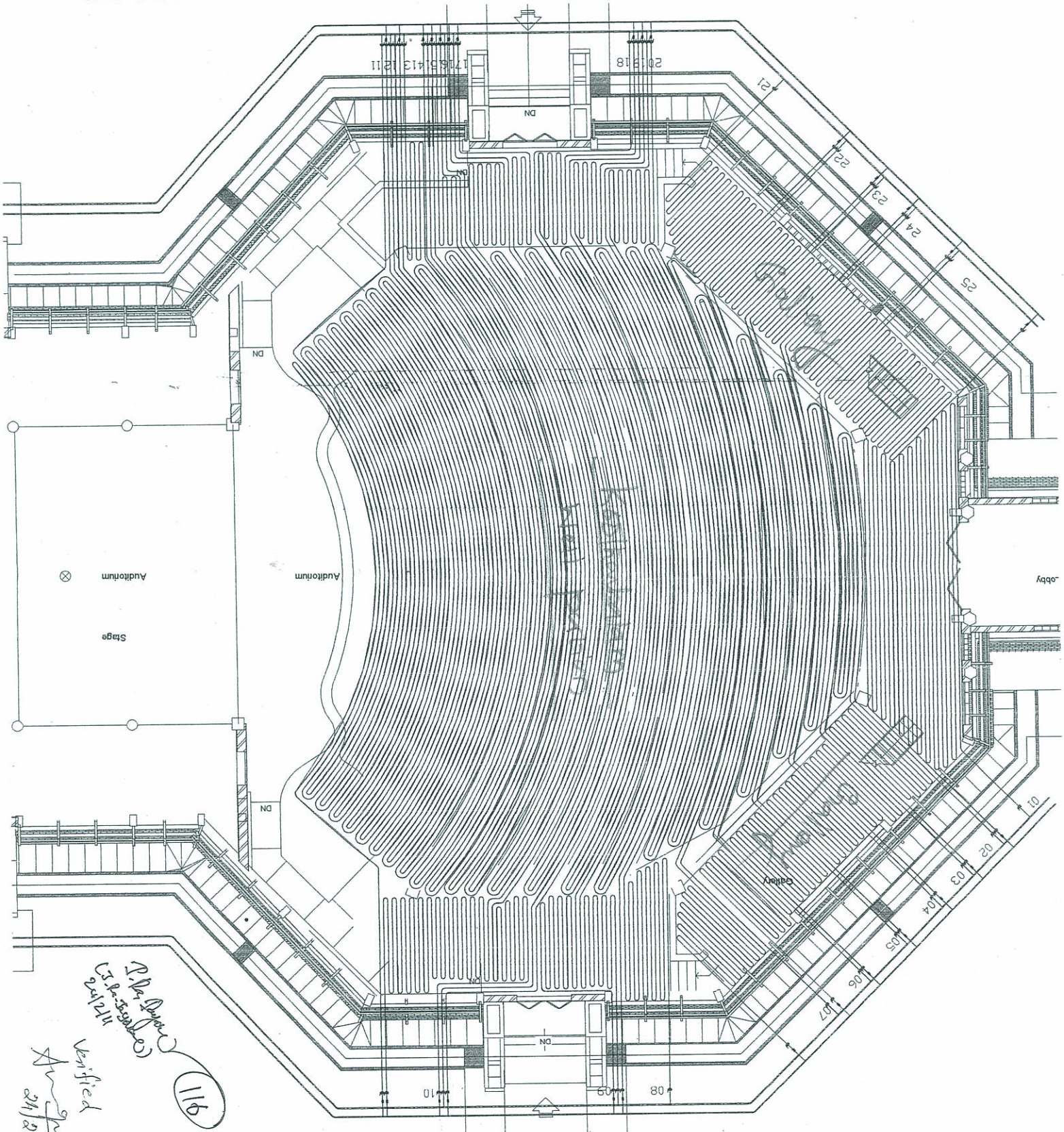
Copy to 1. M/s.CARD/Chennai

Received  
P. R. Jayaraj  
8/3/2011.

