



**Ministry of Jal Shakti  
(A Government of India undertaking)**

**1st Floor, JP Krishna Building, Pallimukku, Pettah  
Trivandrum - 695024**

## **TENDER DOCUMENT FOR**

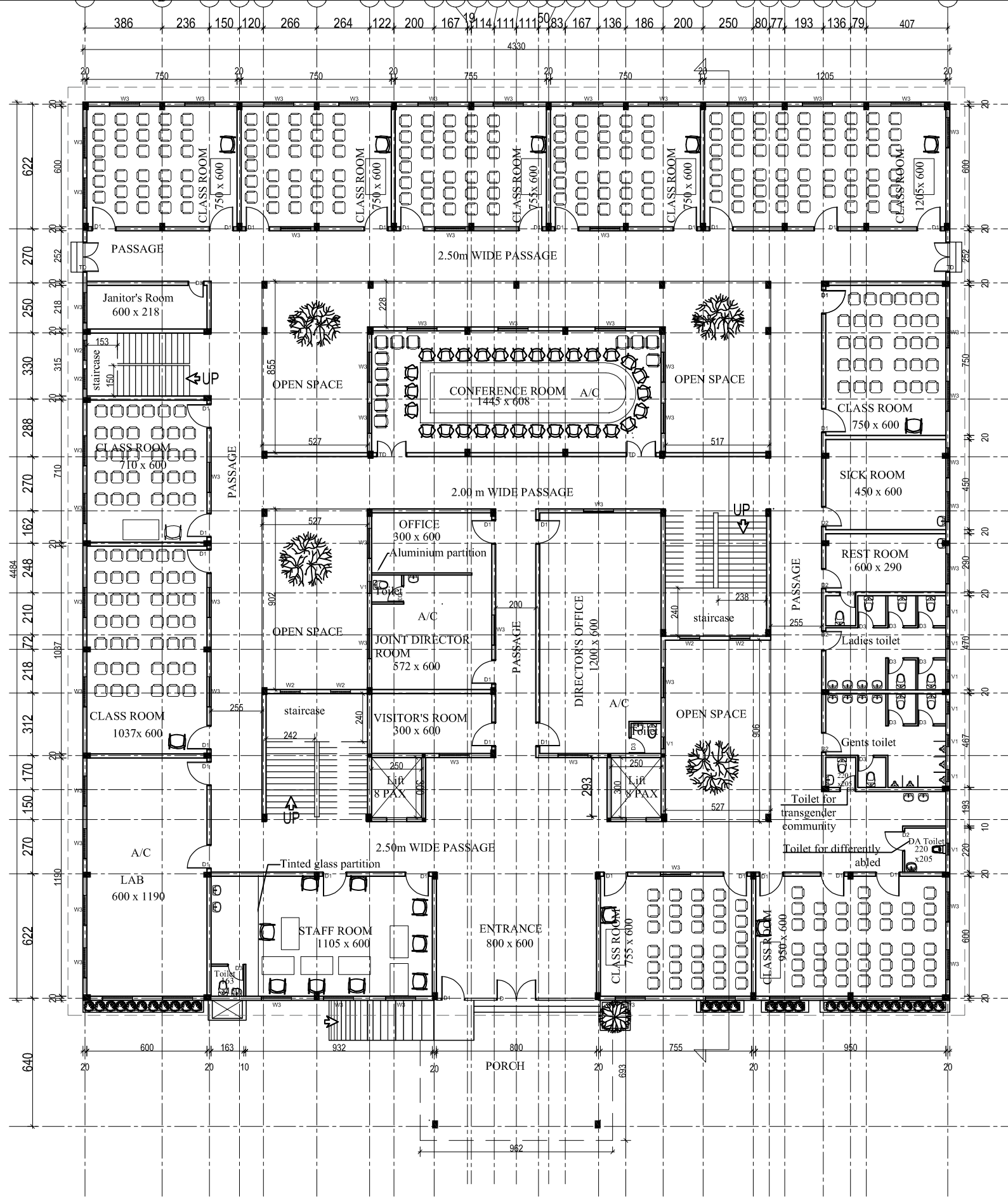
**Construction of Multi Storied Building Facilitate  
Academic activities(Academic Complex, Translational  
Research Laboratory and Academic Incubator Centre) at  
Karyavattom Campus,Trivandrum**

**WAP/INFRA/KERALA/2025/KUA/507**

**Date: 29-03-2025**

## **Volume-II DRAWINGS**

**ARCHITECTURAL**



| DOOR & WINDOW SCHEDULE |      |                   |          |
|------------------------|------|-------------------|----------|
| SNO.                   | NAME | DESCRIPTION       | SIZE     |
| 1.                     | D    | Main door         | 2x2.4m   |
| 2.                     | TD   | Double door       | 1.5x2.4m |
| 3.                     | D1   | Door              | 1.2x2.4m |
| 4.                     | D2   | Door/ toilet door | 1x2.1m   |
| 5.                     | D3   | Toilet door       | 0.8x2.1m |
| 6.                     | W2   | Window            | 1X1.5m   |
| 7.                     | W3   | Window            | 1.5x1.5m |
| 8.                     | V1   | Ventilator        | 0.6x0.6m |

| AREA STATEMENT  |             |
|-----------------|-------------|
| GROUND FLOOR    | 1832.66 SQM |
| FIRST FLOOR     | 1756.23 SQM |
| SECOND FLOOR    | 1756.23 SQM |
| TERRACE         | 153.02 SQM  |
| TOTAL B/UP AREA | 5498.14 SQM |

**NOTES :**

- ALL MEASUREMENTS ARE IN cm unless specified otherwise.
- This drawing should not be scaled.
- The measurements are to be checked on site before construction.



APPROVED BY -

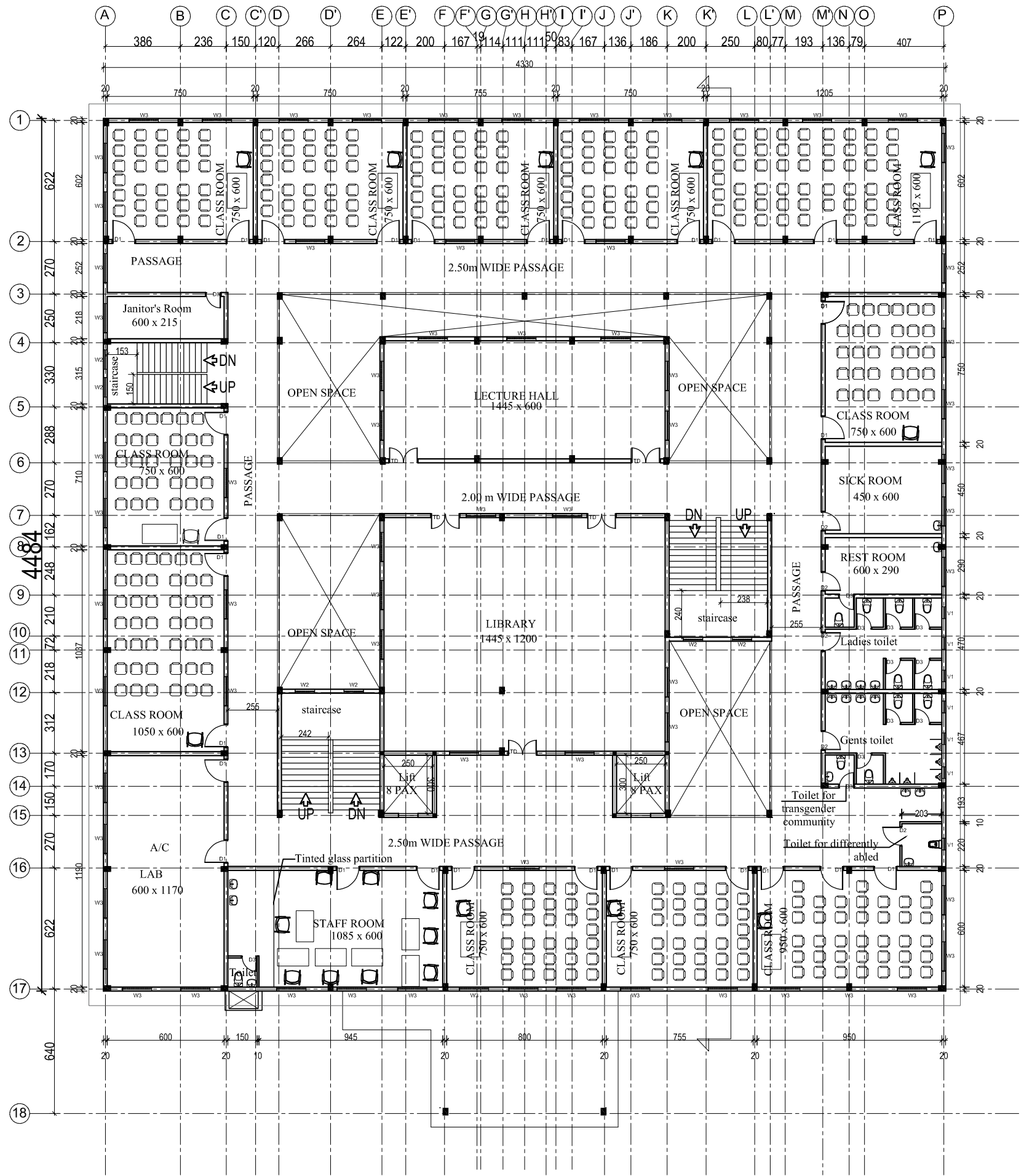
CHECKED BY -

| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |
|           |             |      |
|           |             |      |

**PROJECT NAME :** UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

**SHEET TITLE : PROPOSED ACADEMIC BLOCK**  
**GROUND FLOOR PLAN**

|                                    |  |
|------------------------------------|--|
| <b>DATE : 29/03/2025</b>           |  |
| SCALE : NTS                        |  |
| SHEET SIZE : A3                    |  |
| SHEET NO :                         |  |
| DRAWN BY :                         |  |
| <b>DRAWING NO :</b>                |  |
| <b>DRAWING STATUS : FOR TENDER</b> |  |



| DOOR & WINDOW SCHEDULE |      |                   |          |
|------------------------|------|-------------------|----------|
| SNO.                   | NAME | DESCRIPTION       | SIZE     |
| 1.                     | D    | Main door         | 2x2.4m   |
| 2.                     | TD   | Double door       | 1.5x2.4m |
| 3.                     | D1   | Door              | 1.2x2.4m |
| 4.                     | D2   | Door/ toilet door | 1x2.1m   |
| 5.                     | D3   | Toilet door       | 0.8x2.1m |
| 6.                     | W2   | Window            | 1X1.5m   |
| 7.                     | W3   | Window            | 1.5x1.5m |
| 8.                     | V1   | Ventilator        | 0.6x0.6m |

| AREA STATEMENT  |             |
|-----------------|-------------|
| GROUND FLOOR    | 1832.66 SQM |
| FIRST FLOOR     | 1756.23 SQM |
| SECOND FLOOR    | 1756.23 SQM |
| TERRACE         | 153.02 SQM  |
| TOTAL B/UP AREA | 5498.14 SQM |

NOTES :  
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APPROVED BY -

CHECKED BY -

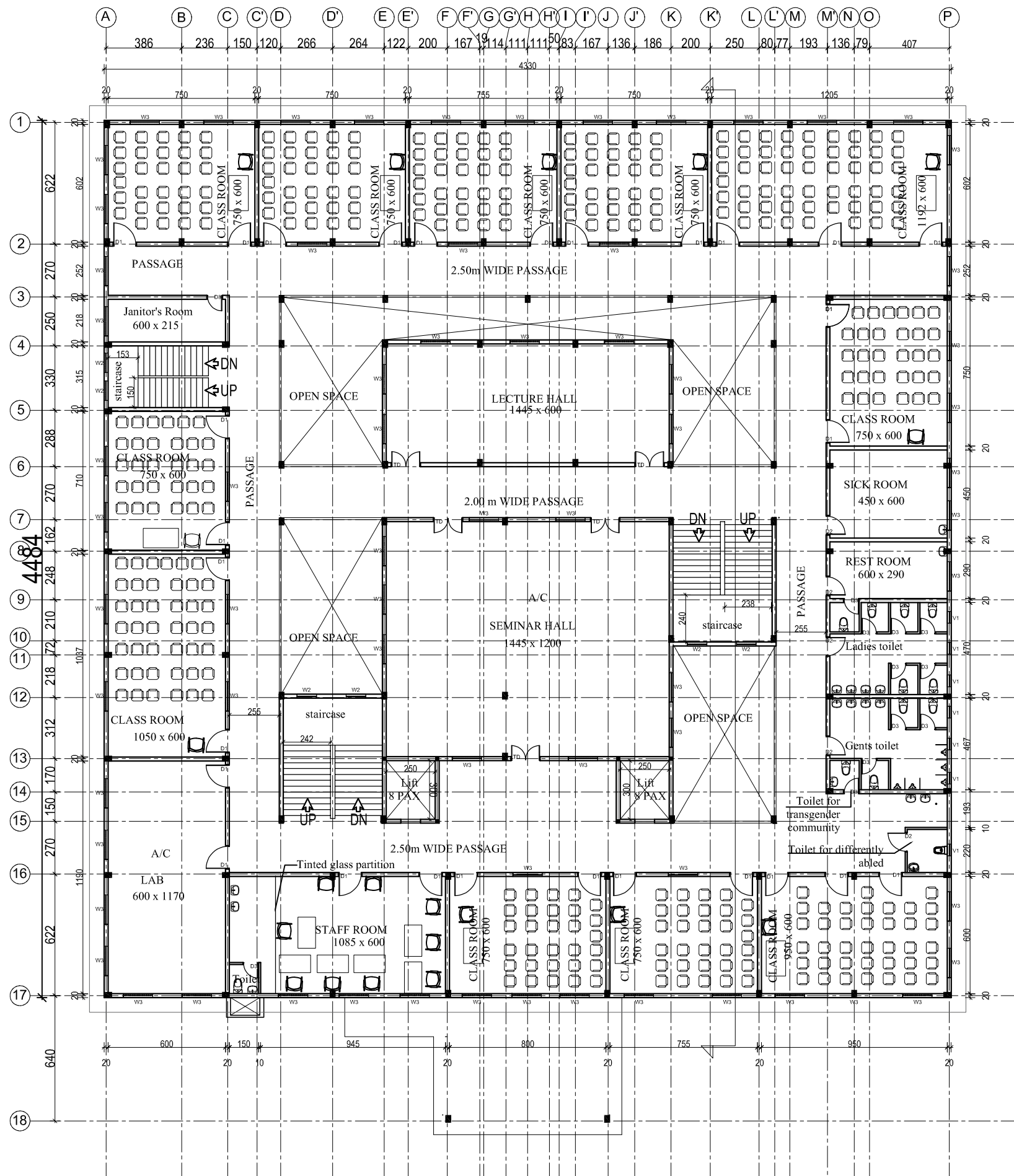
| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |

PROJECT NAME : UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

SHEET TITLE : PROPOSED ACADEMIC BLOCK  
FIRST FLOOR PLAN

|                             |  |
|-----------------------------|--|
| DATE : 29/03/2025           |  |
| SCALE : NTS                 |  |
| SHEET SIZE : A3             |  |
| SHEET NO :                  |  |
| DRAWN BY :                  |  |
| DRAWING NO :                |  |
| DRAWING STATUS : FOR TENDER |  |





| DOOR & WINDOW SCHEDULE |      |                   |          |
|------------------------|------|-------------------|----------|
| SNO.                   | NAME | DESCRIPTION       | SIZE     |
| 1.                     | D    | Main door         | 2x2.4m   |
| 2.                     | TD   | Double door       | 1.5x2.4m |
| 3.                     | D1   | Door              | 1.2x2.4m |
| 4.                     | D2   | Door/ toilet door | 1x2.1m   |
| 5.                     | D3   | Toilet door       | 0.8x2.1m |
| 6.                     | W2   | Window            | 1X1.5m   |
| 7.                     | W3   | Window            | 1.5x1.5m |
| 8.                     | V1   | Ventilator        | 0.6x0.6m |

| AREA STATEMENT  |             |
|-----------------|-------------|
| GROUND FLOOR    | 1832.66 SQM |
| FIRST FLOOR     | 1756.23 SQM |
| SECOND FLOOR    | 1756.23 SQM |
| TERRACE         | 153.02 SQM  |
| TOTAL B/UP AREA | 5498.14 SQM |