Received  
G. Saravanan

(115)

# GROUND LEVEL



*1116*  
*24/2/11*  
*CS.P. 5988*  
*24/2/11*  
*Verified by*  
*24/2/2011*



Details of pipe (Slab cast<sup>g</sup>) laid in lengths  
at Kootambakkam work.

S.No	Description	Rmt
1	Pipe 1	261
2	Pipe 2	117
3	Pipe 3	90
4	Pipe 4	84
5	Pipe 5	100
6	Pipe 6	75
7	Pipe 7	157
8	Pipe 8	156
9	Pipe 9	138
10	Pipe 10	92
11	Pipe 11	360
12	Pipe 12	377
13	Pipe 13	131
14	Pipe 14	115
15	Pipe 15	125
16	Pipe 16	170
17	Pipe 17	92
18	Pipe 18	121
19	Pipe 19	88
20	Pipe 20	172
21	Pipe 21	162
22	Pipe 22	101
23	Pipe 23	92
24	Pipe 24	80
25	Pipe 25	75
	<b>Total</b>	<b>3531</b>

P. Sa. Rajasekhar  
C.I. Sa. Rajasekhar  
24/2/11

Verified by.  
Amritha  
24/2/2011



117

- 2 -

Balance payment (for items in sl.no.1, 3, 6-17) will be released after satisfactorily completion and commissioning after certification by the consultant subject to the retention amount.

Payable to the supplier as per the terms Invoice No.186 dated 24.02.2011 – progressive on completion supported with Measurement book

91,575.00 ✓

## Deductions:

2% Income tax on Rs. 91,575.00 = 1,832.00(-) ✓  
 2% VAT on labour charge 91,575.00 = 1,832.00 (-) ✓  
 10% Retention amount on Rs. 91,575.00 = 9,158.00 (-) ✓

12,822.00 (-) ✓

Payable to the contractor

78,753.00

i).. Total tendered value

Rs. 12,97,449.40 ✓

ii) Passed sofor = Rs. 195,959.00 ✓

In this bill payment = Rs. 91,575.00 ✓

Page 99, 100 ✓  
 Page 93-95 ✓  
 Page 98 ✓

M/s.Caaavery Agro Agencies – Banker details

- Banker name : Indian Bank
- Account No : 834595170
- Name of the branch : Adyar branch
- Type of Account : Current Account
- Banker IFSC No. : IDIB000A002

Page 96.

Submitted for approval of payment:

S.No	Bill amount	Deductions	Gross amount
1	In this bill value		91,575.00 ✓
2	Income tax	1,832.00	
	VAT	1,832.00	
	Retention amount	9,158.00	12,822.00 (-)
	Nett payable to the contractor		78,753.00

S. Ramesh  
 AO 8/3/11

Deputy Director

DIRECTOR

Subal 8/3

Kubera  
 8/3

Approved  
 EQ

(118)

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – second and part bill payment- Approval of – Reg

- Ref: i) The schedule of works in the contracts M/s.Caaavery agro agencies P – 64  
ii) The warranty and Maintenance schedule dated 15<sup>th</sup> February 2011 P – 82  
iii) Recommendation from M/s.CARD and his associates M/s.ATE consultant  
13<sup>th</sup> December 2010 P-62  
iv) Work order issued to M/s.Caaavery agro agencies P-93-95  
v) Invoice No.233 dated 24 Feb 2011 -Supply of materials P97  
vi) Invoice No.186 24.02.2011 - Labour charges P 98

### Chronology

The work was awarded to M/s.Caaavery Agro Agencies at a total cost of Rs.12,97,449.40 Nett.

M/s. Caaavery Agro Agencies delivered the materials vide invoice No.233 dated 24.02.2011 and payment was made to the contractor as certified by M/s.CARD and M/s.ATE for the supply of materials delivered at site as per the payment terms.