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APPROVED BY -

CHECKED BY -

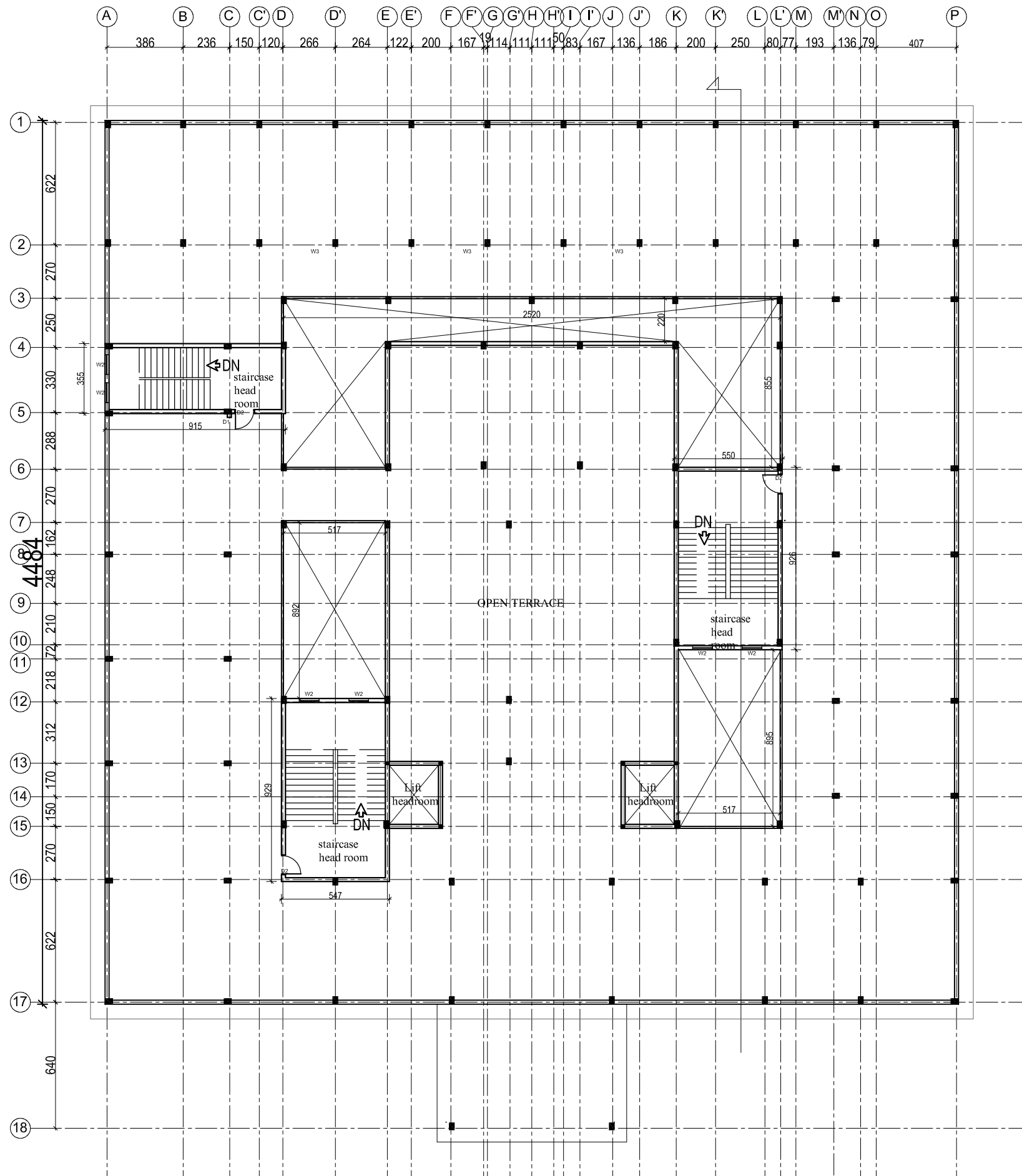
| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |

**PROJECT NAME :** UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

**SHEET TITLE : PROPOSED ACADEMIC BLOCK**

**SECOND FLOOR PLAN**

|                                    |  |
|------------------------------------|--|
| <b>DATE : 29/03/2025</b>           |  |
| SCALE : NTS                        |  |
| SHEET SIZE : A3                    |  |
| SHEET NO :                         |  |
| DRAWN BY :                         |  |
| <b>DRAWING NO :</b>                |  |
| <b>DRAWING STATUS : FOR TENDER</b> |  |



| DOOR & WINDOW SCHEDULE |      |                   |          |
|------------------------|------|-------------------|----------|
| SNO.                   | NAME | DESCRIPTION       | SIZE     |
| 1.                     | D    | Main door         | 2x2.4m   |
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| 7.                     | W3   | Window            | 1.5x1.5m |
| 8.                     | V1   | Ventilator        | 0.6x0.6m |

| AREA STATEMENT  |             |
|-----------------|-------------|
| GROUND FLOOR    | 1832.66 SQM |
| FIRST FLOOR     | 1756.23 SQM |
| SECOND FLOOR    | 1756.23 SQM |
| TERRACE         | 153.02 SQM  |
| TOTAL B/UP AREA | 5498.14 SQM |

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WAPCOS

WAPCOS LIMITED

(A Government of India Undertaking)

Ministry of Jal Shakti

Regional Office (Kerala)

1st Floor, JP Krishna Building

Pollimukku, Pettah

Trivandrum 695024, Kerala

APPROVED BY -

CHECKED BY -

REVISIONS

NO.

DESCRIPTION

DATE

PROJECT NAME :

UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

SHEET TITLE : PROPOSED ACADEMIC BLOCK  
TERRACE PLAN

DATE : 29/03/2025

SCALE : NTS

SHEET SIZE : A3

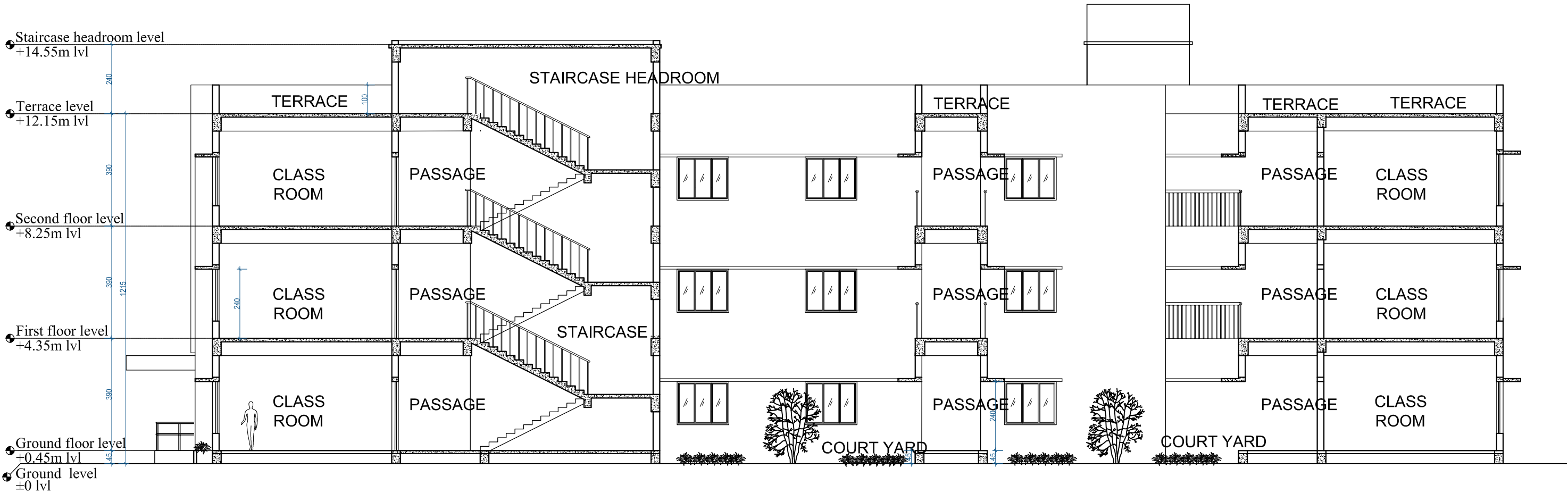
SHEET NO :

DRAWN BY :

DRAWING NO :

DRAWING STATUS : FOR TENDER

N



PROPOSED ACADEMIC COMPLEX - SECTION

**NOTES :**

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APPROVED BY -

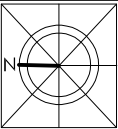
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| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |
|           |             |      |
|           |             |      |

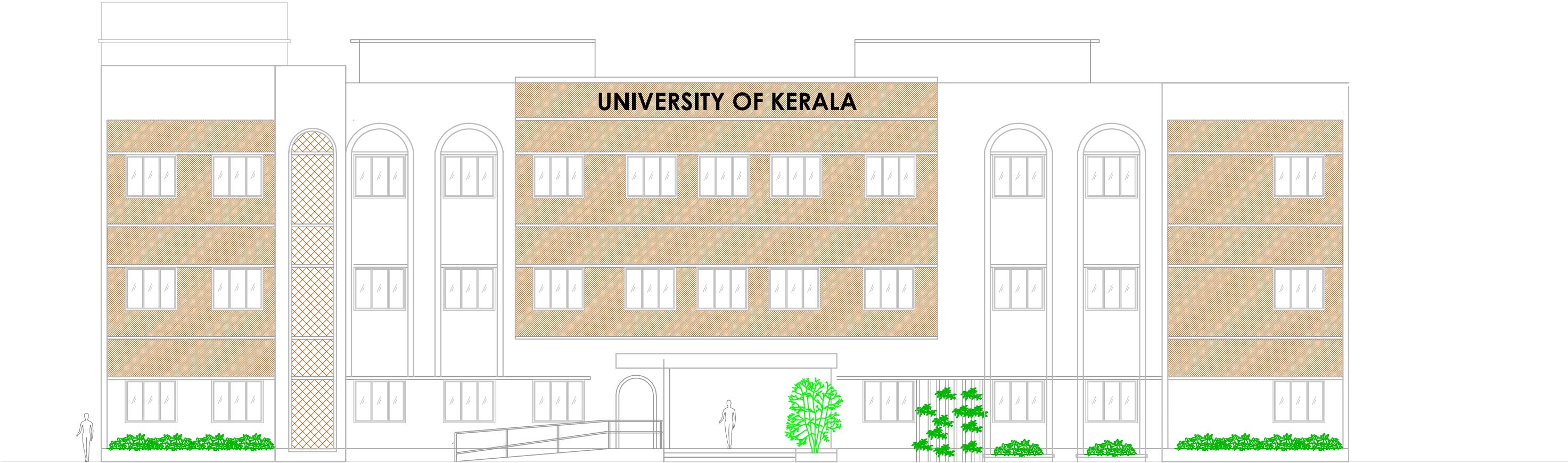
**PROJECT NAME :** UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

**SHEET TITLE :** PROPOSED ACADEMIC BLOCK - SECTION

**DATE :** 29/03/2025  
**SCALE :** NTS  
**SHEET SIZE :** A3  
**SHEET NO :**



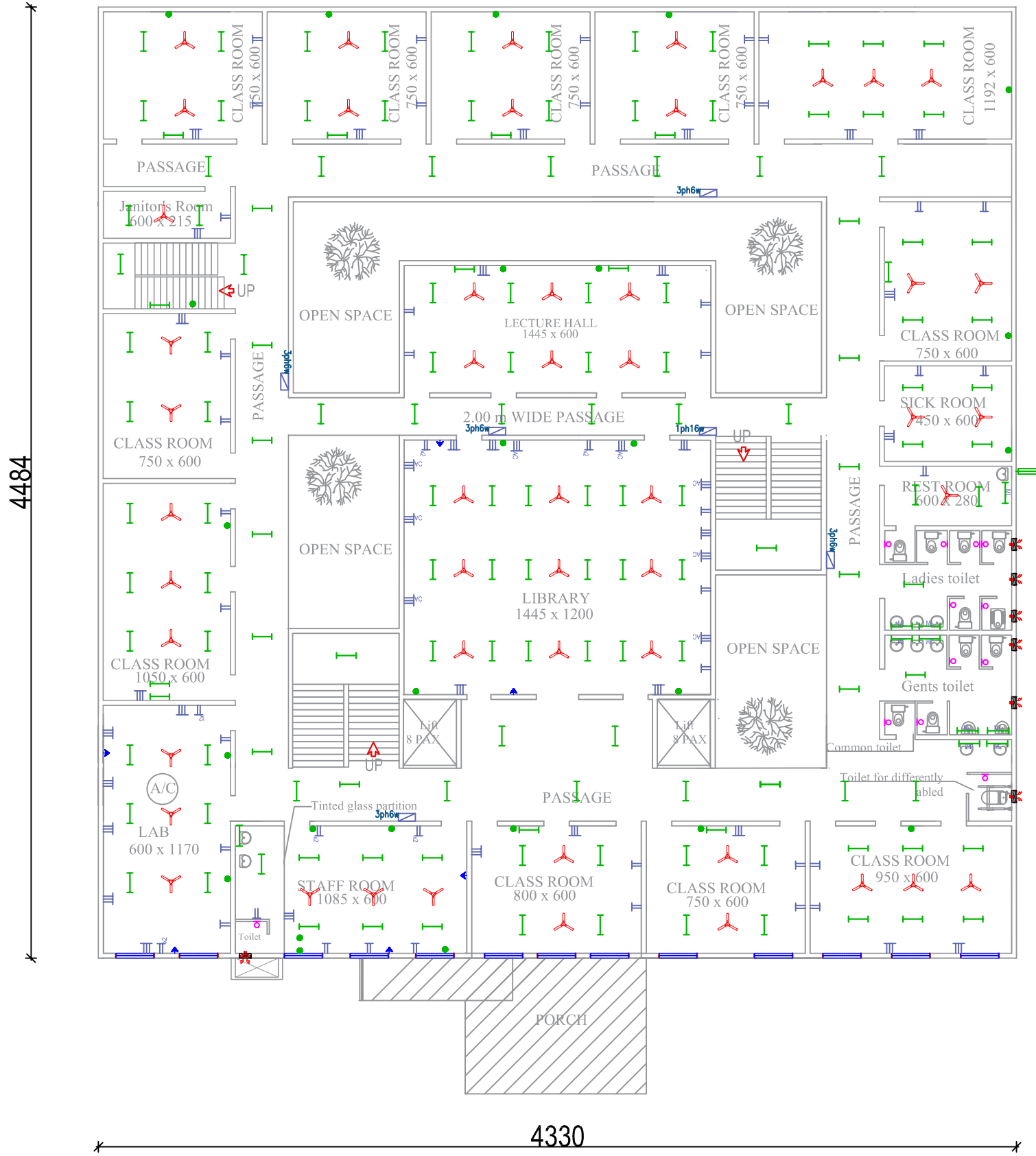
**DRAWN BY :**  
**DRAWING NO :**  
**DRAWING STATUS :** FOR TENDER



PROPOSED ACADEMIC COMPLEX - FRONT ELEVATION

|                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |              |           |  |  |                                                                                                                                                          |                   |                                                                                          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| <div>NOTES :</div> <div><div>• ALL MEASUREMENTS ARE IN cm unless specified otherwise.</div><div>• This drawing should not be scaled.</div><div>• The measurements are to be checked on site before construction.</div></div> | <div><div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div><div>WAPCOS</div><div>WAPCOS LIMITED</div><div>(A Government of India Undertaking)</div><div>Ministry of Jal Shakti</div><div>Regional Office (Kerala)</div><div>1st Floor, JP Krishna Building</div><div>Pallimukku, Pettah</div><div>Trivandrum 695024, Kerala</div></div></div></div></div> | APPROVED BY - | CHECKED BY - | REVISIONS |  |  | PROJECT NAME : <div>UNIVERSITY OF KERALA</div> <div>PM-USHA PROJECT FOR MULTI-DISCIPLINARY</div> <div>EDUCATION &amp; RESEARCH UNIVERSITIES (MERU)</div> | DATE : 29/03/2025 | <div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></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**ELECTRICAL**



LEGEND:

| SL.NO | SYMBOL | DESCRIPTION        | MOUNTING |
|-------|--------|--------------------|----------|
| 1     |        | 6A Switch          | Surface  |
| 2     |        | 6A Switch(UPS)     | Surface  |
| 3     |        | 20W LED Batten     | Surface  |
| 4     |        | 36W LED Batten     | Surface  |
| 5     |        | 36W CRL            | Recessed |
| 6     |        | 36W Square 2x2     | Recessed |
| 7     |        | Exhaust fan        | Recessed |
| 8     |        | 10W Bulkhead       | Surface  |
| 9     |        | Ceiling Fan        | Ceiling  |
| 10    |        | Tube light 20W     |          |
| 11    |        | 6A Combined socket |          |
| 12    |        | 16A Socket         |          |
| 13    |        | Distribution board |          |
| 14    |        | Batten             |          |
| 15    |        | Ceiling light      |          |
| 16    |        | 2nos. 6A socket    |          |
| 17    |        | Street light       |          |
| 18    |        | AC socket          |          |
| 19    |        | Mirror light       |          |
| 20    |        | 6A socket          |          |
| 21    |        | Data point         |          |
| 22    |        | Telephone point    |          |
| 23    |        | Light point        |          |
| 24    |        | Angle batten       |          |

**NOTES :**

- ALL MEASUREMENTS ARE IN cm unless specified otherwise.
- This drawing should not be scaled.
- The measurements are to be checked on site before construction.



APPROVED BY -

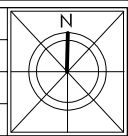
CHECKED BY -

| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |

PROJECT NAME : UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

SHEET TITLE : PROPOSED ACADEMIC BLOCK  
-FIRST FLOOR ELECTRICAL LAYOUT

DATE : 10/03/2025  
SCALE : NTS  
SHEET SIZE : A3  
SHEET NO :  
DRAWN BY :  
DRAWING NO :  
DRAWING STATUS :







LEGEND:

| SL.NO | SYMBOL | DESCRIPTION        | MOUNTING |
|-------|--------|--------------------|----------|
| 1     |        | 6A Switch          | Surface  |
| 2     |        | 6A Switch(UPS)     | Surface  |
| 3     |        | 20W LED Batten     | Surface  |
| 4     |        | 36W LED Batten     | Surface  |
| 5     |        | 36W CRL            | Recessed |
| 6     |        | 36W Square 2x2     | Recessed |
| 7     |        | Exhaust fan        | Recessed |
| 8     |        | 10W Bulkhead       | Surface  |
| 9     |        | Ceiling Fan        | Ceiling  |
| 10    |        | Tube light 20W     |          |
| 11    |        | 6A Combined socket |          |
| 12    |        | 16A Socket         |          |
| 13    |        | Distribution board |          |
| 14    |        | Batten             |          |
| 15    |        | Ceiling light      |          |
| 16    |        | 2nos. 6A socket    |          |
| 17    |        | Street light       |          |
| 18    |        | AC socket          |          |
| 19    |        | Mirror light       |          |
| 20    |        | 6A socket          |          |
| 21    |        | Data point         |          |
| 22    |        | Telephone point    |          |
| 23    |        | Light point        |          |
| 24    |        | Angle batten       |          |

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APPROVED BY -

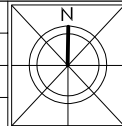
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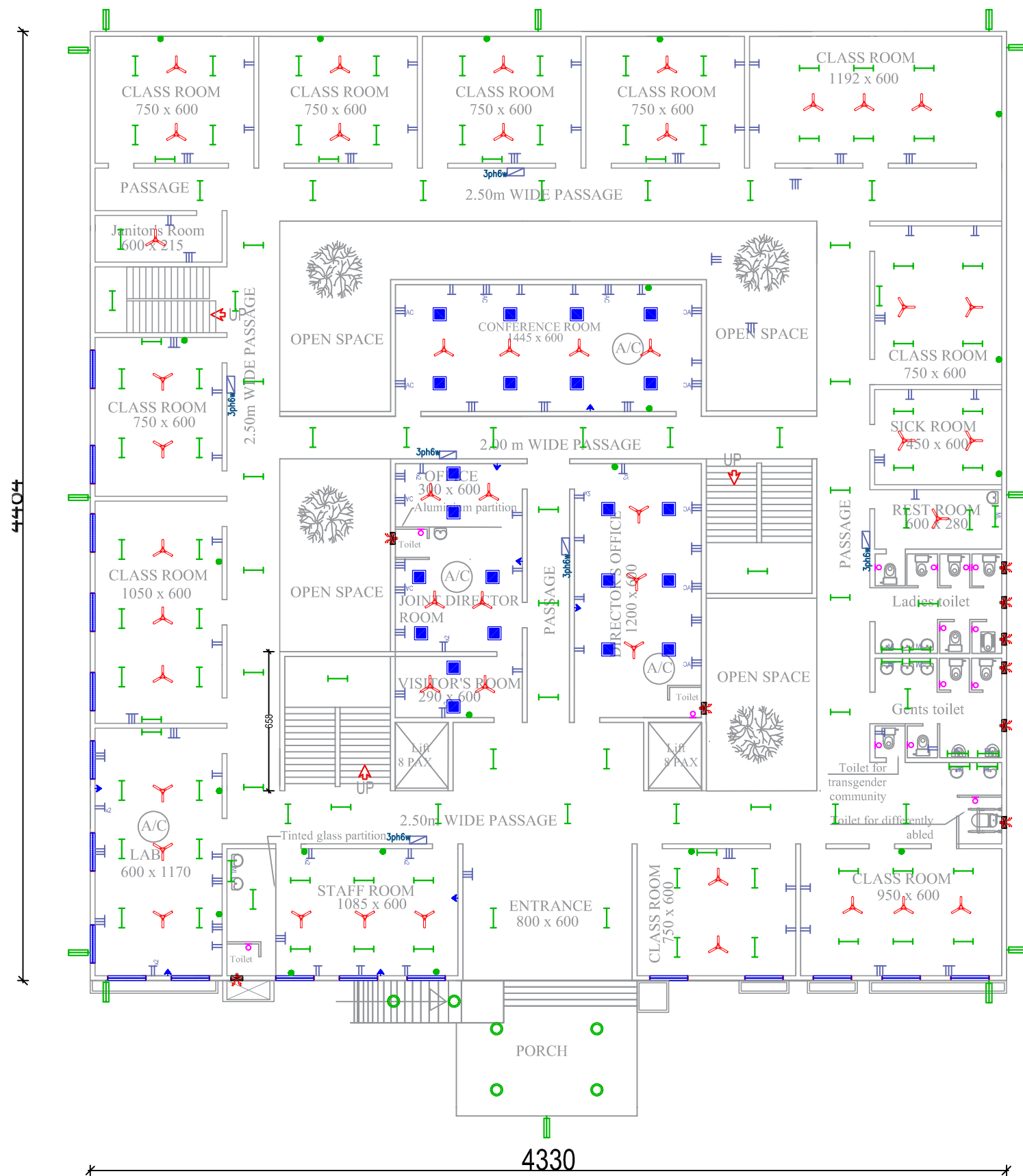
| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |

**PROJECT NAME :** UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

**SHEET TITLE :** PROPOSED ACADEMIC BLOCK  
- SECOND FLOOR ELECTRICAL LAYOUT

**DATE :** 10/03/2025  
**SCALE :** NTS  
**SHEET SIZE :** A3  
**SHEET NO :**  
**DRAWN BY :**  
**DRAWING NO :**  
**DRAWING STATUS :**





LEGEND:

| SL.NO | SYMBOL | DESCRIPTION        | MOUNTING |
|-------|--------|--------------------|----------|
| 1     |        | 6A Switch          | Surface  |
| 2     |        | 6A Switch(UPS)     | Surface  |
| 3     |        | 20W LED Batten     | Surface  |
| 4     |        | 36W LED Batten     | Surface  |
| 5     |        | 36W CRL            | Recessed |
| 6     |        | 36W Square 2x2     | Recessed |
| 7     |        | Exhaust fan        | Recessed |
| 8     |        | 10W Bulkhead       | Surface  |
| 9     |        | Ceiling Fan        | Ceiling  |
| 10    |        | Tube light 20W     |          |
| 11    |        | 6A Combined socket |          |
| 12    |        | 16A Socket         |          |
| 13    |        | Distribution board |          |
| 14    |        | Batten             |          |
| 15    |        | Ceiling light      |          |
| 16    |        | 2nos. 6A socket    |          |
| 17    |        | Street light       |          |
| 18    |        | AC socket          |          |
| 19    |        | Mirror light       |          |
| 20    |        | 6A socket          |          |
| 21    |        | Data point         |          |
| 22    |        | Telephone point    |          |
| 23    |        | Light point        |          |
| 24    |        | Angle batten       |          |

**NOTES :**

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**WAPCOS LIMITED**  
(A Government of India Undertaking)  
Ministry of Jal Shakti  
Regional Office (Kerala)  
1st Floor, JP Krishna Building  
Pallimukku, Pettah  
Trivandrum 695024, Kerala

APPROVED BY -

CHECKED BY -

| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |

PROJECT NAME :  
**UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)**

SHEET TITLE : **PROPOSED ACADEMIC BLOCK  
- GROUND FLOOR ELECTRICAL LAYOUT**

DATE : 10/03/2025

SCALE : NTS

SHEET SIZE : A3

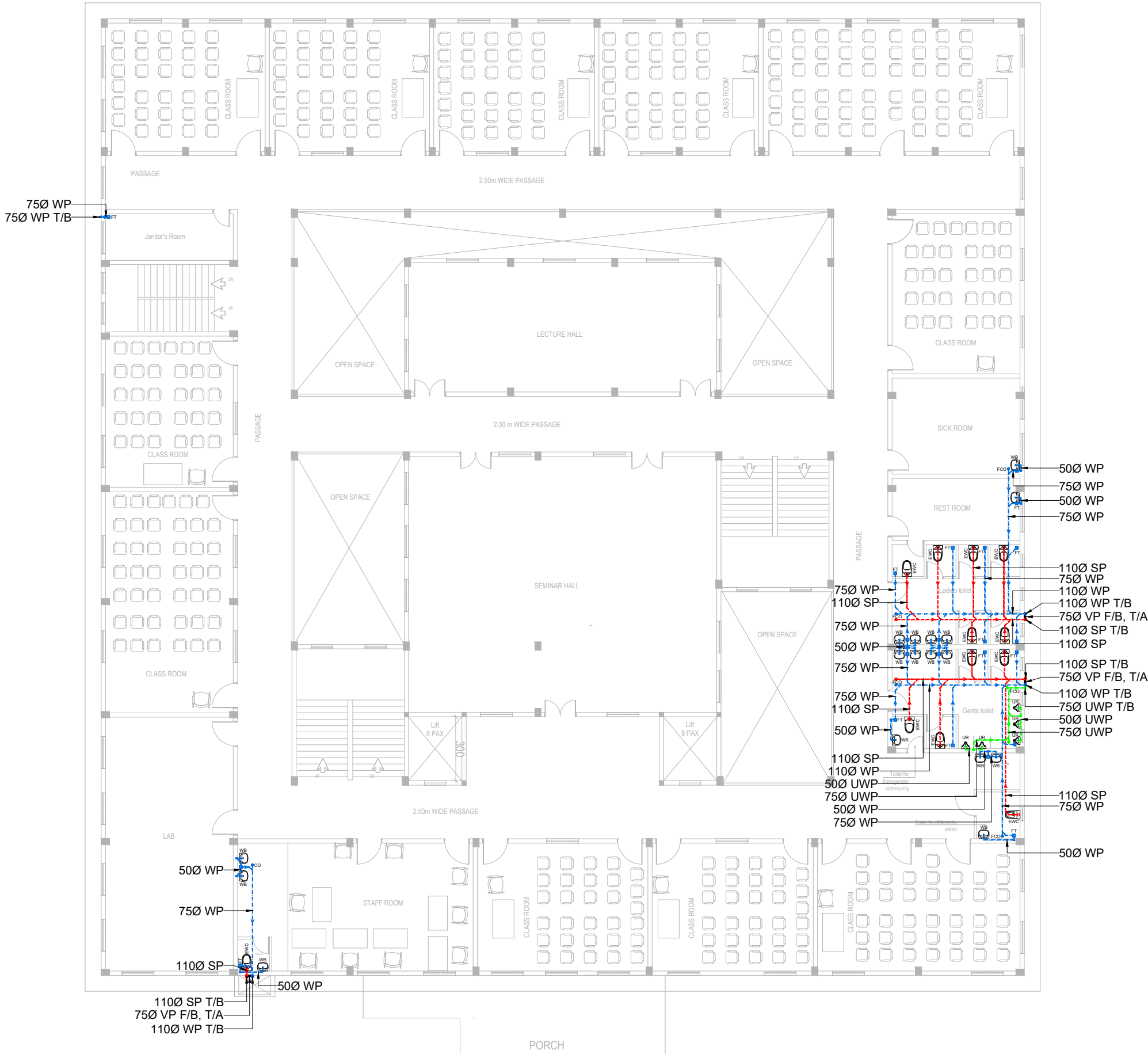
SHEET NO :

DRAWN BY :

DRAWING NO :

DRAWING STATUS :

**PLUMBING**



| LEGENDS |                       |
|---------|-----------------------|
|         | WASTE PIPE            |
|         | SOIL PIPE             |
|         | URINAL WASTE PIPE     |
|         | VENT PIPE             |
|         | FLOOR TRAP            |
|         | CLEAN OUT             |
|         | WASH BASIN            |
|         | EUROPEAN WATER CLOSET |
|         | URINAL                |

| ABBREVIATIONS |                       |
|---------------|-----------------------|
| WP            | WASTE PIPE            |
| SP            | SOIL PIPE             |
| UWP           | URINAL WASTE PIPE     |
| VP            | VENT PIPE             |
| RWP           | RAIN WATER PIPE       |
| FCO           | FLOOR CLEAN OUT       |
| WB            | WASH BASIN            |
| EWC           | EUROPEAN WATER CLOSET |
| UR            | URINAL                |
| FT            | FLOOR TRAP            |
| MH            | MANHOLE               |
| GT            | GULLY TRAP            |
| F/A           | FROM ABOVE            |
| F/B           | FROM BELOW            |
| T/A           | TO ABOVE              |
| T/B           | TO BELOW              |

NOTES :  
• ALL MEASUREMENTS ARE IN cm unless specified otherwise.  
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APPROVED BY -