Towards labour charges, payable to the contractor has now forwarded by M/s.CARD and M/s.ATE with the details of works done and recorded in the measurement for payment made to the contractor M/s. Caaavery Agro Agencies vide the invoice No. 186 dated 24.02.2011 for Rs. 91,575.00

Based on above certification, payment has been worked out based on the tender quantity and rate as per the schedule of items covered with reference to quantity. The payment in the current bill is restricted to:

- Items in the tendered schedule and
- For quantities as available in the tendered schedule

The recorded of the work done has been verified and found to be in order and the bill raised is as per the Measurement book (Page no 4)

As per the payment terms covered in the schedule of works in the contracts

- 70% of payment will be released against the value of materials received at site as per the items covered in the proforma invoice sl.no.1, 3, 6-17.
- The payment of labour charges will be made progressively on completion (for the items covered in sl.no. 2, 4, 5 & 18) supported by the measurements of works in details recorded in the measurement book and duly certified by M/s.CARD.

.....2

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Page 93-95

Page 97

Page 98

Page 91

SPC

105

C:\2010-2011\V.Admin\2.Engineering\i.Plan\Kootambalam\HVAC\slab cooling work.doc	March 8, 2011
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To  
M/s.Caaavery Agro Agencies,  
Maraimalai Nagar,

Sir,  
Sub: Name of the work: Slab cooling work at Koothambalam - HVAC work- second and part bill  
Payment - Remittance advice – regarding

We have now forwarded a request to our banker to remit Rs. **78,753/-** (Rupees seventy eight thousand seven hundred and fifty three only) in your account through NEFT/RTGS today, towards first and part bill payment for the above work to the following account and banker details.

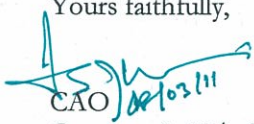
Account No.	834595170
Name of the banker	Indian Bank,
Branch	Adyar Branch
IFSC code no.	IDIB000A002

The summary of the amount remitted is as follows;

In Rs.	Contract value	Total submitted bill value	Total passed sofar	Current bill value	Bill No/Date	Disallowed value	Total amount passed	Add Service tax	Gross bill value	Deductions				Nett amount	Remarks
										IT	VAT	Retention	Mobilisation		
	12,97,449.40		1,95,959.00	91,575.00	Invoice No.186 dated 24.2.2011	0.00	91,575.00	0.00	91,575.00	1,832.00	1,832.00	9,158.00	0.00	78,753/-	

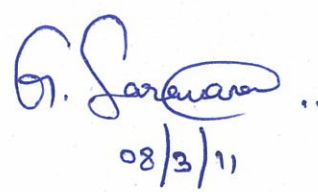
Kindly acknowledge

Yours faithfully,

  
CAO 08/03/11

Copy to 1. M/s.CARD/Chennai

  
T. Na. Srinivas  
8/03/11

  
G. Saravanan ..  
08/3/11

120

# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## Delivery Challan

Kalakshetra Foundation, Besant Nagar, Chennai.

Date 04.03.2011

D/C.No 214

TIN No: 33443161807

S.NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	Stage Warm water Circulation Pump with starter	1	Nos		

Quantities are checked.

*Amr*



*D. R. Jayaram*  
17/3/2011

*17/10/2011* *16/3*  
*R. Chand*

SECURITY Dept  
KALAKSHETRA FOUNDATION  
THIRUVANMIYUR,  
CHENNAI - 600 041.

*146*

*(C. Jayaraman)*

Note: Vista Composite Pipes are Manufactured as per ISI 15450 For Caauvery Agro Agencies

*G. Saravanan*

Authorised Signatory

VISTA PIPES - THE NAME THAT SPELLS QUALITY

*121*



# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## Delivery Challan

Kalakshetra Foundation, Besant Nagar, Chennai.

Date 04.03.2011

D/C. No: 213

TIN No: 33443161807

S.NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	25 Litre Indl. Water Heater	2	Nos		

Quantities are checked.



*D. Na. Jayaram*  
17/3/2011

*17/3/2011*

*16/3*

*(R. Khand)*

SECURITY Dept  
KALAKSHETRA FOUNDATION  
THIRUVANMIYUR,  
CHENNAI - 600 041.