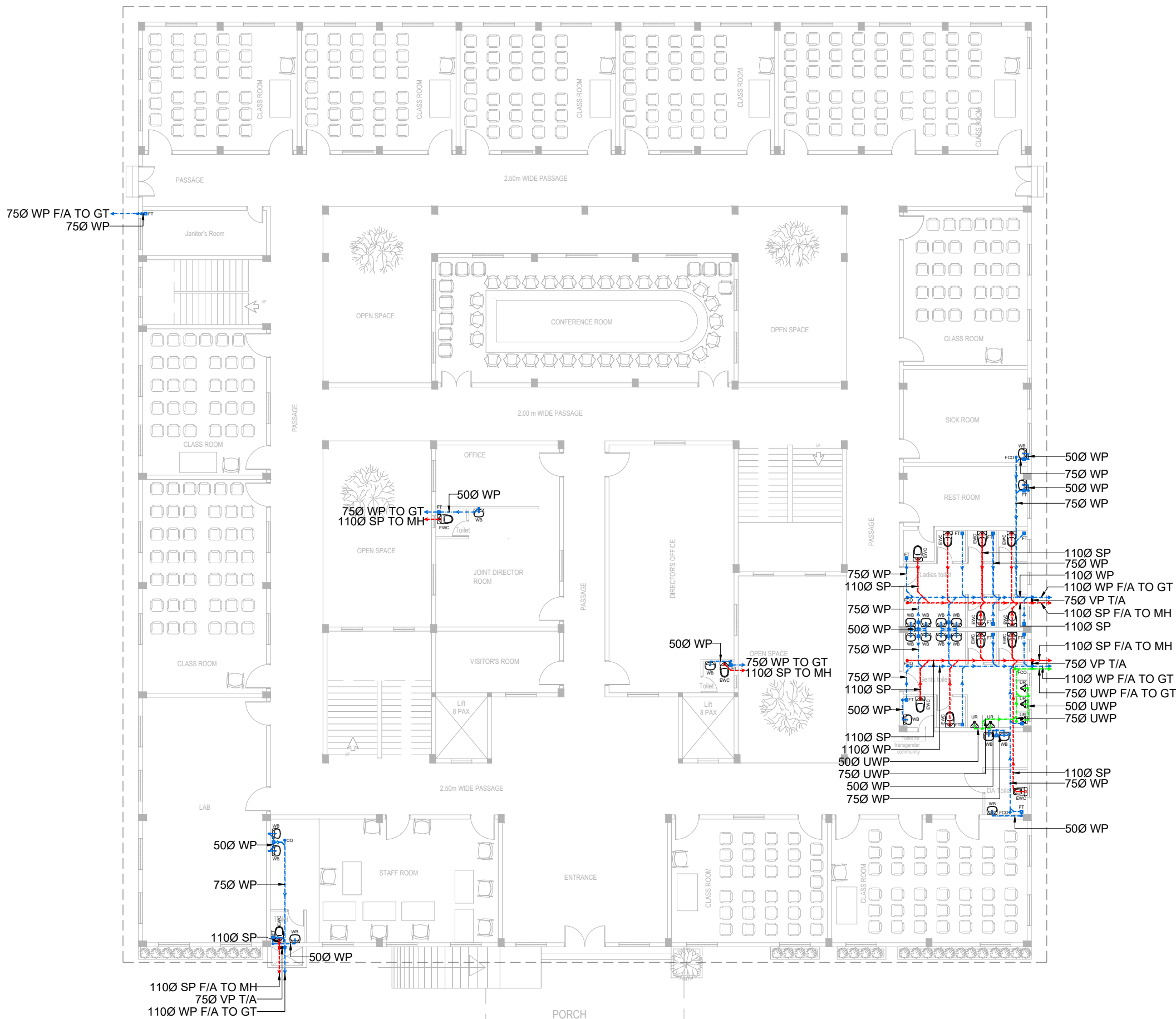
CHECKED BY -

| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |

PROJECT NAME : UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

SHEET TITLE : SECOND FLOOR DRAINAGE LAYOUT\_ACADEMIC BLOCK

|                              |  |
|------------------------------|--|
| DATE :20/01/2025             |  |
| SCALE : NTS                  |  |
| SHEET SIZE : A3              |  |
| SHEET NO :                   |  |
| DRAWN BY :                   |  |
| DRAWING NO : XX-XXXX-XX      |  |
| DRAWING STATUS : PRELIMINARY |  |



| LEGENDS |                       |
|---------|-----------------------|
|         | WASTE PIPE            |
|         | SOIL PIPE             |
|         | URINAL WASTE PIPE     |
|         | VENT PIPE             |
|         | FLOOR TRAP            |
|         | CLEAN OUT             |
|         | WASH BASIN            |
|         | EUROPEAN WATER CLOSET |
|         | URINAL                |

| ABBREVIATIONS |                       |
|---------------|-----------------------|
| WP            | WASTE PIPE            |
| SP            | SOIL PIPE             |
| UWP           | URINAL WASTE PIPE     |
| VP            | VENT PIPE             |
| RWP           | RAIN WATER PIPE       |
| FCO           | FLOOR CLEAN OUT       |
| WB            | WASH BASIN            |
| EWC           | EUROPEAN WATER CLOSET |
| UR            | URINAL                |
| FT            | FLOOR TRAP            |
| MH            | MANHOLE               |
| GT            | GULLY TRAP            |
| F/A           | FROM ABOVE            |
| F/B           | FROM BELOW            |
| T/A           | TO ABOVE              |
| T/B           | TO BELOW              |

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APPROVED BY -

CHECKED BY -

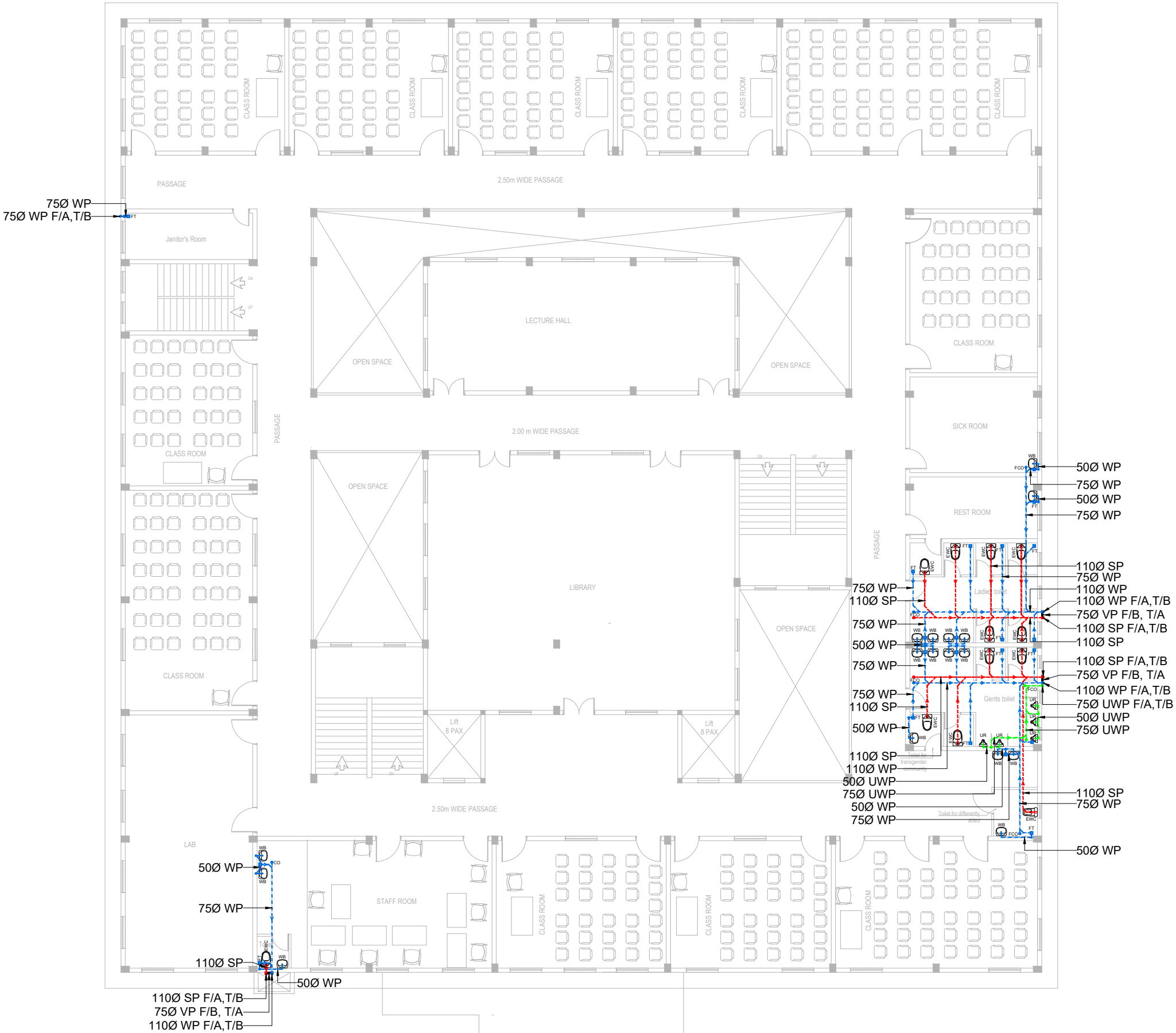
| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |

PROJECT NAME : UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

SHEET TITLE : GROUND FLOOR DRAINAGE LAYOUT\_ACADEMIC BLOCK

|                              |  |
|------------------------------|--|
| DATE :20/01/2025             |  |
| SCALE : NTS                  |  |
| SHEET SIZE : A3              |  |
| SHEET NO :                   |  |
| DRAWN BY :                   |  |
| DRAWING NO : XX-XXXX-XX      |  |
| DRAWING STATUS : PRELIMINARY |  |





| LEGENDS |                       |
|---------|-----------------------|
|         | WASTE PIPE            |
|         | SOIL PIPE             |
|         | URINAL WASTE PIPE     |
|         | VENT PIPE             |
|         | FLOOR TRAP            |
|         | CLEAN OUT             |
|         | WASH BASIN            |
|         | EUROPEAN WATER CLOSET |
|         | URINAL                |

| ABBREVIATIONS |                       |
|---------------|-----------------------|
| WP            | WASTE PIPE            |
| SP            | SOIL PIPE             |
| UWP           | URINAL WASTE PIPE     |
| VP            | VENT PIPE             |
| RWP           | RAIN WATER PIPE       |
| FCO           | FLOOR CLEAN OUT       |
| WB            | WASH BASIN            |
| EWC           | EUROPEAN WATER CLOSET |
| UR            | URINAL                |
| FT            | FLOOR TRAP            |
| MH            | MANHOLE               |
| GT            | GULLY TRAP            |
| F/A           | FROM ABOVE            |
| F/B           | FROM BELOW            |
| T/A           | TO ABOVE              |
| T/B           | TO BELOW              |

NOTES :

- ALL MEASUREMENTS ARE IN cm unless specified otherwise.
- This drawing should not be scaled.
- The measurements are to be checked on site before construction.



APPROVED BY -

CHECKED BY -

| REVISIONS |             |      |
|-----------|-------------|------|
| NO.       | DESCRIPTION | DATE |
|           |             |      |

PROJECT NAME : UNIVERSITY OF KERALA  
PM-USHA PROJECT FOR MULTI-DISCIPLINARY  
EDUCATION & RESEARCH UNIVERSITIES (MERU)

SHEET TITLE : FIRST FLOOR DRAINAGE LAYOUT\_ACADEMIC BLOCK

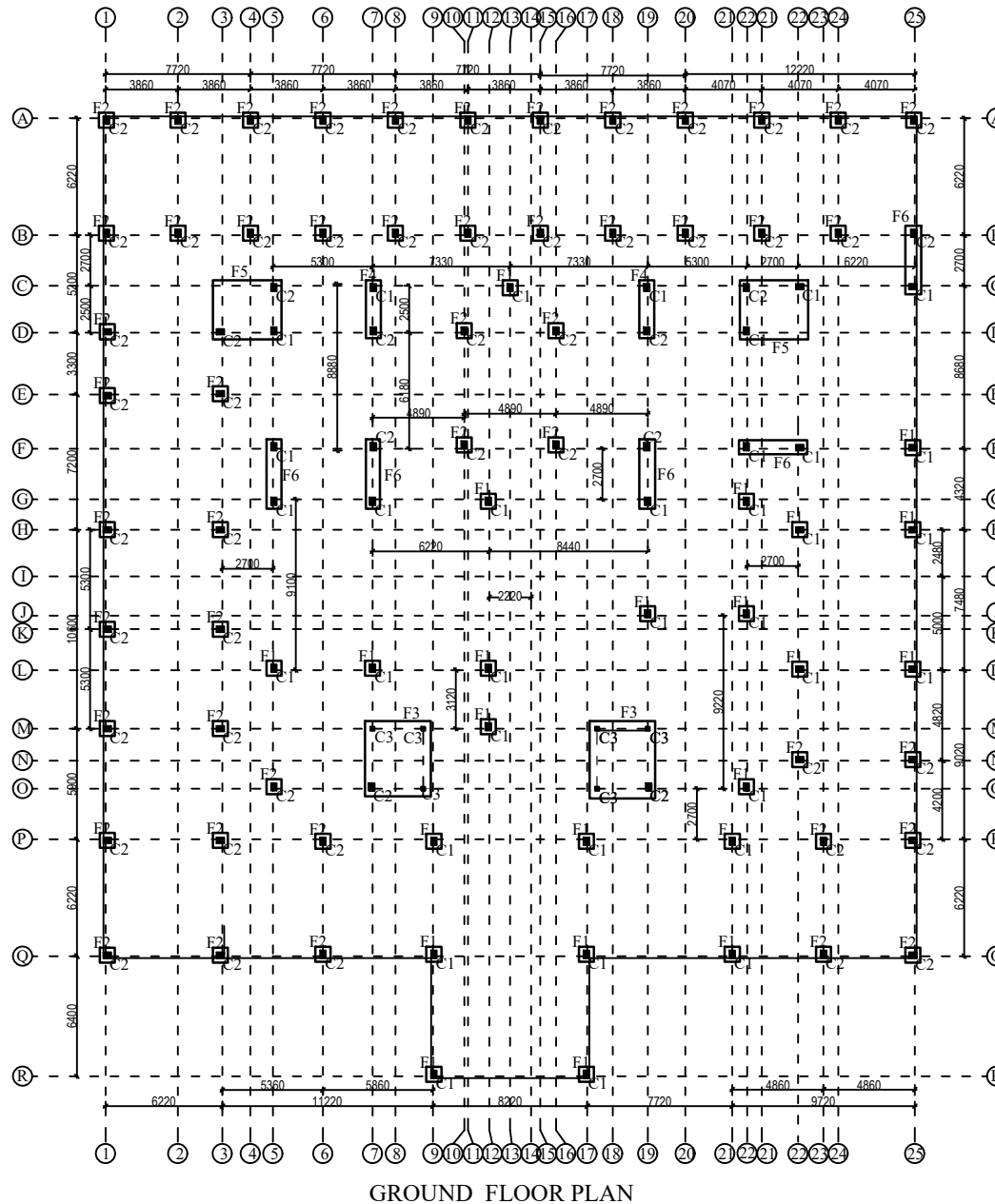
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| SCALE : NTS                  |  |
| SHEET SIZE : A3              |  |
| SHEET NO :                   |  |
| DRAWN BY :                   |  |
| DRAWING NO : XX-XXXX-XX      |  |
| DRAWING STATUS : PRELIMINARY |  |



**STRUCTURAL**

## 2-B. STRUCTURAL LAYOUT PLAN OF SUB-STRUCTURE

### 2.2 FOUNDATION DETAILS



PROJECT

PROPOSED LADIES HOSTEL.  
STRUCTURAL DRAWING

DELINEATION

STRUCTURAL LAYOUT PLAN  
OF SUB-STRUCTURE  
FOUNDATION

CLIENT

M/S WAPCOS LTD

LOCATION

KARIYAVATTOM CAMPUS  
UNIVERSITY OF KERALA,  
THIRUVANANTHAPURAM

AREA : (sq.m)

Basement Floor : 885.50 Sqm  
Ground Floor : 1684.21 Sqm  
First Floor : 1684.21 Sqm  
Second Floor : 1684.21 Sqm  
Total : 5938.13Sqm

PROJECT NUMBER

4

GENERAL NOTE

- 1.Do not Scale Dimensions govern in drawings
- 2.All Dimensions are in Millimeter unless noted otherwise.
- 3.All dimensions shall be verified at site before proceeding the work.
- 4.All Levels are in Meters unless noted otherwise.