Note: Vista Composite Pipes are Manufactured as per ISI 15450 For Caauvery Agro Agencies

*(145) (e. Gayeraman)*

*S. S. Veerholan*

Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

*(122)*

# Cauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## Delivery Challan

Kalakshetra Foundation, Besant Nagar, Chennai.

Date 04.03.2011

D/C. No: 211

TIN No: 33443161807

S.NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	Supply , Laying, fixing and installation of Dia 63mm Stainless Steel Pipe	30	Nos		

*Quantities are checked.*

*Amr*



*P. Na. Rajasekar  
14/3/2011*

*17/16/20* *16/3*  
*R. Ramesh*  
SECURITY Dept. HSG  
KALAKSHETRA FOUNDATION  
THIRUVANMIYUR,  
CHENNAI - 600 041.  
*(144)* *(P. V. Rajaraman)*

**Note: Vista Composite Pipes are Manufactured as per ISI 15450**

**For Cauvery Agro Agencies**

*S. S. Venkatesan*

Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

*123*

# Caaavery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## Delivery Challan

Kalakshetra Foundation, Besant Nagar, Chennai.

Date 04.03.2011

D/C. No: 210

TIN No: 33443161807

S.NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	65 mm Butterfly Isolation Valve PN - 10 - Sakthi Make	3	Nos		
2	40 mm Butterfly Isolation Valve PN -10 - Sakthi Make	6	Nos		
3	65 mm Non Return Valve - Advance Make	1	Nos		
4	25 mm Pressure Independat Balancing Valve - Advance Make	35	Nos		
5	1/2" Ball Valve - Zoloto Make	70	Nos		
6	65 mm Y-Strainer MS fabricated - Emerald make	1	Nos		

Note: Vista Composite Pipes are Manufactured as per ISI 15450  
For Caaavery Agro Agencies

*S. S. Veinhalan*  
Authorised Signatory

*R. R. Jayaram*  
*11/3/11*

*R. R. Jayaram*  
SECURITY Dept.  
KALAKSHETRA FOUNDATION  
THIRUVANMIYUR,  
CHENNAI - 600 041  
(C. Jayaram)

*17/12/2010*  
*10/3/11*

*(112)*

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

Quantities are checked.  
*Anj*



*(129)*

# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## INVOICE

Kalakshetra Foundation, Besant Nagar, Chennai.

Date 15.03.2011

Inv. No: 188

TIN No: 33443161807

18  
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1

S.NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	65 mm Butterfly Isolation Valve PN - 10 - Sakthi Make	3	Nos	3300.00	9,900.00
2	40 mm Butterfly Isolation Valve PN -10 - Sakthi Make	6	Nos	2200.00	13,200.00
3	65 mm Non Return Valve - Advance Make	1	Nos	750.00	750.00
4	25 mm Pressure Independat Balancing Valve - Advance Make	35	Nos	12000.00	420,000.00
5	1/2" Ball Valve - Zoloto Make	70	Nos	190.00	13,300.00
6	65 mm Y-Strainer MS fabricated - Emerald make	1	Nos	1550.00	1,550.00
7	Supply , Laying, fixing and installation of Dia 63mm Stainless Steel Pipe	30	MTR	1200.00	36,000.00
8	25 Litre Indl. Water Heater	2	Nos	15000.00	30,000.00
9	Stage Warm water Circulation Pump with starter	1	Nos	15000.00	15,000.00
					539,700.00
	Discount @			7.5%	40,477.50
					499,222.50
	Vat @			4%	19,968.90
	Total				519,191.40

Net amount  
under bill as per invoice order  
under net bill supply

Net amount  
under bill as per invoice order  
under net bill supply

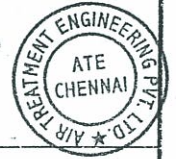
S. R. Suresh  
17/3/11

Note: Vista Composite Pipes are Manufactured as per ISI 15450  
For Caauvery Agro Agencies

Quantities are checked  
as per the DC attached.

G. Saravane...  
Authorised Signatory

Amrith



VISTA PIPES - THE NAME THAT SPELLS QUALITY

125

As per the Invoice No.188 dated 15.03.2011 = Rs. 5, 19,191.00  
 Disallowed item No.7 as per Invoice 36,000.00  
 -----  
 Payable to the supplier as per terms 70% of Rs. 4, 83,191.00

Page 110

= 4, 83,191.00  
= 3, 38, 234.00

Deductions:

2% Income tax on Rs. 3,38, 234.00 = 6,765.00 (-)  
 2% VAT already levied by the supplier  
 10% Retention amount on Rs. 3, 38,234.00 = 33,823.00 (-)  
 -----  
 = 40,588.00 (-)

Payable to the contractor  
 -----  
 2, 97,646.00

- i).. Total tendered value Rs. 12, 97,449.40
- ii) Passed so for on supply of materials Rs. 1, 95,959.00
- iii) Passed so for on labour charges Rs. 91,575.00
- iv) In this bill amount Rs. 3, 38,234.00

Page 93-95  
Page 99, 100  
Page 98  
Page 110

M/s.Caaavery Agro Agencies – Banker details

- Banker name : Indian Bank
- Account No : 834595170
- Name of the branch : Adyar branch
- Type of Account : Current Account
- Banker IFSC No. : IDIB000A002

Page 96.

Submitted for approval of payment:

S.No	Bill amount	Deductions	Gross amount
1	In this bill value		3, 38, 234.00
2	Income tax	6,765.00	
	VAT	0.00	
	Retention amount	33,823.00	40,588.00 (-)
	Nett payable to the contractor		2,97,646.00

Signature  
CEO

J. Hanumanth  
AO 18/3/11

Signature  
18/3/11

Deputy Director

Signature

DIRECTOR

Signature  
21/3

126

Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – Third and part bill payment- Approval of – Reg

- Ref: i) The schedule of works in the contracts M/s.Caaavery agro agencies P – 64  
ii) The warranty and Maintenance schedule dated 15<sup>th</sup> February 2011 P – 82  
iii) Recommendation from M/s.CARD and his associates M/s.ATE consultant  
13<sup>th</sup> December 2010 P-62  
iv) Work order issued to M/s.Caaavery agro agencies P-93-95  
v) Invoice No.233 dated 24 Feb 2011 -Supply of materials P-97  
vi) Invoice No.186 dated 24.02.2011 - Labour charges P-98  
vii) Invoice No.188 dated 15.03.2011 - Supply of materials P- 110

### Chronology

The work was awarded to M/s.Caaavery Agro Agencies at a total cost of Rs.12, 97,449.40  
Nett.

M/s. Caaavery Agro Agencies delivered the 1<sup>st</sup> spell materials and paid to them for  
Rs.1,95,959/- as certified by M/s.CARD and M/s.ATE for the supply of materials  
delivered at site as per the payment terms as first and part bill payment.

Towards labour charges for Rs.91, 975/- was paid to the contractor as certified by  
M/s.CARD and M/s.ATE as second and part bill payment.

M/s.Caaavery Agro Agencies has now delivered 2<sup>nd</sup> spell of materials at site and  
submitted the invoice duly certified by the consultant M/s.CARD and M/s.ATE for  
payment of Rs.5,19,191.40/-

Based on above certification, payment has been worked out based on the tender quantity  
and rate as per the schedule of items covered with reference to quantity. The payment in  
the current bill is restricted to:

- a). Items in the tendered schedule and
- b) For quantities as available in the tendered schedule

As per the payment terms covered in the schedule of works in the contracts

- vi) 70% of payment will be released against the value of materials received at site  
as per the items covered in the proforma invoice sl.no.1, 3, 6-17.
- vii) The payment of labour charges will be made progressively on completion  
(for the items covered in sl.no. 2, 4, 5 & 18) supported by the measurements  
of works in details recorded in the measurement book and duly certified by  
M/s.CARD.