SIGNATURE

CLIENT

CONSULTANT

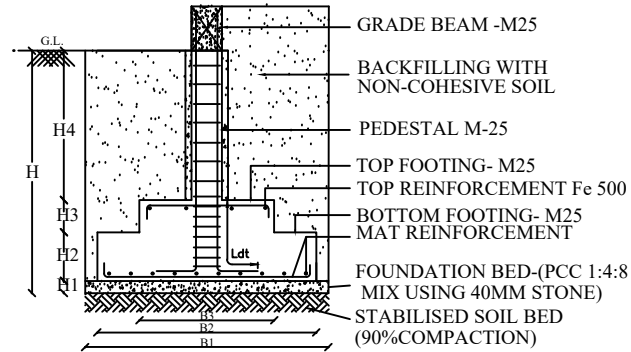
STRUCTURAL CONSULTANT

  
**Y-Shakh**  
Project Management &  
Consultancy Services  
Y- Shakh, Nalanda Nagar-97  
Thirumullavaram P.O. Kollam - 12  
e-mail: yshakhpmcs@gmail.com  
Ph: +91 9447126629  
Office: 0474-2792700

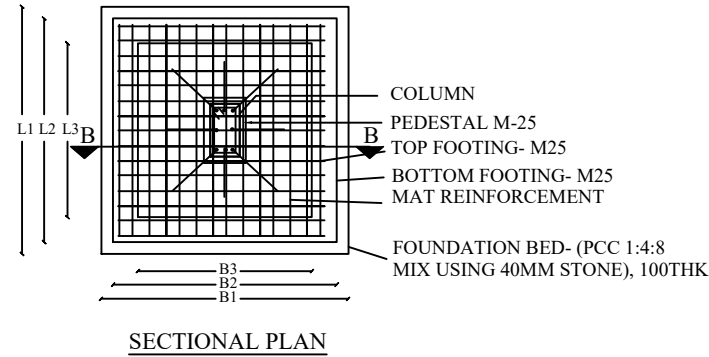
|                 |              |                   |              |                                              |
|-----------------|--------------|-------------------|--------------|----------------------------------------------|
| Ref.No:         | DATE :       | DESIGNED:         | DRAWN:       | PLATE NO: 02                                 |
| YSCASE,194/2025 | 11- 03- 2025 | Dr M.M KHAN. Ph.D | JASMINE.TOMY | SCALE-1:100,All Dimensions are in Millimeter |

### 3. STRUCTURAL DETAILS OF FOUNDATION

#### ISOLATED STEPPED FOOTING -TYPICAL DESIGN



#### MAT REINFORCEMENT DETAILS



#### SPECIAL NOTES

1. THE MINIMUM DEPTH OF FOUNDATION :2.0M BGL
2. S.B.C OF THE SOIL ASSUMED : 120 kN/M<sup>2</sup>
3. GRADE OF CONCRETE : M25
4. GRADE OF STEEL : Fe500
5. CLEAR COVER : 50mm

#### FOUNDATION DETAILS OF PROPOSED PROJECT

| SL. NO | GROUP | FOUNDATION TRENCH |      |      | PCC BED |      |     | BOTTOM FOOTING |      |     | TOP FOOTING |      |     | REINFORCEMENT DETAILS   |                         |                                 |                                 |
|--------|-------|-------------------|------|------|---------|------|-----|----------------|------|-----|-------------|------|-----|-------------------------|-------------------------|---------------------------------|---------------------------------|
|        |       | L1                | B1   | H    | L1      | B1   | H1  | L2             | B2   | H2  | L3          | B3   | H3  | MAT RODS                | TOP RODS                | DEV LENGTH<br>Ld                | LAP LENGTH<br>Ls                |
| 1.     | F1    | 3000              | 3000 | 2000 | 3000    | 3000 | 100 | 2700           | 2700 | 300 | 2500        | 2500 | 350 | Y12 @ 150 C/C BOTH WAYS | Y10 @ 250 C/C BOTH WAYS | 600 mm for Y12 & 500 mm for Y10 | 600 mm for Y12 & 500 mm for Y10 |
| 2.     | F2    | 2500              | 2500 | 2000 | 2500    | 2500 | 100 | 2200           | 2200 | 250 | 1800        | 1800 | 350 | Y12 @ 150 C/C BOTH WAYS | Y10 @ 250 C/C BOTH WAYS | 600 mm for Y12 & 500 mm for Y10 | 600 mm for Y12 & 500 mm for Y10 |
| 3.     | F3    | 5400              | 4900 | 2000 | 5400    | 4900 | 100 | 5200           | 4700 | 300 | 5000        | 4500 | 300 | Y12 @ 150 C/C BOTH WAYS | Y10 @ 250 C/C BOTH WAYS | 600 mm for Y12 & 500 mm for Y10 | 600 mm for Y12 & 500 mm for Y10 |
| 4.     | F4    | 3000              | 5250 | 2000 | 3000    | 5250 | 100 | 2800           | 5000 | 300 | 2500        | 4700 | 350 | Y12 @ 150 C/C BOTH WAYS | Y10 @ 250 C/C BOTH WAYS | 600 mm for Y12 & 500 mm for Y10 | 600 mm for Y12 & 500 mm for Y10 |
| 5.     | F5    | 5250              | 5450 | 2000 | 5250    | 5450 | 100 | 5000           | 5200 | 350 | 4700        | 5000 | 350 | Y12 @ 150 C/C BOTH WAYS | Y10 @ 250 C/C BOTH WAYS | 600 mm for Y12 & 500 mm for Y10 | 600 mm for Y12 & 500 mm for Y10 |
| 6.     | F6    | 5700              | 3000 | 2000 | 5700    | 3000 | 100 | 5500           | 2800 | 300 | 5100        | 2600 | 350 | Y12 @ 150 C/C BOTH WAYS | Y10 @ 250 C/C BOTH WAYS | 600 mm for Y12 & 500 mm for Y10 | 600 mm for Y12 & 500 mm for Y10 |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

PROJECT NUMBER

CLIENT

AREA : (sq.m)

DESIGNED:

DRAWN:

DELINEATION

4

M/S WAPCOS LTD

Basement Floor : 885.50 Sqm  
Ground Floor : 1684.21 Sqm  
First Floor : 1684.21 Sqm  
Second Floor : 1684.21 Sqm  
Total : 5938.13Sqm

Dr M.M KHAN. Ph.D

JASMINE.TOMY

STRUCTURAL  
DETAILS OF  
FOUNDATION

**Y-Shakh**  
Project Management &  
Consultancy Services  
Y- Shakh, Nalanda Nagar-97  
Thirumullavaram P.O. Kollam - 12  
e-mail: yshakhpmcs@gmail.com  
Ph: +91 9447126629  
Office: 0474-2792700

Ref.No: YSCASE,194/2025

DATE : 07- 03- 2025

DRAWING ARE NOT IN SCALE

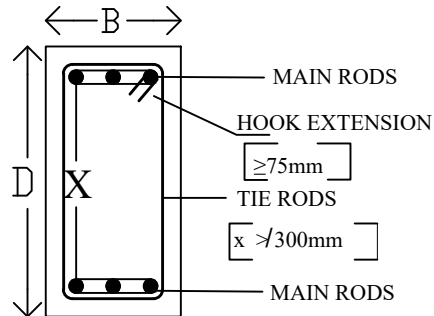
ALL DIMENSIONS ARE IN MM

PLATE NO: 05

## 4. STRUCTURAL DETAILS OF COLUMN

### 4.2 INDEX

#### 4.1 C.S DETAILS OF COLUMNS



| NOTE                |       |
|---------------------|-------|
| GRADE OF CONCRETE : | M25   |
| GRADE OF STEEL :    | Fe500 |
| CLEAR COVER :       | 40 mm |

- Y = Diameter of reinforcement rods HYSD  
 Ld = Development Length of rods 50d  
 Ls = Splices/Lap length at joints of reinforcement rods 50 d for tension & 40 d for compression zone  
 L0 = Confirming region for ductility for seismic resistance  
 H = Height of Column Between support faces  
 H/4 = Region where joints of rods are to be avoided  
 H/2 = Region where joints allowable but shall be restricted to maximum of 50 % of joints at a particular section  
 S = Spacing of stirrups in region free from L0 & Ls  
 S0 = Spacing of stirrups at L0 region  
 Ss = Spacing of stirrups at Ls region  
 X = Space between 2 adjacent main rods in column where shall not exceed 300 mm

#### 4.3 STRUCTURAL DETAILS OF COLUMNS OF THE PROPOSED PROJECT

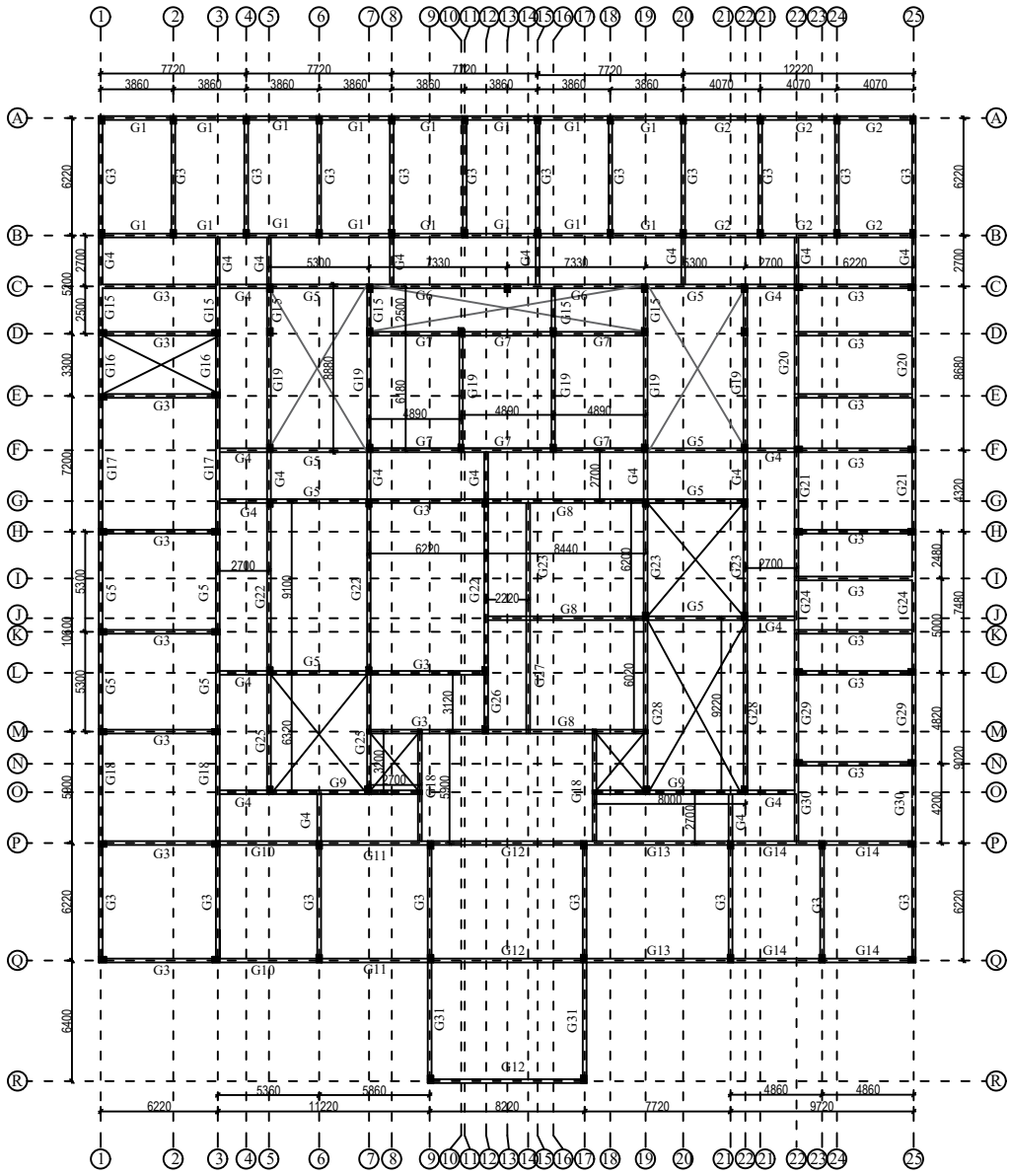
| GROUP | C.S DIMENSION<br>B X D | REINFORCEMENT         |               | CRITICAL ZONES                                |                                              |                               | SPACING OF TIES AT<br>CRITICAL ZONE |                     | CROSS SECTION<br>DETAILS | TIE<br>ARRANGEMENT |
|-------|------------------------|-----------------------|---------------|-----------------------------------------------|----------------------------------------------|-------------------------------|-------------------------------------|---------------------|--------------------------|--------------------|
|       |                        | MAIN                  | TIES          | Dev: Length<br>Ld (mm)                        | Lap length<br>Ls (mm)                        | Confined<br>Length<br>L0 (mm) | Ss(mm)                              | SO(mm)              |                          |                    |
| C1    | 300 x 600              | 4 Y 20<br>+<br>8 Y 16 | Y 8 @ 150 C/C | 1000 mm<br>for Y 20<br>&<br>800 mm<br>for Y16 | 800 mm<br>for Y 20<br>&<br>640 mm<br>for Y16 | 600 mm                        | Y8@<br>100mm/<br>c/c                | Y8@<br>75mm/<br>c/c |                          | 4 Legged           |
| C2    | 300 x 500              | 4 Y 20<br>+<br>4 Y 16 | Y 8 @ 150 C/C | 1000 mm<br>for Y 20<br>&<br>800 mm<br>for Y16 | 800 mm<br>for Y 20<br>&<br>640 mm<br>for Y16 | 500 mm                        | Y8@<br>100mm/<br>c/c                | Y8@<br>75mm/<br>c/c |                          | 4 Legged           |
| C3    | 300 x 300              | 4 Y 16<br>+<br>4 Y 12 | Y 8 @ 150 C/C | 800 mm<br>for Y16<br>&<br>600 mm<br>for Y12   | 640 mm<br>for Y16<br>&<br>500 mm<br>for Y12  | 450 mm                        | Y8@<br>100mm/<br>c/c                | Y8@<br>75mm/<br>c/c |                          | 4 Legged           |

PROJECT : PPROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                              | DESIGNED:                | DRAWN:       | DELINEATION                         | <br><b>Y-Shakh</b><br><b>Project Management &amp;</b><br><b>Consultancy Services</b><br>Y- Shakh, Nalanda Nagar-97<br>Thirumullavaram P.O. Kollam - 12<br>e-mail: yshakhpmcs@gmail.com<br>Ph: +91 9447126629<br>Office: 0474-2792700 |
|-------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4                       | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | STRUCTURAL<br>DETAILS OF<br>COLUMNS |                                                                                                                                                                                                                                                                                                                           |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                   | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 06                        |                                                                                                                                                                                                                                                                                                                           |
|                         |                     |                                                                                                                                            |                          |              |                                     |                                                                                                                                                                                                                                                                                                                           |

5-B. STRUCTURAL LAYOUT PLAN OF GRADE BEAMS



5-1 DETAILS OF GRADE BEAM

| GROUP | EFF.SPAN (IN MM) |
|-------|------------------|
| G1    | 3860             |
| G2    | 4070             |
| G3    | 6220             |
| G4    | 2700             |
| G5    | 5300             |
| G6    | 7330             |
| G7    | 4890             |
| G8    | 8440             |
| G9    | 8000             |
| G10   | 5360             |
| G11   | 5860             |
| G12   | 8220             |
| G13   | 7720             |
| G14   | 4860             |
| G15   | 2500             |
| G16   | 3300             |
| G17   | 7200             |
| G18   | 5900             |
| G19   | 6180             |
| G20   | 8680             |
| G21   | 4320             |
| G22   | 9100             |
| G23   | 6200             |
| G24   | 7480             |
| G25   | 6320             |
| G26   | 3120             |
| G27   | 6020             |
| G28   | 9220             |
| G29   | 4820             |
| G30   | 4200             |
| G31   | 6400             |

PROJECT

PROPOSED LADIES HOSTEL.  
STRUCTURAL DRAWING

DELINEATION

STRUCTURAL LAYOUT  
PLAN OF GRADE BEAMS

CLIENT

M/S WAPCOS LTD

LOCATION

KARIYAVATTOM CAMPUS  
UNIVERSITY OF KERALA,  
THIRUVANANTHAPURAM

AREA : (sq.m)

Basement Floor : 885.50 Sqm  
Ground Floor : 1684.21 Sqm  
First Floor : 1684.21 Sqm  
Second Floor : 1684.21 Sqm  
Total : 5938.13Sqm

PROJECT NUMBER

4

GENERAL NOTE

- 1.Do not Scale Dimensions govern in drawings
- 2.All Dimensions are in Millimeter unless noted otherwise.
- 3.All dimensions shall be verified at site before proceeding the work.
- 4.All Levels are in Meters unless noted otherwise.

SIGNATURE

CLIENT CONSULTANT

STRUCTURAL CONSULTANT

**Y-Shakh  
Project Management &  
Consultancy Services**

Y- Shakh, Nalanda Nagar-97  
Thirumullavaram P.O. Kollam - 12  
e-mail: yshakhpmcs@gmail.com  
Ph: +91 9447126629  
Office: 0474-2792700

Ref.No:

YSCASE,194/2025

DATE :

07- 03- 2025

DESIGNED:

Dr M.M KHAN. Ph.D

DRAWN:

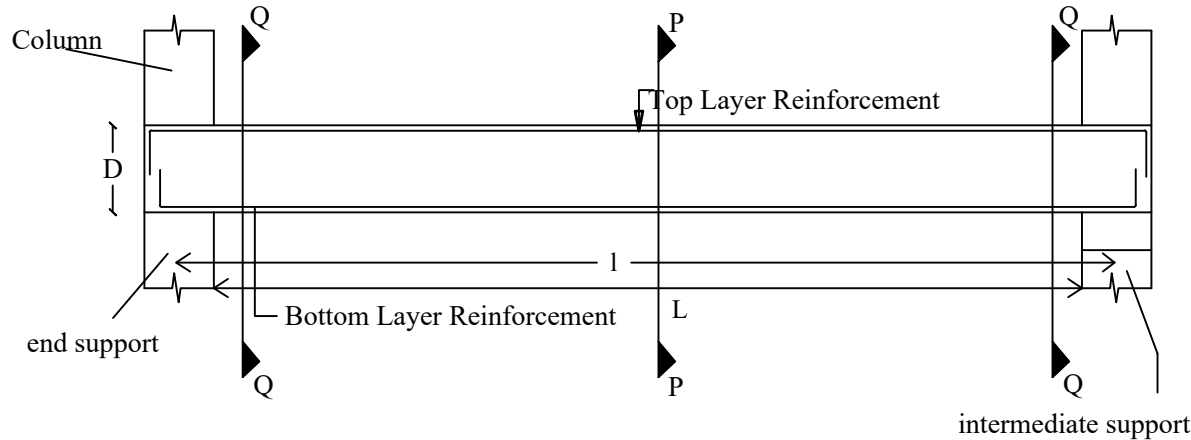
JASMINE.TOMY

PLATE NO: 08

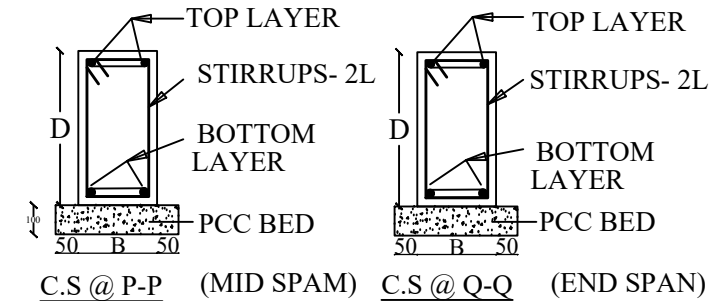
SCALE-1:100,All Dimensions are in Millimeter

## 6. STRUCTURAL DETAILS OF GRADE BEAMS - TYPICAL DESIGN CONCEPT

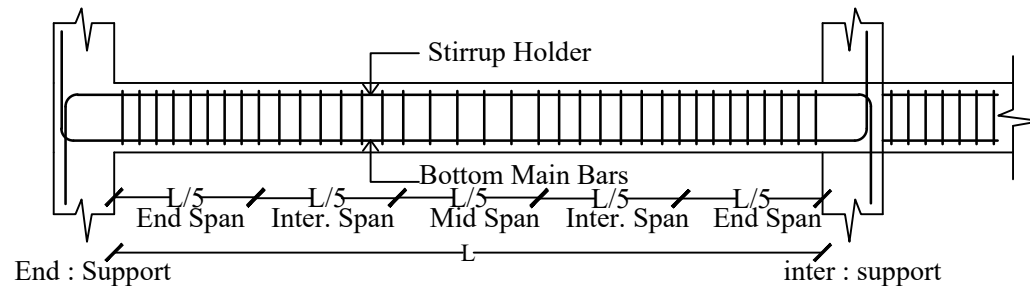
### 6.1 ARRANGEMENT OF MAIN BARS IN RAFT SLAB BEAMS



### 6.3 CROSS-SECTIONAL DETAILS



### 6.2 ARRANGEMENT OF STIRRUPS IN RAFT SLAB BEAMS



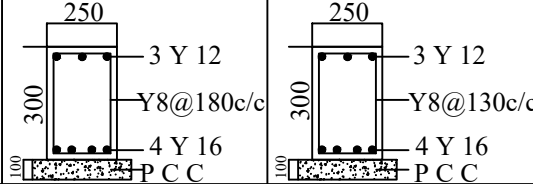
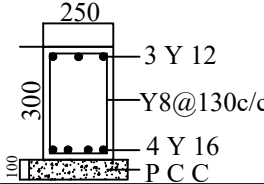
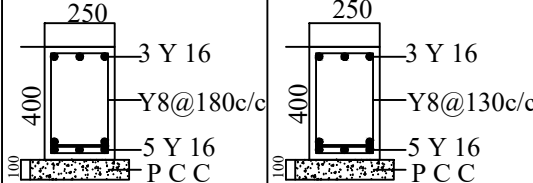
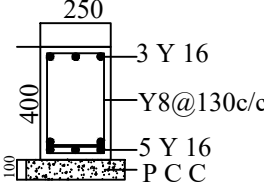
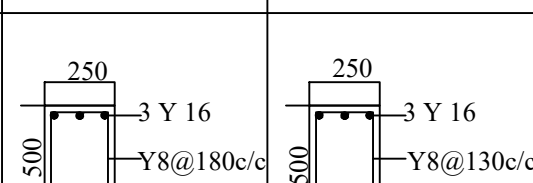
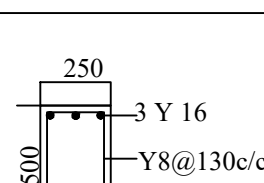
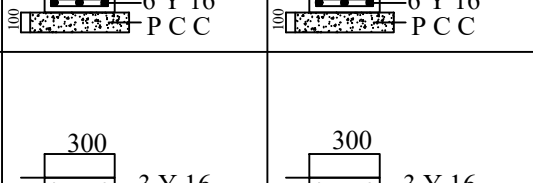
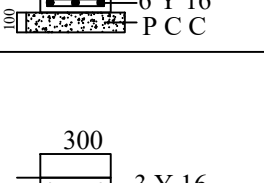
### 6.4 INDEX

- $L$  = CLEAR SPAN
- $l$  = EFFECTIVE SPAN
- $D$  = DEPTH OF BEAM
- $B$  = BREADTH OF BEAM
- GRADE OF CONCRETE : M25
- GRADE OF STEEL : Fe500
- CLEAR COVER : 25mm

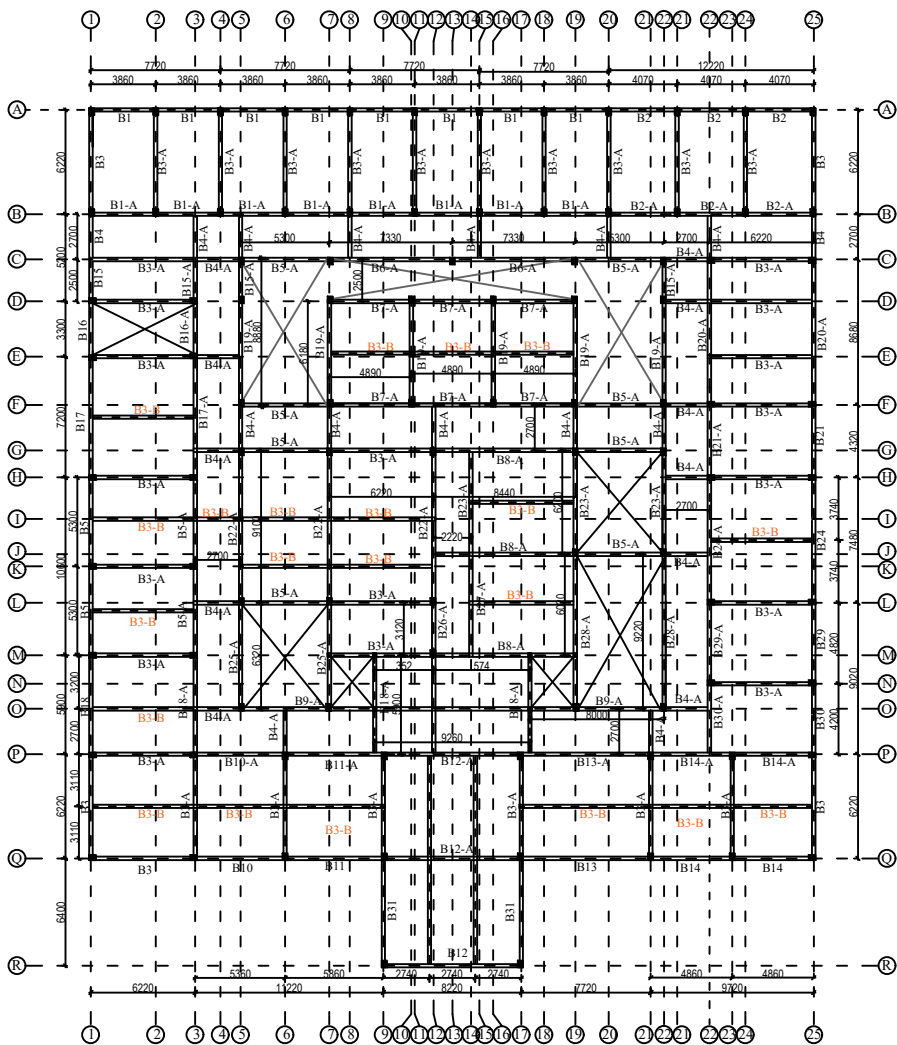
| PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING |                     |                                                                                                                                            |                          |              |                                         | STRUCTURAL CONSULTANT                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT NUMBER                                                                                                        | CLIENT              | AREA : (sq.m)                                                                                                                              | DESIGNED:                | DRAWN:       | DELINATION                              |  <b>Y-Shakh</b><br>Project Management &<br>Consultancy Services<br>Y- Shakh, Nalanda Nagar-97<br>Thirumullavaram P.O. Kollam - 12<br>e-mail: yshakhpmcs@gmail.com<br>Ph: +91 9447126629<br>Office: 0474-2792700 |
| 4                                                                                                                     | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | STRUCTURAL<br>DETAILS OF<br>GRADE BEAMS |                                                                                                                                                                                                                                                                                                      |
| Ref.No: YSCASE,194/2025                                                                                               | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                   | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 09                            |                                                                                                                                                                                                                                                                                                      |
|                                                                                                                       |                     |                                                                                                                                            |                          |              |                                         |                                                                                                                                                                                                                                                                                                      |



## 7 -SCHEDULE OF GRADE BEAMS OF THE PROPOSED PROJECT (C.S SIZE & REINFORCEMENT DETAILS)

| GROUP                                                                                                                                                                                                                                                                                                           | CLEAR<br>SPAN<br>L | C.S<br>DIMENSION<br>BXD | REINFORCEMENT DETAILS |                                                                                                                                                |                      | CRITICAL ZONES                    |                                   |                | TYPICAL SECTION                                                                      |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------|-----------------------------------|----------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                 |                    |                         | BOTTOM<br>MAIN BARS   | TOP<br>MAIN BARS                                                                                                                               | STIRRUP<br>(GENERAL) | LAP<br>Ls                         | DEVp:<br>Ld                       | CONFINED<br>L0 | MID SPAN SECTION<br>CS @ P-P                                                         | END SPAN SECTION<br>CS @ Q-Q                                                         |
| G1<br>G4<br>G15<br>G16<br>G26                                                                                                                                                                                                                                                                                   | 2500<br>to<br>3860 | 250<br>x<br>300         | 4 Y 16                | 3 Y 12                                                                                                                                         | Y8@130 to<br>180 c/c | 800mm for Y 16<br>600mm for Y 12  | 800mm for Y 16<br>600mm for Y 12  | 600mm          |   |   |
| G2<br>G5<br>G7<br>G10<br>G14<br>G21<br>G29<br>G30                                                                                                                                                                                                                                                               | 4070<br>to<br>5360 | 250<br>x<br>400         | 5 Y 16                | 3 Y 16                                                                                                                                         | Y8@130<br>to 180 c/c | 800mm for Y 16                    | 800mm for Y 16                    | 800mm          |   |   |
| G3<br>G11<br>G18<br>G19<br>G23<br>G25<br>G27<br>G31                                                                                                                                                                                                                                                             | 5860<br>to<br>6400 | 250<br>x<br>500         | 6 Y 16                | 3 Y 16                                                                                                                                         | Y8@130<br>to 180 c/c | 800mm for Y 16                    | 800mm for Y 16                    | 1000mm         |   |   |
| G6<br>G8<br>G9<br>G12<br>G13<br>G17<br>G20<br>G22<br>G24<br>G28                                                                                                                                                                                                                                                 | 7200<br>to<br>9220 | 300<br>x<br>700         | 6 Y 20                | 3 Y 16                                                                                                                                         | Y8@130<br>to 180 c/c | 1000mm for Y 20<br>800mm for Y 16 | 1000mm for Y 20<br>800mm for Y 16 | 1500mm         |  |  |
| PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING                                                                                                                                                                                           |                    |                         |                       |                                                                                                                                                |                      |                                   |                                   |                |                                                                                      | STRUCTURAL CONSULTANT                                                                |
| PROJECT NUMBER                                                                                                                                                                                                                                                                                                  |                    | CLIENT                  |                       | AREA : (sq.m)                                                                                                                                  |                      | DESIGNED:                         |                                   | DRAWN:         |                                                                                      | DELINEATION                                                                          |
| 4                                                                                                                                                                                                                                                                                                               |                    | M/S WAPCOS LTD          |                       | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm |                      | Dr M.M KHAN. Ph.D                 |                                   | JASMINE.TOMY   |                                                                                      | SCHEDULE<br>OF GRADE<br>BEAMS                                                        |
| Ref.No: YSCASE,194/2025                                                                                                                                                                                                                                                                                         |                    | DATE : 07- 03- 2025     |                       | DRAWING ARE NOT IN SCALE                                                                                                                       |                      | ALL DIMENSIONS ARE IN MM          |                                   |                |                                                                                      | PLATE NO: 10                                                                         |
| <br><b>Y-Shakh</b><br><b>Project Management &amp; Consultancy Services</b><br>Y- Shakh, Nalanda Nagar-97<br>Thirumullavaram P.O. Kollam - 12<br>e-mail: yshakhpmcs@gmail.com<br>Ph: +91 9447126629<br>Office: 0474-2792700 |                    |                         |                       |                                                                                                                                                |                      |                                   |                                   |                |                                                                                      |                                                                                      |

(ROOF BEAMS - GROUND FLOOR)



## ROOF BEAM DETAILS

|       |        |       |                     |        |
|-------|--------|-------|---------------------|--------|
| R.C.C | STEEL  | COVER | STRIPPING TIME      | CURING |
| M-25  | Fe-500 | 20 mm | Roof beam - 14 Days | 7 DAYS |

**SPECIAL NOTES:**

1. BEAMS HAVE BEEN DESIGNED INDIVIDUALLY BASED ON THEIR STRUCTURAL BEHAVIOUR AND DIFFERENT SECTION ARE PROVIDED FOR EACH BEAM. FOR PRACTICAL PURPOSE BIGGEST SECTION MAY BE PROVIDED FOR CONTINUOUS BEAMS .

| DETAILS OF ROOF BEAM |               |                 |                      |
|----------------------|---------------|-----------------|----------------------|
| Group                |               |                 | EFF: Span<br>(In mm) |
| 1.                   | B1<br>L-Beam  | B1-A<br>T-Beam  | 3860                 |
| 2.                   | B2<br>L-Beam  | B2-A<br>T-Beam  | 4070                 |
| 3.                   | B3<br>L-Beam  | B3-A<br>T-Beam  | 6220                 |
| 4.                   | B4<br>L-Beam  | B4-A<br>T-Beam  | 2700                 |
| 5.                   | B5<br>L-Beam  | B5-A<br>T-Beam  | 5300                 |
| 6.                   | –             | B6-A<br>T-Beam  | 7330                 |
| 7.                   | –             | B7-A<br>T-Beam  | 4890                 |
| 8.                   | –             | B8-A<br>T-Beam  | 8440                 |
| 9.                   | –             | B9-A<br>T-Beam  | 8000                 |
| 10.                  | B10<br>L-Beam | B10-A<br>T-Beam | 5360                 |
| 11.                  | B11<br>L-Beam | B11-A<br>T-Beam | 5860                 |
| 12.                  | B12<br>L-Beam | B12-A<br>T-Beam | 8220                 |
| 13.                  | B13<br>L-Beam | B13-A<br>T-Beam | 7720                 |
| 14.                  | B14<br>L-Beam | B14-A<br>T-Beam | 4860                 |
| 15.                  | B15<br>L-Beam | B15-A<br>T-Beam | 2500                 |
| 16.                  | B16<br>L-Beam | B16-A<br>T-Beam | 3300                 |
| 17.                  | B17<br>L-Beam | B17-A<br>T-Beam | 7200                 |
| 18.                  | B18<br>L-Beam | B18-A<br>T-Beam | 5900                 |
| 19.                  | –             | B19-A<br>T-Beam | 6180                 |
| 20.                  | B20<br>L-Beam | B20-A<br>T-Beam | 8680                 |
| 21.                  | –             | B21-A<br>T-Beam | 4320                 |
| 22.                  | –             | B22-A<br>T-Beam | 9100                 |
| 23.                  | –             | B23-A<br>T-Beam | 6200                 |
| 24.                  | B24<br>L-Beam | B24-A<br>T-Beam | 7480                 |
| 25.                  | –             | B25-A<br>T-Beam | 6320                 |
| 24.                  | –             | B26-A<br>T-Beam | 3120                 |
| 24.                  | –             | B27-A<br>T-Beam | 6020                 |
| 24.                  | –             | B28-A<br>T-Beam | 9220                 |
| 24.                  | B29<br>L-Beam | B29-A<br>T-Beam | 4820                 |
| 24.                  | B30<br>L-Beam | B30-A<br>T-Beam | 4200                 |
| 24.                  | B31<br>L-Beam | –               | 6400                 |

PROJECT

**PROPOSED LADIES HOSTEL.  
STRUCTURAL DRAWING**

## DELINEATION

### STRUCTURAL LAYOUT PLAN OF ROOF BEAMS

CLIENT

**M/S WAPCOS LTD**

LOCATION

**KARIYAVATTOM CAMPUS  
UNIVERSITY OF KERALA,  
THIRUVANANTHAPURAM**

AREA : (sq.m)

|                |               |
|----------------|---------------|
| Basement Floor | : 885.50 Sqm  |
| Ground Floor   | : 1684.21 Sqm |
| First Floor    | : 1684.21 Sqm |
| Second Floor   | : 1684.21 Sqm |
| Total          | : 5938.13Sqm  |

PROJECT NUMBER

4

GENERAL NOTE

1. Do not Scale Dimensions govern in drawings
2. All Dimensions are in Millimeter unless noted otherwise.
3. All dimensions shall be verified at site before proceeding the work.
4. All Levels are in Meters unless noted otherwise.