.....2

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Page 97

Page 98

Page 110

Page 91

30/03/2011

From

VEDAS ASSOCIATES COMPANY

CAAUVERY AGRICULTURAL  
MULTIstage Sand filter 64 USA Per min.  
FRB VESSEL 1 NOS  
with filter.

(36 x 72 - ) (4" TOP)

Ram

17/156

KALAKSHETRA FOUNDATION  
CHENNAI 600 041.

11/03/11  
Raj  
155 (E. Jayaraman)

112

CAAUVER AGRO  
AGENCIES

(13)

01.4.2011

Kalak Shetra Foundation  
Theatre work

Filling Material for Sand  
Filter.

25 Bag sand Only

*Calmy*

SECURITY Dept.  
KALAKSHETRA FOUNDATION  
THIRUVANMIYUR,  
CHENNAI - 600 041.

P. Ra. Deyaree  
01/4/11

(129)



115

# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## INVOICE

Kallakshetra Foundation, Besant Nagar,  
Chennai.

Date 31-Mar-11  
Inv. No: 192  
TIN No: 33443161807

Cost of **VISTA PE-AL-PE** Composite pipes and **VISTA COMPOSITE** Fittings

S.NO.	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1	Multi Stage Sand Filter for 64USGPM	1	Nos	150000.00	150,000.00
2	Filling Materials for Sand Filter	1	Nos	40000.00	40,000.00
	Subtotal				190,000.00
	Discount @			7.5%	14,250.00
	<b>Nett Amount</b>				<b>175,750.00</b>

Note: Vista Composite Pipes are Manufactured as per ISI 15450  
For Caauvery Agro Agencies

*J. J. Venkatesh*

Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

Quantities are checked  
as per the DC attached.

*Amr*



130

ii) The payment of labour charges will be made progressively on completion (for the items covered in sl.no. 2, 4, 5 & 18) supported by the measurements of works in details recorded in the measurement book and duly certified by M/s.CARD.

page 91

As per the Invoice No.192 dated 31.03.2011 = 1,75,750.00  
Payable to the supplier as per terms 70% of Rs.1,75,750.00 = 1,23,025.00

page 113

Deductions:

2% Income tax on Rs. 1,23,025.00 = 2,461.00 (-)  
2% VAT already levied by the supplier  
10% Retention amount on Rs. 1,23,025.00 = 12,303.00 (-)

-----=  
14,764.00 (-)

Payable to the contractor

-----  
1,08,261.00

i).. Total tendered value Rs. 12,97,449.40  
ii) Passed so far on supply of materials Rs. 5,34,193.00  
iii) Passed so far on labour charges Rs. 91,575.00  
iv) In this bill amount Rs. 1,23,025.00

page 93-95  
page 111  
page 103  
page 113.

M/s.Caaavery Agro Agencies – Banker details

- Banker name : Indian Bank
- Account No : 834595170
- Name of the branch : Adyar branch
- Type of Account : Current Account
- Banker IFSC No. : IDIB000A002

page 96

Submitted for approval of payment to M/s.Caaavery Agro Agencies towards third and part bill payment as certified by M/s.CARD and M/s.ATE.

S.No	Bill amount	Deductions	Gross amount
1	In this bill value		1,23,025.00
2	Income tax	2,461.00	
	VAT	0.00	
	Retention amount	12,303.00	14,764.00 (-)
Nett payable to the contractor			1,08,261.00

J. L. ...  
AO 31/3/11

CAO 31/3/11

Deputy Director

K. ...

DIRECTOR

C. ... 31/3/11

AO 31/3/2011

121

11

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C:\ 2009-2010\V.Admin\2. Engineering\i.Plan\Koothambalam\ HVAC slab cooling work.doc	March 31, 2011
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Sub: Koothambalam – Heating, Ventilation and Air conditioning Work (HVAC) –  
Slab Cooling work – Fourth and part bill payment- Approval of – Reg