SIGNATURE

CLIENT

|            |
|------------|
| CONSULTANT |
|------------|

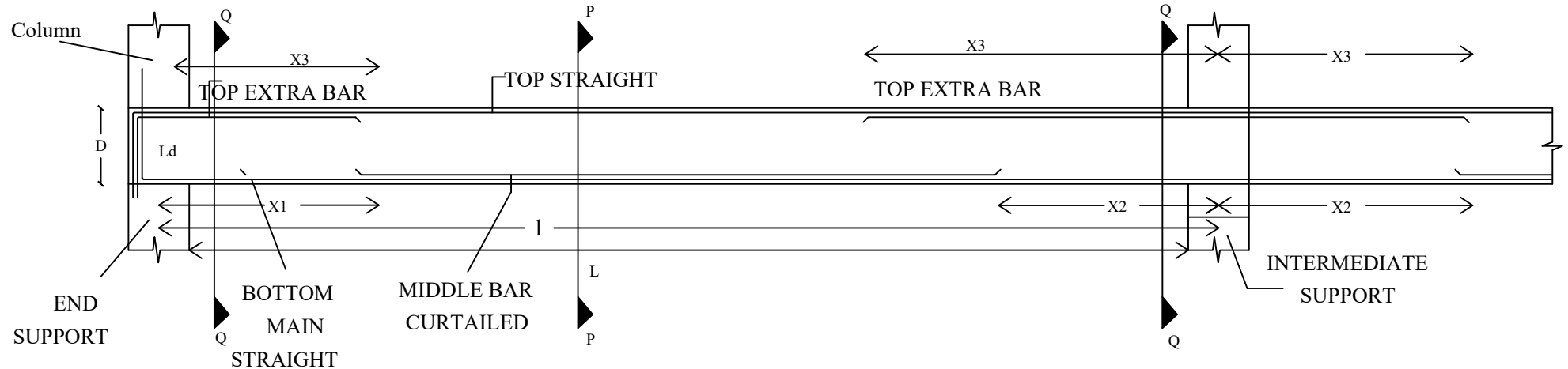
STRUCTURAL CONSULTANT



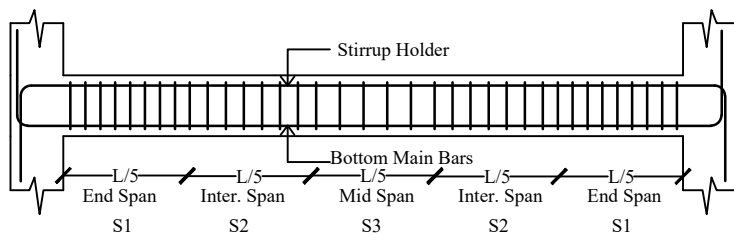
**Y- Shakkh, Nalanda Nagar-97**  
**Thirumullavaram P.O. Kollam - 12**  
**e-mail: yshakhpmcs@gmail.com**  
**Ph: +91 9447126629**  
**Office: 0474-2792700**

## 9. STRUCTURAL DETAILS OF ROOF BEAMS - TYPICAL DESIGN CONCEPT

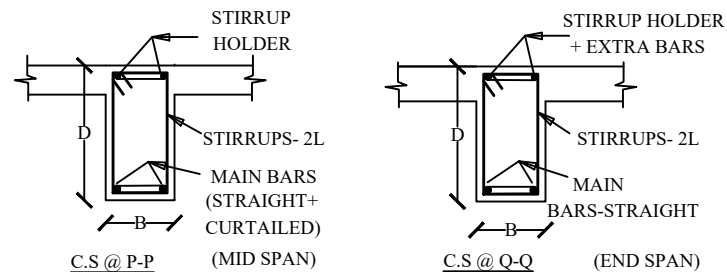
### 9-1 BEAMS - TYPICAL ARRANGEMENT OF REINFORCEMENTS IN BEAMS



### 9-2 .ARRANGEMENT OF STIRRUPS IN BEAMS-TYPICAL



### 9-3. CROSS-SECTIONAL DETAIL



**NOTE :** For end beams the section shall be L- Beam as against T- Beam

### 9.4 INDEX

L = CLEAR SPAN OF BEAM  
I = EFFECTIVE SPAN OF BEAM  
X1 = CURTAILED DISTANCE FROM END SUPPORT  
X2 = CURTAILED DISTANCE FROM INTERMEDIATE SUPPORT  
X3 = LENGTH OF EXTRA BARS AT SUPPORTS  
Ls = LAP LENGTH AT JOINTS  
Ld = DEVELOPMENT LENGTH  
L0 = SPECIAL CONFINED LENGTH FOR SEISMIC LOAD  
D = DEPTH OF BEAM  
B = BREADTH OF BEAMS  
GRADE OF CONCRETE : M25  
GRADE OF STEEL : Fe500  
CLEAR COVER : 25mm

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

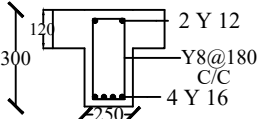
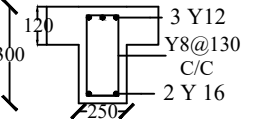
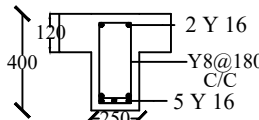
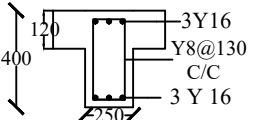
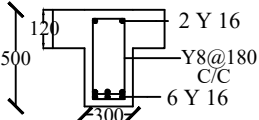
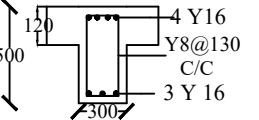
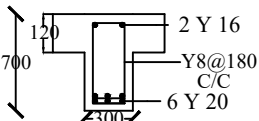
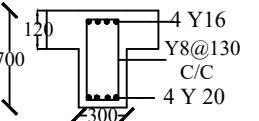
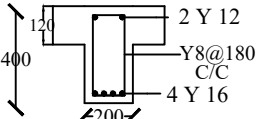
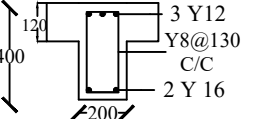
STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                              | DESIGNED:                | DRAWN:       | DELINEATION                               |
|-------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|-------------------------------------------|
| 4                       | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | REINFORCEMENT<br>DETAILS OF<br>ROOF BEAMS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                   | ALL DIMENSIONS ARE IN MM | PLATE NO: 13 |                                           |

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**10-A. SCHEDULE OF ROOF BEAMS OF THE PROPOSED PROJECT**  
**(C.S & REINFORCEMENT DETAILS OF GROUND FLOOR)**

**T - BEAM**

| GROUP                                                                               | CLEAR SPAN<br>L    | C.S<br>SIZE<br>B X D | REINFORCEMENT DETAILS        |                           |                                |              |                          | CRITICAL ZONE                                  |                                                |                | C.S @ P.P<br>MID SPAN                                                                 | C.S @ Q.Q<br>END SPAN                                                                 |
|-------------------------------------------------------------------------------------|--------------------|----------------------|------------------------------|---------------------------|--------------------------------|--------------|--------------------------|------------------------------------------------|------------------------------------------------|----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                     |                    |                      | BOTTOM<br>MIDDLE<br>STRAIGHT | BOTTOM<br>MIDDLE<br>CURT: | TOP STRT:<br>STIRRUP<br>HOLDER | TOP<br>EXTRA | STIRRUPS                 | LAPS<br>Ls                                     | DEVE:<br>LENGTH<br>Ld                          | CONFINED<br>L0 |                                                                                       |                                                                                       |
| B1-A<br>B4-A<br>B15-A<br>B16-A<br>B26-A                                             | 2500<br>to<br>3860 | 250<br>x<br>300      | 2 Y 16                       | 2 Y 16                    | 2 Y 12                         | 1 Y 12       | Y8@<br>130 to 180<br>C/C | 800 mm for<br>Y 16<br>&<br>600 mm for<br>Y 12  | 800 mm for<br>Y 16<br>&<br>600 mm for<br>Y 12  | 600mm          |    |    |
| B2-A<br>B5-A<br>B7-A<br>B10-A<br>B14-A<br>B21-A<br>B29-A<br>B30-A                   | 4070<br>to<br>5360 | 250<br>x<br>400      | 3 Y 16                       | 2 Y 16                    | 2 Y 16                         | 1 Y 16       | Y8@<br>130 TO 180<br>C/C | 800 mm for<br>Y 16<br>&<br>600 mm for<br>Y 12  | 800 mm for<br>Y 16<br>&<br>600 mm for<br>Y 12  | 800mm          |    |    |
| B3-A<br>B11-A<br>B18-A<br>B19-A<br>B23-A<br>B25-A<br>B27-A                          | 5860<br>to<br>6400 | 300<br>x<br>500      | 3 Y 16                       | 3 Y 16                    | 2 Y 16                         | 2 Y 16       | Y8@<br>130 TO 180<br>C/C | 800 mm for<br>Y 16                             | 800 mm for<br>Y 16                             | 1000mm         |    |    |
| B6-A<br>B8-A<br>B9-A<br>B12-A<br>B13-A<br>B17-A<br>B20-A<br>B22-A<br>B24-A<br>B28-A | 7200<br>to<br>9220 | 300<br>x<br>700      | 4 Y 20                       | 2 Y 20                    | 2 Y 16                         | 2 Y 16       | Y8@<br>130 TO 180<br>C/C | 800 mm for<br>Y 16<br>&<br>1000 mm for<br>Y 20 | 800 mm for<br>Y 16<br>&<br>1000 mm for<br>Y 20 | 1500mm         |   |   |
| B3-B                                                                                | 4890<br>&<br>6220  | 200<br>x<br>400      | 2 Y 16                       | 2 Y 16                    | 2 Y 12                         | 1 Y 12       | Y8@<br>130 TO 180<br>C/C | 800 mm for<br>Y 16<br>&<br>600 mm for<br>Y 12  | 800 mm for<br>Y 16<br>&<br>600 mm for<br>Y 12  | 800mm          |  |  |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

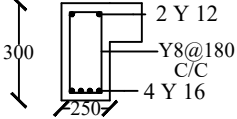
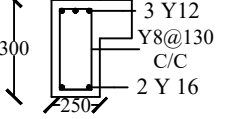
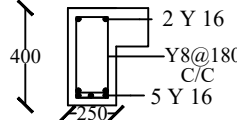
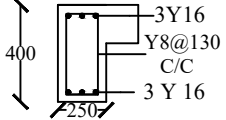
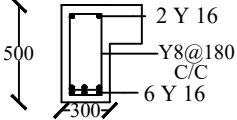
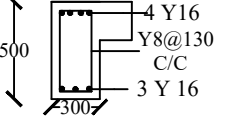
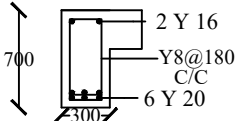
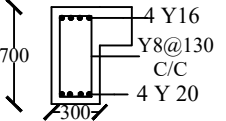
STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                                  | DESIGNED:                | DRAWN:       | DELINEATION                  |
|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|
| 4                       | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                       | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 14                 |

  
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 Office: 0474-2792700

**10-A. SCHEDULE OF ROOF BEAMS OF THE PROPOSED PROJECT**  
**(C.S & REINFORCEMENT DETAILS OF GROUND FLOOR )**

**T - BEAM**

| GROUP                                | CLEAR SPAN L | C.S SIZE B X D | REINFORCEMENT DETAILS  |                     |                          |           |                   | CRITICAL ZONE                      |                                    |             | C.S @ P.P MID SPAN                                                                   | C.S @ Q.Q END SPAN                                                                   |
|--------------------------------------|--------------|----------------|------------------------|---------------------|--------------------------|-----------|-------------------|------------------------------------|------------------------------------|-------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                      |              |                | BOTTOM MIDDLE STRAIGHT | BOTTOM MIDDLE CURT: | TOP STRT: STIRRUP HOLDER | TOP EXTRA | STIRRUPS          | LAPS Ls                            | DEVE: LENGTH Ld                    | CONFINED L0 |                                                                                      |                                                                                      |
| B1<br>B4<br>B15<br>B16               | 2500 to 3860 | 250 x 300      | 2 Y 16                 | 2 Y 16              | 2 Y 12                   | 1 Y 12    | Y8@130 to 180 C/C | 800 mm for Y 16 & 600 mm for Y 12  | 800 mm for Y 16 & 600 mm for Y 12  | 600mm       |   |   |
| B2<br>B5<br>B10<br>B14<br>B29<br>B30 | 4070 to 5360 | 250 x 400      | 3 Y 16                 | 2 Y 16              | 2 Y 16                   | 1 Y 16    | Y8@130 TO 180 C/C | 800 mm for Y 16 & 600 mm for Y 12  | 800 mm for Y 16 & 600 mm for Y 12  | 800mm       |   |   |
| B3<br>B11<br>B18<br>B31              | 5860 to 6400 | 300 x 500      | 3 Y 16                 | 3 Y 16              | 2 Y 16                   | 2 Y 16    | Y8@130 TO 180 C/C | 800 mm for Y 16                    | 800 mm for Y 16                    | 1000mm      |   |   |
| B12<br>B13<br>B17<br>B20<br>B24      | 7200 to 9220 | 300 x 700      | 4 Y 20                 | 2 Y 20              | 2 Y 16                   | 2 Y 16    | Y8@130 TO 180 C/C | 800 mm for Y 16 & 1000 mm for Y 20 | 800 mm for Y 16 & 1000 mm for Y 20 | 1500mm      |  |  |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

PROJECT NUMBER

CLIENT

AREA : (sq.m)

DESIGNED:

DRAWN:

DELINEATION

4

M/S WAPCOS LTD

Basement Floor : 885.50 Sqm  
Ground Floor : 1684.21 Sqm  
First Floor : 1684.21 Sqm  
Second Floor : 1684.21 Sqm

Dr M.M KHAN. Ph.D

JASMINE.TOMY

SCHEDULE OF ROOF BEAMS

  
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e-mail: yshakhpms@gmail.com  
Ph: +91 9447126629  
Office: 0474-2792700

Ref.No: YSCASE,194/2025

DATE : 07- 03- 2025

DRAWING ARE NOT IN SCALE

ALL DIMENSIONS ARE IN MM

PLATE NO: 14

## 11-A. STRUCTURAL DETAILS OF ROOF BEAM - SPACE MANAGEMENT OF REINFORCEMENT

| GROUP   | C.S SIZE<br>BXD | SPAN  |           | CURTAILMENT DETAILS<br>OF MAIN BARS |                            |                     | STIRRUPS SPACING  |                   |                   | STIRRUPS AT CRITICAL<br>ZONE |                         |
|---------|-----------------|-------|-----------|-------------------------------------|----------------------------|---------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------|
|         |                 | CLEAR | EFFECTIVE | FROM END<br>SUPPORT<br>X1           | FROM INT:<br>SUPPORT<br>X2 | EXTRA<br>BARS<br>X3 | END SPAN<br>S1    | INT: SPAN<br>S2   | MID SPAN<br>S3    | LAP ZONE<br>Ss               | CONFINING<br>ZONE<br>S0 |
| B1,B1A  | 250<br>X<br>300 | 3660  | 3860      | 390                                 | 580                        | 920                 | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B2, B2A | 250<br>X<br>400 | 3870  | 4070      | 400                                 | 610                        | 970                 | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B3, B3A | 300<br>X<br>500 | 6020  | 6220      | 620                                 | 940                        | 1500                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B4, B4A | 250<br>X<br>300 | 2700  | 2700      | -                                   | -                          | -                   | Y8@<br>150 mm C/C | Y8@<br>150 mm C/C | Y8@<br>150 mm C/C | Y8@<br>150 mm C/C            | Y8@<br>150 mm C/C       |
| B5, B5A | 250<br>X<br>400 | 5100  | 5300      | 530                                 | 800                        | 1280                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |

|                                                                                                                          |                        |                                                                                                                                                                          |                          |              |                              |                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT :    PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING |                        |                                                                                                                                                                          |                          |              |                              | STRUCTURAL CONSULTANT                                                                                                                                                                                                                                                                                                                            |
| PROJECT NUMBER                                                                                                           | CLIENT                 | AREA : (sq.m)                                                                                                                                                            | DESIGNED:                | DRAWN:       | DELINEATION                  | <br><b>Y-Shakh<br/>Project Management &amp;<br/>Consultancy Services</b><br><b>Y- Shakh, Nalanda Nagar-97</b><br><b>Thirumullavaram P.O. Kollam - 12</b><br><b>e-mail: yshakhpmcs@gmail.com</b><br><b>Ph: +91 9447126629</b><br><b>Office: 0474-2792700</b> |
|                                                                                                                          | M/S WAPCOS LTD         | Basement Floor : 885.50 Sqm<br>Ground Floor    : 1684.21 Sqm<br>First Floor       : 1684.21 Sqm<br>Second Floor    : 1684.21 Sqm<br><br>Total               : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |                                                                                                                                                                                                                                                                                                                                                  |
| Ref.No: YSCASE,194/2025                                                                                                  | DATE :    07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                                                 | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 16                 |                                                                                                                                                                                                                                                                                                                                                  |



## 11-B. STRUCTURAL DETAILS OF ROOF BEAM - SPACE MANAGEMENT OF REINFORCEMENT

| GROUP     | C.S SIZE<br>BXD | SPAN  |           | CURTAILMENT DETAILS<br>OF MAIN BARS |                            |                     | STIRRUPS SPACING  |                   |                   | STIRRUPS AT CRITICAL<br>ZONE |                         |
|-----------|-----------------|-------|-----------|-------------------------------------|----------------------------|---------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------|
|           |                 | CLEAR | EFFECTIVE | FROM END<br>SUPPORT<br>X1           | FROM INT:<br>SUPPORT<br>X2 | EXTRA<br>BARS<br>X3 | END SPAN<br>S1    | INT: SPAN<br>S2   | MID SPAN<br>S3    | LAP ZONE<br>Ss               | CONFINING<br>ZONE<br>S0 |
| B6A       | 300<br>X<br>700 | 7130  | 7330      | 730                                 | 1100                       | 1790                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B7A       | 250<br>X<br>400 | 4690  | 4890      | 490                                 | 740                        | 1170                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B8A       | 300<br>X<br>700 | 8240  | 8440      | 850                                 | 1270                       | 2060                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B9A       | 300<br>X<br>700 | 7800  | 8000      | 800                                 | 1200                       | 1950                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B10,B10-A | 250<br>X<br>400 | 5160  | 5360      | 540                                 | 800                        | 1290                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                                  | DESIGNED:                | DRAWN:       | DELINEATION                  |
|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|
|                         | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                       | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 17                 |


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## 11-B. STRUCTURAL DETAILS OF ROOF BEAM - SPACE MANAGEMENT OF REINFORCEMENT

| GROUP     | C.S SIZE<br>BXD | SPAN  |           | CURTAILMENT DETAILS<br>OF MAIN BARS |                            |                     | STIRRUPS SPACING  |                   |                   | STIRRUPS AT CRITICAL<br>ZONE |                         |
|-----------|-----------------|-------|-----------|-------------------------------------|----------------------------|---------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------|
|           |                 | CLEAR | EFFECTIVE | FROM END<br>SUPPORT<br>X1           | FROM INT:<br>SUPPORT<br>X2 | EXTRA<br>BARS<br>X3 | END SPAN<br>S1    | INT: SPAN<br>S2   | MID SPAN<br>S3    | LAP ZONE<br>Ss               | CONFINING<br>ZONE<br>S0 |
| B11,B11A  | 300<br>X<br>500 | 5660  | 5860      | 590                                 | 880                        | 1420                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B12,B12A  | 300<br>X<br>700 | 8200  | 8220      | 820                                 | 1230                       | 2050                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B13,B13A  | 300<br>X<br>700 | 7520  | 7720      | 770                                 | 1160                       | 1880                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B14,B14A  | 250<br>X<br>400 | 4660  | 4860      | 490                                 | 730                        | 1170                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B15,B15-A | 250<br>X<br>300 | 2300  | 2500      | 250                                 | -                          | -                   | Y8@<br>150 mm C/C | Y8@<br>150 mm C/C | Y8@<br>150 mm C/C | Y8@<br>150 mm C/C            | Y8@<br>150 mm C/C       |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                                  | DESIGNED:                | DRAWN:       | DELINEATION                  |
|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|
|                         | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                       | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 18                 |

  
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## 11-B. STRUCTURAL DETAILS OF ROOF BEAM - SPACE MANAGEMENT OF REINFORCEMENT

| GROUP     | C.S SIZE<br>BXD | SPAN  |           | CURTAILMENT DETAILS<br>OF MAIN BARS |                            |                     | STIRRUPS SPACING  |                   |                   | STIRRUPS AT CRITICAL<br>ZONE |                         |
|-----------|-----------------|-------|-----------|-------------------------------------|----------------------------|---------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------|
|           |                 | CLEAR | EFFECTIVE | FROM END<br>SUPPORT<br>X1           | FROM INT:<br>SUPPORT<br>X2 | EXTRA<br>BARS<br>X3 | END SPAN<br>S1    | INT: SPAN<br>S2   | MID SPAN<br>S3    | LAP ZONE<br>Ss               | CONFINING<br>ZONE<br>S0 |
| B16,B16A  | 250<br>X<br>300 | 3100  | 3300      | 330                                 | 500                        | 780                 | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B17,B17A  | 300<br>X<br>700 | 7000  | 7200      | 720                                 | 1080                       | 1750                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B18,B18A  | 300<br>X<br>500 | 5700  | 5900      | 590                                 | 890                        | 1430                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B19A      | 300<br>X<br>500 | 5980  | 6180      | 620                                 | 930                        | 1500                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B20,B20-A | 300<br>X<br>700 | 8480  | 8680      | 870                                 | 1300                       | 2120                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |

|                                                                                                                       |                     |                                                                                                                                                |                          |              |                              |                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING |                     |                                                                                                                                                |                          |              |                              | STRUCTURAL CONSULTANT                                                                                                                                                                                                                                                                                         |
| PROJECT NUMBER                                                                                                        | CLIENT              | AREA : (sq.m)                                                                                                                                  | DESIGNED:                | DRAWN:       | DELINEATION                  | <br><b>Y-Shakh<br/>Project Management &amp;<br/>Consultancy Services</b><br>Y- Shakh, Nalanda Nagar-97<br>Thirumullavaram P.O. Kollam - 12<br>e-mail: yshakhpmcs@gmail.com<br>Ph: +91 9447126629<br>Office: 0474-2792700 |
|                                                                                                                       | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |                                                                                                                                                                                                                                                                                                               |
| Ref.No: YSCASE,194/2025                                                                                               | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                       | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 19                 |                                                                                                                                                                                                                                                                                                               |

## 11-B. STRUCTURAL DETAILS OF ROOF BEAM - SPACE MANAGEMENT OF REINFORCEMENT

| GROUP    | C.S SIZE<br>BXD | SPAN  |           | CURTAILMENT DETAILS<br>OF MAIN BARS |                            |                     | STIRRUPS SPACING  |                   |                   | STIRRUPS AT CRITICAL<br>ZONE |                         |
|----------|-----------------|-------|-----------|-------------------------------------|----------------------------|---------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------|
|          |                 | CLEAR | EFFECTIVE | FROM END<br>SUPPORT<br>X1           | FROM INT:<br>SUPPORT<br>X2 | EXTRA<br>BARS<br>X3 | END SPAN<br>S1    | INT: SPAN<br>S2   | MID SPAN<br>S3    | LAP ZONE<br>Ss               | CONFINING<br>ZONE<br>S0 |
| B21A     | 250<br>X<br>400 | 4120  | 4320      | 430                                 | 650                        | 1030                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B22A     | 300<br>X<br>700 | 8900  | 9100      | 910                                 | 1370                       | 2230                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B23A     | 300<br>X<br>500 | 6000  | 6200      | 620                                 | 930                        | 1500                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B24,B24A | 300<br>X<br>700 | 7280  | 7480      | 750                                 | 1120                       | 1820                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B25-A    | 300<br>X<br>500 | 6120  | 6320      | 630                                 | 950                        | 1530                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                                  | DESIGNED:                | DRAWN:       | DELINEATION                  |
|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|
|                         | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                       | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 20                 |



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## 11-B. STRUCTURAL DETAILS OF ROOF BEAM - SPACE MANAGEMENT OF REINFORCEMENT

| GROUP     | C.S SIZE<br>BXD | SPAN  |           | CURTAILMENT DETAILS<br>OF MAIN BARS |                            |                     | STIRRUPS SPACING  |                   |                   | STIRRUPS AT CRITICAL<br>ZONE |                         |
|-----------|-----------------|-------|-----------|-------------------------------------|----------------------------|---------------------|-------------------|-------------------|-------------------|------------------------------|-------------------------|
|           |                 | CLEAR | EFFECTIVE | FROM END<br>SUPPORT<br>X1           | FROM INT:<br>SUPPORT<br>X2 | EXTRA<br>BARS<br>X3 | END SPAN<br>S1    | INT: SPAN<br>S2   | MID SPAN<br>S3    | LAP ZONE<br>Ss               | CONFINING<br>ZONE<br>S0 |
| B26-A     | 250<br>X<br>300 | 2920  | 3120      | 310                                 | 470                        | 730                 | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B27A      | 300<br>X<br>500 | 5820  | 6020      | 600                                 | 900                        | 1460                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B28A      | 300<br>X<br>700 | 9020  | 9220      | 920                                 | 1380                       | 2260                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B29,B29A  | 250<br>X<br>400 | 4620  | 4820      | 480                                 | 720                        | 1160                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B30,B30-A | 250<br>X<br>400 | 4000  | 4200      | 420                                 | 630                        | 1000                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |
| B31       | 300<br>X<br>500 | 6200  | 6400      | 640                                 | 960                        | 1550                | Y8@<br>130 mm C/C | Y8@<br>160 mm C/C | Y8@<br>180 mm C/C | Y8@<br>100 mm C/C            | Y8@<br>80 mm C/C        |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

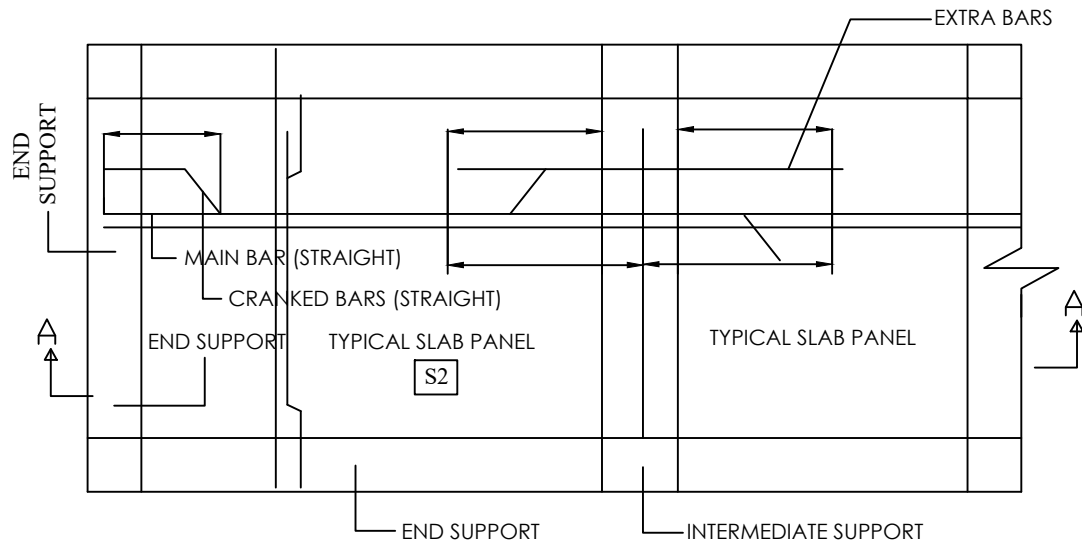
STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                                  | DESIGNED:                | DRAWN:       | DELINEATION                  |
|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------------|
|                         | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br><br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE<br>OF ROOF<br>BEAMS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                       | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 20                 |

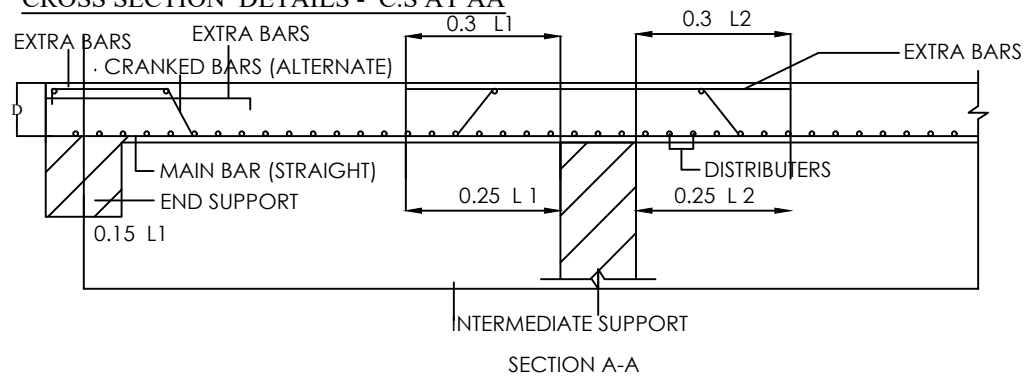

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## 12 . STRUCTURAL DETAILS OF ROOF SLABS

### 12.1 STRUCTURAL DETAILS OF TWO WAY SLAB-TYPICAL



### 12.2 CROSS SECTION DETAILS - C.S AT AA



### 12.3 DESIGN DETAILS OF ROOF SLAB OF PROPOSED PROJECT

- |                              |                                                                              |
|------------------------------|------------------------------------------------------------------------------|
| 1. THICKNESS OF SLAB         | - 130 MM                                                                     |
| 2. DESIGN MIX CONCRETE       | - M25                                                                        |
| 3. GRADE OF REINFORCEMENT    | - Fe - 500 D                                                                 |
| 4. CLEAR COVER               | - 25 mm                                                                      |
| 8. CRANKED BARS              | - EVERY ALTERNATE BARS                                                       |
| 9. CRANKED DISTANCE          | - 0.05L FROM CENTER OF END SUPPORTS<br>&<br>0.25L FROM INTERMEDIATE SUPPORTS |
| 10. LENGTH OF EXTRA BARS TOP | - 0.3L FROM EACH SUPPORT                                                     |

PROJECT : PROPOSED LADIES HOSTEL AT KARIYAVATTOM CAMPUS, UNIVERSITY OF KERALA, THIRUVANANTHAPURAM. STRUCTURAL DRAWING

STRUCTURAL CONSULTANT

| PROJECT NUMBER          | CLIENT              | AREA : (sq.m)                                                                                                                              | DESIGNED:                | DRAWN:       | DELINEATION            |
|-------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|------------------------|
|                         | M/S WAPCOS LTD      | Basement Floor : 885.50 Sqm<br>Ground Floor : 1684.21 Sqm<br>First Floor : 1684.21 Sqm<br>Second Floor : 1684.21 Sqm<br>Total : 5938.13Sqm | Dr M.M KHAN. Ph.D        | JASMINE.TOMY | SCHEDULE OF ROOF SLABS |
| Ref.No: YSCASE,194/2025 | DATE : 07- 03- 2025 | DRAWING ARE NOT IN SCALE                                                                                                                   | ALL DIMENSIONS ARE IN MM |              | PLATE NO: 21           |

  
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