- Ref: i) The schedule of works in the contracts M/s.Caaavery agro agencies P – 64  
 ii) The warranty and Maintenance schedule dated 15<sup>th</sup> February 2011 P – 82  
 iii) Recommendation from M/s.CARD and his associates M/s.ATE consultant  
 13<sup>th</sup> December 2010 P-62  
 iv) Work order issued to M/s.Caaavery agro agencies P-93-95  
 v) Invoice No.233 dated 24 Feb 2011 -Supply of materials P-97  
 vi) Invoice No.186 dated 24.02.2011 - Labour charges P-98  
 vii) Invoice No.188 dated 15.03.2011 - Supply of materials P-110  
 viii) Invoice No.192 dated 31.03.2011 - Supply of materials P-113

**Chronology**

The work was awarded to M/s.Caaavery Agro Agencies at a total cost of Rs.12, 97,449.40 Nett.

Page 93-95

M/s. Caaavery Agro Agencies delivered the 1<sup>st</sup> spell materials for the value of Rs.2,79,942/- and passed for payment of Rs. 1,95,959/- as per terms as certified by M/s.CARD and M/s.ATE for the supply of materials delivered at site as first and part bill payment.

Page 97

Towards labour charges bill for Rs.91, 975/- was claimed and passed for payment to the contractor for Rs. 91, 975/- as per terms as certified by M/s.CARD and M/s.ATE as second and part bill payment.

Page 98

M/s. Caaavery Agro Agencies delivered the 2nd spell materials for the value of Rs 5,19,191.40/- and passed for payment of Rs.3,38,234/- as per terms .as certified by M/s.CARD and M/s.ATE for the supply of materials delivered at site third and part bill payment

Page 110

M/s.Caaavery Agro Agencies has now delivered 3rd spell of materials at site and submitted the invoice duly certified by the consultant M/s.CARD and M/s.ATE for payment of Rs1,75,750/-, *the details of items has been checked with M. Books and found in order.*

Page 115

Based on above certification, payment has been worked out based on the tender quantity and rate as per the schedule of items covered with reference to quantity. The payment in the current bill is restricted to:

- a). Items in the tendered schedule and
- b) For quantities as available in the tendered schedule

As per the payment terms covered in the schedule of works in the contracts

- i) 70% of payment will be released against the value of materials received at site as per the items covered in the proforma invoice sl.no.1, 3, 6-17.

Page 91

.....<sup>2</sup>  


Draft for Approval pl.

KALAKHETRA FOUNDATION.

Dt:02-06-2011.

To

M/s.Caauvery Agro Agencies,  
No.81, Sarvamangala Homes,  
Seethalai Sathanar Street,  
NH 1, Maraimalai Nagar -603209

Sir,

Sub:- Koothambalam – Heating, Ventilation and Air conditioning Work  
(HAVC) – Slab Cooling work in Kalakshera Foundation – Extension  
of Time – Requested – Reg

Ref: Our work order No.C:\2009-10\2.Engineerig\i.Plan\Koothambalam\ -F(92)  
HVAC\work.doc dated 24-02-2011.

Extension of the contract may be applied to this office with valid reasons  
through consultant M\s CARD & M\s Air Treatment Engineering.

Yours faithfully,

Engineer Officer

Copy to

- 1) CARD, 10a, 2<sup>nd</sup> Floor, Dhanalakshimi Colony, Ist Street,  
Vadapalani, Chennai – 600 026 for kind information  
and necessary action.
- 2) M/s Air Treatment Engineering PVT.Ltd;  
HVAC Consultants,  
No. 6, 2<sup>nd</sup> West Street, Kamaraj Nagar, Thiruvanmiyur,  
Chennai- 600 041.

*[Handwritten signature]*  
EO  
AO  
CAO

Deputy Director *[Handwritten signature]*

Director *[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten number 153 in a circle]*

KALAKHETRA FOUNDATION.

Dt:02-06-2011.

To

M/s.Caaavery Agro Agencies,  
No.81, Sarvamangala Homes,  
Seethalai Sathanar Street,  
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Chennai- 600 041.



# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## INVOICE

Kallakshetra Foundation, Besant Nagar, Chennai.	Date	10-Jan-12
	Inv. No:	40
	TIN No:	33443161807

Cost of **VISTA PE-AL-PE** Composite pipes and **VISTA COMPOSITE** Fittings

S.NO.	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1	Additional work Supply and laying of Sleeves for Underfloor cooling water supply line including cutting and chasing of concrete, exterior wall and supply of ISI marked sleeves.	275	Mtrs	160.00	44,000.00
	Subtotal				44,000.00
	Discount @			7.5%	3,300.00
	<b>Nett Amount</b>				<b>40,700.00</b>

Rupees: Fourty Thousand And Seven Hundred Only

For Caauvery Agro Agencies

*S. S. Venkataran*

Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

135

# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603 209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

## INVOICE

Kallakshetra Foundation, Besant Nagar,  
Chennai.

Date 10-Jan-12  
Inv. No: 40  
TIN No: 33443161807

Cost of **VISTA PE-AL-PE** Composite pipes and **VISTA COMPOSITE** Fittings

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	Discount @			7.5%	3,300.00
	Nett Amount				40,700.00

Rupees: Fourty Thousand And Seven Hundred Only

For Caauvery Agro Agencies

*S. S. Venkatar*

Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

136

# Caauvery Agro Agencies

NO. 84/5, Pavendar Salai, NH 1, Maraimalai Nagar, 603.209

Tel : 044-47 400 400, Fax : 044-47 400 500, E.Mail: vista@vista.in , Web: www.vista.in

Salem Branch: #55, Kalanguthu Street, Salem 636 001. Phone: 226 7171

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Rupees: Fourty Thousand And Seven Hundred Only

For Caauvery Agro Agencies

*S.S. Venkataran*

Authorised Signatory

**VISTA PIPES - THE NAME THAT SPELLS QUALITY**

*VST*



The  
**ACCORD**  
METROPOLITAN

Dear Shri Srinivasan,

We are sending a Bill  
for work executed as  
required in the site which  
is originally not covered in  
your work order to us.

Please arrange for the  
Payment at the earliest.

For Coauvey New Agam

J. J. Venkatesh

(38)

To

M/s.CAAUVERY AGRO AGENCIES,  
No.84/5, Pavendar Salai,  
NH 1, Maraimalai Nagar 603 209,

Sir/s,

Sub: Koothambalam -Kalakshetra Foundation – Termination of contract with  
M/s.CARD intimation – Reg.

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This is to inform you that M/s.CARD is now no longer the architect for the Kalakshetra Foundation project as his service has been terminated.

It is requested that you should present on 30.09.2013 at 11.00 am in the Koothambalam site / Kalakshetra Foundation along with M/s.CARD to record the joint inspection and measurement for assessing the status / value of work that have therefore been executed by you.

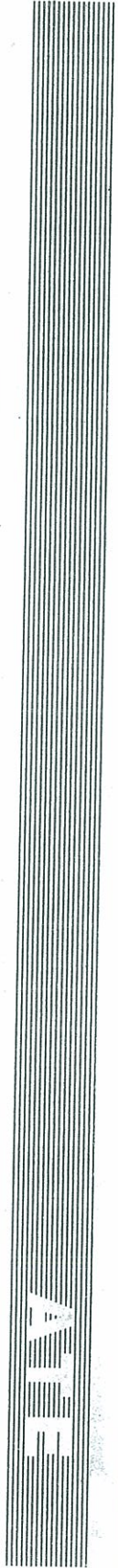
This issues with the approval of competent authority

Yours faithfully



S.Ramachandran.  
Administrative Officer.

159



ATTE

To:-

M/s. KALAKSHETRA FOUNDATIONS,  
Chennai.

(81)

Air Treatment Engineering Pvt Ltd

# L - 6, 2nd West Street, Kamaraj Nagar, Thiruvanniyur, Chennai - 600 041. INDIA  
Tele : 24412536 / 24454891 Fax : 24454306 e-mail:chennai@airtreatment.in

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• Chennai    • Ban  ore    • Hyderabad    • Kolkata    • Mumbai    • Delhi